CALVARY CHAPEL BEAUMONT EXPANSION PROJECT

DRAFT

INITIAL STUDY - MITIGATED NEGATIVE DECLARATION (IS - MND)

January 14, 2026

Lead Agency:

City of Beaumont
Planning Department
550 E. 6th Street
Beaumont, CA 92223

Prepared by:

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CITY OF BEAUMONT
DRAFT INITIAL STUDY

ENVIRONMENTAL CHECKLIST FORM

1. Project Title: Calvary Chapel Church Expansion Project – CUP2023-0074

2. Lead Agency Name and Address: City of Beaumont, 550 E. 6th Street, Beaumont, CA 92223

3. Contact Person and Phone Number: Melody Arechiga, (951) 769-8520 ext. 369

4. Project Location: 1780 Orchard Heights Avenue, APN: 408-070-012.

5. Project Sponsor's Name and Address: Calvary Chapel Beaumont, 1780 Orchard Heights Avenue, Beaumont, CA 92223.

6. General Plan Designation: Low Density Residential

7. Zoning: Residential Single Family (RSF)

8. Description of the Project: The proposed Project includes a Conditional Use Permit for the expansion of the existing Calvary Chapel Beaumont institutional facility at the subject 5.49-acre parcel. The Project site is located at 1780 Orchard Heights Avenue (APN: 408-070-012), which is at the southeast corner of Orchard Heights Avenue and Brookside Avenue, and approximately 2,000 feet west of Highland Springs Avenue. The site currently operates as a church facility that features a 3,000 square-foot sanctuary building, outdoor baptismal, outdoor picnic/patio area, one (1) modular restroom building, five (5) modular classroom buildings, landscaping, and parking improvements. There are portions of the site that remain undeveloped; however, those areas have been disturbed as a result of annual discing and other human activities. The proposed Calvary Chapel Beaumont Expansion will include a new 11,000 square-foot sanctuary building, a 5,000 square-foot children's ministry center, a 7,700 square-foot youth recreation center and multipurpose building, a new baptismal area, two (2) sports court facilities, and an outdoor barbecue area. No demolition is proposed as the project was designed to accommodate the existing parking improvements, and the structures that are to be removed are modular and do not require demolition. Vehicular access to the Project site is provided by a driveway approach on Orchard Heights Avenue and a second approach on Brookside Avenue. An internal drive aisle will allow adequate circulation for pedestrian, vehicular, and emergency access. A total of 216 parking spaces are proposed and the new concrete and pavement area will total 118,000 square feet. The landscaping provided by the Project will total 76,357 square feet.

   The proposed Project will connect to existing infrastructure within Brookside Avenue and Orchard Heights Avenue, where all necessary utility mains are located. Potable water service will be provided by the Beaumont-Chery Valley Water District (BCVWD) through an existing 12-inch water line within Brookside Avenue that currently services the site through a domestic water meter, and the Project also proposes a new 2-inch line to distribute water to the new buildings as well as a separate line for newly irrigated areas. Fire protection will be provided through a dedicated line connected to the 12-inch main, circulating throughout the site beneath the drive aisle. Sewer service will be provided by the City of Beaumont, and it already services the site through an 8-inch sewer line in Brookside Avenue. Existing sewer improvements onsite include sewer inverts, a lift station on the southwest side of the property,

and a 6-inch sewer line extending from the existing worship center to the main line. The Project proposes a new 6-inch sewer line to connect the proposed Buildings A and B to the sewer system, running east to west onsite, and no off-site improvements are necessary. Electrical service is currently provided by Southern California Edison (SCE). No new connections to natural gas are proposed and telecommunications infrastructure is already in place that adequately service the site with no upgrade or extensions required. Stormwater will be managed on-site through a detention basin located at the southwestern corner of the property. The basin will detain and treat runoff in compliance with City's engineering standards and the prepared WQMP before discharging into the existing public storm drain system, and all utility construction will occur onsite or within previously disturbed rights-of-way.

Prior to the current Project proposal, the site that had been previously improved/disturbed due to the construction of the Calvary Chapel Beaumont church facility that concluded in 2014 and from ongoing maintenance of the facility since. The existing facility was approved with Conditional Use Permit 05-CUP-01 and Negative Declaration No. 05-ND - a 3,000 square-foot sanctuary building, outdoor baptismal, outdoor picnic/patio area, landscaping, and parking improvements. According to historic aerials, prior to 2006 the subject property remained vacant with no notable land use activity.

Operations for the proposed Calvary Chapel Beaumont Expansion Project will consist of worship services that are held throughout the week. One service is held on Wednesday nights at 6:30 pm and four services are held throughout Sunday at 8:00 am, 9:45 am, 11:30 am, and 1:30 pm. The youth recreation center will maintain the same hours of operation as the regularly scheduled worship services on Wednesdays and Sundays. Lifegroups, such as bible studies, are held at various times throughout the week in a small group setting. Each service and lifegroup session typically last an hour. In addition to worship services and lifegroups, the facility will employ at least two full-time staff and five part-time staff to be available for office hours as well as support general church functions. Staff members are present on site from 10:00 am to 4:00 pm Monday through Friday and during worship services.

9. Surrounding Land Uses and Setting: Surrounding uses are one- to two-story single-family residences within an urbanized area.

10. Other public agencies whose approval is required (e.g. permits, financing approval, or participation agreement): None

11. Have California Native American tribes traditionally and culturally affiliated with the Project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of the significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?: The City of Beaumont, as Lead Agency, will initiate formal notification and consultation with traditionally and culturally affiliated California Native American tribes in accordance with Public Resources Code section 21080.3.1 (AB 52). As of the preparation of this Initial Study, tribal consultation has been completed and no further action is necessary beyond the established Mitigation Measures contained herein. Further, the Project's Cultural Resources Assessment included a Sacred Lands File search, which returned no known sensitive resources within the Project site. To ensure adequate protection of potential tribal cultural resources, Mitigation Measures MM-CUL-1 thru 4 have been incorporated into the Project. These measures require the presence of Native American and archaeological monitors during ground-disturbing activities, appropriate treatment of inadvertently discovered resources, and proper consultation protocols. Implementation of these measures will ensure that tribal cultural resources are adequately protected, consistent with CEQA Guidelines and AB 52 requirements, and impacts are reduced to less than significant with mitigation. To be updated once consultation has been completed.

Figure 1. Regional Location



Figure 2. Project Location



Figure 3. Site Plan

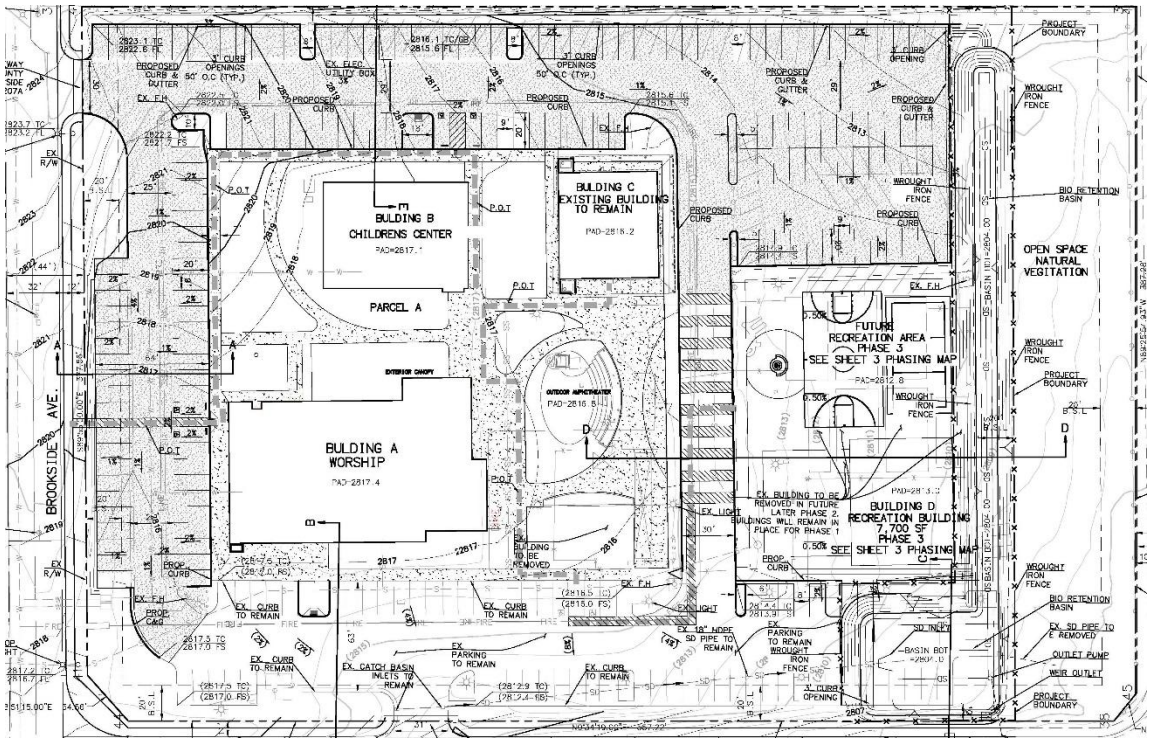


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INTRODUCTION

This section explains the background and purpose of this Mitigated Negative Declaration (MND), which is the environmental review document prepared pursuant to the provisions of the California Environmental Quality Act (CEQA) for a Conditional Use Permit to expand the existing Calvary Chapel Beaumont institutional facility with 29,000 square feet of total building area including both new and existing structures.

It establishes the context and scope for the MND and outlines the process for reviewing the Draft MND and issuing the Final MND. The City of Beaumont is the lead agency under CEQA. A "lead agency" is defined by Section 21067 of CEQA as "the public agency which has the principal responsibility for carrying out or approving a project which may have a significant effect upon the environment."

ENVIRONMENTAL REVIEW PROCESS

This IS and Notice of Intent (NOI) to adopt a MND is being circulated for agency and public review and comment for 30 days beginning February 12th, 2026. All written comments must be received by 5 p.m. March 11th, 2026. Written comments or questions concerning this document should be directed to:

City of Beaumont
ATTN: Melody Arechiga
Senior Planner
marechiga@beaumontca.gov
(951) 769-8520 ext. 369
City of Beaumont
550 E. 6th Street
Beaumont, CA 92223

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below (■) would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

	Aesthetics		Greenhouse Gases		Public Services
	Agricultural Resources		Hazards & Hazardous Materials		Recreation
	Air Quality		Hydrology/Water Quality		Transportation/Traffic
	Biological Resources		Land Use/Planning		Tribal Resources
	Cultural Resources		Mineral Resources		Utilities/Service Systems
	Energy		Noise		Wildfire
	Geology/Soils		Population/Housing		Mandatory Findings of Significance

DETERMINATION:
(To be completed by the Lead Agency)

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	
I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	X
I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	
I find that the proposed project MAY have a "potential significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.	
I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.	

Signature Date

Printed Name For

EVALUATION OF ENVIRONMENTAL IMPACTS

1) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

2) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

3) Must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Potentially Significant Unless Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section 17, "Earlier Analysis," may be cross-referenced).

5) Earlier analysis may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(d). In this case, a brief discussion should identify the following:

   (a) Earlier Analysis Used. Identify and state where they are available for review.

   (b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   (c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g. general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The analysis of each issue should identify: (a) the significance criteria or threshold used to evaluate each question; and (b) the mitigation measure identified, if any, to reduce the impact to less than significance.

AESTHETICS

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
1. **AESTHETICS.** Would the project:				
a) Have a substantial adverse effect on a scenic vista?				**X**
b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?				**X**
c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?				**X**
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			**X**	

a) Have a substantial adverse effect on a scenic vista?

The Project site is located at the southwest corner of Brookside Ave and Orchard Heights Ave, which is generally south of Brookside Ave, east of Orchard Heights Ave, north of Norman Rd, and west of Maureen Dr. corner of Orchard Heights Ave. The Project site is improved with an existing church facility and is surrounded by one- and two-story residential dwellings to the north, east, south and west. The surrounding topography is generally flat and the subject property does not contain any significant or defining features. Additionally, per the Beaumont General Plan, the Project is not located adjacent to or within the vicinity of a designated scenic vista, viewshed, corridor, or any significant natural features. Therefore, the Project would not have a substantial adverse effect on a scenic vista, and as such, no impact would occur.

b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?

As stated above, the Project site is improved with an existing church facility and is surrounded by one- and two-story single-family residential dwellings. The Project would generally be compatible with the surrounding neighborhood in both scale and visual attributes. Per the Caltrans Scenic Highway Program, there are no officially designated or eligible state scenic highways within the City of Beaumont. The closest State Scenic Highway is Route 243 located approximately 6 miles southeast of the Project site. Additionally, the Project site does not contain any notable visual features such as mature trees, rock outcroppings, or historic structures that would qualify as scenic resources; therefore, the Project would not result in any damage to scenic resources within a State Scenic Highway corridor and no impact would occur.

c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

The Project site is located within an urbanized area of the City of Beaumont and is zoned Residential Single Family (RSF), which allows single-family residential development and various institutional uses such as a church. The Project is compatible with the applicable zoning designation for the site, would not introduce structures that would contrast with existing development within the Project Vicinity in terms of scale, massing, architectural style, and land use intensity. Furthermore, both the site and architectural designs would comply with the City established design guidelines including landscaping, building materials, and visual screening where applicable. As a result, the Project would not degrade the visual quality of public views or conflict with applicable zoning and other regulations governing scenic quality. No impact would occur.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Additional lighting would occur with the expansion of the existing church facility; however, all lighting associated with the Project would comply with the City of Beaumont lighting and performance standards and the City's requirements to illuminate the Project site without compromising views or producing undue light or glare. Additionally, all lights used in conjunction with the Project would be shielded and/or hooded to direct light away from adjacent properties and public right-of-way. The Project would comply with the City of Beaumont's Municipal Code Chapter 8.50 Outdoor Lighting to reduce light pollution generated by outdoor lighting. The proposed Project would not create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area, and, therefore, the impact would be less than significant.

AGRICULTURAL RESOURCES

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
2. **AGRICULTURE RESOURCES**: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency to non-agricultural use?				**X**
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				**X**
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?				**X**
d) Result in the loss of forest land or conversion of forest land to non-forest use?				**X**
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				**X**

a) Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency to non-agricultural use?

The California Department of Conservation, Important Farmland Finder, identifies the Project site is as Urban and Built-Up Land (CDC, 2020), which includes areas occupied. The property is not designated as containing any Prime Farmland, Unique Farmland, or Farmland of Statewide importance. Further, the Project site had previously been developed for a church facility that is still in operation and there are no current or historical agricultural activities on-site. As such, the proposed improvements to the Project site would not convert farmland to a non-agricultural use, and no impact would occur.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

The Project site is not zoned for agricultural uses and is not identified in the City of Beaumont's General Plan as a site designated for agricultural purposes. The subject property is zoned Residential Single Family (RSF), which allows for single-family residential and limited institutional uses, such as a church, and is not intended to facilitate broad-scale agricultural operations. Per Table 17.3-3 of the City of Beaumont Development Code, the RSF zone permits only limited agricultural uses as accessory activities such as accessory animal raising; however, in contrast, the Residential Rural (RR) zone permits broad range of agricultural uses both conditionally and by right that include, but are not limited to, commercial animal keeping, dairies, stables, and apiaries. This distinction highlights that the RSF zone does not support or encourage agricultural land uses at a commercial or production scale. Additionally, per the California Department of Conservation's Williamson Act Lands Map there are no active Williamson Act contracts for the proposed Project site, and thus, no impact would occur from conflicts with existing zoning for agricultural use or conflicts with a Williamson Act contract.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

As described in the previous response, the Project is zoned Residential Singel Family (RSF) and developed for urban uses. The Project is not located within any known forest land or timberland, and would, therefore, result in no impact.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

A**s** described in the previous responses, the Project area is not zoned for forest use and is void of any forest land. Thus, the Project would not result in the loss of forest land or conversion of forest land to non-forest use, and no impact would occur.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

The subject property is currently improved with a church facility and is designated "Urban and Built-Up Land" with no portions of the property being used for agricultural purposes or subject to a Williamson Act's contract. Further, no portions of the property or immediate area are located within a forest area. Thus, implementation of the Project would not result in the conversion of farmland to non-agricultural use or forest land to non-forest use, and no impact would occur.

AIR QUALITY

Environmental Setting

Both the U.S Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common air pollutants including 6 criteria pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO2), lead (Pb), and suspended particulate matter (PM). Additionally, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Ambient air quality standards are designed to maintain safe levels to avoid adverse health effects associated with long-term exposure to pollutants. CARB divides the state into air basins. Additionally, they are responsible for setting emission thresholds and designate areas as attainment, nonattainment, or unclassified for all state standards. The United States Environmental Protection Agency (EPA) requires areas that do not meet National Ambient Air Quality Standards (NAAQS) to prepare a State Implementation Plan (SIP), with the goal of reducing emissions as prescribed by the Clean Air Act (CAA).

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
3. **AIR QUALITY:** Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?			**X**	
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?			**X**	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			**X**	
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			**X**	

a) Conflict with or obstruct implementation of the applicable air quality plan?

The Project is located in the South Coast Air Basin (SCAB), which is under the South Coast Air Quality Management District's (SCAQMD) jurisdiction and is responsible for comprehensive air pollution control within the basin. The SCAB is designated as a federal and state non-attainment area for several criteria air pollutants such as ozone (O_3), carbon monoxide (CO), and suspended particulate matter (PM_{10} and $PM_{2.5}$). The SCAQMD and the Southern California Association of Governments (SCAG) are responsible for preparing the Air Quality Management Plan (AQMP), which addresses federal and state Clean Air Act (CAA) requirements. SCAQMD and SCAG use regional growth projections derived from General Plan and zoning information provided by local jurisdictions to prepare the AQMP. Per the CEQA Air Quality Handbook (1993), a project is consistent with the SCAQMD's 2022 AQMP if the project would not increase the frequency or severity of an air quality standards violation or cause a new violation and is consistent with the growth assumptions in the AQMP. Projects consistent with the underlying General Plan designation used in the AQMP are presumed to not conflict with the Plan.

An Air Quality Impact Report prepared by LSA demonstrates that although the Project would result in short-term construction and operational pollutant emissions, the Project would not result in the generation of criteria air pollutants that would exceed SCAQMD thresholds of significance. The Project's construction and operational emissions are further described in response b, along with corresponding tables. The Project would not result in an increase in the frequency or severity of an air quality standards violation or cause a new air quality standards violation.

Per the CEQA Air Quality Handbook, consistency with the AQMP growth assumptions must be analyzed for new or amended General Plan elements, Specific Plans, and regionally significant projects. Significant projects include airport, electrical generating facilities, petroleum and gas refineries, designation of oil drilling districts, water ports, solid waste disposal sites, and offshore drilling facilities; thus, the Project is not defined as a significant project. Furthermore, as

previously stated in the project description, the Project is consistent with the existing General Plan land use designation of Single Family Residential and Residential Single Family (RSF) Zoning. Per Section 17.03.060 of the Beaumont Development Code, the RSF Zone, "is intended to protect established neighborhoods of one-family dwellings and to provide space in suitable locations for additional residential, single-family development. To increase access to shopping, services, and amenities, the RSF Zone allows for limited, appropriately located neighborhood supporting uses I specific locations." Church facilities are identified as a permitted neighborhood-supporting use within the RSF Zone subject to a Conditional Use Permit, and the Project does not require a General Plan Amendment or Zone Change or introduce growth beyond what was anticipated by the Beaumont General Plan or the AQMP. As such, the proposed Project would not conflict with or obstruct implementation of the AQMP, which should be considered a less than significant impact.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

The Project is located in the SCAB, which is under SCAQMD jurisdiction and is responsible for implementing air pollution control strategies within SCAB. SCAB is designated as a federal and state non-attainment area for air pollutants such as ozone, carbon monoxide, and suspended particulate. SCAQMD has established daily mass thresholds to assess the significance of regional area pollutants from individual projects. If a project's construction or operational emissions exceed any of the thresholds would have both an individual and cumulatively significant air quality impact; conversely, any project whose daily emissions do not exceed any of the thresholds, would be considered to have less than a significant impact. on the analysis provided by the Air Quality Report Project's construction and operational emissions thresholds are listed in Table AQ-1.

Table AQ-1: SCAQMD Regional Daily Emissions Thresholds

Pollutant	Construction (lbs /day)	Operations (lbs /day)
VOC's	75	55
No_x	100	55
CO	550	550
SO_x	150	150

Construction activities would include site preparation, grading, building construction paving, and architectural coating. Furthermore, during construction activities, the Project would adhere to SCAQMD Rule 403 – Fugitive Dust, which requires the Project to implement appropriate dust control measures at each phase of construction. Per Rule 403, appropriate dust control measures include, but are not limited to, sufficient water spraying techniques to prevent dust plumes, utilize wheel sashing system – such as a shake plate – to remove dirt and debris from vehicles exiting the site, maintain cover over exposed areas, and the application to soil binders to exposed/uncovered areas. Further, the Project would be required to adhere to Project Conditions of Approval, the Uniform Building Code, Building Energy Efficiency Standards, and other applicable SCAQMD rules pertaining to criteria pollutants. As such, the impacts from the net increase of any criteria pollutant by the proposed Project would be less than significant.

As shown in Table AQ-2, CalEEMod results indicate that construction emissions would not exceed SCAQMD regional thresholds. Therefore, emissions from construction activities would not be cumulatively considerable, and impacts would be less than significant.

Table AQ-2: Short-term Regional Construction Emissions

Construction Phase	Maximum Daily Regional Pollutant Emissions (lbs/day)							
	VOCs	NO_x	CO	SO_x	Fugitive PM_{10}	Exhaust PM_{10}	Fugitive $PM_{2.5}$	Exhaust $PM_{2.5}$
Site Preparation	1.2	39.9	29.7	<0.1	7.9	1.1	4.0	1.0
Grading	0.8	24.0	19.1	<01.	3.1	0.8	1.4	0.7
Building Construction	0.7	19.2	15.5	<0.1	0.3	0.7	<0.1	0.6
Paving	0.8	16.0	13.9	<0.1	0.3	0.7	0.1	0.6

Architectural Coating	4.3	1.1	1.2	<0.1	<0.1	0.1	<0.1	<0.1
Peak Daily Emissions	**5.0**	**39.9**	**29.7**	**<0.1**	**9.0**		**5.0**	
SCAQMD Threshold	75.0	100.0	550.0	150.0	150.0		55.0	
Significant	**No**	**No**	**No**	**No**	**No**		**No**	

Operation of the Project would result in long-term regional emissions of air pollutant emissions associated with mobile sources (e.g., vehicle trips), energy sources (e.g., natural gas), area sources (e.g., architectural coatings, landscaping applications), and off-road sources (e.g., forklifts). The majority of operational emissions would be generated from vehicular emissions. As shown in Table AQ-3, CalEEMod results indicate that long term operational emissions associated with the Project would not exceed the SCAQMD's applicable thresholds. Therefore, operation of the Project would not result in a cumulatively considerable net increase of any criteria pollutant impact, and operational impacts would be less than significant.

Table AQ-3: Operational Emissions

Emission Type	VOCs	NO_x	CO	SO_x	PM_{10}	PM_{10}
Mobile Sources	0.4	0.6	4.9	<0.1	1.1	0.3
Area Sources	1.2	<0.1	1.6	<0.1	<0.1	<0.1
Energy Sources	<0.1	0.4	0.3	<0.1	<0.1	<0.1
Total Project Emissions	**1.6**	**1.0**	**6.8**	**<0.1**	**1.1**	**0.3**
SCAQMD Thresholds	55.0	55.0	550.0	150.0	150.0	55.0
Significant	**No**	**No**	**No**	**No**	**No**	**No**

c) Expose sensitive receptors to substantial pollutant concentrations?

The SCAQMD's Final Localized Significance Threshold Methodology (SCAQMD 2008) recommends that all air quality analyses include the evaluation of air quality impacts to nearby sensitive receptors. Sensitive receptors can include residences, schools, hospitals, playgrounds, childcare centers, and athletic facilities. This evaluation is referred to as a localized significance threshold (LST) analysis which was used to analyze potential localized air quality impacts associated with construction of the Project. LST's are based on the ambient concentrations of No_x, CO, PM_{10}, and $PM_{2.5}$ pollutants within the Project Source Receptor Area (SRA). The Project is located in the Banning Airport (SRA-29). SCAQMD provides LST screening tables for 25, 50,100,200, and 500-meter source receptor distances. The closest sensitive receptors to the Project are the single-family residences located immediately east of the project site, approximately 16 feet away. When receptors are closer than 25 meters, buffer zones can be used. As such, 25 meters was used for the purpose of the LST assessment. Maximum daily disturbed acreage for the Project was calculated based on the anticipated construction equipment at 2.5 acres. The Project is 5.49 acres; therefore, the 5-acre thresholds were also used for operation of the Project. As shown in Table AQ-4 and Table AQ-5, the Project's localized construction and operational emissions would not exceed the applicable SCAQMD LSTs for emissions of any criteria pollutant. Therefore, the Project would not result in a localized air quality impact and impacts would be less than significant.

Table AQ-4: Localized Construction Emissions

Source	Pollutant Emissions (lbs/day)			
	No_x	CO	Total PM_{10}	Total $PM_{2.5}$
On-Site Project Emissions	39.9	28.3	8.8	5.0
Localized Significance Threshold	164.0	1,754.0	12.0	6.8
Exceeds Threshold	No	No	No	No

Table AQ-5: Localized Operational Emissions

Source	Pollutant Emissions (lbs/day)			
	No_x	CO	Total PM_{10}	Total $PM_{2.5}$

On-Site Project Emissions	0.4	2.1	0.1	<0.1
Localized Significance Threshold	242.0	2,969	8.0	3.2
Exceeds Threshold	No	No	No	No

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The threshold for odor is identified by SCAQMD Rule 402 that states: "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or to the public, or which cause, or have a natural tendency to cause, injury or damage to business or property." The proposed Project would not include any activities or operations that would generate objectionable odors. During construction of the Project there may be releases of odor and emissions resulting from asphalt/paving, architectural coating, and similar site or building improvements. However, these odors would be short term, intermittent in nature, and limited within the Project vicinity. Therefore, construction activities would not result in significant levels of odors or other emissions affecting a substantial number of people, and impacts generated by the Project in this regard would be less than significant.

BIOLOGICAL RESOURCES

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
4. **BIOLOGICAL RESOURCES**. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?				X
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?		X		

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service

A comprehensive Biological Resources Assessment (BRA) and MSHCP Consistency Analysis was prepared by LSA Associates, Inc. for the proposed Calvary Chapel Beaumont Expansion Project. These studies were completed in accordance with CEQA Guidelines and the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) protocols. The approximately 5.5-acre project site is located in a disturbed and previously developed area, consisting of compacted dirt, non-native grassland, landscaped surfaces, pavement, and various structures. Despite its urbanized character, the site was carefully evaluated for all applicable biological resources, including special-status wildlife, plant species, vernal pool and aquatic invertebrates, riparian and riverine habitat, and species-specific survey requirements under the MSHCP. The site was determined not to support habitat for the vast majority of special-status species considered. A focused review of vernal pool species and aquatic invertebrates concluded that the single on-site depression (Feature F-1) is a manmade water quality basin that does not exhibit the hydrology, vegetation, or soil characteristics necessary to support fairy shrimp species such as *Branchinecta lynchi*, *Streptocephalus woottoni*, or *Linderiella santarosae*, nor does it meet the criteria for vernal pool classification under MSHCP Section 6.1.2. Similarly, amphibian species were ruled out due to the absence of any natural hydrological features or moist microhabitats, and the site is not within an amphibian survey area.

The project area also lacks any riparian or riverine vegetation, emergent wetland species, or linear drainage features, and therefore does not provide habitat for riparian or migratory bird species such as the Least Bell's Vireo (*Vireo bellii pusillus*), Southwestern Willow Flycatcher (*Empidonax traillii extimus*), or Yellow-Billed Cuckoo (*Coccyzus americanus*). The Delhi Sands Flower-Loving Fly (*Rhaphiomidas terminatus abdominalis*) was ruled out based on the absence of Delhi series soils, which are required for its survival and reproduction. Additionally, the project site lies within the boundaries of the Stephens' Kangaroo Rat Habitat Conservation Plan (SKR HCP), but due to the heavily disturbed nature of the site and the absence of native shrubland or friable soils, no suitable habitat for Stephens' kangaroo rat (*Dipodomys stephensi*) was identified. While the species is not expected to occur, the applicant will nonetheless comply with the SKR HCP through the payment of required mitigation fees.

With respect to plant resources, the site is located within MSHCP Narrow Endemic Plant Species Survey Area 8 (NEPSSA 8), which requires evaluation for *Dudleya multicaulis* (many-stemmed dudleya) and *Allium marvinii* (Marvin's onion). The BRA confirms that the site does not support the clay soils or ecological conditions required for these species, and no individuals were observed during field surveys. As a result, focused surveys were not necessary. The site was also evaluated for potential impacts to MSHCP Table 9-3 species considered not adequately conserved, and while marginally suitable habitat was noted for *Chorizanthe parryi var. parryi* (Parry's spineflower) and *Calochortus plummerae* (Plummer's mariposa lily), both species are now designated as adequately conserved under the MSHCP and no further action is required.

According to the California Natural Diversity Database Records, there are four (4) federal and/or state-listed species have been reported within three (3) miles of the Project site including Crotch's bumble bee (*Bombus crotchii), burrowing owl (Athene cunicularia), western spadefoot (Spea hammondii), and southern rubber boa (Charina umbratical); however, no critical habitat occurs on the Project site.* The only species identified with potential to be impacted by the project is the burrowing owl a California Species of Special Concern as well as a state candidate endangered species under the California Endangered Species Act (CESA). The site is located within the MSHCP burrowing owl survey area, and focused surveys were conducted by LSA in accordance with the County of Riverside's 2006 Burrowing Owl Survey Instructions and CDFW's 2012 Staff Report on Burrowing Owl Mitigation. No individuals were observed during the four required survey visits in Spring 2025; however, one of the four burrows was assessed as suitable for owl use as it contained whitewash and a feather after being discovered on the third visit. Without direct observation of an individual, the Biologist conservatively classified the burrow as occupied, which triggers the need for mitigation under CEQA and MSHCP provisions. With implementation of appropriate mitigation measures (MM-BIO-1), impacts to burrowing owls will be reduced to a less-than-significant level as all other special-status species and sensitive biological resources were either determined to be absent, unlikely to occur, or not impacted. The project would not result in a substantial adverse effect on any species identified in local, regional, state, or federal conservation plans; therefore, the impact would be less than significant with mitigation incorporated.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

The project site was evaluated for riparian habitat and sensitive natural communities as part of the Biological Resources Assessment and MSHCP Consistency Analysis prepared by LSA Associates, Inc. The assessment included an on-site field investigation, review of aerial imagery, regional habitat maps, and California Natural Diversity Database (CNDDB) records to determine whether any riparian corridors or sensitive vegetation communities were present. Based on the results of this evaluation, the site is composed almost entirely of developed land, compacted dirt, disturbed non-native grasslands, and site landscaping. There are no identified natural drainage features, streambeds, or vegetation that would be associated riparian systems. The limited vegetation present on-site consists of ruderal species adapted to disturbed soils and no native or regulated riparian plant communities were observed or identified, and the site does not contain any sensitive natural communities recognized by the California Department of Fish and Wildlife's Natural Communities List or the California Native Plant Society's Inventory of Rare and Endangered Plants. The one potential water feature identified as "F-1" is a manmade stormwater retention basin with no wetland or riparian value as it lacks surface water, wetland plant species, and the hydrologic characteristics necessary to support jurisdictional riparian or wetland resources. Since no riparian or sensitive natural communities exist on the site and no modifications to off-site habitat are proposed, the project would therefore not result in any direct or indirect impacts to such resources and, as such, the proposed project would result in no impact.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The Biological Resources Assessment (BRA) prepared by LSA Associates, Inc. included a field survey to determine whether any state or federally protected wetlands or jurisdictional waters were present on the project site. The assessment utilized criteria from the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Wildlife (CDFW), and the Regional Water Quality Control Board (RWQCB) to identify potential aquatic resources subject to Section 404 of the Clean Water Act, Section 401 of the Clean Water Act, and Section 1600 et seq. of the California Fish and Game Code. No natural drainage features, streambeds, seasonal watercourses, or hydrophytic vegetation were observed during field surveys with the only discernible low-

lying area on-site being an artificial basin identified as Feature F-1. This basin was constructed as part of the site's stormwater management infrastructure and is composed of compacted soils with no hydrologic connection to downstream waters, which lacks characteristics of sensitive wetlands, including saturation or inundation, and does not support hydrophytic plant species or hydric soils. The BRA confirms that F-1 does not qualify as a wetland under federal or state definitions and does not fall under the jurisdiction of the USACE, CDFW, or RWQCB. As such the proposed project would not have an impact on state or federally protected wetlands.

d) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The project site and surrounding area were evaluated for wildlife movement potential and corridor connectivity as part of the Biological Resources Assessment (BRA) prepared by LSA Associates, Inc. The site is located within a developed portion of the City of Beaumont and is bordered on all sides by existing residential uses. The area is characterized by high levels of disturbance, fencing, paved roads, and fragmented habitat conditions, none of which are conducive to supporting wildlife movement corridors or facilitating regional connectivity. The BRA confirmed that the site does not serve as a functional link between larger open space areas or conservation lands and the site is not identified in any regional wildlife corridors via maps prepared by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and the California Department of Fish and Wildlife. Additionally, the site lacks any topographic, vegetative, or hydrological features that would support its use as a native wildlife nursery site. The only faunal activity observed during field surveys consisted of common urban-adapted species such as mourning dove, American crow, and house sparrow, which do not rely on intact corridors or native nursery habitat for reproduction or foraging. Although the site does contain limited open space, the surrounding urban neighborhood, lack of suitable habitat, and existing church activities and operations render the site unsuitable for meaningful wildlife movement. Furthermore, project implementation would not involve the removal of any natural linkages or the introduction of barriers (e.g., highways, sound walls, flood control infrastructure) that could impede regional wildlife flow. As a precautionary measure, the project includes Mitigation Measures (MM-BIO-1), which requires pre-construction burrowing owl surveys and implementation of avoidance and mitigation protocols in the event a burrowing owl is detected to ensure that no nesting or roosting owls are disturbed during construction. With the implementation of Mitigation Measures, the impacts from the proposed project would be less than significant.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The Biological Resources Assessment (BRA) prepared by LSA Associates, Inc. confirmed that the project site does not support any native trees or locally protected vegetation typically subject to conservation, such as oak, sycamore, or cottonwood. The site is primarily disturbed and vegetated with non-native species, and because no sensitive or protected plant species are present and the project would not result in the removal of any vegetation that is regulated by local ordinances or conflict with any local biological resource policies, the proposed project would result in no impact.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The project site is located within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) area and, as such, a full MSHCP Consistency Analysis was conducted as part of the Biological Resources Assessment (BRA) prepared by LSA Associates, Inc. to determine compliance with MSHCP's goals and criteria. The site is not located within a Criteria Cell, Core Area, or Public/Quasi-Public Conservation land, and is situated entirely outside of designated conservation areas nor does it support habitat linkages or other biological features prescribed by the MSHCP reserve system. The project site does fall within a Narrow Endemic Plant Species Survey Area (NEPSSA 8), and species surveys were completed in accordance with the MSHCP guidelines. No narrow endemic plants were observed or identified on site, and the site does not contain the soil types or suitable habitat structure needed. The site also falls within a burrowing owl survey area, and as noted in Section 4(a), focused surveys were completed, and evidence of recent owl activity was documented at a single burrow. As required under the MSHCP, Mitigation Measure BIO 1 will be implemented, which calls for a pre-construction survey and the preparation of a Determination

of Biologically Equivalent or Superior Preservation (DBESP) if burrowing owls are found. This measure ensures the project remains fully compliant with the species protection goals of the MSHCP. With the implementation of precautionary Mitigation Measures (MM-BIO-1), the project would have no impact to a resource protected by a Habitat Conservation Plan, natural community Conservation Plan, or other local, regional or state habitat conservation plan.

Mitigation Measures:

MM-BIO-1 Pre-Construction Burrowing Owl Survey and DBESP Implementation: Prior to any ground-disturbing activity, a qualified biologist shall conduct a pre-construction burrowing owl survey within 30 days of site disturbance. If active burrows or individuals are observed, a Determination of Biologically Equivalent or Superior Preservation (DBESP) shall be prepared and submitted to the Western Riverside County Regional Conservation Authority (RCA) and the California Department of Fish and Wildlife (CDFW) for review and approval. The DBESP shall define measures to avoid, minimize, and compensate for direct and indirect impacts to burrowing owl, including but not limited to the establishment of appropriate buffer zones, seasonal restrictions, passive relocation if feasible, and compensatory habitat banking or in-lieu fees.

CULTURAL RESOURCES

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
5. **CULTURAL RESOURCES**. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?				**X**
b) Cause a substantial adverse change in the significance of an archaeological resources pursuant to Section 15064.5?		**X**		
c) Disturb any human remains, including those interred outside of formal cemeteries?		**X**		

a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?

Per CEQA Guidelines Section 15065.5(a), a "historical resource" is defined as a resource that meets one or more of the following criteria: (1) listed in, or determined eligible for listing in, the California Register of Historical Resources; (2) listed in a local register of historical resources as defined in Public Resources Code (PRC) Section 5020.1(k); (3) identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (4) determined to be a historical resource by a project's Lead Agency (PRC Section 21084.1 and CEQA Guidelines Section 15064.5[a]). The California Register of Historical Resources further defines a "historical resource" as a resource that are either associated with events that have made a significant contribution to the broad patterns or local or regional history of the cultural heritage of California or the United States, associated with the lives of persons important to local, California, or national history, embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of a master or possesses high artistic values, or has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation. Additionally, the California's register considers all resources older than 45 years (i.e. resources from the "historic period") to be evaluated for California Register eligibility, or CEQA significance.

The Cultural Resources Assessment conducted by BRC Consultants for the Project included a cultural resources records search, pedestrian field survey, Sacred Lands File search with the Native American Heritage Commission (NAHC), and paleontological overview. Records search determined that 23 cultural resource studies have been conducted and have recorded 14 cultural resources within one mile of the Project site; however, from the 23 cultural resource studies conducted, no cultural resources have been recorded within the Project's boundaries (Cultural Resources Assessment, 2025). Furthermore, the field survey conducted by BCR Consulting did not discover any cultural resources within the Project's boundaries.

The proposed Project is located on a site that had been previously disturbed with construction activities that concluded in 2014 that consists of a worship building, several patio covers, six (6) portable trailers, parking improvements, street improvements, and landscaping. Before construction of the existing worship facility began in ~~to~~ 2006, the site was vacant. The Cultural Resources Assessment conducted for the Project concluded that the existing church facility is less than 45 years old and as such, is not considered a historical building. There are no historic buildings or structures at the Project site and as such there are no "historical resources" are known to exist within or adjacent to the Project area. Should a historical resource be discovered during construction of the Project, then construction activity would be immediately halted, and a cultural records search/survey would be conducted. Thus, the proposed Project would have no impact related to a historical resource.

b) Cause a substantial adverse change in the significance of an archaeological resources pursuant to Section 15064.5?

As described in previous response, the records search and field survey conducted for the Project did not identify any cultural resources. Any archeological resources that may have been present on-site have likely been disturbed or destroyed by

previous human and/or construction activities. Prior to ground disturbing activities and in the event that field personnel encounter buried cultural materials, work in the immediate vicinity of the find should cease and a qualified archaeologist should be retained to assess the significance of the find. Furthermore, the city will initiate Assembly Bill (AB52) 52 Native Consultation for the Project, thus results are still pending. Implementation of Mitigation Measures MM-CUL-1 through MM-CUL-3, which represent standard protocols for identifying, evaluating, and preserving potentially sensitive cultural and tribal resources encountered during construction, would ensure impacts to significant archaeological resources would be less than significant.

c) Disturb any human remains, including those interred outside of formal cemeteries?

A review of historic aerial photos and USGS Topographic maps along with the Cultural Resources Assessment prepared for the Project did not identify possible cemeteries or known burial sites within the Project area. Further, the site has been previously disturbed by construction activities related to the existing church facility, further reducing the likelihood that human remains could be uncovered during ground-disturbing activities. Additionally, human remains, would likely have been disturbed, destroyed, or uncovered from previous construction and human activities. In the event that human remains are uncovered, however, California Health and Safety Code Section 7050.5 requires that disturbance of the site shall be halted until an investigation is conducted and recommendation has been made concerning the treatment and disposition of the human remains. In addition, if human remains are discovered, the Project would comply with CEQA Section 15064.5, which requires construction activities to halt and the area to be evaluated by a qualified professional, and Public Resources Code Section 5097.98, which requires notification of the County Coroner, and if the remains are determined to be of Native American origin, the involvement of the Native American Heritage Comission (NAHC). With the implementation of Mitigation Measure MM-CUL-4, which ensures appropriate procedures are followed if remains are encountered, would reduce potential impacts to less than significant.

Mitigation Measures:

MM-CUL-1 Inadvertent Cultural Resources Finds: For adequate coverage and the protection of possibly significant buried resources and tribal cultural resources, a qualified archaeologist and Native American Monitor provided by the consulting tribes shall be retained by the applicant to monitor all ground-disturbing construction activities, included but not limited to site preparation, grading and excavation. The applicant, archaeologist and consulting tribes would agree on a monitoring schedule based on the necessary days of ground-disturbance. In the event that Native American cultural resources are discovered during Project development/construction, all work in the immediate vicinity of the find shall cease and a qualified archaeologist meeting Secretary of Interior standards shall be hired to assess the find. Work on the overall Project may continue during this assessment period. If significant Native American cultural resources are discovered, for which a Treatment Plan must be prepared, the developer or his archaeologist shall contact Consulting Tribe(s) and shall, in good faith, consult on the discovery and its disposition (e.g., avoidance, preservation, return of artifacts to tribe, etc.). If avoidance is not possible, an avoidance plan would be prepared and implemented based on consultation between the archaeologist and tribes. If resources are found to be significant historical resources under CEQA then CUL 2 and/or CUL-3 shall apply. For the purposes of these measures, a Consulting Tribe is defined as a tribe that initiated the AB52 tribal consultation process for the Project, has not opted out of the AB52 consultation process, and has completed AB52 consultation with the City as provided for in Public Resources Code Section 21080.3.2(b)(1) of AB52.

MM-CUL-2 Treatment and Disposition of Non-Tribal Cultural Resources: If significant resources are identified that are not identified by the qualified archaeologist and consulting tribe(s) as a Tribal Cultural Resources, and the resources is of scientific/historical value, recovered materials shall be deposited in a federal or state recognized curation facility. The curation of the recovered materials shall be identified and funded by the Applicant and approved by the City. The site record for the resource shall be updated to include the final disposition of the recovered materials and will be submitted to the South Coastal Information Center (SCIC).

MM-CUL-3 Treatment and Disposition of Tribal Cultural Resources: In the event that Native American tribal cultural resources are inadvertently discovered during grading for this Project the following procedures will be carried out for

treatment and disposition of the discoveries: 1. Documentation: In conjunction with the qualified archaeologist, the tribal cultural resource shall be documented to the extent deemed appropriate by the consulting tribe(s) on the appropriate Department of Parks and Recreation (DPR) 523-series forms. The final disposition of the materials shall also be included on the site form. 2. Temporary Curation and Storage: During construction, all discovered resources shall be temporarily curated in a secure location to be mutually agreed upon by the City, Project Archaeologist, and consulting tribes. The removal of any artifacts from the Project site will need to be thoroughly inventoried with tribal monitor oversite of the process; and 3. Treatment and Final Disposition: The landowner(s) shall relinquish ownership of all cultural resources, including sacred items, burial goods, and all archaeological artifacts and non-human remains as part of the required mitigation for impacts to cultural resources. The applicant shall relinquish the artifacts through one or more of the following methods and provide the City Planning Department with evidence of same: a. Accommodate the process for onsite reburial of the discovered items with the consulting Native American tribes or bands. This shall include measures and provisions to protect the future reburial area from any future impacts. Reburial shall not occur until all cataloguing and basic recordation have been completed; b. A curation agreement with an appropriate qualified repository within Riverside County that meets federal standards per 36 CFR Part 79 and therefore would be professionally curated and made available to other archaeologists/researchers for further study. The collections and associated records shall be transferred, including title, to an appropriate curation facility within Riverside County, to be accompanied by payment of the fees necessary for permanent curation: c. If more than one Native American tribe or band is involved with the project and cannot come to a consensus as to the disposition of cultural materials, they shall be curated at the Western Science Center by default; and. d. At the completion of grading, excavation and ground disturbing activities on the site, a Phase IV Monitoring Report shall be submitted to the City documenting monitoring activities conducted by the project Archaeologist and Native Tribal Monitors within 60 days of completion of grading. This report shall document the impacts to the known resources on the property; describe how each mitigation measure was fulfilled; document the type of cultural resources recovered and the disposition of such resources; provide evidence of the required cultural sensitivity training for the construction staff held during the required pre-grade meeting; and, in a confidential appendix, include the daily/weekly monitoring notes from the archaeologist. All reports produced will be submitted to the City, South Coast Information Center and interested tribes:

MM-CUL-4 Human Remains: If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b) remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage Commission must then immediately identify the "most likely descendants(s)" for purposes of receiving notification of discovery. The most likely descendant(s) shall then make recommendations within 48 hours and engage in consultation concerning the treatment of the remains as provided in Public Resources Code Section 5097.98 and the agreement described in MM CUL-3. If the MLD fails to make a recommendation regarding the treatment or the recommendation is not feasible per the property owner, then the remains shall be reburied with appropriate dignity and respect on the property in a location not subject to further disturbance. In the event the MLD fails to make a recommendation - ESA should be set up to prevent further disturbance. The ESA should not indicate that remains are buried there. This should be conducted in coordination with the NAM/D63.

ENERGY

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
6. **ENERGY**. Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The Project would increase the demand for energy during construction and day-to-day operations. During construction, the Project would require energy for activities such as, transportation of materials and equipment, grading, and building construction. The primary energy source during construction activities would be diesel fuel for construction equipment and gasoline fuel from construction workers traveling to and from the Project site. An Energy Report prepared by LSA calculated the projected diesel and gasoline fuel use on default construction equipment assumptions and trip estimates from CalEEMod and fuel efficiencies from EMFAC2021. As shown in Table E-1, the Project's energy consumption during construction would be approximately 56,950.6 gallons of diesel fuel and approximately 8,959.9 gallons of gasoline. Fuel consumption obtained from EMFAC2021 estimated that approximately 302.4 million gallons of diesel and 730.6 million gallons of gasoline would be consumed from vehicle trips in Riverside County in 2025. Construction of the Project would increase the annual construction generated fuel use in Riverside County by approximately 0.02 percent for diesel fuel and by less than 0.01 percent for gasoline. Therefore, the Project's energy consumption during construction would have a negligible effect on local and regional energy consumption. Furthermore, energy consumption related to construction activities would be temporary in nature and limited in use, as gasoline and diesel fuel would be supplied by construction contractors who would conservatively use their supplies to minimize cost. Thus, the Project's construction would not result in wasteful, inefficient, or unnecessary consumption of energy resources.

Table E-1: Construction Energy Consumption

Energy Fuel Type	Total Fuel Consumption	Percentage on Increase Countywide
Diesel Fuel (total gallons)	56,950.6	0.02
Gasoline (total gallons)	8,959.9	<0.01

During the Project's Operation, energy demands would increase from the use of electricity, natural gas, and fuel. The Energy Report prepared for the Project demonstrated that the primary uses of energy during the Project's operations would result from electricity consumption and fuel from vehicle trips. Annual operational energy consumptions shown in Table E-2, estimate the potential annual use of approximately 106,000.0 kWh of electricity, 15,105.0 therms of natural gas, 20,517.1 gallons of gasoline, and 3,113.3 gallons of diesel. Riverside County's electricity consumption in 2022 was 17,780,573,271 kWh. Therefore, the Project's operational activities would result in a less than 0.01 percent annual increase in electricity consumption. Riverside County's natural gas consumption in 2022 was 431.1 million therms. Thus, the Project's operational activities would result in a less than 0.01 percent annual increase in natural gas consumption.

Table E-2: Operation Energy Consumption

Energy Type	Annual Energy Consumption
Electricity (kWh/year)	106,000.0
Natural Gas (Therms/year)	15,105.0
Gasoline (gallons/year)	20,517.1
Diesel Fuel (gallons/year)	3,113.3

The Project's energy consumption as a result of operational activities would have a negligible effect on local and regional energy consumptions. Furthermore, the Project would be required to comply with Title 24 energy efficient standards, which mandate energy-efficient design features such as insulation, use of energy efficient heating and ventilation, air conditioning equipment, and energy efficient indoor and outdoor lighting. Thus, the Project's operation would not result in wasteful, inefficient, or unnecessary consumption of energy resources and impacts would be less than significant.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The Project would be required to comply with applicable federal, state, and local agencies that regulate energy efficiency and renewable energy. The Project would comply with the California Building Energy Efficiency Standards, including Title 24 requirements for energy-efficient building design and appliance standards, as well as utility energy efficiency programs implemented by Southern California Edison and Southern California Gas Company. The Project would include an electric vehicle charging station ready to reduce potential fuel consumption of standard vehicles. The Project would also install rooftop solar photovoltaic (PV) panels to provide renewable energy generation. Both the inclusion of the EV ready charging stations and the installation of PV panels would also reduce Greenhouse Gas emissions. Additionally, the Project would not conflict with the City of Beaumont Energy Action Plan (EAP), which seeks to reduce community-wide energy consumption and increase the use of renewable energy sources. The EAP supports measures such as expanding local solar generation capacity, enhancing energy efficiency in buildings, and encourages electric vehicle infrastructure, which are all included features with the proposed Project. The Project's rooftop PV system directly contributes to the EAP goal of increasing renewable energy generation, while the EV-ready infrastructure aligns with the EAP's Transportation and Land Use strategies to reduce fuel consumption. Furthermore, the Project's compliance with Title 23 standards supports the EAP's Build Environment goals aimed at reducing energy demand through efficient building practices. As such, the Project would not conflict with the California Building Energy Efficiency Standards, including Title 24, or obstruct its implementation throughout the state; therefore, impacts would be less than significant.

GEOLOGY AND SOILS

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
7. **GEOLOGY AND SOILS**. Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				**X**
(i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				**X**
(ii) Strong seismic ground shaking?			**X**	
(iii) Seismic-related ground failure, including liquefaction?			**X**	
(iv) Landslides?				**X**
b) Result in substantial soil erosion or the loss of topsoil?			**X**	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			**X**	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?				**X**
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				**X**
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				**X**

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

According to the City's General Plan Figure 9.5 and the State of California's Alquist-Priolo Earthquake Fault Zoning Map, the Project site is not located within the boundaries of a fault zone as defined under the Alquist-Priolo Earthquake Fault Zone Act. However, the City of Beaumont's General Plan recognizes the city is within a seismically active region. As such, seismic ground shaking and ground rupture due to movement of a fault are potential hazards in Beaumont. The Project would be required to comply with the Beaumont Municipal Code and the California Building Code (CBC), which includes specific provisions for seismic design of structures to mitigate earthquake hazards. Thus, the Project would not expose people or structures to potential substantial adverse effects from a rupture of a known earthquake fault that is delineated on an Alquist-Priolo Earthquake Fault Zoning map, and impacts would not occur.

ii. Strong seismic ground shaking?

The Project site is located in Southern California, which is a seismically active region and subject to ground shaking resulting from earthquakes on nearby faults, with the closest active fault being the Banning Fault north of the Project site. Movement along the Banning Fault could result in seismic ground shaking at the Project site. The intensity of ground shaking is dependent upon several factors including distance to the fault, magnitude of the earthquake, and subsurface conditions. As confirmed in the Soil and Infiltration Evaluation prepared by GeoTek, subsurface conditions at the site consist of sandy silts and silty sands to depths exceeding 30 feet, and these materials are generally not prone to the

amplification of seismic waves. The report recommends compliance with the Beaumont Municipal Code and the California Building Code (CBC), which includes specific provisions for seismic design of structures to mitigate earthquake hazards, which the Project will adhere to. Thus, the Project would result in a less than significant impact related to strong seismic ground shaking.

iii. Seismic-related ground failure, including liquefaction?

Liquefaction is a phenomenon in which loose, saturated, granular soils located approximately 50 feet of the ground surface lose strength due to cyclic pore water pressure or other large cyclic loading, which can result in ground deformation, including both horizontal and vertical movement. According to Figure 9.6 of the City of Beaumont's General Plan, most of the city is within a low liquefaction susceptibility area the Project site. Additionally, the Soil and Infiltration Evaluation prepared by GeoTek indicates that the site is underlain by very stiff sandy silt and silt sand with generally low groundwater levels, and based on these subsurface conditions, the report concludes that the potential for liquefaction at the Project site is considered very low. Furthermore, as previously mentioned, the Project would comply with the Beaumont Municipal Code and the California Building Code (CBC) to maintain compliance with applicable seismic standards. Thus, the Project would result in a less than a significant impact related to seismic-related ground failure, including liquefaction.

iv. Landslides?

As previously discussed, the Project site is improved with an existing church facility and is generally flat and does not contain any hillside areas or sloping features that would be susceptible to slope instability. Therefore, the Project would not be subject to landslides and no impact would occur.

b) Result in substantial soil erosion or the loss of topsoil?

The Project site is not traversed by any identified drainage courses, USGS blue line streams or other observed onsite drainage features that could potentially cause substantial soil erosion or loss of topsoil. Implementation of the Project would require ground disturbing activities, such as grading. During construction activities the Project would temporarily expose underlying soils, increasing the potential for topsoil erosion; however, the Project would be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit which requires implementation of a Storm Water Pollution Prevention Plan (SWPPP) along with appropriate Best Management Practices (BMPs) to manage erosion and the loss of topsoil. Such BMPs may include, but are not limited to, perimeter silt fencing, stabilized construction, and temporary cover of disturbed soils. As such, the Project would not result in substantial soil erosion or loss of topsoil and would have a less than significant impact.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

As described in the responses above, the topography of the Project site is generally flat with no hillside areas, and per Figure 9.6 of the City of Beaumont General Plan, site is not located within an area designated as a high or moderate Liquefaction Susceptibility, thus eliminating the possibility of a potential landslide. Due to the property being located within a low liquefaction zone and the absence of potential landslide hazards, the potential for liquefaction or landslide would be minimal, and implementation of the Project would result in a less than significant impact.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

A review of the most recent soils data, including the 2023 Soils and Infiltration Evaluation by GeoTek and the 2008 Preliminary Soils Report prepared by Geopac, confirms that the near-surface soils consist primarily of silty sands and silty gravels. These materials are granular and exhibit low plasticity, making them non-expansive. The Geopac report specifically states that the site soils are non-expansive, and no indicators of expansive soils, such as clay or silt of high plasticity, were

observed. Thus, the Project would be located on expansive soil and would not result in substantial direct or indirect risks to life or property, and as such, impacts would be less than significant.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

The Project would utilize its existing sewer connection along Brookside Avenue. The Project does not propose to utilize septic tanks or other alternative wastewater disposal systems. Therefore, there are no impacts related to soil capability as it pertains to the adequacy of supporting the usage of septic tanks or alternative wastewater disposal systems. Thus, no impacts would occur.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Overview was included as part of the Cultural and paleontological Resources Assessment prepared for the Project by BCF Consulting. According to the Overview, the Project site is located within mapped areas that have low paleontological sensitivity in the surface sediments, with high sensitivity at depths below five deet due to the potential presence of Pleistocene alluvial fan deposits. These older deposits have been known to yield significant vertebrate fossils in the region. Although no paleontological resources were observed during the pedestrian field survey, the potential to encounter subsurface paleontological resources remains. Through the implementation of Mitigation Measure MM-CUL-1 thru 4, which requires monitoring during ground-disturbing activities at depths greater than five feet and property treatment of any paleontological resources if discovered; therefore, impacts would be less than significant with mitigation incorporated.

GREENHOUSE GAS EMISSIONS

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
8. **GREENHOUSE GAS EMISSIONS.** Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			**X**	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			**X**	

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Atmospheric greenhouse gases (GHG) play a key role in the Earth's radiation amount by trapping infrared radiation emitted from the Earth's surface rather than being released into space. Prominent atmospheric greenhouse gases include carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), ozone, water vapor, and chlorofluorocarbons (CFCs). These GHG's create the Greenhouse Effect, which works to maintain a habitable climate. Human generated emissions of these greenhouse gases in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the Earth's natural climate, known as global warming or climate change.

SCAQMD and the City of Beaumont have not adopted a threshold of significance to evaluate GHG impacts. However, SCAQMD has proposed interim numeric GHG significance thresholds that are based on a 90 percent emissions capture rate for all new or modified stationary source projects, which is 3,000 metric tons carbon dioxide equivalent ($MTCO_2e$) per year (SCAQMD, 2008). Furthermore, SCAQMD does require construction GHG emissions to be amortized over the life of the project, defined by SCAQMD as 30 years, and then added to the project's operational emissions, in order to determine if the project would exceed the 3,000 metric ton threshold.

Construction

During construction activities, the Project would produce temporary GHG emissions from the use of construction equipment, construction vehicles, transportation of materials to and from the site, asphalt paving, and motor vehicles from construction crew. Using CalEEMod, the Project would generate approximately 576.1 $MTCO_2e$ during construction of the Project and 19.2 $MTCO_2e$ annually over a 30-year life of the Project (Air Quality, Energy, Greenhouse Gas Impact Report, 2025).

Operation

Daily operations from implementation of the Project would result in long-term emission from vehicle trips, energy consumption, water sources, solid waste disposal. Using CAlEEMod, GHG emissions for the Project would generate approximately 2,196.9 $MTCO_2e$ annually, which would be below the SCAQMD threshold of 3,000 $MTCO_2e$ year (Air Quality, Energy, Greenhouse Gas Impact Report, 2025).

As shown in Table GHG-1, the Project would result in approximately 2,216.1 $MTCO_2e$ per year, which would be below the threshold of 3,000 $MTCO_2e$ per year. Therefore, impacts related to greenhouse gas emissions would be less than significant.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The proposed Project would expand the existing church facility and would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases. The City of Beaumont adopted a Climate Action Plan (CAP) in 2015. The CAP presents the greenhouse gas (GHG) inventories, identifies the

effectiveness of California initiatives to reduce GHG emissions, and identifies local measures that were selected by the City of Beaumont to reduce GHG emissions under the City's jurisdictional control to achieve the City's identified GHG reduction target. The City of Beaumont participated in the Regional Greenhouse Gas Reduction Plan which presents the collective results of all local efforts to reduce GHG emissions consistent with statewide GHG targets expressed in Assembly Bill (AB) 32, the "Global Warming Solutions Act of 2006" and Senate Bill (SB) 375. At a net level of 474 MTCO2e per year, the Project's GHG emissions do not exceed the SCAQMD threshold of 3,000 MTCO2e per year for residential and/or institutional land uses and would be in compliance with the reduction goals of the City's CAP. Furthermore, the Project would comply with applicable Green Building Standards and City of Beaumont's policies regarding sustainability, and, therefore, impacts would be less than significant.

HAZARDS AND HAZARDOUS MATERIALS

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
9. **HAZARDS AND HAZARDOUS MATERIALS.** Would the project?				
a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?			**X**	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			**X**	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			**X**	
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				**X**
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?				**X**
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				**X**
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			**X**	

a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?

Hazardous materials are defined as any substances or materials that by their chemical, physical, or biological nature, has the potential to cause harm to human health, safety, the environment, or property. During construction, the Project would require transportation, use, and disposal of hazardous materials such as paints, solvents, oils, grease, and caulking as well as fuels and lubricants for on-site construction equipment. However, these types of materials are not acutely hazardous, and all storage, handling, use, and disposal of the materials would be subject to and regulated by federal and state requirements. These regulations include: the federal Occupational Safety and Health Act and Hazardous Materials Transportation Act; Title 8 of the California Code of Regulations (CalOSHA), and the state Unified Hazardous Waste and Hazardous Materials Management Regulatory Program. Compliance with these regulations would ensure the hazardous material discharged during construction of the Project is expected to be less than significant.

During operation of the Project, potential hazardous materials would be limited to routine elements typically associated with landscape maintenance, including the use of such as yard fertilizers, herbicides, and other landscape-related chemicals. These types of materials are not acutely hazardous, and would be used in limited quantities, thus they would not represent a significant hazard. Therefore, the Project would not result in a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials, and impacts would be less than significant.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

As previously discussed, the Project's transportation, use, storage and disposal of hazardous materials are regulated by federal and state requirements, and would not pose a significant hazard. While the potential exists for accidental spills or releases due to improper transportation, use, storage, and disposal of hazardous materials, such incidents are considered unlikely with proper procedures in place. Through compliance with state and federal requirements as well as the use of best management practices (BMPs) through the implementation of a Storm Water Pollution Prevention Plan (SWPPP) and Water

Quality Management Plan (WQMP), impacts from the release of hazardous materials into the environment would be less than significant.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The closest school to the Project site is the Starlight Elementary School, which is located approximately 1,000 feet south of the Project site at 1510 Cougar Way. As previously discussed above, construction and operation of the Project would include the transportation, use, storage and disposal of hazardous materials; however, these materials would be used in limited quantities, and handled in compliance with state and federal requirements, which would reduce the potential for accidental releases into the environment. Thus, impacts to the nearby school would be less than significant.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

The Project site is not included on the Hazardous Waste and Substances Site List (CORTESE) compiled pursuant to Government Code Section 65962.5. In addition, neither the Project site or the surrounding vicinity was not identified by the California Department of Toxic Substances Control (DTSC) EnviroStor as a hazardous materials site. Therefore, impacts related to hazards from the Project being located on a site which is included on a list of hazardous materials sites, pursuant to Government Code § 65962.5, would not occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

The Project site is not within an airport land use plan nor within two miles of a public or private airport. The closest airport to the Project site is the Banning Municipal Airport located approximately 6.17 miles from the Project site. Therefore, the Project would not result in a safety hazard or excessive noise for people residing or working in the project area. No impact would occur.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Per the City of Beaumont's General Plan Figure 9-2, designated evacuation routes include Interstate 10, Interstate 60, as well as several major roadways. Major roadways identified as evacuation routes include Brookside Avenue, Oak Valley Parkway, Highland Springs Avenue, and Beaumont Avenue. The Project site is located along Brookside Avenue which is designated as one of the evacuation routes, between Highland Springs Avenue to the east and Cherry Avenue to the west. The Project involves the expansion of an existing institutional facility within the Residential Single Family (RSF) zone, which allows for compatible institutional uses, and as such, the City of Beaumont's General Plan considered the potential for this property to be developed into a church and its demand on the emergency roadway network. Project improvements would occur entirely within the existing property boundaries and would not block or obstruct any public travel lanes or circulation routes once operational. Further, per the Trip Generation and Vehicles Miles Traveled Analysis prepared by LSA, the proposed Project will generate less than 100 trips during peak hours and is considered a low trip generator, and as such, the proposed Project does not represent an intensification from the existing land use that would impair an adopted emergency response plan or emergency evacuation plan. As such, development of the institutional facility would not impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, and, therefore, no impact would occur.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

According to the State of California's Fire Hazard Severity Zone Regulatory Map, the subject property is not located within

a high or very high fire hazard severity zone. Further, the proposed Project is located within an urbanized area surrounded by existing development. Potential fire hazard risks from future development are addressed through adherence to the City's Conditions of Approval and adherence to the California Fire Code, which include provisions for adequate fire-fighting capabilities. Therefore, the Project would not expose people or structures, either directly or indirectly, to a significant risk or loss, injury or death involving wildland fires, and thus, no impact would occur.

HYDROLOGY AND WATER QUALITY

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
10. **HYDROLOGY AND WATER QUALITY**. Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?			**X**	
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?			**X**	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:			**X**	
(i) result in a substantial erosion or siltation on- or off-site;			**X**	
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;			**X**	
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or			**X**	
(iv) impede or redirect flood flows?			**X**	
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?				**X**
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			**X**	

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

During construction of the Project, the use of heavy equipment and materials such as concrete, cement, asphalt, fuels, oils, grease, solvents, and paint are typically required. The use of these equipment and materials without proper control and measures have the potential to accidentally spill and release pollutants into surface waters or groundwater during construction activities; however, the Project will be required to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) and Water Quality Management Plan (WQMP) to account for construction and operational activities in compliance with the Regional Water Quality Control Board's (RWQCB) water quality standards and NPDES permitting requirements. Both the SWPPP and the WQMP would identify site-specific Best Management Practices (BMPs) to minimize pollutant discharges during grading and construction activities. As such, construction of the Project would not violate any water quality standards or waste discharge requirements, and impacts would be less than significant.

Operational activities of the Project have the potential to introduce pollutants from the use of various chemicals such as cleaners, yard fertilizers, pesticides, and oil and grease from vehicles. The use of these materials has the potential to accidentally release pollutants into surface waters or groundwater; however, a project-specific Preliminary WQMP has been prepared and is included as Appendix J. The Project would require the implementation of a formal WQMP consistent with the requirements of RWQCB and NPDES, and associated BMPs to limit the potential for pollutants to enter surface water. The Preliminary WQMP includes site design features and source control BMPs such as efficient irrigation systems, designated trash storage areas, and regular maintenance practices. Further the Project site does not contain high groundwater levels, and hydrologic design per the included Hydrology Report (Appendix K) confirms that runoff will be managed without causing erosion or degradation of surface or groundwater quality. Thus, the Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or ground water quality and impacts would be less than significant.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the

project may impede sustainable groundwater management of the basin?

The Project would not result in the direct in the direct taking of groundwater or otherwise decrease groundwater supplies. The Project site is currently developed with an existing church facility and receives its water services from the Beaumont Cherry Valley Water District (BCVWD), and according to the BCVWD Will Serve Letter dated July 25, 2024 (Appendix I), the proposed church expansion is within the District's capabilities to accommodate the increase on services. As such, the Project would not place a new demand or constraint on local groundwater sources. Additionally, the Project would not interfere with groundwater recharge as the site is already developed and the proposed improvements include on-site low impact development (LID) features consistent with the Preliminary WQMP, which promotes adequate infiltration and stormwater retention. Therefore, the Project would not substantially decrease groundwater supplies or interfere with groundwater recharge such that it would impede sustainable groundwater management of the basin. Impacts would be less than significant.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

(i-iv) There are no drainage channels or waterways that traverse the subject property. The Project site is relatively flat, gently sloping from northeast to southwest that conveys water toward an existing basin. Upon construction of the Project, a substantial amount of impervious surfaces would be installed, particularly within the parking area, which would substantially increase the amount of onsite runoff; however, the site has been designed to maintain the existing drainage pattern from northeast to southwest and the existing basin would be redesigned/reconstructed to capture the necessary volume of water as to not exceed the rate of historical stormwater runoff. Furthermore, a Storm Water Pollution Prevention Plan (SWPPP) and Water Quality Management Plan (WQMP) would be required prior to the commencement of any construction activities to ensure both on- and off-site water are free of pollution, and the Project would also be required to implement Best Management Practices (BMP's) as well as comply with NPDES permitting requirements. The proposed Project is not located within a known floodway and the proposed grading and drainage improvements would not impede or redirect flood flows. Thus, impacts would be less than significant.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

According to the City of Beaumont's General Plan Figure 9.8, the Project site is not located within the 100-year or 500-year flood plan or an identified floodway. The Project is located inland and approximately 50 miles from the Pacific Ocean; therefore, tsunami hazards are not a threat within the City of Beaumont. Additionally, no major surface water bodies are located within the City of Beaumont or directly adjacent to the Project site. As such, the Project site would not be subject to seiches and would not present a risk for the release of pollutants due to Project inundation. Thus, no impact would occur.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

As previously discussed above, implementation of a SWPPP and use of BPMs during construction activities would ensure impacts associated with degradation of water quality and runoff would be less than significant. Additionally, prior to construction, the Project would need to be reviewed and approved by BCVWD to ensure the Project does not obstruct implementation of a water quality control plan or sustainable groundwater management plan. Therefore, impacts related to water quality control plan or sustainable groundwater management plan would be less than significant.

LAND USE AND PLANNING

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
11. **LAND USE AND PLANNING**. Would the project:				
a) Physically divide an established community?				**X**
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?			**X**	

a) Physically divide an established community?

The Project site is currently developed with a church facility and is surrounded by single-family residences to the north, east, south, and west. Some of the homes, particularly to the west of the Project site, were constructed after the existing church facility was constructed. The expansion of the existing church facility would not physically divide an established community as the proposed expansion is wholly contained within the subject property. Thus, no impact would occur.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental factor?

The Project site has a General Plan land use designation of Single Family Residential (SFR) and is zoned as Residential Single Family (RSF). RSF allows for single-family residences and institutional uses such as a church. The existing zone and land use district allow for the proposed institutional use subject to a Conditional Use Permit with no Variances or Change-of-Zones, or other special permitting requirements are required. Therefore, the Project does not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.; and no impacts would occur.

MINERAL RESOURCES

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
12. **MINERAL RESOURCES.** Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				**X**
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				**X**

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

The State Mining and Geology Board (SMGB) is responsible for managing mineral lands and establishing classification designations. There are 4 Mineral Resources Zones (MRZ):

MRZ-1: An area where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.

MRZ-2: An area where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.

MRZ-3: An area containing mineral deposits, the significance of which cannot be evaluated.

MRZ-4: An area where available information is inadequate for assignment to any other MRZ zone.

According to the City of Beaumont General Plan EIR Section 5.11.1, the Project site does not contain any known mineral resources and is classified as MRZ-3. The Project site is not designated or zoned for the extraction of mineral deposits. In addition, the Project site is currently developed with a church facility and surrounded by urban uses, and no mining activities currently occur on or near the subject property. Therefore, the Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, and no impact would occur.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Per the City of Beaumont General Plan EIR Section 5.11.1, the upper portion of the city is classified as MRZ-3, while the lower portion of the city is in an unstudied area. Additionally, there are no known significant amounts of mineral deposits found in the city nor within the Planning Area. Therefore, the Project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan, and no impact would occur.

NOISE

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
13. **NOISE.** Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			**X**	
b) Generation of excessive groundborne vibration or groundborne noise levels?			**X**	
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				**X**

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Existing Noise Environment

The Project site is located within the City of Beaumont, which is on the south side of Brookside Avenue, west of Highland Springs Avenue and east of Cherry Avenue. The surrounding area has been developed with urban uses including single-family residential on all sides of the development with some vacant land directly south of the Project site. The site is in a typical suburban environment with traffic along Brookside Avenue being the primary source of ambient noise in the vicinity. Although no direct noise measurements were conducted for this Project, existing noise conditions were estimated using the Federal highway Administration (FHWA) Construction Noise Handbook. This handbook utilizes traffic volume, speed, vehicle mix, and distance to estimate average noise levels for nearby roadways. The modeling was based on typical traffic conditions and is consistent with similar suburban land use settings. As a result, existing ambient noise levels in the Project area are expected to range from approximately 55 to 65 dBA CNEL, primarily due to local roadway traffic.

Applicable City of Beaumont noise standards were used to evaluate potential impacts. Table N-1 provides the City's exterior noise level compatibility standards, identifying acceptable levels for various land uses. For residential uses, noise levels up to 60 dBA CNEL are considered normally acceptable, while levels up to 70 dBA CNEL are conditionally acceptable. Table N-2 outlines construction noise standards, including allowable hours of operation, 7:00 a.m. to 6:00 p.m. on weekdays, 8:00 a.m. to 5:00 p.m. on Saturdays, with no construction permitted on Sundays or federal holidays.

Table N-1: Exterior Noise Standards

Zone Use	**Time**	**Decibels**	**Exterior Noise Standards (dB(A))**			
			$L_{25\ (15\ min)}$	**$L_{8\ (5\ min)}$**	**$L_{2\ (1\ min)}$**	**$L_{max\ (0\ min)}$**
Residential	10:00 pm – 7:00 am	45 dB(A)	50	55	60	65
Residential	7:00 am – 10:00 pm	55 dB(A)	60	65	70	75

Table N-2: Construction Noise Levels

Land Use	Direction	Reference Noise Level at 50 ft (dB(A) Leq)	Distance (ft)	Distance Attenuation (dB(A))	Shielding(dB(A))	Noise Level (dB(A) Leq)	
						Exterior	Interior
Residence	North	89.4	440 ft	18.9	0	70.5	50.5
Residence	East	89.4	215 ft	12.7	5[2]	71.7	51.7
Residence	South	89.4	405 ft	18.2	0	71.2	51.2
Residence	West	89.4	285 ft	15.1	0	74.3	54.3

Construction Noise

During construction of the Project, noise would be generated by construction equipment, such as trucks, power tools, and concrete mixers. The City of Beaumont has established base ambient noise levels and exterior noise standards as shown on table N-1. Noise generated from the Project construction would be regulated by the City of Beaumont's Noise Ordinance Section 9.02.110(F) , which states that when a construction site is within one-quarter of a mile of an occupied residence or residences, no construction activities hall be undertake between the hours of 6:00 pm and 6:00 am during the moths of June through September an between the hours of 6:00 pm and 7:00 am during the months of October through May. Project Construction shall not, at any time, exceed sound levels of 55 dB(A) for intervals of more than 15 minutes per hour as measured in the interior of the nearest occupied residence. Additionally, the person engaged in such activity is hereby permitted to exceed sound levels otherwise set for in Chapter 9.02 for the duration of the activity during the above described hours for purposes of construction.

A Noise and Vibration Impact Analysis, prepared by LSA, calculated the interior noise levels that would be generated from the Project's construction activities at the closest surrounding residential buildings from the center of the Project site, shown as Table N-1. As shown in Table N-2, the closest residential building is located east of the Project site would reach an interior noise level of 51.7 dB(A) Leq and would not exceed the City's interior construction noise standard of 55 dB(A) for intervals of more than 15 minutes per hour. Although Project's construction activities would exceed ambient noise levels, the noise generated would be short term and limited as to be in compliance with the City's hours of construction pursuant to Section 9.02.11(F) of the City's Municipal Code.

Operational Noise

Operational activities would include parking lot noise, such as engine sounds, car doors slamming, car alarms, and people conversing, heating, ventilation, and air conditioning equipment, and exhaust fans. The nearest sensitive receptors located approximately 30 feet from the proposed parking areas could be exposed to parking lot sounds. It is not expected that the parking lot activities would occur during the more sensitive nighttime hours and the potential noise levels would remain below the City's exterior noise standard of 55 dB(A) Leq for residential uses, and also,, peak noise levels from parking lot noise would be intermittent when averaged over a one-hour period and would be much lower than the existing noise levels in the Project vicinity, which is dominated by traffic noise. In addition to on-site sources, the Project would generate vehicle trips that would contribute to roadway noise levels on nearby streets; however, additional traffic generated by the Project would increase by less than three (3) dB(A), which is imperceptible to the human ear in an outdoor environment. Impacts

would be within the requirements of the Development Code and would be less than significant.

Table N-3 summarizes the noise levels from the existing and proposed HVAC units and exhaust fans. As shown in Table N-3, noise levels generated from on-site HVAC units would not exceed the City's daytime 15 minute noise standard of 55 dB(A) except for the residential building to the east; however, the noise increase of 1 dB(A) is not considered to be perceptible to the human ear in outdoor environmental setting (Noise and Vibration Impact Analysis, February 2025). Therefore, noise generated by the Project's operational activities would be less than significant.

Table N-3: HVAC and Exhaust Fan Noise Levels

Land Use	Direction	Existing HVAC Noise Level (dB(A) Leq)	Total Project HVAC Noise Level (dB(A) Leq)	Daytime Noise Standard (dB(A) Leq)
Residence	North	42.9	50.7	55.0
Residence	East	54.1	55.1	55.0
Residence	South	43.3	45.0	55.0
Residence	West	44.0	50.2	55.0

b) Generation of excessive groundborne vibration or groundborne noise levels?

The Project would generate additional vibration noises from typical sources associated with construction, such as hammering of nails, grading machinery, etc. The City of Beaumont does not identify specific vibration level limits and thus relies on the Federal Transit Administration (FTA) methodology which provides guidelines for the maximum-acceptable vibration criteria based on the type of land use. The guideline for residential uses is 78 VdB for daytime and 72 VdB for nighttime. The Noise and Vibration Impact Analysis prepared for the Project calculated the projected vibration levels from construction related activities. As shown on Table N-4, the closest residential building from the center of the Project is approximately 215 ft and would experience a vibration level of up to 59 VdB, thus vibration levels would not exceed the FTA guidelines of 78 VdB for daytime residential uses.

Table N-4: Construction Vibration Levels

Land Use	Direction	Equipment/Activity	Distance to Structure (ft)	Vibration Level (VdB)
Residence	North	Large bulldozers	440	50
		Loaded Trucks	440	49
		Jackhammer	440	42
Residence	East	Large bulldozers	215	59
		Loaded Trucks	215	58
		Jackhammer	215	51
Residence	South	Large bulldozers	405	51
		Loaded Trucks	405	50
		Jackhammer	405	43
Residence	West	Large bulldozers	285	55
		Loaded Trucks	285	54
		Jackhammer	285	47

In addition to annoyance thresholds, the Noise and Vibration Impact Analysis also evaluated the potential for structural damage to neighboring structures due to ground borne vibration. According to Table N-5, Potential Construction Vibration Damage, the damage threshold for residential structures of wood-frame or masonry construction is 0.2 in/sec Peak Particle Velocity (PPV). The nearest sensitive receptors are residential uses to the east that are approximately 16 feet from the eastern property line and would experience a vibration level of up to 0.174 in/sec PPV, which is below the FTA vibration damage threshold of 0.20 in/sec PPV. As such, impacts from vibration produced by the Project would be less than significant.

Table N-5: Potential Construction Vibration Damage

Land Use	Direction	Equipment/Activity	Distance to Structure (ft)	Vibration Level PPV(in/sec)
Residence	North	Large bulldozers	130	0.008
		Loaded Trucks	130	0.006
		Jackhammer	130	0.003
Residence	East	Large bulldozers	16	0.174
		Loaded Trucks	16	0.148
		Jackhammer	16	0.068
Residence	South	Large bulldozers	114	0.009
		Loaded Trucks	114	0.008
		Jackhammer	114	0.004
Residence	West	Large bulldozers	64	0.022
		Loaded Trucks	64	0.019
		Jackhammer	64	0.009

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The subject property is located approximately 6.17 miles away from the nearest airport, Banning Municipal Airport, and is not located within an adopted airport land use compatibility plan. Therefore, no impact could occur.

POPULATION AND HOUSING

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
14. **POPULATION AND HOUSING.** Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			**X**	
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				**X**

a) substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The Project site is currently developed with an existing church facility. The Project would be an expansion of the existing church facility and would include: construction of three (3) new buildings, Building A (approximately 11,000 square foot worship building with adjoining offices), Building B (approximately 5,000 square foot children's center) and Building D (approximately 7,700 square foot teen center) on the property, along with associated drive isles, recreational area, baptismal, site utilities and adjacent street pavement improvements. Furthermore, the Project would not extend or construct any infrastructure outside of the Project area. The proposed expansion is necessitated by increased demand placed on the church by the City's growing population and represents a natural and expected progression for an institutional facility to continue meeting the needs of its existing and future congregation. The Project would continue to serve the needs of the existing church facility and would not directly or indirectly contribute to unplanned population growth. Thus, would be less than significant.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

As previously stated in the above response, the Project would be for the expansion of an existing church facility. No residential dwellings exist on the Project site, and no displacement of housing or people would occur that would necessitate the construction of replacement housing elsewhere. Thus, no impact would occur.

PUBLIC SERVICES

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
15. **PUBLIC SERVICES**. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
a) Fire protection?			**X**	
b) Police protection?			**X**	
c) Schools?				**X**
d) Parks?				**X**
e) Other public facilities?				**X**

a) Fire protection?

Fire protection and emergency services for the City of Beaumont are provided by the Riverside County Fire Department in conjunction with the California Department of Forestry, which includes the Project site within its jurisdiction. The Project site is currently developed with an existing church facility and the closest fire station is the Riverside County Fire Department Sation No. 22, located approximately 1.50 miles northwest from the Project site. The Project's internal circulation plan would be consistent with the Fire Department and Public Works standards and requirements and construction would be required to comply with California Fire Code regulations, with verification to occur during the City's permitting process. There are no features of the Project that would create the need for unique or alternative fire protection services. The establishment of the proposed Project would result in incremental demands for fire protection services; however, the City of Beaumont assesses fees such as fire inspection fees, development impact fees, etc. to account for increased demands to fire protection services. Therefore, the Project would result in a less than significant impact to fire protection services.

b) Police Protection?

The Beaumont Police Department provides police protection services to the City of Beaumont, including the subject property. The construction phase may generate an incremental demand for police services; however, onsite security measures in concert with Project design features would serve as a deterrent to potential crimes such as theft or vandalism. Development-related fees, including Building Permit and inspection fees, would be assessed by the City to offset any increased demand on police services. Therefore, impacts in relation to police services would be less than significant.

c) Schools?

The Project site is located within the Beaumont Unified School District and is served by Starlight Elementary School, San Gorgonio High School, and Beaumont High School. The Project involves the expansion of an existing church facility and would not include construction of additional housing. Therefore, the Project would not generate any additional students that could potentially impact the local school district. Thus, no impact would occur.

d) Parks?

As previously stated in the above response, the Project would not involve the construction of new residential housing and, therefore, would not result in increased demand for parkland or recreational facilities. The Project would serve the existing community and would not generate new residents that might otherwise impact the City of Beaumont's park system. Furthermore, the proposed expansion includes two (2) large open lawn areas and a tot lot that would provide recreational opportunities for visitors onsite, which may help reduce demand on public parks within the City. Therefore, no impact to

parks or recreational facilities would occur.

e) Other Public Facilities?

The proposed Project involves the expansion of the existing institutional use located on a site zoned as residential single family (RSF). The RSF zone conditionally permits institutional uses, such as a church, and, therefore, the City's General Plan Environmental Impact Report (EIR) would have contemplated the potential services demands and impacts associated with such uses when establishing acceptable service level and development standards. Since the Project does not involve any residential development or substantial population increase, it would not generate additional demand on public services. The expansion is intended to accommodate existing and future demand generated, which is a natural progression for an institutional facility. Thus, no impact would occur to other public facilities.

RECREATION

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
16. **RECREATION.**				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			**X**	
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?			**X**	

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

As previously described, the Project would be for the expansion of an existing church facility, and would not involve the construction of new residential housing that would not generate population growth within the city. Additionally, the Project proposes open space and recreation facilities as part of the development, including two large open lawn areas, a basketball court, and a tot lot, which would serve the patrons of the church. Since the Project does not generate residential growth and provides additional recreational opportunities, it is not expected to increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. Thus, no impact would occur.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The proposed Project includes the expansion of an existing church facility and incorporates on-site recreational amenities, such as two large open lawn areas and a tot lot intended for use by congregants and visitors to the facility. These features are designed to serve the internal needs of the church community and are not public park facilities. The environmental effects associated with construction and operation of these recreational components have been analyzed as part of the overall Project throughout this Initial Study. These features are integrated into the Project's site design and would not require the expansion or construction of off-sire recreational facilities. As such, the Project does not require the construction or expansion of separate recreational facilities that might result in additional adverse physical impacts on the environment; therefore, impacts would be less than significant.

TRANSPORTATION/TRAFFIC

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
17. **TRANSPORTATION/TRAFFIC.** Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			**X**	
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?			**X**	
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				**X**
d) Result in inadequate emergency access?			**X**	

a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

The proposed Calvary Chapel Beaumont Expansion Project is consistent with the City of Beaumont General Plan land use designation and zoning for the site. The project consists of the redevelopment and expansion of an existing religious facility, which was considered a conditionally permitted use within the applicable residential district at the time of the General Plan's preparation and associated Environmental Impact Report (EIR). The Circulation Element of the General Plan accounts for institutional uses, such as the Calvary Chapel Beaumont Expansion Project, and their traffic implications in its long-range planning and roadway capacity assessments. The project includes half-width frontage improvements along Brookside Avenue and Orchard Heights Avenue, consisting of new sidewalk, curb, and gutter that will be constructed in accordance with the City's design standards and help implement the ultimate right-of-way. The site is not located along or adjacent to any designated bikeways with the nearest Class II bicycle facility located approximately 0.7 miles away. Since the project does not propose modifications to or removal of any existing or planned bicycle infrastructure, no impacts to bicycle facility safety or connectivity would occur. Pedestrian and transit access will be maintained and enhanced through upgraded frontage and site improvements; therefore, the project will not conflict with any plan, policy, or ordinance addressing the performance of the circulation system, and impacts are considered less than significant.

b) Conflict or be inconsistent with CEQA Guidelines Sec. 15064.3, subdivisions (b)?

CEQA Guidelines Section 15064.3, subdivision (b), requires that transportation impacts be evaluated based on Vehicle Miles Traveled (VMT) rather than Level of Service (LOS). The City of Beaumont has adopted Traffic Impact Analysis (TIA) and VMT Guidelines, which align with the Western Riverside Council of Governments (WRCOG) Recommended Guidelines. These guidelines establish screening thresholds and methods for determining whether a project is expected to result in a significant VMT impact. A Trip Generation and Vehicle Miles Traveled Analysis Memorandum was prepared by LSA Associates, Inc. to evaluate the Calvary Chapel Beaumont Expansion Project. According to the analysis, the project is anticipated to generate 94 daily trips on a typical weekday and 108 on a typical Sunday. These totals are below the 110 daily trip threshold that would trigger a full VMT analysis under WRCOG and City of Beaumont guidelines. Additionally, the project is categorized as a "local-serving church," which is identified by WRCOG as a limited trip-generating land use with minimal regional draw. Such land uses typically serve a nearby residential population and are presumed to generate low VMT. Based on its land use type, trip generation, and geographic location, the project qualifies for VMT screening and is presumed to result in a less than significant VMT impact. No unusual site or regional characteristics are present that would disqualify the project from this screening assumption; therefore, the proposed project would not conflict with or be inconsistent with CEQA Guidelines Section 15064.3, and the impact is considered less than significant.

Although LOS is no longer the threshold of significance under CEQA guidelines, the City of Beaumont continues to apply LOS as a tool to evaluate local roadway capacity and operational efficiency. Based on the LSA Trip Generation and VMT Analysis, the proposed project would generate eight (8) AM and fifteen 15 PM peak hour trips with 94 average daily trips

(ADT), which is below the City's 100 trip threshold for requiring further LOS analysis, and as such, potential impacts would be considered less than significant.

c) Substantially increase hazards due to a geometric design feature (e.g. sharp curves or dangerous intersections) or incompatible uses?

The proposed project would be accessed via driveway approaches along Brookside Avenue and Orchard Heights Avenue. These streets form a standard four-way intersection at the project site's northwest corner and provide direct, unobstructed routes to local and regional destinations. Both access points will be designed in compliance with the City of Beaumont's design standards, including the provision to maintain at all times adequate sight distances, turning radii, and a Clear Sight Triangle at all driveways to ensure safe ingress and egress. The project's internal circulation system includes appropriately sized drive aisles, turning areas, and parking spaces designed to safely accommodate passenger vehicles, ADA passenger vehicles, and emergency response vehicles. No oversized vehicles or incompatible land uses are associated with the project that would otherwise increase roadway hazards. Due to the site layout, circulation design, and vehicular access points adhering to City of Beaumont's design standards and the proposed project not including an unusual design feature or an incompatible use, the project will not substantially increase hazards; therefore, impacts are considered less than significant.

d) Result in inadequate emergency access?

The proposed Project is located along Brookside Avenue, a secondary street that connects approximately 2,000 feet to the east to Highland Springs Avenue, a four-lane arterial highway. Both streets are identified evacuations routes that are anticipated to have the capacity to handle an increase in traffic volume. Circulation throughout the Project site will have driveways, internal drive aisles, and parking areas, with adequate width and turning radius among other requirements, that will be designed consistent with the City's Fire Department and Engineering Department requirements and will maintain consistency with the Conditions of Approval to always require adequate circulation throughout the project site. Further, per the Trip Generation and Vehicles Miles Traveled Analysis prepared by LSA, the proposed Project will generate less than 100 trips during peak hours and is considered a low trip generator, and as such, the proposed Project does not represent an intensification from the existing land use that would result in inadequate emergency access. Therefore, the proposed Project will not result in inadequate emergency access, and will, therefore, have a less than significant impact.

TRIBAL RESOURCES

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
18. **TRIBAL RESOURCES.** Would the project:				
a) Cause a substantial adverse change in the significance of a Tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:				
(i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or				**X**
(ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.			**X**	

AB 52 Consultation

The Project would be subject to Chapter 532 of the California Statues of 2014, also known as Assembly Bill (AB) 52, which establishes that a formal consultation process for California Native Tribes be required as part of the California Environmental Quality Act (CEQA). AB52 requires the lead agency to consult with tribes during the CEQA process. The City of Beaumont, acting as the Lead Agency under CEQA, is required to initiate notification and consultation the applicable California Native American tribes traditionally and culturally affiliated with the project area. Tribal consultation has been completed and no further action is necessary beyond the established Mitigation Measures contained herein (MM-CUL-1 thru 4). Further, based on the records search and the Sacred Lands File (SLF) search conducted by the California Native American Heritage Commission (NAHC) included in the Cultural Resources Assessment prepared for the Project, no Tribal Cultural Resources have been identified within the Project boundaries.

a) i – ii. The Project is located on a site that has been previously disturbed with construction activities and day-to-day operations for the existing church facility. Previously, the Project site had remained vacant with no known cultural resources recorded within the Project boundary (Cultural Resources Assessment, 2025). A field survey was conducted as part of the Cultural Resources Assessment and did not find any evidence of cultural resources within the Project site. The Cultural Report also included a cultural resources records search at the South Coastal Information Center (SCIC) located at San Diego State University and determined that the Project site is not listed in the California Register of Historical Resources. In addition, a Sacred Lands Files search was requested from the Native American Heritage Commission (NAHC) and concluded negative results. Tribal consultation was completed and was determined that no additional mitigation beyond was is contained in Mitigation Measure CUL-1 thru 4 is necessary. Therefore, the Project would not result in impacts to historic resources that are listed or eligible for listing in the California Register of Historical Resources or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).

b) Locally, the City of Beaumont General Plan identifies that recorded and unrecorded tribal cultural resources exist along the 10-freeway, 60-freeway, and Beaumont Avenue/State Route 79. However, the Project site is not located within these areas and is approximately 6,500 feet east of the nearest identified location, Beaumont Avenue. Furthermore, the subject property does not feature any significant landforms, outcroppings, creeks, ravines, bluffs, or other significant, defining landscape features that could be of potential value. However, in the unlikely event that archaeological or tribal resources are discovered during grading, excavation, and or construction, mitigation CUL-1, as listed previously in the Cultural Resources Section has been included, herein. The Project would also include standard Conditions of Approval that would mandate appropriate measures be taken in the event something of significance is discovered. Further, tribal consultation

was completed and was determined that no additional mitigation beyond was is contained in Mitigation Measures CUL-1 thru 4 is necessary. Therefore, with the inclusion of Mitigation Measure CUL-1, the Project impacts would be reduced to less than significant.

UTILITIES AND SERVICE SYSTEMS

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
19. **UTILITIES AND SERVICE SYSTEMS.** Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?			**X**	
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?			**X**	
c) Result in a determination by the waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments			**X**	
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?			**X**	
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			**X**	

a-c) Require the expansion, relocation, or construction of new utility systems or service infrastructure, such as water, wastewater, storm drainage, electricity, natural gas, or telecommunications, or would it result in insufficient water supply or wastewater treatment capacity to service the project?

The proposed Project will connect to existing infrastructure within Brookside Avenue and Orchard Heights Avenue, where all necessary utility mains are located. Potable water service will be provided by the Beaumont-Chery Valley Water District (BCVWD). An existing 12-inch water line within Brookside Avenue currently services the site through a domestic water meter, and the Project proposes a new 2-inch line to distribute water to the new buildings as well as a separate line for newly irrigated areas. Fire protection will be provided through a dedicated line connected to the 12-inch main, circulating throughout the site beneath the drive aisle. BCVWD has issued a Will-Serve Letter confirming that sufficient water supply and infrastructure capacity exist to support the Project, even under dry and multiple dry year scenarios. Sewer service will be provided by the City of Beaumont and it already services the site through an 8-inch sewer line in Brookside Avenue. Existing sewer improvements onsite include sewer inverts, a lift station on the southwest side of the property, and a 6-inch sewer line extending from the existing worship center to the main line. The Project proposes a new 6-inch sewer line to connect the proposed Buildings A and B to the sewer system, running east to west onsite. The City's wastewater system has adequate treatment capacity to accommodate the projected flows, and no off-site improvements are necessary. Electric service is currently provided by Southern California Edison (SCE), and while the expansion may require a service panel upgrade, this is a standard permitting requirement handled directly with SCE that does not require a special approval process beyond Edison's standard permit review process. No new connections to natural gas are proposed and telecommunications infrastructure is already in place and adequately services the site with no upgrade or extensions required. The site does not contain a cell tower or mini-cell site that could be impacted by the proposed Project. Stormwater will be managed on-site through a detention basin located at the southwestern corner of the property. The basin will detain and treat runoff in compliance with City's engineering standards and the prepared WQMP before discharging into the existing public storm drain system. All utility construction will occur onsite or within previously disturbed rights-of-way and, as such, the proposed Project's impact to utilities and services systems would be less than significant.

d-e) Generate solid waste in excess of local capacity or conflict with applicable federal, state, or local solid waste regulation or reduction goals?

Solid waste generated by the proposed Project will be typical of institutional and church uses and is not expected to exceed the capacity of the regional waste management system. The City of Beaumont contracts with a franchised solid waste hauler,

Waste Management, to provide collection services in accordance with its Municipal Code and state mandates. As such, Waste Management already provides solid waste services to the subject property. Waste from the Project site will be collected and transported to permitted regional disposal facilities, including the Lamb Canyon Sanitary Landfill, which has sufficient capacity to serve the Project. The Project will comply with all applicable local and state solid waste management regulations, including California Assembly Bill (AB) 341, which mandates commercial recycling, and Senate Bill (SB) 1383, which requires organics diversion and edible food recovery. The Project will include trash enclosures that will be designed to the City's standards and will consist of multi-compartment bins to separate waste into the appropriate bins. Accordingly, the Project will not conflict with any federal, state, or local plans or regulations related to solid waste and will have a less than significant impact.

WILDFIRE

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
20: **Wildfire:** Would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?			**X**	
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?				**X**
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?				**X**
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?				**X**

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

The Project site is located on the south side of Brookside Avenue, which is a secondary street that connects to Highland Springs Avenue, a designated four-lane arterial highway. Per the City of Beaumont's General Plan, the City has an adopted Emergency Operations Plan (EOP) and Standardized Emergency Management System (SEMS)/National Incident Management System (NIMS), which serves as an extension of the State Emergency Plan. The EOP's intent is to facilitate multi-agency and multi-jurisdictional coordination and is consistent with the Safety Element goals and policies. The Project would provide access via two existing driveways along Brookside Avenue and Highland Spring Avenue, which are designated as emergency evacuation routes. As part of the Project, street frontage improvements along Brookside Avenue would be completed prior to operation of the expanded church facility, which would enhance both vehicular and pedestrian access along the designated evacuation routes. Additionally, the Project would be subject to review and approval by the Riverside County Fire Department to ensure adequate emergency access and compliance with applicable fire safety standards for evacuation routes. Further, per the Trip Generation and Vehicles Miles Traveled Analysis prepared by LSA, the proposed Project will generate less than 100 trips during peak hours and is considered a low trip generator, and as such, the proposed Project does not represent an intensification from the existing land use that would impair an adopted emergency response plan or emergency evacuation plan. Therefore, the Project would not substantially impair an adopted emergency response plan or emergency evacuation plan. Thus, impacts would be less than significant.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Pursuant to the Figure 9.3, "Fire Hazard Severity Zone Map," of the City of Beaumont's General Plan, the Project site is not located within an identified moderate, high, or very high fire hazard severity zone. The Project is currently developed and located within an urbanized area that is mostly built out. In addition, the Project would require compliance with the California Building Code (CBC) and the California Fire Code (CFC) to ensure necessary infrastructural improvements such as hydrants, fire sprinklers, use of fire rated materials where appropriate, etc. be constructed appropriately, which will reduce the potential for wildfire-related impacts to people or structures. The CBC also requires new structures to achieve a minimum wind rating, which reduces the possibility of panels or other building materials being torn off from prevailing winds and impacting the neighboring community. Therefore, the Project would not exacerbate wildfire risks due to slope, prevailing winds, or other environmental factors. Thus, no impact would occur.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency

water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Per Figure 9.3, "Fire Hazard Severity Zone Map," of the City of Beaumont's General Plan, the Project site is currently developed as a church facility and is located within an urbanized area that is not identified as a moderate, high, or very high fire hazard severity zone. The Project does not propose any infrastructure improvements that would exacerbate fire risks. All proposed infrastructure improvements would be located entirely within the Project's boundary or its immediate street frontage, and would be designed to comply with CBC and CFC, including fire suppression and fire access standards that would support life safety and fire prevention efforts rather than contribute to increased fire risk. Therefore, the Project would not require the installation or maintenance of associated infrastructure that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment, and no impact would occur.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

As previously mentioned, the Project site is currently developed as a church facility and is located within an urbanized area that is not identified as a moderate, high, or very high fire hazard severity zone. The Project site is relatively flat with no significant or defining features such as drainage channels or hillsides that could be subject to slope instability or landslides caused by fires. The Project site has been designed to maintain the existing drainage pattern that flows from northeast to southwest. As part of the Project, the existing basin would be redesigned and reconstructed to capture the necessary volume of water consistent with pre-development conditions. Therefore, no impact would occur as a result of downslope or downstream flooding or landslides, runoff, post-fire slope instability, or drainage changes.

MANDATORY FINDINGS OF SIGNIFICANCE

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
19. **MANDATORY FINDINGS OF SIGNIFICANCE.**				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		**X**		
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)?		**X**		
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		**X**		

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

The Project site is located within an urbanized and previously disturbed area that has been developed with an existing church facility. A Biological Resources Assessment and a focused Burrowing Owl Survey were prepared for the Project by qualified biological consultants. These technical studies concluded that the Project site does not contain sensitive natural communities, jurisdictional waters, or suitable habitat for rare, threatened, or endangered species. Although indirect evidence of past burrowing owl activity was identified at one burrow location, no burrowing owls were present on-site during the four separate field surveys. Mitigation has been incorporated to require a preconstruction survey 30 days prior to ground disturbing activities and, if necessary, subsequent conservation to avoid impacts in the event Burrowing Owls are discovered. Therefore, the Project would not result in the loss or reduction of biological resources or sensitive habitat, and as such, impacts would be less than significant with mitigation incorporated. Further, a Cultural Resources Report, that included a records search and field survey, was completed for the Project and no historical or archaeological resources were identified or associated with the site. The search from the Sacred Lands File returned the same negative results. Although the records searches and field surveys yielded no positive results, ground-disturbing activities associated with the construction of the Project has the potential to uncover unknown cultural or tribal resources. Mitigation has been included to require monitoring by a qualified archaeologist, and, if requested, a representative of the consulting Tribe. The City of Beaumont, as the Lead Agency, conducted AB 52 consultation with the appropriate California Native American Tribes within the Project area, in accordance with State Law, and it was determined that no further action is necessary beyond the mitigation measures contained herein. Any significant tribal or cultural resources identified during the process will be evaluated, and appropriate measures will be imposed to avoid or mitigate impacts. Based on the technical studies prepared for the Project and the implementation of standards Conditions of Approval and Mitigation Measures identified in this Initial Study, the Project would not result in significant impacts to biological or cultural resources. The Project does not have the potential to substantially degrade the environment or eliminate important examples of the State's natural or cultural heritage. Therefore, impacts related to this Finding would be less than significant with mitigation incorporated.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)?

Cumulative impacts are defined as two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the development when added to the impacts of other closely related past, present, and reasonably foreseeable or probable future developments. Cumulative impacts can result from individually minor but collectively significant developments taking place over a period. CEQA Guidelines, Section 15130 (a) and (b), states:

(a) Cumulative impacts shall be discussed when the project's incremental effect is cumulatively considerable.

(b) The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided of the effects attributable to the project. The discussion should be guided by the standards of practicality and reasonableness. The Project site is currently developed and is located in an urban area.

The Project would be an expansion to the existing church facility, which is consistent with the General Plan Land Use designation, zoning designation, is surrounded by similar compatible development, and does not involve any unique or unusual elements. All other potential impacts related to implementation of the Project would be less than significant or reduced to a less than significant level with implementation of mitigation measures related to biological resources, cultural resources, and tribal cultural resources. Since the Project is an expansion of the existing church facility, is zoned for the proposed use, and can be accommodated by existing roadways, public services, and utilities, the Project would not result in cumulatively considerable impacts to environmental resources; and thus, impacts would be less than significant with mitigation.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

As previously described, the Project involves an expansion to the existing church facility, which is consistent with the General Plan Land Use designation, zoning designation, and surrounded by similar compatible development. The Project has been analyzed in accordance with CEQA guidelines and found that potential impacts related to implementation of the Project would be less than significant or reduced to a less than significant level with implementation of mitigation measures related to biological resources, cultural resources, and tribal cultural resources. The Project, through adherence to all applicable state and federal guidelines and application of the City of Beaumont's Conditions of Approval for the Project, would not result in substantial adverse effects on human beings, either directly or indirectly. Thus, impacts would be reduced to less than significant with mitigation.

Mitigation Measures:

MM-BIO-1 Pre-Construction Burrowing Owl Survey and DBESP Implementation: Prior to any ground-disturbing activity, a qualified biologist shall conduct a pre-construction burrowing owl survey within 30 days of site disturbance. If active burrows or individuals are observed, a Determination of Biologically Equivalent or Superior Preservation (DBESP) shall be prepared and submitted to the Western Riverside County Regional Conservation Authority (RCA) and the California Department of Fish and Wildlife (CDFW) for review and approval. The DBESP shall define measures to avoid, minimize, and compensate for direct and indirect impacts to burrowing owl, including but not limited to the establishment of appropriate buffer zones, seasonal restrictions, passive relocation if feasible, and compensatory habitat banking or in-lieu fees.

MM-CUL-1 Inadvertent Cultural Resources Finds: For adequate coverage and the protection of possibly significant buried resources and tribal cultural resources, a qualified archaeologist and Native American Monitor provided by the consulting tribes shall be retained by the applicant to monitor all ground-disturbing construction activities, included but not limited to site preparation, grading and excavation. The applicant, archaeologist and consulting tribes would agree on a monitoring schedule based on the necessary days of ground-disturbance. In the event that Native American cultural resources

are discovered during Project development/construction, all work in the immediate vicinity of the find shall cease and a qualified archaeologist meeting Secretary of Interior standards shall be hired to assess the find. Work on the overall Project may continue during this assessment period. If significant Native American cultural resources are discovered, for which a Treatment Plan must be prepared, the developer or his archaeologist shall contact Consulting Tribe(s) and shall, in good faith, consult on the discovery and its disposition (e.g., avoidance, preservation, return of artifacts to tribe, etc.). If avoidance is not possible, an avoidance plan would be prepared and implemented based on consultation between the archaeologist and tribes. If resources are found to be significant historical resources under CEQA then CUL 2 and/or CUL-3 shall apply. For the purposes of these measures, a Consulting Tribe is defined as a tribe that initiated the AB52 tribal consultation process for the Project, has not opted out of the AB52 consultation process, and has completed AB52 consultation with the City as provided for in Public Resources Code Section 21080.3.2(b)(1) of AB52.

MM-CUL-2 Treatment and Disposition of Non-Tribal Cultural Resources: If significant resources are identified that are not identified by the qualified archaeologist and consulting tribe(s) as a Tribal Cultural Resources, and the resources is of scientific/historical value, recovered materials shall be deposited in a federal or state recognized curation facility. The curation of the recovered materials shall be identified and funded by the Applicant and approved by the City. The site record for the resource shall be updated to include the final disposition of the recovered materials and will be submitted to the Eastern Information Center (EIC).

MM-CUL-3 Treatment and Disposition of Tribal Cultural Resources: In the event that Native American tribal cultural resources are inadvertently discovered during grading for this Project. The following procedures will be carried out for treatment and disposition of the discoveries: 1. Documentation: In conjunction with the qualified archaeologist, the tribal cultural resource shall be documented to the extent deemed appropriate by the consulting tribe(s) on the appropriate Department of Parks and Recreation (DPR) 523-series forms. The final disposition of the materials shall also be included on the site form. 2. Temporary Curation and Storage: During construction, all discovered resources shall be temporarily curated in a secure location to be mutually agreed upon by the City, Project Archaeologist, and consulting tribes. The removal of any artifacts from the Project site will need to be thoroughly inventoried with tribal monitor oversite of the process; and 3. Treatment and Final Disposition: The landowner(s) shall relinquish ownership of all cultural resources, including sacred items, burial goods, and all archaeological artifacts and non-human remains as part of the required mitigation for impacts to cultural resources. The applicant shall relinquish the artifacts through one or more of the following methods and provide the City Planning Department with evidence of same: a. Accommodate the process for onsite reburial of the discovered items with the consulting Native American tribes or bands. This shall include measures and provisions to protect the future reburial area from any future impacts. Reburial shall not occur until all cataloguing and basic recordation have been completed; b. A curation agreement with an appropriate qualified repository within Riverside County that meets federal standards per 36 CFR Part 79 and therefore would be professionally curated and made available to other archaeologists/researchers for further study. The collections and associated records shall be transferred, including title, to an appropriate curation facility within Riverside County, to be accompanied by payment of the fees necessary for permanent curation: c. If more than one Native American tribe or band is involved with the project and cannot come to a consensus as to the disposition of cultural materials, they shall be curated at the Western Science Center by default; and. d. At the completion of grading, excavation and ground disturbing activities on the site, a Phase IV Monitoring Report shall be submitted to the City documenting monitoring activities conducted by the project Archaeologist and Native Tribal Monitors within 60 days of completion of grading. This report shall document the impacts to the known resources on the property; describe how each mitigation measure was fulfilled; document the type of cultural resources recovered and the disposition of such resources; provide evidence of the required cultural sensitivity training for the construction staff held during the required pre-grade meeting; and, in a confidential appendix, include the daily/weekly monitoring notes from the archaeologist. All reports produced will be submitted to the City, Eastern Information Center and interested tribes:

MM-CUL-4 Human Remains: If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b) remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage Commission must then immediately identify the "most likely descendants(s)" for

purposes of receiving notification of discovery. The most likely descendant(s) shall then make recommendations within 48 hours and engage in consultation concerning the treatment of the remains as provided in Public Resources Code Section 5097.98 and the agreement described in MM CUL-3. If the MLD fails to make a recommendation regarding the treatment or the recommendation is not feasible per the property owner, then the remains shall be reburied with appropriate dignity and respect on the property in a location not subject to further disturbance. In the event the MLD fails to make a recommendation - ESA should be set up to prevent further disturbance. The ESA should not indicate that remains are buried there. This should be conducted in coordination with the NAM/D63.

REFERENCES

1. City of Beaumont Final Program EIR, 2020. Accessed December 2023. https://www.beaumontca.gov/DocumentCenter/View/36788/Attachment-F---link-to-Final-EIR

2. City of Beaumont General Plan, 2020. Accessed December 2023. https://www.beaumontca.gov/DocumentCenter/View/36923/Beaumont-GPU_Final-rev-22521

3. City of Beaumont Development Code. Accessed December 2023. https://library.municode.com/ca/beaumont/codes/code_of_ordinances

4. Caltrans Scenic Highways. Accessed October 2023. www.dot.ca.gov.

5. California Department of Toxic Substances Control. Accessed January 2024. www.dtsc.ca.gov.

6. Department of Homeland Security, FEMA Flood Map Service Center. Accessed December 2023. https://msc.fema.gov/portal/home

7. State Water Resources Control Board. Accessed December 2023. https://www.waterboards.ca.gov/

8. US Fish and Wildlife Service National Wetlands Inventory Mapper. Accessed January 2024. https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/

9. BCR Consulting, LLC. Cultural Resources Assessment. Prepared April 11, 2025.

10. Beaumont, CA U.S.G.S. Topo Map

11. Beaumont 7.5" Quadrangle U.S.G.S. Map

12. Beaumont-Cherry Valley Water District. Fire Flow Analysis and Fire Hydrant Location. Prepared December 10, 2024.

13. CA Important Farmland: 2012. Accessed January 2024. https://gis.data.ca.gov/maps/6bef423a57584fb1817023d0ce7a4619/explore?location=36.326002%2C-118.457953%2C7.43

14. Fehr Peers. Western Riverside Council of Governments Recommended Traffic Impact Analysis Guidelines for Vehicles Miles Traveled and Level of Service Assessment. Prepared January 2020.

15. Geo Tek, Inc. Infiltration Evaluation. Prepared May 3,2023.

16. USGS Maps and Topos. Accessed December 2023. https://ngmdb.usgs.gov/ngmdb/ngmdb_home.html

17. Historic Aerial Photographs. Accessed December 2023. https://www.historicaerials.com/viewer

18. List of Hazardous Material Sites via EnviroStar. Accessed October 2023. https://www.envirostor.dtsc.ca.gov/public/

19. CALFIRE Fire Hazard Severity Zone in State Responsibility Area. Accessed January 2024. https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones

20. FEMA National Flood Hazard Layer (NFHL) Viewer. Accessed January 2024. https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd

21. FEMA 100 year and 500 year Flood Risk Map. Accessed January 2024 https://gis.bam.water.ca.gov/bam/

22. LSA Associates, Inc. Air Quality, Energy, and Greenhouse Gas Impact Report. Prepared February 2025.

23. LSA Associates, Inc. Noise and Vibration Impact Analysis. Prepared February 2025.

24. LSA Associates, Inc. Project Trip Generation and Vehicles Miles Traveled Analysis memorandum. Prepared February 21, 2024.

25. LSA Associates, Inc. Results of a Burrowing Owl Survey. Prepared May 13, 2025.

26. LSA Associates, Inc. Western Riverside County Multiple Species Habitat Conservation Plan Consistency Analysis and Biology Report. Prepared May 2025.

27. California Department of Fish and Wildlife (CDFW). Staff Report on Burrowing Owl Mitigation. March 7, 2012.

28. California Department of Fish and Wildlife (CDFW). *California Natural Diversity Database (CNDDB).* Accessed 2025. https://wildlife.ca.gov/Data/CNDDB

29. California Native American Heritage Commission (NAHC). Sacred Lands File Search Results for the Calvary Chapel Beaumont Expansion Project. April 2025.

30. California Historical Resources Information System (CHRIS). Cultural Resources Records Search Results for the Calvary Chapel Beaumont Expansion Project. Eastern Information Center, April 2025

31. California Air Resources Board (CARB). 2017 Climate Change Scoping Plan. https://ww2.arb.ca.gov

32. Santa Ana Regional Water Quality Control Board (RWQCB*).* Water Quality Control Plan for the Santa Ana River Basin (Basin Plan). Updated 2022

33. City of Beaumont. Energy Action Plan (EAP). Adopted April 21, 2020. https://www.beaumontca.gov/DocumentCenter/View/36978/Beaumont-EAP_Final-042120”

APPENDICES

AIR QUALITY, ENERGY, AND GREENHOUSE GAS IMPACT REPORT

CALVARY CHAPEL EXPANSION PROJECT

BEAUMONT, CALIFORNIA

LSA

October 2025

AIR QUALITY, ENERGY, AND GREENHOUSE GAS IMPACT REPORT

CALVARY CHAPEL EXPANSION PROJECT

BEAUMONT, CALIFORNIA

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October 2025

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LIST OF ABBREVIATIONS AND ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AAQS	ambient air quality standards
AB	Assembly Bill
AQMP	Air Quality Management Plan
Basin	South Coast Air Basin
BAU	business-as-usual
BTU	British thermal units
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFE	Corporate Average Fuel Economy
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CALGreen Code	California Green Building Standards Code
CAP	climate action plan
CARB	California Air Resources Board
CARB Handbook	California Air Resources Board *Air Quality and Land Use Handbook*
CAT	Climate Action Team
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	methane
City	City of Beaumont
CO	carbon monoxide
CO_2	carbon dioxide

CO_2e	carbon dioxide equivalent
Connect SoCal 2024	Connect SoCal: The 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy
County	County of Riverside
CPUC	California Public Utilities Commission
DPM	diesel particulate matter
EMFAC2021	California Emissions Factor Model, Version 2021
EO	Executive Order
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reduction Plan
GWh	gigawatt-hours
GWP	global warming potential
HFCs	hydrofluorocarbons
kWh	kilowatt-hours
LCFS	Low Carbon Fuel Standard
LST	Local Significance Threshold
MMT	million metric tons
MMT CO_2e	million metric tons of carbon dioxide equivalent
mpg	miles per gallon
MPO	Metropolitan Planning Organization
MT	metric tons
MT CO_2e	metric tons of carbon dioxide equivalent
MT CO_2e/yr	metric tons of carbon dioxide equivalent per year
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
O_3	ozone

OPR	Governor's Office of Planning and Research
Pb	lead
PFCs	perfluorocarbons
PM	particulate matter
$PM_{2.5}$	particulate matter less than 2.5 microns in size
PM_{10}	particulate matter less than 10 microns in size
ppm	parts per million
PRC	Public Resources Code
project	Calvary Chapel Expansion Project
RCP	Regional Comprehensive Plan
ROCs	reactive organic compounds
ROGs	reactive organic gases
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCS	Sustainable Communities Strategy
sf	square foot/feet
SF_6	sulfur hexafluoride
SFR	Single Family Residential
SO_2	sulfur dioxide
SoCalGas	Southern California Gas Company
SO_X	sulfur oxides
SRA	Source Receptor Area
SUV	sport utility vehicle

TAC	toxic air contaminant
USEPA	United States Environmental Protection Agency
VMT	vehicle miles traveled
VOCs	volatile organic compounds
Working Group	Greenhouse Gas California Environmental Quality Act Significance Threshold Working Group
WRCOG	Western Riverside Council of Governments
WRELP	Western Riverside Energy Leadership Partnership
ZEV	zero-emission vehicle
ZNE	zero net energy

1. INTRODUCTION

This Air Quality, Energy, and Greenhouse Gas (GHG) Impact Report has been prepared to evaluate the potential air quality and GHG emissions impacts associated with the Calvary Chapel Expansion Project (project) in the City of Beaumont, California. This report follows the guidelines identified by the South Coast Air Quality Management District (SCAQMD) in its *California Environmental Quality Act (CEQA) Air Quality Handbook*,[1] and associated updates. In keeping with these guidelines, this analysis describes existing air quality, including air quality and GHG emissions generated from project-related sources, regional air pollution, and global climate change.

1.1 PROJECT LOCATION

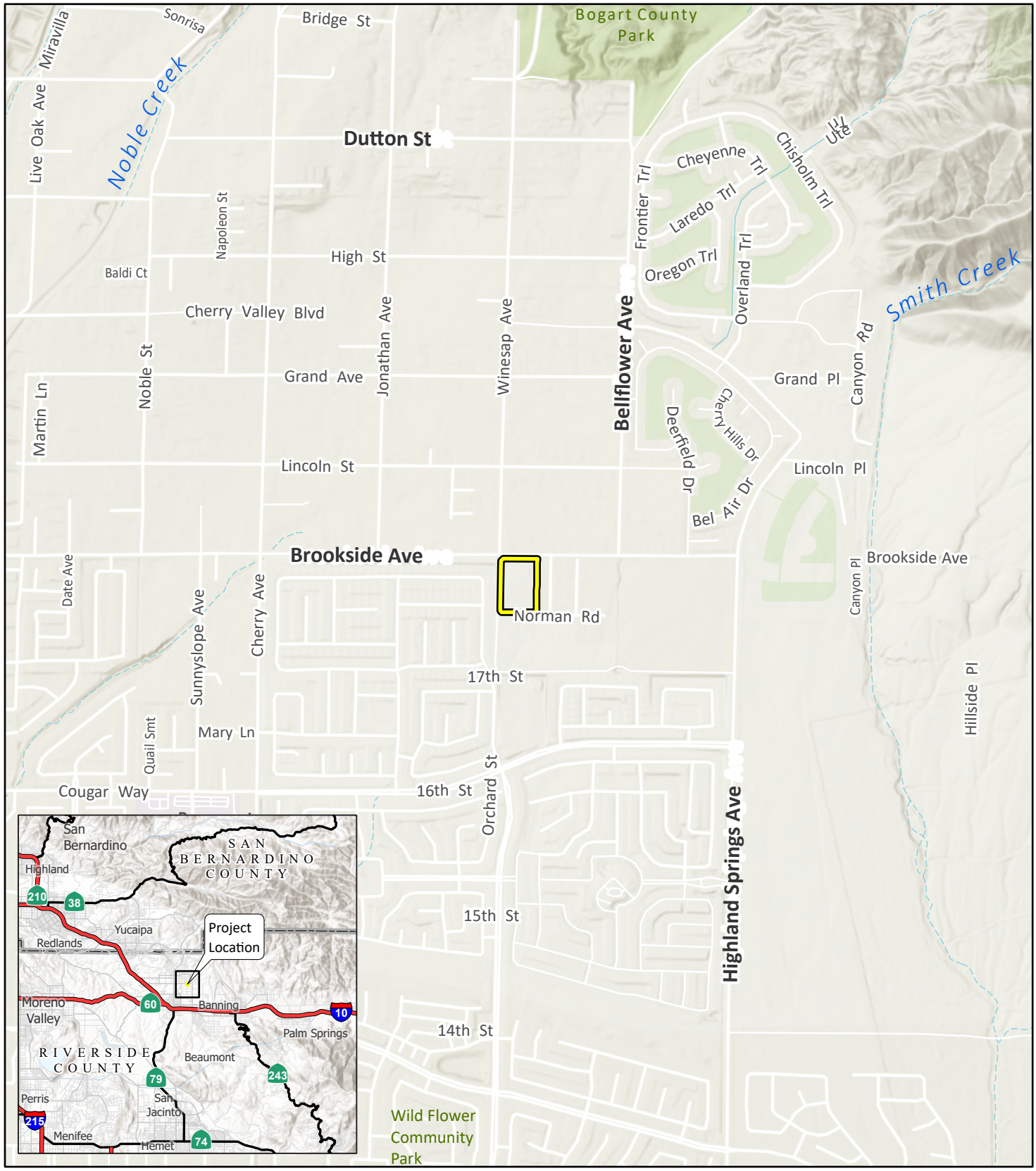
The project site is located at 1780 Orchard Heights Avenue, Beaumont, California (Assessor's Parcel Number 408-070-012), which is at the southeast corner of Orchard Heights Avenue and Brookside Avenue. The site currently operates as a church facility that features a 3,000 square-foot (sf) sanctuary building, outdoor baptismal, outdoor picnic/patio area, one (1) modular restroom building, five (5) modular classroom buildings, landscaping, and parking improvements. Figure 1 shows the regional and project location.

1.2 PROJECT DESCRIPTION

The proposed project would expand the existing Calvary Chapel Beaumont Church facility with three new buildings. The proposed project would include a new 11,000-square-foot (sf) sanctuary building consisting of 641 fixed seats, a 5,000 sf children's ministry center building, and a 7,700 sf youth recreation center and multipurpose building. In addition, a new baptismal area, two sports court facilities, and an outdoor barbecue area are also being proposed as part of the project. The existing sanctuary building will be repurposed as a meeting room for lifegroups and teen-related activities and will no longer be used as a sanctuary for Sunday services. Vehicular access to the project site is provided by a driveway approach on Orchard Heights Avenue and a second approach on Brookside Avenue. An internal drive aisle will allow adequate circulation for pedestrian, vehicular, and emergency access. A total of 216 parking spaces are proposed, and the new concrete and pavement area will total 118,000 sf. The landscaping provided by the project will total 76,357 sf.

Operations of the project consist of worship services that are held throughout the week. One service is held on Wednesday nights at 6:30 p.m. and four services are held throughout Sunday at 8:00 am, 9:45 a.m., 11:30 a.m., and 1:30 p.m. The youth recreation center will maintain the same hours of operation as the regularly scheduled worship services on Wednesdays and Sundays. Lifegroups, such as bible studies, are held at various times throughout the week in a small group setting. Each service and lifegroup session typically last 1 hour. In addition to worship services and lifegroups, the facility will employ at least two full-time staff and five part-time staff to be available for office hours as well as to support general church functions. Staff members are present on site from 10:00 a.m. to 4:00

[1] South Coast Air Quality Management District (SCAQMD). 1993. *CEQA Air Quality Handbook*. Website: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993) (accessed October 2025).



LSA

Project Site

FIGURE 1

N

0 750 1500

FEET

SOURCE: Esri Topographic Basemap

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Calvary Chapel Expansion Project

Project Location and Vicinity

p.m., Monday through Friday, and during worship services. The hours of operation for the proposed youth recreation center are unknown at this time. Therefore, this analysis assumes that the youth center would also operate from 10:00 a.m. to 4:00 p.m., Monday through Friday.

No demolition is proposed as the project was designed to accommodate the existing parking improvements, and the structures that are to be removed are modular and do not require demolition. The project is to include site preparation, grading, building construction, paving, and architectural coating. Construction of the proposed project is anticipated to begin June 2025 with an 18-month construction period and an operational year of 2026. The project has three consecutive phases. However, all three phases have been conservatively modeled to coincide over an 18-month construction period ending January 2027. This analysis also assumes the use of Tier 2 construction equipment. The project site would include 3,839 cubic yards of cut and 13,795 cubic yards of fill. Additionally, the project is estimated to generate 94 daily trips based on the *Calvary Chapel Expansion Project Trip Generation and Vehicle Miles Traveled Analysis Memorandum*.[2] Figure 2 shows the project site plan.

1.3 EXISTING LAND USES

The project site has a City of Beaumont (City) General Plan land use and zoning designation of Single-Family Residential (SFR).[3] The SFR designation allows single-family residential use (attached or detached) and neighborhood commercial use in specified locations. This supports church zoning laws and is applicable for the current use and the Calvary Chapel expansions. Therefore, the proposed projects expansion uses would be consistent with the project site's existing General Plan designation and zoning.

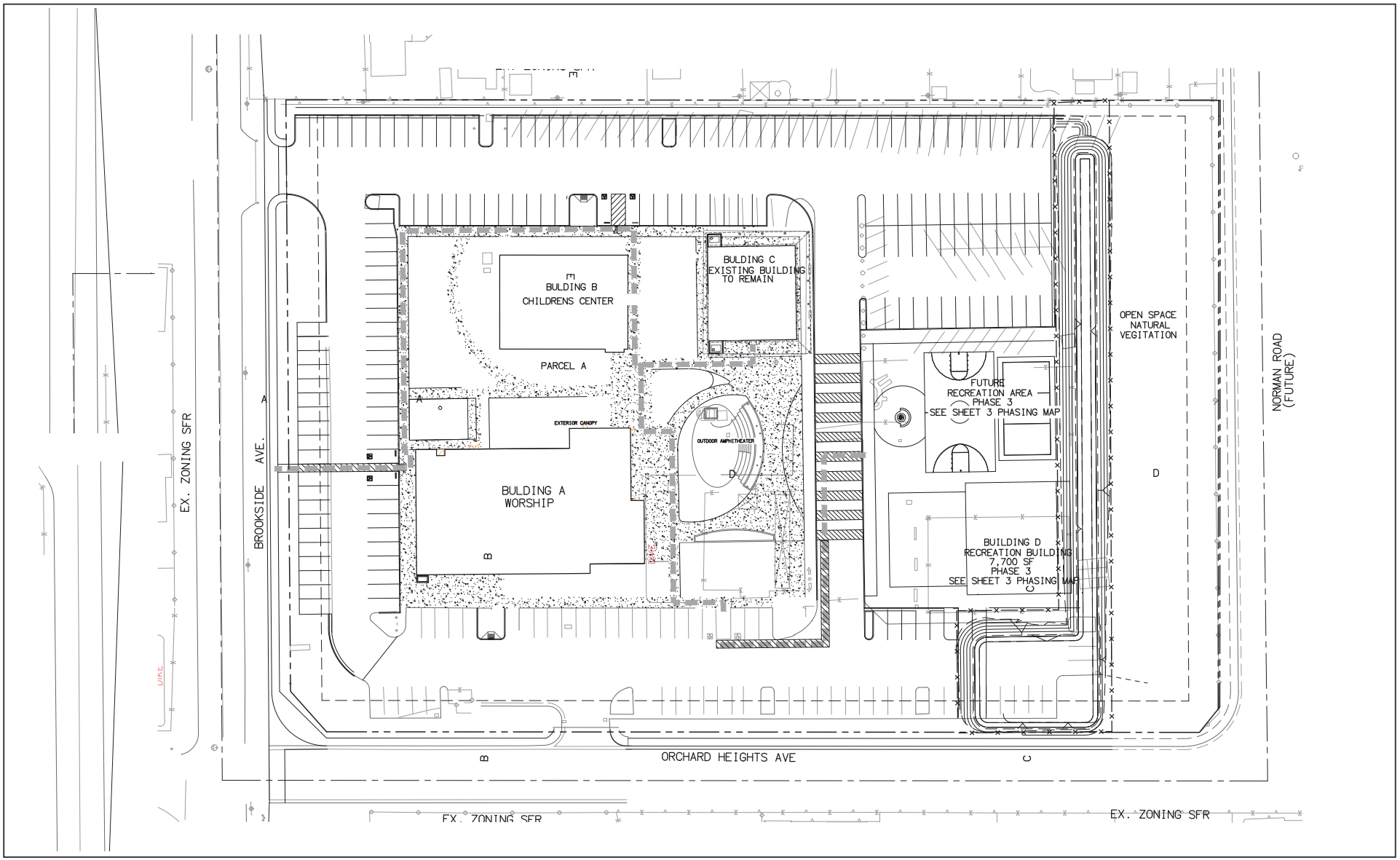
1.4 SENSITIVE RECEPTORS

For the purposes of this analysis, sensitive receptors are areas of population that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include residences, schools, daycare centers, hospitals, parks, and similar uses that are sensitive to air quality. Impacts on sensitive receptors are of particular concern because they are the population most vulnerable to the effects of air pollution. The project site is surrounded by existing single family residential and rural residential uses. The areas adjacent to the project site include the following uses:

- **North:** existing residential uses and undeveloped land
- **South:** existing rural residential uses, undeveloped land, and Starlight Elementary School
- **East:** existing single family residential uses
- **West:** existing single family residential uses

[2] LSA Associates, Inc. (LSA). 2024. *Calvary Chapel Expansion Project Trip Generation and Vehicle Miles Traveled Analysis Memorandum (LSA Project No. 20241535)*. February 21.

[3] City of Beaumont. n.d. *California Code of Ordinances, Zoning Information.* Website: https://www.beaumontca.gov/120/Zoning-Information (accessed October 2025).



LSA

FIGURE 2

N

0 45 90

FEET

SOURCE: City of Beaumont

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Calvary Chapel Expansion Project

Site Plan

The proposed project is bound by Brookside Avenue to the north and Orchard Heights Avenue to the west. The closest sensitive receptors are single-family residential uses to the east along Maureen Drive, approximately 16 feet from the project boundary, and single-family residential uses to the west along Orchard Heights Avenue, approximately 30 feet from the project boundary (see Table A).

Table A: Summary of Analysis Distances by Impact Category

Activity	Nearest Sensitive Receptor	Points of Analysis	Distance (feet)
Construction	Single-family homes on Maureen Drive	Perimeter of construction activities to property line	16
Operations	Single-family homes on Maureen Drive	Emissions sources on-site generalized at the centroid of the project site to residence property line	220

Source: Compiled by LSA (2025).

2 BACKGROUND

This section provides current background information on air pollutants and their health effects, energy, and GHGs. It also provides current regulatory background information, including information from the California Air Resources Board's (CARB) *Air Quality and Land Use Handbook* (CARB Handbook),[4] a description of the general health risks of toxics, and the significance criteria for project evaluation.

2.1 AIR POLLUTANTS AND HEALTH EFFECTS

Both State and federal governments have established health-based ambient air quality standards (California Ambient Air Quality Standards [CAAQS] and National Ambient Air Quality Standards [NAAQS], respectively) for six criteria air pollutants:[5] carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Long-term exposure to elevated levels of criteria pollutants may result in adverse health effects. However, emission thresholds established by an air district are used to manage total regional emissions within an air basin based on the air basin's attainment status for criteria pollutants. These emission thresholds were established for individual projects that would contribute to regional emissions and pollutant concentrations and could adversely affect or delay the projected attainment target year for certain criteria pollutants.

Because of the conservative nature of the thresholds and the basin-wide context of individual project emissions, there is no known direct correlation between a single project and localized air quality-related health effects. One individual project that generates emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like nitrogen oxides (NO_X) and volatile organic compounds (VOCs).

Occupants of facilities such as schools, daycare centers, parks and playgrounds, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to air pollutants because these population groups have increased susceptibility to respiratory disease. Persons engaged in strenuous outdoor work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions, compared to commercial and industrial areas, because people generally spend longer periods of time at their residences, with greater associated exposure to ambient air quality conditions. Recreational uses are also considered sensitive compared to commercial and industrial uses due to greater exposure to ambient air quality conditions associated with exercise.

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4 California Air Resources Board (CARB). 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

5 Criteria pollutants are defined as those pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

2.1.1 Ozone

Rather than being directly emitted, ozone (or smog) is formed by photochemical reactions between NO_X and VOCs. Ozone is a pungent, colorless gas. Elevated ozone concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in sensitive receptors such as the sick, elderly, and young children. Ozone levels peak during the summer and early fall months.

2.1.2 Carbon Monoxide

CO is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions. CO passes through the lungs into the bloodstream, where it interferes with the transfer of oxygen to body tissues.

2.1.3 Particulate Matter

PM is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles are those that are 10 microns or less in diameter (PM_{10}). Fine, suspended particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) is not readily filtered out by the lungs. Nitrates, sulfates, dust, and combustion particulates are major components of PM_{10} and $PM_{2.5}$. These small particles can be directly emitted into the atmosphere as byproducts of fuel combustion, through abrasion (e.g., tire or brake lining wear), or through fugitive dust (e.g., wind or mechanical erosion of soil). They can also be formed in the atmosphere through chemical reactions. Particulates may transport carcinogens and other toxic compounds that adhere to the particle surfaces and can enter the human body through the lungs.

2.1.4 Nitrogen Dioxide

NO_2 is a reddish-brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. NO_2 decreases lung function and may reduce resistance to infection.

2.1.5 Sulfur Dioxide

SO_2 is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels in the region. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

2.1.6 Lead

Leaded gasoline (phased out in the United States beginning in 1973), paint (on older houses and cars), smelters (metal refineries), and the manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has multiple adverse neurotoxic health effects, and children are at special risk. Some lead-containing chemicals cause cancer in animals.

Lead levels in the air have decreased substantially since leaded gasoline was eliminated. Ambient lead concentrations are only monitored on an as-warranted, site-specific basis in California. On October 15, 2008, the United States Environmental Protection Agency (USEPA) strengthened the NAAQS for lead by lowering it from 1.5 to 0.15 micrograms per cubic meter (µg/m^3). The USEPA revised the monitoring requirements for lead in December 2010. These requirements focus on airports and large urban areas, resulting in an increase in 76 monitors nationally.

2.1.7 Volatile Organic Compounds

VOCs (also known as reactive organic gases [ROGs] and reactive organic compounds [ROCs]) are formed from the combustion of fuels and the evaporation of organic solvents. VOCs are not defined as criteria pollutants however, because VOCs accumulate in the atmosphere more quickly during the winter, when sunlight is limited and photochemical reactions are slower, they are a prime component of the photochemical smog reaction. There are no attainment designations for VOCs.

2.1.8 Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated by the USEPA and the CARB. Some examples of TACs include benzene, butadiene, formaldehyde, and hydrogen sulfide. The identification, regulation, and monitoring of TACs is relatively recent compared to that for criteria pollutants.

TACs do not have ambient air quality standards (AAQS), but are regulated by the USEPA, CARB, and the SCAQMD. In 1998, the CARB identified particulate matter from diesel-fueled engines as a TAC. The CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[6] High-volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (e.g., distribution centers and truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high-volume transit centers, and schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

Unlike TACs emitted from industrial and other stationary sources noted above, most diesel particulate matter (DPM) is emitted from mobile sources—primarily “off-road” sources (e.g., construction and mining equipment, agricultural equipment, and truck-mounted refrigeration units) as well as “on-road” sources (e.g., trucks and buses traveling on freeways and local roadways).

Although not specifically monitored, recent studies indicate that exposure to DPM may contribute significantly to a cancer risk (a risk of approximately 500 to 700 in 1,000,000) that is greater than all other measured TACs combined.[7] The technology for reducing DPM emissions from heavy-duty trucks is well established, and both State and federal agencies are moving aggressively to regulate engines and emission control systems to reduce and remediate diesel emissions. The CARB anticipated that by

[6] CARB. 2000. Stationary Source Division and Mobile Source Control Division. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.* October.

[7] Ibid.

2020, average statewide DPM concentrations will decrease by 85 percent from levels in 2000 with full implementation of the CARB's Diesel Risk Reduction Plan,[8] meaning that the statewide health risk from DPM is expected to decrease from 540 cancer cases in 1,000,000 to 21.5 cancer cases in 1,000,000. The CARB 2000 Diesel Risk Reduction Plan is still the most recent version and has not been updated.

Table B summarizes the sources and health effects of air pollutants discussed in this section. Table C presents a summary of CAAQS and NAAQS.

Table B: Sources and Health Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust • Natural events, such as decomposition of organic matter	• Reduced tolerance for exercise • Impairment of mental function • Impairment of fetal development • Death at high levels of exposure • Aggravation of some heart diseases (angina)
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust • High temperature stationary combustion • Atmospheric reactions	• Aggravation of respiratory illness • Reduced visibility • Reduced plant growth • Formation of acid rain
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight	• Aggravation of respiratory and cardiovascular diseases • Irritation of eyes • Impairment of cardiopulmonary function • Plant leaf injury
Lead (Pb)	• Contaminated soil	• Impairment of blood functions and nerve construction • Behavioral and hearing problems in children
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	• Stationary combustion of solid fuels • Construction activities • Industrial processes • Atmospheric chemical reactions	• Reduced lung function • Aggravation of the effects of gaseous pollutants • Aggravation of respiratory and cardiorespiratory diseases • Increased cough and chest discomfort • Soiling • Reduced visibility
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels • Smelting of sulfur-bearing metal ores Industrial processes	• Aggravation of respiratory diseases (asthma, emphysema) • Reduced lung function • Irritation of eyes • Reduced visibility • Plant injury • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board (2015).

[8] CARB. 2000. Stationary Source Division and Mobile Source Control Division. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.* October.

Table C: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
Ozone (O_3)[h]	1-Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m³)		0.070 ppm (137 µg/m³)		
Respirable Particulate Matter (PM_{10})[i]	24-Hour	50 µg/m³	Gravimetric or Beta Attenuation	150 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		–		
Fine Particulate Matter ($PM_{2.5}$)[i]	24-Hour	-		35 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	9.0 µg/m³ [o]		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m³)	–	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m³)		–	–	
Nitrogen Dioxide (NO_2)[j]	Annual Arithmetic Mean	0.03 ppm (57 µg/m³)	Gas Phase Chemi-luminescence	53 ppb (100 µg/m³)	Same as Primary Standard	Gas Phase Chemi-luminescence
	1-Hour	0.18 ppm (339 µg/m³)		100 ppb (188 µg/m³)	-	
Lead (Pb)[l,m]	30-Day Average	1.5 µg/m³	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m³ (for certain areas)[l]	Same as Primary Standard	
	Rolling 3-Month Average[i]	–		0.15 µg/m³		
Sulfur Dioxide (SO_2)[k]	24-Hour	0.04 ppm (105 µg/m³)	Ultraviolet Fluorescence	0.14 ppm (for certain areas)	–	Ultraviolet Fluorescence; Spectro-photometry (Pararosaniline Method)
	3-Hour	–		–	0.5 ppm (1300 µg/m³)	
	1-Hour	0.25 ppm (655 µg/m³)		75 ppb (196 µg/m³)[k]	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)[k]	–	
Visibility-Reducing Particles[l]	8-Hour	See footnote n	Beta Attenuation and Transmittance through Filter Tape.	No Federal Standards		
Sulfates	24-Hour	25 µg/m³	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride[j]	24-Hour	0.01 ppm (26 µg/m³)	Gas Chromatography			

Source: California Air Resources Board (2016) (Website: https://ww2.arb.ca.gov/sites/default/files/2024-08/AAQS%20Table_ADA_FINAL_07222024.pdf).

Table notes are provided on the following page.

[a] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California Ambient Air Quality Standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact USEPA for further clarification and current national policies.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] Any equivalent measurement method which can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.

[e] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[f] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[g] Reference method as described by the USEPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the USEPA.

[h] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m³ to 12.0 µg/m³. The existing national 24- hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m³, as was the annual secondary standard of 15 µg/m³. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m³ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[j] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[k] On June 2, 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[l] The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[m] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[n] In 1989, the CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

[o] On February 7, 2024, the federal annual $PM_{2.5}$ standard was revised from 12.0 µg/m³ to 9.0 µg/m³.

°C = degrees Celsius
µg/m³ = micrograms per cubic meter
CARB = California Air Resources Board
mg/m³ = milligrams per cubic meter
ppb = parts per billion
ppm = parts per million
USEPA = United States Environmental Protection Agency

2.2 ENERGY

2.2.1 Electricity

Electricity is a manmade resource. The production of electricity requires the consumption or conversion of energy resources (including water, wind, oil, gas, coal, solar, geothermal, and nuclear resources) into energy. Electricity is used for a variety of purposes (e.g., lighting, heating, cooling, and refrigeration, and for operating appliances, computers, electronics, machinery, and public transportation systems).

According to the most recent data available, in 2022, California's electricity was generated primarily by natural gas (47.5 percent), renewable sources (52.2 percent), large hydroelectric (7.2 percent), nuclear (8.7 percent), coal (<1.0 percent), and other unspecified sources. Total electric generation in California in 2022 was 287,220 gigawatt-hours (GWh), up 3.4 percent from the 2021 total generation of 277,764 GWh.[9]

The project site is within the service territory of Southern California Edison (SCE). SCE provides electricity to more than 15 million people in a 50,000-square-mile area of Central, Coastal, and Southern California.[10] According to the California Energy Commission (CEC), total electricity consumption in the SCE service area in 2022 was 85,870.0 GWh (31,603.7 GWh for the residential sector and 54,266.3 GWh for the non-residential sector.[11] Total electricity consumption in Riverside County in 2022 was 17,780.6 GWh (or 17,780,573,271 kWh).[12]

2.2.2 Natural Gas

Natural gas is a nonrenewable fossil fuel. Fossil fuels are formed when layers of decomposing plant and animal matter are exposed to intense heat and pressure under the surface of the Earth over millions of years. Natural gas is a combustible mixture of hydrocarbon compounds (primarily methane) that is used as a fuel source. Natural gas is found in naturally occurring reservoirs in deep underground rock formations. Natural gas is used for a variety of uses (e.g., heating buildings, generating electricity, and powering appliances such as stoves, washing machines and dryers, gas fireplaces, and gas grills).

9 California Energy Commission (CEC). 2022. *2022 Total System Electric Generation*. Website: https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2022-total-system-electric-generation (accessed October 2025).

10 Southern California Edison (SCE). 2020. About Us. Website: https://www.sce.com/about-us/who-we-are (accessed October 2025).

11 CEC. 2023a. Electricity Consumption by Entity. Website: http://www.ecdms.energy.ca.gov/ (accessed October 2025).

12 CEC. 2023b. Electricity Consumption by County and Entity. Websites: http://www.ecdms.energy.ca.gov/ (accessed October 2025).

Natural gas consumed in California is used for electricity generation (45 percent), residential uses (21 percent), industrial uses (25 percent), and commercial uses (9 percent). California continues to depend on out-of-state imports for nearly 90 percent of its natural gas supply.[13]

The Southern California Gas Company (SoCalGas) is the natural gas service provider for the project site location. SoCalGas provides natural gas to approximately 21.1 million consumers in a 24,000-square-mile service area throughout Central and Southern California, from Visalia to the Mexican border.[14] According to the CEC, total natural gas consumption in the SoCalGas service area in 2022 was 5,026.5 million therms (2,230.2 million therms for the residential sector). Total natural gas consumption in Riverside County in 2022 was 431.1 million therms (431,052,392 therms).[15]

2.2.3 Fuel

Petroleum is also a nonrenewable fossil fuel. Petroleum is a thick, flammable, yellow-to-black mixture of gaseous, liquid, and solid hydrocarbons that occurs naturally beneath the Earth's surface. Petroleum is primarily recovered by oil drilling. It is refined into a large number of consumer products, primarily fuel oil, gasoline, and diesel.

The average fuel economy for light-duty vehicles (autos, pickups, vans, and sport utility vehicles [SUVs]) in the United States has steadily increased from about 14.9 miles per gallon (mpg) in 1980 to 22.9 mpg in 2021.[16] Federal fuel economy standards have changed substantially since the Energy Independence and Security Act was passed in 2007. This act, which originally mandated a national fuel economy standard of 35 mpg by year 2020,[17] applies to cars and light trucks of Model Years 2011 through 2020. In March 2020, the USEPA and National Highway Traffic Safety Administration (NHTSA) finalized the Corporate Average Fuel Economy standards for Model Years 2024–2026 Passenger Cars and Light Trucks, further detailed below.

Gasoline is the most-used transportation fuel in California, with 97 percent of all gasoline being consumed by light-duty cars, pickup trucks, and SUVs. According to the most recent data available, in 2022, total gasoline consumption in California was 316,425 thousand barrels or 1,597.6 trillion British thermal units (BTU).[18] Of the total gasoline consumption, 299,304 thousand barrels or

13 CEC. 2023c. Supply and Demand of Natural Gas in California. Website: https://www.energy.ca.gov/data-reports/energy-almanac/californias-natural-gas-market/supply-and-demand-natural-gas-california (accessed October 2025).

14 Southern California Gas Company (SoCalGas). 2020. About SoCalGas. Website: https://www.socalgas.com/about-us (accessed October 2025).

15 CEC. 2023d. Gas Consumption by County and Entity. Website: http://www.ecdms.energy.ca.gov/ (accessed October 2025).

16 United States Department of Transportation. n.d. "Table 4-23: Average Fuel Efficiency of U.S. Light Duty Vehicles." Website: https://www.bts.dot.gov/bts/bts/content/average-fuel-efficiency-us-light-duty-vehicles (accessed October 2025).

17 United States Department of Energy. 2007. "Energy Independence & Security Act of 2007." Website: https://afdc.energy.gov/laws/373 (accessed October 2025).

18 United States Energy Information Administration (EIA). 2022. California State Profile and Energy Estimates, Data. Website: https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_mg.html&sid=CA (accessed October 2025).

1,511.2 trillion BTU were consumed for transportation.[19] Based on fuel consumption obtained from CARB's California Emissions Factor Model, Version 2021 (EMFAC2021), approximately 730.6 million gallons of gasoline and 302.4 million gallons of diesel will be consumed from vehicle trips in Riverside County in 2025.[20]

2.3 GREENHOUSE GASES

Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. The Earth's average near-surface atmospheric temperature rose 0.6 ± 0.2 degrees Celsius (°C) or 1.1 ± 0.4 degrees Fahrenheit (°F) in the 20th century. The prevailing scientific opinion on climate change is that most of the warming observed over the last 50 years is attributable to human activities. The increased amounts of carbon dioxide (CO_2) and other GHGs are the primary causes of the human-induced component of warming. GHGs are released by the burning of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect.[21]

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- CO_2
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF_6)

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere and enhancing the natural greenhouse effect, which is believed to be causing global warming. Although manmade GHGs include naturally occurring GHGs (e.g., CO_2, methane, and N_2O), some gases (e.g., HFCs, PFCs, and SF_6) are completely new to the atmosphere.

Certain gases (e.g., water vapor) are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric

19 Ibid.

20 CARB. 2025. California Emissions Factor Model. Emission Inventory. Riverside County. Gasoline and Diesel. Website: https://arb.ca.gov/emfac/emissions-inventory/ff479e229626e4214feaef2f83ed892150d9d110 (accessed October 2025).

21 The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." Just as the glass in a greenhouse lets heat from sunlight in and reduces the heat escaping, greenhouse gases like carbon dioxide, methane, and nitrous oxide in the atmosphere keep the Earth at a relatively even temperature. Without the greenhouse effect, the Earth would be a frozen globe; thus, although an excess of greenhouse gas results in global warming, the naturally occurring greenhouse effect is necessary to keep our planet at a comfortable temperature.

concentrations are largely determined by natural processes (e.g., oceanic evaporation). For the purposes of this air quality analysis, the term "GHGs" will refer collectively to the six gases listed above.

These gases vary considerably in terms of global warming potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The global warming potential is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere (i.e., atmospheric lifetime). The GWP of each gas is measured relative to carbon dioxide, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of CO_2 equivalents (CO_2e). Table D shows the GWP for each type of GHG. For example, SF_6 is 23,900 times more potent at contributing to global warming than CO_2.

Table D: Global Warming Potential of Greenhouse Gases

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100-Year Time Horizon)
Carbon Dioxide	50-200	1
Methane	12	25
Nitrous Oxide	114	310
HFC-23	270	11,700
HFC-134a	14	140
HFC-152a	1.4	140
PFC: Tetrafluoromethane (CF_4)	50,000	6,500
PFC: Hexafluoromethane (C_2F_6)	10,000	9,200
Sulfur Hexafluoride (SF_6)	3,200	23,900

Source: *Second Update to the Climate Change Scoping Plan: Building on the Framework* (CARB 2017).
Website: www.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2017-scoping-plan-documents (accessed July 2024).
HFC = hydrofluorocarbons
PFC = perfluorocarbons

The following discussion summarizes the characteristics of the six GHGs and black carbon.

2.3.1 Carbon Dioxide

In the atmosphere, carbon generally exists in its oxidized form, as CO_2. Natural sources of CO_2 include the respiration (i.e., breathing) of humans, animals, and plants; volcanic out gassing; decomposition of organic matter; and evaporation from the oceans. Human caused sources of CO_2 include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. Natural sources release approximately 150 billion tons of CO_2 each year, far outweighing the 7 billion tons of manmade emissions of CO_2 each year. Nevertheless, natural removal processes (e.g., photosynthesis by land- and ocean-dwelling plant species) cannot keep pace with this extra input of manmade CO_2, and consequently, the gas is building up in the atmosphere.

In 2021, total annual CO_2 accounted for approximately 81.2 percent of California's overall GHG emissions.[22] Transportation is the single largest source of CO_2 in California, which is primarily comprised of on-road travel. Electricity production, industrial, and residential sources also make important contributions to CO_2 emissions in California.

2.3.2 Methane

CH_4 is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands, termites, and oceans. Decomposition occurring in landfills accounts for the majority of human-generated CH_4 emissions in California and in the United States as a whole. Agricultural processes such as intestinal fermentation, manure management, and rice cultivation are also significant sources of CH_4 in California. Total annual emissions of CH_4 accounted for approximately 9.8 percent of GHG emissions in California in 2021.[23]

2.3.3 Nitrous Oxide

N_2O is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. N_2O is a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion emit N_2O, and the quantity emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N_2O emissions in California. N_2O emissions accounted for approximately 3.4 percent of GHG emissions in California in 2021.[24]

2.3.4 Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride

HFCs are primarily used as substitutes for ozone-depleting substances regulated under the Montreal Protocol.[25] PFCs and SF_6 are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no aluminum or magnesium production in California; however, the rapid growth in the semiconductor industry leads to greater use of PFCs. HFCs, PFCs, and SF_6 accounted for about 5.6 percent of GHG emissions in California in 2021.[26]

2.3.5 Black Carbon

Black carbon is the most strongly light-absorbing component of PM formed by burning fossil fuels such as coal, diesel, and biomass. Black carbon is emitted directly into the atmosphere in the form of $PM_{2.5}$ and is the most effective form of PM, by mass, at absorbing solar energy. Per unit of mass in

22 CARB. 2022. GHGs Descriptions & Sources in California. Website: ww2.arb.ca.gov/ghg-descriptions-sources (accessed October 2025).
23 Ibid.
24 Ibid.
25 The Montreal Protocol is an international treaty that was approved on January 1, 1989, and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for ozone depletion.
26 CARB. 2022. op. cit.

the atmosphere, black carbon can absorb one million times more energy than CO_2.[27] Black carbon contributes to climate change both directly (e.g., absorbing sunlight) and indirectly (e.g., affecting cloud formation). However, because black carbon is short-lived in the atmosphere, it can be difficult to quantify its effect on global warming.

Most United States emissions of black carbon come from mobile sources (52 percent), particularly from diesel-fueled vehicles. The other major source of black carbon is open biomass burning, including wildfires, although residential heating and industry also contribute. The CARB estimates that the annual black carbon emissions in California will be reduced approximately 50 percent below 2013 levels by 2030.[28]

27 United States Environmental Protection Agency (USEPA). 2016. Black Carbon, Basic Information. November 29. Website: https://www3.epa.gov/airquality/blackcarbon/basic.html (accessed October 2025).

28 CARB. 2017b. *Short-Lived Climate Pollutant Reduction Strategy.* March. Website: https://ww2.arb.ca.gov/sites/default/files/2020-07/final_SLCP_strategy.pdf (accessed October 2025).

3 REGULATORY SETTING

3.1 AIR QUALITY REGULATIONS

The USEPA and the CARB regulate direct emissions from motor vehicles. The SCAQMD is the regional agency primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as monitoring ambient pollutant concentrations.

3.1.1 Federal Regulations

3.1.1.1 Federal Clean Air Act

The 1970 federal Clean Air Act (CAA) authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 changed deadlines for attaining national standards as well as the remedial actions required of areas of the nation that exceed the standards. Under the CAA, State and local agencies in areas that exceed the national standards are required to develop State Implementation Plans to demonstrate how they will achieve the national standards by specified dates.

3.1.2 State Regulations

3.1.2.1 California Clean Air Act

In 1988, the California Clean Air Act (CCAA) required that all air districts in the State endeavor to achieve and maintain CAAQS for CO, O_3, SO_2, and NO_2 by the earliest practical date. The CCAA provides districts with authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan shows how a district would reduce emissions to achieve air quality standards. Generally, the State standards for these pollutants are more stringent than the national standards.

3.1.2.2 California Air Resources Board

The CARB is the State's "clean air agency." The CARB's goals are to attain and maintain healthy air quality, protect the public from exposure to TACs, and oversee compliance with air pollution rules and regulations.

3.1.2.2.1 Assembly Bill 2588 Air Toxics "Hot Spots" Information and Assessment Act. Under Assembly Bill (AB) 2588, stationary sources of air pollutants are required to report the types and quantities of certain substances their facilities routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, identify facilities having localized impacts, determine health risks, and notify nearby residents of significant risks.

3.1.2.2.2 The California Air Resources Board Handbook. The CARB has developed an *Air Quality and Land Use Handbook*[29] that is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. According to the CARB Handbook, air pollution studies have shown an association between respiratory and other non-cancer health effects and proximity to high traffic roadways. Other studies have shown that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for much of the overall cancer risk from airborne toxics in California. The CARB Handbook recommends that county and city planning agencies strongly consider proximity to these sources when finding new locations for "sensitive" land uses such as homes, medical facilities, daycare centers, schools, and playgrounds.

Land uses that can produce air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners, and large gasoline service stations. Key recommendations in the CARB Handbook include taking steps to avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles per day or rural roads with 50,000 vehicles per day;
- Within 1,000 feet of a major service and maintenance rail yard;
- Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries;
- Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet); and/or
- Within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater).

The CARB Handbook specifically states that its recommendations are advisory and acknowledges land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

The recommendations are generalized and do not consider site-specific meteorology, freeway truck percentages, or other factors that influence risk for a particular project site. The purpose of this guidance is to help land use agencies determine when to further examine project sites for actual health risk associated with the location of new sensitive land uses.

3.1.3 Regional Regulations

3.1.3.1 South Coast Air Quality Management District

The SCAQMD has jurisdiction over most air quality matters in the South Coast Air Basin (Basin). This area includes all of Orange County, Los Angeles County (except for the Antelope Valley), the non-

[29] CARB. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County. The SCAQMD is the agency principally responsible for comprehensive air pollution control in the Basin and is tasked with implementing certain programs and regulations required by the CAA and the CCAA. The SCAQMD prepares plans to attain CAAQS and NAAQS. The SCAQMD is directly responsible for reducing emissions from stationary (area and point) sources. The SCAQMD develops rules and regulations, establishes permitting requirements, inspects emissions sources, and enforces such measures though educational programs or fines, when necessary.

The proposed project could be subject to the following SCAQMD rules and regulations:[30]

- **Regulation IV – Prohibitions:** This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air pollutant emissions, fuel contaminants, start-up/shutdown exemptions, and breakdown events.
    - **Rule 402 – Nuisance:** This rule restricts the discharge of any contaminant in quantities that cause or have a natural ability to cause injury, damage, nuisance, or annoyance to businesses, property, or the public.
    - **Rule 403 – Fugitive Dust:** This rule requires the prevention, reduction, or mitigation of fugitive dust emissions from a project site. Rule 403 restricts visible fugitive dust to a project property line, restricts the net PM_{10} emissions to less than 50 µg/m^3 and restricts the tracking out of bulk materials onto public roads. Additionally, Rule 403 requires an applicant to utilize one or more of the best available control measures (identified in the tables within the rule). Control measures may include adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers, and/or ceasing all activities. Finally, Rule 403 requires that a contingency plan be prepared if so determined by the USEPA. In addition, SCAQMD Rule 403(e), Additional Requirements for Large Operations, includes requirements to provide Large Operation Notification Form 403 N, appropriate signage, additional dust control measures, and employment of a dust control supervisor that has successfully completed the Dust Control training class in the South Coast Air Basin.
- **Regulation XI – Source Specific Standards:** Regulation XI sets emissions standards for different sources.
    - **Rule 1113 – Architectural Coatings:** This rule limits the amount of VOCs from architectural coatings and solvents, which lowers the emissions of odorous compounds.

The SCAQMD is responsible for demonstrating regional compliance with AAQS but has limited indirect involvement in reducing emissions from fugitive, mobile, and natural sources. To that end, the SCAQMD works cooperatively with the CARB, the Southern California Association of Governments (SCAG), County of Riverside (County) transportation commissions, local governments, and other federal and State government agencies. It has responded to this requirement by preparing a series of Air Quality Management Plans (AQMPs) to meet CAAQS and NAAQS. The

[30] SCAQMD. 2024. South Coast AQMD Rule Book. Website: https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book (accessed October 2025).

SCAQMD and the SCAG are responsible for formulating and implementing the AQMP for the Basin. The main purpose of an AQMP is to bring the area into compliance with federal and State air quality standards. Every 3 years, the SCAQMD prepares a new AQMP, updating the previous plan and 20-year horizon.[31]

The Final 2022 AQMP is the currently adopted AQMP. Key elements of the Final 2022 AQMP include the following:

- Calculating and taking credit for co-benefits from other planning efforts (e.g., climate, energy, and transportation)
- A strategy with fair-share emission reductions at the federal, State, and local levels
- Investment in strategies and technologies meeting multiple air quality objectives
- Seeking new partnerships and significant funding for incentives to accelerate deployment of zero-emission and near-zero emission technologies
- Enhanced socioeconomic assessment, including an expanded environmental justice analysis
- Attainment of the 24-hour $PM_{2.5}$ standard in 2019 with no additional measures
- Attainment of the annual $PM_{2.5}$ standard by 2025 with implementation of a portion of the O_3 strategy
- Attainment of the 1-hour O_3 standard by 2022 with no reliance on "black box" future technology (CAA Section 182(e)(5) measures)

The 2022 AQMP builds upon measures already in place from previous AQMPs. It also includes a variety of additional strategies such as regulation, accelerated deployment of available cleaner technologies (e.g., zero emissions technologies, when cost-effective and feasible, and low NO_x technologies in other applications), best management practices, co-benefits from existing programs (e.g., climate and energy efficiency), incentives, and other CAA measures to achieve the 2015 8-hour ozone standard.

3.1.3.2 Southern California Association of Governments

SCAG is a council of governments for Los Angeles, Orange, Riverside, San Bernardino, Imperial, and Ventura Counties. It is a regional planning agency and serves as a forum for regional issues relating to transportation, the economy and community development, and the environment. SCAG is the federally designated Metropolitan Planning Organization (MPO) for the majority of the southern California region and is the largest MPO in the nation. With regard to air quality planning, SCAG prepares the Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP), which address regional development and growth forecasts and form the basis for the land use and transportation control portions of the AQMP and are utilized in the preparation of the air

[31] SCAQMD. 2022. *Final 2022 Air Quality Management Plan*. December 2.

quality forecasts and consistency analysis included in the AQMP. The RTP, RTIP, and AQMP are based on projections originating within local jurisdictions.

Although SCAG is not an air quality management agency, it is responsible for developing transportation, land use, and energy conservation measures that affect air quality. SCAG's Regional Comprehensive Plan (RCP) provides growth forecasts that are used in the development of air quality-related land use and transportation control strategies by the SCAQMD. The RCP is a framework for decision-making for local governments, assisting them in meeting federal and State mandates for growth management, mobility, and environmental standards, while maintaining consistency with regional goals regarding growth and changes. Policies within the RCP include consideration of air quality, land use, transportation, and economic relationships by all levels of government.

SCAG adopted the Connect SoCal: The 2024–2050 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (Connect SoCal 2024)[32] on April 4, 2024. Connect SoCal 2024 is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. Connect SoCal 2024 is an important planning document for the region, allowing project sponsors to qualify for federal funding, and takes into account operations and maintenance costs to ensure reliability, longevity, and cost effectiveness. The forecasted development pattern, when integrated with the financially constrained transportation investments identified in Connect SoCal 2024, would reach the GHG emissions reduction target set by CARB, including the regional target of reducing GHG emissions from autos and light-duty trucks by 19 percent by 2035 (compared to 2005 levels).

3.1.4 Local Regulations

3.1.4.1 City of Beaumont General Plan

The City of Beaumont General Plan[33] addresses air quality in the Land Use and Air Quality Element. The Land Use and Air Quality Element includes goals and policies that work to reduce air pollution and fugitive dust. The following policies apply to the proposed project.

- **Policy 8.4.3:** Avoid the siting of new projects and land uses that would produce localized air pollution (e.g., Interstate 10, SR-60, high traffic roads, certain industrial facilities) in a way that would adversely impact existing air quality-sensitive receptors including schools, childcare centers, senior housing, and subsidized affordable housing. The recommended minimum distance separating these uses should be 500 feet.

32 Southern California Association of Governments (SCAG). 2024. Connect SoCal: The 2024–2050 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments. Website: https://scag.ca.gov/sites/main/files/file-attachments/23-2987-connect-socal-2024-final-complete-040424.pdf?1712261565 (accessed October 2025).

33 City of Beaumont. 2020. *City of Beaumont General Plan*. *Land use and Air Quality Element*. Website: https://www.beaumontca.gov/121/General-Plan (accessed October 2025).

- **Policy 8.4.4:** For sensitive land uses that cannot be avoided within 500 feet of sources of localized air pollution, potential design mitigation options include:
    - Providing residential units with individual HVAC systems in order to allow adequate ventilation with windows closed;
    - Locating air intake systems for heating, ventilation, and air conditioning (HVAC) systems as far away from existing air pollution sources as possible;
    - Using HEPA air filters in the HVAC system and developing a maintenance plan to ensure the filtering system is properly maintained;
        - Utilizing only fixed windows next to any existing sources of pollution;
        - Using sound walls, berms, and vegetation as physical barriers; and
        - Notifying new potential home buyers of risks from air pollution.

3.2 ENERGY REGULATORY SETTING

Federal and State agencies regulate energy use and consumption through various means and programs. On the federal level, the United States Department of Transportation, the United States Department of Energy, and the USEPA are three federal agencies with substantial influence over energy policies and programs. Generally, federal agencies influence and regulate transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy-related research and development projects, and through funding for transportation infrastructure improvements. On the State level, the California Public Utilities Commission (CPUC) and the CEC are two agencies with authority over different aspects of energy.

The CPUC regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies and serves the public interest by protecting consumers and ensuring the provision of safe, reliable utility service and infrastructure at reasonable rates, with a commitment to environmental enhancement and a healthy California economy.

The CEC is the State's primary energy policy and planning agency. The CEC forecasts future energy needs, promotes energy efficiency, supports energy research, develops renewable energy resources, and plans for/directs State response to energy emergencies. The applicable federal, State, regional, and local regulatory framework is discussed below.

3.2.1 Federal Regulations

3.2.1.1 Energy Policy Act of 2005

The Energy Policy Act of 2005 seeks to reduce reliance on nonrenewable energy resources and provide incentives to reduce current demand on these resources. For example, under this act, consumers and businesses can obtain federal tax credits for purchasing fuel-efficient appliances and

products (including hybrid vehicles), building energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

3.2.1.2 Corporate Average Fuel Economy Standards

On March 31, 2022, the NHTSA finalized the Corporate Average Fuel Economy (CAFE) standards for Model Years 2024–2026 Passenger Cars and Light Trucks. The amended CAFE standards would require an industry wide fleet average of approximately 49 mpg for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8 percent annually for model years 2024–2025, and 10 percent annually for model year 2026. The final standards are estimated to save about 234 billion gallons of gasoline between model years 2030 to 2050.

3.2.2 State Regulations

3.2.2.1 Assembly Bill 1575, Warren-Alquist Act

In 1975, largely in response to the oil crisis of the 1970s, the State Legislature adopted AB 1575 (also known as the Warren-Alquist Act), which created the CEC. The statutory mission of the CEC is to forecast future energy needs; license power plants of 50 megawatts (MW) or larger; develop energy technologies and renewable energy resources; plan for and direct State responses to energy emergencies; and, perhaps most importantly, promote energy efficiency through the adoption and enforcement of appliance and building energy efficiency standards. AB 1575 also amended Public Resources Code (PRC) Section 21100(b)(3) and *State CEQA Guidelines* Section 15126.4 to require Environmental Impact Reports (EIRs) to include, where relevant, mitigation measures proposed to minimize the wasteful, inefficient, and unnecessary consumption of energy caused by a project. Thereafter, the State Resources Agency created Appendix F to the *State CEQA Guidelines*. Appendix F assists EIR preparers in determining whether a project will result in the inefficient, wasteful, and unnecessary consumption of energy. Appendix F of the *State CEQA Guidelines* also states that the goal of conserving energy implies the wise and efficient use of energy and the means of achieving this goal, including (1) decreasing overall per capita energy consumption; (2) decreasing reliance on fossil fuels such as coal, natural gas, and oil; and (3) increasing reliance on renewable energy sources.

3.2.2.2 Senate Bill 1389, Energy: Planning and Forecasting

In 2002, the State Legislature passed Senate Bill (SB) 1389, which required the CEC to develop an integrated energy plan every 2 years for electricity, natural gas, and transportation fuels for the California Energy Policy Report. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero emission vehicles (ZEVs) and their infrastructure needs, and encouragement of urban designs that reduce vehicle miles traveled (VMT) and accommodate pedestrian and bicycle access.

In compliance with the requirements of SB 1389, the CEC adopts an Integrated Energy Policy Report every 2 years and an update every other year. The most recently adopted report includes the *2023*

Integrated Energy Policy Report.[34] The *Integrated Energy Policy Report* covers a broad range of topics, including decarbonizing buildings, integrating renewables, energy efficiency, energy equity, integrating renewable energy, updates on Southern California electricity reliability, climate adaptation activities for the energy sector, natural gas assessment, transportation energy demand forecast, and the California Energy Demand Forecast. The *Integrated Energy Policy Report* provides the results of the CEC's assessments of a variety of energy issues facing California. Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining energy reliability and controlling costs.

3.2.2.3 Renewable Portfolio Standard

SB 1078 established the California Renewable Portfolio Standards program in 2002. SB 1078 initially required that 20 percent of electricity retail sales be served by renewable resources by 2017; however, this standard has become more stringent over time. In 2006, SB 107 accelerated the standard by requiring that the 20 percent mandate be met by 2010. In April 2011, SB 2 required that 33 percent of electricity retail sales be served by renewable resources by 2020. In 2015, SB 350 established tiered increases to the Renewable Portfolio Standards of 40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. In 2018, SB 100 increased the requirement to 60 percent by 2030 and required that all the State's electricity come from carbon-free resources by 2045. SB 100 took effect on January 1, 2019.[35]

3.2.2.4 California Energy Code

Energy consumption by new buildings in California is regulated by the Building Energy Efficiency Standards in Part 6 of Title 24 of the California Code of Regulations (CCR), known as the Energy Code. The CEC first adopted the Building Energy Efficiency Standards for Residential and Non-residential Buildings in 1978 in response to a legislative mandate to reduce energy consumption in the State. The Energy Code is updated every 3 years, with the most recent update consisting of the 2022 Energy Code that became effective January 1, 2023. Mid-cycle supplements to the 2022 Code will become effective on July 1, 2024. The efficiency standards apply to both new construction and rehabilitation of both residential and nonresidential buildings, and regulate energy consumed for heating, cooling, ventilation, water heating, and lighting. The building efficiency standards are enforced through the local building permit process. Local government agencies may adopt and enforce energy standards for new buildings, provided these standards meet or exceed those provided in the Energy Code.

3.2.2.5 California Green Building Standards Code

In 2010, the California Building Standards Commission adopted Part 11 of the Title 24 Building Energy Efficiency Standards, referred to as the California Green Building Standards Code (CALGreen Code). The CALGreen Code took effect on January 1, 2011. The CALGreen Code is updated on a regular basis, with the most recent update consisting of the 2022 CALGreen Code standards that

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34 CEC. 2023. *2023 Integrated Energy Policy Report*. California Energy Commission. Docket Number: 23-IEPR-01.

35 California Public Utilities Commission (CPUC). 2019. Renewables Portfolio Standard Program. Website: cpuc.ca.gov/rps (accessed October 2025).

became effective January 1, 2023. The CALGreen Code established mandatory measures for residential and nonresidential building construction and encouraged sustainable construction practices in the following five categories: (1) planning and design, (2) energy efficiency, (3) water efficiency and conservation, (4) material conservation and resource efficiency, and (5) indoor environmental quality. Although the CALGreen Code was adopted as part of the State's efforts to reduce GHG emissions, the CALGreen Code standards have co-benefits of reducing energy consumption from residential and nonresidential buildings subject to the standard.

3.2.2.6 California Energy Efficiency Strategic Plan

On September 18, 2008, the CPUC adopted California's first Long-Term Energy Efficiency Strategic Plan, presenting a roadmap for energy efficiency in California. The Strategic Plan was updated in 2011. The Plan articulates a long-term vision and goals for each economic sector and identifies specific near-term, mid-term, and long-term strategies to assist in achieving those goals. The Plan also reiterates the following four specific programmatic goals known as the "Big Bold Energy Efficiency Strategies" that were established by the CPUC in Decisions D.07-10-032 and D.07-12-051:

- All new residential construction will be zero net energy (ZNE) by 2020.
- All new commercial construction will be ZNE by 2030.
- 50 percent of commercial buildings will be retrofitted to ZNE by 2030.
- 50 percent of new major renovations of State buildings will be ZNE by 2025.

3.2.3 Regional Regulations

There are no regional regulations that apply to the proposed project.

3.2.4 Local Regulations

3.2.4.1 City of Beaumont General Plan 2040

The City of Beaumont addresses energy in the Energy and Safety Element of its General Plan.[36] Energy and Safety Element includes goals and policies that work towards a community that safely manages its energy and mineral resources. The following policies from the Resource Management Element are applicable to the proposed project:**Policy 8.1.7.** Encourage new buildings and buildings undergoing major retrofits to exceed Title 24 energy efficiency standards.

- **Policy 8.1.8.** Require design of new development and renovations to not impair adjacent buildings' solar access, unless it can be demonstrated that the shading benefits substantially offset the impacts of solar energy generation potential.

- **Policy 8.2.1.** Promote the incorporation of alternative energy generation (e.g., solar, wind, biomass) in public and private development.

[36] City of Beaumont. 2020. *City of Beaumont General Plan*. *Energy and Safety Element*. Website: https://www.beaumontca.gov/121/General-Plan (accessed October 2025).

- **Policy 9.10.2.** Encourage new development and redesign of existing buildings to take steps to reduce the impacts of extreme heat events, including:
    - Design buildings to use less mechanical heating and cooling through use of passive solar techniques.
    - Support and incentivize, as feasible, energy efficiency and weatherization programs.
    - Protect and expand the City's urban tree canopy to provide shade, increase carbon sequestration, and purify the air.
    - Provide shade structures in public parks, outdoor playgrounds, and bus shelters.

3.3 GREENHOUSE GAS REGULATORY SETTING

This section describes regulations related to GHGs at the federal, State, and local level.

3.3.1 Federal Regulations

The United States has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the United States Supreme Court ruled that the USEPA has the authority to regulate CO_2 emissions under the CAA. Although there currently are no adopted federal regulations for the control or reduction of GHG emissions, the USEPA commenced several actions in 2009 to implement a regulatory approach to global climate change.

This includes the 2009 USEPA final rule for mandatory reporting of GHGs from large GHG emission sources in the United States. Additionally, the USEPA Administrator signed an endangerment finding action in 2009 under the CAA, finding that six GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to global climate change, leading to national GHG emission standards.

In October 2012, the USEPA and the NHTSA, on behalf of the United States Department of Transportation, issued final rules to further reduce GHG emissions and improve CAFE standards for light-duty vehicles for model years 2017 and beyond (77 *Federal Register* 62624). The NHTSA's CAFE standards have been enacted under the Energy Policy and Conservation Act since 1978. This national program requires automobile manufacturers to build a single light-duty national fleet that meets all requirements under both federal programs and the standards of California and other states. This program would increase fuel economy to the equivalent of 54.5 miles per gallon, limiting vehicle emissions to 163 grams of CO_2 per mile for the fleet of cars and light-duty trucks by model year 2025 (77 *Federal Register* 62630).

On March 31, 2022, the NHTSA finalized the CAFE standards for Model Years 2024–2026 Passenger Cars and Light Trucks. The amended CAFE standards would require an industry wide fleet average of approximately 49 mpg for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8 percent annually for model years 2024 to 2025, and 10 percent annually for model year 2026. The final standards are estimated to save about 234 billion gallons of gas between model years 2030 to 2050.

3.3.2 State Regulations

The CARB is the lead agency for implementing climate change regulations in the State. Since its formation, the CARB has worked with the public, the business sector, and local governments to find solutions to California's air pollution problems. Key efforts by the State are described below.

3.3.2.1 Assembly Bill 1493 (2002)

In a response to the transportation sector's significant contribution to California's CO_2 emissions, AB 1493 was enacted on July 22, 2002. AB 1493 requires the CARB to set GHG emission standards for passenger vehicles and light duty trucks (and other vehicles whose primary use is noncommercial personal transportation in the State) manufactured in 2009 and all subsequent model years. These standards (starting in model years 2009 to 2016) were approved by the CARB in 2004, but the needed waiver of CCAA Preemption was not granted by the USEPA until June 30, 2009. The CARB responded by amending its original regulation, now referred to as Low Emission Vehicle III, to take effect for model years starting in 2017 to 2025. The Trump administration revoked California's waiver in 2019; however, the Biden administration restored California's waiver in 2021.

3.3.2.2 Executive Order S-3-05 (2005)

Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05 on June 1, 2005, which proclaimed that California is vulnerable to the impacts of climate change. To combat those concerns, the EO established California's GHG emissions reduction targets, which established the following goals:

- GHG emissions should be reduced to 2000 levels by 2010;
- GHG emissions should be reduced to 1990 levels by 2020; and
- GHG emissions should be reduced to 80 percent below 1990 levels by 2050.

The Secretary of the California Environmental Protection Agency (CalEPA) is required to coordinate efforts of various State agencies in order to collectively and efficiently reduce GHGs. A biannual progress report must be submitted to the Governor and State Legislature disclosing the progress made toward GHG emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply, public health, agriculture, the coastline, and forestry and report possible mitigation and adaptation plans to address these impacts.

The Secretary of CalEPA leads this Climate Action Team (CAT) made up of representatives from State agencies as well as numerous other boards and departments. The CAT members work to coordinate statewide efforts to implement global warming emission reduction programs and the State's Climate Adaptation Strategy. The CAT is also responsible for reporting on the progress made toward meeting the statewide GHG targets that were established in the EO and further defined under AB 32, the "Global Warming Solutions Act of 2006." The first CAT Report to the Governor and the Legislature was released in March 2006, which laid out 46 specific emission reduction strategies for reducing GHG emissions and reaching the targets established in the EO. The most recent report was released in December 2020.

3.3.2.3 Assembly Bill 32 (2006), California Global Warming Solutions Act

California's major initiative for reducing GHG emissions is AB 32, passed by the State legislature on August 31, 2006. This effort aims at reducing GHG emissions to 1990 levels by 2020. The CARB has established the level of GHG emissions in 1990 at 427 million metric tons (MMT) of CO_2e (MMT CO_2e). The emissions target of 427 MMT CO_2e requires the reduction of 169 MMT CO_2e from the State's projected business-as-usual (BAU) 2020 emissions of 596 MMT CO_2e. AB 32 requires the CARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The Scoping Plan was approved by the CARB on December 11, 2008, which contained the main strategies to achieve the reduction goals and included CARB-recommended GHG reductions for each emissions sector of the State's GHG inventory. The State achieved the GHG emission reduction goals included in the 2008 Scoping Plan.

The CARB approved the First Update to the Climate Change Scoping Plan on May 22, 2014. The First Update identified opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defined CARB climate change priorities until 2020 and also set the groundwork to reach long-term goals set forth in EOs S-3-05 and B-16-2012. The update highlighted California's progress toward meeting the 2020 GHG emission reduction goals as defined in the initial Scoping Plan. It also evaluated how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[37] to reflect the 2030 target set by EO B-30-15 and codified by SB 32.

Most recently, the 2022 Scoping Plan,[38] which was approved in December 2022, assesses progress towards achieving the SB 32 2030 target and lays out a path to achieve carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

The 2022 Scoping Plan focuses on building clean energy production and distribution infrastructure for a carbon-neutral future, including transitioning existing energy production and transmission infrastructure to produce zero-carbon electricity and hydrogen, and utilizing biogas resulting from wildfire management or landfill and dairy operations, among other substitutes. The 2022 Scoping Plan states that in almost all sectors, electrification will play an important role. The 2022 Scoping Plan evaluates clean energy and technology options and the transition away from fossil fuels, including adding four times the solar and wind capacity by 2045 and about 1,700 times the amount of current hydrogen supply. As discussed in the 2022 Scoping Plan, EO N-79-20 requires that all new passenger vehicles sold in California will be zero-emission by 2035, and all other fleets will have

37 CARB. 2017a. *California's 2017 Climate Change Scoping Plan*. November.

38 CARB. 2022. *2022 Scoping Plan Update*. December. Website: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents (accessed October 2025).

transitioned to zero-emission as fully possible by 2045, which will reduce the percentage of fossil fuel combustion vehicles.

3.3.2.4 Senate Bill 97 (2007)

SB 97, signed by the Governor in August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Resources Agency guidelines for mitigating GHG emissions or the effects of GHG emissions, as required by CEQA.

The California Natural Resources Agency adopted the amendments to the *State CEQA Guidelines* in November 2018, which went into effect in December 2018. The amendments do not identify a threshold of significance for GHG emissions, nor do they prescribe assessment methodologies or specific mitigation measures. The amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but preserve the discretion granted by CEQA to lead agencies in making their own determinations based on substantial evidence. The amendments also encourage public agencies to make use of programmatic mitigation plans and programs when they perform individual project analyses.

3.3.2.5 Senate Bill 375 (2008)

SB 375, the Sustainable Communities and Climate Protection Act, which establishes mechanisms for the development of regional targets for reducing passenger vehicle GHG emissions, was adopted by the State on September 30, 2008. On September 23, 2010, the CARB adopted the vehicular GHG emissions reduction targets that had been developed in consultation with the MPOs; the targets require a 6 to 15 percent reduction by 2020 and between 13 to 19 percent reduction by 2035 for each MPO. SB 375 recognizes the importance of achieving significant GHG reductions by working with cities and counties to change land use patterns and improve transportation alternatives. Through the SB 375 process, MPOs such as the SCAG will work with local jurisdictions in the development of Sustainable Communities Strategy (SCS) designed to integrate development patterns and the transportation network in a way that reduces GHG emissions while meeting housing needs and other regional planning objectives. Pursuant to SB 375, the Los Angeles/Southern California reduction targets for per capita vehicular emissions were 8 percent by 2020 and are 19 percent by 2035 as shown in Table E.

Table E: Senate Bill 375 Regional Greenhouse Gas Emissions Reduction Targets

Metropolitan Planning Organization	By 2020 (percent)	By 2035 (percent)
San Francisco Bay Area	10	19
San Diego	15	19
Sacramento	7	19
Central Valley/San Joaquin	6–13	13–16
Los Angeles/Southern California	8	19

Source: California Air Resources Board (2018).

3.3.2.6 Executive Order B-30-15 (2015)

Governor Jerry Brown signed EO B-30-15 on April 29, 2015, which added the immediate target of:

- GHG emissions should be reduced to 40 percent below 1990 levels by 2030.

All State agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets.

3.3.2.7 Senate Bill 350 (2015) Clean Energy and Pollution Reduction Act

SB 350, signed by Governor Jerry Brown on October 7, 2015, updates and enhances AB 32 by introducing the following set of objectives in clean energy, clean air, and pollution reduction for 2030:

- Raise California's renewable portfolio standard from 33 percent to 50 percent; and
- Increase energy efficiency in buildings by 50 percent by the year 2030.

The 50 percent renewable energy standard will be implemented by the CPUC for private utilities and by the CEC for municipal utilities. Each utility must submit a procurement plan showing it will purchase clean energy to displace other non-renewable resources. The 50 percent increase in energy efficiency in buildings must be achieved through the use of existing energy efficiency retrofit funding and regulatory tools already available to State energy agencies under existing law. The addition made by this legislation requires State energy agencies to plan for and implement those programs in a manner that achieves the energy efficiency target.

3.3.2.8 Senate Bill 32, California Global Warming Solutions Act of 2016, and Assembly Bill 197

In the summer of 2016, the State Legislature passed, and the Governor signed, SB 32, and AB 197. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Governor Brown's April 2015 EO B-30-15. SB 32 builds on AB 32 and keeps us on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels, consistent with an Intergovernmental Panel on Climate Change analysis of the emissions trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million (ppm) CO_2e and reduce the likelihood of catastrophic impacts from climate change.

The companion bill to SB 32, AB 197, provides additional direction to CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 meant to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

3.3.2.9 Senate Bill 1020

On September 16, 2022, the Governor signed SB 1020, which requires the state board to prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions and to update the scoping plan at least once every 5 years. The bill would also revise state policy to instead provide that eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use

customers by December 31, 2035; 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040; 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045; and 100 percent of electricity procured to serve all state agencies by December 31, 2035, as specified.

3.3.2.10 Executive Order B-55-18

EO B-55-18, signed September 10, 2018, sets a goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." EO B-55-18 directs CARB to work with relevant State agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal. The goal of carbon neutrality by 2045 is in addition to other statewide goals, meaning not only should emissions be reduced to 80 percent below 1990 levels by 2050, but that, by no later than 2045, the remaining emissions be offset by equivalent net removals of CO_2e from the atmosphere, including through sequestration in forests, soils, and other natural landscapes.

3.3.2.11 Assembly Bill 1279

AB 1279 was signed in September of 2022, and codifies the State goals of achieving net carbon neutrality by 2045 and maintaining net negative GHG emissions thereafter. This bill also requires California to reduce statewide GHG emissions by 85 percent compared to 1990 levels by 2045 and directs CARB to work with relevant State agencies to achieve these goals.

3.3.2.12 Title 24, Part 11, Building Standards Code and CALGreen Code

In November 2008, the California Building Standards Commission established the CALGreen Code, which sets performance standards for residential and non-residential development to reduce environmental impacts and encourage sustainable construction practices. The CALGreen Code addresses energy efficiency, water conservation, material conservation, planning and design, and overall environmental quality. The CALGreen Code is updated every 3 years and was most recently updated in 2022 to include new mandatory measures for residential as well as non-residential uses.

3.3.2.13 California Building Efficiency Standards (Title 24, Part 6)

The California Building Standards Code, or Title 24 of the CCR contains the regulations that govern the construction of buildings in California. Within the California Building Standards Code, two parts pertain to the incorporation of both energy efficient and green building elements into land use development. Part 6 is California's Energy Efficiency Standards for Residential and Non-Residential Buildings. These standards were first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption and are updated on an approximately 3-year cycle to allow consideration and possible incorporation of new energy efficient technologies and methods. The current set of standards was adopted in 2022 and applies to projects seeking building permits on or after January 1, 2023. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions.

3.3.2.14 Cap and Trade

The development of a cap-and-trade program was included as a key reduction measure of the CARB AB 32 Climate Change Scoping Plan. The cap-and-trade program will help put California on the path to meet its goal of reducing GHG emissions to 1990 levels by 2020 and ultimately achieving an 80 percent reduction from 1990 levels by 2050. The cap-and-trade emissions trading program developed by the CARB took effect on January 1, 2012, with enforceable compliance obligations beginning January 1, 2013. The cap-and-trade program aims to regulate GHG emissions from the largest producers in the State by setting a statewide firm limit, or cap, on allowable annual GHG emissions. The cap was set in 2013 at approximately 2 percent below the emissions forecast for 2020. In 2014, the cap declined approximately 2 percent. Beginning in 2015 and continuing through 2020, the cap has been declining approximately 3 percent annually. The CARB administered the first auction on November 14, 2012, with many of the qualified bidders representing corporations or organizations that produce large amounts of GHG emissions, including energy companies, agriculture and food industries, steel mills, cement companies, and universities. On January 1, 2015, compliance obligation began for distributors of transportation fuels, natural gas, and other fuels. The cap-and-trade program was initially slated to sunset in 2020, but the passage of SB 398 in 2017 extended the program through 2030.

3.3.2.15 Executive Order N-79-20

EO N-79-20, which was signed by the Governor on September 23, 2020, sets the following goals for the State: 100 percent of in-state sales of new passenger cars and trucks shall be zero-emission by 2035; 100 percent of medium- and heavy-duty vehicles in the State shall be zero-emission by 2045 for all operations where feasible and by 2035 for drayage trucks; and 100 percent of off-road vehicles and equipment in the State shall be zero-emission by 2035, where feasible.

3.3.2.16 Low Carbon Fuel Standard

In January 2007, EO S-01-07 established a Low Carbon Fuel Standard (LCFS). This executive order calls for a statewide goal to be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020, and that an LCFS for transportation fuels be established for California. The LCFS applies to all refiners, blenders, producers, or importers ("Providers") of transportation fuels in California, including fuels used by off-road construction equipment. In June 2007, CARB adopted the LCFS under AB 32 pursuant to Health and Safety Code Section 38560.5, and, in April 2009, CARB approved the new rules and carbon intensity reference values with new regulatory requirements taking effect in January 2011. The standards require providers of transportation fuels to report on the mix of fuels they provide and demonstrate they meet the LCFS intensity standards annually. This is accomplished by ensuring that the number of "credits" earned by providing fuels with a lower carbon intensity than the established baseline (or obtained from another party) is equal to or greater than the "deficits" earned from selling higher intensity fuels. In response to certain court rulings, CARB re-adopted the LCFS regulation in September 2015, and the LCFS went into effect on January 1, 2016. In 2018, CARB approved amendments to the regulation to readjust carbon intensity benchmarks to meet California's 2030 GHG reductions targets under SB 32. These amendments include opportunities to promote ZEV adoption, carbon capture and sequestration, and advanced technologies for decarbonization of the transportation sector.

3.3.2.17 Advanced Clean Cars Program

In January 2012, CARB approved the Advanced Clean Cars program, which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of ZEVs, into a single package of regulatory standards for vehicle model years 2017 through 2025. The new regulations strengthen the GHG standard for 2017 models and beyond. This will be achieved through existing technologies, the use of stronger and lighter materials, and more efficient drivetrains and engines. The program's ZEVs regulation requires battery, fuel cell, and/or plug-in hybrid electric vehicles to account for up to 15 percent of California's new vehicle sales by 2025. The program also includes a clean fuels outlet regulation designed to support the commercialization of zero-emission hydrogen fuel cell vehicles planned by vehicle manufacturers by 2015 by requiring increased numbers of hydrogen fueling stations throughout the State. The number of stations will grow as vehicle manufacturers sell more fuel cell vehicles. By 2025, when the rules will be fully implemented, the statewide fleet of new cars and light trucks will emit 40 percent fewer GHGs and 75 percent fewer smog-forming emissions than 2012 model year vehicles.

3.3.2.18 Executive Order B-48-18

In January 2018, Governor Brown signed EO B-48-18 requiring all State entities to work with the private sector to have at least 5 million ZEVs on the road by 2030, as well as install 200 hydrogen fueling stations and 250,000 electric vehicle charging stations by 2025. It specifies that 10,000 of the EV charging stations should be direct current fast chargers. This order also requires all State entities to continue to partner with local and regional governments to streamline the installation of ZEV infrastructure. The Governor's Office of Business and Economic Development is required to publish a Plug-in Charging Station Design Guidebook and update the 2015 Hydrogen Station Permitting Guidebook to aid in these efforts. All State entities are required to participate in updating the 2016 Zero-Emissions Vehicle Action Plan to help expand private investment in ZEV infrastructure with a focus on serving low-income and disadvantaged communities. Additionally, all State entities are to support and recommend policies and actions to expand ZEV infrastructure at residential land uses, through the LCFS program, and recommend how to ensure affordability and accessibility for all drivers.

3.3.3 Regional Regulations

3.3.3.1 South Coast Air Quality Management District

In 2008, the SCAQMD formed a GHG CEQA Significance Threshold Working Group (Working Group) to identify GHG emissions thresholds for land use projects that could be used by local lead agencies in the Basin. The Working Group developed several different options that are contained in the SCAQMD 2008 draft guidance document titled, *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules, and Plans,*[39] that could be applied by lead agencies. On September 28, 2010, SCAQMD Working Group Meeting No. 15 provided further guidance, including a tiered approach for evaluating GHG emissions for development projects where the SCAQMD is not the lead

[39] SCAQMD. 2008b. *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules, and Plans*. Website: http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf (accessed October 2025).

agency. The SCAQMD has not presented a finalized version of these thresholds to the governing board.

The SCAQMD identifies the emissions level for which a project would not be expected to substantially conflict with any State legislation adopted to reduce statewide GHG emissions. As such, the utilization of a service population represents the rates of emissions needed to achieve a fair share of the State's mandated emissions reductions. Overall, the SCAQMD identifies a GHG efficiency level that, when applied statewide or to a defined geographic area, would meet the year 2020 and post-2020 emissions targets as required by AB 32 and SB 32. If projects are able to achieve targeted rates of emissions per the service population, the State will be able to accommodate expected population growth and achieve economic development objectives, while also abiding by AB 32's emissions target and future post-2020 targets.

3.3.3.2 Southern California Association of Governments

In April 2024, SCAG adopted Connect SoCal 2024.[40] In general, the SCS outlines a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce VMT from automobiles and light-duty trucks and thereby reduce GHG emissions from these sources. For the SCAG region, CARB has set GHG reduction targets at 8 percent below 2005 per capita emissions levels by 2020, and 19 percent below 2005 per capita emissions levels by 2035. The 2024–2050 RTP/SCS lays out a strategy for the region to meet these targets. Overall, the SCS is meant to provide growth strategies that will achieve the regional GHG emissions reduction targets. Land use strategies to achieve the region's targets include planning for new growth around high-quality transit areas and livable corridors, and creating neighborhood mobility areas to integrate land use and transportation and plan for more active lifestyles.[41] However, the SCS does not require that local General Plans, Specific Plans, or zoning be consistent with the SCS; SCAG is required to consider local land use controls when drafting the SCS.

The horizon year for Connect SoCal 2024 is 2050 and the plan projects that by 2050, 66 percent of new households and 54 percent of new jobs will be located in Priority Development Areas, either near transit or in walkable communities. The objectives of Connect SoCal 2024 are to create a region with transit as a backbone of the transportation system; more Complete Streets where people and safety are prioritized; policies that encourage emerging technologies and mobility innovations that support rather than hamper regional goals; more housing, jobs, and mobility options closer together in Priority Development Areas to preserve natural lands and open spaces; more housing to address the existing housing need; and safe and fluid movement of goods, with a commitment to the broad deployment of zero- and near-zero emission technologies.

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40 SCAG. 2024. Connect SoCal: The 2024–2050 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments. Website: https://scag.ca.gov/connect-socal (accessed July 2024).

41 SCAG. 2024. Connect SoCal: The 2024–2050 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments. Website: https://scag.ca.gov/connect-socal (accessed July 2024).

3.3.4 Local Regulations

3.3.4.1 City of Beaumont General Plan

The City of Beaumont General Plan[42] addresses climate change in the Conservation and Open Space Element. The Conservation and Open Space Element includes goals and policies that work to mitigate against climate change. The following policies apply to the proposed project.

- **Policy 8.3.1.** Establish greenhouse gas emission reduction targets in line with State requirements that call for reducing greenhouse gas emissions as follows:
    - 1990 levels by 2020
    - 40 percent below 1990 levels by 2030
    - 60 percent below 1990 levels by 2040
- **Policy 8.3.5.** Prioritize municipal policies and programs that reduce the City's carbon footprint, such as purchasing alternative fuel vehicles, pursuing solar installations, implementing green purchasing policies, and retrofitting existing buildings.
- **Policy 8.3.7.** Collaborate with regional and State partners to implement the Sustainable Communities Strategy to reduce greenhouse gas emissions, balance jobs and housing, and develop transportation systems that support all modes of circulation.

3.3.4.2 Sustainable Beaumont Climate Action Plan

The City of Beaumont adopted its climate action plan (CAP)[43], also known as Sustainable Beaumont, in October of 2015. The City's CAP serves as a roadmap to greenhouse gas reductions through the incorporation of energy efficiency and water conservation features. Through the implementation of the CAP, the City established goals and policies that incorporate environmental responsibility into the City's daily management of its community and municipal operations. The City has committed to reduce GHG emissions 15 percent by 2020 from 2012 baseline levels, consistent with the State goals set forth in AB 32 and EO S-3-05 for the year of 2020. The following policies from the CAP are applicable to the proposed project:

- Measure 4.1: Encourage or require energy efficiency standards exceeding state requirements
- Measure 5.1: Support water efficiency through enhanced implementation of SB X-7-7
- Measure 5.2: Exceed water efficiency standards
- Measure 6.1: Tree planting for shading and energy efficiency
- Measure 6.2: Light-reflecting surfaces for energy efficiency
- Measure 7.1: Encourage non-motorized transportation options

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42 City of Beaumont. 2020. *City of Beaumont General Plan*. *Conservation and Open Space Element*. Website: https://www.beaumontca.gov/121/General-Plan (accessed October 2025).

43 City of Beaumont. 2015. Sustainable Beaumont. Website: https://www.beaumontca.gov/DocumentCenter/View/26628/8h---Final-Sustainable-Beaumont-Plan-Climate-Action-Plan?bidId= (accessed October 2025)

- Measure 8.1: Reduce waste to landfills
- Measure 9.1: Promote clean energy

3.3.4.3 Western Riverside Council of Governments Subregional Climate Action Plan

The Western Riverside Council of Governments (WRCOG) developed the Western Riverside Energy Leadership Partnership (WRELP)[44] and the Subregional Climate Action Plan (WRCOG CAP) Update[45] with the participation of the City of Beaumont and other jurisdictions in the subregion. The WRELP consists of energy efficiency programs that will reduce utility costs and GHGs associated with energy use at the municipal and community level. The subregional CAP sets forth emissions reduction targets, measures, and actions to help the participating jurisdictions demonstrate consistency with statewide reduction targets stablished by AB 32, SB 32, and CARB's 2017 Scoping Plan. The following reduction measures from the subregional CAP will be applicable to the proposed project.

- **LE-1. Expand Local Renewable Energy Production.** Increase solar PV installations on new and existing buildings.

- **LE-6 Shade Trees.** Increase the canopy/tree count.

- **LT-2 Pedestrian infrastructure improvements.** Fill gaps in the pedestrian network through construction of sidewalks, crosswalks, curb ramps, pedestrian signals, or pedestrian crossings.

- **LT-4 Parking Pricing and limited requirements.** Amend zoning code to limit parking at residential and commercial developments. Require designated parking for carpool vehicles at new non-residential development.

- **LS-1 Zero Waste Initiatives.** Increase the percent of waste and organic waste diverted from landfills.

- **LW-1 Increase Recycled Water Use.** Increase the volume of recycled water used to irrigate parks, golf courses outdoor landscaping.

[44] Western Riverside Council of Governments (WRCOG). n.d. *Western Riverside Energy Partnership.* Website: https://www.wrcog.us/166/Western-Riverside-Energy-Partnership#:~:text=WREP%20is%20a%20local%20government,%2C%20commercial%2C%20and%20residential%20buildings (accessed October 2025).

[45] WRCOG. 2022. *WRCOG Subregional Climate Action Plan.* February. Website: https://wrcog.us/DocumentCenter/View/9987/Climate-Action-Plan-Toolkit (accessed October 2025).

4 SETTING

This section provides the current SCAQMD attainment status, climate and air quality, ambient air quality monitoring results, and GHG emissions inventory.

4.1 ATTAINMENT STATUS

The CARB is required to designate areas of the State as attainment, nonattainment, or unclassified for all State standards. An *attainment* designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A *nonattainment* designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An *unclassified* designation signifies that data do not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The USEPA designates areas for O_3, CO, and NO_2 as either does not meet the primary standards, cannot be classified, or better than national standards. For SO_2, areas are designated as does not meet the primary standards, does not meet the secondary standards, cannot be classified, or better than national standards.

Table F provides a summary of the attainment status for the Basin with respect to NAAQS and CAAQS.

Table F: Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
O_3 1 hour	Nonattainment	Extreme Nonattainment
O_3 8 hour	Nonattainment	Extreme Nonattainment
PM_{10}	Nonattainment	Attainment/Maintenance
$PM_{2.5}$	Nonattainment	Serious Nonattainment
CO	Attainment	Attainment/Maintenance
NO_2	Attainment	Attainment/Maintenance
SO_2	N/A	Attainment/Unclassified
Lead	Attainment	Attainment[1]
All others	Attainment/Unclassified	Attainment/Unclassified

Source: South Coast Air Quality Management District (2018).

[1] Except in Los Angeles County.

CO = carbon monoxide
N/A = not applicable
NO_2 = nitrogen dioxide
O_3 = ozone
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
SO_2 = sulfur dioxide

On February 7, 2024, the federal annual $PM_{2.5}$ standard was revised from 12.0 µg/m^3 to 9.0 µg/m^3. Within 2 years of setting new or revised NAAQS, the CAA requires the USEPA to designate areas as meeting (attainment) or not meeting (nonattainment) the standard. After a new or revised NAAQS has been issued, the CAA requires States to submit initial area designation recommendations within

12 months. The USEPA's final designations are based on 1) the most recent 3 years of ambient air quality monitoring data, 2) recommendations submitted by the States, and 3) other technical information. If the USEPA plans to issue a designation that modifies a State recommendation, the USEPA must notify the State no later than 120 days before the final designation.

4.2 EXISTING CLIMATE AND AIR QUALITY

Air quality in the planning area is not only affected by various emission sources (e.g., mobile and industry), but also by atmospheric conditions (e.g., wind speed, wind direction, temperature, and rainfall). The combination of topography, low mixing height, abundant sunshine, and emissions from the second-largest urban area in the United States gives the Basin some of the worst air pollution in the nation.

The annual average temperature varies little throughout the Basin, ranging from the low to middle 60s°F. With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the site is the Beaumont Station.[46] The monthly average maximum temperature recorded at this station ranged from 60.2°F in January to 93.1°F in July, with an annual average maximum of 74.5°F. The monthly average minimum temperature recorded at this station ranged from 35.7°F in January to 59.3°F in August, with an annual average minimum of 45.3°F. These levels are representative of the project area.

The majority of annual rainfall in the Basin occurs between November and April. Summer rainfall is minimal and is generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the Basin and along the coastal side of the mountains. Average monthly rainfall at the Beaumont Station varied from 2.13 inch in April to 3.73 inches in February, with an annual total of 20.89 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

The Basin experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed in mid-afternoon to late afternoon on hot summer days when the air appears to clear up suddenly. Winter inversions frequently break by midmorning.

Winds in the project area blow predominantly from the south-southwest, with relatively low velocities. Wind speeds in the project area average about 5 miles per hour. Summer wind speeds average slightly higher than winter wind speeds. Low average wind speeds, together with a persistent temperature inversion, limit the vertical dispersion of air pollutants throughout the Basin. Strong, dry,

[46] Western Regional Climate Center. n.d. Recent Climate in the West. Website: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0607 (accessed October 2025).

north, or northeasterly winds, known as Santa Ana winds, occur during the fall and winter months, dispersing air contaminants. The Santa Ana conditions tend to last for several days at a time.

The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly on shore into Riverside and San Bernardino Counties. In the winter, the greatest pollution problems are CO and NO_X because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and brighter sunshine combine to cause a reaction between hydrocarbons and NO_x to form photochemical smog. Smog is a general term that is naturally occurring fog that has become mixed with smoke or pollution. In this context it is better described as a form of air pollution produced by the photochemical reaction of sunlight with pollutants that have been released into the atmosphere, especially by automotive emissions.

4.3 AIR QUALITY MONITORING RESULTS

Air quality monitoring stations are located throughout the nation and are maintained by the local air pollution control district and State air quality regulating agencies. The SCAQMD, together with the CARB, maintains ambient air quality monitoring stations in the Basin. The air quality monitoring stations closest to the project site include the Banning Airport Station located at 200 South Hathaway Street in Banning, California; the AMS-Morongo Boneyard Station located at 12160 Santiago Road in Banning, California; and the Riverside Rubidoux Station located at 5888 Mission Boulevard in Rubidoux, California.

Pollutant monitoring results for years 2021 to 2023 at the nearby air quality monitoring stations, shown in Table G, indicate that air quality in the area has generally been moderate. As indicated in the monitoring results, the federal PM_{10} standard was not exceeded between 2021 and 2023. The State PM_{10} standard was not exceeded in 2021 or 2022, with 2 exceedances in 2023. The federal $PM_{2.5}$ standard had no data for the 3-year period. The State 1-hour ozone standards were exceeded 41 times in 2021, 30 times in 2022, and 28 times in 2023. The State 8-hour ozone standards were exceeded 82 times in 2021, 59 in times in 2022, and 53 times in 2023. The federal 8-hour standards were exceeded 80 times in 2021, 56 times in 2022, and 51 times in in 2023. The federal CO and SO_2 standards were not exceeded in this area during the 3-year period.

4.4 GREENHOUSE GAS EMISSIONS INVENTORY

An emissions inventory that identifies and quantifies the primary human-generated sources and sinks of GHGs is a well-recognized and useful tool for addressing climate change. This section summarizes the latest information on global, United States, and California GHG emission inventories.

Table G: Ambient Air Quality at the Nearby Monitoring Stations

Pollutant	Standard	2021	2022	2023
Carbon Monoxide (CO)[2]				
Maximum 1-hour concentration (ppm)		2.1	3.3	1.4
Number of days exceeded:	State: > 20 ppm	ND	ND	ND
	Federal: > 35 ppm	0	0	0
Maximum 8-hour concentration (ppm)		1.8	1.2	1.2
Number of days exceeded:	State: > 9 ppm	ND	ND	ND
	Federal: > 9 ppm	0	0	0
Ozone (O_3)[1]				
Maximum 1-hour concentration (ppm)		0.139	0.166	0.140
Number of days exceeded:	State: > 0.09 ppm	41	30	28
Maximum 8-hour concentration (ppm)		0.116	0.100	0.106
Number of days exceeded:	State: > 0.07 ppm	82	59	53
	Federal: > 0.07 ppm	80	56	51
Coarse Particulates (PM_{10})[1]				
Maximum 24-hour concentration (µg/m3)		48.6	52.4	100.0
Number of days exceeded:	State: > 50 µg/m^3	0	0	2
	Federal: > 150 µg/m^3	0	0	0
Annual arithmetic average concentration (µg/m3)		21.2	22.5	22.3
Exceeded for the year:	State: > 20 µg/m^3	Yes	Yes	Yes
	Federal: > 50 µg/m^3	No	No	No
Fine Particulates ($PM_{2.5}$)[3]				
Maximum 24-hour concentration (µg/m3)		24.2	42.3	22.2
Number of days exceeded:	Federal: > 35 µg/m^3	ND	ND	ND
Annual arithmetic average concentration (µg/m3)		8.1	7.7	5.7
Exceeded for the year:	State: > 12 µg/m^3	No	No	No
	Federal: > 15 µg/m^{3a}	No	No	No
Nitrogen Dioxide (NO_2)[1,2]				
Maximum 1-hour concentration (ppm)		0.0568	0.0515	0.0498
Number of days exceeded:	State: > 0.250 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.01444	0.01234	0.01122
Exceeded for the year:	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO_2)[2]				
Maximum 1-hour concentration (ppm)		0.0021	0.0067	0.0031
Number of days exceeded:	State: > 0.25 ppm	ND	ND	ND
Maximum 24-hour concentration (ppm)		0.0011	0.0012	0.0007
Number of days exceeded:	State: > 0.04 ppm	ND	ND	ND
	Federal: > 0.14 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.00051	0.00054	0.00002
Exceeded for the year:	Federal: > 0.030 ppm	No	No	No

Sources: CARB (2024) and USEPA (2024).

[1] Data from the Banning Airport station located at 200 South Hathaway Street in Banning, California.

[2] Data from the Riverside Rubidoux station located at 5888 Mission Boulevard in Rubidoux, California.

[3] Data from the AMS-Morongo Boneyard station located at 12160 Santiago Road in Banning, California.

µg/m^3 = micrograms per cubic meter

CARB = California Air Resources Board

ND = No data. There were insufficient (or no) data to determine the value.

ppm = parts per million

USEPA = United States Environmental Protection Agency

4.4.1 Global Emissions

Worldwide emissions of GHGs in 2020 totaled 22.9 billion metric tons (MT) of CO_2e. Global estimates are based on country inventories developed as part of the programs of the United Nations Framework Convention on Climate Change.[47]

4.4.2 United States Emissions

In 2022, the year for which the most recent data are available, the United States emitted about 6,343.2 MMT CO_2e. Overall, emissions in 2022 increased by 0.2 percent compared to the 2021 total GHG emissions. This increase in total GHG emissions was driven by fossil fuel combustion due primarily to economic activity rebounding after the height of the COVID-19 pandemic. However, GHG emissions in 2022 were 16.7 percent below those of 2005 levels.

Of the five major sectors—residential and commercial, agricultural, industry, transportation, and electricity generation—transportation accounted for the highest amount of GHG emissions in 2022 (28 percent), with electricity generation second at 25 percent and emissions from industry third at 23 percent.[48]

4.4.3 State of California Emissions

In 2022, the year for which the most recent data are available, the United States emitted about 6,343.2 million metric tons of CO_2e (MMT CO_2e). Overall, emissions in 2022 increased by 0.2 percent compared to the 2021 total GHG emissions. This increase in total GHG emissions was driven by fossil fuel combustion due primarily to economic activity rebounding after the height of the COVID-19 pandemic. However, GHG emissions in 2022 were 16.7 percent below those of 2005 levels. Of the five major sectors—residential and commercial, agricultural, industry, transportation, and electricity generation—transportation accounted for the highest amount of GHG emissions in 2022 (28 percent), with electricity generation second at 25 percent and emissions from industry third at 23 percent.[49]

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47 United Nations Framework Convention on Climate Change (UNFCCC). 2021. GHG Data from UNFCCC. Website: unfccc.int/process-and-meetings/transparency-and-reporting/greenhouse-gas-data/ghg-data-unfccc/ghg-data-from-unfccc (accessed October 2025).

48 USEPA. 2024. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2022. Website: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022 (accessed October 2025).

49 Ibid.

5 METHODOLOGY

The methodology used to analyze air quality, energy, and GHG impacts is described below.

5.1 CONSTRUCTION EMISSIONS

Construction activities can generate a substantial amount of air pollution. Construction activities are considered temporary; however, short-term impacts can contribute to exceedances of air quality standards. Construction activities include site preparation, earthmoving, and general construction. The emissions generated from these common construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel and gasoline powered equipment, portable auxiliary equipment, and worker commute trips.

The California Emissions Estimator Model version 2022.1 (CalEEMod) computer program was used to calculate emissions from on-site construction equipment and emissions from worker and vehicle trips to the site. As discussed previously in the Project Description, construction is anticipated to begin July 2025 and would last approximately 18 months, which was included in CalEEMod. Construction would include site preparation, grading, building construction, paving, and architectural activities. Construction activities would involve the use of standard earthmoving equipment such as scrapers, graders, water trucks, dozers, cranes, boom trucks, forklifts, rubber-tired loaders, rubber-tired backhoes, and other small- to medium-sized construction equipment, as needed. This analysis also assumes the use of Tier 2 construction equipment and that the proposed project would comply with SCAQMD Rule 403 measures. The proposed project would use cut soil on site and would import approximately 9,955 cubic yards of soil. All other construction details are not yet known; therefore, default assumptions (e.g., construction worker and truck trips and fleet activities) from CalEEMod were used.

Table H lists the tentative project construction schedule based on a start date in July 2025 and an 18-month construction duration. Table I lists the potential construction equipment to be used during project construction under each phase of construction. CalEEMod output sheets are included in Appendix A.

Table H: Tentative Project Construction Schedule

Phase Number	Phase Name	Phase Start Date	Phase End Date	Number of Days/Week	Number of Days
1	Site Preparation	6/15/2025	7/4/2025	5	15
2	Grading	7/5/2025	12/19/2025	5	120
3	Building Construction	12/20/2025	10/26/2026	5	221
4	Paving	10/27/2026	12/15/2026	5	36
5	Architectural Coating	8/15/2026	12/15/2026	5	87

Source: Compiled by LSA (January 2025).
Note: This schedule assumes construction would start June 2025 and would occur for 18 months. It has been adjusted to accommodate all three construction phases.

Table I: Diesel Construction Equipment Utilized by Construction Phase

Construction Phase	Off-Road Equipment Type	Off-Road Equipment Unit Amount	Hours Used per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	3	8	367	0.40
	Tractors/Loaders/Backhoes	4	8	84	0.37
Grading	Excavators	1	8	36	0.38
	Graders	1	8	148	0.41
	Rubber Tired Loaders	1	8	367	0.40
	Tractors/Loaders/Backhoes	3	8	84	0.37
Building Construction	Cranes	1	7	367	0.29
	Forklifts	3	8	82	0.20
	Generator Sets	1	8	14	0.74
	Tractors/Loaders/Backhoes	3	7	84	0.37
	Welders	1	8	46	0.45
Paving	Pavers	2	8	81	0.42
	Paving Equipment	2	8	89	0.36
	Rollers	2	8	36	0.38
	Cement and Mortar Mixers	2	6	10	0.56
	Tractors/Loaders/Backhoes	1	8	84	0.37
Architectural Coating	Air Compressors	1	6	37	0.48

Source: Compiled by LSA using CalEEMod (January 2025).
CalEEMod = California Emissions Estimator Model

5.2 OPERATIONAL EMISSIONS

The air quality analysis includes estimating emissions associated with long-term operation of the proposed project. Consistent with the SCAQMD guidance for estimating emissions associated with land use development projects, the CalEEMod computer program was used to calculate the long-term operational emissions associated with the project.

As discussed in the Project Description, the proposed project involves the expansion of the existing chapel including a place of worship with 641 seats, a day care center approximately 5,000 sf, three outdoor recreational areas approximately 2.4 acres total, and a parking lot with approximately 216 parking spaces. Therefore, the analysis was conducted using land use codes *Educational Place of Worship, Educational Day-Care Center, Recreational City Park,* and *Parking Lot* in CalEEMod. The proposed project would generate approximately 94 average daily trips.[50] The proposed project would include natural gas for some energy usage needs; therefore, this analysis incorporates selections to reflect this. In addition, this analysis assumes that the proposed project would be operational in 2026, which is included in CalEEMod. Where project-specific data were not available, default assumptions (e.g., electricity usage, water usage, and solid waste generation) from CalEEMod were used to estimate project emissions.

[50] LSA. 2024. *Calvary Chapel Expansion Project Trip Generation and Vehicle Miles Traveled Analysis Memorandum (LSA Project No. 20241535).* February 21.

5.3 ENERGY USE

The analysis focuses on the four sources of energy that are relevant to the proposed project: natural gas, electricity, the equipment fuel necessary for project construction, and vehicle fuel necessary for project operations. For the purposes of this analysis, the amounts of electricity, natural gas, construction fuel, and fuel use from operations are quantified and compared to that consumed in Riverside County. The electricity of the proposed project is analyzed on an annual basis. Electricity uses were estimated for the project using default energy intensities by land use type in CalEEMod.

5.4 GREENHOUSE GAS ANALYSIS

Recognizing that the field of global climate change analysis is rapidly evolving, the approaches advocated most recently indicate that for determining a project's contribution to GHG emissions, lead agencies should calculate, or estimate, emissions from vehicular traffic, energy consumption, water conveyance and treatment, waste generation, construction activities, and any other significant source of emissions within the project area. The CalEEMod results were used to quantify GHG emissions generated by the project.

6 THRESHOLDS OF SIGNIFICANCE

This section describes the thresholds of significance used to determine air quality, energy, and GHG impacts associated with the project.

6.1 AIR QUALITY

The *State CEQA Guidelines* indicate that a project would normally have a significant adverse air quality impact if project-generated pollutant emissions would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project is nonattainment under applicable federal or State ambient air quality standards;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) affecting a substantial number of people.

The *State CEQA Guidelines* indicate that a project would normally have a significant adverse greenhouse gas emission impact if the project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reduction the emissions of greenhouse gases.

Certain air districts (e.g., SCAQMD) have created guidelines and requirements to conduct air quality analysis. The SCAQMD's current guidelines, its *CEQA Air Quality Handbook* with associated updates, were followed in this assessment of air quality and GHG impacts for the proposed project.

6.1.1 Criteria Pollutant Thresholds

SCAQMD has established daily emissions thresholds for construction and operation of a proposed project in the Basin. The emissions thresholds were established based on the attainment status of the Basin with regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety, these emissions thresholds are regarded as conservative and would overstate an individual project's contribution to health risks.

Table H lists the CEQA significance thresholds for construction and operational emissions established for the Basin. Projects in the Basin with construction- or operation-related emissions that exceed any of their respective emission thresholds would be considered significant under SCAQMD guidelines. These thresholds, which SCAQMD developed and that apply throughout the Basin, apply

as both project and cumulative thresholds. If a project exceeds these standards, it is considered to have a project-specific and cumulative impact.

Table J: Regional Thresholds for Construction and Operational Emissions

Emissions Source	Pollutant Emissions Threshold (lbs/day)					
	VOCs	NO_X	CO	PM_{10}	$PM_{2.5}$	SO_X
Construction	75	100	550	150	55	150
Operations	55	55	550	150	55	150

Source: Air Quality Significance Thresholds, Website: https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf?sfvrsn=25 (accessed October 2025) (SCAQMD 2023).

CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
SCAQMD = South Coast Air Quality Management District
SO_X = sulfur oxides
VOCs = volatile organic compounds

6.2 LOCALIZED IMPACTS ANALYSIS

The SCAQMD published its *Final Localized Significance Threshold Methodology* in July 2008, recommending that all air quality analyses include an assessment of air quality impacts to nearby sensitive receptors.[51] This guidance was used to analyze potential localized air quality impacts associated with construction of the proposed project. Localized significance thresholds (LST) are developed based on the size or total area of the emission source, the ambient air quality in the source receptor area, and the distance to the project. Sensitive receptors include residences, schools, hospitals, and similar uses that are sensitive to adverse air quality.

LSTs are based on the ambient concentrations of that pollutant within the project Source Receptor Area (SRA) and the distance to the nearest sensitive receptor. For the proposed project, the appropriate SRA for the LST is the nearby Banning Airport (SRA 29). SCAQMD provides LST screening tables for 25, 50, 100, 200, and 500-meter source-receptor distances. As identified above, the closest sensitive receptors to the project site are the single family residences located east of the project site at approximately 16 feet from the project boundary. In cases where receptors may be closer than 82 feet (25 meters), any distances within the 82-foot (25-meter) buffer zone can be used. As such, the minimum distance of 25 meters was used for purposes of the LST assessment. Based on the SCAQMD LST methodology, construction equipment such as crawler tractors, graders, and rubber tired dozers have the potential to disturb up to 0.5 acres per an 8-hour day while scrappers can disturb up to 1 acre per an 8-hour day. [52] Construction-related effects on air quality from the proposed project would be greatest during the grading and site preparation phase due to the disturbance of soils. As detailed in Table I above, the proposed project would include a total of 4 rubber tired dozers and one grader during site preparation and grading phases; therefore, it is assumed that the maximum daily disturbed acreage for the proposed project would be 2.5 acres.[53] The proposed project is 4.85 acres; therefore, the 5-acre thresholds were also used for operation of

51 SCAQMD. 2008a. *Final Localized Significance Threshold Methodology.* July.

52 SCAQMD. n.d. *Fact Sheet for Applying CalEEMod to Localized Significance Thresholds*. Website: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod-guidance.pdf (accessed October 2025).

53 4 Rubber tired dozers x 0.5 = 2.0 acres; 1 grader x 0.5 = 0.5 acres; Total = 2.0 +0.5 = 2.5 acres

the proposed project. Table I lists the emissions thresholds that apply during project construction and operation.

Table K: South Coast Air Quality Management District Localized Significance Thresholds

Emissions Source	Pollutant Emissions Threshold (lbs/day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Construction	164.0	1,754.0	12.0	6.8
Operations	236.0	2,817.0	6.0	3.0

Source: SCAQMD (2008).
Note: Source Receptor Area 29, based on a 2.5-acre disturbance daily area for construction and a 5.0-acre area for operation, at a distance of 25 meters from the project boundary.
CO = carbon monoxide
lbs/day = pounds per day
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
SCAQMD = South Coast Air Quality Management District

6.3 LOCAL MICROSCALE CONCENTRATION STANDARDS

The significance of localized project impacts under CEQA depends on whether ambient CO levels in the vicinity of the project are above or below State and federal CO standards. Because ambient CO levels are below the standards throughout the Basin, a project would be considered to have a significant CO impact if project emissions result in an exceedance of one or more of the 1-hour or 8-hour standards. The following are applicable local emission concentration standards for CO:

- California State 1-hour CO standard of 20 ppm
- California State 8-hour CO standard of 9 ppm

6.3.1 Energy Thresholds

The *State CEQA Guidelines* indicate that a project would normally have a significant adverse impact related to energy if the project would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or

- Conflict with or obstruct a State or local plan for renewable energy or energy efficiency.

6.3.2 Greenhouse Gas Threshold

To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, SCAQMD convened a GHG CEQA Significance Threshold Working Group (Working Group). Based on the last Working Group meeting held in September 2010 (Meeting No. 15), SCAQMD proposed to adopt a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency:

- **Tier 1. Exemptions:** If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.

- **Tier 2. Consistency with a locally adopted GHG Reduction Plan:** If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (i.e., city or county), project-level and cumulative GHG emissions are less than significant.

- **Tier 3. Numerical Screening Threshold:** If GHG emissions are less than the numerical screening-level threshold, project-level and cumulative GHG emissions are less than significant.

  For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment of GHG emissions. The 10,000 MT of CO_2e per year (MT CO_2e/yr) threshold for industrial uses would be recommended for use by all lead agencies. Under Option 1, separate screening thresholds are proposed for residential projects (3,500 MT CO_2e/yr), commercial projects (1,400 MT CO_2e/yr), and mixed-use projects (3,000 MT CO_2e/yr). Under Option 2, a single numerical screening-level threshold of 3,000 MT CO_2e/yr would be used for all non-industrial projects.

- **Tier 4. Performance Standards:** If emissions exceed the numerical screening threshold, a more detailed review of the project's GHG emissions is warranted. SCAQMD has proposed an efficiency target for projects that exceed the bright-line threshold. The current recommended approach is per capita efficiency targets. SCAQMD is not recommending use of a percent emissions reduction target. Instead, SCAQMD proposes a 2020 efficiency target of 4.8 MT CO_2e/yr per service population (for project-level analyses and 6.6 MT CO_2e/yr per service population for plan-level projects (e.g., program-level projects such as general plans).

Furthermore, Section 15064.4 of the *State CEQA Guidelines* states that: "A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project." In performing that analysis, the lead agency has discretion to determine whether to use a model or methodology to quantify GHG emissions or to rely on a qualitative analysis or performance-based standards. In making a determination as to the significance of potential impacts, the lead agency then considers the extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting, whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project, and the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

As described above, the City passed its first CAP in 2015 with the goal of reducing municipal and community-wide GHG emissions 15 percent by 2020 from a 2012 baseline level[54]. However, the City's CAP was prepared based on the State's 2020 GHG targets, which are now superseded by State policies (i.e., the 2022 California Green Building Code), the 2030 GHG targets established in SB 32, and AB 1279.

[54] City of Beaumont. 2015. Sustainable Beaumont. Website: https://www.beaumontca.gov/DocumentCenter/View/26628/8h---Final-Sustainable-Beaumont-Plan-Climate-Action-Plan?bidId= (accessed October 2025)

Additionally, the City participated in the Subregional WRCOG CAP Update in 2021. The consistency of the project with the goals of this CAP fulfills the CEQA goal of fully informing local-agency decision-makers of the environmental impact of the project under consideration at a stage early enough to ensure that GHG emissions are addressed. However, WRCOG Subregional CAP has not established numerical GHG thresholds. Therefore, this analysis would evaluate the proposed project against the SCAQMD threshold of 3,000 MT CO_2e per year. The project is also evaluated for compliance with the WRCOG Subregional CAP, the 2022 Scoping Plan, and the 2024–2050 RTP/SCS.

7 IMPACTS ANALYSIS

This section identifies the air quality and GHG emissions impacts associated with implementation of the proposed project.

7.1 AIR QUALITY IMPACTS

Air pollutant emissions associated with the project would occur over the short term from construction activities and over the long term from operational activities associated with the proposed land uses.

7.1.1 Consistency with Applicable Air Quality Plans

A consistency determination plays an essential role in local agency project review by linking local planning and unique individual projects to the air quality plans. A consistency determination fulfills the CEQA goal of fully informing local agency decision-makers of the environmental costs of the project under consideration at a stage early enough to ensure that air quality concerns are addressed. Only new or amended General Plan elements, Specific Plans, and significantly unique projects need to undergo a consistency review due to the air quality plan strategy being based on projections from local General Plans.

The AQMP is based on regional growth projections developed by SCAG. The proposed 4.85-acre, or 211,266 sf, project involves the expansion of the existing Calvary Chapel. As stated in the *State CEQA Guidelines,* under CEQA, a project has the potential to be regionally significant if it would house more than 1,000 persons, occupy more than 40 acres of land, or encompass more than 650,000 sf of floor area. Thus, the proposed project would not be considered to be regionally significant.

The City's General Plan is compliant with the SCAG Regional Comprehensive Plan Guidelines and the SCAQMD AQMP per Policies 3.10.1 and 8.4. Pursuant to the methodology provided in the SCAQMD's *CEQA Air Quality Handbook*, consistency with the SCAQMD's 2022 AQMP is affirmed when a project (1) would not increase the frequency or severity of an air quality standards violation or cause a new violation and (2) is consistent with the growth assumptions in the AQMP. Consistency review is presented as follows:

1. As demonstrated in Table L and Table M respectively, the proposed project would result in short-term construction and long-term operational pollutant emissions that are all less than the CEQA significance emissions thresholds established by SCAQMD; therefore, the project would not result in an increase in the frequency or severity of an air quality standards violation or cause a new air quality standards violation.

2. The *CEQA Air Quality Handbook* indicates that consistency with AQMP growth assumptions must be analyzed for new or amended General Plan elements, Specific Plans, and significant projects. Significant projects include airports, electrical generating facilities, petroleum and gas refineries, designation of oil drilling districts, water ports, solid waste disposal sites, and offshore drilling facilities; therefore, the proposed project is not defined as significant. The proposed project is currently zoned for single family residential, and it allows for various institutional uses such as a

church. The project would be consistent with the project's site existing General Plan and zoning designation. However, the proposed project would require a Conditional Use Permit (CUP) to operate.

The projections in the AQMP for achieving air quality goals are based, in part, on assumptions in SCAG's 2024–2050 RTP/SCS regarding population, housing, and growth trends, as well as assumptions and projections of local planning agencies to determine control strategies for regional compliance status. According to SCAG's 2024–2050 RTP/SCS, the City's households and employment are forecasted to increase by approximately 5,800 households and 4,500 jobs, respectively, between 2019 and 2050.[55] The designation within the General Plan of a site for a certain use does not necessarily mean that the site would be developed with that use during the planning period because most development depends on property owner initiative.

Therefore, the proposed project will employ at least two full-time staff and five part-time staff, some of which may already reside in Beaumont. According to SCAG, up to 7 employees would represent approximately 0.2 percent of the City's forecast employment growth from 2019 to 2050. Therefore, growth projections of the proposed project would be within the parameters of expected overall growth in Beaumont, and implementation of the proposed project would not result in growth in the area or in Beaumont beyond that which was planned for by SCAG.

Based on the proposed project size and the expected employees, the proposed project is not considered a project of statewide, regional, or areawide significance (e.g., large-scale projects such as airports, electrical generating facilities, petroleum and gas refineries, residential developments of more than 500 dwelling units, and shopping centers or business establishments employing more than 1,000 persons or encompassing more than 500,000 sq ft of floor space) as defined in CCR Title 14, Division 6, Chapter 3, Article 13, Section 15206(b). Because the proposed project would not be defined as a regionally significant project under CEQA, it does not meet SCAG's Intergovernmental Review criteria

Based on the consistency analysis presented above, the proposed project would be consistent with the regional AQMP.

7.1.2 Criteria Pollutant Analysis

The Basin is designated as non-attainment for O_3 and $PM_{2.5}$ for federal standards and non-attainment for O_3, PM_{10}, and $PM_{2.5}$ for State standards. The SCAQMD's nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of AAQS. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air

[55] SCAG. 2024. *Connect SoCal: The 2024–2050 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments*. Website: https://scag.ca.gov/sites/default/files/2024-05/23-2987-tr-demographics-growth-forecast-final-040424.pdf (accessed October 2025).

quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

In developing thresholds of significance for air pollutants, the SCAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary. The following analysis assesses the potential project-level construction- and operation-related air quality impacts.

7.1.2.1 Construction Emissions

Project construction activities would include grading, site preparation, building, paving, and architectural coating activities. Construction-related effects on air quality from the proposed project would be greatest during the grading and site preparation phase due to the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The SCAQMD has established Rule 403: Fugitive Dust, which would require the Applicant to implement measures that would reduce the amount of particulate matter generated during the construction period.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_x, VOCs, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the project using CalEEMod and are presented in Table L. CalEEMod output sheets are included in Appendix A.

Table L: Short-Term Regional Construction Emissions

Construction Phase	Maximum Daily Regional Pollutant Emissions (lbs/day)							
	VOCs	NO_X	CO	SO_X	Fugitive PM_{10}	Exhaust PM_{10}	Fugitive $PM_{2.5}$	Exhaust $PM_{2.5}$
Site Preparation	1.2	39.9	29.7	<0.1	7.9	1.1	4.0	1.0
Grading	0.8	24.0	19.1	<0.1	3.1	0.8	1.4	0.7
Building Construction	0.7	19.2	15.5	<0.1	0.3	0.7	<0.1	0.6
Paving	0.8	16.0	13.9	<0.1	0.3	0.7	0.1	0.6
Architectural Coating	4.3	1.1	1.2	<0.1	<0.1	0.1	<0.1	<0.1
Peak Daily Emissions	**5.0**	**39.9**	**29.7**	**<0.1**	**9.0**		**5.0**	
RSCAQMD Threshold	**75.0**	**100.0**	**550.0**	**150.0**	**150.0**		**55.0**	
Significant?	**No**	**No**	**No**	**No**	**No**		**No**	

Source: Compiled by LSA (January 2025).
Note: Some values may not appear to add correctly due to rounding. Maximum emissions of VOCs occurred during the overlapping building construction and architectural coating phases.
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SO_X = sulfur oxides
VOCs = volatile organic compounds

As shown in Table L, construction emissions associated with the proposed project would not exceed the SCAQMD thresholds for VOCs, NO_X, CO, sulfur oxides (SO_X), $PM_{2.5}$, or PM_{10} emissions. Therefore, construction of the proposed project would not result in emissions that would result in a cumulatively considerable net increase of any criteria pollutant for which the project is in nonattainment under an applicable federal or State ambient air quality standard.

7.1.2.2 Operational Air Quality Impacts

Long-term air pollutant emission impacts are those typically associated with mobile sources (e.g., vehicle and truck trips), energy sources (e.g., natural gas), area sources (e.g., architectural coatings and the use of landscape maintenance equipment), and off-road sources (e.g., use of the forklifts).

Mobile source emissions include VOC and NO_X emissions that contribute to the formation of ozone. Additionally, PM_{10} emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways.

Energy source emissions result from activities in buildings for which natural gas is used. The quantity of emissions is the product of usage intensity (i.e., the amount of natural gas) and the emission factor of the fuel source. The proposed project would include the use of natural gas.

Typically, area source emissions consist of direct sources of air emissions located at the project site, including architectural coatings and the use of landscape maintenance equipment. Off-road sources are associated with the use of the two forklifts.

Long-term operation emissions associated with the proposed project were calculated using CalEEMod. Model results are shown in Table M below. CalEEMod output sheets are included in Appendix A.

Table M: Project Operational Emissions

Emission Type	Pollutant Emissions (lbs/day)					
	VOCs	NO_X	CO	SO_X	Total PM_{10}	Total $PM_{2.5}$
Mobile Sources	0.4	0.6	4.9	<0.1	1.1	0.3
Area Sources	1.2	<0.1	1.6	<0.1	<0.1	<0.1
Energy Sources	<0.1	0.4	0.3	<0.1	<0.1	<0.1
Total Project Emissions	**1.6**	**1.0**	**6.8**	**<0.1**	**1.1**	**0.3**
SCAQMD Thresholds	**55.0**	**55.0**	**550.0**	**150.0**	**150.0**	**55.0**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (January 2025).
Note: Some values may not appear to add correctly due to rounding.
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SO_X = sulfur oxides
VOCs = volatile organic compounds

The results shown in Table M indicate that the emissions associated with the proposed project would not exceed the significance criteria for VOCs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions; thus, the proposed project would not have a significant effect on regional air quality. Therefore, operation of the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project is nonattainment under an applicable federal or State ambient air quality standard.

7.1.2.3 Long-Term Microscale (CO Hot Spot) Analysis

Vehicular trips associated with the proposed project would contribute to congestion at intersections and along roadway segments in the project vicinity. Localized air quality impacts would occur when emissions from vehicular traffic increase as a result of the proposed project. The primary mobile-source pollutant of local concern is CO, a direct function of vehicle idling time and, thus, of traffic flow conditions. CO transport is extremely limited; under normal meteorological conditions, CO disperses rapidly with distance from the source. However, under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels, affecting local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients).

Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient background CO concentrations, modeling is recommended to determine a project's effect on local CO levels.

An assessment of project-related impacts on localized ambient air quality requires that future ambient air quality levels be projected. Existing CO concentrations in the immediate project vicinity are not available. Ambient CO levels monitored at the San Bernardino monitoring station (i.e., the closest station to the project site) showed a highest recorded 1-hour concentration of 2.0 ppm (the State standard is 20 ppm) and a highest 8-hour concentration of 1.6 ppm (the State standard is 9 ppm) during the past 3 years (see Table G). The highest CO concentrations would normally occur

during peak traffic hours; hence, CO impacts calculated under peak traffic conditions represent a worst-case analysis.

The proposed project would generate 94 average daily trips, including 8 trips during the a.m. peak hour and 15 trips during the p.m. peak hour[56]. Because the proposed project would not generate 50 or more peak hour trips, the proposed project does not meet the criteria for an evaluation of study area intersection or roadway segment level of service. Therefore, the addition of the proposed project traffic is not expected to create any significant adverse impacts to nearby intersections and project-related vehicles are not expected to contribute significantly to CO concentrations exceeding the State or federal CO standards. Therefore, the intersections in the project area would not experience CO "hot spots."

7.1.2.4 Localized Significance Analysis

The SCAQMD recommends the evaluation of localized air quality impacts to sensitive receptors (e.g., residential land uses in the immediate vicinity of a project site) as a result of construction activities. The thresholds are based on standards established by the SCAQMD in its LST Methodology and are measured against emissions that occur on a specific project site. Project construction and operation emissions were compared to the LST screening tables in SRA 29, based on a 25-meter source-receptor distance. The results of the LST analysis are summarized in Tables N and O.

Table N: Project Localized Construction Emissions

Source	Pollutant Emissions (lbs/day)			
	NO_X	CO	Total PM_{10}	Total $PM_{2.5}$
On-Site Project Emissions	39.9	28.3	8.8	5.0
Localized Significance Threshold	**164.0**	**1,754.0**	**12.0**	**6.8**
Exceeds Threshold?	**No**	**No**	**No**	**No**

Source: Compiled by LSA (January 2025).
Note: Source Receptor Area 29, based on a 2.5-acre construction disturbance daily area, at a distance of 25 meters from the project boundary.
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size

Table O: Project Localized Operational Emissions

Source	Pollutant Emissions (lbs/day)			
	NO_x	CO	Toal PM_{10}	Total $PM_{2.5}$
On-Site Project Emissions	0.4	2.1	0.1	<0.1
Localized Significance Threshold	**236.0**	**2,817.0**	**6.0**	**3.0**
Exceeds Threshold?	**No**	**No**	**No**	**No**

Source: Compiled by LSA (January 2025).
Note: Source Receptor Area 29, based on a 5.0-acre operational disturbance daily area, at a distance of 25 meters from the project boundary.
CO= carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
$PM_{2.5}$= particulate matter less than 2.5 microns in size
PM_{10}= particulate matter less than 10 microns in size

[56] LSA Associates, Inc. (LSA). 2024. *Calvary Chapel Expansion Project Trip Generation and Vehicle Miles Traveled Analysis Memorandum (LSA Project No. 20241535)*. February 21.

By design, the localized impacts analysis only includes on-site emission sources; however, the CalEEMod outputs do not separate on-site and off-site emissions for mobile sources. For a worst-case scenario assessment, the emissions detailed in Table O assume all area and energy source emissions would occur on site and 5 percent of the project-related new mobile sources, which is an estimate of the amount of project-related on-site vehicle travel, would occur on site. Because the majority of vehicle travel would occur off site and considering the total overall VMT and trip length included in CalEEMod, assuming that 5 percent of the project's VMT would occur on site is conservative.

As shown in Tables N and O, the results of the LST analysis indicate that the proposed project would not result in an exceedance of the SCAQMD LST during project construction or operation.

7.1.3 Odors

Heavy-duty equipment on the project site during construction would emit odors, primarily from equipment exhaust. In addition, odors related to solvents and the application of asphalt paving can occur during construction. However, the construction activity would cease after individual construction is completed. No other sources of objectionable odors have been identified for the proposed project.

The proposed project would comply with SCAQMD Rule 402 regarding odors and sources that could cause nuisances. SCAQMD Rule 402 regarding states: "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."[57] The proposed uses are not anticipated to emit any objectionable odors. The proposed project would also include trash enclosures, which would reduce any potential for odors from project-related waste. Therefore, the proposed project would not result in other emissions (e.g., those leading to odors) adversely affecting a substantial number of people.

7.2 ENERGY IMPACTS

The following describes the potential impacts regarding energy resources that could result from implementation of the proposed project.

7.2.1 Energy Consumption

The proposed project would increase the demand for energy through day-to-day operations and fuel consumption associated with project construction. This section discusses energy use resulting from implementation of the proposed project and evaluates whether the proposed project would result in the wasteful, inefficient, or unnecessary consumption of energy resources or conflict with any applicable plans for renewable energy and energy efficiency.

[57] SCAQMD. 2024. *South Coast AQMD Rule Book*. Website: https://www.aqmd.gov/home/rules-compliance/rules (accessed March 2025).

7.2.1.1 Construction Energy Use

Construction of the proposed project is anticipated to begin in July 2025 and is anticipated to be completed in December 2026. The project would require energy for activities such as the manufacture and transportation of building materials, grading activities, and building construction. Construction of the proposed project would require electricity to power construction-related equipment. Construction of the proposed project would not involve the consumption of natural gas. The construction-related equipment would not be powered by natural gas, and no natural gas demand is anticipated during construction.

Transportation energy represents the largest energy use during construction and would occur from the transport and use of construction equipment, delivery vehicles and haul trucks, and construction worker vehicles that would use petroleum fuels (e.g., diesel fuel and/or gasoline). Therefore, the analysis of energy use during construction focuses on fuel consumption. Construction trucks and vendor trucks hauling materials to and from the project site would be anticipated to use diesel fuel, whereas construction workers traveling to and from the project site would be anticipated to use gasoline-powered vehicles. Fuel consumption from transportation uses depends on the type and number of trips, VMT, the fuel efficiency of the vehicles, and the travel mode.

Estimates of fuel consumption (diesel fuel and gasoline) from construction equipment, construction trucks, and construction worker vehicles were based on default construction equipment assumptions and trip estimates from CalEEMod and fuel efficiencies from EMFAC2021. Fuel consumption estimates are presented in Table P. CalEEMod output sheets are included in Appendix A and detailed energy calculations are included in Appendix B.

Table P: Proposed Project Energy Consumption Estimates during Construction

Energy Fuel Type	Total Fuel Consumption	Percentage of Increase Countywide
Diesel Fuel (total gallons)	56,950.6	0.02
Gasoline (total gallons)	8,959.9	<0.01

Source: Compiled by LSA (January 2025).

As indicated in Table P, the project would consume approximately 56,950.6 gallons of diesel fuel and approximately 8,959.9 gallons of gasoline during construction. Based on fuel consumption obtained from EMFAC2021, approximately 730.6 million gallons of gasoline and 302.4 million gallons of diesel will be consumed from vehicle trips in Riverside County in 2025. Therefore, construction of the proposed project would increase the annual construction generated fuel use in Riverside County by approximately 0.02 percent for diesel fuel usage and by less than 0.01 percent for gasoline fuel usage. As such, project construction would have a negligible effect on local and regional energy supplies. Furthermore, impacts related to energy use during construction would be temporary and relatively small in comparison to Riverside County's overall use of the State's available energy resources. No unusual project characteristics would necessitate the use of construction equipment that would be less energy efficient than at comparable construction sites in the region or the State. In addition, construction activities are not anticipated to result in an inefficient use of energy because gasoline and diesel fuel would be supplied by construction contractors who would conserve the use of their supplies to minimize their costs on the project. The project would not cause or result

in the need for additional energy facilities or an additional or expanded delivery system. For these reasons, fuel consumption during construction would not be inefficient, wasteful, or unnecessary.

7.2.1.2 Operational Energy Use

Operational energy use is typically associated with electricity consumption and fuel used for vehicle trips associated with a project. Energy consumption was estimated for the proposed project using default energy intensities by land use type in CalEEMod. The proposed project would also result in diesel usage associated with the fire pump; however, the fire pump is only expected to run approximately 1 hour per month. Therefore, use of the fire pump is not expected to substantially increase diesel fuel usage and is not evaluated further.

The proposed project would also result in energy usage associated with gasoline and diesel fuel consumed by project-related vehicle and truck trips. Fuel use associated with vehicle and truck trips generated by the proposed project was calculated based on the project's Trip Generation and Vehicle Miles Traveled Analysis,[58] which identifies that the proposed project would generate approximately 94 average daily trips. The amount of operational fuel use was estimated using CARB's EMFAC2021 model, which provided projections for typical daily fuel usage in Riverside County. Electricity and fuel usage estimates associated with the proposed project are shown in Table Q.

Table Q: Proposed Project Energy Consumption Estimates during Operation

Energy Type	Annual Energy Consumption
Electricity Consumption (kWh/year)	106,000.0
Natural Gas Consumption (therms/year)	15,105.0
Gasoline (gallons/year)	20,517.1
Diesel Fuel (gallons/year)	3,113.3

Source: Compiled by LSA (January 2025).
kWh = kilowatt-hours

As shown in Table Q, the estimated potential net increase in electricity demand associated with the operation of the proposed project is 106,000.0 kWh per year. Total electricity consumption in Riverside County in in 2022 was 17,780.6 GWh (or 17,780,573,271 kWh). Therefore, operation of the proposed project would increase the annual electricity consumption in Riverside County by approximately less than 0.01 percent.

As shown in Table Q, the proposed project would result in 15,105.0 therms per year of natural gas. Total natural gas consumption in Riverside County in 2022 was 431.1 million therms (431,052,392 therms). Therefore, operation of the proposed project would increase the annual natural gas consumption in Riverside County by approximately less than 0.01 percent.

Electrical demand associated with project operations would not be considered inefficient, wasteful, or unnecessary in comparison to other similar developments in the region. Furthermore, the proposed project would not conflict with or obstruct a State or local plan for renewable energy or

[58] LSA. 2024. *Calvary Chapel Expansion Project Trip Generation and Vehicle Miles Traveled Analysis Memorandum (LSA Project No. 20241535)*. February 21.

energy efficiency. The project would be required to adhere to all federal, State, and local requirements for energy efficiency, including the Title 24 standards. Title 24 building energy efficiency standards establish minimum efficiency standards related to various building features, including appliances, water and space heating and cooling equipment, building insulation and roofing, and lighting, which would reduce energy usage.

As shown in Table Q, fuel use associated with the vehicle trips generated by the proposed project is estimated at 20,517.1 gallons of gasoline and 3,113.3 gallons of diesel fuel per year. This analysis conservatively assumes that all vehicle trips generated as a result of project operation would be new to Riverside County. Approximately 716.3million gallons of gasoline and 303.0 million gallons of diesel will be consumed from vehicle trips in Riverside County in 2026. Therefore, vehicle and truck trips associated with the proposed project would increase the annual fuel use in Riverside County by approximately 0.02 percent for diesel fuel usage and by less than 0.01 percent for gasoline fuel usage. Fuel consumption associated with vehicle trips generated by project operations would not be considered inefficient, wasteful, or unnecessary in comparison to other similar developments in the region.

7.2.2 Conflict with Renewable Energy or Energy Efficiency Plans

In 2002, the State Legislature passed SB 1389, which required the CEC to develop an integrated energy plan every two years for electricity, natural gas, and transportation fuels for the Integrated Energy Policy Report. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for ZEVs and their infrastructure needs, and encouragement of urban designs that reduce VMT and accommodate pedestrian and bicycle access.

The CEC's *2023 Integrated Energy Policy Report*[59] provide the results of the CEC's assessments of a variety of energy issues facing California. As indicated above, energy usage on the project site during construction would be temporary in nature and would be relatively small in comparison to the overall use in the County. In addition, energy usage associated with operation of the proposed project would be relatively small in comparison to the overall use in Riverside County and the State's available energy resources. Therefore, energy impacts at the regional level would be negligible. Because California's energy conservation planning actions are conducted at a regional level, and because the proposed project's total impact on regional energy supplies would be minor, the proposed project would not conflict with or obstruct California's energy conservation plans as described in the CEC's Integrated Energy Policy Report.

Furthermore, the City's comprehensive Energy Action Plan (EAP) is aimed at reducing greenhouse gas emissions and improving energy efficiency. This plan, which includes both community-wide and municipal initiatives, builds upon the city's past efforts and aligns with state-level goals for climate

[59] CEC. 2023. *2023 Integrated Energy Policy Report*. California Energy Commission. Docket Number: 23-IEPR-01.

action and energy efficiency.[60] As described above, the project would be required to adhere to Title 24 standards. Title 24 building energy efficiency standards establish minimum efficiency standards related to various building features, including appliances, water and space heating and cooling equipment, building insulation and roofing, and lighting, which would reduce energy usage. Therefore, through compliance with Title 24 energy standards, the proposed project would comply with the EAP's energy efficiency and conservation incentives. Additionally, as demonstrated above, the proposed project would not result in the inefficient, wasteful, and unnecessary consumption of energy. Potential impacts related to conflict with or obstruction of a State or local plan for renewable energy or energy efficiency would be less than significant, and no mitigation is required.

7.3 GREENHOUSE GAS IMPACTS

This section describes the project's generation of GHG emissions and evaluates the project's consistency with GHG emission reduction plans.

7.3.1 Generation of Greenhouse Gas Emissions

This section describes the proposed project's construction- and operational-related GHG emissions and contribution to global climate change. Neither the SCAQMD nor City of Beaumont have addressed emission thresholds for construction in its *CEQA Air Quality Handbook*; however, the SCAQMD requires quantification and disclosure. Thus, an evaluation of the project's impacts related to the release of GHG emissions for both construction and operational phases of the project is described below.

7.3.1.1 Short-Term Greenhouse Gas Emissions

Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

As indicated above, neither the SCAQMD nor City of Beaumont have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are required to quantify and disclose GHG emissions that would occur during construction. The SCAQMD then requires the construction GHG emissions to be amortized over the life of the project, defined by the SCAQMD as 30 years,[61] added to the operational emissions, and compared to the applicable interim GHG significance threshold tier.

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60 City of Baumont. 2010. *City of Baumont Energy Action Plan*. July. Website: https://www.beaumontca.gov/DocumentCenter/View/27816/Energy-Action-Plan?bidId= (accessed October 2025)

61 The SCAQMD has identified the average operational lifespan of buildings to be 30 years. SCAQMD. 2008b. *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules, and Plans*. Website: http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf (accessed October 2025).

Using CalEEMod, it is estimated that the project would generate approximately 576.1 MT CO_2e during construction of the project. When annualized over the 30-year life of the project, annual emissions would be 19.2 MT CO_2e.

7.3.1.2 Long-Term Greenhouse Gas Emissions

Long-term GHG emissions are typically generated from mobile sources (e.g., vehicle and truck trips), area sources (e.g., maintenance activities and landscaping), off-road sources (e.g., use of the forklifts), indirect emissions from sources associated with energy consumption, waste sources (land filling and waste disposal), and water sources (water supply and conveyance, treatment, and distribution). Mobile-source GHG emissions would include project-generated vehicle trips to and from the project. Area-source emissions would be associated with activities such as landscaping and maintenance on the project site. Energy source emissions would be generated at off-site utility providers because of increased electricity and combustion of natural gas demand generated by the project. Waste source emissions generated by the proposed project include energy generated by land filling and other methods of disposal related to transporting and managing project-generated waste. In addition, water source emissions associated with the proposed project are generated by water supply and conveyance, water treatment, water distribution, and wastewater treatment.

Following guidance from the SCAQMD, GHG emissions were estimated for the proposed project using CalEEMod. Table R shows the calculated GHG emissions for the proposed project.

Table R: Greenhouse Gas Emissions

Emissions Source	Operational Emissions (MT/yr)				
	CO_2	CH_4	N_2O	CO_2e	Percentage of Total
Mobile Sources	205.1	<0.1	<0.1	208.4	10
Area Sources	0.8	<0.1	<0.1	0.8	<1
Energy Sources	180.4	<0.1	<0.1	181.0	8.0
Water Sources	2.4	<0.1	<0.1	3.7	<1
Waste Sources	515.4	51.5	0.0	1,803.0	82.
Refrigerant Sources	-	-	-	<0.1	<1
Total Operational Emissions				**2,196.9**	**100**
Amortized Construction Emissions				19.2	-
Total Project Emissions				**2,216.1**	**-**
SCAQMD Threshold				**3,000**	-
Exceed?				**No**	**-**

Source: Compiled by LSA (January 2025).
CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
MT/yr = metric tons per year
N_2O = nitrous oxide
SCAQMD = South Coast Air Quality Management District

As discussed above, a project would have less than significant GHG emissions if it would result in operational-related GHG emissions of less than 3,000 MT CO_2e/yr Based on the analysis results, the proposed project would result in approximately 2,216.1 MT CO_2e/yr, which would be below the SCAQMD threshold of 3,000 MT CO_2e/yr. Therefore, operation of the proposed project would not generate significant GHG emissions that would have a significant effect on the environment.

7.3.2 Consistency with Greenhouse Gas Emissions Reduction Plans

An evaluation of the proposed project's consistency with the City's CAP, the WRCOG Subregional CAP, the 2022 Scoping Plan, and Connect SoCal 2024 is provided in this section.

7.3.2.1 City's CAP

As described in the preceding sections, the City passed its first CAP in 2015 with the goal of reducing municipal and community-wide GHG emissions 15 percent by 2020 from a 2012 baseline level. However, the City's CAP was prepared based on the State's 2020 GHG targets, which are now superseded by State policies (i.e., the 2022 California Green Building Code), the 2030 GHG targets established in SB 32, and AB 1279. However, the City's CAP still serves as a roadmap to greenhouse gas reductions through the incorporation of energy efficiency and water conservation features. The following policies from the CAP are applicable to the proposed project:

- Measure 4.1: Encourage or require energy efficiency standards exceeding state requirements
- Measure 5.1: Support water efficiency through enhanced implementation of SB X-7-7
- Measure 5.2: Exceed water efficiency standards
- Measure 6.1: Tree planting for shading and energy efficiency
- Measure 6.2: Light-reflecting surfaces for energy efficiency
- Measure 7.1: Encourage non-motorized transportation options
- Measure 8.1: Reduce waste to landfills
- Measure 9.1: Promote clean energy

The proposed project would provide pedestrian infrastructure such as recreational facilities, sidewalks, and private roadways, which will increase connectivity to the surrounding land uses. Therefore, the proposed project would be consistent with the goal of encouraging non-motorized forms of transportation. The proposed project would also be required to use efficient building practices pursuant to the latest version of Title 24, that require new buildings to reduce water consumption, employ building commissioning to increase building system efficiencies, divert construction waste from landfills, and install low-pollutant-emitting finish materials. In addition, compliance with CalGreen Building Code would ensure the use of energy efficient appliances in the proposed project's commercial buildings and would require water efficient landscaping be incorporated into the proposed project. Therefore, the proposed project would be consistent with the CAP goals for energy and water efficiency standards. The proposed project would also provide new drought tolerant landscaping, consistent with the CAP goal of tree planting. Furthermore, the proposed project would require recycling programs to reduce waste to landfills by a minimum of 50 percent and up to 75 percent by 2020 per AB 341.

7.3.2.2 WRCOG Subregional CAP

The WRCOG CAP covers 12 cities in the subregion to set a subregional GHG emissions reduction target, emissions reduction measures, and action steps to assist each community to demonstrate consistency with AB 32. The GHG emissions reduction potential of each measure included in the WRCOG CAP was estimated for jurisdictions participating at various voluntary levels that could be realistically achieved by 2020. Implementation of the WRCOG CAP will result in a 15 percent

reduction from the subregion's baseline (2010) emissions, consistent with State-recommended goals for local jurisdictions. As a result, the 2020 reduction goal is achieved through implementation of the measures in the WRCOG CAP. The WRCOG CAP also looks beyond 2020 and demonstrates an ongoing commitment to reducing GHG emissions aligned with State-established goals included in SB 375 and Executive Order S-3-05. Continued implementation of the WRCOG CAP beyond 2020 will place the subregion on a trajectory to reduce GHG emissions 49 percent below baseline emissions by 2035[62]. The City will continue to participate in the regional efforts of the CAP and implement feasible measures. The following CAP measures would be applicable to the proposed project.

- **LE-1. Expand Local Renewable Energy Production.** Increase solar PV installations on new and existing buildings.
- **LE-6 Shade Trees.** Increase the canopy/tree count.
- **LT-2 Pedestrian infrastructure improvements.** Fill gaps in the pedestrian network through construction of sidewalks, crosswalks, curb ramps, pedestrian signals, or pedestrian crossings.
- **LS-1 Zero Waste Initiatives.** Increase the percent of waste and organic waste diverted from landfills.
- **LW-1 Increase Recycled Water Use.** Increase the volume of recycled water used to irrigate parks, golf courses outdoor landscaping.

The proposed project would be consistent with the WRCOG CAP through implementation of the GHG reduction measures in the WRCOG CAP and would not impede the various levels of participation to which the City of Beaumont has committed. The proposed project would provide pedestrian infrastructure such as recreational facilities, sidewalks, and private roadways, which will increase connectivity to the surrounding land uses. Therefore, the proposed project would be consistent with the goal of providing pedestrian infrastructure improvements. The proposed project would also be required to use efficient building practices pursuant to the latest version of Title 24, that require new buildings to reduce water consumption, employ building commissioning to increase building system efficiencies, divert construction waste from landfills, and install low-pollutant-emitting finish materials. The implementation of these stricter building and appliance standards would result in water, energy, and construction waste reductions for the proposed project. Compliance with CalGreen Building Code would ensure the use of energy efficient appliances in the proposed project's commercial buildings and would require water efficient landscaping be incorporated into the proposed project. In addition, the proposed project would comply with local and state laws regarding solar energy.

Although the proposed project would include natural gas during operations, natural gas service is currently provided to the project site under existing conditions. No new natural gas lines are proposed for the expansion project. Moreover, any new or replacement appliances would be more efficient than the existing appliances. As such, the proposed project will be consistent with

62 Western Riverside Council of Governments (WRCOG). 2014. *Subregional Climate Action Plan*. September 2014.

CALGreen Code. Therefore, the proposed project would not result in a significant increase in natural gas demand. The proposed project would also provide new drought tolerant landscaping, consistent with the CAP goal of increased canopy and tree count. Furthermore, the proposed project would require recycling programs to reduce waste to landfills by a minimum of 50 percent and up to 75 percent by 2020 per AB 341.

Other measures in the WRCOG CAP would be implemented by other local jurisdictions and on a State and regional level, such as measure SR-1 from the WRCOG CAP, which would implement the statewide renewable energy portfolio standard of 33 percent by 2020. As such, the proposed project would be consistent with the applicable GHG reduction measures in the WRCOG CAP that the City has committed to. As a result, the proposed project would be considered consistent with the WRCOG CAP.

7.3.2.3 2022 Scoping Plan

The following discussion evaluates the proposed project according to the goals of the 2022 Scoping Plan, EO B-30-15, AB 1279, SB 32, AB 197, and AB 1279.

EO B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[63] to reflect the 2030 target set by EO B-30-15 and codified by SB 32. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in EO B-30-15. SB 32 builds on AB 32 and keeps the State on the path toward achieving the 2050 objective of reducing emissions to 80 percent below 1990 levels. The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197, intended to provide easier public access to air emissions data collected by CARB, was posted in December 2016. AB 1279 codifies the State goals of achieving net carbon neutrality by 2045 and maintaining net negative GHG emissions thereafter.

In addition, the 2022 Scoping Plan assesses progress toward the statutory 2030 target while laying out a path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

Energy efficient measures are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. As discussed above, the proposed project would comply with the CALGreen Code,

[63] CARB. 2017a. *California's 2017 Climate Change Scoping Plan*. November. Website: ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf (accessed June 2024).

regarding energy conservation and green building standards. Although the proposed project would include natural gas during operations, natural gas service is currently provided to the project site under existing conditions. No new natural gas lines are proposed for the expansion project. Moreover, any new or replacement appliances would be more efficient than the existing appliances. Therefore, the proposed project will be consistent with CALGreen Code. As such, the proposed project would not conflict with the State's energy goals. Therefore, the proposed project would comply with applicable energy measures.

Water conservation and efficiency measures are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. As noted above, the project would comply with the CALGreen Code, which includes a variety of different measures, including the reduction of wastewater and water use. In addition, the proposed project would be required to comply with the California Model Water Efficient Landscape Ordinance. The proposed project would also have low-flow plumbing fixtures in restrooms and low-maintenance, drought-tolerant landscaping. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

The goal of transportation and motor vehicle measures is to develop regional GHG emissions reduction targets for passenger vehicles. Specific regional emission targets for transportation emissions would not directly apply to the proposed project. The Pavley II (LEV III) Advanced Clean Cars Program will reduce GHG emissions from new cars by 34 percent from 2016 levels by 2025, resulting in a 3 percent decrease in average vehicle emissions for all vehicles by 2020. Vehicles traveling to the project site would comply with the Pavley II (LEV III) Advanced Clean Cars Program. Therefore, the proposed project would not conflict with the identified transportation and motor vehicle measures.

7.3.2.4 Connect SoCal: The 2024–2050 Regional Transportation Plan/Sustainable Communities Strategy

SCAG's Connect SoCal 2024 identifies that land use strategies that focus on new housing and job growth in areas served by high quality transit and other opportunity areas would be consistent with a land use development pattern that supports and complements the proposed transportation network. The core vision in Connect SoCal 2024 is to better manage the existing transportation system through design management strategies, integrate land use decisions and technological advancements, create complete streets that are safe to all roadway users, preserve the transportation system, and expand transit and foster development in transit-oriented communities. Connect SoCal 2024 contains transportation projects to help more efficiently distribute population, housing, and employment growth, as well as forecast development that is generally consistent with regional-level general plan data. The forecasted development pattern, when integrated with the financially constrained transportation investments identified in Connect SoCal 2024, would reach the GHG emissions target set by CARB, including the regional target of reducing GHG emissions from autos and light-duty trucks by 19 percent by 2035 (compared to 2005 levels). Connect SoCal 2024 does not require that local General Plans, Specific Plans, or zoning be consistent with Connect SoCal 2024 but provides incentives for consistency for governments and developers.

The objectives of Connect SoCal 2024 are to create a region with transit as a backbone of the transportation system; more complete streets where people and safety are prioritized; policies that encourage emerging technologies and mobility innovations that support rather than hamper regional goals; more housing, jobs, and mobility options closer together in Priority Development Areas to preserve natural lands and open spaces; more housing to address the existing housing need; and safe and fluid movement of goods, with a commitment to the broad deployment of zero- and near-zero emission technologies.

As discussed above, the proposed chapel expansion uses would be consistent with the project site's existing General Plan designation and zoning. As such, it is assumed that the project's labor demand would not substantially increase population, households, or employment in the City. As such, the project would be consistent with SCAG's goals for new job growth in the region. Therefore, because the proposed project would accommodate planned regional growth, the proposed project would not exceed the growth assumptions in the SCAG's Connect SoCal 2024.

Implementing SCAG's Connect SoCal 2024 will greatly reduce the regional GHG emissions from transportation, helping to achieve statewide emissions reduction targets. The proposed project would not interfere with SCAG's ability to achieve the region's GHG reduction target of 19 percent below 2005 per capita emissions levels by 2035. Furthermore, the proposed project is not regionally significant per *State CEQA Guidelines* Section 15206, and as such, it would not conflict with the SCAG Connect SoCal 2024 targets because those targets were established and are applicable on a regional level.

Based on the nature of the proposed project, it is anticipated that implementation of the proposed project would not interfere with SCAG's ability to implement the regional strategies outlined in Connect SoCal 2024.

7.3.2.5 Greenhouse Gas Reduction Plan Consistency Summary

As demonstrated above, the proposed project would generally be consistent with the WRCOG Subregional CAP, the 2022 Scoping Plan, and SCAG's Connect SoCal 2024. As such, the proposed project would comply with existing State regulations adopted to achieve the overall GHG emissions reduction goals identified in the 2022 Scoping Plan, EO B-30-15, and AB 197 and would be consistent with applicable State plans and programs designed to reduce GHG emissions. Therefore, the proposed project would not conflict with applicable plans, policies, and regulations adopted for the purpose of reducing the emissions of GHGs.

8 CONCLUSIONS

Based on the analysis presented above, construction and operation of the proposed project would not result in the generation of criteria air pollutants that would exceed SCAQMD thresholds of significance. Compliance with SCAQMD Rule 403: Fugitive Dust would further reduce construction dust impacts. Construction and operational fuel and energy consumption for the proposed project would not be considered inefficient, wasteful, or unnecessary in comparison to other similar developments in the region. In addition, the proposed project is not expected to produce significant emissions that would affect nearby sensitive receptors. The project would also not result in other emissions (such as those leading to odors) affecting a substantial number of people. Operation of the proposed project would not generate GHG emissions that would have a significant impact on the environment. In addition, the proposed project would be consistent with the WRCOG Subregional CAP, the 2024–2050 RTP/SCS, and the goals of the 2022 Scoping Plan.

APPENDIX A

CALEEMOD OUTPUT SHEETS

Calvary Chapel Expansion Project Custom Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Calvary Chapel Expansion Project
Construction Start Date	7/7/2025
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	19.2
Location	1780 Orchard Heights Ave, Beaumont, CA 92223, USA
County	Riverside-South Coast
City	Beaumont
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5630
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Place of Worship	641	Seat	0.50	32,374	0.00	—	—	Worship

Day-Care Center	5.00	1000sqft	0.11	5,000	0.00	—	—	Children's Center
City Park	0.18	Acre	0.18	0.00	0.00	0.00	—	Recreational Building
Parking Lot	213	Space	1.92	0.00	0.00	—	—	Parking
City Park	1.75	Acre	1.75	0.00	0.00	0.00	—	Landscape
City Park	0.40	Acre	0.40	0.00	0.00	0.00	—	Recreational Area

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.01	39.9	29.7	0.05	1.12	7.89	9.01	1.02	3.99	5.01	—	5,542	5,542	0.23	0.14	5,564
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.14	24.1	18.8	0.03	0.77	3.15	3.91	0.71	1.43	2.14	—	3,869	3,869	0.14	0.14	3,916
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.51	13.0	10.6	0.02	0.49	1.36	1.68	0.46	0.64	0.93	—	1,884	1,884	0.07	0.05	1,897
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.28	2.38	1.93	< 0.005	0.09	0.25	0.31	0.08	0.12	0.17	—	312	312	0.01	0.01	314

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.15	39.9	29.7	0.05	1.12	7.89	9.01	1.02	3.99	5.01	—	5,542	5,542	0.23	0.14	5,564
2026	5.01	20.2	16.7	0.03	0.76	0.30	1.06	0.71	0.07	0.78	—	2,975	2,975	0.12	0.06	2,997
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.80	24.1	18.8	0.03	0.77	3.15	3.91	0.71	1.43	2.14	—	3,869	3,869	0.14	0.14	3,916
2026	5.14	20.2	16.4	0.03	0.76	0.34	1.08	0.71	0.08	0.78	—	2,954	2,954	0.11	0.06	2,974
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.33	10.0	7.78	0.01	0.31	1.36	1.68	0.29	0.64	0.93	—	1,565	1,565	0.06	0.05	1,582
2026	1.51	13.0	10.6	0.02	0.49	0.19	0.67	0.46	0.05	0.50	—	1,884	1,884	0.07	0.04	1,897
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.06	1.83	1.42	< 0.005	0.06	0.25	0.31	0.05	0.12	0.17	—	259	259	0.01	0.01	262
2026	0.28	2.38	1.93	< 0.005	0.09	0.03	0.12	0.08	0.01	0.09	—	312	312	0.01	0.01	314

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.63	0.93	6.84	0.02	0.04	1.12	1.16	0.04	0.28	0.33	3,115	2,416	5,531	311	0.07	13,342
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	1.34	0.96	4.34	0.01	0.04	1.12	1.16	0.04	0.28	0.32	3,115	2,329	5,444	311	0.07	13,251
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.52	0.98	5.61	0.01	0.04	1.11	1.15	0.04	0.28	0.32	3,115	2,345	5,460	311	0.07	13,270
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.28	0.18	1.02	< 0.005	0.01	0.20	0.21	0.01	0.05	0.06	516	388	904	51.6	0.01	2,197

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.43	0.51	4.88	0.01	0.01	1.12	1.13	0.01	0.28	0.29	—	1,307	1,307	0.04	0.05	1,329
Area	1.17	0.01	1.63	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.68	6.68	< 0.005	< 0.005	6.71
Energy	0.02	0.41	0.34	< 0.005	0.03	—	0.03	0.03	—	0.03	—	1,090	1,090	0.08	0.01	1,093
Water	—	—	—	—	—	—	—	—	—	—	2.35	12.2	14.5	0.24	0.01	22.3
Waste	—	—	—	—	—	—	—	—	—	—	3,113	0.00	3,113	311	0.00	10,890
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14
Total	1.63	0.93	6.84	0.02	0.04	1.12	1.16	0.04	0.28	0.33	3,115	2,416	5,531	311	0.07	13,342
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.41	0.55	4.00	0.01	0.01	1.12	1.13	0.01	0.28	0.29	—	1,227	1,227	0.05	0.06	1,245
Area	0.91	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.02	0.41	0.34	< 0.005	0.03	—	0.03	0.03	—	0.03	—	1,090	1,090	0.08	0.01	1,093
Water	—	—	—	—	—	—	—	—	—	—	2.35	12.2	14.5	0.24	0.01	22.3
Waste	—	—	—	—	—	—	—	—	—	—	3,113	0.00	3,113	311	0.00	10,890
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14

Total	1.34	0.96	4.34	0.01	0.04	1.12	1.16	0.04	0.28	0.32	3,115	2,329	5,444	311	0.07	13,251
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.40	0.56	4.16	0.01	0.01	1.11	1.12	0.01	0.28	0.29	—	1,239	1,239	0.05	0.06	1,259
Area	1.09	0.01	1.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.58	4.58	< 0.005	< 0.005	4.59
Energy	0.02	0.41	0.34	< 0.005	0.03	—	0.03	0.03	—	0.03	—	1,090	1,090	0.08	0.01	1,093
Water	—	—	—	—	—	—	—	—	—	—	2.35	12.2	14.5	0.24	0.01	22.3
Waste	—	—	—	—	—	—	—	—	—	—	3,113	0.00	3,113	311	0.00	10,890
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14
Total	1.52	0.98	5.61	0.01	0.04	1.11	1.15	0.04	0.28	0.32	3,115	2,345	5,460	311	0.07	13,270
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.07	0.10	0.76	< 0.005	< 0.005	0.20	0.20	< 0.005	0.05	0.05	—	205	205	0.01	0.01	208
Area	0.20	< 0.005	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.76	0.76	< 0.005	< 0.005	0.76
Energy	< 0.005	0.07	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	180	180	0.01	< 0.005	181
Water	—	—	—	—	—	—	—	—	—	—	0.39	2.02	2.41	0.04	< 0.005	3.69
Waste	—	—	—	—	—	—	—	—	—	—	515	0.00	515	51.5	0.00	1,803
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02
Total	0.28	0.18	1.02	< 0.005	0.01	0.20	0.21	0.01	0.05	0.06	516	388	904	51.6	0.01	2,197

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.07	39.9	28.3	0.05	1.12	—	1.12	1.02	—	1.02	—	5,295	5,295	0.21	0.04	5,314
Dust From Material Movement	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	1.64	1.16	< 0.005	0.05	—	0.05	0.04	—	0.04	—	218	218	0.01	< 0.005	218
Dust From Material Movement	—	—	—	—	—	0.32	0.32	—	0.16	0.16	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.30	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	36.0	36.0	< 0.005	< 0.005	36.2
Dust From Material Movement	—	—	—	—	—	0.06	0.06	—	0.03	0.03	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	1.35	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	247	247	0.01	0.01	250
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.44	9.44	< 0.005	< 0.005	9.57
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.56	1.56	< 0.005	< 0.005	1.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.73	23.2	17.8	0.03	0.75	—	0.75	0.69	—	0.69	—	2,959	2,959	0.12	0.02	2,970
Dust From Material Movement	—	—	—	—	—	2.76	2.76	—	1.34	1.34	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.73	23.2	17.8	0.03	0.75	—	0.75	0.69	—	0.69	—	2,959	2,959	0.12	0.02	2,970
Dust From Material Movement	—	—	—	—	—	2.76	2.76	—	1.34	1.34	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.24	7.62	5.84	0.01	0.25	—	0.25	0.23	—	0.23	—	973	973	0.04	0.01	976
Dust From Material Movement	—	—	—	—	—	0.91	0.91	—	0.44	0.44	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	1.39	1.07	< 0.005	0.05	—	0.05	0.04	—	0.04	—	161	161	0.01	< 0.005	162
Dust From Material Movement	—	—	—	—	—	0.17	0.17	—	0.08	0.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	1.16	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	211	211	0.01	0.01	215
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.79	0.19	< 0.005	0.01	0.19	0.20	0.01	0.05	0.07	—	715	715	0.01	0.11	750

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.07	0.88	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	194	194	0.01	0.01	197
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.83	0.20	< 0.005	0.01	0.19	0.20	0.01	0.05	0.07	—	715	715	0.01	0.11	749
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.30	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	64.7	64.7	< 0.005	< 0.005	65.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.28	0.06	< 0.005	< 0.005	0.06	0.07	< 0.005	0.02	0.02	—	235	235	< 0.005	0.04	246
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.7	10.7	< 0.005	< 0.005	10.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.05	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	38.9	38.9	< 0.005	0.01	40.8

3.5. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	18.9	14.3	0.02	0.69	—	0.69	0.64	—	0.64	—	2,398	2,398	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.01	0.44	0.34	< 0.005	0.02	—	0.02	0.02	—	0.02	—	56.3	56.3	< 0.005	< 0.005	56.5
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.08	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.32	9.32	< 0.005	< 0.005	9.35
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.08	0.92	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	203	203	0.01	0.01	206
Vendor	< 0.005	0.22	0.07	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	188	188	< 0.005	0.03	196
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.84	4.84	< 0.005	< 0.005	4.91
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.40	4.40	< 0.005	< 0.005	4.61
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.80	0.80	< 0.005	< 0.005	0.81
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.73	0.73	< 0.005	< 0.005	0.76
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	18.9	14.3	0.02	0.69	—	0.69	0.64	—	0.64	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	18.9	14.3	0.02	0.69	—	0.69	0.64	—	0.64	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.36	11.0	8.37	0.01	0.40	—	0.40	0.38	—	0.38	—	1,403	1,403	0.06	0.01	1,408
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	2.02	1.53	< 0.005	0.07	—	0.07	0.07	—	0.07	—	232	232	0.01	< 0.005	233
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	1.13	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	216	216	0.01	0.01	220
Vendor	< 0.005	0.20	0.06	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	184	184	< 0.005	0.03	193
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.07	0.85	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	199	199	< 0.005	0.01	201
Vendor	< 0.005	0.21	0.06	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	185	185	< 0.005	0.03	193
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.52	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	118	118	< 0.005	< 0.005	120
Vendor	< 0.005	0.12	0.04	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	108	108	< 0.005	0.02	113
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.10	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	19.5	19.5	< 0.005	< 0.005	19.8
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	17.9	17.9	< 0.005	< 0.005	18.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.9. Paving (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.60	15.9	12.6	0.02	0.68	—	0.68	0.64	—	0.64	—	1,885	1,885	0.08	0.02	1,892
Paving	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	1.57	1.25	< 0.005	0.07	—	0.07	0.06	—	0.06	—	186	186	0.01	< 0.005	187
Paving	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.29	0.23	< 0.005	0.01	—	0.01	0.01	—	0.01	—	30.8	30.8	< 0.005	< 0.005	30.9
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.10	1.23	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	285	285	< 0.005	0.01	289
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.13	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	28.5	28.5	< 0.005	< 0.005	28.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.72	4.72	< 0.005	< 0.005	4.78
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.11. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	1.09	0.96	< 0.005	0.07	—	0.07	0.06	—	0.06	—	134	134	0.01	< 0.005	134
Architectural Coatings	4.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	1.09	0.96	< 0.005	0.07	—	0.07	0.06	—	0.06	—	134	134	0.01	< 0.005	134
Architectural Coatings	4.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.26	0.23	< 0.005	0.02	—	0.02	0.01	—	0.01	—	31.8	31.8	< 0.005	< 0.005	31.9
Architectural Coatings	1.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	< 0.005	0.05	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.27	5.27	< 0.005	< 0.005	5.29
Architectural Coatings	0.18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.23	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	43.3	43.3	< 0.005	< 0.005	43.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.17	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	39.8	39.8	< 0.005	< 0.005	40.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.61	9.61	< 0.005	< 0.005	9.74
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.59	1.59	< 0.005	< 0.005	1.61
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	0.43	0.51	4.88	0.01	0.01	1.12	1.13	0.01	0.28	0.29	—	1,307	1,307	0.04	0.05	1,329
Day-Care Center	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.43	0.51	4.88	0.01	0.01	1.12	1.13	0.01	0.28	0.29	—	1,307	1,307	0.04	0.05	1,329
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	0.41	0.55	4.00	0.01	0.01	1.12	1.13	0.01	0.28	0.29	—	1,227	1,227	0.05	0.06	1,245
Day-Care Center	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.41	0.55	4.00	0.01	0.01	1.12	1.13	0.01	0.28	0.29	—	1,227	1,227	0.05	0.06	1,245
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	0.07	0.10	0.76	< 0.005	< 0.005	0.20	0.20	< 0.005	0.05	0.05	—	205	205	0.01	0.01	208
Day-Care Center	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.07	0.10	0.76	< 0.005	< 0.005	0.20	0.20	< 0.005	0.05	0.05	—	205	205	0.01	0.01	208

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	—	452	452	0.03	< 0.005	453
Day-Care Center	—	—	—	—	—	—	—	—	—	—	—	47.4	47.4	< 0.005	< 0.005	47.6
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	107	107	0.01	< 0.005	107
Total	—	—	—	—	—	—	—	—	—	—	—	606	606	0.04	< 0.005	608
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	—	452	452	0.03	< 0.005	453
Day-Care Center	—	—	—	—	—	—	—	—	—	—	—	47.4	47.4	< 0.005	< 0.005	47.6
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	107	107	0.01	< 0.005	107
Total	—	—	—	—	—	—	—	—	—	—	—	606	606	0.04	< 0.005	608
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Place of Worship	—	—	—	—	—	—	—	—	—	—	—	74.8	74.8	< 0.005	< 0.005	75.0
Day-Care Center	—	—	—	—	—	—	—	—	—	—	—	7.85	7.85	< 0.005	< 0.005	7.88
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	17.7	17.7	< 0.005	< 0.005	17.7
Total	—	—	—	—	—	—	—	—	—	—	—	100	100	0.01	< 0.005	101

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	0.02	0.37	0.31	< 0.005	0.03	—	0.03	0.03	—	0.03	—	446	446	0.04	< 0.005	447
Day-Care Center	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	38.4	38.4	< 0.005	< 0.005	38.5
City Park	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.02	0.41	0.34	< 0.005	0.03	—	0.03	0.03	—	0.03	—	484	484	0.04	< 0.005	485
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	0.02	0.37	0.31	< 0.005	0.03	—	0.03	0.03	—	0.03	—	446	446	0.04	< 0.005	447
Day-Care Center	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	38.4	38.4	< 0.005	< 0.005	38.5
City Park	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00

Total	0.02	0.41	0.34	< 0.005	0.03	—	0.03	0.03	—	0.03	—	484	484	0.04	< 0.005	485
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	< 0.005	0.07	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	73.8	73.8	0.01	< 0.005	74.0
Day-Care Center	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.35	6.35	< 0.005	< 0.005	6.37
City Park	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	< 0.005	0.07	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	80.1	80.1	0.01	< 0.005	80.4

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.27	0.01	1.63	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.68	6.68	< 0.005	< 0.005	6.71
Total	1.17	0.01	1.63	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.68	6.68	< 0.005	< 0.005	6.71
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Consumer	0.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.91	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.03	< 0.005	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.76	0.76	< 0.005	< 0.005	0.76
Total	0.20	< 0.005	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.76	0.76	< 0.005	< 0.005	0.76

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	1.94	10.0	12.0	0.20	< 0.005	18.4
Day-Care Center	—	—	—	—	—	—	—	—	—	—	0.41	2.13	2.54	0.04	< 0.005	3.90
City Park	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00

Total	—	—	—	—	—	—	—	—	—	—	2.35	12.2	14.5	0.24	0.01	22.3
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	1.94	10.0	12.0	0.20	< 0.005	18.4
Day-Care Center	—	—	—	—	—	—	—	—	—	—	0.41	2.13	2.54	0.04	< 0.005	3.90
City Park	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	2.35	12.2	14.5	0.24	0.01	22.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	0.32	1.66	1.99	0.03	< 0.005	3.05
Day-Care Center	—	—	—	—	—	—	—	—	—	—	0.07	0.35	0.42	0.01	< 0.005	0.65
City Park	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	0.39	2.02	2.41	0.04	< 0.005	3.69

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	3,109	0.00	3,109	311	0.00	10,878

Day-Care Center	—	—	—	—	—	—	—	—	—	—	3.50	0.00	3.50	0.35	0.00	12.3
City Park	—	—	—	—	—	—	—	—	—	—	0.11	0.00	0.11	0.01	0.00	0.38
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	3,113	0.00	3,113	311	0.00	10,890
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	3,109	0.00	3,109	311	0.00	10,878
Day-Care Center	—	—	—	—	—	—	—	—	—	—	3.50	0.00	3.50	0.35	0.00	12.3
City Park	—	—	—	—	—	—	—	—	—	—	0.11	0.00	0.11	0.01	0.00	0.38
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	3,113	0.00	3,113	311	0.00	10,890
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	515	0.00	515	51.4	0.00	1,801
Day-Care Center	—	—	—	—	—	—	—	—	—	—	0.58	0.00	0.58	0.06	0.00	2.03
City Park	—	—	—	—	—	—	—	—	—	—	0.02	0.00	0.02	< 0.005	0.00	0.06
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	515	0.00	515	51.5	0.00	1,803

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13
Day-Care Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13
Day-Care Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Place of Worship	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02
Day-Care Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 0.005
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	6/15/2025	7/4/2025	5.00	15.0	—
Grading	Grading	7/5/2025	12/19/2025	5.00	120	—
Building Construction	Building Construction	12/20/2025	10/26/2026	5.00	221	—
Paving	Paving	10/27/2026	12/15/2026	5.00	36.0	—
Architectural Coating	Architectural Coating	8/15/2026	12/15/2026	5.00	87.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Tier 2	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 2	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Tier 2	1.00	8.00	36.0	0.38
Grading	Graders	Diesel	Tier 2	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Tier 2	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Tier 2	3.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Tier 2	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Tier 2	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Tier 2	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 2	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Tier 2	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Tier 2	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Tier 2	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Tier 2	2.00	8.00	36.0	0.38
Paving	Cement and Mortar Mixers	Diesel	Tier 2	2.00	6.00	10.0	0.56
Paving	Tractors/Loaders/Backhoes	Diesel	Tier 2	1.00	8.00	84.0	0.37
Architectural Coating	Air Compressors	Diesel	Tier 2	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	10.4	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	15.7	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	6.13	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	22.5	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	3.14	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	56,061	18,687	5,010

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	0.00	0.00	48.0	0.00	—
Grading	9,955	0.00	20.0	0.00	—
Paving	0.00	0.00	0.00	0.00	1.92

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Place of Worship	0.00	0%
Day-Care Center	0.00	0%

City Park	0.00	0%
Parking Lot	1.92	100%
City Park	0.00	0%
City Park	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	532	0.03	< 0.005
2026	0.00	532	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Place of Worship	94.2	94.2	94.2	34,393	1,582	1,582	1,582	577,506
Day-Care Center	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	56,061	18,687	5,010

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Place of Worship	309,789	532	0.0330	0.0040	1,390,474
Day-Care Center	32,540	532	0.0330	0.0040	119,702
City Park	0.00	532	0.0330	0.0040	0.00
Parking Lot	73,150	532	0.0330	0.0040	0.00
City Park	0.00	532	0.0330	0.0040	0.00
City Park	0.00	532	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Place of Worship	1,012,939	0.00
Day-Care Center	214,448	0.00
City Park	0.00	0.00

Parking Lot	0.00	0.00
City Park	0.00	0.00
City Park	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Place of Worship	5,769	—
Day-Care Center	6.50	—
City Park	0.02	—
Parking Lot	0.00	—
City Park	0.15	—
City Park	0.03	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Place of Worship	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Place of Worship	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Place of Worship	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
Place of Worship	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0

Day-Care Center	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Day-Care Center	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Day-Care Center	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
Day-Care Center	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

8. User Changes to Default Data

Screen	Justification

Construction: Construction Phases	No demolition is expected for the expansion project. The project has three phases, all three phases have been conservatively modeled to coincide over an 18 month construction period ending 12/15/2026. To accommodate for the three phases, 5 days of site preparation has been allocated for each phase resulting in a total of 15 days. Additionally, 120 day has been assumed for grading per the client. Moreover, architectural coating and paving coincides with building construction, as such, work days per phase have been adjusted accordingly.
Construction: Off-Road Equipment	Tier 2 Default
Land Use	Adjusted Place of Worship to 0.503 so that the sum total of all land uses is equivalent to the total construction area of 4.85 acres.
Construction: Dust From Material Movement	Soil import/export is expected to occur during the grading phase.
Operations: Vehicle Data	94 daily trips 641 seats Trip rate = ADT / # seats = 94 ADT / 641 seats = 0.14

APPENDIX B

ENERGY CALCULATIONS

Construction Off-Road Equipment										
Phase	**Off-Road Equipment Type**	**Amount**	**Usage Hour/Day**	**Total Usage Days**	**Total Usage Hours/Equipment**	**Horsepower**	**Load Factor**	**Total Usage Hours/ Equipment**	**Horsepower-Hour**	**Fuel Usage (gallons)**
Site Preparation	Rubber Tired Dozers	3	8	15	360	367	0.4	360	52,848.00	2,705.82
	Tractors/Loaders/Backhoes	4	8	15	480	84	0.37	480	14,918.40	763.82
Grading	Excavators	1	8	120	960	36	0.38	960	13,132.80	672.40
	Graders	1	8	120	960	148	0.41	960	58,252.80	2,982.54
	Rubber Tired Dozers	1	8	120	960	367	0.4	960	140,928.00	7,215.51
	Tractors/Loaders/Backhoes	3	8	120	2,880	84	0.37	2880	89,510.40	4,582.93
Building Construction	Cranes	1	7	221	1,547	367	0.29	1547	164,647.21	8,429.94
	Forklifts	3	8	221	5,304	82	0.2	5304	86,985.60	4,453.66
	Generator Sets	1	8	221	1,768	14	0.74	1768	18,316.48	937.80
	Tractors/Loaders/Backhoes	3	7	221	4,641	84	0.37	4641	144,242.28	7,385.20
	Welders	1	8	221	1,768	46	0.45	1768	36,597.60	1,873.80
Paving	Pavers	2	8	36	576	81	0.42	576	19,595.52	1,003.29
	Paving Equipment	2	8	36	576	89	0.36	576	18,455.04	944.90
	Rollers	2	8	36	576	36	0.38	576	7,879.68	403.44
	Cement and Mortar Mixers	2	6	36	432	10	0.56	432	2,419.20	123.86
	Tractors/Loaders/Backhoes	1	8	36	288	84	0.37	288	8,951.04	458.29
Architectural Coating	Air Compressors	1	6	87	522	37	0.48	522	9,270.72	474.66
									Total	**45,411.88**

Construction Truck and Construction Worker Vehicle Fuel Efficiency				
		EMFAC 2021 Outputs		
Vehicle Type	Vehicle Class	Fuel Consumption (1,000 gallons/day)	VMT (miles/ day)	Fuel Efficency (miles/gallon)
Construction Truck	MHDT	78.2	704,552.18	9.0
	HHDT	672.1	4,202,412.58	6.3
	HHDT/MHDT	-	-	7.6
Construction Worker Vehicle	LDA	864.1	25,913,929.34	30.0
	LDT1	83.1	2,050,905.80	24.7
	LDT2	496.6	12,228,523.63	24.6
	Worker Mix	-	-	27.3

Notes:

[1] For construction trucks assumes 50 percent HHDT and 50 percent MHDT vehicles, consistent with assumptions in CalEEMod for hauling trucks. For construction worker vehicles assumes 50 percent LDA, 25 percent LDT1, and 25 percent LDT2 vehicles, consistent with assumptions in CalEEMod for worker vehicles.

[2] EMFAC2021 was run for Riverside County for the construction year 2025. Data was aggregated over all vehicle model years and speed bins.

[3] The fuel efficiency was calculated by dividing the VMT (miles/day) by the fuel consumption (gallons/day).

Construction Vehicle Fuel Use - Diesel Vehicles						
Phase	Trip Type	Total Trips	Trip Length (miles)	Total VMT	Diesel Fuel Effiency (miles/gallon)	Fuel Usage (gallons/year)
Grading	Hauling	2,490.00	20	49,800.00	6.3	7,904.76
Building Construction	Vendor	2,707.69	10.2	27,618.46	7.6	3,634.01
					Total	**11,538.77**

Diesel

[1] Assumes 100 percent HHDT vehicles for haul trucks and 50 percent HHDT/50 percent MHDT vehicles for MHDT, consistent with assumptions in CalEEMod.

[2] EMFAC2021 was run for Riverside County for the construction year 2025. Data was aggregated over all vehicle model years and speed bins.

[3] The fuel efficiency was calculated by dividing the VMT (miles/day) by the fuel consumption (gallons/day).

Construction Worker Vehicle Fuel Use - Gasoline Vehicles							
Phase	Total One-Way Trips/Day	Total Days	Total Trips	Trip Length (miles)	Total VMT	Gasoline Fuel Effiency (miles/gallon)	Fuel Usage (gallons/year)
Site Preparation	17.5	15	525.00	18.5	9,712.50	27.3	355.77
Grading	15	120	3,600.00	18.5	66,600.00	27.3	2,439.56
Building Construction	15.68	221	6,930.56	18.5	128,215.36	27.3	4,696.53
Paving	22.5	36	1,620.00	18.5	29,970.00	27.3	1,097.80
Architectural Coating	3.14	87	546.36	18.5	10,107.66	27.3	370.24
						Total	**8,959.91**

Gas

Total Construction Gasoline Usage	**8,959.91**	This is the total estimates for construction and what will need to be inputed in the reports
Total Construction Diesel Usage	**56,950.65**	Already accounts for diesel use from construction equipment

Proposed Project Operational Trips			
Vehicle Class	CalEEMod	Total Project Trips	Total Trips per Vehicle Class
LDA	0.4962	94	46.6
LDT1	0.03798	94	3.6
LDT2	0.2049	94	19.3
MDV	0.1583	94	14.9
LHD1	0.03144	94	3.0
LHD2	0.008964	94	0.8
MHD	0.01466	94	1.4
HHD	0.01613	94	1.5
OBUS	0.000602	94	0.1
UBUS	0.0003867	94	0.0
MCY	0.02312	94	2.2
SBUS	0.001338	94	0.1
MH	0.00602	94	0.6

Proposed Project Operational Trips – Fuel Efficiency					
Fuel	Vehicle Class	EMFAC2021 Outputs1			
		Fleet Mix (%)2	Consumption (1,000 gallons/day)	VMT (miles/day)	Fuel Efficiency3 (miles/gallon)
Gas	LDA	52%	843.2	25,836,352.57	15.8
	LDT1	4%	80.1	2,017,862.22	1.0
	LDT2	25%	495.7	12,519,105.47	6.3
	MDV	17%	428.0	8,675,375.11	3.5
	LHD1	2%	62.0	887,366.42	0.3
	MCY	0%	4.3	181,404.52	0.2
	MH	0%	9.4	45,625.96	0.0
	Fleet Mix	–	–	–	27.0
Diesel	LHD2	6%	18.3	318,411.11	1.0
	MHDT	13%	78.6	711,810.70	1.2
	HHDT	81%	675.1	4,288,158.00	5.1
	Fleet Mix	–	–	–	7.4

Notes:

[1] EMFAC2021 was run for Riverside County for the operational year 2026. Data was aggregated over all vehicle model years and speed bins.

[2] Fleet mix is based on assumptions made in CalEEMod for the proposed project.

[3] The fuel efficiency was calculated by dividing the VMT (miles/day) by the fuel consumption (gallons/day).

Proposed Project Operational Trips – Fuel Usage						
Land Use	Total Annual VMT2 (miles/year)	Fuel Type	Portion of Fleet3 (%)	VMT by Fuel Type (miles/year)	Fleet Mix Efficiency4 (miles/gallon)	Fuel Usage (gallons/ year)
Proposed Project	577,506.00	Gas	96%	554,223.67	27.0	20,517.11
		Diesel	4%	22,958.17	7.4	3,113.27
					Total Gasoline/year	**20,517.11**
					Total Diesel/year	**3,113.27**

Notes:

[1] Calculated for operational year 2026 only. Future years will likely use less fuel due to more efficient cars.

[2] Total VMT is based on project's trip generation and trip lengths.

[3] Fleet distribution is based on EMFAC2021 output and CalEEMod assumptions.

[4] Fuel efficiency is based on fuel consumption and VMT data from EMFAC2021 for Riverside County and total VMT.

Proposed Project Electricity Usage	
Electricity by Land Use	**kWh/year**
Prposed Project	105,999.89
Parking Lot	0
Total	**106,000**

Proposed Project Natural Gas Usage			
Natural Gas by Land Use	**kBTU/year**	**BTU/year**	**therms/year**
Proposed Project Natural Gas Usag	1,510,176	1,510,176,000	15,105
Parking Lot	0	0	0
Total	**1,510,176**	**1,510,176,000**	**15,105**

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: County
Region: Riverside
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consum

Region	Calendar Y	Vehicle Ca	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Cor	NOx_RUNE
Riverside	2025	LDA	Aggregate	Aggregate	Gasoline	628741.8	25913929	25913929	0	2926821	0	1.009585
Riverside	2025	LDT1	Aggregate	Aggregate	Gasoline	55586.9	2050906	2050906	0	241530.2	0	0.390063
Riverside	2025	LDT2	Aggregate	Aggregate	Gasoline	284782.4	12228524	12228524	0	1337655	0	0.839337
Riverside	2025	LHD1	Aggregate	Aggregate	Gasoline	23953.96	890989.2	890989.2	0	356878.2	0	0.142421
Riverside	2025	LHD2	Aggregate	Aggregate	Gasoline	3679.24	129727.5	129727.5	0	54815.2	0	0.018837
Riverside	2025	MCY	Aggregate	Aggregate	Gasoline	31129.95	182166.5	182166.5	0	62259.9	0	0.114102
Riverside	2025	MDV	Aggregate	Aggregate	Gasoline	215897.5	8689270	8689270	0	989570.8	0	0.960415
Riverside	2025	MH	Aggregate	Aggregate	Gasoline	5588.102	48512.85	48512.85	0	559.0337	0	0.016887
Riverside	2025	OBUS	Aggregate	Aggregate	Gasoline	514.8271	22309.97	22309.97	0	10300.66	0	0.009402
Riverside	2025	SBUS	Aggregate	Aggregate	Gasoline	530.154	24322.97	24322.97	0	2120.616	0	0.010154
Riverside	2025	T6TS	Aggregate	Aggregate	Gasoline	1937.413	102040.7	102040.7	0	38763.76	0	0.045007
Riverside	2025	T7IS	Aggregate	Aggregate	Gasoline	8.568357	648.6425	648.6425	0	171.4357	0	0.003761
Riverside	2025	UBUS	Aggregate	Aggregate	Gasoline	146.496	18545.86	18545.86	0	585.9839	0	0.004535

ıption

NOx_IDLEX	NOx_STRE	NOx_TOTE	PM2.5_RUI	PM2.5_IDL	PM2.5_STR	PM2.5_TOT	PM2.5_PM	PM2.5_PMI	PM2.5_TOT	PM10_RUN	PM10_IDLE	PM10_STRI
0	0.737424	1.747009	0.032467	0	0.006002	0.038469	0.05713	0.0663	0.161899	0.035311	0	0.006528
0	0.113885	0.503948	0.004333	0	0.000784	0.005117	0.004521	0.006311	0.015949	0.004712	0	0.000852
0	0.43328	1.272617	0.015587	0	0.002759	0.018346	0.026959	0.035814	0.081119	0.016952	0	0.003001
0.000951	0.246597	0.389969	0.001035	0	0.000108	0.001142	0.001964	0.026813	0.029919	0.001125	0	0.000117
0.000147	0.038778	0.057762	0.000131	0	1.26E-05	0.000144	0.000286	0.004555	0.004984	0.000143	0	1.37E-05
0	0.008889	0.122991	0.000349	0	0.000208	0.000556	0.000201	0.000843	0.001601	0.000373	0	0.000221
0	0.445986	1.406401	0.011446	0	0.00215	0.013596	0.019157	0.026482	0.059235	0.012448	0	0.002339
0	0.000265	0.017152	5.31E-05	0	2.03E-07	5.33E-05	0.00016	0.000788	0.001002	5.77E-05	0	2.21E-07
3.64E-05	0.004614	0.014052	1.58E-05	0	2.69E-06	1.85E-05	7.38E-05	0.000362	0.000454	1.72E-05	0	2.92E-06
0.000537	0.001697	0.012388	2.38E-05	0	1.00E-06	2.48E-05	5.36E-05	0.00044	0.000518	2.59E-05	0	1.09E-06
0.000187	0.018058	0.063252	0.000101	0	1.96E-05	0.00012	0.000337	0.001655	0.002113	0.000109	0	2.13E-05
0	7.47E-05	0.003836	6.85E-07	0	1.71E-07	8.56E-07	3.58E-06	2.00E-05	2.45E-05	7.46E-07	0	1.86E-07
0	0.000531	0.005066	2.51E-05	0	2.93E-07	2.54E-05	5.30E-05	0.000732	0.00081	2.73E-05	0	3.18E-07

PM10_TOTI	PM10_PMT	PM10_PME	PM10_TOTA	CO2_RUNE	CO2_IDLE)	CO2_STRE	CO2_TOTE	CH4_RUNE	CH4_IDLE)	CH4_STRE	CH4_TOTE	N2O_RUNE
0.041838	0.228522	0.189428	0.459788	7976.363	0	218.3329	8194.696	0.060257	0	0.201514	0.261771	0.122114
0.005565	0.018086	0.01803	0.041681	764.7256	0	23.17087	787.8964	0.019416	0	0.030761	0.050177	0.02751
0.019953	0.107837	0.102326	0.230115	4586.372	0	123.4337	4709.806	0.037415	0	0.107905	0.14532	0.076161
0.001242	0.007857	0.076607	0.085707	592.4863	3.136385	10.02371	605.6464	0.003939	0.003022	0.012683	0.019644	0.008348
0.000156	0.001144	0.013013	0.014313	98.49588	0.559934	1.525845	100.5817	0.000371	0.000467	0.001915	0.002754	0.001224
0.000594	0.000803	0.00241	0.003807	37.92213	0	3.248657	41.17078	0.033152	0	0.011668	0.04482	0.007909
0.014787	0.076626	0.075664	0.167077	4049.639	0	114.7681	4164.407	0.038684	0	0.105156	0.14384	0.074852
5.79E-05	0.000642	0.002253	0.002952	94.47392	0	0.019053	94.49297	0.000486	0	2.26E-05	0.000509	0.001137
2.01E-05	0.000295	0.001034	0.00135	40.41805	0.215123	0.352105	40.98528	0.000219	0.000112	0.00039	0.000721	0.000486
2.70E-05	0.000214	0.001256	0.001497	24.23002	1.536647	0.130593	25.89726	0.000251	0.001426	0.000159	0.001835	0.000616
0.000131	0.00135	0.004729	0.006209	181.3807	1.147147	1.936078	184.4639	0.001133	0.000557	0.00195	0.00364	0.002305
9.31E-07	1.43E-05	5.72E-05	7.24E-05	1.602842	0	0.010466	1.613308	8.48E-05	0	1.28E-08	8.48E-05	0.000125
2.76E-05	0.000212	0.00209	0.00233	31.13789	0	0.048282	31.18617	7.77E-05	0	6.86E-05	0.000146	0.000408

N2O_IDLE	N2O_STRE	N2O_TOTE	ROG_RUNI	ROG_IDLE	ROG_STRE	ROG_TOTE	ROG_DIUR	ROG_HOTS	ROG_RUNI	ROG_TOTA	TOG_RUNE	TOG_IDLE
0	0.101426	0.22354	0.219034	0	0.881435	1.100469	1.069059	0.277056	0.694122	3.140706	0.319614	0
0	0.010872	0.038381	0.085624	0	0.159095	0.244719	0.242899	0.056545	0.165445	0.709608	0.124943	0
0	0.051866	0.128027	0.14201	0	0.480788	0.622798	0.48381	0.117226	0.317118	1.540951	0.207221	0
7.92E-05	0.01988	0.028307	0.019072	0.010897	0.061488	0.091456	0.083648	0.018662	0.104144	0.29791	0.027829	0.015901
1.20E-05	0.00304	0.004276	0.001654	0.001688	0.009217	0.01256	0.012447	0.00271	0.014628	0.042345	0.002414	0.002464
0	0.000529	0.008438	0.216127	0	0.085673	0.3018	0.179172	0.247603	0.263895	0.992469	0.259976	0
0	0.044167	0.119018	0.157709	0	0.510609	0.668318	0.505213	0.116335	0.343384	1.63325	0.230085	0
0	2.96E-05	0.001166	0.001994	0	8.84E-05	0.002082	0.029959	0.006819	0.000156	0.039017	0.002909	0
2.98E-06	0.000351	0.00084	0.001032	0.000424	0.002034	0.00349	0.001963	0.0004	0.001841	0.007695	0.001506	0.000618
4.89E-05	0.000153	0.000818	0.001233	0.006217	0.000908	0.008357	0.001459	0.000315	0.00079	0.010921	0.001799	0.009072
1.56E-05	0.001382	0.003703	0.005433	0.002147	0.010541	0.018122	0.007251	0.001434	0.01153	0.038336	0.007928	0.003133
0	2.06E-06	0.000127	0.000433	0	6.62E-08	0.000434	6.24E-05	1.45E-05	0.000121	0.000632	0.000632	0
0	5.20E-05	0.00046	0.000242	0	0.000273	0.000515	0.000167	4.89E-05	8.63E-05	0.000818	0.000354	0

TOG_STRE	TOG_TOTE	TOG_DIURI	TOG_HOTS	TOG_RUNL	TOG_TOTA	CO_RUNE	CO_IDLEX	CO_STREX	CO_TOTEX	SOx_RUNE	SOx_IDLEX	SOx_STREX
0.96506	1.284674	1.069059	0.277056	0.694122	3.324911	20.5951	0	8.759986	29.35508	0.078854	0	0.002158
0.174189	0.299132	0.242899	0.056545	0.165445	0.764021	4.283269	0	1.492909	5.776177	0.00756	0	0.000229
0.526402	0.733623	0.48381	0.117226	0.317118	1.651776	11.46966	0	4.632881	16.10254	0.045341	0	0.00122
0.067321	0.111051	0.083648	0.018662	0.104144	0.317505	0.944159	0.099308	1.164145	2.207611	0.005857	3.10E-05	9.91E-05
0.010092	0.01497	0.012447	0.00271	0.014628	0.044755	0.10353	0.01529	0.172271	0.291091	0.000974	5.54E-06	1.51E-05
0.093152	0.353128	0.179172	0.247603	0.263895	1.043797	2.594297	0	0.522947	3.117245	0.000375	0	3.21E-05
0.559052	0.789137	0.505213	0.116335	0.343384	1.754069	10.11017	0	3.94587	14.05604	0.040035	0	0.001135
9.67E-05	0.003006	0.029959	0.006819	0.000156	0.03994	0.056902	0	0.001892	0.058793	0.000934	0	1.88E-07
0.002227	0.004352	0.001963	0.0004	0.001841	0.008556	0.025756	0.003278	0.041561	0.070595	0.0004	2.13E-06	3.48E-06
0.000994	0.011864	0.001459	0.000315	0.00079	0.014428	0.02504	0.048049	0.020086	0.093175	0.00024	1.52E-05	1.29E-06
0.011541	0.022602	0.007251	0.001434	0.01153	0.042817	0.13247	0.030725	0.223853	0.387048	0.001793	1.13E-05	1.91E-05
7.25E-08	0.000633	6.24E-05	1.45E-05	0.000121	0.000831	0.021777	0	0.000832	0.022609	1.58E-05	0	1.03E-07
0.000299	0.000652	0.000167	4.89E-05	8.63E-05	0.000955	0.009469	0	0.004746	0.014215	0.000308	0	4.77E-07

SOx_TOTE›	NH3_RUNE	Fuel Consumption
0.081013	1.015789	864.1205
0.007789	0.086879	83.0827
0.046561	0.504405	496.6431
0.005987	0.044144	63.86466
0.000994	0.006433	10.60621
0.000407	0.001771	4.341408
0.041169	0.345287	439.1315
0.000934	0.002402	9.964166
0.000405	0.001106	4.321846
0.000256	0.001207	2.730833
0.001824	0.005061	19.45149
1.59E-05	3.20E-05	0.170121
0.000308	0.00092	3.288543
		2001.717
		2.001717
		730.6267

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: County
Region: Riverside
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consun

Region	Calendar Y	Vehicle Ca	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Cor	NOx_RUNE
Riverside	2025	All Other B	Aggregate	Aggregate	Diesel	227.3862	12094.05	12094.05	0	2023.738	0	0.024782
Riverside	2025	LDA	Aggregate	Aggregate	Diesel	1836.098	62062.6	62062.6	0	7926.656	0	0.011276
Riverside	2025	LDT1	Aggregate	Aggregate	Diesel	24.9814	466.678	466.678	0	70.49584	0	0.000809
Riverside	2025	LDT2	Aggregate	Aggregate	Diesel	950.1628	42713.04	42713.04	0	4570.676	0	0.002045
Riverside	2025	LHD1	Aggregate	Aggregate	Diesel	19293.11	711434.3	711434.3	0	242683	0	1.331633
Riverside	2025	LHD2	Aggregate	Aggregate	Diesel	8709.677	321982.2	321982.2	0	109556.8	0	0.473829
Riverside	2025	MDV	Aggregate	Aggregate	Diesel	3125.1	127495.2	127495.2	0	14457.82	0	0.0178
Riverside	2025	MH	Aggregate	Aggregate	Diesel	2642.984	22620.2	22620.2	0	264.2984	0	0.098939
Riverside	2025	Motor Coa	Aggregate	Aggregate	Diesel	58.42408	7811.014	7811.014	0	1342.585	0	0.012844
Riverside	2025	PTO	Aggregate	Aggregate	Diesel	0	52134.72	52134.72	0	0	0	0.166893
Riverside	2025	SBUS	Aggregate	Aggregate	Diesel	646.5716	13349.28	13349.28	0	9362.357	0	0.111313
Riverside	2025	T6 CAIRP C	Aggregate	Aggregate	Diesel	15.01526	1006.423	1006.423	0	345.0507	0	0.000416
Riverside	2025	T6 CAIRP C	Aggregate	Aggregate	Diesel	19.86534	1382.93	1382.93	0	456.5055	0	0.000536
Riverside	2025	T6 CAIRP C	Aggregate	Aggregate	Diesel	67.4163	3589.255	3589.255	0	1549.226	0	0.001222
Riverside	2025	T6 CAIRP C	Aggregate	Aggregate	Diesel	111.1495	22736.03	22736.03	0	2554.216	0	0.008923
Riverside	2025	T6 Instate [	Aggregate	Aggregate	Diesel	539.7232	18233.15	18233.15	0	7701.851	0	0.020898
Riverside	2025	T6 Instate [	Aggregate	Aggregate	Diesel	511.1506	17417.74	17417.74	0	7294.118	0	0.010512
Riverside	2025	T6 Instate [	Aggregate	Aggregate	Diesel	1474.543	49945.41	49945.41	0	21041.72	0	0.046987
Riverside	2025	T6 Instate [	Aggregate	Aggregate	Diesel	228.3295	12343.86	12343.86	0	3258.261	0	0.011631
Riverside	2025	T6 Instate (	Aggregate	Aggregate	Diesel	1973.56	82586.34	82586.34	0	22814.35	0	0.078241
Riverside	2025	T6 Instate (	Aggregate	Aggregate	Diesel	4394.632	191018.9	191018.9	0	50801.95	0	0.092657
Riverside	2025	T6 Instate (	Aggregate	Aggregate	Diesel	3237.199	138081.8	138081.8	0	37422.02	0	0.108858
Riverside	2025	T6 Instate (	Aggregate	Aggregate	Diesel	1559.295	70789.06	70789.06	0	18025.45	0	0.058621
Riverside	2025	T6 Instate]	Aggregate	Aggregate	Diesel	23.47452	1163.764	1163.764	0	271.3654	0	0.001152

Riverside	2025	T6 Instate T	Aggregate	Aggregate	Diesel	483.7364	28288.92	28288.92	0	5591.993	0	0.02518
Riverside	2025	T6 OOS Cla	Aggregate	Aggregate	Diesel	8.978386	597.4727	597.4727	0	206.3233	0	0.000294
Riverside	2025	T6 OOS Cla	Aggregate	Aggregate	Diesel	11.81948	819.6252	819.6252	0	271.6117	0	0.000336
Riverside	2025	T6 OOS Cla	Aggregate	Aggregate	Diesel	40.41223	2141.704	2141.704	0	928.673	0	0.000847
Riverside	2025	T6 OOS Cla	Aggregate	Aggregate	Diesel	61.10793	15572.85	15572.85	0	1404.26	0	0.006403
Riverside	2025	T6 Public C	Aggregate	Aggregate	Diesel	110.6336	3824.106	3824.106	0	567.5503	0	0.017912
Riverside	2025	T6 Public C	Aggregate	Aggregate	Diesel	161.8819	5886.963	5886.963	0	830.454	0	0.013826
Riverside	2025	T6 Public C	Aggregate	Aggregate	Diesel	233.3717	8159.323	8159.323	0	1197.197	0	0.040103
Riverside	2025	T6 Public C	Aggregate	Aggregate	Diesel	364.8074	16424.11	16424.11	0	1871.462	0	0.07846
Riverside	2025	T6 Utility C	Aggregate	Aggregate	Diesel	213.5556	8654.97	8654.97	0	2733.512	0	0.00341
Riverside	2025	T6 Utility C	Aggregate	Aggregate	Diesel	40.35145	1628.968	1628.968	0	516.4986	0	0.000652
Riverside	2025	T6 Utility C	Aggregate	Aggregate	Diesel	45.49224	2258.515	2258.515	0	582.3007	0	0.000754
Riverside	2025	T7 CAIRP C	Aggregate	Aggregate	Diesel	5605.981	1162096	1162096	0	128825.4	0	1.820935
Riverside	2025	T7 NNOOS	Aggregate	Aggregate	Diesel	5070.902	1396762	1396762	0	116529.3	0	2.143957
Riverside	2025	T7 NOOS C	Aggregate	Aggregate	Diesel	2142.575	507332	507332	0	49236.37	0	0.816229
Riverside	2025	T7 POLA Cl	Aggregate	Aggregate	Diesel	2960.29	373426.2	373426.2	0	48430.35	0	0.638777
Riverside	2025	T7 Public C	Aggregate	Aggregate	Diesel	728.1524	29432.77	29432.77	0	3735.422	0	0.291014
Riverside	2025	T7 Single C	Aggregate	Aggregate	Diesel	1281.245	88480.12	88480.12	0	12069.32	0	0.083785
Riverside	2025	T7 Single D	Aggregate	Aggregate	Diesel	1235.543	71733.83	71733.83	0	11638.82	0	0.110383
Riverside	2025	T7 Single O	Aggregate	Aggregate	Diesel	1453.084	83566.16	83566.16	0	13688.05	0	0.11522
Riverside	2025	T7 SWCV C	Aggregate	Aggregate	Diesel	63.54118	4122.603	4122.603	0	292.2894	0	0.061406
Riverside	2025	T7 Tractor (	Aggregate	Aggregate	Diesel	6272.664	478518.1	478518.1	0	91141.81	0	0.788398
Riverside	2025	T7 Utility C	Aggregate	Aggregate	Diesel	155.9332	6942.474	6942.474	0	1995.945	0	0.007544
Riverside	2025	UBUS	Aggregate	Aggregate	Diesel	0.311734	30.10971	30.10971	0	1.246935	0	5.35E-06

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NOx_IDLEX	NOx_STREX	NOx_TOTEX	PM2.5_RUI	PM2.5_IDL	PM2.5_STR	PM2.5_TOT	PM2.5_PM	PM2.5_PMI	PM2.5_TOT	PM10_RUN	PM10_IDLE	PM10_STRI
0.001017	0.002821	0.028619	0.000663	4.99E-06	0	0.000668	4.00E-05	0.000196	0.000905	0.000693	5.22E-06	0
0	0	0.011276	0.000959	0	0	0.000959	0.000137	0.000162	0.001259	0.001003	0	0
0	0	0.000809	0.000118	0	0	0.000118	1.03E-06	1.58E-06	0.00012	0.000123	0	0
0	0	0.002045	0.000218	0	0	0.000218	9.42E-05	0.000123	0.000435	0.000228	0	0
0.043464	0	1.375097	0.019688	0.000556	0	0.020244	0.002353	0.021409	0.044006	0.020579	0.000581	0
0.019401	0	0.49323	0.008339	0.000252	0	0.00859	0.001065	0.011304	0.02096	0.008716	0.000263	0
0	0	0.0178	0.001051	0	0	0.001051	0.000281	0.000393	0.001726	0.001099	0	0
0	0	0.098939	0.003268	0	0	0.003268	9.97E-05	0.000367	0.003735	0.003416	0	0
0.002911	0.003061	0.018816	0.000206	1.05E-06	0	0.000207	2.58E-05	0.000231	0.000465	0.000216	1.09E-06	0
0	0	0.166893	0.000253	0	0	0.000253	0	0	0.000253	0.000264	0	0
0.023033	0.002246	0.136593	0.000621	2.34E-05	0	0.000644	4.41E-05	0.000241	0.00093	0.000649	2.45E-05	0
4.69E-05	0.000223	0.000685	7.87E-06	3.41E-08	0	7.91E-06	3.33E-06	1.63E-05	2.75E-05	8.23E-06	3.57E-08	0
6.13E-05	0.000298	0.000895	9.11E-06	1.88E-08	0	9.13E-06	4.57E-06	2.24E-05	3.61E-05	9.52E-06	1.97E-08	0
0.000206	0.001004	0.002432	2.41E-05	1.07E-07	0	2.42E-05	1.19E-05	5.81E-05	9.42E-05	2.52E-05	1.12E-07	0
0.000335	0.001639	0.010897	0.000149	8.35E-08	0	0.000149	7.52E-05	0.000368	0.000592	0.000155	8.73E-08	0
0.006702	0.012644	0.040244	0.000357	1.75E-05	0	0.000374	6.03E-05	0.000297	0.000731	0.000373	1.82E-05	0
0.005623	0.012476	0.028611	0.000189	6.75E-06	0	0.000196	5.76E-05	0.000284	0.000537	0.000198	7.05E-06	0
0.017151	0.035535	0.099673	0.000785	3.52E-05	0	0.00082	0.000165	0.000813	0.001798	0.00082	3.68E-05	0
0.002466	0.005655	0.019752	0.00012	1.63E-06	0	0.000121	4.08E-05	0.000201	0.000363	0.000125	1.70E-06	0
0.025975	0.043188	0.147404	0.001341	7.59E-05	0	0.001417	0.000273	0.001344	0.003034	0.001402	7.93E-05	0
0.050756	0.101856	0.245269	0.001348	3.20E-05	0	0.00138	0.000632	0.00311	0.005121	0.001409	3.34E-05	0
0.04069	0.072633	0.222181	0.0018	9.25E-05	0	0.001893	0.000457	0.002247	0.004597	0.001882	9.66E-05	0
0.018542	0.036453	0.113615	0.000656	2.57E-05	0	0.000682	0.000234	0.001152	0.002068	0.000686	2.68E-05	0
0.000313	0.000512	0.001978	1.91E-05	9.85E-07	0	2.01E-05	3.85E-06	1.89E-05	4.28E-05	2.00E-05	1.03E-06	0

0.005749	0.011227	0.042156	0.000261	5.02E-06	0	0.000266	9.35E-05	0.000461	0.000821	0.000273	5.25E-06	0
2.96E-05	0.000134	0.000458	5.72E-06	3.31E-08	0	5.75E-06	1.98E-06	9.67E-06	1.74E-05	5.98E-06	3.46E-08	0
3.78E-05	0.000179	0.000553	5.69E-06	1.34E-08	0	5.70E-06	2.71E-06	1.33E-05	2.17E-05	5.94E-06	1.40E-08	0
0.000132	0.000611	0.001589	1.68E-05	9.55E-08	0	1.69E-05	7.08E-06	3.46E-05	5.86E-05	1.76E-05	9.99E-08	0
0.000193	0.000915	0.007511	0.000104	4.59E-08	0	0.000104	5.15E-05	0.000252	0.000407	0.000108	4.80E-08	0
0.004706	0.000583	0.023201	8.76E-05	6.17E-06	0	9.38E-05	1.26E-05	6.20E-05	0.000168	9.16E-05	6.45E-06	0
0.005456	0.001156	0.020438	8.37E-05	4.14E-06	0	8.78E-05	1.95E-05	9.55E-05	0.000203	8.75E-05	4.33E-06	0
0.008978	0.001285	0.050366	0.000241	2.30E-05	0	0.000264	2.70E-05	0.000132	0.000424	0.000252	2.40E-05	0
0.013294	0.002044	0.093798	0.000491	3.52E-05	0	0.000526	5.43E-05	0.000267	0.000847	0.000513	3.68E-05	0
0.001764	0.00419	0.009364	4.68E-05	4.41E-07	0	4.73E-05	2.86E-05	0.00014	0.000216	4.90E-05	4.61E-07	0
0.000331	0.000798	0.001782	8.54E-06	8.34E-08	0	8.63E-06	5.39E-06	2.64E-05	4.05E-05	8.93E-06	8.71E-08	0
0.000373	0.000873	0.002	1.09E-05	9.40E-08	0	1.10E-05	7.47E-06	3.67E-05	5.51E-05	1.13E-05	9.82E-08	0
0.711417	0.315434	2.847786	0.041759	0.000263	0	0.042021	0.011529	0.032031	0.085581	0.043647	0.000274	0
0.856138	0.297805	3.2979	0.048106	0.000295	0	0.048401	0.013857	0.038493	0.100751	0.050281	0.000308	0
0.361839	0.124304	1.302372	0.018682	0.000125	0	0.018807	0.005033	0.013986	0.037826	0.019527	0.00013	0
0.130592	0.12335	0.89272	0.011783	4.54E-05	0	0.011828	0.003705	0.010593	0.026126	0.012316	4.75E-05	0
0.031568	0.009305	0.331888	0.001834	8.41E-05	0	0.001918	0.000292	0.001007	0.003217	0.001917	8.79E-05	0
0.029587	0.045924	0.159296	0.001599	1.12E-05	0	0.00161	0.000878	0.002548	0.005036	0.001671	1.17E-05	0
0.02968	0.039149	0.179212	0.001574	1.90E-05	0	0.001593	0.000712	0.002061	0.004365	0.001645	1.99E-05	0
0.035014	0.047462	0.197697	0.001779	2.43E-05	0	0.001804	0.000829	0.002387	0.00502	0.00186	2.54E-05	0
0.004002	0.000103	0.065511	7.47E-05	1.13E-05	0	8.60E-05	4.09E-05	0.000334	0.000461	7.80E-05	1.18E-05	0
0.276393	0.396447	1.461238	0.01383	0.000107	0	0.013937	0.004747	0.013426	0.032111	0.014456	0.000112	0
0.001269	0.010951	0.019764	0.000107	4.45E-07	0	0.000107	6.89E-05	0.000197	0.000373	0.000112	4.65E-07	0
0	0	5.35E-06	7.00E-08	0	0	7.00E-08	9.96E-08	1.28E-06	1.45E-06	7.31E-08	0	0

PM10_TOT	PM10_PMT	PM10_PME	PM10_TOT	CO2_RUNE	CO2_IDLE	CO2_STRE	CO2_TOTE	CH4_RUNE	CH4_IDLE	CH4_STRE	CH4_TOTE	N2O_RUNE
0.000698	0.00016	0.000561	0.001419	13.86657	0.157944	0	14.02451	5.18E-05	1.20E-06	0	5.30E-05	0.002185
0.001003	0.000547	0.000464	0.002014	16.17747	0	0	16.17747	7.42E-05	0	0	7.42E-05	0.002549
0.000123	4.12E-06	4.51E-06	0.000132	0.214038	0	0	0.214038	7.60E-06	0	0	7.60E-06	3.37E-05
0.000228	0.000377	0.00035	0.000954	14.30932	0	0	14.30932	2.64E-05	0	0	2.64E-05	0.002254
0.02116	0.009411	0.061169	0.09174	382.1557	2.822037	0	384.9778	0.003716	0.000108	0	0.003824	0.060209
0.008979	0.004259	0.032298	0.045536	206.7173	2.043651	0	208.7609	0.001524	4.89E-05	0	0.001573	0.032568
0.001099	0.001124	0.001124	0.003347	59.30134	0	0	59.30134	9.49E-05	0	0	9.49E-05	0.009343
0.003416	0.000399	0.001049	0.004864	24.42002	0	0	24.42002	8.14E-05	0	0	8.14E-05	0.003847
0.000217	0.000103	0.000661	0.000981	14.71608	0.660438	0	15.37652	5.25E-06	1.19E-05	0	1.72E-05	0.002319
0.000264	0	0	0.000264	116.4718	0	0	116.4718	5.37E-05	0	0	5.37E-05	0.01835
0.000673	0.000177	0.000689	0.001539	18.64579	1.68861	0	20.3344	0.000101	5.37E-06	0	0.000107	0.002938
8.27E-06	1.33E-05	4.65E-05	6.81E-05	1.215634	0.009683	0	1.225317	4.34E-07	4.10E-08	0	4.75E-07	0.000192
9.54E-06	1.83E-05	6.39E-05	9.18E-05	1.671707	0.012895	0	1.684602	4.42E-07	5.07E-08	0	4.93E-07	0.000263
2.53E-05	4.75E-05	0.000166	0.000239	4.263106	0.042394	0	4.3055	1.25E-06	1.77E-07	0	1.43E-06	0.000672
0.000155	0.000301	0.001051	0.001507	25.27708	0.070505	0	25.34759	6.69E-06	2.81E-07	0	6.97E-06	0.003982
0.000391	0.000241	0.000848	0.00148	21.65044	1.216913	0	22.86735	2.80E-05	6.50E-06	0	3.45E-05	0.003411
0.000205	0.00023	0.00081	0.001246	20.97881	1.141144	0	22.11995	1.22E-05	5.03E-06	0	1.72E-05	0.003305
0.000857	0.000661	0.002324	0.003841	58.87657	3.314298	0	62.19087	5.52E-05	1.64E-05	0	7.17E-05	0.009276
0.000127	0.000163	0.000574	0.000864	14.34829	0.529391	0	14.87768	6.52E-06	2.10E-06	0	8.62E-06	0.002261
0.001481	0.001092	0.003839	0.006413	99.35041	4.817365	0	104.1678	9.65E-05	2.67E-05	0	0.000123	0.015653
0.001442	0.002527	0.008885	0.012854	231.6929	10.59081	0	242.2837	7.78E-05	4.26E-05	0	0.00012	0.036503
0.001978	0.001827	0.006421	0.010226	165.2586	7.848931	0	173.1076	0.000122	4.01E-05	0	0.000162	0.026037
0.000713	0.000936	0.003292	0.004941	82.91953	3.872911	0	86.79244	3.58E-05	1.73E-05	0	5.31E-05	0.013064
2.10E-05	1.54E-05	5.41E-05	9.04E-05	1.385108	0.057543	0	1.442651	1.30E-06	3.28E-07	0	1.63E-06	0.000218

0.000278	0.000374	0.001316	0.001969	31.24026	1.205321	0	32.44558	1.38E-05	4.93E-06	0	1.87E-05	0.004922
6.01E-06	7.90E-06	2.76E-05	4.15E-05	0.713471	0.005745	0	0.719216	3.47E-07	2.61E-08	0	3.73E-07	0.000112
5.96E-06	1.08E-05	3.79E-05	5.47E-05	0.980778	0.007615	0	0.988393	2.89E-07	3.04E-08	0	3.19E-07	0.000155
1.77E-05	2.83E-05	9.90E-05	0.000145	2.505729	0.025103	0	2.530832	9.48E-07	1.10E-07	0	1.06E-06	0.000395
0.000108	0.000206	0.00072	0.001034	17.18228	0.038539	0	17.22082	4.61E-06	1.55E-07	0	4.77E-06	0.002707
9.80E-05	5.06E-05	0.000177	0.000326	4.539138	0.409466	0	4.948604	5.58E-06	1.62E-06	0	7.20E-06	0.000715
9.18E-05	7.79E-05	0.000273	0.000443	7.073099	0.602215	0	7.675314	5.50E-06	2.21E-06	0	7.70E-06	0.001114
0.000276	0.000108	0.000378	0.000762	9.725776	0.828022	0	10.5538	1.51E-05	4.95E-06	0	2.00E-05	0.001532
0.000549	0.000217	0.000761	0.001528	19.51185	1.285153	0	20.797	3.08E-05	7.76E-06	0	3.86E-05	0.003074
4.94E-05	0.000114	0.000401	0.000565	10.04738	0.378514	0	10.4259	2.40E-06	1.49E-06	0	3.89E-06	0.001583
9.02E-06	2.15E-05	7.55E-05	0.000106	1.882833	0.071415	0	1.954248	4.14E-07	2.81E-07	0	6.95E-07	0.000297
1.14E-05	2.99E-05	0.000105	0.000146	2.615726	0.080608	0	2.696334	4.92E-07	3.16E-07	0	8.08E-07	0.000412
0.043921	0.046116	0.091516	0.181553	1935.487	146.6132	0	2082.1	0.000726	0.002995	0	0.003721	0.304937
0.050589	0.055428	0.109981	0.215998	2274.244	159.7781	0	2434.022	0.000852	0.003362	0	0.004214	0.358308
0.019657	0.020133	0.039961	0.07975	835.9176	68.71905	0	904.6366	0.000323	0.001421	0	0.001744	0.131699
0.012363	0.014819	0.030266	0.057448	673.5818	27.45476	0	701.0365	0.000214	0.000518	0	0.000732	0.106123
0.002005	0.001168	0.002876	0.006049	53.65476	2.666312	0	56.32107	0.0001	4.22E-05	0	0.000142	0.008453
0.001683	0.003511	0.007279	0.012473	155.9727	6.06693	0	162.0396	3.66E-05	0.000122	0	0.000159	0.024574
0.001665	0.002847	0.005887	0.010399	128.7476	6.351182	0	135.0988	5.04E-05	0.000119	0	0.000169	0.020284
0.001885	0.003316	0.006821	0.012023	147.8737	7.255378	0	155.1291	5.52E-05	0.00014	0	0.000195	0.023298
8.99E-05	0.000164	0.000954	0.001208	16.67546	0.272954	0	16.94841	4.39E-07	3.80E-06	0	4.23E-06	0.002627
0.014567	0.018989	0.03836	0.071917	806.909	57.08001	0	863.989	0.000338	0.001109	0	0.001447	0.127129
0.000112	0.000276	0.000563	0.000951	12.30538	0.27115	0	12.57653	3.40E-06	5.07E-06	0	8.47E-06	0.001939
7.31E-08	3.98E-07	3.65E-06	4.12E-06	0.029947	0	0	0.029947	5.58E-08	0	0	5.58E-08	4.72E-06

N2O_IDLE	N2O_STRE	N2O_TOTE	ROG_RUNI	ROG_IDLE	ROG_STRE	ROG_TOTE	ROG_DIUR	ROG_HOTS	ROG_RUNI	ROG_TOTA	TOG_RUNE	TOG_IDLE
2.49E-05	0	0.00221	0.001114	2.59E-05	0	0.00114	0	0	0	0.00114	0.001269	2.95E-05
0	0	0.002549	0.001598	0	0	0.001598	0	0	0	0.001598	0.001819	0
0	0	3.37E-05	0.000164	0	0	0.000164	0	0	0	0.000164	0.000186	0
0	0	0.002254	0.000569	0	0	0.000569	0	0	0	0.000569	0.000648	0
0.000445	0	0.060653	0.079998	0.002334	0	0.082332	0	0	0	0.082332	0.091072	0.002657
0.000322	0	0.03289	0.032814	0.001054	0	0.033868	0	0	0	0.033868	0.037357	0.0012
0	0	0.009343	0.002044	0	0	0.002044	0	0	0	0.002044	0.002327	0
0	0	0.003847	0.001753	0	0	0.001753	0	0	0	0.001753	0.001996	0
0.000104	0	0.002423	0.000113	0.000257	0	0.00037	0	0	0	0.00037	0.000129	0.000293
0	0	0.01835	0.001157	0	0	0.001157	0	0	0	0.001157	0.001317	0
0.000266	0	0.003204	0.002185	0.000116	0	0.0023	0	0	0	0.0023	0.002487	0.000132
1.53E-06	0	0.000193	9.35E-06	8.82E-07	0	1.02E-05	0	0	0	1.02E-05	1.06E-05	1.00E-06
2.03E-06	0	0.000265	9.53E-06	1.09E-06	0	1.06E-05	0	0	0	1.06E-05	1.08E-05	1.24E-06
6.68E-06	0	0.000678	2.70E-05	3.81E-06	0	3.08E-05	0	0	0	3.08E-05	3.07E-05	4.34E-06
1.11E-05	0	0.003994	0.000144	6.05E-06	0	0.00015	0	0	0	0.00015	0.000164	6.89E-06
0.000192	0	0.003603	0.000603	0.00014	0	0.000743	0	0	0	0.000743	0.000686	0.000159
0.00018	0	0.003485	0.000263	0.000108	0	0.000371	0	0	0	0.000371	0.000299	0.000123
0.000522	0	0.009798	0.001189	0.000354	0	0.001543	0	0	0	0.001543	0.001354	0.000403
8.34E-05	0	0.002344	0.00014	4.53E-05	0	0.000186	0	0	0	0.000186	0.00016	5.16E-05
0.000759	0	0.016412	0.002077	0.000574	0	0.002651	0	0	0	0.002651	0.002365	0.000654
0.001669	0	0.038172	0.001675	0.000917	0	0.002592	0	0	0	0.002592	0.001907	0.001044
0.001237	0	0.027273	0.002619	0.000863	0	0.003482	0	0	0	0.003482	0.002982	0.000982
0.00061	0	0.013674	0.000771	0.000373	0	0.001143	0	0	0	0.001143	0.000877	0.000424
9.07E-06	0	0.000227	2.81E-05	7.05E-06	0	3.51E-05	0	0	0	3.51E-05	3.20E-05	8.03E-06

0.00019	0	0.005112	0.000297	0.000106	0	0.000403	0	0	0	0.000403	0.000338	0.000121
9.05E-07	0	0.000113	7.47E-06	5.63E-07	0	8.03E-06	0	0	0	8.03E-06	8.50E-06	6.41E-07
1.20E-06	0	0.000156	6.22E-06	6.55E-07	0	6.88E-06	0	0	0	6.88E-06	7.08E-06	7.45E-07
3.96E-06	0	0.000399	2.04E-05	2.37E-06	0	2.28E-05	0	0	0	2.28E-05	2.32E-05	2.69E-06
6.07E-06	0	0.002713	9.93E-05	3.33E-06	0	0.000103	0	0	0	0.000103	0.000113	3.79E-06
6.45E-05	0	0.00078	0.00012	3.49E-05	0	0.000155	0	0	0	0.000155	0.000137	3.97E-05
9.49E-05	0	0.001209	0.000118	4.75E-05	0	0.000166	0	0	0	0.000166	0.000135	5.41E-05
0.00013	0	0.001663	0.000325	0.000106	0	0.000432	0	0	0	0.000432	0.00037	0.000121
0.000202	0	0.003277	0.000664	0.000167	0	0.000831	0	0	0	0.000831	0.000756	0.00019
5.96E-05	0	0.001643	5.18E-05	3.21E-05	0	8.39E-05	0	0	0	8.39E-05	5.89E-05	3.65E-05
1.13E-05	0	0.000308	8.91E-06	6.05E-06	0	1.50E-05	0	0	0	1.50E-05	1.01E-05	6.89E-06
1.27E-05	0	0.000425	1.06E-05	6.80E-06	0	1.74E-05	0	0	0	1.74E-05	1.21E-05	7.75E-06
0.023099	0	0.328036	0.015626	0.064477	0	0.080103	0	0	0	0.080103	0.017789	0.073402
0.025173	0	0.383481	0.018339	0.072387	0	0.090726	0	0	0	0.090726	0.020878	0.082407
0.010827	0	0.142526	0.006957	0.030585	0	0.037541	0	0	0	0.037541	0.00792	0.034819
0.004326	0	0.110449	0.004602	0.011155	0	0.015757	0	0	0	0.015757	0.005239	0.0127
0.00042	0	0.008873	0.002154	0.000908	0	0.003062	0	0	0	0.003062	0.002452	0.001034
0.000956	0	0.025529	0.000787	0.002631	0	0.003418	0	0	0	0.003418	0.000896	0.002995
0.001001	0	0.021285	0.001085	0.002557	0	0.003641	0	0	0	0.003641	0.001235	0.002911
0.001143	0	0.024441	0.001189	0.003015	0	0.004204	0	0	0	0.004204	0.001353	0.003433
4.30E-05	0	0.00267	9.45E-06	8.17E-05	0	9.12E-05	0	0	0	9.12E-05	1.08E-05	9.30E-05
0.008993	0	0.136122	0.007267	0.023885	0	0.031153	0	0	0	0.031153	0.008273	0.027192
4.27E-05	0	0.001981	7.32E-05	0.000109	0	0.000182	0	0	0	0.000182	8.34E-05	0.000124
0	0	4.72E-06	1.20E-06	0	0	1.20E-06	0	0	0	1.20E-06	1.37E-06	0

TOG_STRE	TOG_TOTE	TOG_DIUR	TOG_HOTS	TOG_RUNI	TOG_TOTA	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	SOx_RUNE	SOx_IDLEX	SOx_STREX
0	0.001298	0	0	0	0.001298	0.003612	0.000553	0	0.004165	0.000131	1.50E-06	0
0	0.001819	0	0	0	0.001819	0.020727	0	0	0.020727	0.000153	0	0
0	0.000186	0	0	0	0.000186	0.001106	0	0	0.001106	2.03E-06	0	0
0	0.000648	0	0	0	0.000648	0.005496	0	0	0.005496	0.000136	0	0
0	0.093729	0	0	0	0.093729	0.25584	0.019348	0	0.275188	0.003621	2.67E-05	0
0	0.038557	0	0	0	0.038557	0.090136	0.008734	0	0.098871	0.001959	1.94E-05	0
0	0.002327	0	0	0	0.002327	0.03372	0	0	0.03372	0.000562	0	0
0	0.001996	0	0	0	0.001996	0.007905	0	0	0.007905	0.000231	0	0
0	0.000422	0	0	0	0.000422	0.000622	0.003782	0	0.004404	0.000139	6.25E-06	0
0	0.001317	0	0	0	0.001317	0.013743	0	0	0.013743	0.001103	0	0
0	0.002619	0	0	0	0.002619	0.005339	0.002069	0	0.007408	0.000177	1.60E-05	0
0	1.16E-05	0	0	0	1.16E-05	4.10E-05	3.47E-05	0	7.57E-05	1.15E-05	9.17E-08	0
0	1.21E-05	0	0	0	1.21E-05	4.79E-05	4.56E-05	0	9.35E-05	1.58E-05	1.22E-07	0
0	3.50E-05	0	0	0	3.50E-05	0.000127	0.000156	0	0.000283	4.04E-05	4.01E-07	0
0	0.000171	0	0	0	0.000171	0.000786	0.000255	0	0.001041	0.000239	6.68E-07	0
0	0.000846	0	0	0	0.000846	0.002153	0.004345	0	0.006498	0.000205	1.15E-05	0
0	0.000422	0	0	0	0.000422	0.001085	0.004015	0	0.005101	0.000199	1.08E-05	0
0	0.001756	0	0	0	0.001756	0.004478	0.01175	0	0.016228	0.000558	3.14E-05	0
0	0.000211	0	0	0	0.000211	0.000698	0.001758	0	0.002456	0.000136	5.01E-06	0
0	0.003019	0	0	0	0.003019	0.007531	0.017203	0	0.024733	0.000941	4.56E-05	0
0	0.002951	0	0	0	0.002951	0.008513	0.036762	0	0.045274	0.002194	0.0001	0
0	0.003964	0	0	0	0.003964	0.010303	0.027841	0	0.038143	0.001565	7.43E-05	0
0	0.001302	0	0	0	0.001302	0.003763	0.013039	0	0.016801	0.000785	3.67E-05	0
0	4.00E-05	0	0	0	4.00E-05	0.000106	0.000205	0	0.000311	1.31E-05	5.45E-07	0

0	0.000459	0	0	0	0.000459	0.001545	0.004012	0	0.005557	0.000296	1.14E-05	0
0	9.14E-06	0	0	0	9.14E-06	2.94E-05	2.09E-05	0	5.03E-05	6.76E-06	5.44E-08	0
0	7.83E-06	0	0	0	7.83E-06	2.98E-05	2.72E-05	0	5.69E-05	9.29E-06	7.21E-08	0
0	2.59E-05	0	0	0	2.59E-05	8.72E-05	9.36E-05	0	0.000181	2.37E-05	2.38E-07	0
0	0.000117	0	0	0	0.000117	0.000543	0.00014	0	0.000684	0.000163	3.65E-07	0
0	0.000176	0	0	0	0.000176	0.000399	0.000811	0	0.00121	4.30E-05	3.88E-06	0
0	0.000189	0	0	0	0.000189	0.000424	0.001416	0	0.001839	6.70E-05	5.70E-06	0
0	0.000491	0	0	0	0.000491	0.000979	0.001844	0	0.002823	9.21E-05	7.84E-06	0
0	0.000946	0	0	0	0.000946	0.001952	0.002931	0	0.004883	0.000185	1.22E-05	0
0	9.55E-05	0	0	0	9.55E-05	0.000267	0.00134	0	0.001608	9.51E-05	3.58E-06	0
0	1.70E-05	0	0	0	1.70E-05	5.02E-05	0.000254	0	0.000304	1.78E-05	6.76E-07	0
0	1.98E-05	0	0	0	1.98E-05	6.50E-05	0.000288	0	0.000353	2.48E-05	7.63E-07	0
0	0.091191	0	0	0	0.091191	0.053562	0.951537	0	1.0051	0.018328	0.001388	0
0	0.103285	0	0	0	0.103285	0.0577	1.068659	0	1.126358	0.021536	0.001513	0
0	0.042738	0	0	0	0.042738	0.023669	0.451404	0	0.475073	0.007916	0.000651	0
0	0.017939	0	0	0	0.017939	0.027437	0.16483	0	0.192267	0.006378	0.00026	0
0	0.003486	0	0	0	0.003486	0.008526	0.006649	0	0.015175	0.000508	2.52E-05	0
0	0.003891	0	0	0	0.003891	0.003705	0.03883	0	0.042536	0.001477	5.75E-05	0
0	0.004145	0	0	0	0.004145	0.005438	0.036797	0	0.042236	0.001219	6.01E-05	0
0	0.004786	0	0	0	0.004786	0.005535	0.043272	0	0.048808	0.0014	6.87E-05	0
0	0.000104	0	0	0	0.000104	4.91E-05	0.000359	0	0.000408	0.000158	2.58E-06	0
0	0.035465	0	0	0	0.035465	0.029992	0.350115	0	0.380107	0.007641	0.000541	0
0	0.000208	0	0	0	0.000208	0.000386	0.00161	0	0.001997	0.000117	2.57E-06	0
0	1.37E-06	0	0	0	1.37E-06	9.67E-07	0	0	9.67E-07	2.84E-07	0	0

SOx_TOTE›	NH3_RUNE	Fuel Consumption
0.000133	0.002676	1.252804
0.000153	0.000212	1.445127
2.03E-06	1.59E-06	0.01912
0.000136	0.000146	1.278246
0.003648	0.130697	34.38991
0.001978	0.062812	18.64853
0.000562	0.000436	5.297365
0.000231	0.003257	2.181431
0.000146	0.001894	1.373579
0.001103	0.012639	10.40438
0.000193	0.001255	1.816463
1.16E-05	0.000243	0.109457
1.60E-05	0.000335	0.150485
4.08E-05	0.000867	0.384609
0.00024	0.005514	2.26429
0.000217	0.004225	2.042731
0.000209	0.004168	1.975967
0.000589	0.011775	5.555485
0.000141	0.002993	1.329017
0.000986	0.019451	9.305267
0.002294	0.046139	21.64311
0.001639	0.032842	15.46363
0.000822	0.017156	7.753134
1.37E-05	0.000274	0.128871

MHDT = sum of all T6 vehicles

HHDT = sum of all T7 vehicles

	Fuel Consu	VMT
MHDT	78.19637	704552.2
HHDT	672.1068	4202413

0.000307	0.006857	2.898351
6.81E-06	0.000143	0.064247
9.36E-06	0.000198	0.088293
2.40E-05	0.000516	0.226078
0.000163	0.003777	1.538329
4.69E-05	0.000584	0.442057
7.27E-05	0.001087	0.685633
9.99E-05	0.001276	0.942767
0.000197	0.002636	1.857788
9.87E-05	0.002099	0.931341
1.85E-05	0.000395	0.174572
2.55E-05	0.000548	0.240862
0.019716	0.281818	185.9932
0.023049	0.338727	217.4303
0.008566	0.123032	80.81083
0.006638	0.090559	62.62332
0.000533	0.003384	5.031139
0.001534	0.021456	14.47493
0.001279	0.017387	12.06832
0.001469	0.020254	13.85762
0.00016	0.000172	1.513995
0.008181	0.116035	77.1798
0.000119	0.001684	1.123456
2.84E-07	7.30E-06	0.002675
		828.4128
		0.828413
		302.3707

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: County
Region: Riverside
Calendar Year: 2026
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consun

Region	Calendar Y	Vehicle Ca	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Cor	NOx_RUNE
Riverside	2026	LDA	Aggregate	Aggregate	Gasoline	629192.4	25836353	25836353	0	2926558	0	0.935343
Riverside	2026	LDT1	Aggregate	Aggregate	Gasoline	54607.39	2017862	2017862	0	237519.8	0	0.345677
Riverside	2026	LDT2	Aggregate	Aggregate	Gasoline	292443.4	12519105	12519105	0	1373356	0	0.778995
Riverside	2026	LHD1	Aggregate	Aggregate	Gasoline	23753.52	887366.4	887366.4	0	353892.1	0	0.126583
Riverside	2026	LHD2	Aggregate	Aggregate	Gasoline	3617.684	127179	127179	0	53898.11	0	0.016638
Riverside	2026	MCY	Aggregate	Aggregate	Gasoline	31192.06	181404.5	181404.5	0	62384.12	0	0.111
Riverside	2026	MDV	Aggregate	Aggregate	Gasoline	216033.8	8675375	8675375	0	989931	0	0.849306
Riverside	2026	MH	Aggregate	Aggregate	Gasoline	5284.767	45625.96	45625.96	0	528.6881	0	0.014716
Riverside	2026	OBUS	Aggregate	Aggregate	Gasoline	498.8993	21236.15	21236.15	0	9981.978	0	0.008232
Riverside	2026	SBUS	Aggregate	Aggregate	Gasoline	534.1769	24503.14	24503.14	0	2136.708	0	0.01023
Riverside	2026	T6TS	Aggregate	Aggregate	Gasoline	1934.069	102747.9	102747.9	0	38696.86	0	0.038867
Riverside	2026	T7IS	Aggregate	Aggregate	Gasoline	7.582862	601.9404	601.9404	0	151.7179	0	0.003126
Riverside	2026	UBUS	Aggregate	Aggregate	Gasoline	146.7792	18580.6	18580.6	0	587.1169	0	0.004048

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NOx_IDLEX	NOx_STREX	NOx_TOTEX	PM2.5_RUI	PM2.5_IDL	PM2.5_STR	PM2.5_TOT	PM2.5_PM	PM2.5_PMI	PM2.5_TOT	PM10_RUN	PM10_IDLE	PM10_STRI
0	0.709374	1.644717	0.031225	0	0.00584	0.037065	0.056959	0.066647	0.160671	0.03396	0	0.006351
0	0.105191	0.450868	0.003986	0	0.000727	0.004713	0.004449	0.006237	0.015399	0.004335	0	0.00079
0	0.41998	1.198974	0.015318	0	0.002743	0.01806	0.0276	0.036924	0.082584	0.016659	0	0.002983
0.000917	0.236446	0.363945	0.001027	0	9.96E-05	0.001127	0.001956	0.026704	0.029787	0.001117	0	0.000108
0.000141	0.037145	0.053924	0.000128	0	1.15E-05	0.00014	0.00028	0.004465	0.004885	0.00014	0	1.25E-05
0	0.00853	0.11953	0.000351	0	0.000209	0.000559	0.0002	0.00084	0.001599	0.000375	0	0.000222
0	0.412785	1.262091	0.010984	0	0.002078	0.013062	0.019126	0.026592	0.05878	0.011946	0	0.00226
0	0.000258	0.014974	4.84E-05	0	1.86E-07	4.86E-05	0.000151	0.000741	0.000941	5.26E-05	0	2.02E-07
3.46E-05	0.004408	0.012675	1.56E-05	0	2.65E-06	1.83E-05	7.02E-05	0.000345	0.000433	1.70E-05	0	2.88E-06
0.000537	0.001762	0.012529	2.41E-05	0	1.02E-06	2.51E-05	5.40E-05	0.000443	0.000522	2.62E-05	0	1.11E-06
0.000182	0.017431	0.05648	0.000101	0	1.93E-05	0.00012	0.00034	0.001667	0.002127	0.00011	0	2.09E-05
0	4.00E-05	0.003166	5.77E-07	0	1.31E-07	7.08E-07	3.32E-06	1.84E-05	2.24E-05	6.28E-07	0	1.42E-07
0	0.000469	0.004516	2.71E-05	0	3.11E-07	2.74E-05	5.31E-05	0.000733	0.000814	2.95E-05	0	3.38E-07

PM10_TOT	PM10_PMT	PM10_PME	PM10_TOT	CO2_RUNE	CO2_IDLE	CO2_STRE	CO2_TOTE	CH4_RUNE	CH4_IDLE	CH4_STRE	CH4_TOTE	N2O_RUNE
0.040311	0.227838	0.19042	0.45857	7782.412	0	213.6214	7996.034	0.055585	0	0.191257	0.246842	0.116979
0.005126	0.017794	0.017821	0.040741	737.5121	0	22.23246	759.7445	0.017186	0	0.028206	0.045392	0.024875
0.019642	0.1104	0.105496	0.235538	4577.725	0	123.4292	4701.154	0.035312	0	0.104644	0.139957	0.073513
0.001225	0.007825	0.076296	0.085347	575.3454	3.083915	9.918157	588.3474	0.00348	0.002932	0.012081	0.018493	0.007468
0.000152	0.001122	0.012757	0.014031	94.60064	0.54692	1.491155	96.63871	0.000313	0.000449	0.00182	0.002582	0.001099
0.000597	0.0008	0.0024	0.003797	37.62388	0	3.189302	40.81318	0.032178	0	0.011428	0.043607	0.007762
0.014206	0.076504	0.075977	0.166687	3947.199	0	112.0394	4059.238	0.034808	0	0.098095	0.132902	0.068701
5.28E-05	0.000604	0.002118	0.002775	88.78766	0	0.017952	88.80561	0.000414	0	2.13E-05	0.000435	0.001021
1.99E-05	0.000281	0.000985	0.001285	38.05761	0.20723	0.338578	38.60342	0.000191	0.000108	0.000374	0.000673	0.000432
2.73E-05	0.000216	0.001265	0.001509	24.35411	1.54524	0.131138	26.03049	0.000246	0.001437	0.000161	0.001844	0.000623
0.000131	0.001359	0.004762	0.006252	180.5055	1.135524	1.902847	183.5439	0.000974	0.00056	0.001894	0.003429	0.002062
7.70E-07	1.33E-05	5.26E-05	6.66E-05	1.464074	0	0.009222	1.473296	7.17E-05	0	1.28E-08	7.17E-05	0.00011
2.98E-05	0.000212	0.002094	0.002337	30.8027	0	0.047895	30.8506	7.66E-05	0	6.12E-05	0.000138	0.00036

N2O_IDLE	N2O_STRE	N2O_TOTE	ROG_RUNI	ROG_IDLE	ROG_STRE	ROG_TOTE	ROG_DIUR	ROG_HOTS	ROG_RUNI	ROG_TOTA	TOG_RUNE	TOG_IDLE
0	0.098984	0.215964	0.199141	0	0.829491	1.028632	1.042826	0.267622	0.686831	3.025911	0.290586	0
0	0.010326	0.035201	0.075332	0	0.144436	0.219768	0.221075	0.052386	0.152135	0.645363	0.109924	0
0	0.051693	0.125206	0.132123	0	0.461615	0.593739	0.482411	0.115346	0.319668	1.511163	0.192794	0
7.77E-05	0.019319	0.026864	0.016754	0.010509	0.058286	0.085548	0.081199	0.017827	0.102505	0.287079	0.024447	0.015334
1.16E-05	0.002932	0.004043	0.001367	0.001618	0.008726	0.011712	0.01224	0.002608	0.014528	0.041088	0.001995	0.002361
0	0.000511	0.008273	0.20806	0	0.083618	0.291678	0.180171	0.248144	0.265611	0.985604	0.251122	0
0	0.042461	0.111162	0.139931	0	0.470343	0.610273	0.49132	0.111854	0.335215	1.548662	0.204177	0
0	2.89E-05	0.00105	0.00166	0	8.22E-05	0.001742	0.028288	0.006339	0.000149	0.036519	0.002423	0
2.83E-06	0.000336	0.00077	0.000897	0.000411	0.001952	0.003259	0.002059	0.000404	0.001986	0.007709	0.001308	0.000599
4.86E-05	0.000158	0.000829	0.001203	0.006265	0.000923	0.008391	0.001654	0.00034	0.00092	0.011305	0.001756	0.009141
1.55E-05	0.001366	0.003444	0.004625	0.002147	0.010136	0.016908	0.007008	0.001371	0.011402	0.036688	0.006749	0.003133
0	1.24E-06	0.000111	0.000357	0	6.59E-08	0.000357	4.64E-05	1.15E-05	9.44E-05	0.000509	0.000521	0
0	4.88E-05	0.000409	0.000239	0	0.000243	0.000482	0.000111	3.31E-05	6.88E-05	0.000695	0.000348	0

TOG_STRE	TOG_TOTE	TOG_DIUR	TOG_HOTS	TOG_RUNL	TOG_TOTA	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	SOx_RUNE	SOx_IDLEX	SOx_STREX
0.908188	1.198774	1.042826	0.267622	0.686831	3.196053	19.6442	0	8.33889	27.98308	0.076937	0	0.002112
0.15814	0.268063	0.221075	0.052386	0.152135	0.693659	3.874883	0	1.360821	5.235704	0.007291	0	0.00022
0.505411	0.698205	0.482411	0.115346	0.319668	1.615629	11.13598	0	4.500766	15.63675	0.045255	0	0.00122
0.063815	0.103596	0.081199	0.017827	0.102505	0.305128	0.899426	0.098523	1.169606	2.167555	0.005688	3.05E-05	9.81E-05
0.009554	0.01391	0.01224	0.002608	0.014528	0.043287	0.096505	0.015041	0.170463	0.282009	0.000935	5.41E-06	1.47E-05
0.090927	0.342049	0.180171	0.248144	0.265611	1.035974	2.503393	0	0.521337	3.02473	0.000372	0	3.15E-05
0.514966	0.719143	0.49132	0.111854	0.335215	1.657532	9.447151	0	3.723977	13.17113	0.039022	0	0.001108
9.00E-05	0.002512	0.028288	0.006339	0.000149	0.037289	0.045856	0	0.00175	0.047606	0.000878	0	1.77E-07
0.002137	0.004045	0.002059	0.000404	0.001986	0.008494	0.022326	0.003177	0.039704	0.065207	0.000376	2.05E-06	3.35E-06
0.00101	0.011908	0.001654	0.00034	0.00092	0.014821	0.024523	0.048418	0.02007	0.09301	0.000241	1.53E-05	1.30E-06
0.011097	0.02098	0.007008	0.001371	0.011402	0.04076	0.111817	0.03071	0.21414	0.356666	0.001784	1.12E-05	1.88E-05
7.21E-08	0.000521	4.64E-05	1.15E-05	9.44E-05	0.000673	0.018314	0	0.00074	0.019055	1.45E-05	0	9.12E-08
0.000266	0.000614	0.000111	3.31E-05	6.88E-05	0.000827	0.009109	0	0.004957	0.014066	0.000305	0	4.73E-07

SOx_TOTE›	NH3_RUNE	Fuel Consumption
0.079049	1.035864	843.1718
0.007511	0.085826	80.11411
0.046476	0.525316	495.7308
0.005816	0.043981	62.0405
0.000955	0.006308	10.19043
0.000403	0.001771	4.303699
0.04013	0.350746	428.0416
0.000878	0.002261	9.364441
0.000382	0.001053	4.070682
0.000257	0.001215	2.744882
0.001815	0.005096	19.35447
1.46E-05	2.98E-05	0.155357
0.000305	0.000922	3.253157
		1962.536
		1.962536
		716.3256

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: County
Region: Riverside
Calendar Year: 2026
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consun

Region	Calendar Y	Vehicle Ca	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Cor	NOx_RUNE
Riverside	2026	All Other B	Aggregate	Aggregate	Diesel	232.4412	12122.51	12122.51	0	2068.726	0	0.023814
Riverside	2026	LDA	Aggregate	Aggregate	Diesel	1694.635	56557.4	56557.4	0	7305.391	0	0.008981
Riverside	2026	LDT1	Aggregate	Aggregate	Diesel	20.50812	379.8184	379.8184	0	57.08657	0	0.000642
Riverside	2026	LDT2	Aggregate	Aggregate	Diesel	997.7585	44387.84	44387.84	0	4784.998	0	0.001953
Riverside	2026	LHD1	Aggregate	Aggregate	Diesel	19119	700848.5	700848.5	0	240493	0	1.191222
Riverside	2026	LHD2	Aggregate	Aggregate	Diesel	8695.553	318411.1	318411.1	0	109379.1	0	0.432134
Riverside	2026	MDV	Aggregate	Aggregate	Diesel	3101.906	124791.6	124791.6	0	14279.45	0	0.015684
Riverside	2026	MH	Aggregate	Aggregate	Diesel	2605.128	21983.74	21983.74	0	260.5128	0	0.094032
Riverside	2026	Motor Coa	Aggregate	Aggregate	Diesel	60.87922	7857.77	7857.77	0	1399.004	0	0.01245
Riverside	2026	PTO	Aggregate	Aggregate	Diesel	0	52223.11	52223.11	0	0	0	0.165083
Riverside	2026	SBUS	Aggregate	Aggregate	Diesel	633.8063	12936.96	12936.96	0	9177.515	0	0.104272
Riverside	2026	T6 CAIRP C	Aggregate	Aggregate	Diesel	15.17212	1013.977	1013.977	0	348.6552	0	0.000382
Riverside	2026	T6 CAIRP C	Aggregate	Aggregate	Diesel	19.95451	1394.508	1394.508	0	458.5546	0	0.000503
Riverside	2026	T6 CAIRP C	Aggregate	Aggregate	Diesel	69.65069	3608.167	3608.167	0	1600.573	0	0.001121
Riverside	2026	T6 CAIRP C	Aggregate	Aggregate	Diesel	113.1392	22980.87	22980.87	0	2599.938	0	0.008328
Riverside	2026	T6 Instate [	Aggregate	Aggregate	Diesel	547.6799	18423.05	18423.05	0	7815.392	0	0.018347
Riverside	2026	T6 Instate [	Aggregate	Aggregate	Diesel	521.2288	17609.58	17609.58	0	7437.935	0	0.00967
Riverside	2026	T6 Instate [	Aggregate	Aggregate	Diesel	1498.919	50479.28	50479.28	0	21389.58	0	0.042008
Riverside	2026	T6 Instate [	Aggregate	Aggregate	Diesel	236.0637	12549.31	12549.31	0	3368.629	0	0.011731
Riverside	2026	T6 Instate (	Aggregate	Aggregate	Diesel	2010.178	83416.1	83416.1	0	23237.66	0	0.069236
Riverside	2026	T6 Instate (	Aggregate	Aggregate	Diesel	4505.118	193078.5	193078.5	0	52079.16	0	0.087253
Riverside	2026	T6 Instate (	Aggregate	Aggregate	Diesel	3303.677	139528.3	139528.3	0	38190.51	0	0.097548
Riverside	2026	T6 Instate (	Aggregate	Aggregate	Diesel	1627.215	71699.47	71699.47	0	18810.61	0	0.057727
Riverside	2026	T6 Instate]	Aggregate	Aggregate	Diesel	23.99144	1172.392	1172.392	0	277.341	0	0.000998

Riverside	2026	T6 Instate T	Aggregate	Aggregate	Diesel	504.8346	28719.97	28719.97	0	5835.888	0	0.025052
Riverside	2026	T6 OOS Cla	Aggregate	Aggregate	Diesel	9.165549	608.9197	608.9197	0	210.6243	0	0.000279
Riverside	2026	T6 OOS Cla	Aggregate	Aggregate	Diesel	11.99127	835.3283	835.3283	0	275.5594	0	0.000323
Riverside	2026	T6 OOS Cla	Aggregate	Aggregate	Diesel	42.27977	2182.737	2182.737	0	971.5891	0	0.000799
Riverside	2026	T6 OOS Cla	Aggregate	Aggregate	Diesel	62.13434	15871.21	15871.21	0	1427.847	0	0.006109
Riverside	2026	T6 Public C	Aggregate	Aggregate	Diesel	108.9112	3803.539	3803.539	0	558.7145	0	0.016055
Riverside	2026	T6 Public C	Aggregate	Aggregate	Diesel	162.2832	5891.936	5891.936	0	832.5128	0	0.012528
Riverside	2026	T6 Public C	Aggregate	Aggregate	Diesel	227.7203	8100.685	8100.685	0	1168.205	0	0.034399
Riverside	2026	T6 Public C	Aggregate	Aggregate	Diesel	359.456	16329.6	16329.6	0	1844.009	0	0.068562
Riverside	2026	T6 Utility C	Aggregate	Aggregate	Diesel	213.7118	8636.085	8636.085	0	2735.511	0	0.003022
Riverside	2026	T6 Utility C	Aggregate	Aggregate	Diesel	40.37535	1626.189	1626.189	0	516.8045	0	0.000576
Riverside	2026	T6 Utility C	Aggregate	Aggregate	Diesel	45.24251	2250.866	2250.866	0	579.1041	0	0.00068
Riverside	2026	T7 CAIRP C	Aggregate	Aggregate	Diesel	5700.016	1179494	1179494	0	130986.4	0	1.782334
Riverside	2026	T7 NNOOS	Aggregate	Aggregate	Diesel	5184.997	1430330	1430330	0	119151.2	0	2.155158
Riverside	2026	T7 NOOS C	Aggregate	Aggregate	Diesel	2203.723	519524.5	519524.5	0	50641.56	0	0.811517
Riverside	2026	T7 POLA Cl	Aggregate	Aggregate	Diesel	3031.778	387554.8	387554.8	0	49599.89	0	0.652834
Riverside	2026	T7 Public C	Aggregate	Aggregate	Diesel	707.8883	28706.39	28706.39	0	3631.467	0	0.269609
Riverside	2026	T7 Single C	Aggregate	Aggregate	Diesel	1280.515	87681.65	87681.65	0	12062.45	0	0.081084
Riverside	2026	T7 Single D	Aggregate	Aggregate	Diesel	1261.262	71428.67	71428.67	0	11881.09	0	0.106441
Riverside	2026	T7 Single O	Aggregate	Aggregate	Diesel	1505.27	84928.55	84928.55	0	14179.65	0	0.114375
Riverside	2026	T7 SWCV C	Aggregate	Aggregate	Diesel	56.10065	3640.768	3640.768	0	258.063	0	0.052512
Riverside	2026	T7 Tractor (	Aggregate	Aggregate	Diesel	6591.975	487903.8	487903.8	0	95781.39	0	0.782415
Riverside	2026	T7 Utility C	Aggregate	Aggregate	Diesel	158.8865	6965.318	6965.318	0	2033.748	0	0.007402
Riverside	2026	UBUS	Aggregate	Aggregate	Diesel	0.311734	30.10971	30.10971	0	1.246935	0	5.35E-06

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NOx_IDLEX	NOx_STREX	NOx_TOTEX	PM2.5_RUN	PM2.5_IDL	PM2.5_STR	PM2.5_TOT	PM2.5_PMT	PM2.5_PMI	PM2.5_TOT	PM10_RUN	PM10_IDLE	PM10_STRI
0.000999	0.002869	0.027682	0.000632	4.64E-06	0	0.000636	4.01E-05	0.000197	0.000873	0.00066	4.85E-06	0
0	0	0.008981	0.000771	0	0	0.000771	0.000125	0.00015	0.001045	0.000806	0	0
0	0	0.000642	9.37E-05	0	0	9.37E-05	8.37E-07	1.30E-06	9.59E-05	9.80E-05	0	0
0	0	0.001953	0.000218	0	0	0.000218	9.79E-05	0.000129	0.000445	0.000228	0	0
0.041633	0	1.232856	0.018316	0.000551	0	0.018867	0.002318	0.021091	0.042275	0.019144	0.000576	0
0.018733	0	0.450868	0.00789	0.000252	0	0.008142	0.001053	0.011179	0.020374	0.008247	0.000263	0
0	0	0.015684	0.000962	0	0	0.000962	0.000275	0.000389	0.001626	0.001005	0	0
0	0	0.094032	0.003088	0	0	0.003088	9.69E-05	0.000357	0.003542	0.003228	0	0
0.002903	0.003157	0.01851	0.000205	1.09E-06	0	0.000206	2.60E-05	0.000234	0.000466	0.000214	1.14E-06	0
0	0	0.165083	0.000249	0	0	0.000249	0	0	0.000249	0.00026	0	0
0.022195	0.002328	0.128795	0.000584	2.19E-05	0	0.000606	4.28E-05	0.000234	0.000882	0.00061	2.28E-05	0
4.52E-05	0.000221	0.000649	7.47E-06	2.97E-08	0	7.50E-06	3.35E-06	1.64E-05	2.73E-05	7.81E-06	3.11E-08	0
5.92E-05	0.000294	0.000856	8.93E-06	1.81E-08	0	8.95E-06	4.61E-06	2.26E-05	3.61E-05	9.34E-06	1.90E-08	0
0.0002	0.001015	0.002336	2.30E-05	9.64E-08	0	2.31E-05	1.19E-05	5.84E-05	9.34E-05	2.41E-05	1.01E-07	0
0.000325	0.00164	0.010293	0.000147	8.50E-08	0	0.000147	7.60E-05	0.000372	0.000595	0.000153	8.89E-08	0
0.006407	0.012848	0.037601	0.00031	1.45E-05	0	0.000324	6.09E-05	0.0003	0.000685	0.000324	1.51E-05	0
0.005514	0.012646	0.027829	0.000171	5.71E-06	0	0.000177	5.82E-05	0.000287	0.000522	0.000179	5.96E-06	0
0.016592	0.036012	0.094612	0.000689	2.91E-05	0	0.000718	0.000167	0.000822	0.001707	0.00072	3.04E-05	0
0.002514	0.005822	0.020066	0.000121	1.45E-06	0	0.000122	4.15E-05	0.000204	0.000368	0.000126	1.51E-06	0
0.024879	0.043957	0.138072	0.001175	6.25E-05	0	0.001237	0.000276	0.001357	0.00287	0.001228	6.54E-05	0
0.050111	0.103329	0.240692	0.001298	2.89E-05	0	0.001327	0.000638	0.003143	0.005108	0.001357	3.02E-05	0
0.039386	0.073829	0.210764	0.001596	7.53E-05	0	0.001671	0.000461	0.002271	0.004403	0.001668	7.87E-05	0
0.018887	0.037823	0.114437	0.000651	2.27E-05	0	0.000674	0.000237	0.001167	0.002078	0.000681	2.37E-05	0
0.0003	0.000523	0.00182	1.66E-05	8.12E-07	0	1.74E-05	3.88E-06	1.91E-05	4.03E-05	1.73E-05	8.48E-07	0

0.005871	0.011648	0.042571	0.000262	4.71E-06	0	0.000267	9.50E-05	0.000468	0.00083	0.000274	4.92E-06	0
3.01E-05	0.000137	0.000446	5.53E-06	3.05E-08	0	5.56E-06	2.01E-06	9.85E-06	1.74E-05	5.78E-06	3.19E-08	0
3.82E-05	0.000181	0.000542	5.64E-06	1.31E-08	0	5.66E-06	2.76E-06	1.35E-05	2.19E-05	5.90E-06	1.37E-08	0
0.000137	0.000639	0.001576	1.62E-05	8.89E-08	0	1.63E-05	7.22E-06	3.53E-05	5.89E-05	1.70E-05	9.29E-08	0
0.000196	0.000932	0.007237	0.000104	4.67E-08	0	0.000104	5.25E-05	0.000257	0.000413	0.000108	4.88E-08	0
0.004335	0.000616	0.021006	8.06E-05	5.52E-06	0	8.61E-05	1.26E-05	6.17E-05	0.00016	8.42E-05	5.77E-06	0
0.005134	0.001198	0.01886	7.84E-05	3.75E-06	0	8.22E-05	1.95E-05	9.56E-05	0.000197	8.20E-05	3.92E-06	0
0.008133	0.001371	0.043903	0.000206	1.83E-05	0	0.000225	2.68E-05	0.000131	0.000383	0.000216	1.91E-05	0
0.012169	0.002189	0.08292	0.000432	2.94E-05	0	0.000461	5.40E-05	0.000265	0.00078	0.000451	3.08E-05	0
0.001664	0.0041	0.008786	4.48E-05	4.42E-07	0	4.53E-05	2.86E-05	0.00014	0.000214	4.69E-05	4.61E-07	0
0.000313	0.00078	0.001668	8.21E-06	8.34E-08	0	8.30E-06	5.38E-06	2.64E-05	4.01E-05	8.59E-06	8.72E-08	0
0.000351	0.000852	0.001883	1.06E-05	9.35E-08	0	1.07E-05	7.44E-06	3.65E-05	5.47E-05	1.11E-05	9.77E-08	0
0.690658	0.318535	2.791527	0.041904	0.000267	0	0.042171	0.011702	0.032812	0.086684	0.043799	0.000279	0
0.875238	0.306172	3.336568	0.04909	0.000301	0	0.049392	0.01419	0.039777	0.103358	0.05131	0.000315	0
0.372049	0.129164	1.312729	0.018951	0.000128	0	0.019079	0.005154	0.014463	0.038697	0.019808	0.000134	0
0.132546	0.126814	0.912195	0.012388	4.65E-05	0	0.012435	0.003845	0.011024	0.027304	0.012948	4.86E-05	0
0.029696	0.009872	0.309177	0.001722	7.60E-05	0	0.001798	0.000285	0.000977	0.003061	0.0018	7.94E-05	0
0.028128	0.045389	0.154601	0.001564	1.11E-05	0	0.001575	0.00087	0.002547	0.004992	0.001635	1.16E-05	0
0.029548	0.040071	0.176061	0.001562	1.79E-05	0	0.00158	0.000709	0.002063	0.004351	0.001632	1.87E-05	0
0.035476	0.049362	0.199213	0.001805	2.26E-05	0	0.001828	0.000843	0.002438	0.005108	0.001887	2.36E-05	0
0.003565	0.000113	0.056189	6.55E-05	8.92E-06	0	7.45E-05	3.61E-05	0.000295	0.000406	6.85E-05	9.32E-06	0
0.283694	0.417287	1.483397	0.014072	0.00011	0	0.014182	0.00484	0.013764	0.032786	0.014708	0.000115	0
0.001265	0.011143	0.019811	0.000107	4.53E-07	0	0.000108	6.91E-05	0.000199	0.000376	0.000112	4.74E-07	0
0	0	5.35E-06	7.00E-08	0	0	7.00E-08	9.96E-08	1.28E-06	1.45E-06	7.31E-08	0	0

PM10_TOT	PM10_PMT	PM10_PME	PM10_TOT	CO2_RUNE	CO2_IDLE	CO2_STRE	CO2_TOTE	CH4_RUNE	CH4_IDLE	CH4_STRE	CH4_TOTE	N2O_RUNE
0.000665	0.00016	0.000562	0.001388	13.78439	0.159578	0	13.94397	4.95E-05	1.16E-06	0	5.07E-05	0.002172
0.000806	0.000499	0.000427	0.001732	14.57041	0	0	14.57041	6.14E-05	0	0	6.14E-05	0.002296
9.80E-05	3.35E-06	3.71E-06	0.000105	0.172778	0	0	0.172778	6.11E-06	0	0	6.11E-06	2.72E-05
0.000228	0.000391	0.000368	0.000987	14.55359	0	0	14.55359	2.70E-05	0	0	2.70E-05	0.002293
0.01972	0.009271	0.060259	0.089249	374.6597	2.773121	0	377.4329	0.003443	0.000107	0	0.003551	0.059028
0.00851	0.004212	0.03194	0.044662	203.0331	2.02407	0	205.0572	0.001436	4.89E-05	0	0.001485	0.031988
0.001005	0.0011	0.001111	0.003217	57.04069	0	0	57.04069	8.79E-05	0	0	8.79E-05	0.008987
0.003228	0.000388	0.001019	0.004635	23.73788	0	0	23.73788	7.80E-05	0	0	7.80E-05	0.00374
0.000215	0.000104	0.00067	0.000988	14.63855	0.67899	0	15.31754	5.12E-06	1.25E-05	0	1.76E-05	0.002306
0.00026	0	0	0.00026	115.1911	0	0	115.1911	5.20E-05	0	0	5.20E-05	0.018148
0.000633	0.000171	0.000668	0.001472	18.01688	1.651815	0	19.6687	9.72E-05	5.22E-06	0	0.000102	0.002839
7.84E-06	1.34E-05	4.69E-05	6.81E-05	1.214735	0.009679	0	1.224414	4.01E-07	4.07E-08	0	4.42E-07	0.000191
9.35E-06	1.84E-05	6.45E-05	9.23E-05	1.673362	0.012818	0	1.68618	4.30E-07	5.08E-08	0	4.80E-07	0.000264
2.42E-05	4.77E-05	0.000167	0.000239	4.252476	0.043325	0	4.295801	1.17E-06	1.81E-07	0	1.35E-06	0.00067
0.000153	0.000304	0.001062	0.00152	25.20873	0.070767	0	25.2795	6.67E-06	2.86E-07	0	6.95E-06	0.003972
0.000339	0.000244	0.000857	0.00144	21.77211	1.223318	0	22.99543	2.38E-05	6.22E-06	0	3.00E-05	0.00343
0.000185	0.000233	0.000819	0.001237	21.09095	1.154828	0	22.24578	1.08E-05	4.99E-06	0	1.58E-05	0.003323
0.000751	0.000668	0.002348	0.003767	59.26643	3.339904	0	62.60633	4.75E-05	1.59E-05	0	6.34E-05	0.009337
0.000128	0.000166	0.000584	0.000877	14.55558	0.545749	0	15.10133	6.57E-06	2.14E-06	0	8.71E-06	0.002293
0.001293	0.001103	0.003878	0.006274	99.87274	4.859484	0	104.7322	8.25E-05	2.54E-05	0	0.000108	0.015735
0.001387	0.002554	0.00898	0.012921	232.8976	10.76925	0	243.6669	7.35E-05	4.32E-05	0	0.000117	0.036693
0.001747	0.001846	0.006488	0.01008	166.2803	7.938223	0	174.2185	0.000105	3.85E-05	0	0.000144	0.026198
0.000705	0.000948	0.003334	0.004987	83.55944	4.022217	0	87.58166	3.54E-05	1.75E-05	0	5.29E-05	0.013165
1.82E-05	1.55E-05	5.45E-05	8.82E-05	1.388842	0.058168	0	1.44701	1.11E-06	3.11E-07	0	1.42E-06	0.000219

0.000279	0.00038	0.001336	0.001995	31.48982	1.251763	0	32.74158	1.38E-05	5.07E-06	0	1.89E-05	0.004961
5.81E-06	8.05E-06	2.81E-05	4.20E-05	0.716041	0.00577	0	0.721811	3.30E-07	2.63E-08	0	3.56E-07	0.000113
5.91E-06	1.10E-05	3.86E-05	5.56E-05	0.9855	0.007608	0	0.993109	2.84E-07	3.08E-08	0	3.15E-07	0.000155
1.71E-05	2.89E-05	0.000101	0.000147	2.513092	0.025797	0	2.538889	8.96E-07	1.14E-07	0	1.01E-06	0.000396
0.000108	0.00021	0.000734	0.001052	17.24335	0.038538	0	17.28188	4.65E-06	1.57E-07	0	4.80E-06	0.002717
9.00E-05	5.03E-05	0.000176	0.000317	4.498833	0.398204	0	4.897036	5.11E-06	1.57E-06	0	6.69E-06	0.000709
8.59E-05	7.79E-05	0.000273	0.000437	7.055189	0.596477	0	7.651666	5.11E-06	2.20E-06	0	7.31E-06	0.001112
0.000235	0.000107	0.000376	0.000718	9.60055	0.800974	0	10.40152	1.29E-05	4.35E-06	0	1.72E-05	0.001513
0.000482	0.000216	0.000757	0.001455	19.27969	1.254235	0	20.53392	2.71E-05	7.10E-06	0	3.42E-05	0.003038
4.73E-05	0.000114	0.000401	0.000562	9.994988	0.373744	0	10.36873	2.25E-06	1.49E-06	0	3.74E-06	0.001575
8.67E-06	2.15E-05	7.54E-05	0.000106	1.874503	0.070495	0	1.944999	3.92E-07	2.81E-07	0	6.73E-07	0.000295
1.12E-05	2.98E-05	0.000104	0.000145	2.596092	0.079137	0	2.675229	4.79E-07	3.14E-07	0	7.94E-07	0.000409
0.044078	0.046806	0.093747	0.184631	1935.732	146.489	0	2082.221	0.00072	0.003045	0	0.003765	0.304975
0.051625	0.05676	0.113648	0.222033	2273.308	159.537	0	2432.845	0.000859	0.003438	0	0.004297	0.358161
0.019942	0.020616	0.041324	0.081883	840.1275	69.13678	0	909.2643	0.000323	0.001461	0	0.001784	0.132362
0.012997	0.015379	0.031498	0.059874	698.8619	27.94737	0	726.8093	0.000221	0.000531	0	0.000752	0.110106
0.00188	0.001139	0.002793	0.005811	52.10301	2.568936	0	54.67195	9.40E-05	4.08E-05	0	0.000135	0.008209
0.001647	0.003479	0.007276	0.012402	153.0314	5.983893	0	159.0152	3.61E-05	0.000122	0	0.000158	0.02411
0.001651	0.002835	0.005894	0.010379	127.4623	6.429658	0	133.892	4.85E-05	0.000121	0	0.00017	0.020082
0.00191	0.00337	0.006965	0.012246	149.5134	7.456032	0	156.9695	5.42E-05	0.000145	0	0.000199	0.023556
7.78E-05	0.000144	0.000843	0.001065	14.66089	0.241153	0	14.90204	4.42E-07	3.16E-06	0	3.60E-06	0.00231
0.014823	0.019362	0.039326	0.073511	815.0021	59.25969	0	874.2618	0.000332	0.001166	0	0.001498	0.128404
0.000113	0.000276	0.000568	0.000957	12.29063	0.273816	0	12.56445	3.37E-06	5.17E-06	0	8.54E-06	0.001936
7.31E-08	3.98E-07	3.65E-06	4.12E-06	0.029947	0	0	0.029947	5.58E-08	0	0	5.58E-08	4.72E-06

N2O_IDLE	N2O_STRE	N2O_TOTE	ROG_RUNI	ROG_IDLE	ROG_STRE	ROG_TOTE	ROG_DIUR	ROG_HOTS	ROG_RUNI	ROG_TOTA	TOG_RUNE	TOG_IDLE
2.51E-05	0	0.002197	0.001066	2.51E-05	0	0.001091	0	0	0	0.001091	0.001213	2.85E-05
0	0	0.002296	0.001322	0	0	0.001322	0	0	0	0.001322	0.001505	0
0	0	2.72E-05	0.000132	0	0	0.000132	0	0	0	0.000132	0.00015	0
0	0	0.002293	0.00058	0	0	0.00058	0	0	0	0.00058	0.000661	0
0.000437	0	0.059465	0.074134	0.002313	0	0.076447	0	0	0	0.076447	0.084397	0.002633
0.000319	0	0.032307	0.030918	0.001052	0	0.03197	0	0	0	0.03197	0.035198	0.001198
0	0	0.008987	0.001891	0	0	0.001891	0	0	0	0.001891	0.002153	0
0	0	0.00374	0.001679	0	0	0.001679	0	0	0	0.001679	0.001911	0
0.000107	0	0.002413	0.00011	0.000268	0	0.000378	0	0	0	0.000378	0.000125	0.000305
0	0	0.018148	0.00112	0	0	0.00112	0	0	0	0.00112	0.001275	0
0.00026	0	0.003099	0.002093	0.000112	0	0.002205	0	0	0	0.002205	0.002383	0.000128
1.52E-06	0	0.000193	8.64E-06	8.77E-07	0	9.52E-06	0	0	0	9.52E-06	9.84E-06	9.99E-07
2.02E-06	0	0.000266	9.25E-06	1.09E-06	0	1.03E-05	0	0	0	1.03E-05	1.05E-05	1.25E-06
6.83E-06	0	0.000677	2.52E-05	3.90E-06	0	2.91E-05	0	0	0	2.91E-05	2.86E-05	4.44E-06
1.11E-05	0	0.003983	0.000144	6.16E-06	0	0.00015	0	0	0	0.00015	0.000163	7.01E-06
0.000193	0	0.003623	0.000512	0.000134	0	0.000646	0	0	0	0.000646	0.000583	0.000152
0.000182	0	0.003505	0.000233	0.000107	0	0.00034	0	0	0	0.00034	0.000265	0.000122
0.000526	0	0.009864	0.001022	0.000342	0	0.001364	0	0	0	0.001364	0.001164	0.000389
8.60E-05	0	0.002379	0.000142	4.61E-05	0	0.000188	0	0	0	0.000188	0.000161	5.25E-05
0.000766	0	0.016501	0.001776	0.000546	0	0.002322	0	0	0	0.002322	0.002022	0.000622
0.001697	0	0.03839	0.001583	0.00093	0	0.002513	0	0	0	0.002513	0.001802	0.001059
0.001251	0	0.027448	0.002264	0.000829	0	0.003093	0	0	0	0.003093	0.002577	0.000943
0.000634	0	0.013799	0.000763	0.000376	0	0.001139	0	0	0	0.001139	0.000868	0.000428
9.16E-06	0	0.000228	2.39E-05	6.69E-06	0	3.06E-05	0	0	0	3.06E-05	2.72E-05	7.62E-06

0.000197	0	0.005158	0.000297	0.000109	0	0.000406	0	0	0	0.000406	0.000338	0.000124
9.09E-07	0	0.000114	7.10E-06	5.65E-07	0	7.67E-06	0	0	0	7.67E-06	8.08E-06	6.44E-07
1.20E-06	0	0.000156	6.12E-06	6.63E-07	0	6.78E-06	0	0	0	6.78E-06	6.96E-06	7.55E-07
4.06E-06	0	0.0004	1.93E-05	2.45E-06	0	2.17E-05	0	0	0	2.17E-05	2.20E-05	2.79E-06
6.07E-06	0	0.002723	0.0001	3.38E-06	0	0.000103	0	0	0	0.000103	0.000114	3.85E-06
6.27E-05	0	0.000772	0.00011	3.39E-05	0	0.000144	0	0	0	0.000144	0.000125	3.86E-05
9.40E-05	0	0.001206	0.00011	4.74E-05	0	0.000157	0	0	0	0.000157	0.000125	5.39E-05
0.000126	0	0.001639	0.000277	9.37E-05	0	0.000371	0	0	0	0.000371	0.000316	0.000107
0.000198	0	0.003235	0.000584	0.000153	0	0.000737	0	0	0	0.000737	0.000665	0.000174
5.89E-05	0	0.001634	4.84E-05	3.21E-05	0	8.05E-05	0	0	0	8.05E-05	5.51E-05	3.65E-05
1.11E-05	0	0.000306	8.45E-06	6.05E-06	0	1.45E-05	0	0	0	1.45E-05	9.62E-06	6.89E-06
1.25E-05	0	0.000421	1.03E-05	6.77E-06	0	1.71E-05	0	0	0	1.71E-05	1.18E-05	7.70E-06
0.023079	0	0.328055	0.015498	0.065559	0	0.081057	0	0	0	0.081057	0.017644	0.074634
0.025135	0	0.383296	0.018501	0.074016	0	0.092517	0	0	0	0.092517	0.021062	0.084261
0.010893	0	0.143255	0.006952	0.031458	0	0.03841	0	0	0	0.03841	0.007914	0.035813
0.004403	0	0.114509	0.004756	0.011425	0	0.01618	0	0	0	0.01618	0.005414	0.013006
0.000405	0	0.008614	0.002024	0.000878	0	0.002902	0	0	0	0.002902	0.002304	0.001
0.000943	0	0.025053	0.000778	0.002629	0	0.003407	0	0	0	0.003407	0.000886	0.002993
0.001013	0	0.021095	0.001044	0.002606	0	0.003649	0	0	0	0.003649	0.001188	0.002966
0.001175	0	0.024731	0.001167	0.003116	0	0.004283	0	0	0	0.004283	0.001329	0.003547
3.80E-05	0	0.002348	9.52E-06	6.81E-05	0	7.76E-05	0	0	0	7.76E-05	1.08E-05	7.75E-05
0.009336	0	0.13774	0.007147	0.025103	0	0.03225	0	0	0	0.03225	0.008137	0.028577
4.31E-05	0	0.00198	7.25E-05	0.000111	0	0.000184	0	0	0	0.000184	8.26E-05	0.000127
0	0	4.72E-06	1.20E-06	0	0	1.20E-06	0	0	0	1.20E-06	1.37E-06	0

TOG_STRE	TOG_TOTE	TOG_DIUR	TOG_HOTS	TOG_RUNL	TOG_TOTA	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	SOx_RUNE	SOx_IDLEX	SOx_STREX
0	0.001242	0	0	0	0.001242	0.00347	0.000561	0	0.004031	0.000131	1.51E-06	0
0	0.001505	0	0	0	0.001505	0.018222	0	0	0.018222	0.000138	0	0
0	0.00015	0	0	0	0.00015	0.000906	0	0	0.000906	1.64E-06	0	0
0	0.000661	0	0	0	0.000661	0.005666	0	0	0.005666	0.000138	0	0
0	0.08703	0	0	0	0.08703	0.231252	0.019173	0	0.250425	0.00355	2.63E-05	0
0	0.036396	0	0	0	0.036396	0.083417	0.00872	0	0.092137	0.001924	1.92E-05	0
0	0.002153	0	0	0	0.002153	0.03202	0	0	0.03202	0.00054	0	0
0	0.001911	0	0	0	0.001911	0.007554	0	0	0.007554	0.000225	0	0
0	0.000431	0	0	0	0.000431	0.000595	0.003942	0	0.004537	0.000139	6.43E-06	0
0	0.001275	0	0	0	0.001275	0.013351	0	0	0.013351	0.001091	0	0
0	0.002511	0	0	0	0.002511	0.005142	0.002089	0	0.007231	0.000171	1.56E-05	0
0	1.08E-05	0	0	0	1.08E-05	3.92E-05	3.51E-05	0	7.43E-05	1.15E-05	9.17E-08	0
0	1.18E-05	0	0	0	1.18E-05	4.74E-05	4.59E-05	0	9.32E-05	1.58E-05	1.21E-07	0
0	3.31E-05	0	0	0	3.31E-05	0.000122	0.000161	0	0.000283	4.03E-05	4.10E-07	0
0	0.00017	0	0	0	0.00017	0.000785	0.00026	0	0.001045	0.000239	6.70E-07	0
0	0.000735	0	0	0	0.000735	0.001892	0.004377	0	0.006269	0.000206	1.16E-05	0
0	0.000387	0	0	0	0.000387	0.001009	0.004083	0	0.005092	0.0002	1.09E-05	0
0	0.001553	0	0	0	0.001553	0.004015	0.011878	0	0.015893	0.000561	3.16E-05	0
0	0.000214	0	0	0	0.000214	0.000712	0.001816	0	0.002528	0.000138	5.17E-06	0
0	0.002643	0	0	0	0.002643	0.006711	0.017366	0	0.024078	0.000946	4.60E-05	0
0	0.002861	0	0	0	0.002861	0.008305	0.037662	0	0.045967	0.002205	0.000102	0
0	0.003521	0	0	0	0.003521	0.009329	0.028218	0	0.037547	0.001575	7.52E-05	0
0	0.001297	0	0	0	0.001297	0.003772	0.013569	0	0.017341	0.000791	3.81E-05	0
0	3.48E-05	0	0	0	3.48E-05	9.35E-05	0.000207	0	0.000301	1.32E-05	5.51E-07	0

0	0.000462	0	0	0	0.000462	0.00156	0.004184	0	0.005744	0.000298	1.19E-05	0
0	8.73E-06	0	0	0	8.73E-06	2.86E-05	2.13E-05	0	4.99E-05	6.78E-06	5.46E-08	0
0	7.72E-06	0	0	0	7.72E-06	2.97E-05	2.76E-05	0	5.73E-05	9.33E-06	7.20E-08	0
0	2.48E-05	0	0	0	2.48E-05	8.48E-05	9.79E-05	0	0.000183	2.38E-05	2.44E-07	0
0	0.000118	0	0	0	0.000118	0.000548	0.000143	0	0.000691	0.000163	3.65E-07	0
0	0.000164	0	0	0	0.000164	0.000371	0.000843	0	0.001214	4.26E-05	3.77E-06	0
0	0.000179	0	0	0	0.000179	0.000401	0.001468	0	0.001869	6.68E-05	5.65E-06	0
0	0.000422	0	0	0	0.000422	0.000858	0.001891	0	0.002749	9.09E-05	7.58E-06	0
0	0.000838	0	0	0	0.000838	0.001751	0.003034	0	0.004784	0.000183	1.19E-05	0
0	9.16E-05	0	0	0	9.16E-05	0.000257	0.001343	0	0.0016	9.46E-05	3.54E-06	0
0	1.65E-05	0	0	0	1.65E-05	4.82E-05	0.000255	0	0.000303	1.78E-05	6.68E-07	0
0	1.95E-05	0	0	0	1.95E-05	6.32E-05	0.000286	0	0.000349	2.46E-05	7.49E-07	0
0	0.092277	0	0	0	0.092277	0.049979	0.967821	0	1.0178	0.01833	0.001387	0
0	0.105324	0	0	0	0.105324	0.056165	1.092913	0	1.149078	0.021527	0.001511	0
0	0.043726	0	0	0	0.043726	0.022287	0.464437	0	0.486724	0.007956	0.000655	0
0	0.01842	0	0	0	0.01842	0.027724	0.16881	0	0.196534	0.006618	0.000265	0
0	0.003303	0	0	0	0.003303	0.008001	0.006808	0	0.014809	0.000493	2.43E-05	0
0	0.003879	0	0	0	0.003879	0.003514	0.038819	0	0.042333	0.001449	5.67E-05	0
0	0.004155	0	0	0	0.004155	0.00517	0.037635	0	0.042805	0.001207	6.09E-05	0
0	0.004876	0	0	0	0.004876	0.005368	0.044924	0	0.050293	0.001416	7.06E-05	0
0	8.83E-05	0	0	0	8.83E-05	4.21E-05	0.000325	0	0.000367	0.000139	2.28E-06	0
0	0.036714	0	0	0	0.036714	0.029019	0.368418	0	0.397437	0.007718	0.000561	0
0	0.000209	0	0	0	0.000209	0.000376	0.001641	0	0.002017	0.000116	2.59E-06	0
0	1.37E-06	0	0	0	1.37E-06	9.67E-07	0	0	9.67E-07	2.84E-07	0	0

SOx_TOTE›	NH3_RUNE	Fuel Consumption
0.000132	0.002691	1.245609
0.000138	0.000193	1.301569
1.64E-06	1.30E-06	0.015434
0.000138	0.000152	1.300066
0.003576	0.132663	33.71593
0.001943	0.063488	18.31768
0.00054	0.000426	5.095422
0.000225	0.003245	2.120495
0.000145	0.001906	1.368309
0.001091	0.012661	10.28997
0.000186	0.001276	1.756997
1.16E-05	0.000245	0.109376
1.60E-05	0.000338	0.150626
4.07E-05	0.000873	0.383742
0.000239	0.005573	2.258207
0.000218	0.004307	2.054172
0.000211	0.004225	1.987207
0.000593	0.011968	5.592599
0.000143	0.003043	1.348996
0.000992	0.01976	9.355688
0.002307	0.04667	21.76667
0.00165	0.033317	15.56287
0.000829	0.017378	7.823635
1.37E-05	0.000278	0.129261

LHD2 = LHD2 in Energy calc table for VMT and fuel consumption

MMDT = sum of all T6 Vehicles

HHDT = sum of all T7 Vehicles

	Fuel	VMT
MHDT	78.595	711810.7
HHDT	675.101	4288158

0.00031	0.006962	2.924793
6.84E-06	0.000146	0.064479
9.40E-06	0.000202	0.088714
2.40E-05	0.000526	0.226798
0.000164	0.003849	1.543784
4.64E-05	0.000616	0.43745
7.25E-05	0.001124	0.68352
9.85E-05	0.00136	0.929164
0.000194	0.002782	1.834287
9.82E-05	0.002094	0.926235
1.84E-05	0.000394	0.173746
2.53E-05	0.000546	0.238977
0.019717	0.286037	186.004
0.023038	0.346867	217.3251
0.00861	0.125989	81.22422
0.006882	0.093985	64.92558
0.000518	0.003484	4.883823
0.001506	0.021263	14.20477
0.001268	0.017314	11.96052
0.001486	0.020586	14.02202
0.000141	0.000162	1.331193
0.008279	0.118313	78.09746
0.000119	0.001689	1.122377
2.84E-07	7.30E-06	0.002675
		830.2262
		0.830226
		303.0326

WESTERN RIVERSIDE COUNTY MULTIPLE SPECIES HABITAT CONSERVATION PLAN CONSISTENCY ANALYSIS AND BIOLOGY REPORT

CALVARY CHAPEL EXPANSION PROJECT

BEAUMONT, RIVERSIDE COUNTY, CALIFORNIA

MSHCP PERMITTEE:

BEAUMONT

LSA

August 2025

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BEAUMONT

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LSA Project No. 20242107

LSA

August 2025

EXECUTIVE SUMMARY

Matlock Design Build Inc. retained LSA to conduct a Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) consistency analysis and general biological study of the approximately 5.5-acre Calvary Chapel Expansion Project (project) within Assessor's Parcel Number (APN) 408-070-012. The project is located on the southeast corner of Orchard Heights Avenue and Brookside Avenue in Beaumont, Riverside County, California. LSA conducted the study to address compliance with the MSHCP and the California Environmental Quality Act (CEQA) and for the identification of potential jurisdictional waters. Results of the MSHCP consistency analysis and general biological study are summarized below.

- One aquatic feature (identified as Feature 1 [F-1]) is present on the project site. F-1 is a man-made, seasonally wet shallow depression. Because F-1 is a man-made water quality basin, is isolated in nature, and is not a tributary of a traditionally navigable water, F-1 is not subject to the jurisdiction by the United States Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB) Porter-Cologne Water Quality Control Act, or the California Department of Fish and Wildlife (CDFW) jurisdiction to Section 1602 of the California Fish and Game Code.

- The site does not contain riverine/riparian areas as defined in the MSHCP. Therefore, focused surveys will not be required for sensitive riparian birds.

- The project site is not within an MSHCP designated Criteria Area.

- F-1 is not subject to compliance with MSHCP Section 6.1.2, Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools, due to the basin being artificially created and not containing wetland indicators of soils, vegetation, and hydrology; therefore, F-1 is not a vernal pool. A fairy shrimp habitat assessment was conducted in December 2024, which determined F-1 would not support the necessary hydrological period for fairy shrimp species, including those covered under the MSHCP. Therefore, no fairy shrimp habitat is present, and focused surveys will not be required for fairy shrimp species.

- The project site is located within the MSHCP survey area for burrowing owl (*Athene cunicularia* [BUOW]). The undeveloped areas of the site contain suitable soils for burrowing and four potential burrows that may be suitable for BUOW occupation were observed. As a result, focused BUOW surveys were conducted in accordance with MSHCP protocol between March 5 and April 30, 2025. Evidence of BUOW activity was observed at one of the four suitable burrows on-site. Given the presence of appropriate habitat and observed BUOW sign and activity on site, a pre-construction survey will be required within 30 days prior to any ground-disturbing activities. A Determination of Biologically Equivalent or Superior Preservation (DBESP) is also required under the MSHCP to document avoidance or justify unavoidable impacts to this species and to describe and commit to the implementation of an appropriate mitigation strategy to be approved by the wildlife resource agencies.

- The project site is within an MSHCP Narrow Endemic Plant Species Survey Area (NEPSSA) for two plant species: many-stemmed dudleya (*Dudleya multicaulis*) and Marvin's onion (*Allium marvinii*). NEPSSA species were not observed during the surveys and the project site lacks the soil requirements for these species. Therefore, the project will have no impact on NEPSSA species.

- The project site is not within an MSHCP designated survey area for any other species and does not contain Delhi series soils. Therefore, no surveys for other species will be required.

- Pursuant to the Urban/Wildlands Interface guidelines presented in MSHCP Section 6.1.4, the project will not be subject to MSHCP Urban/Wildlands interface requirements because the site is not within or adjacent to an identified Conservation Area.

- The project is within the Stephens' Kangaroo Rat Habitat Conservation Plan area, and payment of the appropriate fees will be required.

- The project site does contain marginally suitable habitat for species considered not adequately conserved as described in MSHCP Table 9-3. Suitable habitat for Parry's spineflower (*Chorizanthe parryi* var. *parryi*) and Plummer's mariposa lily (*Calochortus plummerae*) is present on the project site. Although these species are included in MSHCP Table 9-3, they are now considered adequately conserved. Therefore, no surveys for species listed in MSHCP Table 9-3 are required.

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LIST OF ABBREVIATIONS AND ACRONYMS

APN	Assessor's Parcel Number
ARL	additional reserve lands
BIOS	Biogeographic Information and Observation System
BUOW	burrowing owl
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cm	centimeter(s)
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	Clean Water Act
EONDX	Element Occurrence Index
F-1	Feature 1
FAC	facultative
FACU	facultative upland
GPS	global positioning system
HCP	Habitat Conservation Plan
IPaC	Information for Planning and Consultation
MSHCP	Multiple Species Habitat Conservation Plan
NEPSSA	Narrowly Endemic Plant Species Survey Area
NETR	Nationwide Environmental Title Research, LLC
NRCS	National Resources Conservation Service
OHWM	ordinary high water mark
project	Calvary Chapel Expansion Project

RCA	Regional Conservation Authority
RWQCB	Regional Water Quality Control Board
SKR	Stephens' kangaroo rat
SKR HCP	Stephens' Kangaroo Rat Habitat Conservation Plan
UPL	upland
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WOTS	waters of the State
WOTUS	waters of the United States

1.0 INTRODUCTION

Matlock Design Build Inc. retained LSA to conduct a Multiple Species Habitat Conservation Plan (MSHCP) consistency analysis and general biological study of the approximately 5.5-acre Calvary Chapel Expansion Project (project) within Assessor's Parcel Number (APN) 408-070-012. The project is located on the southeast corner of Orchard Heights Avenue and Brookside Avenue in Beaumont, Riverside County, California (see Figure 1; all figures are provided in Appendix A). LSA conducted the study to address compliance with the MSHCP and California Environmental Quality Act (CEQA) and identify potential jurisdictional waters. The study included a general biological resources assessment, jurisdictional delineation, and burrowing owl (BUOW; *Athene cunicularia*) burrow survey on December 11, 2024, by LSA biologists Kelly McDonald and Jenna Wedworth and a follow up visit to assess the site for vernal pools and fairy shrimp habitat on December 18, 2024, by LSA botanist Dr. Stan Spencer.

1.1 PROJECT AREA

The project site consists of APN 408-070-012 and is approximately 5.5 acres (Figure 2). The proposed project also includes a Conditional Use Permit for the expansion of the existing Calvary Chapel Beaumont institutional facility on the northernmost, 4.85-acre parcel. The remainder 0.64-acre lot will remain vacant.

1.2 PROJECT DESCRIPTION

The proposed project is for the expansion of an existing church facility that includes the construction of three (3) new buildings, Building A (an approximately 11,000-square-foot worship building with adjoining offices), Building B (an approximately 5,000-square-foot children's center) and Building D (an approximately 7,700-square-foot teen center) on the property, along with associated drive isles, recreational area, baptismal, site utilities, and adjacent street pavement improvements. The existing facility consists of partial parking improvements, Building C (a 3,000-square-foot worship building that will remain), and six (6) portable trailers that will be removed. There will be approximately 23,700 square feet of new building area (Figure 2). A Tentative Parcel Map is also proposed to create a project site of approximately 4.75 acres and a Not-A-Part Lot that could be improved with single-family residences in the future.

1.3 GENERAL SETTING

The project site is located at 1780 Orchard Heights Avenue (APN: 408-070-012), which is at the southeast corner of Orchard Heights Avenue and Brookside Avenue and approximately 2,000 feet west of Highland Springs Avenue. Specifically, the project location is depicted on the United States Geological Survey (USGS) *Beaumont, California* topographical quadrangle map in Section 35, Township 2 South, Range 1 West San Bernardino Principal Meridian (USGS 2024) (Figure 1). The site elevation is approximately 2,820 feet above mean sea level. The mapped soil on the project site is Hanford coarse sandy loam, 2 to 8 percent slopes (HcC) (National Resources Conservation Service [NRCS] 2024) (Figure 3). Observed soils throughout the site appear to be consistent with this designation. The project site is currently an active church that sees regular activity and traffic.

Residential areas surround the project site to the north, east, and west. South of the project site, there is a partially developed lot with a single-family home and an undeveloped nonnative grassland.

2.0 RESERVE ASSEMBLY ANALYSIS

2.1 CELL AND CRITERIA ANALYSIS

The MSHCP provides for the assembly of a Conservation Area consisting of Core Areas and Linkages for the conservation of covered species. The Conservation Area is to be assembled from portions of the MSHCP Criteria Area, which consist of quarter-section (i.e., approximately 160 acres) Criteria Cells, each with specific criteria for the species conservation within that cell.

The project site is not within the MSHCP Criteria Area; therefore, no cell or criteria analysis is required.

2.2 PUBLIC/QUASI-PUBLIC LANDS ANALYSIS

The project site is not within or adjacent to public/quasi-public lands; therefore, no additional public/quasi-public lands analysis is required. It should also be noted that the project site is not located within or adjacent to MSHCP additional reserve lands (ARL) or non-MSHCP conservation easements.

3.0 VEGETATION

Vegetation within the project site was classified using *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009). The project site is highly disturbed due to the development of the chapel in 2009. Based on a review of historic aerial photographs and topographic maps of the project site extending back to the mid-1960s (Nationwide Environmental Title Research, LLC [NETR] 2023), the project site consisted of undeveloped land until at least 2009 when the development of the site began. Since 2009, the site has seen consistent traffic every Sunday as well as throughout the week. Any undeveloped areas of the site are used an overflow parking for activities happening onsite.

As a result, the vegetation on the project site is primarily bare ground but also includes ornamental vegetation and nonnative grassland (Table A). A complete list of plant species observed on the site is included in Appendix B. Figure 4 shows vegetation communities/land cover and photograph locations and site photographs are provided in Figure 7.

Table A: Mapped Vegetation/Land Cover Classifications and Impacts

Vegetation/Land Cover	Project Site		
	Project Site (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)
Bare ground	1.92	0.00	1.92
Developed	2.69	0.00	2.69
Nonnative grassland	0.87	0.00	0.24
TOTAL	**5.48**	**0.00**	**4.85**

Source: Compilation from field surveys conducted by LSA (2024).

3.1 BARE GROUND

A total of 1.92 acres of bare ground is present throughout the project site. This landcover type lacks vegetation and is not associated with a natural vegetation community.

3.2 DEVELOPED

2.69 acres of developed habitat occurs throughout most of the project site and is comprised of paved areas, ornamental vegetation, and buildings.

3.3 NONNATIVE GRASSLAND

0.87 acre of nonnative grassland is present on the southern border of the project site. Dominant species include rattail sixweek grass (*Festuca myuros*), redstem stork's bill (*Erodium cicutarium*), and annual bur-weed (*Ambrosia acanthicarpa*). There is no corresponding semi-natural alliance for this vegetation within *A Manual of California Vegetation, Second Edition*. As such, this vegetation community is described as nonnative grassland.

4.0 PROTECTION OF SPECIES ASSOCIATED WITH RIPARIAN/RIVERINE AREAS AND VERNAL POOLS (MSHCP SECTION 6.1.2)

Section 6.1.2 of the MSHCP requires assessment of impacts to riparian habitats, riverine areas, and vernal pools, including focused surveys for sensitive riparian bird and fairy shrimp species when suitable habitat is present. The intent of the assessment requirement is to provide for the protection of resources used by MSHCP covered species, as well as existing and future downstream conservation areas. Riverine/riparian areas and vernal pools are defined in Section 6.1.2 of the MSHCP as follows:

> **Riparian/Riverine Areas** are lands which contain Habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year.
>
> **Vernal pools** are seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. The determination that an area exhibits vernal pool characteristics, and the definition of the watershed supporting vernal pool hydrology, must be made on a case-by-case basis. Such determinations should consider the length of the time the area exhibits upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soils, and drainage characteristics, uses to which it has been subjected, and weather and hydrologic records.
>
> **Fairy Shrimp.** For Riverside, vernal pool, and Santa Rosa fairy shrimp, mapping of stock ponds, ephemeral pools and other features shall also be undertaken as determined appropriate by a qualified biologist.
>
> With the exception of wetlands created for the purpose of providing wetland habitat or resulting from human actions to create open waters or from the alteration of natural stream courses, areas demonstrating characteristics as described above which are artificially created are not included in these definitions.

4.1 RIPARIAN/RIVERINE AREAS

4.1.1 Methods

The project site was assessed for riparian/riverine areas at the time of the December 11, 2024, site visit. The assessment included identification and mapping of plant communities on the site as well as any drainage features.

4.1.2 Existing Conditions and Results

There are no drainage features or riparian vegetation on the project site; therefore, there are no areas that would meet the MSHCP definition of riparian/riverine areas.

4.2 VERNAL POOLS

4.2.1 Methods

The project site was assessed for the presence of potential vernal pools by LSA botanist Dr. Stan Spencer, on December 18, 2024. The assessment included a search for depressions that may provide sufficient ponding of water to sustain hydrophytic vegetation and create hydric soil conditions during the growing season. The assessment also included a review of seasonally appropriate aerial photographs from Google Earth.

4.2.2 Existing Conditions and Results

A small water quality basin (identified as Feature 1 [F-1]) was identified at the southwest corner of the site. For a depression to be considered a vernal pool under the MSHCP, it must have wetlands indicators of all three parameters (soils, vegetation, and hydrology) and must not be artificially created. The basin was artificially created and does not have wetland indicators of soils, vegetation, and hydrology; therefore, it is not a vernal pool. There are no other features on the site that would qualify as vernal pools.

4.3 FAIRY SHRIMP

4.3.1 Methods

The project site was assessed for fairy shrimp habitat by Dr. Spencer at the same time and using the same methods as the vernal pool assessment. The MSHCP calls for habitat assessments for three sensitive species of fairy shrimp: Santa Rosa Plateau fairy shrimp (*Linderiella santarosae*), Riverside fairy shrimp (*Streptocephalus woottoni*), and vernal pool fairy shrimp (*Branchinecta lynchi*). The Santa Rosa Plateau fairy shrimp occurs only on the Santa Rosa Plateau of extreme southwestern Riverside County. A fourth sensitive species of Southern California, the San Diego fairy shrimp (*Branchinecta sandiegonensis*), is found primarily in coastal areas of Orange and San Diego counties. It has been found as far inland as the Wildomar area of southwest Riverside County but is not expected in the project area. These sensitive fairy shrimp species inhabit vernal pools as well as stock ponds, large road ruts, and other similar habitats that pond water long enough to allow growth and reproduction. To provide fairy shrimp habitat, a feature must regularly pond water for at least 18 days for vernal pool fairy shrimp (Eriksen and Belk 1999) and 2 months for Riverside fairy shrimp (United States Fish and Wildlife Service [USFWS] 2012).

4.3.2 Existing Conditions and Results

The only substantial depressional feature on the site is F-1. This feature has upland vegetation and lacks indicators of hydrology or hydric soils. For this feature to provide habitat for sensitive fairy shrimp species, it would need to regularly pond for at least 18 days. This length of ponding would create wetland conditions, including indicators of hydrology, growth of hydrophytic vegetation, and hydric soils. The absence of these characteristics indicates that this feature does not pond water long enough to provide habitat for sensitive fairy shrimp species. The feature has no biological signs of prolonged ponding, such as shells of aquatic invertebrates, algal mats, or hydrophytic plants, which indicates that this feature generally does not regularly pond water long enough for these organisms to complete their life cycles, and certainly not for the 18 days that would be required to support vernal pool fairy shrimp or the 2 months or more that would be needed to support Riverside fairy shrimp. Based on the results of the habitat assessment, the study area does not contain habitat for any sensitive fairy shrimp species, and no additional studies or assessments are be needed for sensitive fairy shrimp species.

4.4 RIPARIAN BIRDS

4.4.1 Methods

Habitat suitability for riparian birds, including least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and yellow-billed cuckoo (*Coccyzus americanus*), was assessed in conjunction with the assessment for riverine/riparian areas.

4.4.2 Existing Conditions and Results

Riparian/riverine areas or any habitat suitable for riparian birds is absent from the project site. Therefore, no surveys for riparian birds will be required.

5.0 PROTECTION OF NARROW ENDEMIC PLANT SPECIES (MSHCP SECTION 6.1.3)

Section 6.1.3 of the MSHCP requires focused surveys for specified sensitive plant species if a project is within a Narrowly Endemic Plant Species Survey Area (NEPSSA) and suitable habitat is present.

The project lies within NEPSSA 8, which requires a focused habitat assessment for the plant species listed below in Table B. The probability for special-status species to occur, including NEPSSA species, was assessed based on the following criteria: direct observation of the species or its sign within the BSA or immediate vicinity during biological surveys conducted for the project; recorded observations on site by other qualified biologists; reported sightings in the surrounding region by the CNDDB or CNPS; and the species' distribution, elevation range, and habitat requirements.

Table B: MSHCP Narrow Endemic Plant Survey Species

Species	Status	MSHCP Habitat	Growth Form and Blooming Period	Occurrence Probability
Marvin's onion *Allium marvinii*	US: – CA: – CRPR:1B.2 MSHCP: S	Openings in clay soils in chaparral. Known only from the Yucaipa and Beaumont areas of the San Bernardino Mountains; 760 to 1,065 meters (2,500 to 3,500 feet) elevation.	Blooms April through May (perennial bulbiferous herb)	**Absent.** No clay soil, rocky outcrops or chaparral habitat is present.
Many-stemmed dudleya *Dudleya multicaulis*	US: – CA: – CRPR: 1B.2 MSHCP: S	Heavy, often clay soils or around granitic outcrops in chaparral, coastal sage scrub, and grassland below 790 meters (2,600 feet) elevation. Known only from Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties.	Blooms April through July (perennial herb)	**Absent.** No clay soils or granitic outcrops.

Sources: California Natural Diversity Database (CNDDB) (CDFW 2024); Biogeographic Information and Observation System (BIOS) (CDFW n.d.); California Native Plant Society (CNPS 2024); and Information for Planning and Consultation (IPaC) database (USFWS n.d.)

US: Federal Classifications
FE = Listed as endangered.

CA: State Classifications
SA = Special Animal. Refers to any other animal monitored by the Natural Diversity Database, regardless of its legal or rarity status.
SSC = Species of Special Concern. Refers to animals with vulnerable or seriously declining populations.
SR = State listed as rare.

CNPS CRPR Designations
1B.1 = Rare threatened, or endangered in California and elsewhere
1B.2 = Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California
1B.3 = Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California
2B.1 = Plants rare, threatened, or endangered in California, but more common elsewhere; seriously threatened in California
2B.2 = Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California
2B.3 = Plants rare, threatened, or endangered in California, but more common elsewhere; not very threatened in California

Western Riverside County MSHCP Status
S = Species is covered and adequately conserved under the MSHCP, but surveys are required within indicated habitats and/or survey areas.

CA = California
CDFW = California Department of Fish and Wildlife
CNPS = California Native Plant Society
CRPR = California Rare Plant Rank
MSHCP = Multiple Species Habitat Conservation Plan
US = United States
USFWS = United States Fish and Wildlife Service

5.1 METHODS

A habitat suitability assessment for Marvin's onion (*Allium marvinii*) and many-stemmed Dudleya (*Dudleya multicaulis*) was conducted during the December 11, 2024, site visit. The assessment included evaluation of soils, identification of plant species and communities, and investigation of landforms and evidence of past hydrologic conditions on the project site relative to the habitat requirements summarized for each narrow endemic plant species. The assessment also included a review of aerial photographs to look at historical vegetation patterns and for areas of ponding that could provide habitat for vernal pool plants. Based on the disturbed site conditions and lack of suitable clay soils, granitic outcrops, and rock outcrops, suitable habitat is absent for Marvin's onion and many-stemmed dudleya. Therefore, no focused surveys for the two NEPSSA species are recommended.

5.2 EXISTING CONDITIONS AND RESULTS

No suitable habitat was found to be present for Marvin's onion and many-stemmed dudleya.

5.3 IMPACTS AND MITIGATION

Based on the lack of suitable habitat for Marvin's onion and many-stemmed dudleya, the project is not anticipated to impact NEPSSA plants.

6.0 ADDITIONAL SURVEY NEEDS AND PROCEDURES (MSHCP SECTION 6.3.2)

MSHCP Section 6.3.2 requires surveys for additional plants, amphibians, small mammals, and BUOW for projects within mapped survey areas.

6.1 CRITERIA AREA PLANT SPECIES

The project is not within a mapped survey area for Criteria Area Species Survey Area plant species; therefore, no surveys for Criteria Area plant species are required.

6.2 AMPHIBIANS

The project is not within a mapped survey area for amphibian species.

6.3 BURROWING OWL

The project site is within the MSHCP BUOW survey area. BUOW is found in open, dry grasslands, agricultural and rangelands, and desert habitats often associated with burrowing animals. It can also inhabit grass, forb, and shrub stages of pinyon and ponderosa pine habitats. It nests in abandoned burrows of ground squirrels or other animals, in pipes, under piles of rock or debris, and in other similar features.

6.3.1 Methods

Habitat suitability for BUOW was assessed during the December 11, 2024, site visit by LSA biologists Kelly McDonald and Jenna Wedworth. The assessment included an evaluation of soil texture; vegetative cover; topography; and the presence of mammal burrows, rock piles, or other areas suitable for nest construction. Due to the presence of suitable habitat within an MSHCP BUOW survey area, a BUOW burrow survey was conducted at the time of the site visit in accordance with *County of Riverside Guidelines for Burrowing Owl Surveys* (revised March 29, 2006) (County of Riverside 2006). Four potential BUOW burrows were observed and were mapped using a handheld global positioning system (GPS) unit.

Focused BUOW surveys were conducted by LSA biologist Chrissy Kent according to the *County of Riverside Guidelines for Burrowing Owl Surveys* (revised March 29, 2006). A total of four surveys were conducted from March 3 to April 30, 2025. Suitable habitat was surveyed on foot along 30-meter transects with the aid of binoculars. Surveyors looked for BUOWs, potential burrows (burrows greater than 11 centimeters [cm] in diameter and 150 cm deep), and BUOW sign. Potential burrows encountered during the survey were mapped using a handheld global positioning system (GPS) unit and examined for owl sign (e.g., feathers, pellets, whitewash, and prey remnants).

6.3.2 Existing Conditions and Results

Four burrows suitable for BUOW occupancy were observed on the project site. Each had an entrance diameter ranging from 11 to 13 cm and extended to a depth of at least 150 cm. One of these burrows showed evidence of BUOW activity, including whitewash around the entrance and a feather, both observed during the April 14, 2025, survey. Despite rain events between visits, the

whitewash remained visible during the follow-up survey on April 30, 2025. Although no BUOWs were directly observed during the surveys, this burrow was classified as occupied based on the presence of these signs. The remaining three suitable burrows showed no evidence of owl use and were considered unoccupied.

Because portions of the project site and adjacent areas are suitable for BUOW and because BUOW could occupy these areas prior to construction, a pre-construction BUOW survey will be required within 30 days prior to ground disturbance.

6.3.3 Impacts and Mitigation

Since BUOW was detected during the focused surveys, a Determination of Biologically Equivalent or Superior Preservation (DBESP) is required under the MSHCP to document avoidance or justify unavoidable impacts to this species and to describe and commit to the implementation of an appropriate mitigation strategy to be approved by the wildlife resource agencies.

If BUOW is found during the preconstruction survey, the project proponent will need to inform California Department of Fish and Wildlife (CDFW) and prepare a BUOW Protection and Relocation Plan for agency approval prior to initiating ground disturbance.

6.4 MAMMALS

The project is not within a mapped survey area for mammals.

7.0 INFORMATION ON OTHER SPECIES

7.1 DELHI SANDS FLOWER-LOVING FLY

The MSHCP requires surveys for the Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*) in most areas of mapped Delhi series soils where suitable habitat exists (MSHCP Section 9).

The project site is not within an area of mapped Delhi soils, and (as noted in Section 1.3, above) the soil mapped and observed throughout the site is sandy loam, which is inconsistent with Delhi soils; therefore, no survey or additional analysis is required for this species.

7.2 SPECIES NOT ADEQUATELY CONSERVED

Some species that will eventually have full coverage under the MSHCP are not considered adequately conserved until the requirements indicated in Table 9-3 of the MSHCP are met.

7.2.1 Methods

A literature review was conducted to investigate the potential occurrence of special-status species on the project site or in the vicinity[1]. Database records for a 3-mile radius of the project site were also searched on December 6, 2024, using RareFind 5 (CDFW 2024) to help aid in occurrence determinations.

7.2.2 Existing Results

Two species, Parry's spineflower (*Chorizanthe parryi* var. *parryi*) and Plummer's mariposa lily (*Calochortus plummerae*), listed in MSHCP Table 9-3, have been reported within a 3-mile radius of the project site. Based on the lack of suitable habitat on site, neither species are expected to occur, as described below in Table C. In addition, the Western Riverside County Regional Conservation Authority (RCA) frequently provides updates to MSHCP Table 9-3 to determine if conservation requirements for each of the species have been met. Based on the Western Riverside County RCA's January 21, 2022, update, Parry's spineflower and Plummer's mariposa lily have met their MSHCP Table 9-3 requirement and are considered adequately conserved (Western Riverside County RCA 2022). Therefore, focused surveys and mitigation are not required.

[1] LSA conducted a literature review to assist in determining the potential occurrence of special-status plant and animal species within a 3-mile radius of the project site. This includes using sources such as USGS (2024), CDFW (2024), CNPS (2024), USFWS (2024), and Google Earth (2024).

Table C: MSHCP Species Not Adequately Conserved

Species	Status	MSHCP Habitat	Blooming Period/ Activity Period	Occurrence Probability
Chorizanthe parryi var. *parryi* **Parry's spineflower**	US: – CA: – CRPR:1B.1 MSHCP: C	Annual herb. Sandy or rocky soils in chaparral, coastal scrub, oak woodlands, and grassland at 40 to 1,705 meters (100 to 5,600 feet). Known only from Los Angeles, Riverside, and San Bernardino counties.	Blooms April through June	**Absent.** No suitable habitat within the project site. Three known records of occurrence within the CNDDB database within 3 miles of the project site, the most recent is from 2015 (EONDX 73483), this record is presumed extant.
Calochortus plummerae **Plummer's mariposa-lily**	US: – CA: – CRPR: 4.2 MSHCP:C (P)	Rocky sites of granitic or alluvial material in valley and foothill grassland, coastal scrub, chaparral, cismontane woodland, and lower montane coniferous forest, at 100 to 1,700 meters (300 to 5,600 feet) elevation. Known from Riverside, San Bernardino, Orange, Los Angeles, and Ventura Counties, California. In the western Riverside County area, this species is known from the foothills of the San Bernardino Mountains, northeastern Santa Ana Mountains, Box Springs Mountains, and from the Lake Skinner area (*The Vascular Plants of Western Riverside County*, California. F.M. Roberts et al., 2004). Appears to intergrade with *Calochortus weedii* var. *intermedius,* which is mostly from Santa Ana Mountains eastward.	Blooms May through July (perennial herb)	**Absent.** No suitable habitat within the project site. One known record of occurrence within the CNDDB database within 3 miles of the project site from 2008 (EONDX 81705), this record is presumed extant.

Sources: California Natural Diversity Database (CNDDB) (CDFW 2024); Biogeographic Information and Observation System (BIOS) (CDFW n.d.); and Information for Planning and Consultation (IPaC) database (USFWS n.d.)

CNPS CRPR Classifications

1B.1 = Rare threatened, or endangered in California and elsewhere; seriously threatened in California

4.2 = Watch list, plants of limited distribution or are infrequent throughout the broader area for California

Western Riverside County MSHCP Status

C = Species is covered and adequately conserved under the MSHCP

P = Species is covered and would be adequately conserved when MSHCP specified requirements are met

CA = California

CDFW = California Department of Fish and Wildlife

CNPS = California Native Plant Society

CRPR = California Rare Plant Rank

EONDX = Element Occurrence Index

MSHCP = Multiple Species Habitat Conservation Plan

US = United States

USFWS = United States Fish and Wildlife Service

8.0 GUIDELINES PERTAINING TO THE URBAN/WILDLANDS INTERFACE (MSHCP SECTION 6.1.4)

To preserve the integrity of areas described as existing or future MSHCP Conservation Areas, the guidelines contained in MSHCP Section 6.1.4 (Urban Wildlands Interface Guidelines) are to be implemented for projects adjacent to either existing conservation or land described for conservation in the MSHCP Criteria Area.

The project site is not adjacent to conserved lands or lands in a Criteria Area described for conservation. Therefore, the Urban Wildlands Interface Guidelines do not apply to this project.

9.0 POTENTIAL JURISDICTIONAL WATERS AND STREAMBEDS

9.1 UNITED STATES ARMY CORPS OF ENGINEERS JURISDICTION

9.1.1 Jurisdictional 404 Waters of the United States

A small water quality basin (F-1) is present at the southwest corner of the site (Figure 6). The basin was constructed between December 2006 and January 2009 (Google Earth Pro 2006–2009). A 1.5-foot diameter plastic corrugated pipe enters the basin from the north but is mostly filled with dirt and does not appear to have conducted flows during the past wet season. Runoff enters the basin from a swale to the east as sheet flow. Although a drainage feature with bed and bank appears in this area in imagery from closer to the time of construction (Google Earth Pro 2009–2011), no drainage feature connecting to the basin is visible in the most recent imagery (Google Earth Pro 2022–2024), and no such feature was visible during the December 11 or 18, 2024, site visits. No ordinary high water mark (OHWM) or wetland hydrology indicators (e.g. soil cracks, biotic crusts, sediment deposits, etc.) were visible at the time of the site visits. A 16-inch soil pit was dug during the December 18, 2024, visit. No hydric soil indicators or hydrophytic vegetation was present. Fescue was the dominant plant within the basin and is classified as a facultative upland (FACU) species (i.e., usually occurring in non-wetlands). The other species present included flax-leaved horseweed (*Erigeron bonariensis*), common sow thistle (*Sonchus oleraceus*), shortpod mustard (*Hirschfeldia incana*), Spanish clover (*Acmispon americanus*), bur-clover (*Medicago polymorpha*), redstem stork's bill, and common knotweed (*Polygonum aviculare*). All these species are classified as upland (UPL) or FACU species except common knotweed, which is facultative (FAC), meaning it is equally likely to occur in wetlands and non-wetlands. On the project site, this species is common both within and outside the basin.

Based on the results of the jurisdictional delineation, feature F-1 is a man-made, seasonally wet shallow depression (Figure 6). The feature is isolated with no connection to any tributary of a traditionally navigable water and is not anticipated to be subject to United States Army Corps of Engineers (USACE) jurisdiction under Section 404 of the Clean Water Act (CWA).

9.2 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE JURISDICTION

9.2.1 Jurisdictional 1602 Streambeds and Associated Riparian Habitat

In accordance with Section 1602 of the California Fish and Game Code, CDFW asserts jurisdiction over rivers, streams, and lakes, as well as any riparian vegetation associated with those features. There are no rivers, streams, lakes, or riparian vegetation that are associated with F-1 or adjacent to the project site (Figure 6). Therefore, permitting under CDFW jurisdiction will not be required.

9.3 REGIONAL WATER QUALITY CONTROL BOARD JURISDICTION

9.3.1 Jurisdictional 401 Waters of the State

All areas determined to be waters of the United States (WOTUS) under both current and historic USACE definitions and guidelines are also considered to be waters of the State (WOTS). However, Regional Water Quality Control Board (RWQCB) jurisdiction often extends beyond the limits of USACE jurisdiction and may also include areas not identified as subject to USACE jurisdiction.

Although there are specific procedures for delineating State wetlands (State Water Resources Control Board 2019), there is currently no formal statewide guidance on determining RWQCB non-wetland WOTS. Each RWQCB has the discretion to determine the occurrence and extent of jurisdictional non-wetland WOTS. In this particular case, there are no WOTUS that meet the USACE current definitions.

F-1 did not contain standing water at the time of the field survey, and no OHWM was observed (Figure 6). Furthermore F-1 has an insignificant topographic depression of approximately 1 foot in elevation and is not expected to contain standing water during ordinary precipitation events; therefore, F-1 is not considered subject to RWQCB jurisdiction pursuant to Section 401 of the CWA and/or the Porter-Cologne Water Quality Control Act.

10.0 NESTING BIRDS

During the bird breeding season (typically February 1 through August 31), electrical distribution poles and large trees on or adjacent to the project site may be used by hawks, ravens, or other large birds for nesting. Trees, shrubs, and other vegetation may provide nest sites for smaller birds, and BUOWs may nest in ground squirrel burrows, pipes, or similar features. Most birds and their active nests are protected from "take" (meaning destruction, pursuit, possession, etc.) under the Migratory Bird Treaty Act and/or Sections 3503 through 3801 of the California Fish and Game Code. Activities that cause destruction of active nests, or that cause nest abandonment and subsequent death of eggs or young, may constitute violations of one or both of these laws.

If vegetation is to be removed during the nesting season (February 1 through August 31), a preconstruction nesting bird survey shall be conducted, and avoidance measures shall be taken to ensure that no take of birds or their nests will occur.

11.0 CEQA COMPLIANCE

11.1 ADOPTED HABITAT CONSERVATION PLANS

Section 10(a)(2)(A) of the 1973 Federal Endangered Species Act requires the preparation of a Habitat Conservation Plan (HCP) for incidental take of threatened or endangered species when there is no federal agency involvement in a project. Continuing land development may cause incidental take of listed species; therefore, HCPs have been prepared for areas within western Riverside County. The MSHCP and the Stephens' Kangaroo Rat Habitat Conservation Plan (SKR HCP) are the principal HCPs in western Riverside County. The USFWS regional office maintains a current list of HCPs for the Southern California region.

The project site is within the MSHCP area and within the SKR HCP fee area. Because the project site is within the SKR HCP, focused surveys for Stephens' kangaroo rat (SKR; *Dipodomys stephensi*) are not required, but a fee associated with the SKR HCP will be required. The project site is not subject to any other adopted HCP.

11.2 THREATENED AND ENDANGERED SPECIES

The USFWS and the CDFW may list species as threatened or endangered or Candidates for listing under the federal Endangered Species Act and the California Endangered Species Act. The USFWS can designate critical habitat that identifies specific areas, either occupied or unoccupied, that are essential to the conservation of a listed species. Critical habitat areas may require special management considerations or protections. The USFWS and the CDFW have issued permits for the take of most threatened and endangered species within the MSHCP area. The MSHCP covers impacts to these species. However, if a project has the involvement of a federal agency, that agency is required to address impacts to listed species and critical habitat by consulting with the USFWS. The USFWS has indicated in the permit issued for the MSHCP that, in such cases, the consultation will be expedited, and no restrictions will be imposed on the project beyond those specified in the MSHCP.

No critical habitat occurs on the project site. Four federal and/or State-listed species have been reported within 3 miles of the project site according to California Natural Diversity Database records: Crotch's bumble bee (*Bombus crotchii*), BUOW, western spadefoot (*Spea hammondii*), southern rubber boa (*Charina umbratica*) and SKR. Table D describes the habitat requirements for all four species, along with an assessment of habitat and the likelihood of the species occurring on the site.

11.3 OTHER SPECIAL-STATUS SPECIES

Other special-status species may occur on the project site. The CDFW; the USFWS; local agencies; and special interest groups, such as the California Native Plant Society (CNPS), maintain lists of species they consider to need monitoring. Legal protection for special-status species varies widely.

Table D: Threatened and Endangered Species

Species	Status	MSHCP Habitat	Blooming Period/ Activity Period	Occurrence Probability
Invertebrates				
Bombus crotchii **Crotch's bumble bee**	US: – CA: SCE	Inhabits open scrub (including chaparral) and grassland from coastal California to crest of Sierra-Cascade and in desert edge areas, south into Mexico. Primarily nests underground. Suitable bumble bee habitat requires the continuous availability of flowers on which to forage throughout the duration of the colony (spring through fall), colony nest sites, and overwintering sites for the queens.	Spring and summer	**Low.** Limited suitable habitat within the project site. Two known records of occurrence within the CNDDB database within 3 miles of the project site from 2020 (EONDX 119731), this record is presumed extant.
Birds				
Athene cunicularia (burrow sites) **Burrowing owl**	US: – CA: SCE/SSC MSHCP: S	Open, treeless areas with low, sparse vegetation, usually on flat or gently sloping terrain, including grasslands, sparse scrub (cover less than 30 percent), farmland, airfields, airports, road embankments, cemeteries, urban vacant lots, desert areas, and other open habitat. They usually occupy ground squirrel burrows but may also utilize man-made structures such as culverts or debris piles, usually temporarily.	Year-round	**Moderate to High.** Project site contains suitable soils and habitat for this species. The project site also contains an abundance of squirrel borrows, which BUOW often favors to occupy.
Amphibians				
Spea hammondii **Western spadefoot**	US: PT CA: SSC MSHCP: C	Grasslands and occasionally hardwood woodlands; largely terrestrial but requires rain pools or other ponded water persisting at least three weeks for breeding; burrows in loose soils during dry season. Occurs in the Central Valley and adjacent foothills, the non-desert areas of southern California, and Baja California.	October through April (following onset of winter rains)	**Not Expected.** No suitable habitat within the project site. One known record of occurrence within the CNDDB database within 3 miles of the project site from 1990 (EONDX 24004), this record is presumed extant.
Reptiles				
Charina umbratica **Southern rubber boa**	US: - CA: ST MSHCP: P	Montane oak or conifer forest near rock outcrops and woody debris, from about 1,500 to 2,400 meters (5,000 to 8,000 feet) elevation. Occurs in the San Bernardino and San Jacinto Mountains, with an intergrading population (with northern rubber boa) in the Mount Pinos and Tehachapi Mountain areas.	April through October (nocturnal)	**Not Expected.** No suitable habitat within the project site. Two known records of occurrence within the CNDDB database within 3 miles of the project site from 1970 (EONDX 27460) and 1995 (EONDX 107251; these records are presumed extant.
Mammals				
Dipodomys stephensi **Stephens' kangaroo rat**	US: FE CA: ST MSHCP: C	Found in plant communities transitional between grassland and coastal sage scrub, with perennial vegetation cover of less than 50 percent. Most commonly associated with *Artemisia tridentata, Eriogonum fasciculatum,* and *Erodium.* Requires well-drained soils with compaction characteristics suitable for burrow construction (neither sandy nor too hard). Not found in soils that are highly rocky or sandy, less than 20 inches	Year-round, nocturnal	**Not Expected.** No suitable habitat is present within the project site. Two known records of occurrence within the CNDDB database within 3 miles of the project site, the most recent is from 1990 (EONDX 9293), this

Table D: Threatened and Endangered Species

Species	Status	MSHCP Habitat	Blooming Period/ Activity Period	Occurrence Probability
		deep, or heavily alkaline or clay, or in areas exceeding 25 percent slope. Occurs only in western Riverside County, northern San Diego County, and extreme southern San Bernardino County, below 915 meters (3,000 feet) in elevation. In northwestern Riverside County, known only from east of Interstate 15. Reaches its northwest limit in south Norco, southeastern Riverside, and in the Reche Canyon area of Riverside and extreme southern San Bernardino Counties.		record is presumed extant.

Sources: California Natural Diversity Database (CNDDB) (CDFW 2024); Biogeographic Information and Observation System (BIOS) (CDFW n.d.); and Information for Planning and Consultation (IPaC) database (USFWS n.d.)

US: Federal Classifications
FE = Listed as endangered.
PT = Proposed threatened

CA: State Classifications
ST = Listed as threatened
SE = Listed as endangered
SCE = State Candidate Endangered

Western Riverside County MSHCP Status
C = Species is covered and adequately conserved under the MSHCP.
S = Species is covered and adequately conserved under the MSHCP, but surveys are required within indicated habitats and/or survey areas.

CA = California
CDFW = California Department of Fish and Wildlife
CNDDB = California Natural Diversity Database
EONDX = Element Occurrence Index
MSHCP = Multiple Species Habitat Conservation Plan
US = United States
USFWS = United States Fish and Wildlife Service

The special-status species listed in Table E may be expected to occur in the general project vicinity but are not covered under the MSHCP. None of the species listed in Table E has been reported from the project site, and none were observed during the site visit. Additionally, none of the species listed in Table E have a moderate or higher potential to occur within the project site.

Table E: Special-Status Species Potentially Occurring in the Project Vicinity (Not Covered by MSHCP)

Species	Status	Habitat and Distribution	Blooming Period/ Activity Period	Occurrence Probability
Plants				
Abronia villosa var. *aurita* **Chaparral sand-verbena**	US: – CA: – CRPR: 1B.1	Sandy areas (generally flats and benches along washes) in chaparral and coastal sage scrub, and improbably in desert dunes or other sandy areas, below 1,600 meters (5,300 feet) elevation. In California, reported from Riverside, San Diego, Imperial, Los Angeles, and Ventura Counties. Believed extirpated from Orange County. Also reported from Arizona and Mexico (Baja California). Plants reported from desert communities are likely misidentified.	Blooms mostly March through August (annual or perennial herb)	**Not Expected.** No suitable habitat (in chaparral and coastal sage scrub) within the project site. Outside of this species expected elevation range.
Astragalus hornii var. *hornii* **Horn's milk-vetch**	US: – CA: – CRPR: 1B.2	Alkaline playas and lake margins from 60 to 850 meters (200 to 2,800 feet) elevation. In California, known only from Inyo and Kern Counties. Believed extirpated from San Bernardino County. Also occurs in Nevada.	Blooms May through October (annual herb)	**Not Expected**. No suitable habitat within the project site. One known record of occurrence within the CNDDB database within 3 miles of the project site from 1889 (EONDX 117508); this record is presumed extant.
Astragalus lentiginosus var. *coachellae* **Coachella Valley milk-vetch**	US: FE CA: – CRPR: 1B.1	Sandy areas, typically in coarse sands in active sand fields, adjacent to dunes, along roadsides in dune areas, or along the margins of sandy washes, in Sonoran Desert scrub at 60 to 655 meters (200 to 2,150 feet) elevation. Known only from Riverside County in the Coachella Valley between Cabazon and Indio, and in the Chuckwalla Valley northeast of Desert Center.	Blooms February through May (annual or perennial herb)	**Not Expected.** No suitable habitat within the project site. Outside of this species expected elevation range.
Calochortus palmeri var. *palmeri* **Palmer's mariposa-lily**	US: – CA: – CRPR: 1B.2	Mesic sites in chaparral and lower montane coniferous forest at 600 to 2,400 meters (2,000 to 7,900 feet) elevation. Known from Riverside, San Bernardino, Santa Barbara, Los Angeles, Ventura, Kern, and San Luis Obispo Counties.	Blooms April through July (perennial herb)	**Not Expected.** No suitable habitat within the project site.
Chorizanthe xanti var. *leucotheca* **White-bracted spineflower**	US: – CA: – CRPR: 1B.2	Sandy to gravelly places in Mojave desert scrub, pinyon and juniper woodland, or coastal scrub in the Transverse and Peninsular Ranges and desert edge foothills at 300 to 1,200 meters (980 to 3,900 feet) elevation in coastal southern California and adjacent desert areas. Known only	Blooms April through June (annual herb)	**Not Expected.** No suitable habitat within the project site. Outside of this species expected elevation range.

Table E: Special-Status Species Potentially Occurring in the Project Vicinity (Not Covered by MSHCP)

Species	Status	Habitat and Distribution	Blooming Period/ Activity Period	Occurrence Probability
		from Los Angeles, Riverside, San Bernardino, and San Diego Counties, California.		
Horkelia cuneata var. puberula **Mesa horkelia**	US: – CA: – CRPR: 1B.1	Sandy or gravelly soils in chaparral, or rarely in cismontane woodland or coastal scrub at 70 to 825 meters (200 to 2,700 feet) elevation. Known only from San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Bernardino Counties, California. Believed extirpated from Riverside and San Diego Counties.	Blooms February through July (sometimes to September) (perennial herb)	**Not Expected.** No suitable habitat within the project site.
Imperata brevifolia **California satintail**	US: - CA: – CRPR: 2B.1	Springs, meadows, streambanks, moist canyons, canals, alkaline sinks, and similar wet areas below 1220 meters (4,000 feet) elevation. Known from Butte, Fresno, Imperial, Inyo, Kern, Lake, Los Angeles, Orange, Riverside, San Bernardino, Tehama, Tulare, and Ventura Counties, though many collections are old and the populations likely extirpated. Also occurs in other areas of the western U.S. and Mexico.	Blooms September through May (perennial grass)	**Not Expected.** No suitable habitat within the project site. Outside of this species expected elevation range.
Mentzelia tricuspis **Spiny-hair blazing star**	US: – CA: – CRPR: 2B.1	Sandy or gravelly slopes and washes at 150 to 1,280 meters (500 to 4,200 feet) elevation in desert scrub. In California, known from Inyo, Riverside, San Bernardino, and San Diego Counties. Also occurs in Arizona, Nevada, and Utah.	Blooms March through May (annual herb)	**Not Expected**. No suitable habitat within the project site. One known record of occurrence within the CNDDB database within 3 miles of the project site from 1886 (EONDX 82808); this record is presumed extant.
Petalonyx linearis **Narrow-leaf sandpaper-plant**	US: – CA: – CRPR: 2B.3	In Mojavean and Sonoran Desert scrub, typically in rocky and sandy soils within canyons at -25 to 1115 meters (-80 to 3660 feet) elevation. In California, it is found in Imperial, Riverside, San Bernadino, and San Diego Counties.	Blooms March through May (perennial shrub)	**Not Expected.** No suitable habitat within the project site.
Pseudognaphalium leucocephalum **White rabbit-tobacco**	US: – CA: – CRPR: 2B.2	Sand and gravel at the edges of washes or mouths of steep canyons at 0 to 2,100 meters (0 to 7,000 feet) elevation. In California, known from Los Angeles, Orange, Riverside, Santa Barbara, San Diego, San Luis Obispo, and Ventura Counties. Also occurs in Arizona, New Mexico, Texas, and Mexico.	Blooms usually August through November (perennial herb)	**Not Expected.** No suitable habitat within the project site.

Table E: Special-Status Species Potentially Occurring in the Project Vicinity (Not Covered by MSHCP)

Species	Status	Habitat and Distribution	Blooming Period/ Activity Period	Occurrence Probability
Sidalcea neomexicana **Salt Spring checkerbloom**	US: – CA: – CRPR: 2B.2	Alkaline springs and brackish marshes below 1,530 meters (5,000 feet) elevation. In California, known only from Kern, Orange, Riverside, San Bernardino, San Diego, and Ventura Counties. Believed extirpated from Los Angeles County. Also known from Arizona, New Mexico, Nevada, Utah, and Mexico.	Blooms March through June (perennial herb)	**Not Expected.** No suitable habitat within the project site. Outside of this species expected elevation range.
Symphyotrichum defoliatum **San Bernardino aster**	US: – CA: – CRPR: 1B.2	Vernally wet sites (such as ditches, streams, and springs) in many plant communities below 2,040 meters (6,700 feet) elevation. In California, known from Ventura, Kern, San Bernardino, Los Angeles, Orange, Riverside, and San Diego Counties. May also occur in San Luis Obispo County. In the western Riverside County area, this species is scarce, and documented only from Temescal and San Timoteo Canyons (*The Vascular Plants of Western Riverside County, California*. F.M. Roberts et al., 2004).	Blooms July through November (perennial herb)	**Not Expected.** No suitable habitat within the project site. Outside of this species expected elevation range.
Tortula californica **California screw moss**	US: – CA: – CRPR: 1B.2	Rock outcrops, vertical rock walls and soil banks with appropriate moisture conditions, at 10 to 1,460 meters (30 to 4,800 feet) elevation. Known only from Modoc, Kern, Los Angeles, Modoc, Monterey, Riverside, San Diego, Santa Barbara, and Ventura Counties, California.	Capsules mature in spring	**Not Expected.** No suitable habitat within the project site.
Reptiles				
Anniella stebbinsi **Southern California legless lizard**	US: – CA: SSC	Inhabits sandy or loose loamy soils with high moisture content under sparse vegetation in Southern California.	Nearly year round, at least in southern areas	**Not Expected.** No suitable habitat within the project site One known record of occurrence within the CNDDB database within 3 miles of the project site from 1949 (EONDX 112481); this record is presumed extant.
Arizona elegans occidentalis **California glossy snake**	US: – CA: SSC	Scrub and grassland habitats, often with loose or sandy soils. Patchily distributed from the eastern portion of San Francisco Bay to southern San Joaquin Valley and in non-desert areas of southern California. Also occurs in Baja California, Mexico.	Most active March through June (nocturnal)	**Not Expected.** No suitable habitat within the project site. No known records of occurrence in the CNDDB database within 3 miles of the project site.

Table E: Special-Status Species Potentially Occurring in the Project Vicinity (Not Covered by MSHCP)

Species	Status	Habitat and Distribution	Blooming Period/ Activity Period	Occurrence Probability
Mammals				
Antrozous pallidus **Pallid bat**	US: – CA: SSC	Most common in open, dry habitats with rocky areas for roosting. Day roosts in caves, crevices, rocky outcrops, tree hollows or crevices, mines and occasionally buildings, culverts, and bridges. Night roosts may be more open sites, such as porches and open buildings. Grasslands, shrublands, woodlands, and forest in western North America.	Year-round; nocturnal	**Low.** Suitable roosting and foraging habitat within the project site. No known records of occurrence in the CNDDB database within 3 miles of the project site.
Corynorhinus townsendii **Townsend's big-eared bat**	US: – CA: SSC	Requires caves, mines, tunnels, bridges, buildings, or other similar structures for roosting. Has also been documented using rock crevices and hollow trees for roosting. Often uses separate sites for night, day, hibernation, or maternity roosts. Ranges from southwestern Canada through the western United States to southern Mexico.	Year-round; nocturnal	**Low.** Suitable roosting and foraging habitat within the project site. No known records of occurrence in the CNDDB database within 3 miles of the project site.
Lasiurus xanthinus **Western yellow bat**	US: – CA: SSC	Found mostly in desert and desert riparian areas of the southwest US, but also expanding its range with the increased usage of native and nonnative ornamental palms in landscaping. Individuals typically roost amid dead fronds of palms but have also been documented roosting in cottonwood trees. Forage over many habitats.	Year-round; nocturnal	**Low.** Suitable roosting and foraging habitat within the project site. One known record of occurrence within the CNDDB database within 3 miles of the project site from 1989 (EONDX 58971); this record is presumed extant.
Onychomys torridus ramona **Southern grasshopper mouse**	US: – CA: SSC	Believed to inhabit sandy or gravelly valley floor habitats with friable soils in open and semi-open scrub, including coastal sage scrub, mixed chaparral, low sagebrush, riparian scrub, and annual grassland with scattered shrubs, preferring low to moderate shrub cover. More susceptible to small- and large-scale habitat loss and fragmentation than most other rodents, due to its low fecundity, low population density, and large home range size. Arid portions of southwestern California and northwestern Baja California.	Nocturnal, active year-round	**Not Expected.** No suitable habitat within the project site. No known records of occurrence in the CNDDB database within 3 miles of the project site.

Sources: California Natural Diversity Database (CNDDB) (CDFW 2023); Biogeographic Information and Observation System (BIOS) (CDFW n.d.); and Information for Planning and Consultation (IPaC) database (USFWS n.d.)

Table footnotes continued on next page

US: Federal Classifications
FE = Listed as endangered.
CA: State Classifications
SA = Special Animal. Refers to any other animal monitored by the Natural Diversity Database, regardless of its legal or rarity status.
SSC = Species of Special Concern. Refers to animals with vulnerable or seriously declining populations.
SR = State listed as rare.
CNPS CRPR Designations
1B.1 = Rare threatened, or endangered in California and elsewhere
1B.2 = Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California
1B.3 = Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California
2B.1 = Plants rare, threatened, or endangered in California, but more common elsewhere; seriously threatened in California
2B.2 = Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California
2B.3 = Plants rare, threatened, or endangered in California, but more common elsewhere; not very threatened in California
amsl = above mean sea level
CA = California
CDFW = California Department of Fish and Wildlife
ft = foot/feet
m = meter(s)
MSHCP = Multiple Species Habitat Conservation Plan
US = United States
USFWS = United States Fish and Wildlife Service

The following special-status species listed in Table E were reported within 3 miles of the project site: Horn's milk-vetch (*Astragalus hornii* var. *hornii),* spiny-hair blazing star *(Mentzelia tricuspis),* southern California legless lizard (*Anniella stebbinsi*), and western yellow bat (*Lasiurus xanthinus).* Horn's milk-vetch, spiny-hair blazing star, and southern California legless lizard are not expected to occur within the project site due to the absence of suitable habitat. Western yellow bat has a low potential to occur within the project site due to suitable foraging and marginally suitable roosting habitat present within the project site. Though there is suitable foraging habitat on site for western yellow bat, they are unlikely to roost on site. This species will roost within dead palm fronds, and although there are a few ornamental palms on site, they are small and well maintained, with any dead fronds cut off the palms. Additionally, the potential for occurrence is low because the last known record of occurrence within 3 miles of the project site was from 1989 (CDFW 2024).

11.4 WILDLIFE MOVEMENT, CORRIDORS, AND NURSERY SITES

Wildlife movement includes seasonal migration along corridors and daily movements for foraging. Migration corridors may include areas of unobstructed movement of deer, riparian corridors providing cover for migrating birds, routes between breeding waters and upland habitat for amphibians, and areas between roosting and feeding areas for birds.

The project site does not contain any essential connectivity areas, natural landscape blocks, natural areas small or potential riparian connections, as documented in the California Essential Habitat Connectivity Project report (Spencer et al. 2010).

The project site is bordered by existing paved roads and development on three of the four adjoining properties that restrict wildlife movement in the project vicinity. The majority of wildlife movement within the project site is anticipated to be limited to wildlife present on site or within the nonnative grasslands to the adjoining south of the project site. The project would not substantially limit wildlife movement.

11.5 NATURAL COMMUNITIES OF INTEREST

Riparian habitats, oak woodlands, and vernal pools are among the natural communities of interest to the CDFW.

Plant communities and land covers present on site are limited to nonnative grasslands and developed areas. None of these plant communities or land covers are riparian habitats, oak woodlands, or vernal pools or are considered natural communities of interest. Therefore, impacts to natural communities of interest will not occur on site.

11.6 WETLANDS

Wetland areas are not present on site. Additional focused surveys are not required.

11.7 LOCAL POLICIES AND ORDINANCES PROTECTING BIOLOGICAL RESOURCES

The Riverside County General Plan and development ordinances may include regulations or policies governing biological resources. For example, policies may include tree preservation, locally designated species survey areas, local species of interest, and significant ecological areas.

The project will not conflict with local policies or ordinances applicable to biological resources.

11.8 INDIRECT EFFECTS

Indirect impacts to surrounding areas as a result of the project may include, but are not limited to, increased dust, noise, lighting, traffic, and stormwater runoff. Because of the small scale of the project and its location within a landscape that is already highly disturbed or developed, substantial indirect impacts to sensitive biological resources are not anticipated.

11.9 CUMULATIVE EFFECTS

Project construction will contribute to the incremental loss of nonnative grassland in the region, including potential habitat for some special-status species. Cumulative impacts potentially include habitat fragmentation, increased edge effects, reduced habitat quality, and increased wildlife mortality. The MSHCP provides a comprehensive approach to the regional conservation of these habitats and, as a regional plan, serves to provide mitigation for cumulative impacts to covered species. Project compliance and consistency with the MSHCP ensure that any cumulative impacts to covered species are effectively mitigated. Special-status species that are not covered by the MSHCP also benefit from the surveys, conservation, and other measures of the MSHCP because they occupy many of the same habitats.

12.0 REFERENCES

California Department of Fish and Wildlife (CDFW). 2024. California Natural Diversity Database (CNDDB) RareFind 5 (Version 5.2.14). Website: https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data (accessed December 2024).

_____. n.d. Biogeographic Information and Observation System (BIOS). Website: https://apps.wildlife.ca.gov/bios/ (accessed December 2024).

California Native Plant Society (CNPS). 2024. Inventory of Rare and Endangered Plants of California. Website: http://www.rareplants.cnps.org (accessed December 2024).

County of Riverside. 2006. *Burrowing Owl Survey Instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area.*

Eriksen, C., and D. Belk. 1999. *Fairy Shrimps of California's Puddles, Pools, and Playas.* Eureka, California: Mad River Press, Inc.

Google Earth. Various dates from 1996–2024. Aerial images of the project site.

Nationwide Environmental Title Research, LLC (NETR). 2023. Website: https://historicaerials.com/ (accessed December 2024).

Natural Resource Conservation Service (NRCS). 2024 Web Soil Survey. Website: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx (accessed December 2024).

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation*, Second Edition. Sacramento: California Native Plant Society.

Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

State Water Resources Control Board. 2019. State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State [For Inclusion in the Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California]. Website: https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedures.pdf (accessed December 2024)

United States Army Corps of Engineers (USACE). 1987. Environmental Laboratory. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. United States Army Engineer Waterways Vicksburg, Mississippi: Experiment Station.

_____. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, eds., J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, Mississippi: United States Army Engineer Research and Development Center.

United States Fish and Wildlife Service (USFWS). 2012. Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Riverside Fairy Shrimp; Final Rule. Federal Register 77: 72070-72140.

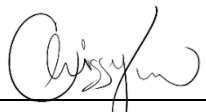
_____. n.d. Information for Planning and Consultation (IPaC) database. Website: https://ipac.ecosphere.fws.gov/ (accessed December 2024).

United States Geological Survey (USGS). 2024. *Beaumont, California* topographical quadrangle map in Section 35, Township 2 South, Range 1 West San Bernardino Principal Meridian.

Western Riverside County Regional Conservation Authority (RCA). 2022. Current (As of 1/21/2022) Status of Covered Species Not Adequately Conserved (Table 9-3 Species). Website: https://www.wrc-rca.org/wp-content/uploads/2022/01/Current_Status_of_Covered_Species_Not_Adequately_Conserved-REV2022.pdf (accessed December 2024).

13.0 CERTIFICATION STATEMENT

I hereby certify that the statements furnished in this report present the data and information required for this biological evaluation and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

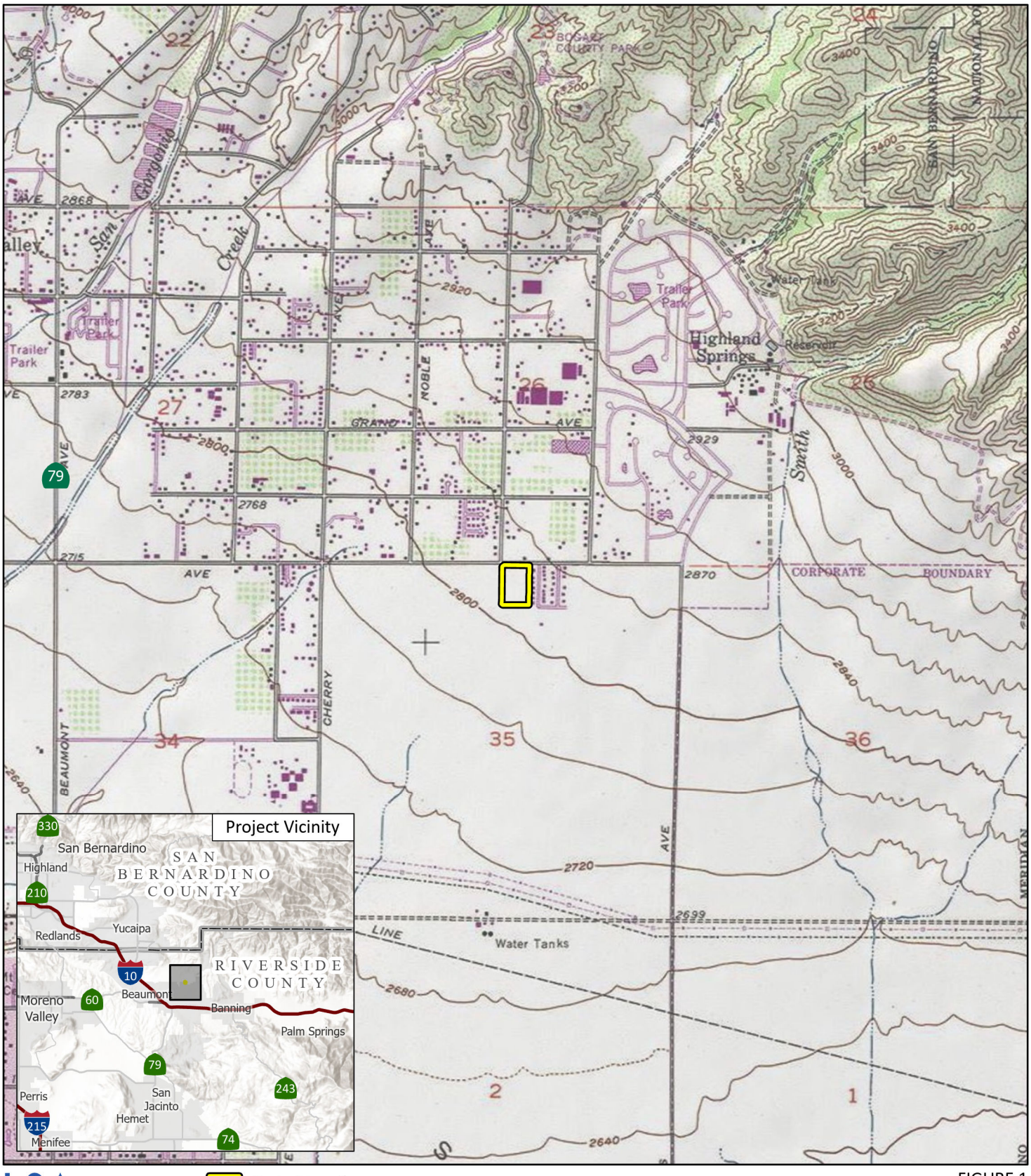
Date: August 4, 2025 Signature: 

Chrissy Kent
Biologist

APPENDIX A

FIGURES 1–7

Figure 1: Project Location
Figure 2: Project Site
Figure 3: Soils Mapped within the Project Area
Figure 4: Vegetation Communities within the Project Area
Figure 5: Burrowing Owl Survey Results
Figure 6: Jurisdictional Delineation Map
Figure 7: Representative Site Photographs



LSA

Project Location

FIGURE 1

N

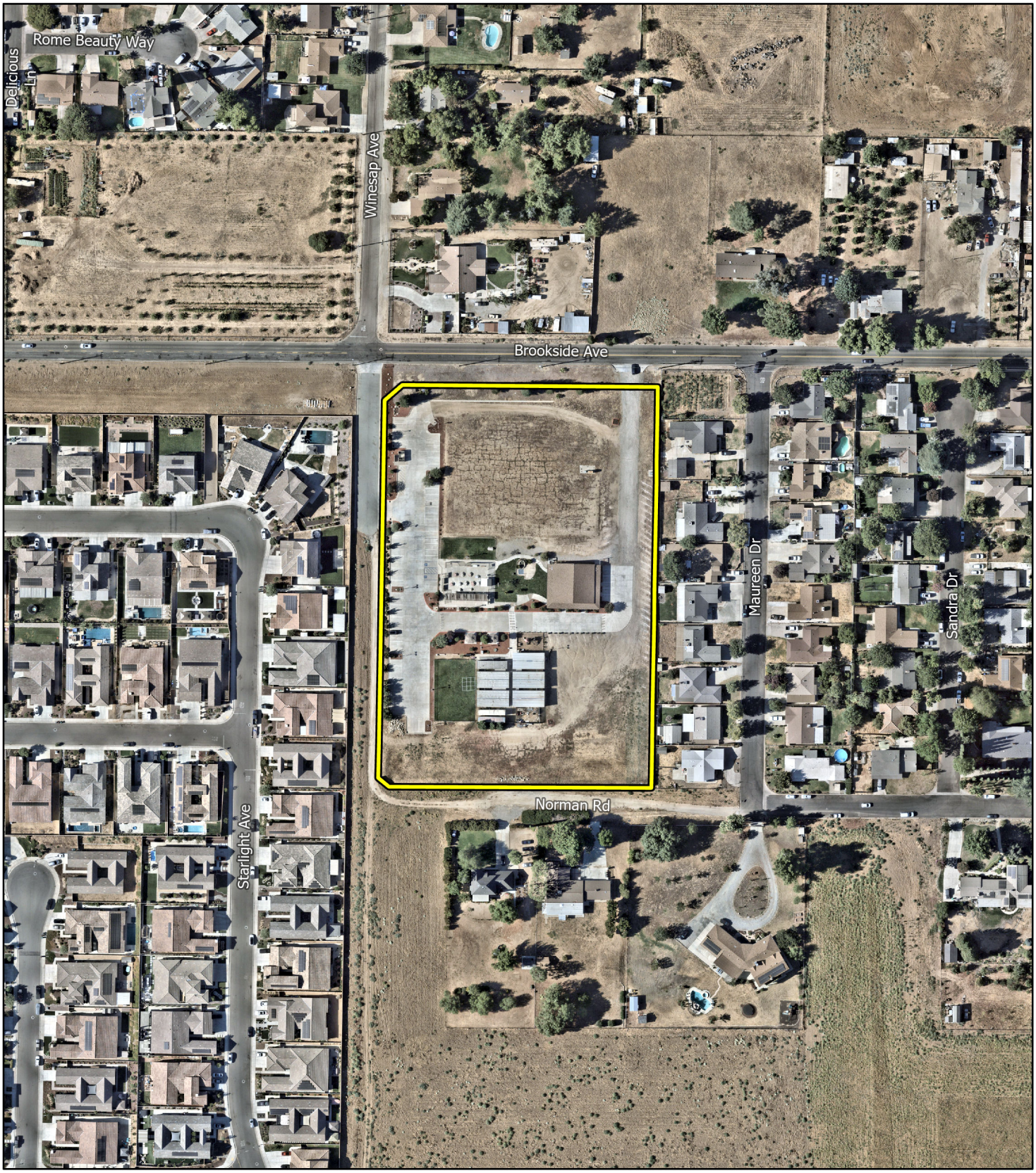
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FEET

SOURCE: USGS 7.5' Quad - *Beaumont (1988)*, CA

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Calvary Chapel Expansion Project

Project Location



LSA

Project Location

FIGURE 2

N

0 100 200
FEET

SOURCE: Nearmap Aerial Imagery (August 27, 2024)

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Calvary Chapel Expansion Project

Project Site



LSA

Project Location

Soils

HcC - Hanford coarse sandy loam, 2 to 8 percent slopes

FIGURE 3

N

0 50 100

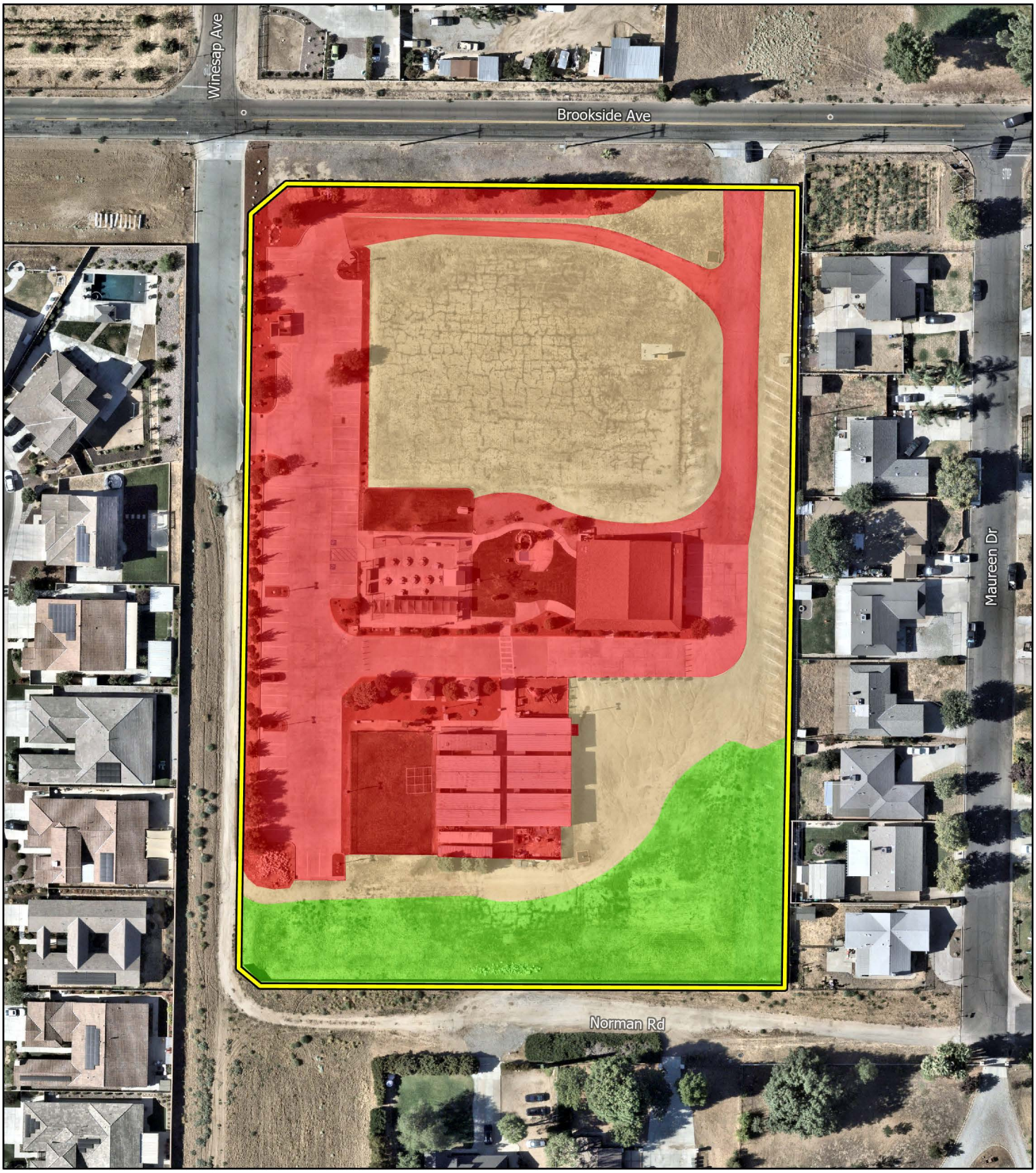
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Calvary Chapel Expansion Project

Soils Mapped within the Project Area

SOURCE: Nearmap Aerial Imagery (August 27, 2024)

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LSA

FIGURE 4

Project Location

Vegetation

Barren (1.92 ac)

Developed/Ornamental (2.69 ac)

Nonnative Grassland (0.87 ac)

N

0 50 100

FEET

Calvary Chapel Expansion Project

Vegetation Communities within the Project Area

SOURCE: Nearmap Aerial Imagery (August 27, 2024)

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LSA

FIGURE 5

Project Location

Observations

Active Ground Squirrel Burrow

Inactive Ground Squirrel Burrow

N

0 50 100

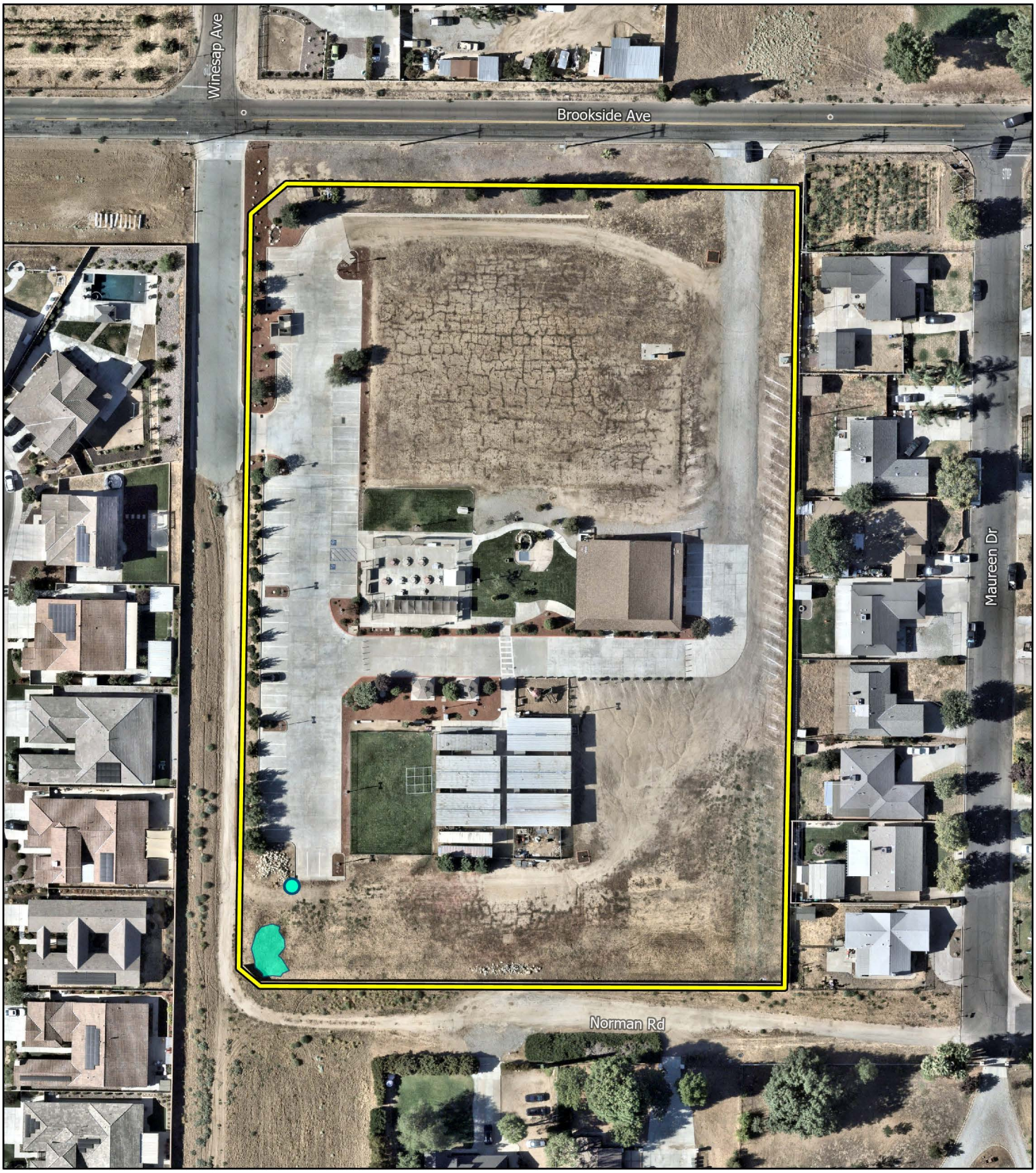
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SOURCE: Nearmap Aerial Imagery (August 27, 2024)

Calvary Chapel Expansion Project

Burrowing Owl Survey Results

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LSA

Project Location

Low Area

Inlet to 18" Plastic Pipe

FIGURE 6

N

0 50 100

FEET

SOURCE: Nearmap Aerial Imagery (August 27, 2024)

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Calvary Chapel Expansion Project

Jurisdictional Delineation Map



Photo 1: View of project site along the eastern boarder of the project boundary facing north. December 11, 2024.



Photo 2: View of the existing parking lot along the western project boundary, facing north. December 11, 2024.



Photo 3: View of burned tree in the southwestern corner of the project site, looking south. December 11, 2024.



Photo 4: View of barren area in the northern portion of the project site, facing south. December 11, 2024.

LSA

FIGURE 7

Calvary Chapel
Representative Site Photographs

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APPENDIX B

PLANT AND ANIMAL SPECIES OBSERVED

LSA biologists observed the following species in the specified study area.

* Introduced species that are not native to California

Scientific Name	Common Name
Eudicots	
Pinus sp.	Pines
*Cupressus sempervirens**	Italian cypress
Ambrosia acanthicarpa	annual bur-sage
Heterotheca grandiflora	telegraph weed
*Hirschfeldia incana**	shortpod mustard
Croton sp.	Croton
*Salsola tragus**	Russian thistle
*Schinus molle**	pepper tree
*Erodium cicutarium**	redstem stork's bill
Cercis occidentalis	western redbud
*Sonchus oleraceus**	sow thistle
*Polygonum aviculare**	prostrate knotweed
*Medicago polymorpha**	California burclover
*Erigeron bonariensis**	flax-leaved horseweed
Acmispon americanus	Spanish lotus
Monocots	
*Washingtonia robusta**	Mexican fan palm
*Festuca myuros**	rattail sixweek grass
Birds	
*Columba livia**	rock pigeon
Calypte anna	Anna's hummingbird
Buteo jamaicensis	red-tailed hawk
Charadrius vociferus	killdeer
Sayornis nigricans	black phoebe
Falco sparverius	American kestrel
Corvus brachyrhynchos	American crow
Sturnella neglecta	western meadowlark
Mammals	
Otospermophilus beecheyi	California ground squirrel

CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

May 13, 2025

Elizabeth Shorts
Matlock Design Build Inc.
1614 East Holt Boulevard,
Suite 106
Ontario, California 91761

Subject: Results of a Burrowing Owl Survey for the Calvary Chapel Project in Beaumont, Riverside County, California (LSA Project No. 20242107)

Dear Ms. Shorts:

This report documents the results of a burrowing owl (*Athene cunicularia*) survey for the Calvary Chapel Project. The approximately 5.5-acre project site (Assessor's Parcel Number [APN] 408-070-012) is located at 1780 Orchard Heights Avenue, which is at the southeast corner of Orchard Heights Avenue and Brookside Avenue and approximately 2,000 feet west of Highland Springs Avenue in Beaumont, Riverside County, California (see Figure 1; all figures attached).

The survey results were positive for burrowing owl.

BACKGROUND

Burrowing owls are found in open, dry grasslands; agricultural and range lands; desert habitats; and grass, forb, and shrub stages of pinyon and ponderosa pine habitats. They nest in abandoned burrows of ground squirrels or other animals; in pipes, rock and debris piles; and in other similar features.

Burrowing owls and their nests and eggs are protected from "take" under Sections 3503, 3503.5, and 3800 of the California Fish and Game Code. Activities that cause destruction of active nests, or that cause nest abandonment and subsequent death of eggs or young, may constitute violations of this law.

Burrowing owl is a species of special concern and a candidate species listing as endangered under the California Endangered Species Act (CESA) as determined by the California Department of Fish and Wildlife (CDFW). It is also a covered species under the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP has established survey areas for burrowing owl where focused surveys are required if suitable habitat is determined to be present. The project site is within one of these areas.

SURVEY AREA

The project site is currently an active church that sees regular activity and traffic. Residential areas surround the project site to the north, east, and west. South of the project site, there is a partially

developed lot with a single-family home and undeveloped non-native grasslands. Soils observed on the site are consistent with sandy loams.

The survey area consists of potentially suitable habitat on the project site and within the 150-meter buffer (see Figure 2). Suitable habitat within the approximately 5.5-acre project site and buffer consists of bare ground and non-native grassland. The non-native grassland is dominated by rat-tail fescue grass (*Festuca myuros*), redstem stork's bill (*Erodium cicutarium*), and annual bur-weed (*Ambrosia acanthicarpa*). Unsuitable habitat within the project site and buffer consists of developed areas of the church, adjacent ornamental vegetation, and neighboring residential communities. Site photographs are included in Figure 3.

METHODS

The surveys were conducted by LSA biologist Chrissy Kent according to the *County of Riverside Guidelines for Burrowing Owl Surveys* (revised March 29, 2006). A total of four surveys were conducted from March 3 to April 30, 2025. See Table A, below. Suitable habitat was surveyed on foot along 30-meter transects with the aid of binoculars (see Figure 2). Surveyors looked for burrowing owls, potential burrows (burrows greater than 11 centimeters [cm] in diameter and 150 cm deep), and burrowing owl sign. Potential burrows encountered during the survey were mapped using a handheld global positioning system (GPS) unit and examined for owl sign (e.g., feathers, pellets, whitewash, and prey remnants).

Table A: Focused Survey Dates, Times, and Weather Conditions

Survey	Personnel	Date (2025)	Time (24-Hour) (start/finish)	Temperature (°F) (start/finish)	Wind (mph)	Cloud Cover
Burrowing Owl Survey 1	Chrissy Kent	3/5/2025	06:30/07:45	45/46	<1	75%
Burrowing Owl Survey 2	Chrissy Kent	3/28/2025	07:15/08:20	54/55	3-6	100%
Burrowing Owl Survey 3	Chrissy Kent	4/14/2025	06:45/09:00	52/54	<1	50%
Burrowing Owl Survey 4	Chrissy Kent	4/30/2025	06:30/08:30	53/54	<1	25%

Source: LSA Field Surveys (2025).
°F = degrees Fahrenheit
mph = miles per hour

RESULTS

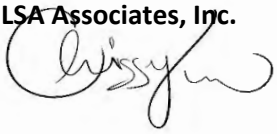
Wildlife species detected during the survey included American crow (*Corvus brachyrhynchos*), American kestral (*Falco sparverius*), American pipit (*Anthus rubescens*), Anna's hummingbird (*Calypte anna*), California towhee (*Pipilo crissalis*), Cassin's kingbird (*Tyrannus vociferans*), common raven (*Corvus corax*), Eurasian collared dove (*Streptopelia decaocto*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), lesser goldfinch (*Carduelis psaltria*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), Say's phoebe (*Sayornis saya*), song sparrow (*Melospiza melodia*), western meadowlark (*Sturnella neglecta*), white-crowned sparrow (*Zonotrichia leucophrys*), yellow-rumped warbler (*Setophaga coronata*), Botta's pocket gopher (*Thomomys bottae*), and California ground squirrel (*Spermophilus beecheyi*).

Four burrows suitable for burrowing owl occupancy were observed on the project site. Each had an entrance diameter ranging from 11 to 13 cm and extended to a depth of at least 150 cm. One of these burrows showed evidence of burrowing owl activity, including whitewash around the entrance and a feather, both observed during the April 14, 2025 survey. Despite rain events between visits, the whitewash remained visible during the follow-up survey on April 30, 2025. Although no burrowing owls were directly observed during the surveys, this burrow was classified as occupied based on the presence of these signs. The remaining three suitable burrows showed no evidence of owl use and were considered unoccupied.

Because portions of the project site and adjacent areas are suitable for burrowing owl and because burrowing owl could occupy these areas prior to construction, a pre-construction burrowing owl survey will be required within 30 days prior to ground disturbance. If burrowing owl is found during the pre-construction survey, the project proponent will need to inform the CDFW and United States Fish and Wildlife Service (USFWS) and prepare a mitigation plan for approval by these agencies prior to initiating ground disturbance.

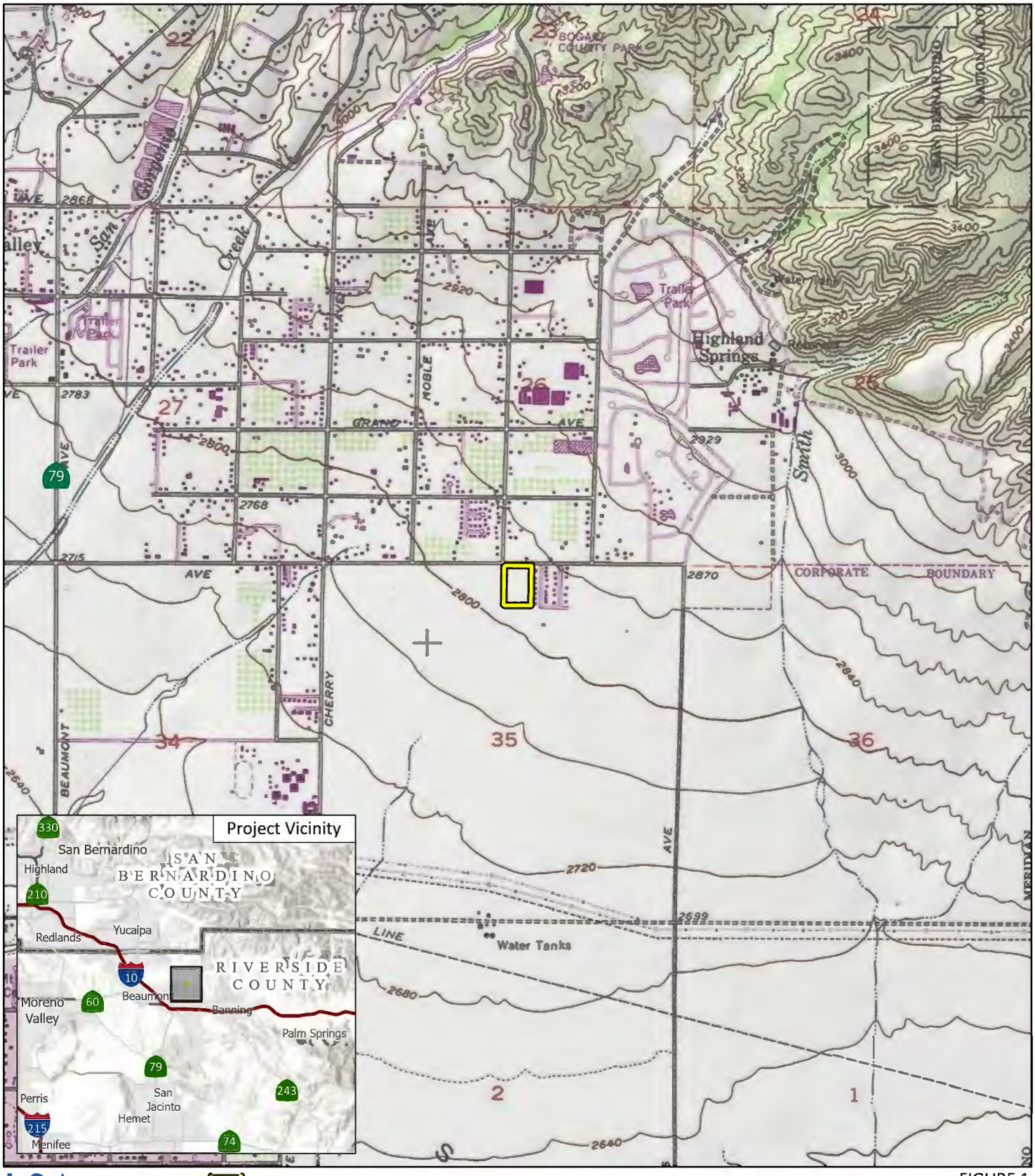
Sincerely,

LSA Associates, Inc.



Chrissy Kent
Biologist

Attachments: Figure 1: Location and Regional Vicinity
Figure 2: Burrowing Owl Survey
Figure 3: Representative Site Photographs



LSA

FIGURE 1

Calvary Chapel Expansion Project

Location and Regional Vicinity

SOURCE: USGS 7.5' Quad - *Beaumont (1988)*, CA

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LSA

FIGURE 2

Calvary Chapel Expansion Project

Burrowing Owl Survey

SOURCE: Nearmap Aerial Imagery (January 20, 2025)

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Photo 1: View of project site along the eastern border of the project boundary facing north.



Photo 2: View of the existing parking lot along the western project boundary, facing north.



Photo 3: View of burned tree in the southwestern corner of the project site, looking south.



Photo 4: View of barren area in the northern portion of the project site, facing south.

LSA

FIGURE 3

Calvary Chapel Expansion Project

Representative Site Photographs

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Photo 5: View of burrowing owl burrow with whitewash by entrance.



Photo 6: View of burrowing owl feather near entrance of burrowing owl burrow.

LSA

FIGURE 3

Calvary Chapel Expansion Project

Representative Site Photographs

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CULTURAL RESOURCES ASSESSMENT

Calvary Chapel Beaumont Project
City of Beaumont, Riverside County, California

Prepared for:

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Project No. MDB2501

Data Base Information:
Type of Study: Cultural Resources Assessment
Resources Recorded: None
Keywords: Beaumont
USGS Quadrangle: 7.5-minute *Beaumont, California* (1979)

BCRCONSULTING LLC

August 1, 2025

MANAGEMENT SUMMARY

BCR Consulting LLC (BCR Consulting) is under contract to Matlock Design Build to conduct a Cultural Resources Assessment of the Calvary Chapel Beaumont Project (approximately 5.49 acres; the project) in the City of Beaumont, Riverside County, California. The work is being performed pursuant to the California Environmental Quality Act (CEQA). A cultural resources records search, pedestrian field survey, Sacred Lands File search with the Native American Heritage Commission (NAHC), and paleontological overview were conducted for the project.

The records search revealed that 23 cultural resource studies have taken place resulting in the recording of 14 cultural resources within one mile of the project site. Of the 23 previous studies, none have assessed the project site and no cultural resources have been previously recorded within its boundaries. During the field survey, BCR Consulting archaeologists did not discover any cultural resources (including prehistoric or historic-period archaeological sites or historic-period buildings) within the project site boundaries. It should be noted that the project site is occupied by a church complex that is not historic in age (less than 45 years old) and as such, it does not warrant further consideration. Based on these results, BCR Consulting recommends a finding of no impacts to historical resources under CEQA. BCR Consulting also recommends that no additional cultural resources work or monitoring is necessary during proposed activities associated with the development of the project site. However, if previously undocumented cultural resources are identified during earthmoving activities, a qualified archaeologist should be contacted to assess the nature and significance of the find, diverting construction excavation if necessary.

While the current study has not indicated sensitivity for unknown cultural resources within the project boundaries, ground disturbing activities always have the potential to reveal buried deposits not observed on the surface during previous surveys. Prior to the initiation of ground-disturbing activities, field personnel should be alerted to the possibility of buried prehistoric or historic cultural deposits. In the event that field personnel encounter buried cultural materials, work in the immediate vicinity of the find should cease and a qualified archaeologist should be retained to assess the significance of the find. The qualified archaeologist shall have the authority to stop or divert construction excavation as necessary. If the qualified archaeologist finds that any cultural resources present meet eligibility requirements for listing on the California Register or the National Register, plans for the treatment, evaluation, and mitigation of impacts to the find will need to be developed. Prehistoric or historic cultural materials that may be encountered during ground-disturbing activities include:

- historic artifacts such as glass bottles and fragments, cans, nails, ceramic and pottery fragments, and other metal objects;
- historic structural or building foundations, walkways, cisterns, pipes, privies, and other structural elements;
- prehistoric flaked-stone artifacts and debitage (waste material), consisting of obsidian, basalt, and or cryptocrystalline silicates;
- groundstone artifacts, including mortars, pestles, and grinding slabs;

- dark, greasy soil that may be associated with charcoal, ash, bone, shell, flaked stone, groundstone, and fire affected rocks.

Results of the Sacred Lands File search were negative (see Appendix D). The City will initiate Assembly Bill (AB) 52 Native American Consultation for the project. Since the City will initiate and carry out the required Native American Consultation, the results of the consultation are not provided in this report. However, this report may be used during the consultation process, and BCR Consulting staff is available to answer questions and address concerns as necessary.

According to CEQA Guidelines, projects subject to CEQA must determine whether the project would "directly or indirectly destroy a unique paleontological resource". The Beaumont area contains geological formations that comprise rocky highlands of the San Jacinto Mountains, the faulted plain of the San Gorgonio Pass, and the San Timoteo Badlands. The project site is occupied by alluvial valley deposits of the San Timoteo Badlands, and sediments therein are from the late Holocene (Qa) and have low sensitivity for paleontological resources (i.e. fossils; City of Beaumont 2020:5.6-1, 5.6-31; see Appendix C). Since the project site has a demonstrated low sensitivity for paleontological resources, proposed project activities are not likely to directly or indirectly destroy a unique paleontological resource or site or unique geological feature and no additional work associated with paleontological resources is recommended.

If human remains are encountered during the undertaking, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC.

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INTRODUCTION

BCR Consulting LLC (BCR Consulting) is under contract to Matlock Design Build to conduct a Cultural Resources Assessment of the Calvary Chapel Beaumont Project (approximately 5.49 acres; the project) in the City of Beaumont (City), Riverside County, California. The work is being performed pursuant to the California Environmental Quality Act (CEQA). A cultural resources records search, pedestrian field survey, Sacred Lands File search with the Native American Heritage Commission (NAHC), and paleontological overview were conducted for the project. The project site includes a single parcel depicted on the United States Geological Survey (USGS) *Beaumont, California* (1985) 7.5-minute topographic quadrangle (Figure 1). The project site is located in the northeast quarter of Section 35, Township 2 South, Range 1 West.

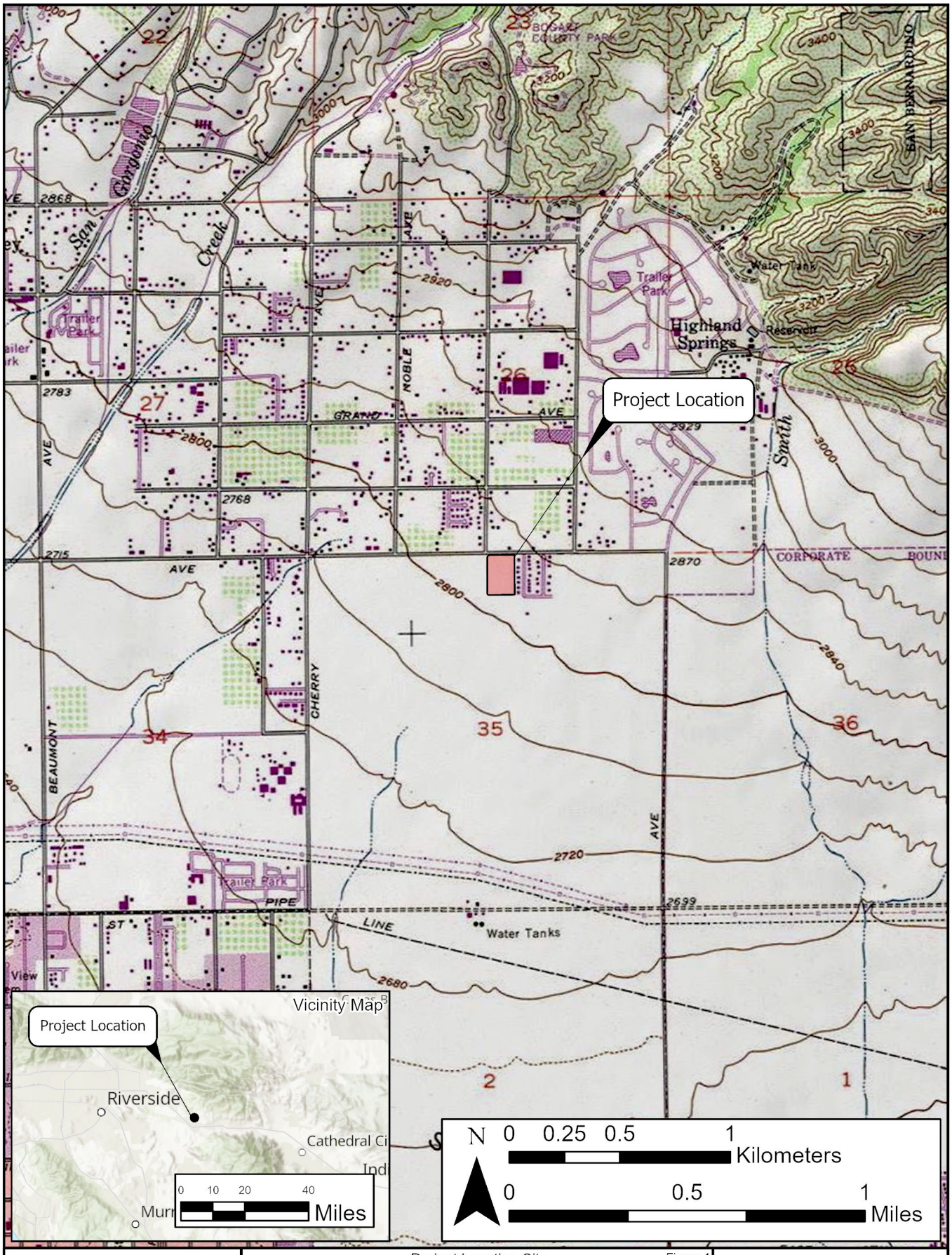
Regulatory Setting

The California Environmental Quality Act. CEQA applies to all discretionary projects undertaken or subject to approval by the state's public agencies (California Code of Regulations 14(3), § 15002(i)). Under CEQA, "A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (Cal. Code Regs. tit. 14(3), § 15064.5(b)). State CEQA Guidelines section 15064.5(a) defines a "historical resource" as a resource that meets one or more of the following criteria:

- Listed in, or eligible for listing in, the California Register of Historical Resources (California Register)
- Listed in a local register of historical resources (as defined at Cal. Public Res. Code § 5020.1(k))
- Identified as significant in a historical resource survey meeting the requirements of § 5024.1(g) of the Cal. Public Res. Code
- Determined to be a historical resource by a project's lead agency (Cal. Code Regs. tit. 14(3), § 15064.5(a))

A historical resource consists of "Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Generally, a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing in the California Register of Historical Resources" (Cal. Code Regs. tit. 14(3), § 15064.5(a)(3)).

The significance of a historical resource is impaired when a project demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for the California Register. If an impact on a historical or archaeological resource is significant, CEQA requires feasible measures to minimize the impact (State CEQA Guidelines § 15126.4 (a)(1)). Mitigation of significant impacts must lessen or eliminate the physical impact that the project will have on the resource. Section 5024.1 of the Cal. Public Res. Code established the California Register. Generally, a resource is considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the California Register (Cal. Code



BCRCONSULTING LLC

Project Location Site
Cavalry Chapel Beaumont Project

Figure 1

Reference: ESRI; USGS Quad: Beaumont, California (1985)

Matlock Design Build

Regs. tit. 14(3), § 15064.5(a)(3)). The eligibility criteria for the California Register are similar to those of the National Register of Historic Places (National Register), and a resource that meets one or more of the eligibility criteria of the National Register will be eligible for the California Register. The California Register program encourages public recognition and protection of resources of architectural, historical, archaeological, and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for state historic preservation grant funding and affords certain protections under CEQA. Criteria include:

1. Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
2. Associated with the lives of persons important to local, California or national history.
3. Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values.
4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

In addition to meeting one or more of the above criteria, the California Register requires that sufficient time has passed since a resource's period of significance to "obtain a scholarly perspective on the events or individuals associated with the resources." (CCR 4852 [d][2]). Fifty years is normally considered sufficient time for a potential historical resource, and in order that the evaluation remain valid for a minimum of five years after the date of this report, all resources older than 45 years (i.e. resources from the "historic-period") will be evaluated for California Register listing eligibility, or CEQA significance. The California Register also requires that a resource possess integrity. This is defined as the ability for the resource to convey its significance through seven aspects: location, setting, design, materials, workmanship, feeling, and association. Finally, CEQA requires that significant effects on unique archaeological resources be considered and addressed. CEQA defines a unique archaeological resource as any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

CEQA Guidelines Section 15064.5 Appendix G includes significance criteria relative to archaeological and historical resources. These have been utilized as thresholds of significance here, and a project would have a significant environmental impact if it would:

a) cause a substantial adverse change in the significance of a historical resource as defined in section 10564.5;

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 10564.5;

c) Disturb any human remains, including those interred outside of formal cemeteries.

Tribal Cultural Resources. The Legislature added requirements regarding tribal cultural resources for CEQA in Assembly Bill 52 (AB 52) that took effect July 1, 2015. AB 52 requires consultation with California Native American tribes and consideration of tribal cultural resources in the CEQA process. By including tribal cultural resources early in the CEQA process, the legislature intended to ensure that local and Tribal governments, public agencies, and project proponents would have information available, early in the project planning process, to identify and address potential adverse impacts to tribal cultural resources. By taking this proactive approach, the legislature also intended to reduce the potential for delay and conflicts in the environmental review process. To help determine whether a project may have such an effect, the Public Resources Code requires a lead agency to consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a Proposed Project. Since the City will initiate and carry out the required AB52 Native American Consultation, the results of the consultation are not provided in this report. However, this report may be used during the consultation process, and BCR Consulting staff are available to answer questions and address comments as necessary.

NATURAL SETTING

The elevation of the project site averages approximately 2815 feet above mean sea level (AMSL). Local rainfall averages between 5 and 15 inches annually (Jaeger and Smith 1971:36-37), and snowfall occasionally occurs during the winter. The project exhibits relatively flat terrain with a slight southwest aspect, and the nearest natural water source is an unnamed intermittent drainage approximately 0.44 miles to the southwest. The project site is located on the western approach to the San Gorgonio Pass between the San Bernardino Mountains of the Transverse Range geologic province to the north, and the San Jacinto Mountains of the Peninsular Range geologic province to the south (see Dibblee 1982; Morton 1978a, 1978b, and others). Each of the adjacent mountain ranges are over 11,000 feet AMSL and are composed of Jurassic and Cretaceous granitic rocks, which have intruded and metamorphosed older rocks. Finer local sediments range in age from late Miocene, Pliocene, Pleistocene, and Holocene (Rewis et al. 2006). Remnants of a coastal sage scrub biotic community remain sporadically in place. Signature plant species include black sage (*Salvia mellifera*), California brittlebush (*Encelia californica*), California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemesia californica*), deerweed (*Lotus scoparius*), golden yarrow (*Eriophyllum confertiflorum*), laurel sumac (*Malosma laurina*), lemonadeberry (*Rhus integrifolia*), poison oak (*Toxicodendron diverilobum*), purple sage (*Salvia leucophyla*), sticky monkeyflower (*Mimulus aurantiacus*), sugar bush (*Rhus ovate*), toyon (*Heteromeles arbutifolia*), white sage (*Salvia apiana*), coastal century plant (*Agave shawii*), coastal cholla (*Opuntia prolifera*), Laguna Beach liveforever (*Dudleya stolonifera*), many-stemmed liveforever (*Dudleya multicaulis*), our Lord's candle (*Yucca whipplei*), prickly pear cactus (*Opuntia sp.*) (Williams et al. 2008:118-

119). Signature animal species within Coastal Sage Scrub habitat include the kangaroo rat (*Dipodomys sp.*), California horned lizard (*Phrynosoma coronatum frontale*), and orange throated whiptail (*Cnemidophorus hyperthrus*).

CULTURAL SETTING

Prehistory

Various regional syntheses have been utilized in the archaeological literature for southern California. The following framework derives information from local studies to provide a useful overview for the project site.

Paleoindian (12,000 to 10,000 BP) and Lake Mojave (10,000 to 7,000 BP) Periods. Climatic warming characterizes the transition from the Paleoindian Period to the Lake Mojave Period. This transition also marks the end of Pleistocene Epoch and ushers in the Holocene. The Paleoindian Period has been loosely defined by isolated fluted (such as Clovis) projectile points, dated by association with similar artifacts found in-situ in the Great Plains (Sutton 1996:227-228). Some fluted bifaces have been associated with fossil remains of Rancholabrean mammals approximately dated to ca. 13,300-10,800 BP near China Lake in the Mojave Desert. The Lake Mojave Period has been associated with cultural adaptations to moist conditions, and resource allocation pointing to more lacustrine environments than previously (Bedwell 1973). Artifacts that characterize this period include stemmed points, flake and core scrapers, choppers, hammerstones, and crescentics (Warren and Crabtree 1986:184). Projectile points associated with the period include the Silver Lake and Lake Mojave styles. Lake Mojave sites commonly occur on shorelines of Pleistocene lakes and streams, where geological surfaces of that epoch have been identified (Basgall and Hall 1994:69).

Pinto Period (7,000 to 4,000 BP). The Pinto Period has been largely characterized by desiccation of southern California. As formerly rich lacustrine environments began to disappear, the artifact record reveals more sporadic occupation of the drier regions, indicating occupants' recession into the cooler fringes (Warren 1984). Pinto Period sites are rare, and are characterized by surface manifestations that usually lack significant in-situ remains. Artifacts from this era include Pinto projectile points and a flake industry similar to the Lake Mojave tool complex (Warren 1984), though use of Pinto projectile points as an index artifact for the era has been disputed (see Schroth 1994). Milling stones have also occasionally been associated with sites of this period (Warren 1984).

Gypsum Period. (4,000 to 1,500 BP). A temporary return to moister conditions during the Gypsum Period is postulated to have encouraged technological diversification afforded by the relative abundance of available resources (Warren 1984:419-420; Warren and Crabtree 1986:189). Lacustrine environments reappear and begin to be exploited during this era (Shutler 1961, 1968). Concurrently a more diverse artifact assemblage reflects intensified reliance on plant resources. The new artifacts include milling stones, mortars, pestles, and a proliferation of Humboldt Concave Base, Gypsum Cave, Elko Eared, and Elko Corner-notched dart points (Warren 1984; Warren and Crabtree 1986). Other artifacts include leaf-shaped projectile points, rectangular-based knives, drills, large scraper planes, choppers, hammer stones, shaft straighteners, incised stone pendants, and drilled slate tubes. The

bow and arrow appears around 2,000 BP, evidenced by a smaller type of projectile point, the Rose Spring point (Rogers 1939; Schroeder 1953, 1961; Shutler 1961; Yohe 1992).

Saratoga Springs Period (1,500 to 800 BP). During the Saratoga Springs Period regional cultural diversifications of Gypsum Period developments are evident. Influences from Patayan/Yuman assemblages are apparent in the southern inland areas, and include buff and brown wares often associated with Cottonwood and Desert Side-notched projectile points (Warren 1984:423). Obsidian becomes more commonly used throughout southern California and characteristic artifacts of the period include milling stones, mortars, pestles, ceramics, and ornamental and ritual objects. Large villages evidence more structured settlement patterns, and three types of identifiable archaeological sites (major habitation, temporary camps, and processing stations) emerge (McGuire and Hall 1988). Diversity of resource exploitation continues to expand, indicating a much more generalized, somewhat less mobile subsistence strategy.

Shoshonean Period (800 BP to Contact). The Shoshonean period is the first to benefit from contact-era ethnography –and is subject to its inherent biases. Interviews of living informants allowed anthropologists to match artifact assemblages and particular traditions with linguistic groups, and plot them geographically (see Kroeber 1925; Gifford 1918). During the Shoshonean Period, continued diversification of site assemblages and reduced Anasazi and Yuman influence both coincide with the expansion of Numic (Uto-Aztecan language family) speakers across the Great Basin, Takic (also Uto-Aztecan) speakers into southern California, and the Hopi across the Southwest (Sutton 1996). Hunting and gathering continued to diversify, and the diagnostic arrow points include desert side-notch and cottonwood triangular, which have been locally recorded. Ceramics continue to proliferate, though are more common in the desert during this period (Warren and Crabtree 1986). Trade became well established between coastal and inland groups during this period.

Ethnography

The project site is situated in an area occupied by the Cahuilla. The Cahuilla were semi-nomadic hunter-gatherers who spoke a Cupan variation of the Takic language subfamily. An ethnographic summary is provided below.

Cahuilla. Spanish missionaries first encountered the Cahuilla in the late 18th century. Early written accounts of the Cahuilla are attributed to mission fathers; later documentation was by Strong (1972), Bright (1998), and others. The territory of the Cahuilla ranges from the area near the Salton Sea up into the San Bernardino Mountains and San Gorgonio Pass (Bean and Smith 1978; Kroeber 1925). The Cahuilla are generally divided into three groups: Desert Cahuilla, Mountain Cahuilla, and Western (or Pass) Cahuilla (Kroeber 1925). The term Western Cahuilla is preferred over Pass Cahuilla because this group is not confined to the San Gorgonio Pass area (Bean and Smith 1978). The distinctions are believed to be primarily geographic, although linguistic and cultural differences may have existed to varying degrees (Strong 1972). Cahuilla territory lies within the geographic center of Southern California and the Cocopa-Maricopa Trail, a major prehistoric trade route, ran through it. The Cahuilla share a common tradition with Gabrielino, Serrano, and Luiseño, with whom they shared tribal boundaries to the west, north, and southwest respectively (Bean and Smith 1978:575). The Cahuilla situated their villages in close proximity to reliable water sources.

Subsistence was based on a combination of hunting, gathering, and a sort of proto-agriculture that produced corn, beans, squash, and melons. The diverse habitat of the Cahuilla allowed significant yields of their most important staples, which included acorns from six varieties of oak, piñon nuts, screw bean mesquite, and various cacti (Bean and Smith 1978:578; see also Lightfoot and Parrish 2009).

History

In southern California, the historic era is generally divided into three periods: the Spanish or Mission Period (1769 to 1821), the Mexican or Rancho Period (1821 to 1848), and the American Period (1848 to present). These periods are each represented in the history of the San Gorgonio pass, summarized below.

The San Gorgonio Pass. The project site is located in the San Gorgonio Pass. The San Gorgonio Pass has always been a vital connection between southern California's desert and the less arid interior and coast. Originally a Native American trade route, the pass was eventually occupied by Spanish ranchers living on the eastern frontier of lands administered by Mission San Gabriel. The region also served as a base from which Native Americans and Spaniards annually formed cooperative caravans from the mission via the pass to the "Salton Sea flat to gather enough of the almost pure salt to sustain the missions and pueblo of Los Angeles for another year" (Lech 2004:14). During the Mexican Period, Rancho San Jacinto y San Gorgonio dominated the local economy. It was granted to Santiago Johnson in 1843 and sold to Louis Rubidoux in 1844 (Gunther 1984:471). The American Period saw the breakup of most of the huge Mexican-era ranchos and San Jacinto y San Gorgonio was no exception. The San Gorgonio Pass remained an important travel corridor during the early American Period. Freight wagons and the Pony Express regularly crossed the pass before Wells Fargo surveyed and constructed an official stage line in 1862, and the Bradshaw Road was opened in 1863 (Robinson 2001:106-107). Eventually five separate wagon routes were in regular operation through the pass, although the arrival of the Southern Pacific Railroad in 1877 signaled the end of the stagecoach era (Eyer 1974). While most of the large Mexican ranchos were gone by the mid to late 19th century, the ranching tradition persisted, and to some extent remains locally viable. Banning was founded in 1884. It was named for Phineas Banning who ran a regular stage line between Los Angeles and San Pedro with his brother alexander in the 1850s. Banning was a principal promoter of transportation infrastructure and is considered one of the "grand old men" of Los Angeles (Gudde 1962:24). Although the City of Beaumont retains a relatively rural character, low housing costs resulted in accelerated residential developments in the early 2000s and the communities of the San Gorgonio Pass experienced the fastest population growth in Riverside County during this era (Woolsey 2007).

PERSONNEL

David Brunzell, M.A., RPA acted as Principal Investigator and provided project oversight. Joseph Orozco, M.A. RPA acted as Project Manager for the current study, and compiled the technical report with contributions by BCR Consulting Archaeological Crew Chief Tim Blood. Mr. Blood and BCR Staff Archaeologist Douglas Kazmier, B.A., performed the cultural resources records search at the South Coastal Information Center (SCIC) located at San

Diego State University. BCR Consulting Staff Archaeologist/Historian George Brentner, B.A. completed the field survey.

METHODS

Research

Prior to fieldwork, a cultural resources records search was conducted at the SCIC. This included a review of all recorded historic and prehistoric cultural resources, as well as a review of known cultural resources, and survey and excavation reports generated from projects located within one mile of the project site. In addition, the Built Environment Resources Directory (BERD) was reviewed to discern the status of any listed or eligible National Register of Historic Places (National Register) and/or the California Register of Historical Resources (California Register) properties, or properties that have been designated as locally eligible by the California State Historic Preservation Officer (SHPO) located within the records search radius.

Field Survey

An archaeological pedestrian field survey of the project site was conducted on March 4, 2025. The survey was conducted by walking parallel transects spaced 15 meters apart across 100 percent of portions of the project site that exhibited sufficient surface visibility. Soil exposures, including natural and artificial clearings were carefully inspected for evidence of cultural resources. In areas of low visibility, transect width was narrowed to 10 meters and vegetation was removed at regular intervals to inspect the ground surface.

RESULTS

Research

Data from the SCIC revealed that 23 cultural resource studies have taken place resulting in the recording of 14 cultural resources within one mile of the project site. Of the 23 previous studies, none have assessed the project site and no cultural resources have been previously recorded within its boundaries. The records search is summarized in Table A, and a complete bibliography is provided in Appendix A.

Table A. Cultural Resources and Reports Located Within One Mile of the Project Site

USGS Quad	Cultural Resource	Cultural Reports
Beaumont (1985), California	P-33-90: Prehistoric Lithic Scatter/Milling Feature (3/4 Mi. NE) P-33-6125: Historic-Period Single Family Property (7/8 Mi. NW) P-33-6126: Historic-Period Single Family Property (1/2 Mi. W) P-33-6127: Historic-Period Single Family Property (1/2 Mi. W) P-33-6128: Historic-Period Single Family Property (1/2 Mi. SW) P-33-6130: Historic-Period Single Family Property (7/8 Mi. N) P-33-6210: Historic-Period Single Family Property 1/8 Mi. N) P-33-13640: Historic-Period Agriculture/Water System(1/2 Mi. NW) P-33-13827: Historic Period Refuse Scatter (1/4 Mi. E) P-33-13828: Historic-Period Refuse Scatter (1/2 Mi. E) P-33-13829: Historic-Period Refuse Scatter (1 Mi. S) P-33-15033: Historic-Period Water Conveyance System (1 Mi. SE) P-33-15035: Historic-Period Transmission Line (1 Mi. SE) P-33-20295: Historic-Period Single Family Residence (3/4 Mi. W)	RI-39, 40, 3421, 3852, 5017, 5660, 6192, 6722, 7053, 7054, 7288, 7869, 8409, 8449, 9167, 9298, 9359, 10157, 10706, 10934, 11022, 8449, 10157

Field Survey

During the field survey, BCR Consulting personnel carefully inspected the project site, and identified no cultural resources within the project site boundaries. The project site is occupied by a modern church complex and parking lot that are first visible on Google Earth images between 2006 and 2011. Since these buildings and parking lot are not historic in age (i.e. 45 or more years old) they do not merit further consideration. Surface visibility in the undeveloped areas was approximately 75 percent. Vegetation included pine trees, seasonal grasses and landscaped planters. Visible sediments consisted of light brown sandy loam with moderate levels (20-40% subangular granitic pebbles). No cultural resources (including prehistoric or historic-period archaeological sites or historic-period buildings) were identified during the field survey. The project site has been subject to severe disturbances associated with off-highway vehicle traffic, and the construction of the paved parking lot and buildings.

RECOMMENDATIONS

The records search and field survey did not identify any cultural resources (including prehistoric or historic archaeological sites or historic-period buildings) within the project site. Furthermore, research results combined with surface conditions have failed to indicate sensitivity for buried cultural resources. Therefore, no significant impacts related to archaeological or historical resources are anticipated and no further investigations are recommended for the project site unless:

- the proposed project is changed to include areas not subject to this study;
- the proposed project is changed to include the construction of additional facilities;
- cultural materials are encountered during project activities.

Although the current study has not indicated sensitivity for cultural resources within the project site boundaries, ground disturbing activities always have the potential to reveal buried deposits not observed on the surface during previous surveys. Prior to the initiation of ground-disturbing activities, field personnel should be alerted to the possibility of buried prehistoric or historic cultural deposits. In the event that field personnel encounter buried cultural materials, work in the immediate vicinity of the find should cease and a qualified archaeologist should be retained to assess the significance of the find. The qualified archaeologist shall have the authority to stop or divert construction excavation as necessary. If the qualified archaeologist finds that any cultural resources present meet eligibility requirements for listing on the California Register or the National Register, plans for the treatment, evaluation, and mitigation of impacts to the find will need to be developed. Prehistoric or historic cultural materials that may be encountered include:

- historic artifacts such as glass bottles and fragments, cans, nails, ceramic and pottery fragments, and other metal objects;
- historic structural or building foundations, walkways, cisterns, pipes, privies, and other structural elements;
- prehistoric flaked-stone artifacts and debitage (waste material), consisting of obsidian, basalt, and or cryptocrystalline silicates;
- groundstone artifacts, including mortars, pestles, and grinding slabs;

- dark, greasy soil that may be associated with charcoal, ash, bone, shell, flaked stone, groundstone, and fire affected rocks.

According to CEQA Guidelines, projects subject to CEQA must determine whether the project would "directly or indirectly destroy a unique paleontological resource". The Beaumont area contains geological formations that comprise rocky highlands of the San Jacinto Mountains, the faulted plain of the San Gorgonio Pass, and the San Timoteo Badlands. The project site is occupied by alluvial valley deposits of the San Timoteo Badlands, and sediments therein are from the late Holocene (Qa) and have low sensitivity for paleontological resources (i.e. fossils; City of Beaumont 2020:5.6-1, 5.6-31; see Appendix C). Since the project site has a demonstrated low sensitivity for paleontological resources, proposed project activities are not likely to directly or indirectly destroy a unique paleontological resource or site or unique geological feature and no additional work associated with paleontological resources is recommended.

If human remains are encountered during the undertaking, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC.

REFERENCES

Basgall, Mark E., and M.C. Hall
1994 Perspectives on the Early Holocene Archaeological Record of the Mojave Desert: *Kelso Conference Papers 1987-1992,* edited by G.D. Everson and J.S. Schneider. CSU Bakersfield, Museum of Anthropology Occasional Papers in Anthropology 4.

Bean, Lowell John, and Charles Smith
1978 *California*, edited by R.F. Heizer. Handbook of North American Indians, Vol. 8, W.C. Sturtevant, general editor, Smithsonian Institution. Washington, D.C.

Bedwell, S.F.
1973 *Fort Rock Basin: Prehistory and Environment.* University of Oregon Books, Eugene.

Bright, William
1998 *California Place Names, The Origin and Etymology of Current Geographical Names*. University of California Press, Berkeley, California.

City of Beaumont
2020 *Draft Program Environmental Impact Report Beaumont General Plan Update (Beaumont 2040 Plan) and Revisions to the Zoning Ordinance and Zoning Map.* Prepared by Albert A. Webb Associates

Dibblee, T.W., Jr.
1982 G*eologic Map of the Banning, California 15-minute Topographic Quadrangle.* South Coast Geological Society Geologic Map SCGS-2.

Eyer, William K.
1974 *Condensed History of Beaumont and Cherry Valley From 1812.* L & M Graphics. Beaumont, California.

Gifford, Edward W.
1918 Clans and Moieties in Southern California. *University of California Publications in American Archaeology and Anthropology* 14(22)155-219

Gunther, Jane Davies
1984 *Riverside County, California Place Names: Their Origins and Their Stories.* Rubidoux Printing Company. Riverside, California.

Gudde, Erwin G.
1962 *California Place Names. The Origin and Etymology of Current Geographical Names.* University of California Press. Los Angeles.

Jaeger, Edmund C., and Arthur C. Smith
1971 *Introduction to the Natural History of Southern California*. California Natural History Guides: 13. University of California Press. Los Angeles

Kroeber, Alfred L.
1925 *Handbook of the Indians of California.* Bureau of American Ethnology Bulletin No. 78. Washington D.C.: Smithsonian Inst. Reprinted 1976, Dover Publications. New York.

Lech, Steve
2004 *Along the Old Roads: A History of the Portion of Southern California that Became Riverside County: 1772-1893.* Published by the Author. Riverside, California.

Lightfoot, Kent G., Otis Parrish
2009 *California Indians and Their Environment, an Introduction.* University of California Press, Berkeley.

McGuire, K.R., and M.C. Hall
1988 *The Archaeology of Tiefort Basin, Fort Irwin, San Bernardino County, California.* Far West Anthropological Research Group, Inc., Davis, California.

Morton, D.M.
1978a *Geologic Map of the Redlands, California 7.5-Minute Topographic Quadrangle.* U.S. Geological Survey Open File Report 78-21.

1978b *Geologic Map of the Sunnymead 7.5-Minute Topographic Quadrangle.* U.S. Geological Survey Open File Report 78-21.

Rewis, D.L., A.H. Christensen, J.C. Matti, J.A. Hevesi, T. Nishikawa, and P. Martin
2006 *Geology, Ground Water Hydrology, Geochemistry, and Ground-Water Simulation of the Beaumont and Banning Storage Units, San Gorgonio Pass Area, Riverside County, California.* U.S. Geological Survey Scientific Investigations Report 2006.

Robinson, John
2001 *The San Bernardinos The Mountain Country from Cajon Pass to Oak Glen Two Centuries of Changing Use.* Big Santa Anita Historical Society. Arcadia, California.

Rogers, M.J.
1939 *Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Desert Areas.* San Diego Museum Papers No. 3.

Schroth, Adella Beverly
1994 *The Pinto Point Controversy in the Western United States.* Unpublished PhD Dissertation, University of California, Riverside.

Schroeder, Albert H.
1953 A Few Sites in Moapa Valley, Nevada. *The Masterkey* 27(1):18-24, (2):62-68

1961 *The Archaeological Excavations at Willow Beach, AZ, 1950.* Utah Anthro. Papers 50.

Shutler, Richard, Jr.
1961 *Lost City, Pueblo Grande de Nevada.* Nev. State Museum Anthropological Papers 5.

1968 The Great Basin Archaic. In Prehistory in the Western United States. *Contributions in Anthropology* 1(3):24-26. Edited by C. Irwin-Williams, E. New Mexico University.

Strong, William Duncan
1972 Aboriginal Society in Southern California. *University of California Publications in*

American Archaeology and Ethnology 26(1):1-358.

Sutton, Mark Q.
1996 The Current Status of Archaeological Research in the Mojave Desert. *Journal of California and Great Basin Anthropology* 18(2):221-257.

United States Geological Survey
1985 *Beaumont, California* 7.5 Minute Topographic Quadrangle Map.

Warren, Claude N.
1984 The Desert Region. In *California Archaeology*, by M. Moratto with contributions by D.A. Fredrickson, C. Raven, and C.N. Warren, pp. 339–430. Academic Press, Orlando, Florida.

Warren, Claude N. and R.H. Crabtree
1986 The Prehistory of the Southwestern Great Basin. In *Handbook of the North American Indians, Vol. 11, Great Basin,* edited by W.L. d'Azevedo, pp.183-193. W.C. Sturtevant, General Editor. Smithsonian Institution, Washington D.C.

Williams, Patricia, Leah Messinger, Sarah Johnson
2008 *Habitats Alive! An Ecological Guide to California's Diverse Habitats.* California Institute for Biodiversity, Claremont, California.

Woolsey, Matt
2007 *Americas Fastest Growing Suburbs.* Electronic document. forbes.com. Accessed June 5, 2015.

Yohe, Robert M., II
1992 *A Reevaluation of Western Great Basin Cultural Chronology and Evidence for the Timing of the Introduction of the Bow and Arrow to Eastern California Based on New Excavations at the Rose Spring Site (CA-INY-372).* Unpublished PhD Dissertation, University of California, Riverside.

APPENDIX A

RECORDS SEARCH BIBLIOGRAPHY

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-00039	NADB-R - 1080050; Submitter - 54; Voided - MF-0044	1972	Mary A. Brown and Martha J. Solig	Development of Highland Springs: Expected Impact on Archaeological Resources.	Archaeological Research Unit and Dry Lands Research Institute, U.C. Riverside	
RI-00040	NADB-R - 1080051; Voided - MF-0044	1982	David M. Van Horn	Cultural Resources Assessment: Tentative Tract 14209 near Highland Springs in Unincorporated Riverside County, California	Archaeological Associates, LTD	
RI-03421	NADB-R - 1084088; Submitter - 89-1229; Voided - MF-3678	1989	BROWN, JOAN and JUANITA SHINN	Cultural Resources Literature Review for the 1,162 Acre Deutsch Specific Plan Project, Located In the City Of Beaumont, Riverside County, California	RMW PALEO ASSOCIATES	
RI-03852	NADB-R - 1084726; Submitter - 1008; Voided - MF-4197	1993	WHITNEY-DESAUTELS, NANCY	CULTURAL RESOURCE ASSESSMENT OF THE SAN GORGONIO PASS WATER AGENCY WATER IMPORTATION PROJECT, RIVERSIDE AND SAN BERNARDINO COUNTIES, CALIFORNIA	SCIENTIFIC RESOURCE SURVEYS, INC.	
RI-05017	NADB-R - 1086379; Submitter - 11-04-12-1025	2004	Jeanette A. McKenna	Archaeological Survey Report: A Phase I Cultural Resources Investigation of the Leonard H. Peterson Property in the Cherry Valley Area of Riverside County, California	McKenna et al.	
RI-05660	NADB-R - 1087023; Submitter - 101	2004	ALEXANDROWICZ, JOHN STEPHEN	AN HISTORICAL RESOURCES INVESTIGATION OF TENTATIVE TRACT MAP NO. 31729, GRAND AVENUE, RIVERSIE COUNTY, CA	ARCHAEOLOGICAL CONSULTING SERVICES	33-013640
RI-06192	NADB-R - 1087555; Submitter - CRM TECH CONTRACT #1227	2004	Bai Tang, Michael Hogan, Josh Smallwood, and Daniel Ballester	Historical/Archaeological Resources Survey Report, Assessor's Parcel No. 402-160-002, Near The Community Of Cherry Valley, Riverside County, California	CRM TECH	
RI-06722	NADB-R - 1088089; Submitter - PROJECT NO. PDH0601	2006	BRUNZELL, DAVID	Cultural Resources Assessment and Historic Evaluations: Deutsch Property Specific Plan, City of Banning, Riverside County, California	LSA ASSOCIATES, INC.	33-015033, 33-015034, 33-015035
RI-07053	Submitter - 2053	2007	Tang, Bai and Michael Hogan	Historical/Archaeological Resources Survey Report: 40587 High Street, Assessor's Parcel No. 402-140-008, Near the City of Beaumont, Riverside County, California.	CRM Tech	
RI-07054	Submitter - 1973A	2007	Hogan, Michael and Bai Tang	Cultural Resource Reconnaissance and Sensitivity Assessment: Beaumont-Cherry Valley Water Disterict Sewer System, in the Communtiy of Cherry Valley, Riverside County, California.	CRM TECH	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-07288	Submitter - CRM TECH Contract No. 2051	2007	Mariam Dahdul, Daniel Ballester, and Laura H. Shaker	Identification and Evaluation of Historic Properties Recycled Water System in and Near the Cities of Beaumont and Calimesa, Riverside County, California	CRM TECH, Riverside, CA	33-009498, 33-015720
RI-07869	Other - Contract No. 00708.08	2008	Jordan, Stacey C. and Michael M. DeGiovine	Archaeological Survey Report for Southern California Edison Company Deteriorated Pole Replacement Project for a Total of Ten Poles on IDA 12KV (#4679978E and #4744631E), Oak Glen 12KV (#4744626E), Bryn Mawr 12KV (#4744645E), Stewart 4KV (#4760030E), Boulder 12KV (#4714250E, Lapins 12KV (4759904E), Mesa Grande 12KV (#4759915E), Conine 12KV (#4759921E) and Preston 12KV (#4759658E) Circuits and Removal of One Pole on Bench 12KV (#782504H) Circuit on Private Lands in Riverside and San Bernardino Counties, California (WO#6031-4800, AI#8-4850, AI#8-4852)	ICF Jones & Stokes	
RI-08409	Other - Contract No. 0311-051	2004	William T. Eckhardt, Kristen E. Walker, and Richard L. Carrico	Draft Cultural Resources Inventory of the Proposed Vista to Devers Transmission Line, Riverside and San Bernardino Counties, California.	Mooney/Hayes Associatesm LLC	33-002262, 33-004768, 33-007888, 33-013427, 33-013428, 33-013429, 33-013430, 33-013431, 33-013432, 33-013433, 33-013434
RI-08449	Submitter - CRM TECH Contract #1211	2004	Bai "Tom" Tang, Michael Hogan, Josh Smallwood, and Terri Jacquemain	Cultural Resources Technical Report City of Banning General Plan.	CRM TECH	
RI-09167		2013	Roderic McLean, Natalie Brodie, Jacqueline Hall, Shannon Carmack, Phil Fulton, Ingri Quon, Erin Martinelli, Richard Erickson, and Jay Michalski	Cultural Resources Assessment and Class III Inventory Volume I West of Devers Project San Bernardino and Riverside Counties, California.	LSA	33-000179, 33-001296, 33-002262, 33-003446, 33-003449, 33-004213, 33-006015, 33-006103, 33-006107, 33-006109, 33-006156, 33-006168, 33-006219, 33-007296, 33-007870, 33-008334, 33-008347, 33-009498, 33-011265, 33-012642, 33-012643, 33-013427, 33-013429, 33-013430, 33-013431, 33-013432, 33-013433, 33-014871, 33-015033, 33-015035, 33-015183, 33-015184, 33-015185, 33-015186, 33-015189, 33-015720, 33-015760, 33-015843, 33-015845, 33-015992, 33-016898, 33-016904, 33-016907, 33-016961, 33-016993, 33-018123, 33-018648, 33-019671, 33-020721

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-09298		2015	David Brunzell	Cultural Resources Assessment of the Joule Project, Beumont, Riverside County, California (BCR Consulting Project NO. TRF1429)	BRC Consulting	
RI-09359		2011	Chris Millington, Benjamin Vargas, and John Dietler	Cultural Resources Survey For Five Deteriorated Poles (GT14318, GT14322E, 2302533E, 2260773E, 2312202E) Near Redlands, San Bernardino County, and Banning, Riverside County, California	SWCA Environmental Consultants	
RI-10157		2014	Audry Williams and Andrew Belcourt	Archival Research Evaluation Results of 33 Cultural Resources For Southern California Edison Company's West of Devers Upgrade Project, Riverside and San Bernardino Counties, California Volume 1	Southern California Edison	33-003449, 33-007870, 33-013431, 33-014871, 33-015033, 33-015035, 33-015843, 33-016993, 33-022345, 33-022354, 33-022355, 33-022356, 33-022362, 33-022364, 33-022372, 33-022380, 33-022387, 33-022388, 33-022389, 33-022514, 33-023484, 33-026222
RI-10706		2015	Carrie D. Wills and Sarah A. Williams	Cultural Resource Records Search and Site Visit Results for Cello Partnership and their Controlled Affiliates doing business as Verizon Wireless Canidate 'Midnight', Rover Lane, Unaddressed Parcel APN: 408-100-022-9, Beaumont, Riverside County, California	Helix Environmental Planning	
RI-10754		2019	Andrew J. Garrison and Brian F. Smith	A Class III Historic Resource Study for Phase 3 of the Atwell Project for Section 106 Compliance, SPL- Banning, California	Brian F. Smith and Associates, Inc.	33-015034, 33-015035
RI-10766		2018	Andrew J. Garrison and Brian F. Smith	A Class III Historic Resource Study for Phase 2 of the Atwell Project for Section 106 Compliance, SPL-, Banning, California	Brain F. Smith and Associates, Inc.	33-007997
RI-10934		2019	Brain F Smith	Results of Archaeological Monitoring at the Atwell Phase 1A Project (formerly Butterfield Specific Plan), City of Banning, Riverside County, California (TM 37298; APNs 408-120- 001 to -005, -007, and -008 and portions of APNs 408-120-006, -010, -012, -019, and -020)	Brain F Smith and Assocaites Inc	
RI-11022		2021	David Brunzell	Cultural Resources Assessment of the IE25515A Project, Beaumont, Riverside County, California (BCR Consulting Project No. ACE211)	BCR Consulting LLC	

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-33-000090	CA-RIV-000090		Other	Prehistoric, Historic	AP02; AP04; AP16	1957 (Johnston, n/a); 1967 (Fred & Lucille Hirsch, n/a); 1967 (McCall, n/a); 1978 (M. Brown, n/a); 2006 (D. McDougall, Applied EarthWorks, Inc.)	
P-33-006125		Other - 33-32223-33	Building	Historic	HP02	1983 (J. Warner, Riverside County Historical Comm.)	
P-33-006126		Other - 33-32223-34	Building	Historic	HP02	1983 (Jim Warner, Riverside Country Historical Comm.)	
P-33-006127		Other - 33-32223-35	Building	Historic	HP02	1983 (Jim Warner, Riverside County Historical Comm.)	
P-33-006128		Other - R.K. Edgar Home; Other - Ser. No. 33-2223-36	Building	Historic	HP02	1983 (Jim Warner, Riverside County Historical Comm.)	
P-33-006130		Other - 33-223-38	Building	Historic	HP02	1983 (Jim Warner, Riverside County Historical Commission)	
P-33-006210		Other - 33-32223-110	Building	Historic	HP02	1983 (Jim Warner, Riv. Co. Historical Comm.)	
P-33-013640	CA-RIV-007504	ACS-McManus-1	Site	Historic	AH03; AH06	2014 (John Stephen Alexandrowicz, Archeological Consulting Services)	RI-05660
P-33-013827			Site	Historic	AH04	2004 (Harris, N., Harris Arch. Cons.)	
P-33-013828			Site	Historic	AH04	2004 (Harris, N., Harris Arch. Cons.)	
P-33-013829		Other - HAC-SUN-3H	Site	Historic	AH03; AH04	2004 (Harris, N., Harris Arch. Cons.)	
P-33-015033	CA-RIV-007997	Other - Smith Creek Ditch	Structure	Historic	AH06	2006 (Brunzell, David, LSA Associates, Inc); 2013 (J. Miller, C.Morgan, R.Goodwin, J.Hall, LSA Associates, Inc.)	RI-06722, RI-08980, RI-09167, RI-10157

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-33-015035	CA-RIV-013001	Other - Chino Mira Loma 200kV Transmission Line; Other - Mira Loma-Vista 220kV Transmission Line; Other - Devers-Vista No. 1 220kV Transmission Line; Other - Southern California Edison Company Chino-Hayfield 220kV Transmission Line; Other - Devers-San Bernardino No. 1 220kV Transmission Line; Other - Julian Hinds-Mirage 220kV Transmission Line; Other - LSA-PDH0601-H3; Other - SCE1110-TL-1; Voided - 33-022389; Other - Devers-Hinds 220 kv Transmission Line; Voided - 33-008411	Structure	Historic	HP11	1998 (J. Brock, Archaeological Advisory Group); 2006 (Brunzell, David, LSA Associates, Inc.); 2010 (S. Justus, B. Wilson, A. Giacinto, ASM Affiliates); 2012 (L. Davidson, R. Goodwin, B. Smith, LSA Associates, Inc.); 2012 (L.Davidson, R.Goodwin, B.Smith, LSA Associates, Inc.); 2013 (Wendy L. Tinsley Becker, Steven Treffers, Urbana Preservation and Planning, SWCA); 2013 (Wendy L. Tinsley Becker, Steven Treffers, Urbana Preservation and Planning, SWCA Environmental Consultants); 2014 (Wendy L. Tinsley Becker, Steven Treffers, Urbana Preservation and Planning, SWCA); 2015 (S. Kremkau, SRI); 2019 (Joseph Orozco, BRC Consulting LLC)	RI-06722, RI-07603, RI-08980, RI-09035, RI-09151, RI-09167, RI-10157, RI-10435, RI-10754
P-33-020295		National Register - 6z; Other - Lattin-1	Building	Historic	HP02	2011 (Laura S. White, Archaeological Associates)	

APPENDIX B

PROJECT PHOTOGRAPHS



Photo 1: Project Site Overview (SSW)



Photo 2: Landscaped Features Overview (SSE)



Photo 3: Project Overview (W)



Photo 4: Overview of Existing Building (SE)



Photo 5: Project Overview (WNW)



Photo 6: Project Overview (ENE)

APPENDIX C

PALEONTOLOGICAL OVERVIEW

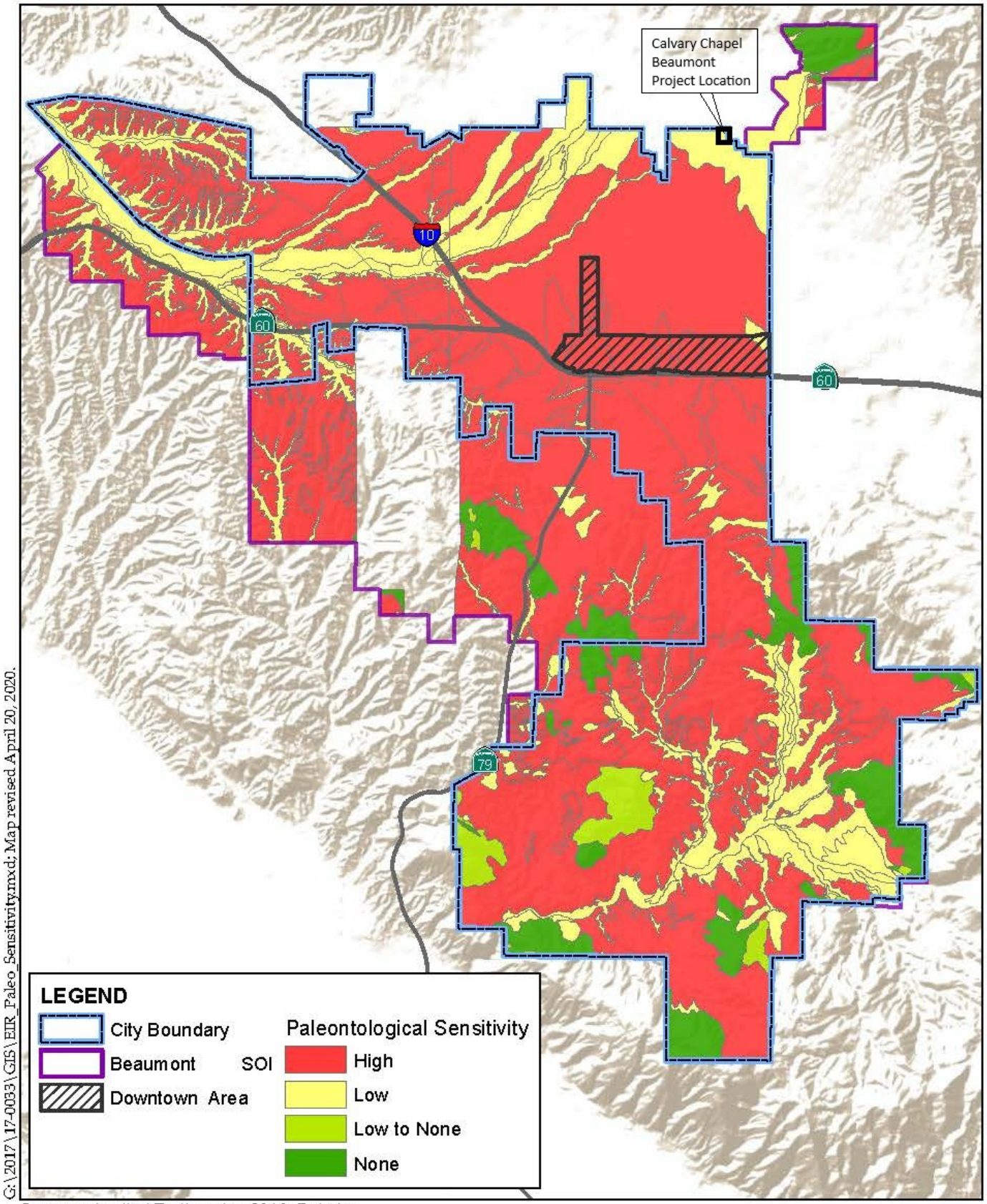


Figure 5.6-9 Paleontological Sensitivity

City of Beaumont General Plan Update

ALBERT A. WEBB ASSOCIATES

APPENDIX D

NAHC SACRED LANDS FILE SEARCH

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Reginald Pagaling
Chumash

VICE-CHAIRPERSON
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

SECRETARY
Sara Dutschke
Miwok

PARLIAMENTARIAN
Wayne Nelson
Luiseño

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Stanley Rodriguez
Kumeyaay

COMMISSIONER
Reid Milanovich
Cahuilla

COMMISSIONER
Bennae Calac
Pauma-Yuima Band of Luiseño Indians

COMMISSIONER
Vacant

ACTING EXECUTIVE SECRETARY
Steven Quinn

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov

March 20, 2025

Timothy Blood
BCR Consulting, LLC

Via Email to: bcrllc2008@gmail.com

Re: Cavalry Chapel Beaumont Project, Riverside County

To Whom It May Concern:

As requested, a record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed based on information submitted for the above referenced project. The results were negative. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. As such, a SLF search is not a substitute for consultation with all tribes that are traditionally and culturally affiliated with a project's geographic area.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. If within two weeks of notification, a response has not been received, the Commission requests that you follow-up with a telephone call or email to ensure that the project information was received.

If you receive notification of a change of address or phone number from a tribe, please notify the NAHC so that we can assure that our lists contain current information.

In addition to engaging in tribal consultation, you should consult the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center to determine whether it has information regarding the presence of recorded archaeological sites within the project area.

If you have any questions or need additional information, please contact me at Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Riverside County
3/20/2025

Tribe Name	Contact Person	Contact Address	Phone #	Email Address
Agua Caliente Band of Cahuilla Indians	Lacy Padilla, Director of Historic Preservation/THPO	5401 Dinah Shore Drive Palm Springs, CA, 92264	(760) 333-5222	ACBCI-THPO@aguacaliente.net
Augustine Band of Cahuilla Indians	Tribal Operations,	84-001 Avenue 54 Coachella, CA, 92236	(760) 398-4722	info@augustinetribe-nsn.gov
Cabazon Band of Cahuilla Indians	Doug Welmas, Chairperson	84-245 Indio Springs Parkway Indio, CA, 92203	(760) 342-2593	jstapp@cabazonindians-nsn.gov
Cahuilla Band of Indians	BobbyRay Esparza, Cultural Director	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549	besparza@cahuilla-nsn.gov
Cahuilla Band of Indians	Erica Schenk, Chairperson	52701 CA Highway 371 Anza, CA, 92539	(951) 590-0942	chair@cahuilla-nsn.gov
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This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

NOISE AND VIBRATION IMPACT ANALYSIS

CALVARY CHAPEL EXPANSION PROJECT

BEAUMONT, CALIFORNIA

LSA

October 2025

NOISE AND VIBRATION IMPACT ANALYSIS

CALVARY CHAPEL EXPANSION PROJECT

BEAUMONT, CALIFORNIA

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October 2025

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LIST OF ABBREVIATIONS AND ACRONYMS

ADA	Americans with Disabilities Act
ADT	average daily traffic
ALUC	Airport Land Use Compatibility Plan
APN	Assessor's Parcel Number
CalEEMod	California Emissions Estimator Model
CEQA	California Environmental Quality Act
City	City of Beaumont
CNEL	Community Noise Equivalent Level
dB	decibel(s)
dBA	A-weighted decibel(s)
FHWA	Federal Highway Administration
ft	foot/feet
FTA	Federal Transit Administration
FTA Manual	FTA's *Transit Noise and Vibration Impact Assessment Manual*
HVAC	heating, ventilation, and air conditioning
in/sec	inches per second
L_{dn}	day-night average noise level
L_{eq}	equivalent continuous sound level
L_{max}	maximum instantaneous noise level
L_{min}	minimum instantaneous noise level
L_V	velocity in decibels
PPV	peak particle velocity
project	Calvary Chapel Expansion Project
RMS	root-mean-square (velocity)
sf	square foot/feet
V	root-mean-square velocity amplitude
VdB	vibration velocity decibels
V_{ref}	reference velocity amplitude

NOISE AND VIBRATION IMPACT ANALYSIS

INTRODUCTION

This Noise and Vibration Impact Analysis has been prepared to evaluate the potential noise and vibration impacts and mitigation measures associated with the Calvary Chapel Expansion Project (project) in Beaumont, California. This report is intended to satisfy the City of Beaumont's (City) requirements and the California Environmental Quality Act (CEQA) for a project-specific noise and vibration impact analysis by examining the short-term and long-term noise and vibration impacts on sensitive uses adjacent to the project site and evaluating mitigation measures that the project requires.

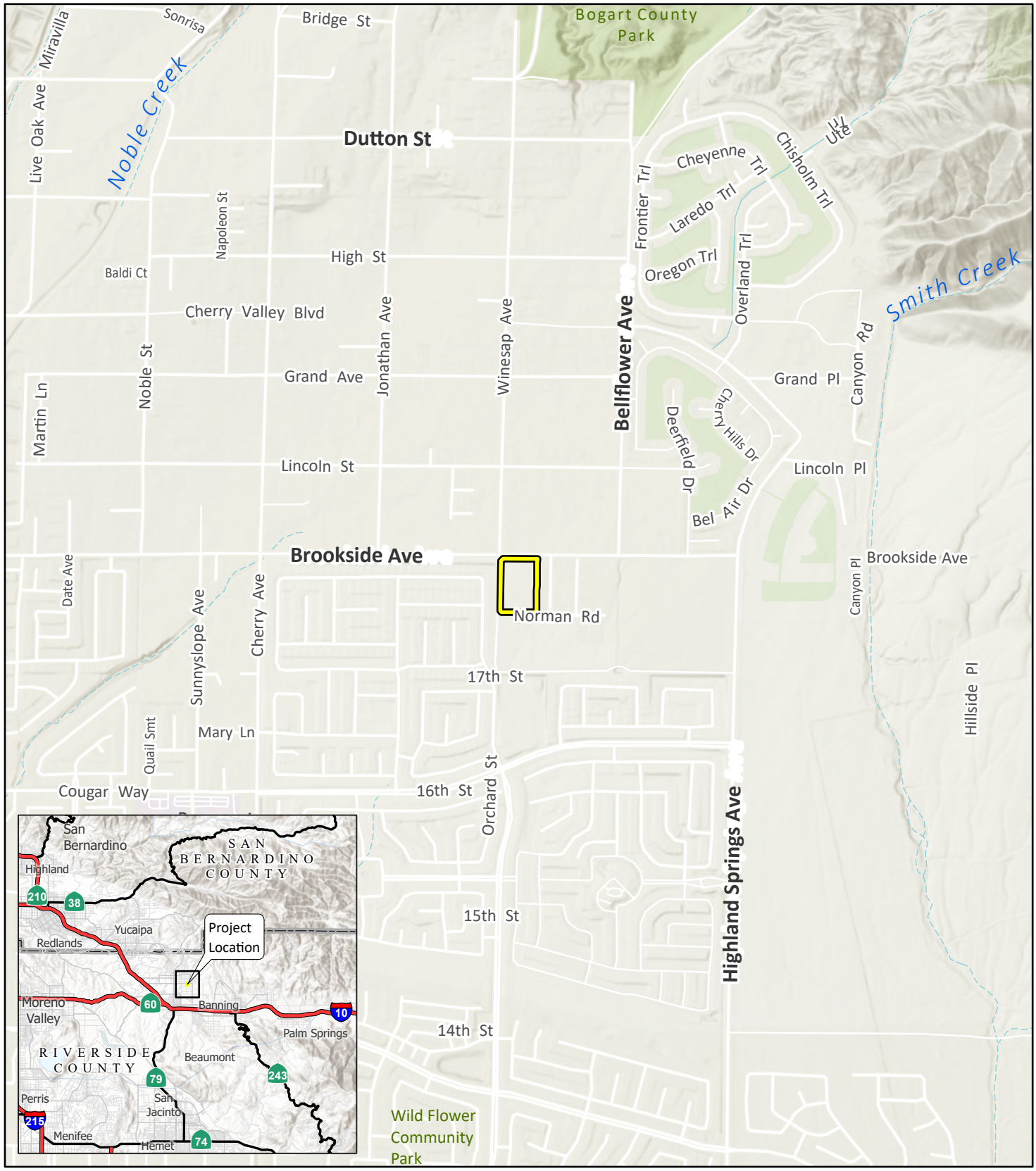
PROJECT LOCATION

The project site is located at 1780 Orchard Heights Avenue (Assessor's Parcel Number [APN] 408-070-012), which is at the southeast corner of Orchard Heights Avenue and Brookside Avenue. The site currently operates as a church facility that features a 3,000 square-foot (sf) sanctuary building, outdoor baptismal, outdoor picnic/patio area, one (1) modular restroom building, five (5) modular classroom buildings, landscaping, and parking improvements. Figure 1 shows the regional and project location.

PROJECT DESCRIPTION

The proposed project would expand the existing Calvary Chapel Beaumont Church facility with three new buildings. The proposed project would include a new 11,000 square-foot (sf) sanctuary building (Building A) consisting of 641 fixed seats, a 5,000 sf children's ministry center building (Building B), and a 7,700 sf youth recreation center and multipurpose building (Building D). In addition, a new baptismal area, two sports court facilities, and an outdoor barbecue area are also being proposed as part of the project. The existing sanctuary building (Building C) will be repurposed as a meeting room for lifegroups and teen-related activities and will no longer be used as a sanctuary for Sunday services. Vehicular access to the project site is provided by a driveway approach on Orchard Heights Avenue and a second approach on Brookside Avenue. An internal drive aisle will allow adequate circulation for pedestrian, vehicular, and emergency access. A total of 216 parking spaces are proposed, and the new concrete and pavement area will total 118,000 sf. The landscaping provided by the project will total 76,357 sf.

Operations of the project consist of worship services that are held throughout the week. One service is held on Wednesday nights at 6:30 p.m. and four services are held throughout Sunday at 8:00 am, 9:45 a.m., 11:30 a.m., and 1:30 p.m. The youth recreation center will maintain the same hours of operation as the regularly scheduled worship services on Wednesdays and Sundays. Lifegroups, such as Bible studies, are held at various times throughout the week in a small group setting. Each service and lifegroup session typically last an hour. In addition to worship services and lifegroups, the facility will employ at least two full-time staff and five part-time staff to be available for office hours as well as support general church functions. Staff members are present on site from 10:00 a.m. to 4:00 p.m. Monday through Friday and during worship services. The hours of operation for the proposed youth recreation center are unknown at this time. Therefore, this analysis assumes that the youth center



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Project Site

FIGURE 1

N

0 750 1500

FEET

SOURCE: Esri Topographic Basemap

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Calvary Chapel Expansion Project

Project Location and Vicinity

would also operate from 10:00 a.m. to 4:00 p.m., Monday through Friday. Figure 2 shows the project site plan.

No demolition is proposed as the project was designed to accommodate the existing parking improvements, and the structures that are to be removed are modular and do not require demolition. The project would include site preparation, grading, building construction, paving, and architectural coating. Construction of the proposed project is anticipated to begin in June 2025 with an 18-month construction period and an operational year of 2026. The project has three consecutive phases. However, all three phases have been conservatively modeled to coincide over an 18-month construction period ending January 2027. This analysis also assumes the use of Tier 2 construction equipment. The project site would include 3,839 cubic yards of cut and 13,795 cubic yards of fill. Additionally, the project is estimated to generate an additional 94 daily trips based on the *Calvary Chapel Expansion Project Trip Generation and Vehicle Miles Traveled Analysis Memorandum* (LSA 2024).

CHARACTERISTICS OF SOUND

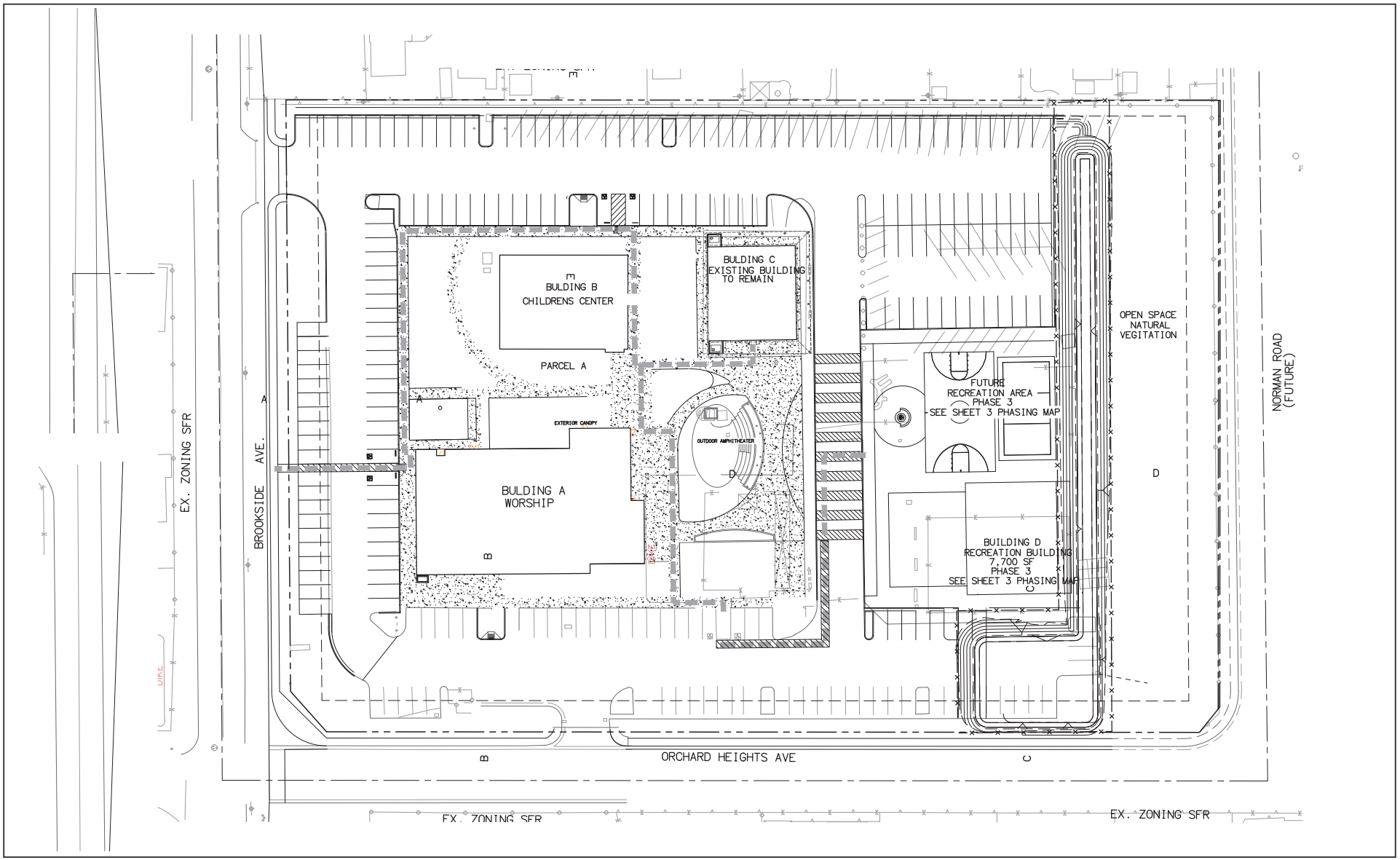
Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations (or cycles per second) of a wave, resulting in the tone's range from high to low. Loudness is the strength of a sound, describes a noisy or quiet environment, and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity is the average rate of sound energy transmitted through a unit area perpendicular to the direction in which the sound waves are traveling. This characteristic of sound can be precisely measured with instruments. In the analysis of a project, the noise environment of the project area is defined in terms of sound intensity and its effect on adjacent sensitive land uses.

Measurement of Sound

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. A decibel (dB) scale, unlike the linear scale (e.g., inches or pounds), is a scale based on powers of 10.

For example, 10 dB is 10 times more intense than 0 dB, 20 dB is 100 times more intense than 0 dB, and 30 dB is 1,000 times more intense than 0 dB. Thirty decibels (30 dB) represent 1,000 times as much acoustic energy as 0 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).



LSA

FIGURE 2

N

0 45 90

FEET

SOURCE: City of Beaumont

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Calvary Chapel Expansion Project

Site Plan

Sound levels generate from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source, such as highway traffic or railroad operations, the sound decreases 3 dB for each doubling of distance in a hard site environment. Line source noise in a relatively flat environment with absorptive vegetation decreases 4.5 dB for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The equivalent continuous sound level (L_{eq}) is the total sound energy of time-weighted average noise over a sample period. However, the predominant rating scales for human communities in California are L_{eq} and the Community Noise Equivalent Level (CNEL) or the day-night average noise level (L_{dn}) based on dBA. CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noises occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the relaxation hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance, when assessing the annoyance factor, include the maximum instantaneous noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise. Another noise scale often used together with L_{max} in noise ordinances for enforcement purposes is noise standards in terms of percentile noise levels. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level; half the time the noise level exceeds this level and half the time it is less. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first is audible impacts, which refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 dB and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of

75 dBA increasing body tensions and thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear, even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. Sound levels from 160 to 165 dBA will potentially result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less developed areas.

Table A lists definitions of acoustical terms, and Table B shows common sound levels and their noise sources.

Table A: Definitions of Acoustical Terms

Term	Definition
Decibel, dB	A unit of noise level that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very-low-frequency and very-high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. (All sound levels in this report are A-weighted unless reported otherwise.)
L_2, L_8, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Sound Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Average Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter during a designated time interval using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time; usually a composite of sound from many sources from many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.

Source: *Handbook of Acoustical Measurements and Noise Control* (Harris 1991).

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	—
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	—
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	—
Near-Freeway Auto Traffic	70	Moderately Loud	Reference Level
Average Office	60	Quiet	½ as loud
Suburban Street	55	Quiet	—
Light Traffic; Soft Radio Music in Apartment	50	Quiet	¼ as loud
Large Transformer	45	Quiet	—
Average Residence without Stereo Playing	40	Faint	⅛ as loud
Soft Whisper	30	Faint	—
Rustling Leaves	20	Very Faint	—
Human Breathing	10	Very Faint	Threshold of Hearing
—	0	Very Faint	—

Source: Compiled by LSA (2004).

FUNDAMENTALS OF VIBRATION

Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors. The motion may be discernible outdoors, but without the effects associated with the shaking of a building, there is less adverse reaction. Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by occupants as the motion of building surfaces, the rattling of items on shelves or wall hangings, or a low-frequency rumbling noise. The rumbling noise is caused by the vibration of walls, floors, and ceilings radiating sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less, which is an order of magnitude below the damage threshold for normal buildings.

Typical sources of ground-borne vibration are construction activities (e.g., blasting, pile driving, and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with both ground-borne vibration and noise from these sources are usually localized to areas within approximately 100 feet (ft) from the vibration source, although there are examples of ground-borne vibration causing interference out to distances greater than 200 ft (Federal Transit Administration's [FTA] *Transit Noise and Vibration Impact Assessment Manual* [FTA Manual] [2018]). When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that ground-borne vibration from street traffic will not exceed the impact criteria; however, both

construction of the project and freight train operations could result in ground-borne vibration that may be perceptible and annoying.

Ground-borne noise is not likely to be a problem because noise arriving via the normal airborne path will usually be greater than ground-borne noise. Ground-borne vibration has the potential to disturb people and damage buildings. Although it is very rare for train-induced ground-borne vibration to cause even cosmetic building damage, it is not uncommon for construction processes (e.g., blasting and pile driving) to cause vibration of sufficient amplitudes to damage nearby buildings (FTA 2018). Ground-borne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). The RMS velocity is best for characterizing human response to building vibration, and PPV is used to characterize potential for damage. Decibel notation acts to compress the range of numbers required to describe vibration. The vibration velocity level in decibels is defined as the following:

$$L_v = 20 \log_{10} [V/V_{ref}]$$

where L_v is the vibration velocity in decibels (VdB), V is the RMS velocity amplitude, and V_{ref} is the reference velocity amplitude, or 1 x 10^{-6} inches/second (in/sec) used in the United States.

REGULATORY SETTING

Federal Guidelines

Federal Transit Administration

Vibration standards included in the FTA's *Transit Noise and Vibration Impact Assessment Manual* (2018) were used to evaluate vibration impacts because the City does not have vibration standards. Table C provides the criteria for assessing the potential for interference or annoyance from vibration levels in a building, while Table D lists the potential vibration building damage criteria associated with construction activities.

Table C: Interpretation of Vibration Criteria for Detailed Analysis

Land Use	Max L_v (VdB)[1]	Description of Use
Workshop	90	Vibration that is distinctly felt. Appropriate for workshops and similar areas not as sensitive to vibration.
Office	84	Vibration that can be felt. Appropriate for office and similar areas not as sensitive to vibration.
Residential Day	78	Vibration that is barely felt. Adequate for computer equipment and low-power optical microscopes (up to 20X).
Residential Night and Operating Rooms	72	Vibration is not felt, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power optical microscopes (100X) and other equipment of low sensitivity.

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] As measured in 1/3-octave bands of frequency over the frequency range 8 to 80 Hz.
FTA = Federal Transit Administration
Hz = hertz
LV = velocity in decibels
Max = maximum
VdB = vibration velocity decibels

Table D: Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
Reinforced concrete, steel, or timber (no plaster)	0.50
Engineered concrete and masonry (no plaster)	0.30
Nonengineered-timber and masonry buildings	0.20
Buildings extremely susceptible to vibration damage	0.12

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
FTA = Federal Transit Administration
in/sec = inches per second
PPV = peak particle velocity

Local Regulations

City of Beaumont

General Plan Noise Element. The City's General Plan Noise Element has established policies to meet the City's noise-related goals. The applicable General Plan Noise Element goals and policies for the proposed project are listed below.

> **Goal 10.1:** A City where noise exposure is minimized for those living and working in the community.
>
> > **Policy 10.1.2:** Adopt, maintain, and enforce planning guidelines that establish the acceptable noise standards (identified in Table E).
> >
> > **Policy 10.1.3:** Protect noise-sensitive uses, such as residences, schools, health care facilities, hotels, libraries, parks and places of worship, from excessive noise levels through land use adjacency, building design, and noise ordinance enforcement.
> >
> > **Policy 10.1.6:** Encourage reduction of stationary noise impacts from commercial and industrial land uses, activities, events, and businesses on noise-sensitive land uses.

Municipal Code. Sections 9.02.060, 9.02.070, and 9.02.90 of the City's Municipal Code has established base ambient noise levels for residential, commercial, and industrial properties, which are shown in Table E. No ambient noise shall be deemed to be less than the specified levels. If the actual measured noise level exceeds the base ambient noise level, the actual measured noise level shall be employed as the base ambient noise level. Also, the City's Municipal Code has established noise levels at residential properties that shall not be exceeded for specific duration periods shown in Table E.

Table E: Exterior Noise Standards

Zone Use	Time Period	Noise Level (dBA)				
		BANL	L_{25}	L_8	L_2	NP
Residential	10:00 p.m. – 7:00 a.m.	45	50	55	60	65
	7:00 a.m. – 10:00 p.m.	55	60	65	70	75
Industrial and Commercial	10:00 p.m. – 7:00 a.m.	50	--	--	--	--
	7:00 a.m. – 10:00 p.m.	75	--	--	--	--

Source: City of Beaumont Municipal Code, Sections 9.02.60 through 9.02.90.
BANL = Base ambient noise level
dBA = A-weighted decibels
NP = Not Permitted
L_2 = 15 dBA above the BANL for a cumulative period of more than 1 minute in any hour.
L_8 = 10 dBA above the BANL for a cumulative period of more than 5 minutes in any hour.
L_{25} = 5 dBA above the BANL for a cumulative period of more than 15 minutes in any hour.
Not Permitted = The noise standard plus 20 dBA or the maximum measured ambient noise level for any period of time.

Section 9.02.110(F) of the City's Municipal Code limits noise sources associated with construction, between the hours of 7:00 a.m. and 6:00 p.m. except when construction activities exceed 55 dBA for intervals of more than 15 minutes per hour as measured in the interior of the nearest occupied residence or school. Also, the City prohibits construction activities to between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September and between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May if the construction site is within 0.25 mile of an occupied residence or residences.

Section 9.02.110(G) of the City's Municipal Code limits noise generated from machinery, equipment, fans, and air conditioning to not exceed the base ambient noise level by 5 dBA.

EXISTING SETTING

Overview of the Existing Noise Environment

Transportation facilities are the primary existing noise sources in the project area. Traffic noise in the project area includes Brookside Avenue and other local roadways in the project area.

Land Uses in the Project Vicinity

The project site is surrounded by existing single-family residences to the north across Brookside Avenue and immediately to the east, south, and west.

Existing Aircraft Noise

The nearest airport to the project site is the Banning Municipal Airport, which is located approximately 6 miles southeast of the project site. Based on the Riverside County Airport Land Use Compatibility Plan (ALUC 2004), the project site is located outside the 55 CNEL noise contours of Banning Municipal Airport. In addition, the project site is not located in the vicinity of a private airstrip. Therefore, the project would not expose people working in the vicinity to aviation-related excessive noise levels, and this topic is not further discussed.

IMPACTS

Short-Term Construction Noise Impacts

Two types of short-term noise impacts could occur during construction on the project site. First, construction crew commutes and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on roads leading to the site. The pieces of heavy equipment for construction activities will be moved on site, will remain for the duration of each construction phase, and will not add to the daily traffic volume in the project vicinity. Although there would be a relatively high single-event noise exposure potential causing intermittent noise nuisance (passing trucks at 50 ft would generate up to a maximum of 84 dBA), the effect on longer-term (hourly or daily) ambient noise levels would be small because the daily construction-related vehicle trips are small compared to the existing daily traffic volume on Brookside Avenue. The grading phase would generate the most trips out of all of the construction phases based on the California Emissions Estimator Model (CalEEMod) (Version 2022.1) results contained in Appendix A of the *Calvary Chapel Expansion Project Air Quality, Greenhouse Gas, and Energy Impact Report* (LSA 2025), which would have an acoustical equivalent traffic volume of 482 passenger car equivalents. Brookside Avenue would be used to access the project site. Also, it is assumed that the existing average daily traffic (ADT) volume on Brookside Avenue is higher than 482 vehicles because there are more than 52 single-family residences in the vicinity of the project site, which would generate a daily traffic volume of 490 vehicles based on a Institute of Transportation Engineers (ITE) Trip Generation (11th Edition) that has a trip rate of 9.43 for single-family detached housing (Land Use 210). Based on the information above, construction-related traffic would increase noise levels by less than 3 dBA, which would not be perceptible to the human ear in an outdoor environment. Therefore, short-term construction-related noise impacts associated with worker commute and equipment transport to the project site would be less than significant. No mitigation measures are required.

The second type of short-term noise impact is related to noise generated from construction activities. Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. The project anticipates building construction, paving, and architectural coating phases of construction. These various sequential phases change the character of the noise generated on a project site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table F lists the maximum noise levels (L_{max}) recommended for noise impact assessments for typical construction equipment included in the *FHWA Highway Construction Noise Handbook* (Federal Highway Administration [FHWA] 2006), based on a distance of 50 ft between the equipment and a noise receptor.

Table G lists the anticipated construction equipment for each construction phase based on the CalEEMod (Version 2022.1) results contained in Appendix A of the *Calvary Chapel Expansion Project Air Quality, Greenhouse Gas, and Energy Impact Report* (LSA 2025). Table G shows the combined noise level at 50 ft from all of the equipment in each phase, and the L_{eq} noise level for each piece of equipment at 50 ft based on the quantity, reference L_{max} noise level at 50 ft, and the acoustical usage factor. As shown in Table G, construction noise levels would reach up to 89.4 dBA L_{eq} at a distance of 50 ft.

Table F: Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor[1]	Maximum Noise Level (L_{max}) at 50 ft[2]
Backhoe	40	80
Compactor (ground)	20	80
Compressor	40	80
Concrete Mixer Truck	40	85
Crane	16	85
Dozer	40	85
Dump Truck	40	84
Excavator	40	85
Flatbed Truck	40	84
Forklift	20	85
Front-End Loader	40	80
Generator	50	82
Grader	40	85
Impact Pile Driver	20	95
Jackhammer	20	85
Paver	50	85
Pavement Scarafier	20	85
Pickup Truck	40	55
Pneumatic Tools	50	85
Pump	50	77
Rock Drill	20	85
Roller	20	85
Scraper	40	85
Tractor	40	84
Welder	40	73

Source: *FHWA Highway Construction Noise Handbook,* Table 9.1 (FHWA 2006).
Note: The noise levels reported in this table are rounded to the nearest whole number.
[1] Usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.
[2] Maximum noise levels were developed based on Spec 721.560 from the CA/T program to be consistent with the City of Boston, Massachusetts, Noise Code for the "Big Dig" project.
CA/T = Central Artery/Tunnel
FHWA = Federal Highway Administration
ft = foot/feet
L_{max} = maximum instantaneous noise level

Table G: Summary of Construction Phase, Equipment, and Noise Levels

Construction Phase	Construction Equipment	Quantity	Reference Noise Level at 50 ft (dBA L_{max})	Acoustical Usage Factor[1] (%)	Noise Level at 50 ft (dBA L_{eq})	Combined Noise Level at 50 ft (dBA L_{eq})
Site Preparation	Dozer	3	85	40	85.8	87.3
	Front-End Loader	4	80	40	82.0	
Grader	Excavator	1	85	40	81.0	87.0
	Grader	1	85	40	81.0	
	Dozer	1	85	40	81.0	
	Front-End Loader	3	80	40	80.8	
Building Construction	Crane	1	85	16	77.0	86.5
	Forklift	3	85	20	82.8	
	Generator	1	82	50	79.0	
	Front-End Loader	3	80	40	80.8	
	Welder/Torch	1	73	40	69.0	
Paving	Pavers	2	85	50	85.0	89.4
	Pavement Scarafier	2	85	20	81.0	
	Roller	2	85	20	81.0	
	Concrete Mixer Truck	2	85	40	84.0	
	Front-End Loader	1	80	40	76.0	
Architectural Coating	Air Compressors	1	80	40	76.0	76.0

Source: Compiled by LSA (2025).
[1] The acoustical usage factor is the percentage of time during a construction noise operation that a piece of construction equipment operates at full power.
dBA = A-weighted decibels
ft = foot/feet
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level

Table H shows the calculated interior noise levels generated from project construction activities at the closest surrounding residential buildings from the center of the project site. The interior noise level was calculated based on the calculated exterior construction noise level and an exterior-to-interior noise reduction of 20 dBA (FHWA 2011). As shown in Table H, the closest residential building is located east of the project site and would be exposed to interior construction noise levels of 51.7 dBA L_{eq}. This noise level would not exceed the City's interior construction noise standard of 55 dBA for more than 15 minutes per hour. Although noise generated by project construction activities would be higher than the ambient noise levels and may result in a temporary increase in the ambient noise levels, construction noise would stop once project construction is completed. Compliance with the City's hours of construction pursuant to Section 9.02.110(F) of the City's Municipal Code listed below would ensure construction-related noise would not be generated during the more sensitive nighttime hours. Therefore, noise levels generated from project construction would be less than significant. No mitigation measures are required.

- The construction contractor shall limit construction activities to between the hours of 7:00 a.m. and 6:00 p.m. No construction shall take place outside of these hours.

Short-Term Construction Vibration Impacts

This construction vibration impact analysis discusses the level of human annoyance using vibration levels in VdB and assesses the potential for building damage using vibration levels in PPV (in/sec). Vibration levels calculated in RMS velocity are best for characterizing human response to building vibration, whereas vibration levels in PPV are best for characterizing damage potential.

Table H: Construction Noise Levels

Land Use	Direction	Reference Noise Level at 50 ft (dBA L_{eq})	Distance[1] (ft)	Distance Attenuation (dBA)	Shielding (dBA)	Noise Level (dBA L_{eq})	
						Exterior	Interior[3]
Residence	North	89.4	440	18.9	0	70.5	50.5
Residence	East	89.4	215	12.7	5[2]	71.7	51.7
Residence	South	89.4	405	18.2	0	71.2	51.2
Residence	West	89.4	285	15.1	0	74.3	54.3

Source: Compiled by LSA (2025).
[1] Distance from center of the project site to the off-site noise-sensitive building structure.
[2] The backyards of single-family residences have a 7 ft high private property wall that would provide a minimum noise reduction of 5 dBA.
[3] The interior noise level was calculated based on the calculated exterior construction noise level and an exterior-to-interior noise reduction of 20 dBA (FHWA 2011).
dBA = A-weighted decibels
ft = foot/feet
L_{eq} = equivalent continuous sound level

Table I shows the reference vibration levels at a distance of 25 ft for each type of standard construction equipment from the 2018 FTA Manual. Project construction is expected to require the use of large bulldozers, loaded trucks, and jackhammers, which would generate ground-borne vibration levels of up to 87 VdB (0.089 PPV [in/sec]), 86 VdB (0.076 PPV [in/sec]), and 79 VdB (0.035 PPV [in/sec]), respectively, when measured at 25 ft.

Table I: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 ft	
	PPV (in/sec)	L_V (VdB)[1]
Pile Driver (Impact), Typical	0.644	104
Pile Driver (Sonic), Typical	0.170	93
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large Bulldozer[2]	**0.089**	**87**
Caisson Drilling	0.089	87
Loaded Trucks[2]	**0.076**	**86**
Jackhammer[2]	**0.035**	**79**
Small Bulldozer	0.003	58

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] RMS vibration velocity in decibels (VdB) is 1 µin/sec.
[2] The equipment shown in **bold** is expected to be used on site.
µin/sec = microinches per second
ft = foot/feet
FTA = Federal Transit Administration
in/sec = inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity decibels

The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project boundary (assuming the construction equipment would be used at or near the project boundary) because vibration impacts normally occur within the buildings.

The formula for vibration transmission is provided below:

$$L_v dB\ (D) = L_v dB\ (25\ ft) - 30\ Log\ (D/25)$$

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

Table J lists the projected vibration levels from various construction equipment expected to be used on the project site in the active construction area to the nearest buildings in the project vicinity. As shown in Table J, the closest residential building from the center of the project is approximately 215 ft and would experience a vibration level of up to 59 VdB. This vibration level would not have the potential to result in community annoyance because vibration levels would not exceed the FTA community annoyance threshold of 78 VdB for daytime residences. Other residential buildings that surround the project site would experience lower vibration levels because they are farther away.

Table J: Potential Construction Vibration Annoyance

Land Use	Direction	Equipment/ Activity	Reference Vibration Level (VdB) at 25 ft	Distance to Structure (ft)[1]	Vibration Level (VdB)
Residence	North	Large bulldozers	87	440	50
		Loaded trucks	86	440	49
		Jackhammer	79	440	42
Residence	East	Large bulldozers	87	215	59
		Loaded trucks	86	215	58
		Jackhammer	79	215	51
Residence	South	Large bulldozers	87	405	51
		Loaded trucks	86	405	50
		Jackhammer	79	405	43
Residence	West	Large bulldozers	87	285	55
		Loaded trucks	86	285	54
		Jackhammer	79	285	47

Source: Compiled by LSA (2025).
[1] Distance from the center of the project site to the building structure.
ft = foot/feet
VdB = vibration velocity decibels
FTA = Federal Transit Administration

Similarly, Table K lists the projected vibration levels from various construction equipment expected to be used on the project site at the project construction boundary to the nearest buildings in the project vicinity. As shown in Table K, the closest building from the project construction boundary is approximately 16 ft south of the project site and would experience a vibration level of up to 0.174 PPV (in/sec). This vibration level would not result in building damage because the residential buildings would be constructed equivalent to non-engineered timber, and masonry and vibration levels would not exceed the FTA vibration damage threshold of 0.20 PPV (in/sec). Other residential building structures that surround the project site would experience lower vibration levels because they are farther away and would be constructed equivalent to non-engineered timber and masonry. Therefore, construction vibration impacts during project construction would be less than significant. No mitigation measures are required.

Table K: Potential Construction Vibration Damage

Land Use	Direction	Equipment/Activity	Reference Vibration Level at 25 ft	Distance to Structure (ft)[1]	Vibration Level
			PPV (in/sec)		PPV (in/sec)
Residence	North	Large bulldozers	0.089	130	0.008
		Loaded trucks	0.076	130	0.006
		Jackhammer	0.035	130	0.003
Residence	East	Large bulldozers	0.089	16	0.174
		Loaded trucks	0.076	16	0.148
		Jackhammer	0.035	16	0.068
Residence	South	Large bulldozers	0.089	114	0.009
		Loaded trucks	0.076	114	0.008
		Jackhammer	0.035	114	0.004
Residence	West	Large bulldozers	0.089	64	0.022
		Loaded trucks	0.076	64	0.019
		Jackhammer	0.035	64	0.009

Source: Compiled by LSA (2025).
Note: The FTA-recommended building damage threshold is 0.20 PPV [in/sec]) at the receiving non-engineered timber and masonry building.
[1] Distance from the project construction boundary to the building structure.
ft = foot/feet
FTA = Federal Transit Administration
in/sec = inches per second
PPV = peak particle velocity
VdB = vibration velocity decibels

Long-Term Traffic Noise Impacts

The project is estimated to generate an additional 94 daily trips based on the *Calvary Chapel Expansion Project Trip Generation and Vehicle Miles Traveled Analysis Memorandum* (LSA 2024). The existing ADT volume on Brookside Avenue and other roadways used to access the project site is higher than 482 vehicles because there are more than 52 single-family residences in the vicinity of the project site, which would generate a daily traffic volume of 490 vehicles based on the Institute of Transportation Engineers (ITE) Trip Generation (11th Edition), which has a trip rate of 9.43 for single-family detached housing (Land Use 210). Based on the information above, project-related traffic would not increase noise levels by 3 dBA. A noise level increase of less than 3 dBA would not be perceptible to the human ear in an outdoor environment. Therefore, traffic noise impacts from project-related traffic on off-site sensitive receptors would be less than significant. No mitigation measures are required.

Long-Term Stationary Source Noise Impacts

Operation of the proposed project would include parking lot activities, heating, ventilation, and air conditioning (HVAC) equipment, and exhaust fans that would result in stationary noise impacts. The following provides a detailed noise analysis and discussion of each stationary noise source.

Parking Activities

Noise generated from parking lot activities would include vehicles traveling at slow speeds, engine start-up noise, car door slams, car horns, car alarms, and tire squeals. The proposed project would

improve parking on site to provide a total of 213 parking spaces and 6 Americans with Disabilities Act (ADA) parking spaces. Despite the expansion of the chapel and improved parking, parking activities and associated noise would remain the same as existing conditions because the proposed project would not result in an increase in the number of parishioners. Noise generated from parking activities associated with lifegroups, such as Bible studies, held throughout the week in a small group setting would be substantially lower than parking activities associated with worship services. Also, noise generated from parking activities would not exceed the City's nighttime noise standards because the proposed project would not operate during nighttime hours. Therefore, noise generated from parking activities on the project site would be less than significant. No mitigation measures are required.

HVAC and Exhaust Fan Noise

The proposed project would include new rooftop HVAC units and exhaust fans for the new sanctuary building (Building A) and children's ministry building (Building B). The new HVAC units and exhaust fans would operate with the existing rooftop HVAC units at Building C. The existing and new HVAC units and exhaust fans would only operate during daytime hours because the proposed project would not operate during nighttime hours. The rooftop HVAC units and exhaust fans would generate noise levels that range from 22.8 to 61.4 dBA L_{eq} at a distance of 50 ft. A list of the HVAC units and exhaust fans for each building (Buildings A and B) along with their specifications and reference noise levels are provided in Appendix A.

Table L summarizes the existing and existing with project HVAC and exhaust fan noise levels along with potential noise increases at the closest residential property lines surrounding the project site. The detailed HVAC and exhaust fan noise level calculations are provided in Appendix A. As shown in Table L, noise levels generated from on-site HVAC units would not exceed the City's daytime 15-minute noise standard of 55 dBA except for the residential property line to the east. However, the project-related noise increase would be 1 dBA, which is considered not perceptible to the human ear in an outdoor environmental. Also, noise levels generated from on-site HVAC units would not exceed the City's nighttime 15-minute noise standard of 50 dBA because the proposed project would not operate during nighttime hours. Therefore, noise generated from on-site HVAC equipment would be less than significant because the project would not substantially increase ambient noise levels exceeding the City's noise standards. No mitigation measures are required.

Table L: HVAC and Exhaust Fan Noise Levels

Land Use	Direction	Existing HVAC Noise Level (dBA L_{eq})	Existing with Project HVAC Noise Level (dBA L_{eq})	Daytime Noise Standard (dBA L_{eq})
Residence	North	42.9	50.7	55.0
Residence	East	54.1	55.1	55.0
Residence	South	43.3	45.0	55.0
Residence	West	44.0	50.2	55.0

Source: Compiled by LSA (2025).
dBA = A-weighted decibels
HVAC = heating, ventilation, and air conditioning
L_{eq} = equivalent continuous sound level

Long-Term Ground-Borne Noise and Vibration from Vehicular Traffic

The proposed project would not generate vibration. In addition, vibration levels generated from project-related traffic on Brookside Avenue and other roadways in the project vicinity are unusual for on-road vehicles because the rubber tires and suspension systems of on-road vehicles provide vibration isolation. Therefore, vibration impacts from project-related operations would be less than significant. No mitigation measures are required.

REGULATORY COMPLIANCE MEASURES

Implementation of the following measure would ensure that construction noise would be generated only during allowable times:

- The construction contractor shall limit construction activities to between the hours of 7:00 a.m. and 6:00 p.m. No construction shall take place outside of these hours.

REFERENCES

City of Beaumont. 2025. Municipal Code. September 22. Website: https://library.municode.com/ca/beaumont/codes/code_of_ordinances (accessed October 2025).

_____. 2020. Beaumont General Plan. December 1. Website: https://www.beaumontca.gov/DocumentCenter/View/36923/Beaumont-GPU_Final-rev-22521(accessed October 2025).

Federal Highway Administration (FHWA). 2006. *FHWA Highway Construction Noise Handbook*. Roadway Construction Noise Model, FHWA-HEP-06-015. DOT-VNTSC-FHWA-06-02. NTIS No. PB2006-109012. August.

_____. 2011. *FHWA Highway Traffic Noise: Analysis and Abatement Guidance,* FHWA-HEP-10-025. December. Website: https://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf (accessed October 2025).

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment Manual*. FTA Report No. 0123. September. Website: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf (accessed October 2025).

Harris, Cyril M., ed. 1991. *Handbook of Acoustical Measurements and Noise Control*. 3rd Edition. McGraw-Hill, Inc.

LSA Associates, Inc. (LSA). 2024. *Calvary Chapel Expansion Project Trip Generation and Vehicle Miles Traveled Analysis Memorandum*. February 21.

_____. 2025. *Calvary Chapel Expansion Project Air Quality, Greenhouse Gas, and Energy Impact Report*. October.

Riverside County Airport Lane Use Commission (ALUC). 2004. Riverside County Airport Land Use Compatibility Plan. October 14. Website: https://rcaluc.org/riverside-county-airport-land-use-compatibility-plan (accessed October 2025).

APPENDIX A

HVAC AND EXHAUST FAN EQUIPMENT LIST, SPECIFICATIONS, AND CALCULATIONS

A/C UNIT SCHEDULE

TAG	MANUFACTURER & MODEL NO.	AREA SERVED	COOLING PERFORMANCE				FILTER	HEATING PERFORMANCE					FAN PERFORMANCE						REFRIG. TYPE	ELECTRICAL		(1) POWER EXHAUST/ ECONOMIZER ELECTRICAL		REMARKS (SEE EQUIPMENT NOTES BELOW)	OPR. WEIGHT WITH ACCESSORIES (LBS.)	ANCHORAGE DETAIL REFERENCE	SMOKE DETECTOR FOR SHUTDOWN
			EAT DB/WB	LAT DB/WB	CAPACITY (BTU/H)	EFF.		EAT (°F)	TEMP RISE	HEAT PUMP CAPACITY	EFF.	ELEC. HEAT	FLOW	MIN./MAX. OSA	ESP	RPM	DRIVE	BHP		V-PH-HZ	AMPS	V-PH-HZ	AMPS			
AC 1A	TRANE WHJ300A4S0N**00D	SANCTUARY 101. STAGE 102. STORAGE 103, MEDIA 104	85.4 / 63.4	61.2 / 54.38	250,760 TOTAL CAP. 250,760 SENS. CAP.	10.4 EER 16.1 IEER	MERV-13	54.2	12.46°F - ELEC HEAT 22.60°F - HEAT PUMP 35.06°F - TOTAL	188,890 BTU/H	3.5 COP	36 kW	9,000 CFM	515 / 3,310 CFM	1.279"	1,477	VARIABLE DIRECT	3.0	R-410A	480V-3a-60Hz	113 MCA 125 MOCP	480V-3a-60Hz	7.875 MCA 14.175 MOCP	(2)(3)(5)(6)(7)(8)(9)(10)	2185 - UNIT 730 - ISO CURB 736 - ECONO / PE 000 - TOTAL	(12) M4.1	YES
AC 2A	TRANE WHJ300A4S0N**00D	SANCTUARY 101. STAGE 102, AV AREA 112, JANITOR 107, CAFE 108	85.4 / 63.4	61.2 / 54.38	250,760 TOTAL CAP. 250,760 SENS. CAP.	10.4 EER 16.1 IEER	MERV-13	54.2	12.46°F - ELEC HEAT 22.60°F - HEAT PUMP 35.06°F - TOTAL	188,890 BTU/H	3.5 COP	36 kW	9,000 CFM	515 / 3,310 CFM	1.279"	1,477	VARIABLE DIRECT	3.0	R-410A	480V-3a-60Hz	113 MCA 125 MOCP	480V-3a-60Hz	7.875 MCA 14.175 MOCP	(2)(3)(5)(6)(7)(8)(9)(10)	2185 - UNIT 730 - ISO CURB 736 - ECONO / PE 000 - TOTAL	(12) M4.1	YES
AC 3A	TRANE WHC120H4RGA**07D1	LOBBY 100, CRY ROOM 106, NEW BELIEVER RM. 105, RESTROOMS 109 & 110, CORRIDOR 111	85.1 / 63.3	59.69 / 53.87	114,800 TOTAL CAP. 114,800 SENS. CAP.	11.5 EER 16.0 IEER	MERV-13	54.6	14.15°F - ELEC HEAT 19.69°F - HEAT PUMP 30.84°F - TOTAL	85,040 BTU/H	3.8 COP	18 kW	4,000 CFM	395 / 1,065 CFM	1.00"	1,471	VARIABLE DIRECT	2.01	R-410A	480V-3a-60Hz	51 MCA 60 MOCP	480V-3a-60Hz	3.875 MCA 6.975 MOCP	(2)(3)(5)(6)(7)(8)(9)	1298 - UNIT 730 - ISO CURB 331 - ECONO / PE 000 - TOTAL	(12) M4.1	YES
AC 4A	TRANE WHC039H4R0B**01D10	OFFICE 115, OFFICE 116, RR1 117, RR2 118, STOR. 120, GREEN RM. 121, CONF. RM 122, CORRIDOR 2 114	79.8 / 62.4	56.62 / 54.02	30,830 TOTAL CAP. 30,830 SENS. CAP.	12.5 EER 16.0 IEER	MERV-13	61.9	16.63°F	105,220 BTU/H	3.8 COP	-	1,200 CFM	225 CFM / 225 CFM	1.00"	994	VARIABLE DIRECT	0.58	R-410A	480V-3a-60Hz	10 MCA 15 MOCP	N/A	N/A	(2)(4)(7)	793 - UNIT 730 - ISO CURB 1,523 - TOTAL	(12) M4.1	NO
AC 1B	TRANE WHC120H4RGA**07D1	CLASSROOM 200, 202, 203, 205 LOBBY 207, BREAKROOM 206, CORRIDOR 217	81.4 / 62.7	57.02 / 53.53	109,540 TOTAL CAP. 109,540 SENS. CAP.	11.5 EER 16.0 IEER	MERV-13	59.7	14.15°F - ELEC HEAT 19.69°F - HEAT PUMP 30.84°F - TOTAL	85,040 BTU/H	3.9 COP	18kW	4,000 CFM	340 CFM / 955 CFM	1.18"	1,466	VARIABLE DIRECT	1.95	R-410A	480V-3a-60Hz	51 MCA 60 MOCP	480V-3a-60Hz	3.875 MCA 6.975 MOCP	(3)(5)(6)(7)(8)(9)	1,298 - UNIT 331 - ECONO / PE 1,629 - TOTAL	(17) M4.1	YES
AC 2B	TRANE WHC120H4RGA**07D1	CLASSROOM 208, 210, 211, 213, CORRIDOR 217, OFFICE 216	81.2 / 62.2	56.95 / 53.54	109,540 TOTAL CAP. 109,540 SENS. CAP.	11.5 EER 16.0 IEER	MERV-13	60.1	14.15°F - ELEC HEAT 19.69°F - HEAT PUMP 30.84°F - TOTAL	85,040 BTU/H	3.9 COP	18kW	4,000 CFM	335 CFM / 925 CFM	1.18"	1,466	VARIABLE DIRECT	1.95	R-410A	480V-3a-60Hz	51 MCA 60 MOCP	480V-3a-60Hz	3.875 MCA 6.975 MOCP	(3)(5)(6)(7)(8)(9)	1,298 - UNIT 331 - ECONO / PE 1,629 - TOTAL	(17) M4.1	YES

EQUIPMENT NOTES:

1. STAND-A-LONE DISCONNECT & POWER
2. MICROMETL 21" ISOLATION CURB
3. HORIZONTAL DISCHARGE
4. VERTICAL DISCHAGE
5. CANFAB UNIT MOUNTED FULLY MODULATING POWER ECONOMIZER W/ DRY BULB CONTROL & POWER EXHAUST
6. CO2 SENSOR
7. WI-FI ENABLED THERMOSTAT
8. ECONOMIZER OUTSIDE AIR TEMPERATURE SENSOR TO BE LOCATED AWAY FROM DIRECT SUNLIGHT
9. OSA DAMPER TO ACTUATE TO ALLOW MAX. OSA (NON-ECONOMIZER MODE) WHEN CO2 SENSOR READS 1,000 P.P.M. AND ABOVE. OTHERWISE OSA DAMPER TO BE AT MINIMUM POSITION
10. UNIT CONTROLS: SYMBIO 700 & LOW AMBIENT

EXHAUST FAN SCHEDULE

TAG	MANUFACTURER & MODEL NO.	AREA SERVED	FAN SYSTEM				SONES	ELECTRICAL		OPR. WT WITH ACCESSORIES (LBS.)	REMARKS (SEE EQUIPMENT NOTES BELOW)	ANCHORAGE DETAIL REFERENCE	UNIT INTERLOCK
			CFM	ESP	RPM	PWR		V-PH-HZ	AMPS				
EF 1A	GREENHECK G-099-VG	CAFE 108	170	0.457"	1,676	0.22 BHP 1/4 HP	12.4 INLET	120V-1Ø-60Hz	1.38 FLA	45	(1)(2)(3)(4)(5)	(9) M4.1	AC 2A
EF 2A	GREENHECK G-099-VG	MEN 109 & WOMEN 108	980	0.457"	1,676	0.22 BHP 1/4 HP	12.4 INLET	120V-1Ø-60Hz	1.38 FLA	45	(1)(2)(3)(4)(5)	(9) M4.1	AC 3A
EF 3A	GREENHECK G-060-VG	JANITOR 107	85	0.311"	1,553	0.02 BHP 1/15 HP	3.6 INLET	120V-1Ø-60Hz	1.3 FLA	37	(1)(2)(3)(6)(7)	(9) M4.1	
EF 4A	GREENHECK G-080-VG	RR1 117, RR2 117	225	0.326"	1,317	0.03 BHP 1/10 HP	5.8 INLET	120V-1Ø-60Hz	1.3 FLA	37	(1)(2)(3)(6)(7)	(9) M4.1	AC 4A
EF 1B	GREENHECK CSP-A390-VG	RR1 201, RR2 204, BREAKROOM 206	190	0.5"	1,242	38 WATTS	1.5 INLET	120V-1Ø-60Hz	1.3 FLA	37	(8)(9)(10)(11)(12)	(8) M4.1	AC 1B
EF 2B	GREENHECK CSP-A390-VG	RR3 209, RR4 212, RR5 214	210	0.5"	1,251	42 WATTS	1.5 INLET	120V-1Ø-60Hz	1.3 FLA	37	(8)(9)(10)(11)(12)	(8) M4.1	AC 2B
EF 3B	GREENHECK CSP-A200	JAN 215	50	0.5"	1,195	61 WATTS	3.5	120V-1Ø-60Hz	1.3 FLA	37	(8)(9)(10)(11)(12)	(8) M4.1	

EQUIPMENT NOTES:

1. VARI-GREEN MOTOR WITH DIAL FOR BALANCING
2. CA T24 MOTOR EFFICIENCY REQUIREMENTS
3. GALV. BIRD SCREEN
4. GRAVITY DAMPER, BD-100-PB-10X10
5. ROOF CURB, GPI-17-10-G12
6. GRAVITY DAMPER, BD-90-PB-8X8
7. ROOF CURB, GPI-8-10-G12
8. VARI-GREEN MOTOR W/ MOUNTED POTENITOMETER DIAL
9. SQUARE HOODED WALL CAP, WC-8X8
10. ROUND DUCT CONNECTOR, RDC-8
11. ISOLATION KIT, VI KIT-SP/CSP
12. MOUNTING BRACKET

INDOOR UNIT SCHEDULE

TAG	MANUFACTURER & MODEL NO.	AREA SERVED	DESIGN CONDITION		CFM	MOTOR POWER	REFRIGERANT TYPE	ELECTRICAL			MIN OSA	OPR. WEIGHT (LBS.)	REMARKS (SEE EQUIPMENT NOTES BELOW)	ANCHORAGE DETAIL REFERENCE
			EAT DB/WB	LAT DB/WB				V-PH-HZ	MCA	MOCP				
IU 1A	MITSUBISHI TPKA0A0121HA70A	DATA ROOM 123	86 / 67	55 / 54	425	30 WATTS	R-410A	(1)	1.0	15	0	29	(2)(3)	(10) M4.1
IU 1B	MITSUBISHI TPKA0A0121HA70A	OFFICE 216	86 / 67	55 / 54	425	30 WATTS	R-410A	(1)	1.0	15	20	29	(2)(3)	(10) M4.1

EQUIPMENT NOTES:

1. POWER TO FAN COIL IS FEED FROM CONDENSING UNIT
2. WIRED REMOTE CONTROLLER
3. BLUE DIAMOND MINI CONDENSATE PUMP W/ RESERVOIR & SENSOR (208V-1PH-60Hz)

OUTDOOR UNIT SCHEDULE

TAG	MANUFACTURER & MODEL NO.	COOLING PERFORMANCE		HEATING PERFORMANCE		ELECTRICAL			OPR. WEIGHT (LBS.)	REMARKS (SEE EQUIPMENT NOTES BELOW)	ANCHORAGE DETAIL REFERENCE
		CAPACITY	EFF.	BTU/HR	EFF.	V-PH-HZ	MCA	MOCP			
OU 1A	MITSUBISHI TRUZA0121KA70	12,000 BTU/H TOTAL 9,720 BTU/H SENSIBLE	20.8 SEER 12 EER	(5)	(5)	208V-1a-60Hz	11	28	93	(1)(2)(3)(4)	(11) M4.1
OU 1B	MITSUBISHI TRUZA0121KA70	12,000 BTU/H TOTAL 9,720 BTU/H SENSIBLE	20.8 SEER 12 EER	14,000 BTU/H @ 47F 9,200 BTU/H @ 17F	10.2 HSPF	208V-1a-60Hz	11	28	93	(1)(2)(3)(4)	(11) M4.1

EQUIPMENT NOTES:

1. POWER FROM OUTDOOR UNIT TO INDOOR UNIT
2. DRAIN PAN
3. HAIL GUARD
4. MOUNTING PAD: 16"x36"x3"
5. DISABLE HEATING MODE

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APN: 408-700-12

PLANS FOR:
CALVARY CHAPEL BEAUMONT
1780 Orchard Hts, Beaumont, CA 92223

JOB#
2358

DRAW / CHECK
Author

DATE
01/26/23

REVISIONS

No.	Date	Description

M0.2

MECHANICAL SCHEDULES CONT.

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BID SET - 09-05-2024

Product Catalog

Packaged Rooftop Air Conditioners Precedent™ Heat Pump

High Efficiency

12.5 to 25 Tons — 60 Hz



December 2022

PKGP-PRC021A-EN

Introduction

Packaged Heat Pumps

Trane's customers demand products that provide exceptional reliability, meet stringent performance requirements, and are competitively priced. Trane delivers with Precedent™.

Precedent™ features cutting edge technologies: reliable compressors, Trane engineered Symbio controls, computer-aided run testing, and Integrated Comfort™ Systems. So, whether you're the contractor, the engineer, or the owner you can be certain Precedent™ products are built to meet your needs.

Through the years, Trane has designed and developed the most complete line of Packaged Rooftop products available in the market today. Trane was the first to introduce the Micro—microelectronic unit controls—and has continued to improve and revolutionize this design concept.

Symbio control platform offers the same great features and functionality as the original Micro, with additional benefits for greater application flexibility.

With its sleek, compact cabinet, Precedent™ continues to provide the highest standards in quality and reliability, comfort, ease of service, and the performance of Trane light commercial products.

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Features and Benefits

Features

Table 1. Precedent™ features – standard and optional

	Standard Features	Options		
		Factory Installed	Factory or Field Installed	Field Installed
3-year Limited Parts Warranty	X			
5-year Limited Compressor Warranty	X			
2 inch Filter	X			
2 inch MERV 8 Filters		X		
2 inch MERV 13 Filters		X		
Access Doors		X		
Access Door (Control Box)	X			
Access Panels	X			
Anti-Short Cycle Timer (Standard with Symbio)	X			
Barometric Relief			X	
CO_2 Sensor				X
Clogged Filter Switch[a]			X	
Coil guards	X			
Condensate Overflow Switch[b]			X	
Convertible Airflow[c]	X			
Colored and Numbered Wiring	X			
Crankcase Heaters	X			
Direct Drive Plenum Fan	X			
Discharge Air Temperature Sensing Kit — MZVAV, SZVAV, Economizer	X			
Discharge Air Temperature Sensing Kit — Standard (Multispeed)			X	
Economizer: Low Leak — Downflow (12.5 to 25 Tons)[a]			X	
Economizer: Low Leak — Horizontal (12.5 to 25 Tons)[d] [a]				X
Economizer: Standard — Downflow (12.5 to 25 Tons)[a]			X	
Economizer: Standard — Horizontal (12.5 to 25 Tons)[a]				X
Electric Heater[b]			X	
Expansion Modules[e]			X	
Fault Detection and Diagnostics (FDD)[f]	X			
Filter Removal Tool	X			
Foil-Faced and Edge Protected Insulation	X			
Frostat™	X			
High Pressure Control	X			
High Static/Oversized Motor		X		
High Temperature Sensor				X
IAQ Dual Sloped Composite Drain Pan	X			
Liquid Line Refrigerant Drier	X			
Low Ambient Cooling to 0°F			X	
Low Ambient Cooling to 40°F	X			
Low Pressure Control	X			
Manual Outside Air Damper			X	
Motorized Outside Air Damper			X	
Multispeed Direct Drive Motors	X			
Multiple Zone VAV (Variable Air Volume)		X		

Table 1. Precedent™ features – standard and optional (continued)

	Standard Features	Options		
		Factory Installed	Factory or Field Installed	Field Installed
Operating Charge of R-410A	X			
Phase Balance/Loss/Reversal Protection	X			
Phase Monitor	X			
Powered Exhaust				X
Powered or Unpowered Convenience Outlet		X		
Quick Adapt Curbs				X
Reference or Comparative Enthalpy			X	
Roof Curb				X
Single Point Power	X			
Single Side Service	X			
Smoke Detector - Return[a]		X		
Smoke Detector - Supply[b]		X		
Stainless Steel Drain Pan		X		
Standardized Components	X			
Symbio Controls	X			
Thermal Expansion Valve	X			
Through-the-Base Electrical Access		X		
Through-the-Base Electrical with Circuit Breaker		X		
Through-the-Base Electrical with Disconnect Switch		X		
Variable Air Flow (SZVAV)/Variable Air Flow (MZVAV)		X		
Ventilation Override[g]				X

[a] Includes Symbio Fresh Air Options Module.
[b] Includes Symbio Indoor Options Module.
[c] Factory ships in downflllow. For WHJ150-300 units where horizontal airflow is required, FIAHZDC001* (Horizontal Conversion Panel) is required.
[d] Provided by third party.
[e] Requires Tracer TU and utilizes TGP2 software.
[f] Fault Detection and Diagnostics (FDD) requires Advanced Controller (either Digit 21=1 for BACnet or 21=3 for Air-Fi).
[g] Requires FIASCCM001 accessory.

Control Options

Table 2. Precedent™ control options — standard and optional

	Standard Features	Options		
		Factory Installed	Factory or Field Installed	Field Installed
Dual Thermistor Remote Zone Sensor				X
Symbio Service and Installation App	X			
Symbio 700 Advanced Module[a]			X	
Humidity Sensor/Humidistat				X
Thermostat				X
Wireless Zone Sensor				X
Zone Sensor				X
LonTalk® Communication Interface (LCI)[b]			X	
Trane® Air-Fi® Wireless Communication Interface (WCI)[b]			X	

Note: For more information, reference the Controls chapter.

[a] Symbio 700 Advanced Module includes BACnet MS/TP or IP communication protocols.
[b] Requires Symbio 700 Advanced Module (MOD03103).

Accessories

FIA KIT #S	DESCRIPTION	Used With Cabinets	Used With Models
FIAEHWD318*[a]	18kW, 208-230V Electric Heater	D	WHJ150A3-180A3
FIAEHWD336*[a]	36kW, 208-230V Electric Heater	D	WHJ150A3-300A3
FIAEHWD354*[a]	54kW, 208-230V Electric Heater	D	WHJ150A3-300A3
FIAEHWD372*[a]	72kW, 208-230V Electric Heater	D	WHJ210A3-300A3
FIAEHWD418*[a]	18kW, 460V Electric Heater	D	WHJ150A4-180A4
FIAEHWD436*[a]	36kW, 460V Electric Heater	D	WHJ150A4-300A4
FIAEHWD454*[a]	54kW, 460V Electric Heater	D	WHJ150A4-300A4
FIAEHWD472*[a]	72kW, 460V Electric Heater	D	WHJ210A4-300A4
FIAEHWDW18*[a]	18kW, 575V Electric Heater	D	WHJ150AW-180AW
FIAEHWDW36*[a]	36kW, 575V Electric Heater	D	WHJ150AW-300AW
FIAEHWDW54*[a]	54kW, 575V Electric Heater	D	WHJ150AW-300AW
FIAEHWDW72*[a]	72kW, 575V Electric Heater	D	WHJ210AW-300AW
FIABARM003*	Barometric Relief	D	WHJ150A-300A
FIAC02K001*	CO_2 (DCV) Wall Mounted Sensor	ALL	WHJ150A-300A
FIAC02K002*	CO_2 (DCV) Duct Mounted Sensor	ALL	WHJ150A-300A
FIACURB404*	14-inch Full Perimeter Knockdown Curb	D	WHJ150A-300A
FIACLFS003*[b]	Clogged Filter Switch	D	WHJ150A-300A
FIACLFS004*[b]	Clogged Filter Switch (MERV13)	D	WHJ150A-300A
FIADAST008*	Discharge Air Sensing Tube Kit T/W Models	D	WHJ150A-300A
FIADFDB001*[b]	Differential Dry Bulb Economizer Control	ALL	WHJ150A-300A
FIADMPR003*	Manual Damper	D	WHJ150A-300A
FIADMPR103*	Motorized Damper	D	WHJ150A-300A
FIAECON003*[b]	Dry Bulb Downflow Economizer	D	WHJ150A-300A
FIAECON303*[b]	Dry Bulb Horizonal Economizer	D	WHJ150A-300A
FIAECON103*[b]	Dry Bulb Downflow Low Leak	D	WHJ150A-300A
FIAECON203*[b]	Dry Bulb Horizontal Low Leak	D	WHJ150A-300A
FIAENTH001*	Reference Enthalpy Economizer Control	ALL	WHJ150A-300A
FIAENTH002*	Comparative Enthalpy Economizer Control	ALL	WHJ150A-300A
FIAHTST001*	High Temperature (Fire) Duct Mounted Stat	ALL	WHJ150A-300A
FIAHZDC001*	Horizontal Conversion Panel	D	WHJ150A-300A
FIALOAM001*	Low Ambient	ALL	WHJ150A-300A
FIALTCI001*	LonTalk Communication Interface	ALL	WHJ150A-300A
FIAOPTN001*	Indoor Options Module	ALL	WHJ150A-300A
FIAOPTN002*	Fresh Air Options Module	ALL	WHJ150A-300A
FIAOVFL001*[a]	Condensate Overflow Switch	ALL	WHJ150A-300A
FIAPWRX303*	Power Exhaust 230V	D	WHJ150A3-300A3
FIAPWRX403*	Power Exhaust 460V	D	WHJ150A4-300A4
FIAPWRXW03*	Power Exhaust 575V	D	WHJ150AW-300AW
FIASCCM001*[c], [d]	Symbio Customer Connection Module	ALL	WHJ150A-300A
FIAXMOD030*[d], [e]	Symbio 700 XM30 Expansion Module	ALL	WHJ150A-300A
FIAXMOD032*[d], [e]	Symbio 700 XM32 Expansion Module	ALL	WHJ150A-300A

[a] Requires Symbio Indoor Options Module.
[b] Requires Symbio Fresh Air Options Module.
[c] Provides Ventilation Override, External Auto/Stop, Alarm Indicator, Remote Min Position.
[d] Requires Symbio Advanced Controller (digit 21=1 or 3).
[e] Requires Tracer TU and Utilizes TGP2 Software (programming knowledge required).

Key Benefits

Airflow Distribution

Airflow is outstanding. Precedent™ can replace an older machine with old ductwork and, in many cases, improve the comfort through better air distribution.

Cabinet Integrity

For added water integrity, Precedent™ has a raised 1 inch lip around the supply and return of the downflow units to prevent water from blowing into the ductwork.

Coil Guards

Coil guards protect condenser coil during shipping as well as hail, vandals, wind, etc. Toolless design lends itself to ease of maintenance in cleaning coils.



CO_2 Sensor — Demand Control Ventilation (DCV)

Demand-controlled ventilation (DCV) is a control strategy that responds to the actual demand (need) for ventilation by regulating the rate at which the HVAC system brings outdoor air into the building. A CO_2 sensor measures the concentration (parts per million, ppm) of CO_2 (carbon dioxide) in the air. As the CO_2 concentration changes, the outside air damper modulates to meet the current ventilation needs of the zone. The CO_2 sensor kit is available as a field installed accessory and wires directly to the Symbio 700 controller.

Controls — Symbio

Enhanced BAS Integration and Connectivity

- Open standard communications
  - BACnet®over Zigbee (Air-Fi Wireless)
  - BACnet MS/TP
  - BACnet IP
  - Modbus™ RTU
  - Modbus TCP/IP
  - LonTalk®
- Securely access, troubleshoot, and monitor equipment from anywhere via Trane Connect™

Serviceability

- Wireless mobile app interface (iPhone and Android) to simplify startup/service
- On-board user interface
- Data Trending

- Real-time, clear language diagnostics
- Historical alarm logs
- Backup and Restore functionality to reduce commissioning and service time

Flexibility

- Future-ready upgradable software, supporting changing codes and new sequences of operation
- Standard, consistent pre-engineered applications that meet industry standards
- Built-in Schedules (requires Tracer® TU)
- Expandable inputs and outputs (requires Tracer TU)
- Ability to add custom programmed sequences (requires Tracer TU)

Accessibility

Control box consists of a multilevel design with Symbio Controls located on hinged panels which provide protection from high voltage components for ease of servicing.

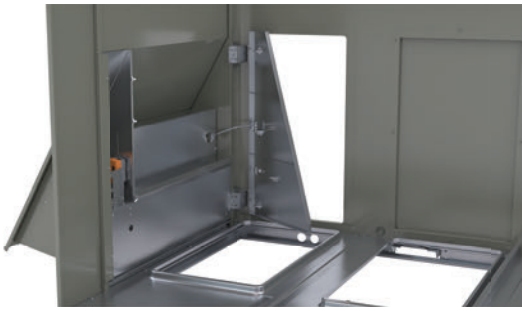
Convenience Outlet

This option is GFCI, 120V/15A, 2 plug, convenience outlet powered or GFCI, 120V/20A, 2 plug convenience outlet unpowered. This option can be ordered when through the base electrical with either the disconnect switch or circuit breaker option is ordered.



Convertible Units

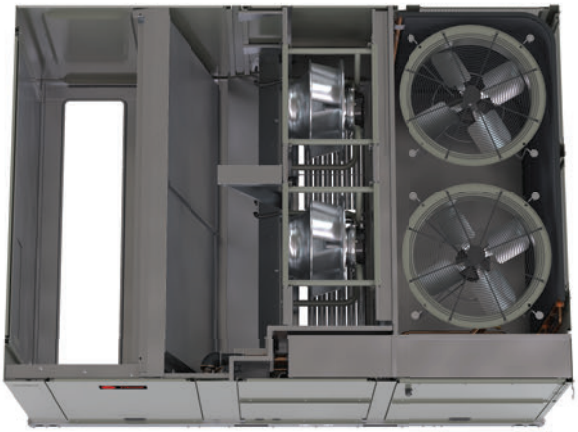
Units ship in a downflow configuration and can be easily converted to horizontal by simply removing two panels. Optional field accessory kits required for 12.5 to 25 ton units.



Direct Drive Plenum Fans

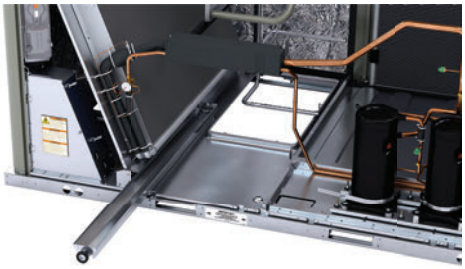
All 12.5 to 25 tons units are equipped with a direct drive plenum fan design with the following features.

- Backward-curved fan wheel
- External rotor direct drive variable speed indoor motor
- Variable speed adjustment available in Symbio controller
- Designed to slide out for ease of maintenance



Drain Pan

Every Precedent™ unit has an easy-to-clean, composite removable dual-sloped drain pan (IAQ).





Fault Detection and Diagnostics (FDD)

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit via Symbio™ 700 board or app. This feature provides detection of the following faults: Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements.

Flexibility

Precedent™ offers ultimate flexibility. Units are built to order in our standard ship cycle time.

High Efficiency Filtration

Precedent™ units offer a variety of high efficiency filtration options. MERV 8 and MERV 13 filters provide additional filtration beyond the capabilities of typical 2 inches throwaway filters.

High Static Motor

Available on 25 ton models, this high static motor option extends beyond the capability of the standard motor.

Hinged Access Doors

These doors permit easy access to the filter, fan and compressor/control sections. They reduce the potential roof damage from screws or sharp access door corners.



Humidity Sensor/Humidistat

The humidity sensor/humidistat, when used in conjunction with our dehumidification (hot gas reheat) units will provide outstanding humidity control and comfort. Humidity sensors can be wall or duct mounted. The humidity deadband can be set between 40% and 60% relative humidity.

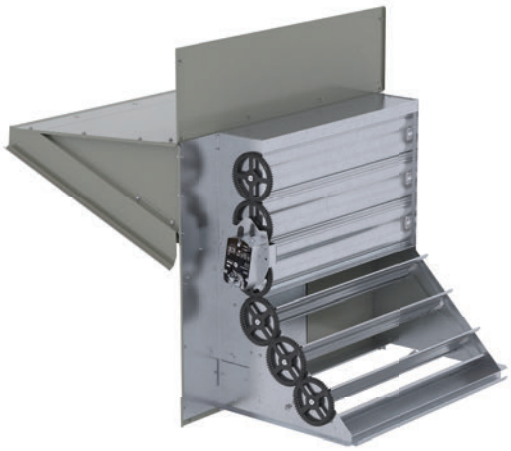
Low Ambient Cooling

All Precedent™ units have cooling capabilities down to 40°F. Factory installed option or field installed accessory extends operation down to 0°F.

Low Leak Economizer

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (4 cfm/ft^2@1" wg exterior air/return air). This option allows 100% outdoor air supply from 0 to 100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. This option can be paired with or without fault detection and diagnostics (FDD) to meet current mandatory CA Title 24 requirements.

The economizers come with four control options, dry bulb, reference enthalpy, comparative enthalpy, or differential dry bulb.



Note: *Downflow low leak economizer is available as a factory installed option. Horizontal low leak economizer option is only available as a field installed option.*

Multi-Speed Indoor Fan System

This system incorporates a multi-speed fan control to change the speed of the fan to 66% of full airflow based off of compressor stages.

Multiple-Zone VAV Control

A multiple-zone VAV (MZVAV) system consists of a packaged rooftop unit that serves several individually controlled zones. Each zone is equipped with a VAV terminal unit that varies the quantity of air delivered to maintain the desired temperature in that zone. The rooftop unit controller varies the speed of the indoor fan to maintain the static pressure in the supply ductwork at a setpoint, ensuring that all zones receive the necessary quantity of air. In addition, cooling capacity is cycled to maintain the supply air temperature at the desired setpoint.

For decades, Trane has been an industry leader in rooftop VAV systems. Now, multiple-zone VAV control is available in the light commercial rooftop platform (12.5 to 25 tons).

Other Benefits

- Cabinet design ensures water integrity
- Ease of Service, Installation and Maintenance
- Mixed model build enables “fastest in the industry” ship cycle times
- Outstanding Airflow Distribution
- Symbio Controls

Quick Adapt Curbs

Enables easy upgrade of existing Voyager™ 12.5 to 25 tons units to Precedent™ units on replacement jobs.

Rigorous Testing

All of the Precedent™ designs were rigorously rain tested at the factory to ensure water integrity.

Actual shipping tests were performed to determine packaging requirements. Units were test shipped around the country to determine the best packaging design. Factory shake and drop tests were used as part of the package design process to help assure that the unit arrives at the job site in top condition.

Rigging tests include lifting a unit into the air and letting it drop one foot, assuring that the lifting lugs and rails hold up under stress.

We perform a 100% coil leak test at the factory. The assembled unit is leak tested to 465 psig.

All parts are inspected at the point of final assembly. Sub-standard parts are identified and rejected immediately.

Every unit receives a 100% unit run test before leaving the production line to make sure it meets rigorous requirements.

Single Zone VAV (SZVAV)

SZVAV is fully integrated into the control system. It provides the simplest and fastest commissioning in the industry through proven factory-installed, wired, and tested system controllers. All control modules, logic boards and sensors are factory installed and tested to ensure the highest quality and most reliable system available. This means no special programming of algorithms, or hunting at the jobsite for field installed sensors, boards, etc. SZVAV is a quick and simple solution for many applications and is available from your most trusted rooftop VAV system solution provider -Trane.

Building system modeling in energy simulation software such as TRACE is recommended to evaluate performance improvements for your application.

Supply/Return Air Smoke Detector

With this option installed, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. In order for the supply air smoke detector or return air smoke detector to properly sense smoke in the supply air stream or the return air stream, the air velocity entering the smoke detector unit must be between 500 to 4000 feet per minute. Equipment covered in this manual will develop an airflow velocity that falls within these limits over the entire airflow range specified in the evaporator fan performance table. Supply and/or return smoke detectors may not be used with the plenum smoke detector.

Figure 1. Supply/Return air smoke detector



Through-the-Base Electrical Access

An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through-the-base of the unit. Option will allow for field installation of liquid-tight conduit and an external field installed disconnect switch.

Model Number Description

Digit 1 — Unit Function

W = Packaged Heat Pump

Digit 2 — Cooling Efficiency

H = High Efficiency

Digit 3 — Refrigerant

J = R-410A

Digit 4,5,6 — Nominal Gross Cooling Capacity (MBh)

150 = 12.5 Ton
180 = 15 Ton
210 = 17.5 Ton
240 = 20 Ton
300 = 25 Ton

Digit 7 — Design Sequence

Digit 8 — Voltage Selection

3 = 208–230/60/3
4 = 460/60/3
W = 575/60/3

Digit 9 — Unit Controls

S = Symbio™ 700

Digit 10 — Heat Type

0 = Base Model (None or Electric)

Digit 11 — Heating Capacity[1]

0 = No Heat
G = 18 kW Electric Heat
K = 27 kW Electric Heat
N = 36 kW Electric Heat
P = 54 kW Electric Heat
R = 72 kW Electric Heat

Digit 12, 13 — Service Sequence

****** = Factory Assigned

Digit 14 — Fresh Air Selection

0 = No Fresh Air
A = Manual Outside Air Damper 0–50%
B = Motorized Outside Air Damper 0–50%
C = Economizer, Dry Bulb 0–100% without Barometric Relief[2]
D = Economizer, Dry Bulb 0–100% with Barometric Relief[2]
E = Economizer, Reference Enthalpy 0–100% without Barometric Relief[2]
F = Economizer, Reference Enthalpy 0–100% with Barometric Relief[2]
G = Economizer, Comparative Enthalpy 0–100% without Barometric Relief[2]
H = Economizer, Comparative Enthalpy 0–100% with Barometric Relief[2]
K = Downflow Low Leak Economizer, Dry Bulb with Barometric Relief[2]
M = Downflow Low Leak Economizer, Reference Enthalpy with Barometric Relief[2]
P = Downflow Low Leak Economizer, Comparative Enthalpy with Barometric Relief[2]
R= Downflow Low Leak Economizer, Differential Dry Bulb with Barometric Relief[2]

Digit 15 — Supply Fan/Motor

0 = Multi-Speed Motor
1 = Optional Oversized/High Static Motor
2 = Single Zone Variable Air Volume with Standard Motor
3 = Single Zone Variable Air Volume with Oversized/High Static Motor
4 = Multiple Zone Variable Air Volume with Standard Motor
5 = Multiple Zone Variable Air Volume with Oversized/High Static Motor

Digit 16 — Hinged Access/Filters

0 = Standard Panels/Standard Filters
A = Hinged Access Panels/Standard Filters
B = Standard Panels/2 inch MERV 8 Filters
C = Hinged Access Panels/2 inch MERV 8 Filters
D = Standard Panels/2 inch MERV 13 Filters
E = Hinged Access Panels/2 inch MERV 13 Filters

Digit 17 — Coil Protection

0 = Standard Coil

Digit 18 — Through-the-Base Provisions

0 = No Through-the-Base Provisions
A = Through-the-Base Electric

Digit 19 — Disconnect/Circuit Breaker (three-phase only)

0 = No Disconnect/No Circuit Breaker
1 = Unit Mounted/Non-Fused Disconnect
2 = Unit Mounted Circuit Breaker

Digit 20— Convenience Outlet

0 = No Convenience Outlet
A = Unpowered 20A Convenience Outlet
B = Powered 15A Convenience Outlet (three-phase only)

Digit 21— Communications Options

0 = No Communications Interface
1 = Advanced Controller with BACnet® Communications Interface
2 = Advanced Controller with LonTalk® Communications Interface
3 = Advanced Controller with Air-Fi® Communications Interface

Digit 22— Refrigeration System Option

0 = Standard Refrigeration System
A = Dehumidification Option[1, 3]

Digit 23— Controls Expansion Module

0 = None
1 = XM-30 Expansion Module
2 = XM-32 Expansion Module
3 = XM-30 and XM-32 Expansion Module
4 = XM–30 Expansion Module (Qty 2)
5 = XM–32 Expansion Module (Qty 2)

Digit 24— Smoke Detector

0 = No Smoke Detector
A = Return Air Smoke Detector[2]
B = Supply Air Smoke Detector[1]
C = Supply and Return Air Smoke Detectors[1, 2]

Digit 25— System Monitoring Controls

0 = No Monitoring Control
1 = Clogged Filter Switch[2]
2 = Condensate Overflow Switch[1]
3 = Discharge Air Sensing Tube
4 = Clogged Filter Switch and Condensate Overflow Switch[1, 2]
5 = Clogged Filter Switch and Discharge Air Sensing Tube[2]
6 = Condensate Overflow Switch and Discharge Air Sensing Tube[1]
7 = Clogged Filter Switch, Condensate Overflow Switch and Discharge Air Sensing Tube[1, 2]

Digit 26— Not Used

Digit 27— Hardware Enhancements

0 = No Enhancements
1 = Stainless Steel Drain Pan

Digit 28— Short Circuit Current Rating

0 = Standard (5k) SCCR Marking
A = Tier 2 (=65K) SCCR Marking

Digit 29— Low Ambient[4]

0 = None
A = Low Ambient Cooling to 0°F

Model Number Notes
Notes:
1. Includes Symbio™ Indoor Module.
2. Includes Symbio™ Fresh Air Module.
3. Includes Symbio™Customer Connection Module.
4. Standard Low Ambient Cooling Limit is 40°F.

General Data

Table 3. General data— 15 to 25 tons, high efficiency

	12.5 Tons	15 Tons	20 Tons	25 Tons
	WHJ150	WHJ180	WHJ240	WHJ300
Cooling Performance				
Gross Cooling Capacity	154000	182000	246000	272000
EER	12.3	12.0	11.2	10.4
Nominal cfm/AHRI Rated cfm	5000	6000	8000	10000
AHRI Net Cooling Capacity	150000	178000	240000	262000
IEER (2-Speed)	17.8	17.9	17.2	16.1
IEER (SZVAV/MZVAV)	18.3	18.4	17.7	16.6
System Power (kW)	12.20	14.83	21.43	25.19
Heating Performance				
High Temp Btuh Rating	135000	162000	224000	242000
System Power (kW) / COP	10.41 / 3.80	12.05 / 3.90	18.14 / 3.60	20.21 / 3.50
Low Temp Btuh Rating	62500	76000	119000	136000
System Power (kW) / COP	8.81 / 2.08	10.66 / 2.09	16.37 / 2.13	17.11 / 2.33
Compressor				
Number/Type	2/Manifold Scroll	2/Manifold Scroll	2/Manifold Scroll	2/Manifold Scroll
Percent Capacity (Stage 1 - Stage 4)	33/67/100/NA	33/67/100/NA	24/36/64/100	25/37/63/100
Sound				
Outdoor Sound Rating (dBA)	87	87	93	93
Outdoor Coil				
Type	RTPF Lanced	RTPF Lanced	RTPF Lanced	RTPF Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.313	0.313	0.313	0.313
Face Area (sq. ft.)	34.71	34.71	40.05	40.05
Rows/FPI (Fins per inch)	3/16	3/16	3/16	3/16
Refrigerant Control	TXV	TXV	TXV	TXV
Indoor Coil				
Type	RTPF Lanced	RTPF Lanced	RTPF Lanced	RTPF Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.313	0.313	0.313	0.313
Face Area (sq. ft.)	25.83	25.83	30.09	30.09
Rows/FPI (Fins per inch)	4/16	4/16	4/16	4/16
Refrigerant Control	TXV	TXV	TXV	TXV
STD. Drain Connection No./Size (in.)	1/1.00 PVC Female	1/1.00 PVC Female	1/1.00 PVC Female	1/1.00 PVC Female
Stainless Drain Connection No./Size (in.)	1/1.00 NPT	1/1.00 NPT	1/1.00 NPT	1/1.00 NPT
Reheat Coil				
Type	RTPF Lanced	RTPF Lanced	RTPF Lanced	RTPF Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.313	0.313	0.313	0.313
Face Area (sq. ft.)	–	–	–	–

Table 3. General data— 15 to 25 tons, high efficiency (continued)

	12.5 Tons	15 Tons	20 Tons	25 Tons
	WHJ150	WHJ180	WHJ240	WHJ300
Rows/FPI (Fins per inch)	1/16	1/16	1/16	1/16
Outdoor Fan				
Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter (in.)	2/26x3	2/26x3	2/28x4	2/28x4
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM	10480	10480	15810	15810
Motor HP	2/0.50	2/0.50	2/1.0	2/1.0
Motor RPM	1125	1125	1125	1125
Indoor Fan				
Type	BC Plenum	BC Plenum	BC Plenum	BC Plenum
No. Used/Diameter (in.)/Width (in.)	2/23x6	2/23x6	2/23x6	2/23x6
Drive Type/No. Speeds/RPM	Direct / Variable	Direct / Variable	Direct / Variable	Direct / Variable
Motor HP (Standard/Oversized)	3.0 / –	3.0 / –	3.0 / –	3.0 / 4.6
Max Motor RPM	1850	1850	1850	1850 / 1940
Filters[a]				
Type Furnished	Throwaway	Throwaway	Throwaway	Throwaway
Number Size Recommended	(8) 20 x 24 x 2	(8) 20 x 24 x 2	(4) 20 x 24 x 2 (4) 20 x 30 x 2	(4) 20 x 24 x 2 (4) 20 x 30 x 2
Refrigerant Charge				
lbs of R-410A	30.0	33.0	39.0	38.0
Cabinet				
Cabinet Size	D0	D0	D1	D1

[a] Outdoor sound rating shown is tested in accordance with AHRI 370-2015. For additional information reference the outdoor sound power level data in the performance section.

Gross Cooling Capacities

Table 4. Gross cooling capacities — 12.5 tons

CFM	Ent DB (°F)	Entering Wet Bulb Temp (°F)						Entering Wet Bulb Temp (°F)						Entering Wet Bulb Temp (°F)					
		61		67		73		61		67		73		61		67		73	
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
		Ambient Temperature 85°F						Ambient Temperature 95°F						Ambient Temperature 105°F					
3750	75	138.5	109.3	154.1	85.8	169.9	61.2	130.4	105.0	145.1	81.4	159.7	56.9	121.8	100.4	135.8	77.0	149.2	52.5
	80	139.0	127.7	154.9	105.5	171.1	81.1	131.0	123.2	145.9	101.1	161.2	76.8	122.7	118.5	136.7	96.7	151.0	72.4
	85	142.3	142.3	155.3	125.0	171.9	100.8	135.5	135.5	146.5	120.7	162.1	96.5	128.4	128.4	137.2	116.2	152.0	92.2
	90	150.3	150.3	155.8	143.3	172.4	120.4	143.3	143.3	147.2	138.8	162.7	116.2	136.0	136.0	138.2	134.2	152.6	111.8
4500	75	143.5	120.7	159.2	92.5	174.3	63.1	134.9	116.2	149.6	88.0	163.7	58.8	125.8	109.9	139.9	83.5	152.7	54.3
	80	145.0	142.5	160.0	115.9	176.1	86.8	136.8	136.8	150.5	111.4	165.7	82.5	128.9	128.9	140.8	106.9	155.0	78.1
	85	152.3	152.3	160.6	139.2	177.0	110.3	144.8	144.8	151.2	133.1	166.7	106.0	137.0	137.0	141.6	128.4	156.0	101.6
	90	160.9	160.9	162.3	160.8	177.5	133.7	153.2	153.2	153.6	153.6	167.3	129.4	145.2	145.2	145.4	145.4	156.7	125.0
5000	75	146.1	128.0	161.7	96.7	176.6	64.3	137.3	121.6	151.9	92.3	165.6	59.6	128.3	116.6	141.9	87.7	153.6	55.0
	80	148.9	148.9	162.6	122.6	178.7	90.5	141.2	141.2	152.9	118.1	168.0	86.1	133.3	133.3	142.9	113.6	157.0	81.7
	85	157.8	157.8	163.5	146.6	179.6	116.5	149.9	149.9	154.0	141.8	169.0	112.1	141.7	141.7	144.3	137.0	158.1	107.7
	90	166.8	166.8	167.0	167.0	180.2	142.3	158.7	158.7	158.9	158.9	169.7	138.0	150.2	150.2	150.4	150.4	158.9	133.5
5500	75	148.5	133.1	163.8	100.9	178.4	65.5	139.6	128.2	153.8	96.4	167.3	61.1	130.4	123.2	143.6	91.8	155.8	56.6
	80	153.3	153.3	164.7	129.2	180.8	94.1	145.4	145.4	154.8	124.7	169.8	89.7	137.1	137.1	144.6	120.1	158.7	85.3
	85	162.6	162.6	166.1	155.2	181.7	122.5	154.4	154.4	156.6	150.4	170.9	118.1	145.8	145.8	146.8	145.5	159.8	113.6
	90	171.8	171.8	172.1	172.1	182.5	150.7	163.3	163.3	163.6	163.6	171.8	146.4	154.4	154.4	154.7	154.7	160.8	139.2
6000	75	150.7	139.7	165.6	104.9	180.0	66.6	141.6	134.8	155.4	100.4	168.6	62.1	132.4	129.6	145.0	95.8	156.8	57.6
	80	157.3	157.3	166.6	135.6	182.6	97.6	149.0	149.0	156.5	131.1	171.4	93.2	140.4	140.4	146.2	123.5	160.1	88.7
	85	166.8	166.8	168.7	163.6	183.6	128.4	158.2	158.2	159.0	158.8	172.6	124.0	149.3	149.3	149.4	149.4	161.3	119.5
	90	176.3	176.3	176.5	176.5	184.5	159.1	167.4	167.4	167.6	167.6	173.7	151.8	158.2	158.2	158.4	158.4	162.6	146.9
		Ambient Temperature 115°F						Ambient Temperature 125°F											
3750	75	112.8	95.7	126.1	72.4	138.3	48.0	103.0	89.1	115.6	67.5	126.5	43.2						
	80	114.0	113.6	127.0	92.1	140.4	67.9	105.3	105.3	116.5	87.2	128.9	63.2						
	85	120.8	120.8	127.4	110.2	141.4	87.7	112.5	112.5	117.1	105.0	129.9	83.0						
	90	128.2	128.2	128.9	128.9	142.0	107.4	119.7	119.7	119.9	119.9	130.6	102.6						
4500	75	116.6	104.7	129.6	78.8	141.3	49.8	106.7	99.3	118.6	74.0	129.1	45.0						
	80	120.8	120.8	130.6	102.3	143.9	73.5	112.0	112.0	119.6	97.4	131.9	68.8						
	85	128.7	128.7	131.7	123.4	145.0	97.1	119.7	119.7	121.1	118.1	133.0	92.3						
	90	136.6	136.6	136.8	136.8	145.7	120.5	127.3	127.3	127.5	127.5	133.8	113.2						
5000	75	118.8	111.4	131.4	83.0	142.8	50.9	108.7	105.8	120.1	78.1	130.1	46.0						
	80	124.8	124.8	132.4	108.9	145.6	77.1	115.6	115.6	121.2	101.0	133.4	72.4						
	85	133.0	133.0	134.2	131.9	146.8	103.1	123.5	123.5	123.7	123.7	134.6	98.3						
	90	141.1	141.1	141.4	141.4	147.6	126.4	131.3	131.3	131.5	131.5	135.7	121.0						
5500	75	120.8	117.9	132.8	87.1	143.8	51.9	110.7	110.7	121.3	82.1	130.8	47.1						
	80	128.3	128.3	134.0	112.4	147.0	80.7	118.7	118.7	122.8	106.8	134.5	75.9						
	85	136.7	136.7	136.8	136.8	148.3	109.1	126.8	126.8	126.9	126.9	135.9	104.3						
	90	145.0	145.0	145.2	145.2	149.5	134.1	134.7	134.7	134.9	134.9	137.4	128.7						
6000	75	122.8	122.8	134.0	91.0	144.5	52.9	113.0	113.0	122.3	86.1	131.4	48.1						
	80	131.2	131.2	135.5	118.1	148.2	84.1	121.3	121.3	124.2	112.4	135.5	79.3						
	85	139.8	139.8	140.0	140.0	149.5	114.9	129.6	129.6	129.7	129.7	136.9	105.9						
	90	148.4	148.4	148.6	148.6	151.2	141.7	137.7	137.7	137.9	137.9	139.0	136.2						

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain NET cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total gross capacity
3. SHC = Sensible heat capacity

Table 5. Gross cooling capacities — 15 tons

CFM	Ent DB (°F)	Entering Wet Bulb Temp (°F)						Entering Wet Bulb Temp (°F)						Entering Wet Bulb Temp (°F)					
		61		67		73		61		67		73		61		67		73	
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
		Ambient Temperature 85°F						Ambient Temperature 95°F						Ambient Temperature 105°F					
4500	75	165.1	129.5	183.4	101.0	202.7	71.5	155.7	124.2	173.1	95.8	191.4	66.3	145.8	118.8	162.4	90.4	179.6	61.0
	80	165.8	152.9	184.0	124.5	203.1	95.1	156.5	146.8	173.8	119.3	191.9	90.0	146.9	141.3	163.0	113.9	180.2	84.7
	85	169.8	169.8	184.4	147.9	203.6	118.7	161.9	161.9	174.3	142.7	192.5	113.6	153.5	153.5	163.6	137.4	180.9	108.3
	90	179.1	179.1	185.3	171.4	204.1	142.1	171.0	171.0	175.3	166.2	193.0	137.1	162.4	162.4	165.0	159.8	181.4	131.8
5400	75	170.9	142.9	189.1	108.9	208.1	73.7	161.0	137.5	178.3	103.6	196.2	68.5	150.7	132.0	167.1	98.1	183.8	63.2
	80	172.9	169.9	189.8	136.8	208.8	101.8	163.5	163.5	179.0	131.5	197.0	96.6	154.0	154.0	167.8	126.0	184.8	91.3
	85	181.4	181.4	190.5	164.6	209.3	129.8	172.7	172.7	180.0	159.4	197.7	124.6	163.6	163.6	168.9	154.0	185.5	119.3
	90	191.4	191.4	192.9	191.5	209.8	157.7	182.5	182.5	183.0	183.0	198.3	152.5	173.1	173.1	173.3	173.3	186.2	147.3
6000	75	174.0	151.5	192.1	113.9	210.9	75.1	163.9	146.1	181.0	108.5	198.6	69.9	153.4	140.6	169.5	103.0	186.0	64.5
	80	177.4	177.4	192.7	144.6	211.6	106.1	168.5	168.5	181.7	139.3	199.6	100.9	159.2	159.2	170.3	133.8	187.1	95.6
	85	187.7	187.7	194.0	175.5	212.2	137.0	178.6	178.6	183.2	168.9	200.3	131.8	169.1	169.1	172.1	163.2	187.9	126.5
	90	198.1	198.1	198.2	198.2	212.9	167.8	188.7	188.7	189.0	189.0	201.1	162.6	178.8	178.8	179.1	179.1	188.8	157.3
6600	75	176.8	160.0	194.5	118.7	213.1	76.4	166.5	154.6	183.2	113.3	200.6	71.2	156.0	147.2	171.5	107.8	187.8	65.8
	80	182.5	182.5	195.2	152.3	214.0	110.3	173.3	173.3	184.0	147.0	201.8	105.1	163.7	163.7	172.4	141.5	189.1	99.7
	85	193.2	193.2	197.1	184.6	214.6	144.0	183.7	183.7	186.2	179.1	202.5	138.8	173.8	173.8	175.0	173.4	189.8	133.4
	90	203.8	203.8	204.1	204.1	215.5	177.7	194.1	194.1	194.3	194.3	203.5	172.5	183.8	183.8	184.1	184.1	191.0	167.2
7200	75	179.3	166.6	196.6	123.4	215.0	77.7	169.0	160.9	185.1	118.0	202.4	72.5	158.4	155.0	173.2	112.5	189.3	67.1
	80	187.0	187.0	197.4	159.8	216.0	114.4	177.5	177.5	186.1	154.5	203.6	109.1	167.5	167.5	174.3	149.0	190.7	103.7
	85	197.9	197.9	200.0	194.7	216.7	150.8	188.1	188.1	189.2	189.1	204.3	145.6	177.8	177.8	178.1	178.1	191.4	140.3
	90	208.9	208.9	209.1	209.1	217.8	187.4	198.8	198.8	199.0	199.0	205.7	182.3	188.1	188.1	188.3	188.3	193.1	174.8
		Ambient Temperature 115°F						Ambient Temperature 125°F											
4500	75	135.4	113.1	151.1	84.9	167.1	55.6	124.3	107.2	139.0	79.0	153.6	49.8						
	80	136.9	135.5	151.8	108.4	167.9	79.3	126.5	126.5	139.7	102.5	154.6	73.5						
	85	144.5	144.5	152.4	131.8	168.6	102.9	134.9	134.9	140.5	126.0	155.4	97.1						
	90	153.2	153.2	154.3	154.2	169.2	126.4	143.2	143.2	143.5	143.5	156.0	120.6						
5400	75	139.9	126.3	155.3	92.5	170.8	57.7	128.5	118.8	142.6	86.6	156.8	51.9						
	80	144.7	144.7	156.0	120.4	172.0	85.8	134.5	134.5	143.4	114.5	158.2	80.0						
	85	153.9	153.9	157.4	146.9	172.7	113.8	143.3	143.3	145.2	140.8	158.9	108.0						
	90	163.0	163.0	163.3	163.3	173.5	141.8	152.1	152.1	152.4	152.4	159.8	136.0						
6000	75	142.5	133.2	157.4	97.4	172.7	59.0	131.0	126.8	144.5	91.4	158.5	53.2						
	80	149.4	149.4	158.3	128.2	174.0	90.1	138.8	138.8	145.5	122.3	159.9	84.2						
	85	158.9	158.9	160.4	157.3	174.8	120.9	147.9	147.9	148.2	148.2	160.7	115.1						
	90	168.3	168.3	168.6	168.6	175.8	151.9	156.8	156.8	157.1	157.1	161.9	146.1						
6600	75	145.0	141.1	159.2	102.1	174.3	60.3	133.4	133.4	146.0	96.1	159.8	54.4						
	80	153.5	153.5	160.2	135.8	175.7	94.2	142.4	142.4	147.2	129.9	161.4	88.3						
	85	163.2	163.2	163.5	163.5	176.5	127.9	151.7	151.7	151.9	151.9	162.3	122.1						
	90	172.8	172.8	173.1	173.1	177.9	161.8	160.9	160.9	161.1	161.1	164.0	153.4						
7200	75	147.3	147.3	160.7	106.8	175.6	61.5	136.0	136.0	147.3	100.8	161.0	55.7						
	80	157.0	157.0	162.0	143.3	177.2	98.2	145.6	145.6	148.9	134.8	162.6	92.3						
	85	166.9	166.9	167.1	167.1	178.0	134.7	155.0	155.0	155.2	155.2	163.6	128.9						
	90	176.7	176.7	176.9	176.9	179.9	168.9	164.3	164.3	164.5	164.5	165.9	162.5						

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain NET cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total gross capacity
3. SHC = Sensible heat capacity

Gross Cooling Capacities

Table 6. Gross cooling capacities — 20 tons

CFM	Ent DB (°F)	Entering Wet Bulb Temp (°F)						Entering Wet Bulb Temp (°F)						Entering Wet Bulb Temp (°F)					
		61		67		73		61		67		73		61		67		73	
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
		Ambient Temperature 85°F						Ambient Temperature 95°F						Ambient Temperature 105°F					
6000	75	222.9	176.2	248.0	138.3	274.7	98.9	209.8	169.3	233.8	131.5	259.0	92.3	195.7	162.0	218.6	124.4	242.3	85.4
	80	224.4	207.8	248.9	169.8	275.3	130.6	211.6	199.6	234.8	163.0	259.9	124.1	198.0	192.1	219.7	155.9	243.5	117.2
	85	230.4	230.4	249.6	201.1	276.1	162.2	219.6	219.6	235.7	194.4	260.9	155.7	207.8	207.8	220.8	187.4	244.6	148.8
	90	243.2	243.2	251.3	232.8	276.8	193.7	232.1	232.1	237.7	226.2	261.7	187.2	220.2	220.2	223.3	217.5	245.5	180.3
7200	75	231.0	194.2	255.9	148.8	282.1	102.0	217.3	187.2	241.0	141.9	265.7	95.3	202.6	179.9	225.1	134.8	248.1	88.3
	80	234.4	230.4	256.9	186.2	283.2	139.6	221.5	221.5	242.1	179.3	267.0	133.0	208.2	208.2	226.2	172.2	249.9	126.1
	85	246.1	246.1	258.4	223.7	284.1	177.1	234.3	234.3	243.9	217.0	268.2	170.6	221.5	221.5	228.4	209.9	251.1	163.7
	90	259.9	259.9	262.2	259.7	284.9	214.5	247.8	247.8	248.7	248.7	269.2	208.0	234.8	234.8	235.1	235.1	252.3	201.2
8000	75	235.4	205.8	260.0	155.5	285.9	103.8	221.4	198.8	244.7	148.6	269.0	97.1	206.5	189.1	228.4	141.4	251.1	90.1
	80	240.7	240.7	261.0	196.7	287.2	145.4	228.4	228.4	245.9	189.9	270.7	138.7	215.3	215.3	229.8	182.7	253.2	131.8
	85	254.8	254.8	263.3	238.3	288.2	186.8	242.4	242.4	248.5	229.4	271.8	180.1	229.0	229.0	232.9	221.8	254.4	173.2
	90	269.1	269.1	269.5	269.5	289.3	228.1	256.4	256.4	256.8	256.8	273.2	221.5	242.7	242.7	243.0	243.0	256.1	214.7
8800	75	239.3	217.2	263.4	162.0	289.0	105.6	225.1	207.7	247.8	155.0	271.8	98.9	210.2	199.8	231.2	147.8	253.6	91.9
	80	247.5	247.5	264.6	207.0	290.6	151.0	234.9	234.9	249.2	200.2	273.7	144.3	221.3	221.3	232.8	193.0	255.9	137.4
	85	262.2	262.2	267.7	250.2	291.6	196.1	249.3	249.3	252.9	243.1	274.9	189.5	235.4	235.4	237.2	235.5	257.2	182.6
	90	277.0	277.0	277.4	277.4	293.2	241.4	263.7	263.7	264.1	264.1	276.8	234.8	249.5	249.5	249.8	249.8	259.4	228.0
9600	75	242.9	225.7	266.3	168.3	291.6	107.3	228.7	218.1	250.4	161.3	274.2	100.6	213.6	210.2	233.5	154.0	255.7	93.5
	80	253.6	253.6	267.8	217.1	293.4	156.5	240.5	240.5	252.2	210.3	276.3	149.8	226.6	226.6	235.6	203.1	258.2	142.8
	85	268.7	268.7	272.0	263.7	294.5	205.3	255.4	255.4	257.0	256.4	277.5	198.7	241.0	241.0	241.5	241.5	259.6	191.7
	90	283.9	283.9	284.3	284.3	296.6	254.4	270.2	270.2	270.5	270.5	280.0	247.9	255.4	255.4	255.7	255.7	262.4	241.1
		Ambient Temperature 115°F						Ambient Temperature 125°F											
6000	75	180.7	154.3	202.3	117.0	224.3	78.2	164.5	146.3	184.8	109.1	204.9	70.5						
	80	183.7	183.7	203.5	148.5	226.0	110.0	169.5	169.5	186.0	140.7	207.1	102.5						
	85	195.1	195.1	204.8	180.1	227.2	141.7	181.3	181.3	187.6	172.4	208.4	134.1						
	90	207.2	207.2	208.3	208.3	228.2	173.2	193.1	193.1	193.5	193.5	209.5	165.7						
7200	75	187.0	170.0	208.1	127.2	229.5	81.0	170.5	161.3	189.9	119.3	209.3	73.3						
	80	194.8	194.8	209.4	164.7	231.7	118.9	180.2	180.2	191.3	156.9	212.0	111.3						
	85	207.8	207.8	212.0	200.1	233.0	156.5	192.8	192.8	194.7	191.7	213.4	148.9						
	90	220.7	220.7	221.0	221.0	234.4	194.0	205.3	205.3	205.6	205.6	215.1	186.5						
8000	75	190.8	180.8	211.1	133.8	232.1	82.8	174.2	172.0	192.4	125.9	211.6	75.1						
	80	201.3	201.3	212.6	175.2	234.6	124.6	186.0	186.0	194.3	167.3	214.5	116.9						
	85	214.6	214.6	216.5	213.9	235.9	166.0	199.0	199.0	199.3	199.3	216.0	158.4						
	90	227.9	227.9	228.3	228.3	237.9	207.6	211.8	211.8	212.1	212.1	218.2	196.8						
8800	75	194.4	191.4	213.5	140.2	234.3	84.5	177.8	177.8	194.5	132.2	213.4	76.8						
	80	206.8	206.8	215.5	185.5	237.0	130.1	191.0	191.0	196.8	174.0	216.6	122.4						
	85	220.5	220.5	220.9	220.9	238.4	175.3	204.3	204.3	204.5	204.5	218.2	167.7						
	90	234.2	234.2	234.4	234.4	240.9	217.6	217.4	217.4	217.6	217.6	221.3	209.2						
9600	75	197.8	197.8	215.6	146.4	236.1	86.2	181.6	181.6	196.3	138.4	214.9	78.4						
	80	211.5	211.5	217.9	192.1	239.0	135.5	195.3	195.3	199.3	183.3	218.3	127.8						
	85	225.6	225.6	225.8	225.8	240.6	184.5	208.8	208.8	209.0	209.0	220.2	176.9						
	90	239.5	239.5	239.8	239.8	243.9	229.8	222.1	222.1	222.4	222.4	224.2	221.3						

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain NET cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total gross capacity
3. SHC = Sensible heat capacity

Table 7. Gross cooling capacities — 25 tons

CFM	Ent DB (°F)	Entering Wet Bulb Temp (°F)						Entering Wet Bulb Temp (°F)						Entering Wet Bulb Temp (°F)					
		61		67		73		61		67		73		61		67		73	
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
		Ambient Temperature 85°F						Ambient Temperature 95°F						Ambient Temperature 105°F					
7500	75	247.4	201.9	273.9	155.7	301.5	107.9	233.5	194.4	258.6	148.2	284.3	100.4	218.8	186.5	242.5	140.4	266.0	92.7
	80	250.4	238.1	275.3	193.8	303.1	146.3	237.0	230.3	260.1	186.3	286.4	138.9	222.9	222.1	244.0	178.5	268.8	131.3
	85	260.5	260.5	276.6	231.8	304.4	184.4	248.4	248.4	261.7	224.4	288.0	177.1	235.4	235.4	245.9	216.7	270.5	169.5
	90	274.9	274.9	280.0	267.7	305.4	222.4	262.5	262.5	265.6	260.0	289.1	215.2	249.2	249.2	250.6	250.6	271.7	207.6
9000	75	255.6	222.5	281.6	167.6	308.2	111.2	241.2	214.9	265.7	160.0	290.4	103.8	225.8	207.0	248.8	152.1	271.5	96.0
	80	261.5	261.5	283.1	212.5	310.7	156.6	248.1	248.1	267.3	204.9	293.4	149.1	234.5	234.5	250.5	197.0	275.0	141.4
	85	276.3	276.3	285.7	257.7	312.3	201.6	263.1	263.1	270.3	250.3	295.1	194.2	249.1	249.1	253.9	238.4	276.9	186.5
	90	291.7	291.7	292.4	292.4	313.6	246.4	278.2	278.2	278.3	278.3	296.7	239.1	263.7	263.7	264.1	264.1	278.7	231.5
10000	75	260.2	235.7	285.7	175.2	311.9	113.4	245.5	228.1	269.3	167.5	293.6	105.8	230.0	215.4	252.0	159.6	274.4	98.0
	80	268.7	268.7	287.2	224.4	314.7	163.1	255.6	255.6	271.1	216.8	297.0	155.6	241.4	241.4	254.0	209.0	278.2	147.9
	85	284.8	284.8	290.9	270.6	316.3	212.5	271.1	271.1	275.3	262.5	298.8	205.1	256.4	256.4	258.9	253.9	280.1	197.3
	90	300.8	300.8	301.2	301.2	318.1	261.9	286.7	286.7	287.0	287.0	300.9	254.5	271.5	271.5	271.8	271.8	282.6	246.9
11000	75	264.3	248.5	289.0	182.4	314.9	115.4	249.5	235.9	272.4	174.8	296.3	107.8	233.9	227.1	254.8	166.7	276.7	99.9
	80	275.8	275.8	290.8	236.0	318.1	169.4	262.0	262.0	274.5	228.4	300.0	161.9	247.2	247.2	257.2	220.5	280.9	154.1
	85	292.2	292.2	295.8	285.7	319.7	223.0	277.9	277.9	280.1	277.5	301.8	215.6	262.7	262.7	263.6	263.6	282.9	207.8
	90	308.6	308.6	308.9	308.9	322.1	276.9	293.9	293.9	294.2	294.2	304.6	269.5	278.2	278.2	278.4	278.4	286.1	261.9
12000	75	268.2	255.8	291.9	189.5	317.4	117.3	253.2	247.3	275.0	181.7	298.6	109.7	237.4	237.4	257.1	173.7	278.6	101.8
	80	281.8	281.8	294.1	247.3	320.9	175.5	267.5	267.5	277.5	239.7	302.5	167.9	252.3	252.3	260.0	231.7	283.2	160.1
	85	298.5	298.5	300.4	300.4	322.6	233.2	283.8	283.8	284.6	284.6	304.4	225.8	268.1	268.1	268.2	268.2	285.2	218.0
	90	315.3	315.3	315.7	315.7	325.7	291.4	300.1	300.1	300.4	300.4	308.0	284.1	283.9	283.9	284.1	284.1	289.3	269.9
		Ambient Temperature 115°F						Ambient Temperature 125°F											
7500	75	203.0	178.3	225.2	132.2	246.7	84.6	186.2	169.5	206.7	123.5	225.9	76.1						
	80	208.2	208.2	226.8	170.3	250.0	123.3	193.3	193.3	208.4	161.7	229.8	114.8						
	85	221.4	221.4	229.0	208.7	251.9	161.5	206.2	206.2	211.0	196.2	231.7	153.1						
	90	234.8	234.8	235.0	235.0	253.3	199.7	219.1	219.1	219.4	219.4	233.3	191.2						
9000	75	209.6	194.3	230.8	143.8	251.5	87.8	192.5	184.5	211.5	135.1	229.9	79.2						
	80	219.8	219.8	232.7	188.8	255.5	133.4	203.9	203.9	213.7	180.2	234.5	124.8						
	85	234.0	234.0	236.8	229.5	257.5	178.4	217.5	217.5	218.6	218.6	236.6	169.9						
	90	248.1	248.1	248.4	248.4	259.7	223.6	231.1	231.1	231.3	231.3	239.1	215.1						
10000	75	213.7	206.2	233.7	151.2	253.9	89.8	196.3	196.2	214.0	142.4	231.8	81.1						
	80	226.1	226.1	236.0	200.7	258.4	139.8	209.5	209.5	216.5	186.5	237.0	131.2						
	85	240.7	240.7	241.7	241.7	260.4	189.2	223.5	223.5	223.6	223.6	239.1	180.7						
	90	255.2	255.2	255.5	255.5	263.3	239.0	237.4	237.4	237.6	237.6	242.5	224.2						
11000	75	217.4	217.4	236.1	158.4	255.8	91.7	200.0	200.0	216.0	149.5	233.2	82.9						
	80	231.4	231.4	238.9	212.3	260.7	146.0	214.3	214.3	219.3	196.7	239.0	137.3						
	85	246.4	246.4	246.5	246.5	262.8	199.7	228.6	228.6	228.8	228.8	241.3	191.1						
	90	261.3	261.3	261.5	261.5	266.6	247.5	242.7	242.7	243.0	243.0	245.7	237.6						
12000	75	220.9	220.9	238.1	165.3	257.3	93.5	203.7	203.7	217.7	156.3	234.3	84.7						
	80	236.1	236.1	241.5	216.8	262.7	152.0	218.4	218.4	221.8	206.4	240.6	143.3						
	85	251.3	251.3	251.5	251.5	265.0	209.9	232.9	232.9	233.1	233.1	243.3	201.3						
	90	266.4	266.4	266.7	266.7	269.8	260.6	247.3	247.3	247.5	247.5	248.8	248.8						

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain NET cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total gross capacity
3. SHC = Sensible heat capacity

Heating Capacities

Table 8. Heating capacities — 12.5 tons

Outdoor Temp (°F) 0% RH	Integrated Heating Capacity (MBh/1000) at Indicated Dry Bulb Temp (°F)				Total Power (kW) at Indicated Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	45.7	43.4	42.3	41.1	9.0	9.9	10.3	10.8
-3	52.6	50.3	49.1	47.9	9.1	10.0	10.5	10.9
2	59.8	57.3	56.1	54.8	9.2	10.1	10.6	11.1
7	67.3	64.6	63.3	61.9	9.4	10.3	10.8	11.3
12	75.3	72.5	71.1	69.7	9.5	10.4	10.9	11.4
17	83.7	80.6	79.1	77.7	9.7	10.6	11.1	11.6
22	92.6	89.3	87.7	86.1	9.8	10.8	11.3	11.8
27	101.9	98.3	96.5	94.8	10.0	10.9	11.5	12.0
32	111.5	107.6	105.7	103.8	10.2	11.1	11.6	12.2
37	121.1	116.8	114.7	112.7	10.4	11.3	11.8	12.4
42	130.9	126.2	124.0	121.8	10.6	11.5	12.0	12.6
47	141.0	136.0	133.5	131.2	10.8	11.7	12.3	12.8
52	151.6	146.1	143.5	140.9	11.0	12.0	12.5	13.0
57	162.5	156.5	153.7	150.9	11.2	12.2	12.7	13.3
62	173.2	166.8	163.8	160.8	11.5	12.4	13.0	13.5
67	185.1	178.1	174.8	171.5	11.7	12.7	13.2	13.8
72	196.6	188.7	185.0	181.3	12.0	12.9	13.5	14.0

Notes:

1. For other airflow conditions, see heating capacity correction factor Net Heating Capacity and Power Input include indoor fan heat at nominal CFM and 0.35 inch ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Heating capacities and powers are integrated to include the effects of defrost in the frost region.
3. All heating capacities and power (kW) are at 70% OD relative humidity.

Table 9. Heating capacities — 15 tons

Outdoor Temp (°F) 70% RH	Integrated Heating Capacity (MBh/1000) at Indicated Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	55.5	54.0	53.2	52.3	11.0	12.1	12.6	13.3
-3	63.6	61.8	60.9	59.9	11.1	12.2	12.8	13.4
2	72.0	70.0	68.9	67.9	11.3	12.4	13.0	13.6
7	80.8	78.6	77.4	76.2	11.5	12.6	13.2	13.9
12	90.2	87.7	86.4	85.1	11.7	12.8	13.4	14.1
17	99.9	97.1	95.7	94.2	11.9	13.0	13.6	14.3
22	110.3	107.2	105.6	104.0	12.1	13.2	13.8	14.5
27	121.0	117.6	115.8	114.0	12.3	13.5	14.1	14.7
32	132.2	128.4	126.5	124.5	12.5	13.7	14.3	14.9
37	143.3	139.0	136.9	134.8	12.7	13.9	14.5	15.2
42	154.7	150.0	147.6	145.3	13.0	14.1	14.8	15.4
47	166.2	161.1	158.6	156.0	13.2	14.4	15.0	15.7
52	178.2	172.6	169.8	167.1	13.4	14.6	15.3	15.9
57	190.5	184.3	181.3	178.3	13.7	14.9	15.5	16.2

Table 9. Heating capacities — 15 tons (continued)

Outdoor Temp (°F) 70% RH	Integrated Heating Capacity (MBh/1000) at Indicated Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
62	202.0	195.3	192.0	188.6	14.0	15.1	15.8	16.4
67	213.9	206.6	202.9	199.2	14.3	15.4	16.1	16.7
72	226.9	218.7	214.7	210.8	14.6	15.8	16.4	17.1

Notes:

1. For other airflow conditions, see heating capacity correction factor Net Heating Capacity and Power Input include indoor fan heat at nominal CFM and 0.35 inch ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Heating capacities and powers are integrated to include the effects of defrost in the frost region.
3. All heating capacities and power (kW) are at 70% OD relative humidity.

Table 10. Heating capacities — 20 tons

Outdoor Temp (°F) 70% RH	Integrated Heating Capacity (MBh/1000) at Indicated Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	79.9	76.5	74.7	72.8	16.2	17.7	18.5	19.4
-3	91.0	87.4	85.6	83.7	16.4	17.9	18.8	19.7
2	102.4	98.7	96.8	94.8	16.7	18.2	19.0	19.9
7	114.3	110.4	108.4	106.2	16.9	18.4	19.3	20.2
12	127.1	123.0	120.8	118.5	17.1	18.7	19.5	20.5
17	140.1	135.8	133.5	131.2	17.3	18.9	19.8	20.7
22	154.1	149.5	147.1	144.6	17.6	19.2	20.1	21.0
27	168.6	163.6	161.0	158.4	17.8	19.4	20.3	21.3
32	183.7	178.3	175.5	172.8	18.1	19.7	20.6	21.5
37	198.5	192.7	189.8	186.8	18.3	20.0	20.9	21.8
42	213.9	207.6	204.4	201.2	18.6	20.2	21.1	22.1
47	229.5	222.8	219.4	216.0	18.8	20.5	21.4	22.4
52	245.7	238.5	234.8	231.1	19.1	20.8	21.7	22.7
57	262.5	254.6	250.6	246.7	19.4	21.1	22.0	23.0
62	278.8	270.3	266.0	261.7	19.6	21.3	22.3	23.3
67	295.1	285.8	281.1	276.4	19.9	21.6	22.6	23.6
72	312.8	302.3	297.1	291.9	20.2	22.0	22.9	23.9

Notes:

1. For other airflow conditions, see heating capacity correction factor Net Heating Capacity and Power Input include indoor fan heat at nominal CFM and 0.35 inch ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Heating capacities and powers are integrated to include the effects of defrost in the frost region.
3. All heating capacities and power (kW) are at 70% OD relative humidity.

Table 11. Heating capacities — 25 tons

Outdoor Temp (°F) 70% RH	Integrated Heating Capacity (MBh/1000) at Indicated Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	90.3	88.2	87.4	86.7	17.6	19.2	20.1	21.0
-3	101.7	99.4	98.4	97.7	17.8	19.5	20.4	21.3
2	113.6	111.2	110.1	109.1	18.1	19.7	20.6	21.6
7	126.1	123.4	122.2	121.0	18.3	20.0	20.9	21.8
12	139.1	136.2	134.8	133.6	18.6	20.2	21.2	22.1
17	152.6	149.3	147.8	146.5	18.8	20.5	21.4	22.4

Heading Capacities

Table 11. Heating capacities — 25 tons (continued)

Outdoor Temp (°F) 70% RH	Integrated Heating Capacity (MBh/1000) at Indicated Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	167.0	163.5	161.8	160.1	19.1	20.8	21.7	22.7
27	182.0	177.9	176.2	174.3	19.3	21.0	22.0	23.0
32	197.9	193.6	191.2	189.3	19.6	21.3	22.3	23.3
37	213.6	208.8	206.4	204.2	19.8	21.6	22.5	23.5
42	230.0	224.7	222.1	219.5	20.1	21.9	22.8	23.8
47	246.6	240.8	237.9	235.0	20.4	22.1	23.1	24.1
52	263.9	257.5	254.3	251.2	20.6	22.4	23.4	24.4
57	282.2	275.2	271.6	268.1	20.9	22.7	23.7	24.7
62	300.4	292.6	288.7	284.8	21.2	23.0	24.0	25.1
67	318.4	309.8	305.4	301.0	21.5	23.3	24.3	25.4
72	338.1	328.1	323.2	318.2	21.9	23.7	24.7	25.7

Notes:

1. For other airflow conditions, see heating capacity correction factor Net Heating Capacity and Power Input include indoor fan heat at nominal CFM and 0.35 inch ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Heating capacities and powers are integrated to include the effects of defrost in the frost region.
3. All heating capacities and power (kW) are at 70% OD relative humidity.

Evaporator Fan Performance

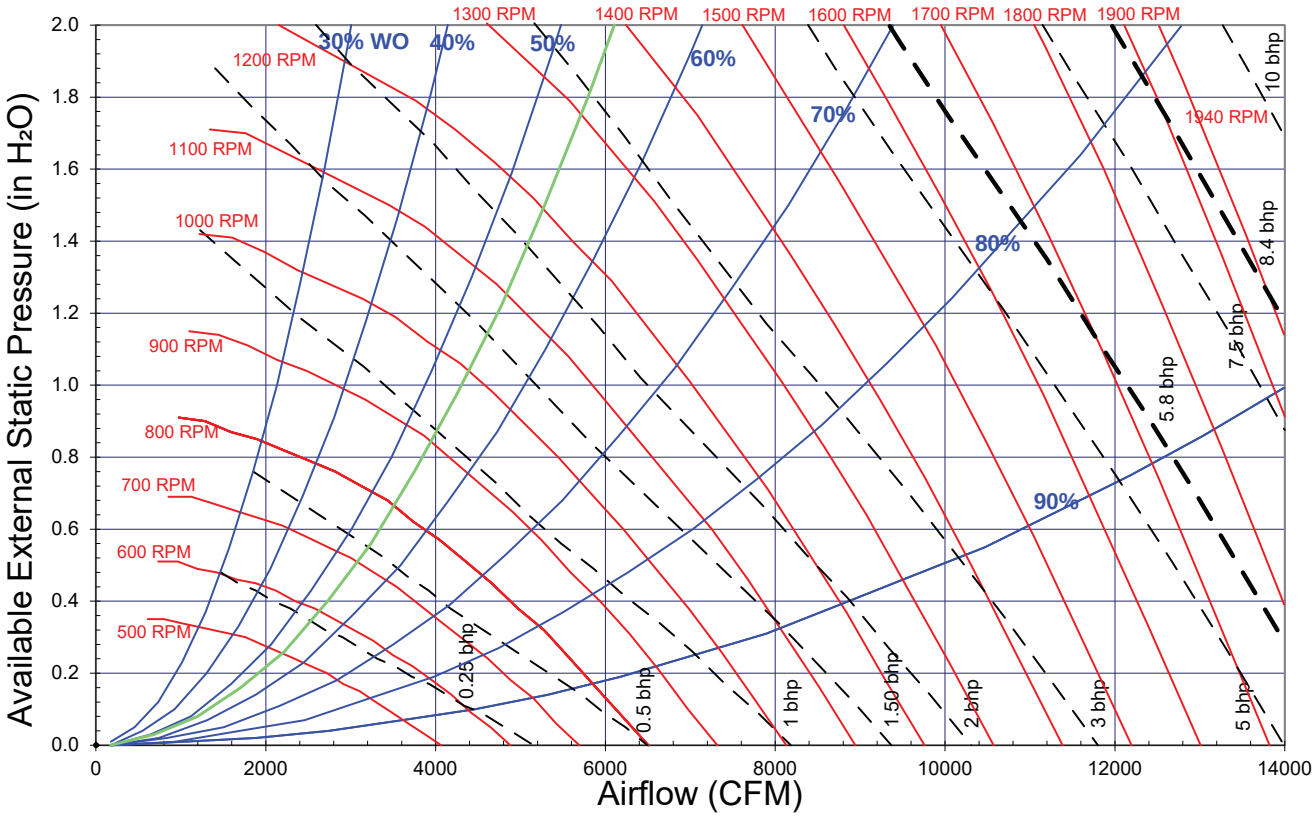
Fan Curve Limits:

- WHJ150–300 Std Motor, Max 5.8 hp or 1850 rpm
- WHJ300 High static, Max 8.4 hp or 1940 rpm
- Maximum CFM — 480 cfm/ton
- Maximum ESP = 2.0 in-H_2O @ 400 cfm/ton

The fan curve graphs include standard filter and a wet indoor coil. Available static pressure is reduced with options based on the accessory table component pressure drop. To determine available static pressure at rpm/cfm with other options/accessories, select intersection point of the RPM vs CFM and then reduce available static pressure shown in graph by the sum of additional option static pressure drop listed in the fan performance accessory table section. For more detailed and precise RPM, BHP, and CFM operating points, see evaporator tables below.

12.5 to 25 Ton Units — Downflow

Figure 2. Fan curves — 12.5 to 25 tons, downflow



Evaporator Fan Performance

Table 12. Evaporator fan performance — 12.5 ton, model WHJ, downflow

Available External Static Pressure (Inches of Water Gauge)																				
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3750	541	0.19	604	0.28	661	0.37	713	0.47	761	0.58	807	0.69	850	0.80	891	0.91	930	1.03	968	1.16
4000	568	0.21	629	0.31	684	0.41	734	0.51	781	0.62	825	0.74	868	0.85	908	0.97	947	1.10	983	1.22
4500	625	0.28	679	0.38	731	0.49	779	0.61	823	0.73	866	0.85	905	0.97	944	1.10	982	1.23	1018	1.37
5000	683	0.35	732	0.47	780	0.58	826	0.71	868	0.84	908	0.97	947	1.11	983	1.24	1018	1.38	1053	1.53
5500	742	0.45	786	0.57	831	0.69	874	0.83	915	0.97	953	1.11	989	1.26	1025	1.40	1059	1.55	1092	1.70
6000	801	0.55	842	0.68	883	0.82	924	0.96	962	1.11	999	1.26	1035	1.42	1068	1.58	1102	1.74	1133	1.90
Available External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3750	1005	1.29	1040	1.43	1074	1.57	1106	1.71	1137	1.86	1168	2	1198	2.15	1228	2.31	1257	2.46	1285	2.62
4000	1019	1.36	1054	1.5	1088	1.64	1120	1.79	1152	1.94	1182	2.09	1211	2.24	1240	2.4	1269	2.56	1297	2.72
4500	1052	1.51	1085	1.65	1117	1.79	1149	1.95	1180	2.1	1211	2.26	1240	2.43	1268	2.59	1296	2.76	1323	2.93
5000	1087	1.67	1120	1.82	1151	1.98	1182	2.13	1211	2.29	1240	2.45	1269	2.62	1297	2.79	1325	2.97	1352	3.15
5500	1123	1.86	1155	2.02	1186	2.18	1216	2.34	1246	2.51	1274	2.68	1302	2.85	1328	3.02	1354	3.2	1381	3.38
6000	1164	2.06	1194	2.23	1223	2.4	1252	2.57	1281	2.74	1309	2.92	1336	3.1	1363	3.28	1389	3.47	1414	3.66

Notes:

1. Available External Static Pressure is the static pressure difference between the return duct and the supply duct plus the static pressure drop caused by accessories and options.
2. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
3. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
4. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
5. Direct drive fan motor heat is negligible.
6. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 13. Evaporator fan performance — 15 ton, model WHJ, downflow

Available External Static Pressure (Inches of Water Gauge)																				
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	625	0.28	679	0.38	731	0.49	779	0.61	823	0.73	866	0.85	905	0.97	944	1.10	982	1.23	1018	1.37
4800	660	0.32	711	0.43	760	0.54	807	0.67	850	0.79	891	0.92	930	1.05	967	1.18	1003	1.32	1039	1.46
5400	730	0.43	775	0.54	821	0.67	864	0.80	905	0.94	944	1.08	981	1.22	1017	1.37	1051	1.52	1084	1.67
6000	801	0.55	842	0.68	883	0.82	924	0.96	962	1.11	999	1.26	1035	1.42	1068	1.58	1102	1.74	1133	1.90
6600	873	0.71	911	0.85	948	1.00	985	1.15	1022	1.31	1057	1.47	1091	1.63	1123	1.81	1155	1.98	1185	2.16
7200	945	0.89	981	1.04	1014	1.20	1049	1.36	1083	1.53	1116	1.70	1148	1.88	1180	2.06	1210	2.25	1239	2.43
Available External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	1052	1.51	1085	1.65	1117	1.79	1149	1.95	1180	2.1	1211	2.26	1240	2.43	1268	2.59	1296	2.76	1323	2.93
4800	1073	1.61	1106	1.75	1137	1.90	1168	2.05	1198	2.21	1228	2.37	1257	2.54	1286	2.71	1313	2.88	1340	3.06
5400	1115	1.82	1148	1.98	1179	2.14	1209	2.3	1239	2.46	1267	2.63	1295	2.80	1322	2.97	1348	3.15	1375	3.33
6000	1164	2.06	1194	2.23	1223	2.40	1252	2.57	1281	2.74	1309	2.92	1336	3.10	1363	3.28	1389	3.47	1414	3.66
6600	1215	2.33	1244	2.51	1272	2.69	1300	2.87	1326	3.05	1352	3.24	1379	3.43	1405	3.62	1431	3.82	1456	4.02
7200	1268	2.63	1295	2.82	1323	3.01	1350	3.2	1376	3.4	1401	3.6	1426	3.79	1450	4.00	1474	4.2	1498	4.41

Notes:

1. Available External Static Pressure is the static pressure difference between the return duct and the supply duct plus the static pressure drop caused by accessories and options.
2. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
3. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
4. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
5. Direct drive fan motor heat is negligible.
6. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 14. Evaporator fan performance — 20 ton, model WHJ, downflow

Available External Static Pressure (Inches of Water Gauge)																				
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	785	0.51	827	0.64	868	0.77	907	0.91	945	1.05	981	1.20	1016	1.35	1049	1.50	1081	1.65	1112	1.80
6400	831	0.61	872	0.74	911	0.88	948	1.02	984	1.17	1019	1.33	1053	1.48	1085	1.64	1116	1.80	1146	1.96
7200	925	0.83	962	0.97	997	1.13	1031	1.28	1064	1.45	1096	1.61	1128	1.79	1158	1.96	1188	2.14	1217	2.32
8000	1020	1.09	1054	1.26	1086	1.42	1117	1.60	1148	1.77	1177	1.95	1206	2.14	1235	2.33	1263	2.52	1290	2.72
8800	1115	1.42	1146	1.60	1176	1.78	1205	1.96	1233	2.15	1261	2.35	1288	2.55	1314	2.75	1341	2.96	1367	3.17
9600	1211	1.81	1240	2.00	1268	2.20	1295	2.39	1321	2.60	1347	2.81	1372	3.02	1397	3.24	1421	3.46	1445	3.68
Available External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	1141	1.95	1170	2.1	1198	2.25	1227	2.41	1255	2.57	1282	2.74	1308	2.9	1333	3.07	1358	3.24	1383	3.41
6400	1175	2.12	1203	2.28	1231	2.44	1257	2.6	1284	2.77	1311	2.94	1337	3.11	1362	3.29	1387	3.46	1411	3.64
7200	1245	2.49	1272	2.67	1299	2.85	1324	3.03	1349	3.21	1374	3.39	1397	3.57	1421	3.76	1445	3.95	1469	4.14
8000	1317	2.91	1343	3.11	1369	3.31	1394	3.5	1418	3.7	1442	3.9	1465	4.1	1487	4.31	1510	4.5	1532	4.7
8800	1392	3.38	1417	3.59	1442	3.81	1466	4.02	1489	4.24	1512	4.46	1534	4.68	1557	4.89	1578	5.11	1599	5.33
9600	1469	3.9	1493	4.13	1517	4.37	1539	4.6	1562	4.83	1584	5.07	1606	5.31	1627	5.54	1648	5.78	-	-

Notes:

1. Available External Static Pressure is the static pressure difference between the return duct and the supply duct plus the static pressure drop caused by accessories and options.
2. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
3. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
4. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
5. Direct drive fan motor heat is negligible.
6. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 15. Evaporator fan performance — 25 ton, model WHJ, downflow

Available External Static Pressure (Inches of Water Gauge)																				
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3-hp Standard Motor																			
7500	961	0.92	996	1.07	1030	1.23	1063	1.40	1095	1.56	1126	1.74	1157	1.91	1187	2.09	1216	2.28	1244	2.46
8000	1020	1.09	1054	1.26	1086	1.42	1117	1.60	1148	1.77	1177	1.95	1206	2.14	1235	2.33	1263	2.52	1290	2.72
9000	1139	1.51	1170	1.69	1199	1.88	1227	2.06	1255	2.26	1282	2.46	1309	2.66	1335	2.87	1360	3.07	1386	3.29
10000	1259	2.02	1287	2.23	1314	2.43	1340	2.64	1365	2.84	1390	3.06	1415	3.28	1439	3.51	1463	3.73	1486	3.96
11000	1379	2.65	1405	2.87	1430	3.09	1454	3.32	1478	3.54	1501	3.77	1523	4.01	1546	4.25	1568	4.50	1590	4.75
12000	1500	3.39	1524	3.63	1547	3.87	1570	4.12	1592	4.37	1613	4.61	1634	4.86	1655	5.12	1676	5.39	1696	5.65
Available External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3-hp Standard Motor																			
7500	1272	2.65	1299	2.83	1325	3.02	1350	3.2	1375	3.39	1399	3.58	1422	3.77	1446	3.96	1468	4.15	1491	4.34
8000	1317	2.91	1343	3.11	1369	3.31	1394	3.5	1418	3.7	1442	3.9	1465	4.1	1487	4.31	1510	4.5	1532	4.7
9000	1411	3.5	1436	3.72	1460	3.94	1484	4.16	1507	4.38	1530	4.61	1552	4.83	1574	5.05	1596	5.27	1617	5.5
10000	1509	4.19	1532	4.43	1555	4.67	1577	4.91	1599	5.15	1621	5.4	1643	5.64	-	-	-	-	-	-
11000	1611	4.99	1633	5.25	1653	5.5	1674	5.76	-	-	-	-	-	-	-	-	-	-	-	-
12000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. Available External Static Pressure is the static pressure difference between the return duct and the supply duct plus the static pressure drop caused by accessories and options.
2. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
3. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
4. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
5. Direct drive fan motor heat is negligible.
6. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 16. Evaporator fan performance — 25 ton, downflow, model WHJ, high static drive

Available External Static Pressure (Inches of Water Gauge)																		
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	5-hp Oversized Motor																			
7500	983	0.94	1019	1.10	1053	1.26	1086	1.42	1117	1.59	1148	1.76	1179	1.94	1209	2.11	1238	2.29	1266	2.47
8000	1044	1.12	1078	1.28	1110	1.45	1142	1.63	1171	1.80	1200	1.98	1230	2.17	1259	2.36	1287	2.55	1314	2.74
9000	1166	1.55	1197	1.73	1226	1.92	1255	2.11	1283	2.30	1309	2.50	1335	2.70	1361	2.91	1387	3.12	1413	3.33
10000	1289	2.08	1317	2.28	1344	2.48	1370	2.69	1396	2.91	1421	3.12	1445	3.34	1468	3.56	1491	3.79	1515	4.02
11000	1412	2.72	1438	2.94	1463	3.16	1487	3.39	1511	3.62	1534	3.86	1557	4.09	1579	4.33	1601	4.58	1622	4.82
12000	1535	3.48	1560	3.72	1583	3.97	1605	4.21	1628	4.46	1650	4.72	1671	4.97	1692	5.23	1712	5.49	1732	5.75
Available External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	5-hp Oversized Motor																			
7500	1294	2.66	1321	2.84	1346	3.03	1371	3.21	1396	3.4	1419	3.6	1442	3.79	1466	3.98	1489	4.18	1511	4.37
8000	1341	2.93	1367	3.12	1392	3.32	1417	3.52	1441	3.72	1464	3.92	1487	4.12	1509	4.32	1531	4.53	1553	4.74
9000	1438	3.54	1463	3.76	1487	3.97	1510	4.19	1534	4.41	1556	4.62	1579	4.85	1600	5.07	1622	5.29	1642	5.52
10000	1539	4.25	1562	4.49	1585	4.72	1607	4.96	1629	5.2	1651	5.43	1672	5.68	1693	5.92	1714	6.16	1734	6.4
11000	1643	5.07	1665	5.32	1686	5.58	1707	5.84	1728	6.1	1749	6.36	1769	6.61	1789	6.88	1809	7.14	1829	7.4
12000	1752	6.02	1771	6.28	1790	6.55	1810	6.83	1830	7.11	1850	7.39	1869	7.67	1888	7.96	1907	8.24	-	-

Notes:

1. Available External Static Pressure is the static pressure difference between the return duct and the supply duct plus the static pressure drop caused by accessories and options.
2. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
3. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
4. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
5. Direct drive fan motor heat is negligible.
6. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

12.5 to 25 Ton Units — Horizontal

Figure 3. Fan curves — 12.5 to 25 tons, horizontal

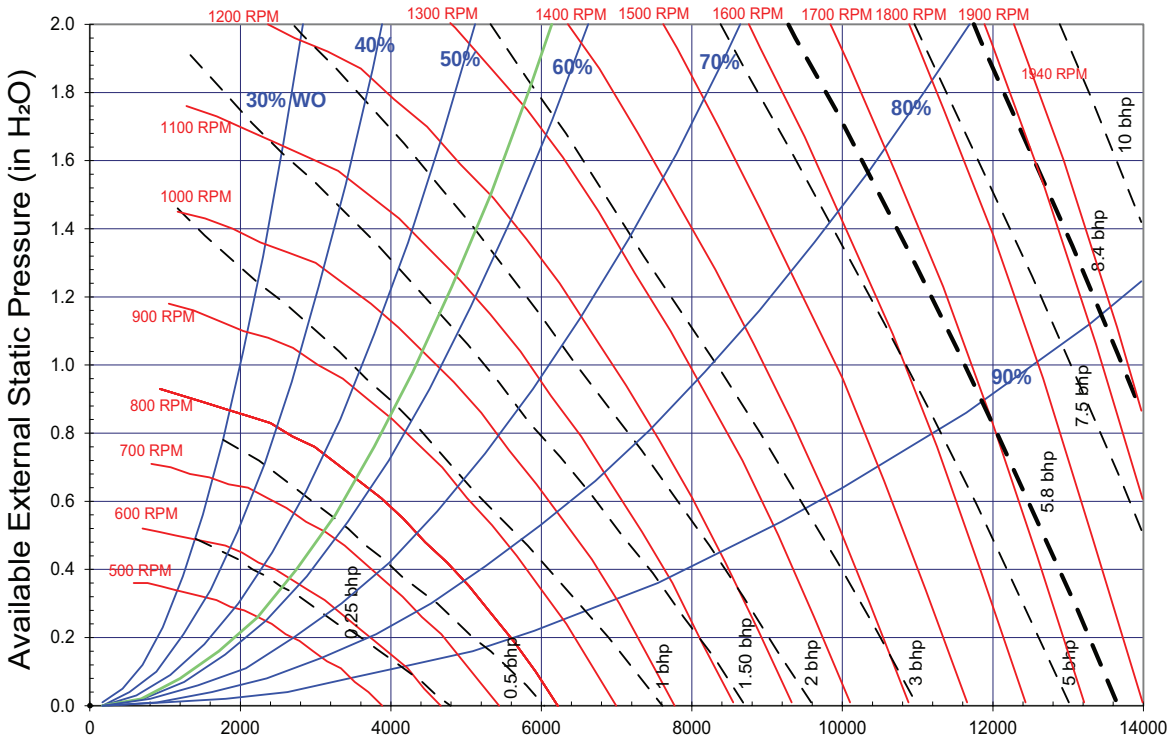


Table 17. Evaporator fan performance — 12.5 ton, model WHJ, horizontal

Available External Static Pressure (Inches of Water Gauge)																				
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3750	562	0.22	618	0.30	672	0.39	723	0.49	771	0.59	815	0.70	858	0.81	898	0.93	936	1.04	972	1.16
4000	592	0.25	646	0.34	696	0.44	745	0.54	792	0.65	835	0.76	877	0.87	916	0.99	954	1.11	990	1.24
4500	653	0.33	701	0.43	748	0.54	792	0.64	835	0.76	877	0.88	917	1.00	955	1.13	991	1.26	1027	1.39
5000	716	0.43	759	0.54	802	0.65	843	0.77	882	0.89	922	1.02	959	1.15	996	1.29	1031	1.43	1065	1.57
5500	779	0.55	819	0.67	858	0.79	896	0.92	933	1.04	969	1.17	1005	1.32	1039	1.46	1073	1.61	1106	1.76
6000	842	0.69	879	0.82	915	0.95	951	1.08	985	1.22	1020	1.36	1052	1.50	1085	1.66	1117	1.82	1149	1.98
Available External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3750	1007	1.29	1042	1.42	1075	1.55	1107	1.69	1138	1.83	1168	1.97	1197	2.11	1225	2.26	1253	2.41	1280	2.56
4000	1024	1.36	1057	1.49	1090	1.63	1122	1.77	1153	1.91	1183	2.06	1212	2.21	1240	2.36	1268	2.51	1294	2.66
4500	1060	1.53	1093	1.67	1124	1.81	1155	1.95	1184	2.1	1213	2.25	1242	2.41	1270	2.56	1298	2.73	1324	2.89
5000	1098	1.71	1130	1.86	1161	2.01	1191	2.16	1220	2.32	1248	2.47	1275	2.63	1302	2.79	1328	2.96	1355	3.13
5500	1138	1.91	1169	2.07	1199	2.23	1228	2.39	1256	2.55	1284	2.72	1311	2.89	1338	3.06	1364	3.23	1389	3.4
6000	1180	2.14	1210	2.3	1239	2.47	1267	2.64	1295	2.81	1322	2.99	1348	3.16	1375	3.34	1400	3.52	1425	3.7

Notes:

1. Available External Static Pressure is the static pressure difference between the return duct and the supply duct plus the static pressure drop caused by accessories and options.
2. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
3. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
4. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
5. Direct drive fan motor heat is negligible.
6. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 18. Evaporator fan performance — 15 ton, model WHJ, horizontal

Available External Static Pressure (Inches of Water Gauge)																				
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	653	0.33	701	0.43	748	0.54	792	0.64	835	0.76	877	0.88	917	1.00	955	1.13	991	1.26	1027	1.39
4800	690	0.39	736	0.49	780	0.60	822	0.72	863	0.83	903	0.96	942	1.09	979	1.22	1015	1.36	1049	1.50
5400	766	0.53	807	0.64	846	0.76	885	0.88	923	1.01	959	1.14	995	1.28	1030	1.43	1065	1.57	1098	1.72
6000	842	0.69	879	0.82	915	0.95	951	1.08	985	1.22	1020	1.36	1052	1.50	1085	1.66	1117	1.82	1149	1.98
6600	919	0.90	953	1.03	986	1.17	1019	1.32	1051	1.47	1082	1.62	1114	1.77	1144	1.93	1173	2.09	1203	2.26
7200	997	1.13	1028	1.28	1058	1.43	1089	1.59	1118	1.75	1148	1.91	1177	2.08	1205	2.25	1233	2.42	1261	2.59
Available External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	1060	1.53	1093	1.67	1124	1.81	1155	1.95	1184	2.1	1213	2.25	1242	2.41	1270	2.56	1298	2.73	1324	2.89
4800	1083	1.64	1115	1.78	1146	1.93	1176	2.07	1205	2.23	1234	2.38	1261	2.53	1289	2.7	1316	2.86	1342	3.03
5400	1130	1.87	1161	2.03	1191	2.18	1220	2.34	1249	2.5	1277	2.67	1304	2.83	1331	3	1356	3.17	1382	3.34
6000	1180	2.14	1210	2.3	1239	2.47	1267	2.64	1295	2.81	1322	2.99	1348	3.16	1375	3.34	1400	3.52	1425	3.7
6600	1232	2.44	1261	2.61	1289	2.79	1317	2.97	1343	3.15	1370	3.34	1396	3.53	1421	3.71	1445	3.9	1469	4.1
7200	1288	2.77	1315	2.96	1342	3.15	1368	3.34	1394	3.53	1420	3.73	1445	3.92	1469	4.12	1493	4.33	1517	4.53

Notes:

1. Available External Static Pressure is the static pressure difference between the return duct and the supply duct plus the static pressure drop caused by accessories and options.
2. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
3. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
4. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
5. Direct drive fan motor heat is negligible.
6. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 19. Evaporator fan performance — 20 ton, model WHJ, horizontal

Available External Static Pressure (Inches of Water Gauge)																				
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	810	0.60	847	0.72	883	0.84	920	0.97	956	1.10	989	1.23	1022	1.37	1054	1.52	1085	1.66	1114	1.80
6400	860	0.71	894	0.84	928	0.96	962	1.10	997	1.23	1029	1.37	1061	1.52	1092	1.67	1122	1.82	1150	1.98
7200	958	0.98	990	1.11	1020	1.26	1050	1.40	1081	1.55	1112	1.71	1141	1.86	1169	2.02	1197	2.18	1225	2.35
8000	1058	1.30	1087	1.46	1114	1.61	1142	1.77	1168	1.93	1196	2.10	1224	2.27	1251	2.44	1277	2.62	1303	2.80
8800	1158	1.70	1185	1.87	1210	2.04	1235	2.21	1260	2.38	1284	2.56	1309	2.74	1335	2.93	1359	3.12	1384	3.32
9600	1259	2.17	1283	2.35	1307	2.54	1330	2.72	1353	2.91	1376	3.11	1398	3.30	1420	3.50	1444	3.70	1467	3.91
Available External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	1142	1.94	1170	2.09	1197	2.24	1223	2.39	1250	2.54	1276	2.7	1302	2.86	1327	3.02	1352	3.19	1377	3.36
6400	1178	2.13	1204	2.28	1231	2.43	1256	2.59	1282	2.75	1306	2.91	1331	3.07	1356	3.24	1381	3.41	1404	3.59
7200	1252	2.53	1278	2.7	1303	2.87	1327	3.04	1350	3.21	1374	3.39	1397	3.56	1420	3.74	1442	3.92	1464	4.09
8000	1327	2.97	1352	3.16	1377	3.35	1401	3.55	1424	3.74	1446	3.93	1468	4.12	1490	4.31	1511	4.5	1532	4.69
8800	1407	3.51	1431	3.7	1453	3.9	1476	4.1	1498	4.31	1520	4.52	1542	4.74	1563	4.95	1584	5.15	1604	5.36
9600	1490	4.12	1512	4.33	1533	4.53	1555	4.75	1575	4.96	1596	5.17	1617	5.4	1637	5.63	-	-	-	-

Notes:

1. Available External Static Pressure is the static pressure difference between the return duct and the supply duct plus the static pressure drop caused by accessories and options.
2. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
3. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
4. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
5. Direct drive fan motor heat is negligible.
6. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 20. Evaporator fan performance — 25 ton, model WHJ, horizontal

Available External Static Pressure (Inches of Water Gauge)																				
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3-hp Standard Motor																			
7500	996	1.09	1026	1.23	1055	1.38	1084	1.53	1113	1.69	1143	1.85	1172	2.01	1200	2.17	1227	2.34	1253	2.51
8000	1058	1.30	1087	1.46	1114	1.61	1142	1.77	1168	1.93	1196	2.10	1224	2.27	1251	2.44	1277	2.62	1303	2.80
9000	1183	1.81	1209	1.98	1234	2.15	1259	2.33	1283	2.51	1307	2.69	1330	2.87	1356	3.07	1380	3.26	1404	3.46
10000	1309	2.44	1333	2.63	1356	2.82	1378	3.01	1400	3.21	1422	3.41	1443	3.61	1464	3.81	1486	4.02	1509	4.23
11000	1436	3.21	1457	3.41	1478	3.62	1499	3.83	1519	4.05	1539	4.26	1559	4.48	1579	4.70	1598	4.92	1617	5.14
12000	1562	4.12	1582	4.34	1602	4.57	1621	4.80	1640	5.03	1658	5.26	1676	5.5	1695	5.74	-	-	-	-
Available External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3-hp Standard Motor																			
7500	1280	2.69	1305	2.87	1330	3.05	1354	3.23	1378	3.4	1401	3.58	1423	3.76	1445	3.94	1467	4.13	1489	4.31
8000	1327	2.97	1352	3.16	1377	3.35	1401	3.55	1424	3.74	1446	3.93	1468	4.12	1490	4.31	1511	4.5	1532	4.69
9000	1428	3.65	1451	3.85	1473	4.05	1495	4.25	1517	4.46	1539	4.68	1561	4.9	1582	5.11	1602	5.33	1622	5.54
10000	1531	4.45	1553	4.67	1574	4.88	1595	5.1	1616	5.32	1636	5.54	1655	5.77	-	-	-	-	-	-
11000	1637	5.38	1658	5.61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. Available External Static Pressure is the static pressure difference between the return duct and the supply duct plus the static pressure drop caused by accessories and options.
2. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
3. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
4. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
5. Direct drive fan motor heat is negligible.
6. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 21. Evaporator fan performance — 25 ton, model WHJ, horizontal, high static drive

Available External Static Pressure (Inches of Water Gauge)																		
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	5-hp Oversized Motor																			
7500	1023	1.11	1054	1.27	1086	1.42	1119	1.59	1149	1.76	1177	1.92	1205	2.09	1233	2.25	1259	2.42	1286	2.59
8000	1087	1.33	1117	1.49	1145	1.65	1177	1.83	1207	2.02	1234	2.19	1260	2.36	1286	2.54	1312	2.71	1337	2.89
9000	1216	1.85	1242	2.03	1268	2.21	1294	2.40	1323	2.60	1350	2.80	1374	3.00	1398	3.20	1421	3.39	1444	3.59
10000	1346	2.50	1369	2.69	1393	2.89	1416	3.09	1440	3.30	1465	3.53	1490	3.75	1513	3.98	1535	4.19	1556	4.41
11000	1476	3.28	1497	3.48	1519	3.70	1540	3.92	1561	4.15	1583	4.38	1606	4.63	1628	4.88	1650	5.13	1671	5.37
12000	1606	4.22	1626	4.44	1645	4.67	1665	4.91	1685	5.15	1704	5.4	1723	5.65	1745	5.92	1766	6.19	1786	6.47
Available External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	5-hp Oversized Motor																			
7500	1311	2.76	1336	2.93	1360	3.11	1384	3.3	1408	3.48	1432	3.67	1454	3.86	1477	4.04	1500	4.23	1522	4.42
8000	1362	3.07	1386	3.25	1410	3.44	1432	3.63	1455	3.82	1478	4.01	1501	4.21	1523	4.41	1544	4.61	1565	4.81
9000	1467	3.79	1490	3.99	1512	4.19	1534	4.39	1555	4.59	1576	4.8	1597	5.01	1617	5.22	1637	5.44	1658	5.66
10000	1576	4.63	1597	4.85	1618	5.07	1639	5.29	1659	5.51	1679	5.73	1699	5.95	1718	6.18	1737	6.41	1756	6.65
11000	1690	5.61	1710	5.85	1728	6.09	1747	6.33	1766	6.57	1785	6.81	1804	7.05	1822	7.29	1841	7.54	1859	7.78
12000	1806	6.74	1825	7	1843	7.26	1860	7.52	1877	7.78	1894	8.04	1911	8.31	-	-	-	-	-	-

Notes:

1. Available External Static Pressure is the static pressure difference between the return duct and the supply duct plus the static pressure drop caused by accessories and options.
2. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
3. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
4. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
5. Direct drive fan motor heat is negligible.
6. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Fan Performance

Table 22. Outdoor sound power level

Tons	Unit Model Number	Octave Center Frequency								Overall dBA
		63	125	250	500	1000	2000	4000	8000	
12.5	WHJ150A*	83	87	87	85	82	77	74	69	87
15	WHJ180A*	83	87	87	85	82	77	74	69	87
20	WHJ240A*	94	90	92	91	88	84	81	75	93
25	WHJ300A*	94	90	92	91	88	84	81	75	93

Notes:

1. Outdoor sound rating shown is tested in accordance with AHRI 270/370-2015. For additional information reference the outdoor sound power level data in the performance section.
2. Taken in accordance with AHRI 270/370-2015.
3. Indoor sound in accordance with AHRI 260 is available through Trane's selection software.

Table 23. Static pressure drop through accessories (inches water column) - high efficiency- economizer

Tons	Unit Model Number	cfm[a]	Standard Filters[b]	2" MERV 8 Filter[c]	2" MERV 13 Filter[c]	Reheat Coil	Economizer with OA/RA Dampers[d]							
							Downflow		Horizontal		Low Leak Downflow[e]		Low Leak Horizontal	
							100% OA	100% RA	100% OA	100% RA	100% OA	100% RA	100% OA	100% RA
12.5	WHJ150A	3750	0.02	0.04	0.07	0.02	0.10	0.02	0.10	0.02	0.11	0.09	0.05	0.09
		5000	0.03	0.06	0.10	0.04	0.15	0.03	0.15	0.03	0.17	0.13	0.09	0.14
		6000	0.04	0.08	0.13	0.04	0.20	0.04	0.20	0.04	0.23	0.17	0.12	0.18
15	WHJ180A	4500	0.03	0.05	0.09	0.04	0.13	0.02	0.13	0.02	0.14	0.11	0.07	0.12
		6000	0.04	0.08	0.13	0.04	0.20	0.04	0.20	0.04	0.23	0.17	0.12	0.18
		7200	0.06	0.10	0.17	0.02	0.27	0.05	0.27	0.05	0.32	0.23	0.16	0.25
20	WHJ240A	6000	0.04	0.08	0.13	0.04	0.20	0.04	0.20	0.04	0.23	0.17	0.12	0.18
		8000	0.07	0.12	0.21	0.02	0.32	0.06	0.32	0.06	0.39	0.27	0.19	0.30
		9600	0.09	0.16	0.27	0.05	0.44	0.07	0.44	0.07	0.54	0.37	0.27	0.41
25	WHJ300A	7500	0.06	0.11	0.19	0.02	0.29	0.05	0.29	0.05	0.34	0.24	0.17	0.27
		10000	0.09	0.17	0.29	0.06	0.48	0.08	0.48	0.08	0.58	0.40	0.29	0.45
		12000	0.12	0.23	0.39	0.06	0.66	0.11	0.66	0.11	0.82	0.55	0.39	0.62

[a] See below for restrictions:
Multi-speed, single zone VAV or multi-zone VAV applications are capable of running below 300 cfm/ton during low speed airflow operation.

[b] Tested with: 2-in filters 12.5 to 25 tons.

[c] Difference in pressure drop should be considered when utilizing optional 2-in pleated filters.

[d] OA = Outside Air and RA = Return Air.

[e] Model digit 11 selection of low gas heat is 5x5, medium gas heat is 7x7, and high gas heat is 8x8 for 12.5 to 25T units.

Table 24. Static pressure drop through accessories (inches water column) - high efficiency- electric

Tons	Unit Model Number	cfm[a]	Electric Heater			
			Accessory (kW)			
			18	36	54	72
12.5	WHJ150A	3750	0	0.01	0.01	N/A
		5000	0.01	0.03	0.03	N/A
		6000	0.01	0.04	0.04	N/A
15	WHJ180A	4500	0.01	0.02	0.02	N/A
		6000	0.01	0.04	0.04	N/A
		7200	0.02	0.06	0.06	N/A
20	WHJ240A	6000	N/A	0.04	0.04	0.04
		8000	N/A	0.08	0.08	0.08
		9600	N/A	0.12	0.12	0.12

Table 24. Static pressure drop through accessories (inches water column) - high efficiency- electric (continued)

Tons	Unit Model Number	cfm[a]	Electric Heater			
			Accessory (kW)			
			18	36	54	72
25	WHJ300A	7500	N/A	0.07	0.07	0.07
		10000	N/A	0.13	0.13	0.13
		12000	N/A	0.20	0.20	0.20

[a] See below for restrictions:
Multi-speed, single zone VAV or multi-zone VAV applications are capable of running below 300 cfm/ton during low speed airflow operation.

Heating Performance

Table 25. Auxiliary electric heat capacity

Tons	Unit Model Number	Total[a]		No. of Stages	Stage 1		Stage 2	
		kw Input[b]	MBh Output		kw Input	MBh Output	kw Input	MBh Output
12.5 to 15	WH*150*3,4,W WH*180*3,4,W	18.00	61.47	1	18.00	61.47	–	–
		36.00	122.94	2	18.00	61.47	18.00	61.47
		54.00	184.41	2	36.00	122.94	18.00	61.47
20 to 25	WH*240*3,4,W WH*300*3,4,W	36.00	122.94	2	18.00	61.47	18.00	61.47
		54.00	184.41	2	36.00	122.94	18.00	61.47
		72	245.88	2	36	122.94	36	122.94

[a] Heaters are rated at 240V, 480V, and 600V. For other than rated voltage, CAP = (voltage/rated voltage)2 x rated cap.

[b] For all input/output categories, does not include fan power or heat.

Table 26. Air temperature rise

kW	Stages	12.5 Tons 3750 cfm	15 Tons 4500 cfm	20 Tons 6000 cfm	25 Tons 7500 cfm
		Three Phase WH*150*3,4,W	Three Phase WH*180*3,4,W	Three Phase WH*240*3,4,W	Three Phase WH*300*3,4,W
18.00	1	15.17	12.64	-	-
27.00	2	22.76	-	-	-
36.00	2	30.35	25.28	18.96	15.17
54.00	2	45.52	37.93	28.45	22.76
72.00	2	-	-	37.93	30.34

Note: For minimum design airflow, see airflow performance table for each unit. To calculate temp. rise at different airflow, use the following formula:
Temp. rise across electric heater = (kW x 3414)/(1.08 x cfm).

Controls

Enhanced BAS Integration and Connectivity

- Symbio™ 700 integrates seamlessly with Trane® Tracer® Synchrony and Tracer Ensemble® to deliver optimized building automation and building management features and functions.
- Easily integrate with open standard protocols to connect seamlessly to a BAS (whether that is Trane or non-Trane).
- Digit 21 must equal 1, 2, or 3 for communication support.

BACnet® Communications

Symbio™ 700 includes native BACnet communications which allows the unit to communicate directly with a Tracer or non-Trane Building Automation System via open protocol BACnet MS/TP or IP.

Modbus Communications

Symbio 700 includes native Modbus communications which allows the unit to communicate directly with a Tracer or non-Trane Building Automation System via open protocol Modbus RTU or TCP/IP.

LonTalk® Communications

The optional LonTalk® communications module allows the unit to communicate directly with a Tracer or non-Trane Building Automation System via open protocol LonTalk.

Air-Fi® Wireless Communications

The optional Air-Fi communications module allows the unit to communicate directly with a Tracer Building Automation System via open protocol BACnet over Zigbee wireless.

Secure Remote Connectivity with Trane Connect

The Symbio controller enables secure remote connectivity via Trane Connect to Trane Intelligent Services and remote monitoring. Trane Connect provides anywhere/anytime access to monitor and manage with secure remote access and connectivity options through a multitude of platforms. Peace of mind that the system will be operational and provide comfort to customers.

Serviceability

Symbio Service and Installation Mobile App

The Symbio Service and Installation mobile app is accessible through mobile devices (phones and tablets) via Bluetooth connectivity or via Trane Connect. The intuitive mobile app feels natural to technicians and operators. They'll quickly be able to view equipment status and alarms, perform startup tasks, change configurations, test the equipment's performance in specific modes—and much more. Free for download from App Store (Apple iOS) and Google Play (Android devices).

To download the Symbio Service and Installation Mobile App use the links below or scan the code with your mobile phone camera.

Apple download link (https://apps.apple.com/us/app/symbio-service-installation/id1309310176)

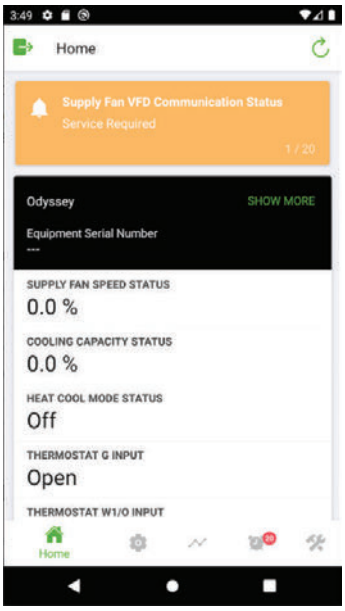
Google Play (Android) download link (https://play.google.com/store/apps/details?id=com.trane.mobileservicetool)

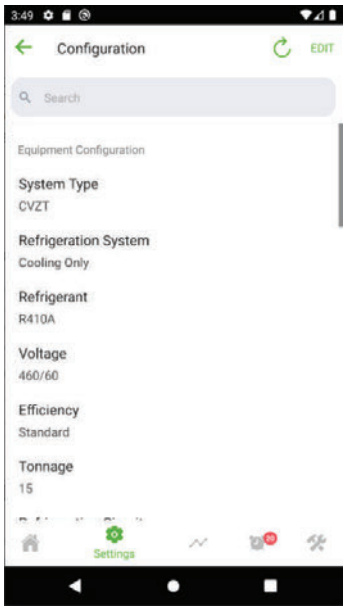
Figure 4. Scan code

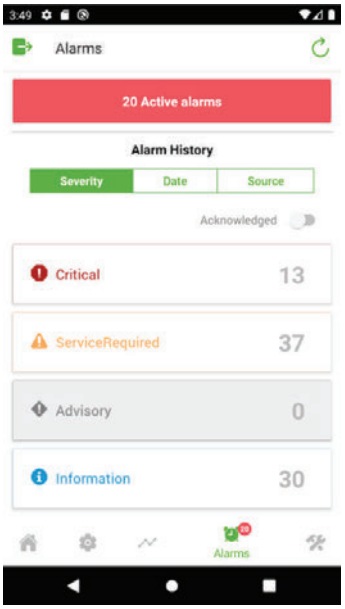




Figure 5. Symbio service and installation mobile app



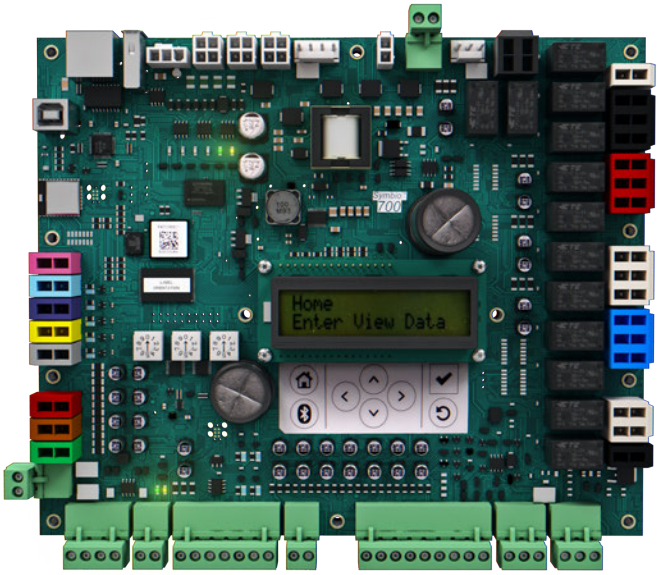




Onboard User Interface

An integrated onboard user interface that makes setup and continued operation easy. It provides real time operational performance, status, data, and alarms. It also allows the user to interact with, service, troubleshoot, and control their equipment without additional service software tools or when a mobile interface is not available.

Figure 6. Onboard user interface



Service Test Mode

Symbio 700 requires no special tools to run the unit through its paces. Simply navigate to the ‘Service’ section of the on-board user interface or the ‘Tools’ section of the Symbio Service and Installation Mobile App and enter the ‘Service Test Mode’ section. Here the unit can be placed in the desired operating condition for a pre-determined amount of time supporting troubleshooting efforts in the field. The Symbio 700 will return to normal control when the user exits test mode or when the pre-determined, user-selected Service Test time has expired.

Symbio 700 controls with upgradeable software

Trane’s equipment and systems feature engineered, tested, and proven applications that meet industry energy standards and provide the flexibility to customize and update over the life of the equipment. Professional operational algorithms are embedded within the Symbio 700 controller at the Trane factory. Symbio 700 standardizes each equipment unit to maintain standards for comfort, efficiency, and air quality, without additional field programming. Symbio 700 provides the flexibility over the life of the equipment to meet changing customer needs and/or industry standards.

Flexibility

Expansion Modules (requires Tracer® TU)

- XM30 – Provides 4 universal inputs or analog outputs
- XM32 – Provides 4 binary outputs

Field Programming via TGP2 (requires Tracer TU)

- Control ancillary equipment
- Custom sequences

TGP2 and XM Limitations:

- Programs will only have access to available BACnet® points. (Ensures system reliability.)
- TGP2 programs will not have direct I/O control access for factory components. (Compressors will not be able to be directly controlled On/Off without going through factory provided protection sequences.)
- Onboard I/O will not be available to custom applied TGP2 programs. If additional I/O is required for a new control loop, a separate expansion module will be required.

- Customer applied I/O will be limited to a maximum combination of 2 XM modules. Only XM30 or XM32 modules will be supported by the Symbio 700 UC.
- Tracer TU will be required to configure XMs and to create, view, or modify TGP2 programs.

Economizer Controls

There are four options for economizer control, Dry Bulb Temperature, Comparative Enthalpy, Reference Enthalpy and Differential Dry Bulb Temperature.

Dry Bulb Temperature Control

The dry bulb system measures outdoor temperature comparing it to the economizer enable setpoint. If the outdoor temperature is below the economizer enable setpoint, the economizer will operate freely. This system is best suited for arid regions where the humidity levels of outside air would not be detrimental to building comfort and indoor air quality.

Comparative Enthalpy Control

The comparative enthalpy system measures the temperature and humidity of both return air and outside air to determine which source has lower enthalpy. This system allows true comparison of outdoor air and return air enthalpy by measurement of outdoor air and return air temperature and humidity.

Reference Enthalpy Control

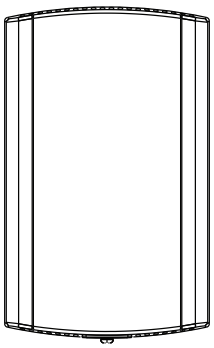
The reference enthalpy system compares outdoor air temperature and humidity to the economizer enthalpy enable setpoint. If outdoor air temperature and humidity are below the economizer enthalpy enable setpoint, the economizer will operate freely. This system provides more sophisticated control where outdoor air humidity levels may not be acceptable for building comfort and indoor air quality.

Differential Dry Bulb Temperature Control

The differential dry bulb system measures the temperature of both return air and outside air to determine when to economize. If outdoor air temperature is below the return air temperature minus a differential, the economizer will operate freely. This system is best suited for arid regions where the humidity levels of outside air would not be detrimental to building comfort and indoor air quality.

Zone Sensors

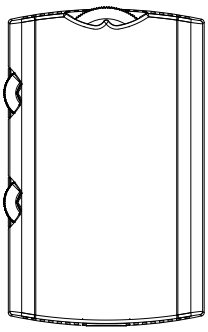
Zone Temperature Only



BAYSENS077

Provides temperature input only. Can be used as a secondary remote temperature input for thermostats.

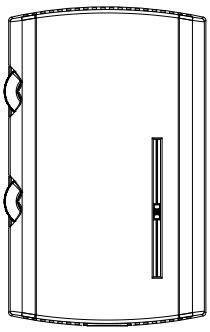
Manual Changeover



BAYSENS106

Heat, Cool or Off System Switch. Fan Auto or Off Switch. Single temperature setpoint thumbwheel.

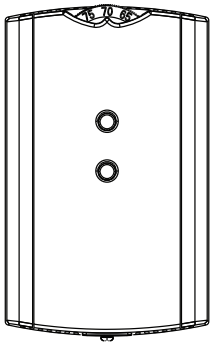
Manual/Automatic Changeover



BAYSENS108

Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Dual temperature setpoint sliders

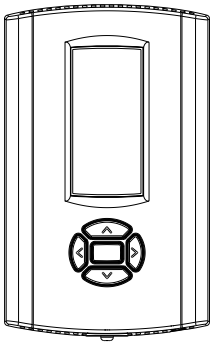
Integrated Comfort™ System



BAYSENS073 / BAYSENS074 / BAYSENS075

Sensor(s) available with optional temperature adjustment and override buttons to provide central control through a Trane Integrated Comfort system.

Wired Display Sensor



BAYSENS135

LCD display that provides heat, cool, auto, or off. Includes two temperature setpoints and a lockable setting with °F or °C indicators.

Touchscreen Digital Display Communicating Sensor



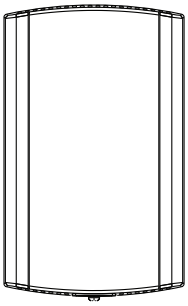
BAYSENS800

Uses BACnet® MS/TP link to communicate zone temperature and setpoints. Auto, Heat, Cool or Off System Switch. Fan Auto or On Switch. 7-day programmable thermostat with night setback.

Note: *Not compatible with VAV units. Requires BACnet communications.*

Air-Fi Wireless Communicating Zone Sensors

Wireless Zone Temperature Only

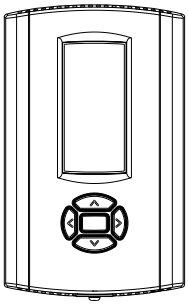


BAYSENS203

Measures temperature and optional humidity (with WCS-SH) for use in public spaces where no local user interface is preferred.

Note: *Requires BACnet communications.*

Wireless Display Sensor

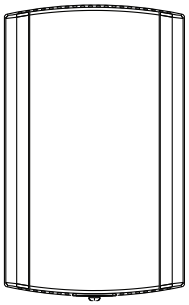


BAYSENS202

Easy-to-use interface for clear and simple monitoring and control. Can be configured for any Trane system or to meet the customer's preference.

Note: *Requires BACnet communications.*

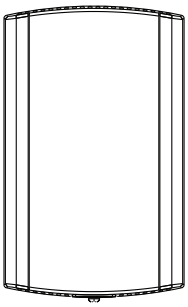
Wired CO_2 Sensor



FIACO2K001 wall mount CO_2 Sensor
FIACO2K002 duct mount CO_2 Sensor

The maintenance-free carbon dioxide (CO_2) sensor is primarily used for demand control ventilation applications.

Wired Zone Temperature and Humidity Sensor

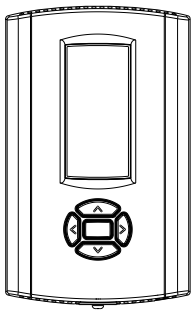


BAYSENS036

Measures temperature and relative humidity. Relative humidity input is used to control activation of dehumidification.

Thermostats

Digital Display Programmable Thermostat (3H/2C)

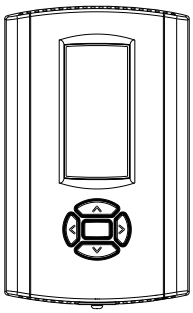


BAYSTAT150

Three Heat/Two Cool Auto changeover digital display thermostat. 7-day programmable thermostat with night setback.

Note: *Not compatible with VAV units.*

Digital Display Programmable Thermostat (1H/1C)

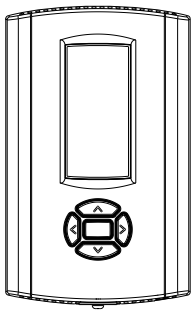


BAYSTAT151

One Heat/One Cool Auto changeover digital display thermostat.

Note: *Not compatible with VAV units.*

Digital Display Thermostat (3H/2C)

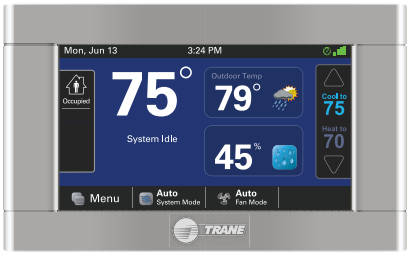


BAYSTAT155

Three Heat/Two Cool Auto changeover display thermostat.

Note: *Not compatible with VAV units.*

Pivot® Web Enabled Smart Thermostat (3H/2C)



BAYSTAT814

Our Pivot Smart Thermostat system is great for commercial buildings. With its intuitive touchscreen and customizable display, it is easy for occupants to use. The Trane Pivot mobile app enables users to control multiple buildings remotely, making changes in seconds to all systems.

Note: *Not compatible with VAV units.*

Touchscreen Programmable Thermostat with Relative Humidity Sensor (3H/2C)



BAYSTAT152

Three Heat, Two Cool digital display thermostat with built-in humidity control. This thermostat combines both humidity and temperature into one.

Note: *Not compatible with VAV units.*

Electrical Data

Table 27. Unit wiring

Tons	Unit Model Number	Voltage Range	Standard Indoor Fan Motor		Oversized/High Static Indoor Fan Motor		Optional Power Exhaust Standard Indoor Fan Motor		Optional Power Exhaust Oversized/High Static Indoor Fan Motor	
			MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
12.5	WHJ150A3	187-253	72	90	-	-	78	100	-	-
	WHJ150A4	414-506	37	50	-	-	40	50	-	-
	WHJ150AW	517-633	29	40	-	-	32	40	-	-
15	WHJ180A3	187-253	78	100	-	-	83	110	-	-
	WHJ180A4	414-506	41	50	-	-	45	60	-	-
	WHJ180AW	517-633	32	40	-	-	34	45	-	-
20	WHJ240A3	187-253	108	150	-	-	113	150	-	-
	WHJ240A4	414-506	54	70	-	-	57	70	-	-
	WHJ240AW	517-633	47	60	-	-	49	70	-	-
25	WHJ300A3	187-253	119	150	124	150	125	150	129	175
	WHJ300A4	414-506	59	80	61	80	62	80	64	80
	WHJ300AW	517-633	46	60	48	60	48	60	50	60

Table 28. Unit wiring with electric heat

Tons	Unit Model Number	Heater Model Number	Heater kW Rating	Control Stages	Standard Indoor Fan Motor[a]		Oversized/High Static Indoor Fan Motor		Optional Power Exhaust Standard Indoor Fan Motor		Optional Power Exhaust Oversized/High Static Indoor Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
208/230 Volts Three Phase												
12.5	WHJ150A3	FIAEHWD318AA	13.5/18.0	1	119/126	125/150	-	-	125/132	125/150	-	-
		FIAEHWD336AA	27.0/36.0	2	166/180	175/200	-	-	172/186	175/200	-	-
		FIAEHWD354AA	40.6/54.0	2	213/202	225/225	-	-	219/208	225/225	-	-
15	WHJ180A3	FIAEHWD318AA	13.5/18.0	1	124/132	125/150	-	-	130/137	150/150	-	-
		FIAEHWD336AA	27.0/36.0	2	171/186	175/200	-	-	177/191	200/200	-	-
		FIAEHWD354AA	40.6/54.0	2	218/207	225/225	-	-	224/213	225/225	-	-
20	WHJ240A3	FIAEHWD336AA	27.0/36.0	2	201/216	225/225	-	-	207/222	225/225	-	-
		FIAEHWD354AA	40.6/54.0	2	248/238	300/300	-	-	254/243	300/250	-	-
		FIAEHWD372AA	54.0/72.0	2	258/281	300/300	-	-	263/287	300/300	-	-
25	WHJ300A3	FIAEHWD336AA	27.0/36.0	2	213/227	225/250	214/232	225/250	219/233	225/250	223/238	250/250
		FIAEHWD354AA	40.6/54.0	2	260/249	300/300	264/254	300/300	266/255	300/300	270/259	300/300
		FIAEHWD372AA	54.0/72.0	2	269/292	300/300	274/297	300/300	275/298	300/300	279/303	300/350
460 Volts Three Phase												

Table 28. Unit wiring with electric heat (continued)

Tons	Unit Model Number	Heater Model Number	Heater kW Rating	Control Stages	Standard Indoor Fan Motor[a]		Oversized/High Static Indoor Fan Motor		Optional Power Exhaust Standard Indoor Fan Motor		Optional Power Exhaust Oversized/High Static Indoor Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
12.5	WHJ150A4	FIAEHWD418AA	18	1	64	70	-	-	67	70	-	-
		FIAEHWD436AA	36	2	91	100	-	-	94	100	-	-
		FIAEHWD454AA	54	2	102	110	-	-	105	110	-	-
15	WHJ180A4	FIAEHWD418AA	18	1	68	70	-	-	72	80	-	-
		FIAEHWD436AA	36	2	96	100	-	-	99	100	-	-
		FIAEHWD454AA	54	2	106	110	-	-	110	125	-	-
20	WHJ240A4	FIAEHWD436AA	36	2	108	110	-	-	111	125	-	-
		FIAEHWD454AA	54	2	119	150	-	-	122	125	-	-
		FIAEHWD472AA	72	2	140	150	-	-	143	150	-	-
25	WHJ300A4	FIAEHWD436AA	36	2	113	125	115	125	116	125	118	125
		FIAEHWD454AA	54	2	124	150	126	150	127	150	129	150
		FIAEHWD472AA	72	2	146	150	147	150	149	150	151	175
575 Volts Three Phase												
12.5	WHJ150AW	FIAEHWDW18AA	18	1	51	60	-	-	53	60	-	-
		FIAEHWDW36AA	36	2	73	80	-	-	75	80	-	-
		FIAEHWDW54AA	54	2	81	90	-	-	84	90	-	-
15	WHJ180AW	FIAEHWDW18AA	18	1	53	60	-	-	56	60	-	-
		FIAEHWDW36AA	36	2	75	80	-	-	77	80	-	-
		FIAEHWDW54AA	54	2	84	90	-	-	86	90	-	-
20	WHJ240AW	FIAEHWDW36AA	36	2	90	100	-	-	93	100	-	-
		FIAEHWDW54AA	54	2	99	125	-	-	101	110	-	-
		FIAEHWDW72AA	72	2	116	125	-	-	119	125	-	-
25	WHJ300AW	FIAEHWDW36AA	36	2	89	100	91	100	92	100	93	100
		FIAEHWDW54AA	54	2	98	125	100	110	100	110	102	110
		FIAEHWDW72AA	72	2	115	125	117	125	118	125	119	125

[a] The standard motor is a multispeed, direct drive motor.

Table 29. Electrical characteristics - compressor motor and condenser motor

Tons	Unit Model Number	No.	Compressor Motors						No.	Condenser Fan Motor				
			Volts	Phase	hp[a]	rpm	Amps[b]			Volts	Phase	hp	Amps	
							RLA	LRA					FLA	LRA
12.5	WHJ150A3	2	208/230	3	7.6/3.5	3500/3500	28.4/14.1	191.0/83.1	1	208/230	3	0.5	2.2	7.3
	WHJ150A4	2	460	3	7.6/3.5	3500/3500	14.6/6.5	100/41	1	460	3	0.5	1.3	4.2
	WHJ150AW	2	575	3	7.6/3.5	3500/3500	11.9/5.4	78/33	1	575	3	0.5	1.1	3.6
15	WHJ180A3	2	208/230	3	8.7/4.3	3500/3500	30.9/16.4	240/110	2	208/230	3	0.5	2.2	7.3
	WHJ180A4	2	460	3	8.7/4.3	3500/3500	16.7/8.2	130/52	2	460	3	0.5	1.3	4.2
	WHJ180AW	2	575	3	8.7/4.3	3500/3500	12.8/6.6	93.7/38.9	2	575	3	0.5	1.1	3.6
20	WHJ240A3	2	208/230	3	11.4/6.3	3500/3500	43.1/26.1	270/167	2	208/230	3	1	4.8	19.4
	WHJ240A4	2	460	3	11.4/6.3	3500/3500	21.3/12.2	147/84	2	460	3	1	2.5	10.1
	WHJ240AW	2	575	3	11.4/6.3	3500/3500	21.3/9.6	109/60	2	575	3	1	1.9	8.0
25	WHJ300A3	2	208/230	3	12.8/7.6	3500/3500	49.5/29.6	335.5/223.0	2	208/230	3	1	4.8	19.4
	WHJ300A4	2	460	3	12.8/7.6	3500/3500	23.9/14.4	141/100	2	460	3	1	2.5	10.1
	WHJ300AW	2	575	3	12.8/7.6	3500/3500	19.8/10.8	109/70	2	575	3	1	1.9	8.0

[a] Hp for each compressor.
[b] Amp draw for each motor (compressor and condenser fan motor); multiply value by number of motors to determine total amps.

Table 30. Electrical characteristics - indoor fan motor

Tons	Unit Model Number	No.	Volts	Phase	hp	Amps[a]	
						FLA	LRA
12.5	WHJ150A3	2	208/230	3	3	8.8	-
	WHJ150A4	2	460	3	3	4.6	-
	WHJ150AW	2	575	3	3	3.2	-
15	WHJ180A3	2	208/230	3	3	8.8	-
	WHJ180A4	2	460	3	3	4.6	-
	WHJ180AW	2	575	3	3	3.2	-
20	WHJ240A3	2	208/230	3	3	8.8	-
	WHJ240A4	2	460	3	3	4.6	-
	WHJ240AW	2	575	3	3	3.2	-
25	WHJ300A3	2	208/230	3	3	8.8	-
	WHJ300A4	2	460	3	3	4.6	-
	WHJ300AW	2	575	3	3	3.2	-

[a] Amp draw for each motor (compressor and condenser fan motor); multiply value by number of motors to determine total amps.

Table 31. Electrical characteristics - power exhaust

Tons	Volts	Phase	hp	rpm	FLA	LRA
12.5-25	208-230	1	0.87	1075	5.7	13.6
12.5-25	460	1	0.87	1075	3.3	7.2
12.5-25	575	1	0.80	1075	2.3	5.8

Dimensional Data

Figure 7. 12.5 to 25 tons high efficiency

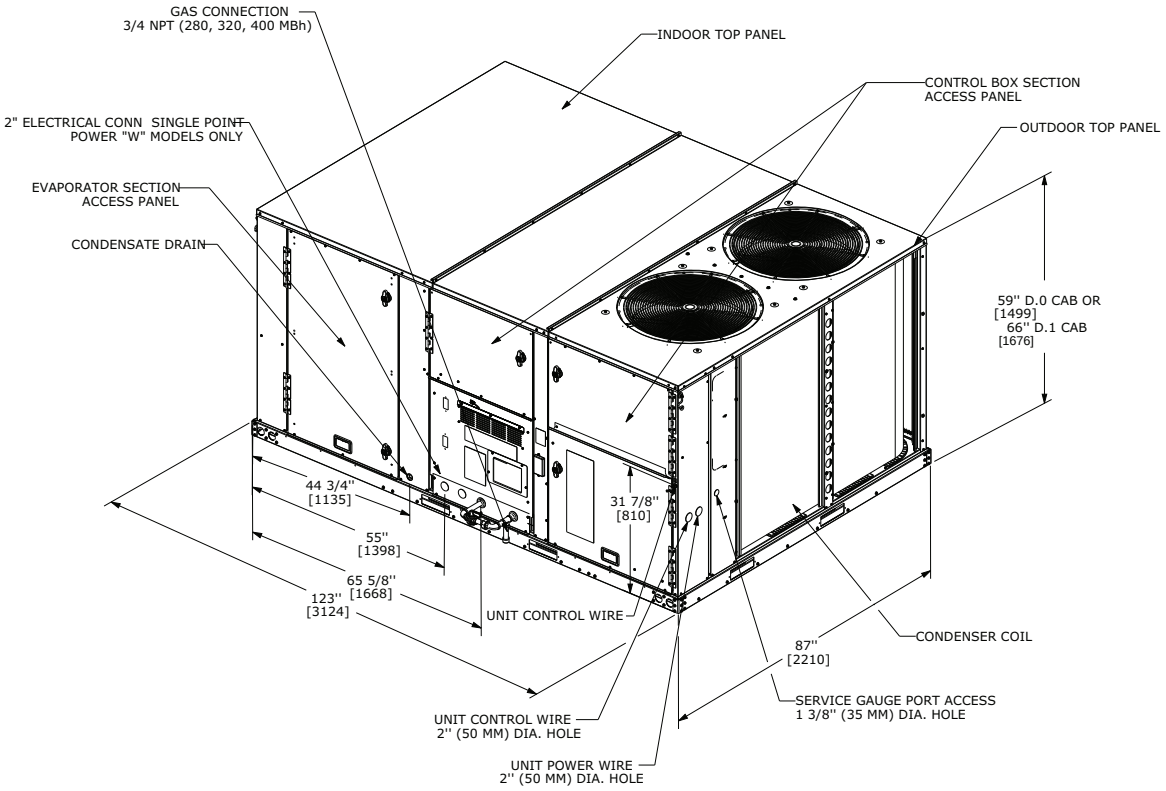


Figure 8. 12.5 to 25 tons high efficiency – downflow airflow supply/return, through-the-base utilities

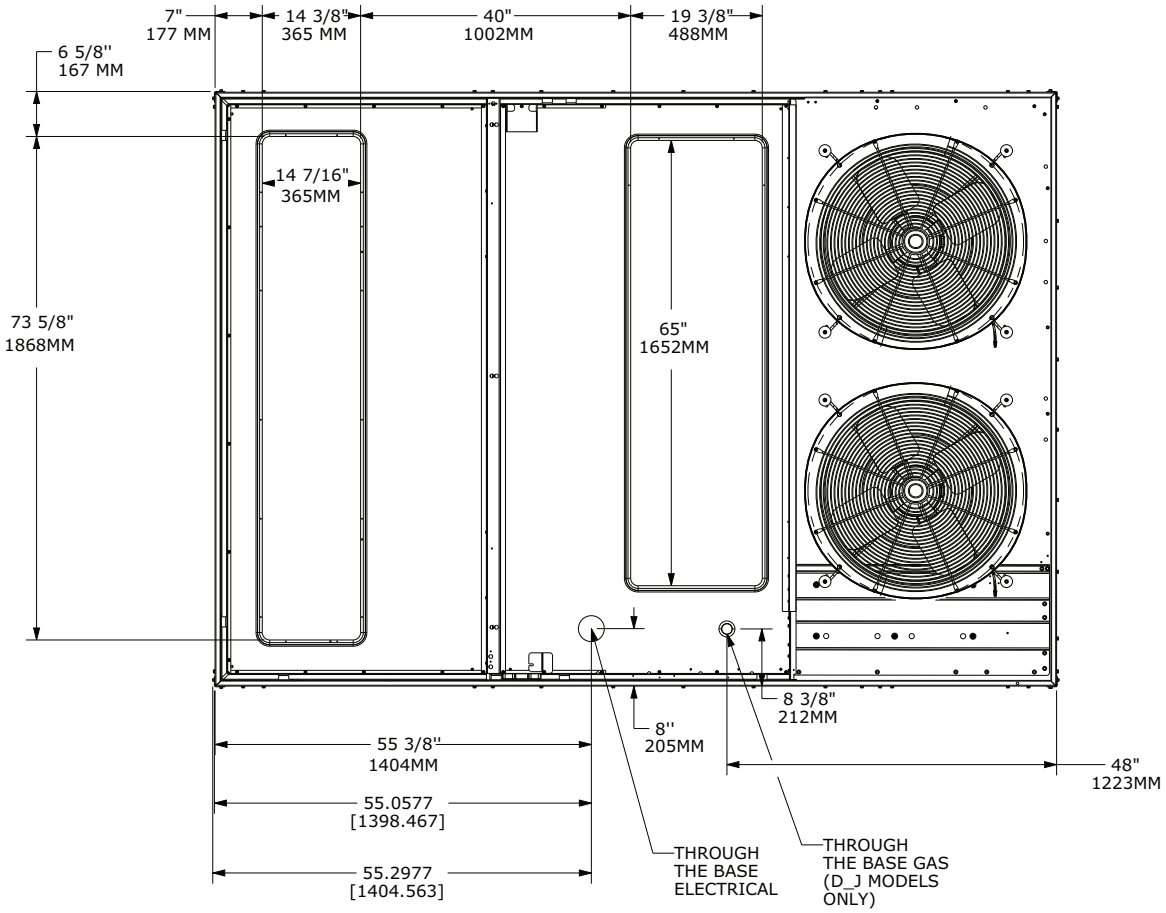


Figure 9. 12.5 to 25 tons high efficiency – horizontal airflow supply/return

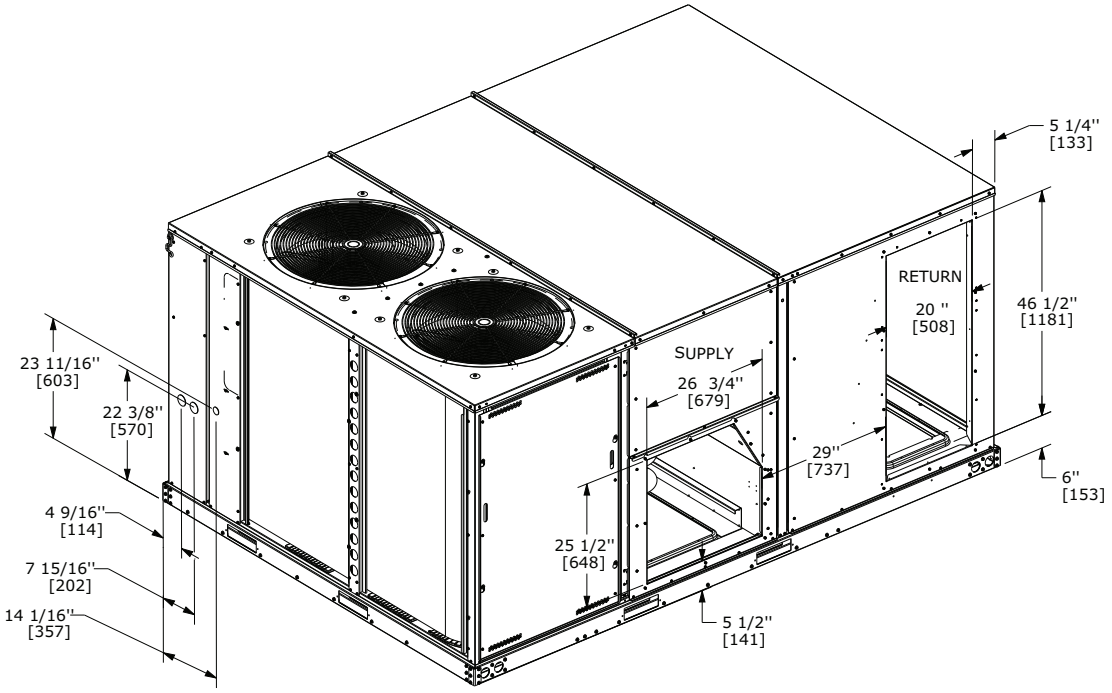


Figure 10. 12.5 to 25 tons high efficiency – power exhaust

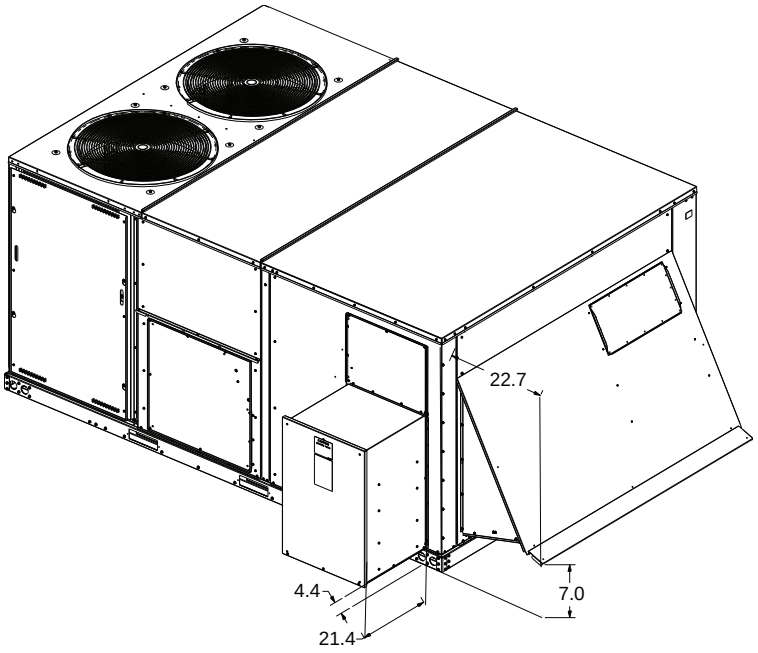


Figure 11. 12.5 to 25 tons high efficiency – unit clearance and roof opening

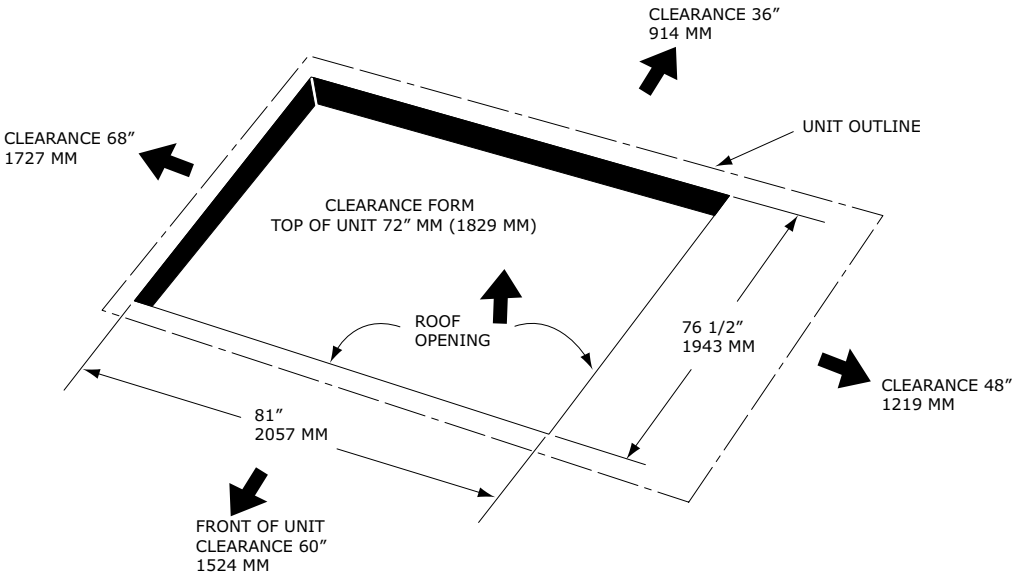


Figure 12. 12.5 to 25 tons high efficiency – roof curb

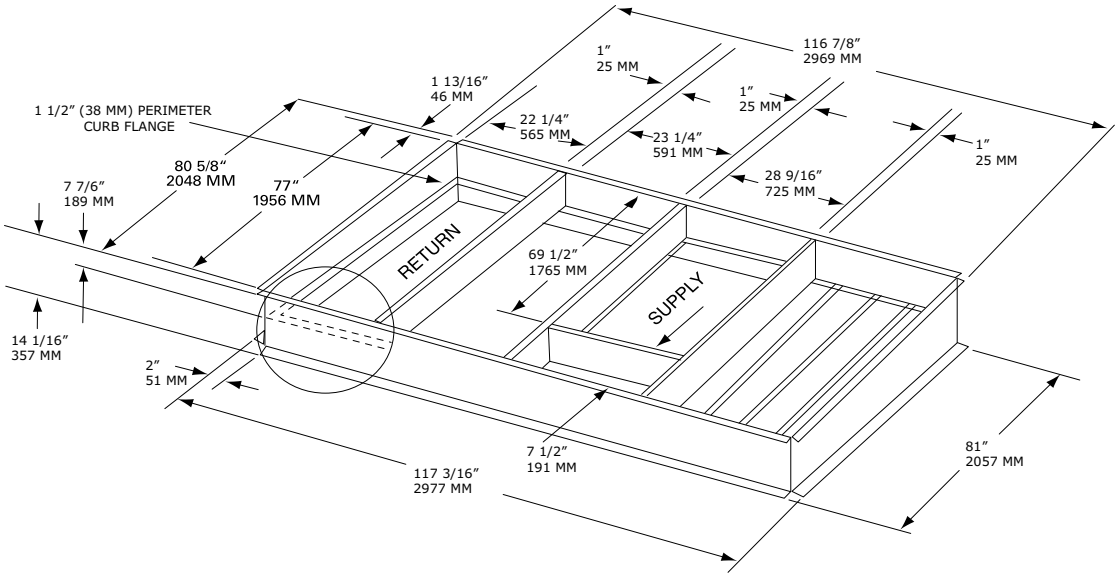
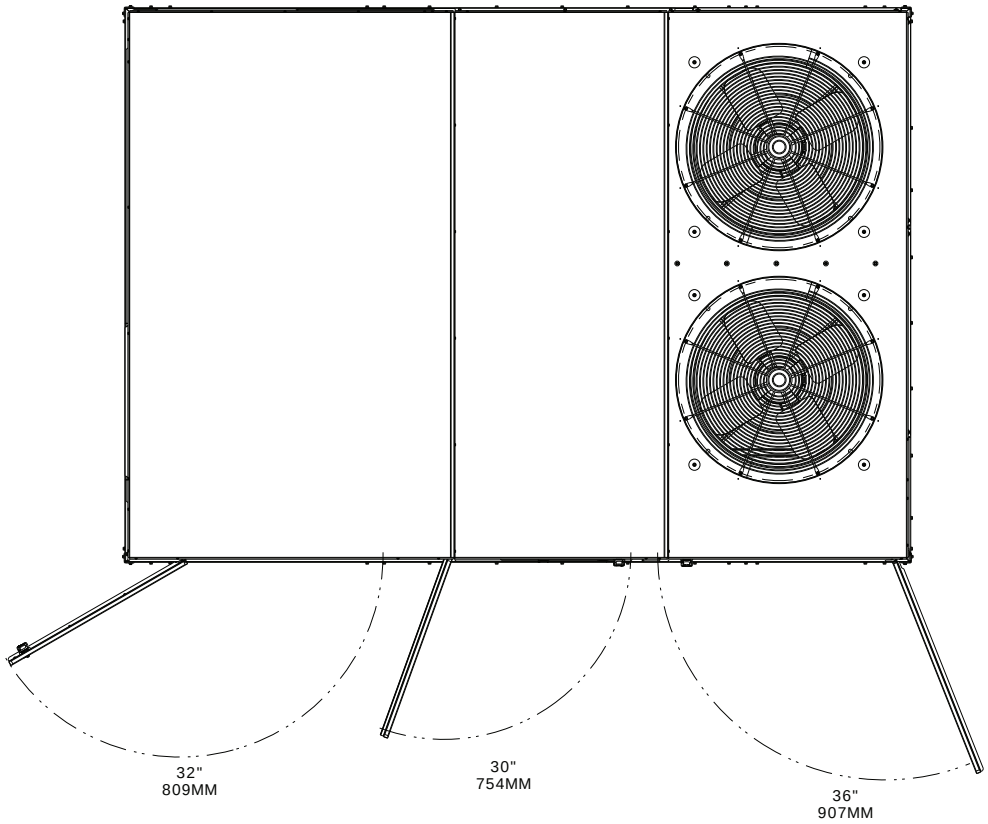


Figure 13. 12.5 to 25 ton high efficiency – swing diameter for hinged door(s) option



Weights

Table 32. Model weights, corner weights (lbs) and center of gravity dimensions (in.)

Tons	Unit Model No.	Model Weights[a]		Corner Weights[b]				Center of Gravity (in.)	
		Shipping	Net	A	B	C	D	Length	Width
12.5	WHJ150	2225	2005	688	487	344	486	51	36
15	WHJ180	2246	2026	695	492	348	491	51	36
20	WHJ240	2403	2183	680	550	426	527	55	38
25	WHJ300	2405	2185	680	550	427	528	55	38

(a) Weights are approximate. Weights do not include additional factory or field installed options/accessories. For option/accessory additional weights to be added to unit weight, reference the following table.

(b) Corner weights are given for information only.

Figure 14. Corner weights

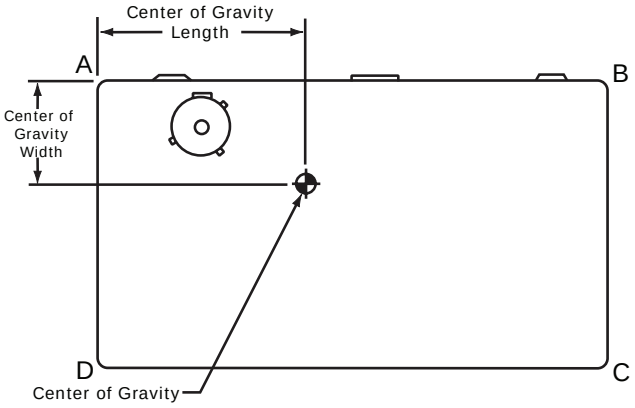


Table 33. Factory installed options (FIOPS)/accessory net weights (lb)

Accessory	WHJ150-210	WHJ240-300
	12.5, 15 Tons	20, 25 Tons
Barometric Relief	40	40
Economizer	91	91
Electric Heaters	75	75
Hinged Doors	20	30
Low Leak Economizer - Downflow	150	150
Low Leak Economizer - Horizontal	180	180
Manual Outside Air Damper	15	15
Motorized Outside Air Damper	82	82
Oversized Motor	–	30
Powered Convenience Outlet	50	50
Powered Exhaust	110	110
Reheat Coil	100	100
Roof Curb	235	235
Smoke Detector, Supply	5	5
Smoke Detector, Return	5	5
Through-the-Base Electrical	10	10
Unit Mounted Circuit Breaker	10	10

Table 33. Factory installed options (FIOPS)/accessory net weights (lb) (continued)

Accessory	WHJ150-210	WHJ240-300
	12.5, 15 Tons	20, 25 Tons
Unit Mounted Disconnect	10	10

Notes:

1. Weights for options not listed are less than 5 pounds.
2. Net weight should be added to unit weight when ordering factory-installed accessories.
3. Weights are approximate.

Mechanical Specifications

General

- Packaged rooftop units cooling, heating capacities, and efficiencies are AHRI Certified within scope of AHRI Standard 210-240 for 12.5 to 25 Tons.
- Convertible airflow.
- Symbio controls operating range between 40°F and 125°F in cooling mode standard from the factory. Factory or field-installed low ambient kit extended operating range down to 0°F.
- Factory assembled, internally wired, fully charged with R-410A, and 100 percent run tested to check cooling and heat pump operation, fan and blower rotation, and control sequence before leaving the factory.
- Colored and numbered wiring internal to the unit for simplified identification.
- Units cULus listed and labeled, classified in accordance for Central Cooling Air Conditioners.

Casing

- Zinc coated, heavy gauge, galvanized steel.
- Weather resistant pre-painted metal with galvanized substrate.
- Meets ASTM B117, 672 hour salt spray test.
- Removable single side maintenance access panels.
- Lifting handles in maintenance access panels (can be removed and reinstalled by removing fasteners while providing a water and air tight seal).
- Exposed vertical panels and top covers in the indoor air section insulated with a cleanable foil-faced, fire-retardant permanent, odorless glass fiber material.
- Base pan shall have no penetrations within the perimeter of the curb other than the raised 1 inch high downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up.
- Base of the unit insulated with 1/8 inch, foil-faced, closed-cell insulation.
- Unit base provisions for forklift and/or crane lifting on three sides of unit.

Coils

Evaporator and Condenser

- Internally finned, 5/16-inch copper tubes mechanically bonded to a configured aluminum plate fin are standard.
- Coils are leak tested at the factory to ensure integrity.
- Evaporator coil and condenser coil are leak tested to 600 psig.
- Assembled unit is leak tested to 465 psig.
- Condenser coil is patent pending 1+1+1 hybrid coil, designed with slight gaps for cleaning ease.
- Composite, dual-sloped, removable condensate drain pan is standard.

Coil Guards

Provides condenser coil protection.

Compressors

- All units have direct-drive, hermetic, scroll type compressors with centrifugal type oil pumps.
- Suction gas-cooled motor with voltage utilization range of plus or minus 10 percent of unit nameplate voltage.
- Internal overloads standard with scroll compressors.
- Crankcase heaters are standard on all compressors.
- All units have dual compressors.
- Three stages of cooling available on 12.5 to 17.5 tons units and four stages of cooling available on 20 and 25 tons units.

Filters

- Standard throwaway filters
- Optional 2 inch MERV 8 and MERV 13 filters

Frostat™

- Utilized as a safety device.
- Opens to prevent freezing temperatures on evaporator coil.
- Temperature will need to rise to 50°F before closing.
- Utilized in low airflow or high outside air applications (cooling only).

Indoor Fan

- Direct drive plenum fan design – 12.5 to 25 tons units.
- Plenum fan design — backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor.
- Supply fan speed adjustments can be made using the Symbio 700 or Mobile App.
- Motors are thermally protected.
- Variable speed direct drive motors are high efficiency – 12.5 to 25 tons.

Powered or Unpowered Convenience Outlet

- Powered GFCI, 120V/15A, 2 plug, convenience outlet or unpowered GFCI, 120V/20A, 2 plug, convenience outlet.
- When convenience outlet is powered, a service receptacle disconnect will be available.
- Convenience outlet is powered from the line side of the disconnect or circuit breaker, and therefore will not be affected by the position of the disconnect or circuit breaker.
- Available to order when through-the-base electrical with disconnect switch or circuit breaker option is ordered.

Stainless Steel Drain Pan

- Corrosion and oxidation resistance.
- Constructed of 304 stainless steel.

Through-the-Base Electrical with Circuit Breaker

- Thermal magnetic, molded case, HACR circuit breaker with provisions for through-the-base electrical connections.
- Circuit breaker installed within unit in water tight enclosure.
- Wiring provided from the switch to the unit high voltage terminal block.
- Circuit breaker will provide overcurrent protection, sized per NEC and cULus guidelines, and agency recognized by cULus.

Through-the-Base Electrical with Disconnect Switch

- 3-pole, molded case, disconnect switch with provisions for through-the-base electrical connections.
- Disconnect switch installed within unit in a water tight enclosure.
- Wiring provided from the switch to the unit high voltage terminal block.
- Switch cULus agency recognized.

Note: *Disconnect switch sized per NEC and cULus guidelines but will not be used in place of unit overcurrent protection*

Economizer (Standard)

- Available with or without barometric relief.

- Fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control.
- Barometric relief shall provide a pressure operated damper that shall be gravity closing.
- Barometric relief shall prohibit entrance of outside air during the equipment “off” cycle.
- Optional solid state or differential enthalpy control.
- Arrives in shipping position and shall be moved to the operating position by the installing contractor.

Manual Outside Air Damper

Rain hood and screen shall provide up to 50 percent outside air.

Motorized Outside Air Damper

- Once set, when indoor fan starts, outdoor air dampers shall open to set position.
- When indoor fan shuts down, damper shall close to the full closed position.

Powered Exhaust

- Available for 12.5 to 25 ton units.
- Shall provide exhaust of return air, when using an economizer.
- Maintain better building pressurization.

Roof Curb

- Designed to mate with the unit’s downflow supply and return.
- Provide support and a water tight installation when installed properly.
- Shall allow field-fabricated rectangular supply/return ductwork to be connected directly to the curb.
- Curb shall be shipped knocked down for field assembly.
- Shall include wood nailer strips.

Ventilation Override Operation

- Unit can be set to transition up to 3 different pre-programmed sequences for smoke purge, pressurization, and exhaust.
- Transition occurs when binary input on the Symbio is closed (shorted) (typically hard wired relay output from a smoke detector/ fire control panel.

  Note: *Requires Symbio™Customer Connection Module, FIASCCM001*.*

Notes





The AHRI Certified mark indicates Trane U.S. Inc. participation in the AHRI Certification program. For verification of individual certified products, go to ahridirectory.org.

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PKGP-PRC021A-EN 02 Dec 2022
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Product Catalog

Packaged Rooftop Air Conditioners
Precedent™ — Heat Pump

3 to 10 Tons — 60 Hz



December 2022 **PKGP-PRC013AA-EN**

Introduction

Packaged Heat Pumps

Trane® customers demand products that provide exceptional reliability, meet stringent performance requirements, and are competitively priced.

Precedent™ features cutting edge technologies: reliable compressors, Trane® engineered ReliaTel™ controls, computer-aided run testing, and Integrated Comfort™ Systems. So, whether you're the contractor, the engineer, or the owner you can be certain Precedent™ Products are built to meet your needs.

Through the years, Trane® has designed and developed the most complete line of Packaged Rooftop products available in the market today. Trane® was the first to introduce the Micro—microelectronic unit controls—and has continued to improve and revolutionize this design concept.

The ReliaTel™ control platform offers the same great features and functionality as the original Micro, with additional benefits for greater application flexibility.

With its sleek, compact cabinet, Precedent™ continues to provide the highest standards in quality and reliability, comfort, ease of service, and the performance of Trane® light commercial products.

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Revision History

- Added EER2/SEER2, Low/High temp COP2 and HSPF2 data and footnote in the General Data chapter.
- Updated the Roof Curb values in Factory installed options table in the Weights chapter.

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Features and Benefits

Table 1. Precedent™ options — standard and optional

	Standard Features	Options[a]		
		Factory Installed	Factory or Field Installed	Field Installed
1-year Limited Parts Warranty	X			
2” MERV 8 Filters or 2” MERV 13 Filters with Filter Removal Tool		X		
5-year Limited Compressor Warranty	X			
5-year Limited Heat Exchanger Warranty	X			
Anti-Short Cycle Timer (Standard with ReliaTel™)	X			
Auxiliary Gas Heat (High Efficiency Models Only)		X		
Barometric Relief			X	
Black Epoxy Pre-Coated Coils		X		
CO_2 Sensor Only Kit / CO_2 Sensor and Wiring Kit				X
CO_2 Sensor (Wiring Only)		X		
Clogged Filter/Fan Failure Switch			X	
Colored and Numbered Wiring	X			
Condensate Overflow Switch		X		
Convertible Airflow	X			
Crankcase Heaters	X			
Direct Drive Variable Speed Motors	X			
Discharge Air Temperature Sensing Kit			X	
Easy Access Low Voltage Terminal Board (LTB)	X			
Economizer: Low Leak				X
Economizer: Standard and Low Leak			X	
Electric Heaters			X	
Fault Detection and Diagnostics (FDD); Meets CA Title 24 Requirements		X		
Filters are Standard on all Units	X			
Foil-Faced and Edge Captured Insulation	X			
Frostat™			X	
Hail Guards			X	
Heat Exchanger	X			
High Altitude Kit				X
High Pressure Control	X			
High Static Motor			X	
Hinged Access Doors		X		
IAQ Dual Sloped, Plastic, Removable, Reversible Drain Pan	X			
Liquid Line Refrigerant Drier	X			
Low Ambient Cooling to 0°F	X			
Low Pressure Control	X			
Manual Outside Air Damper				X
Motorized Outside Air Dampers				X
Multispeed Direct Drive Motors on Select Models	X			
Multispeed Indoor Fan System		X		
Operating Charge of R-410A	X			
Outside Air Measuring/Monitoring Control (Traq Dampers)				X
Patent-Pending Hybrid Condenser Coil for easy cleaning	X			

Table 1. Precedent™ options — standard and optional (continued)

	Standard Features	Options[a]		
		Factory Installed	Factory or Field Installed	Field Installed
Phase Loss Protection	X			
Phase Monitor	X			
Phase Reversal Protection	X			
Phase Balance Protection	X			
Plenum Fan on Select Models	X			
Powered Exhaust				X
Powered or Unpowered Convenience Outlet		X		
Provisions for Through-the-Base Condensate Drain Connections	X			
Quick Access Panels	X			
Quick Adapt Curbs				X
Quick Start Kit				X
Reference or Comparative Enthalpy			X	
Remote Potentiometer				X
Roof Curb				X
Single Point Power	X			
Single Side Service	X			
Single Zone Variable Air Volume (SZVAV)		X		
Stainless Steel Drain Pan		X		
Stainless Steel Heat Exchanger		X		
Standardized Components	X			
Supply, Return or Plenum Air Smoke Detector		X		
Thermal Expansion Valve	X			
Through-the-Base Electrical Access		X		
Through-the-Base Electrical with Circuit Breaker		X		
Through-the-Base Electrical with Disconnect Switch		X		
Touch Safe Control Box	X			
Ventilation Override Accessory				X

(a) Refer to model number description for option availability

Table 2. Precedent™ control options — standard and optional

	Standard Features	Options[a]		
		Factory Installed	Factory or Field Installed	Field Installed
BACnet® Communications Interface (BCI)			X	
Dual Thermistor Remote Zone Sensor				X
Human Interface		X		
LonTalk® Communications Interface (LCI)			X	
ReliaTel™ Microprocessor Controls	X			
Thermostat				X
Trane® Air-Fi® Wireless Communication Interface		X		
Trane® Communications Interface (TCI)			X	
Zone Sensor				X

(a) Refer to model number description for option availability.

Other Benefits

- Cabinet design ensures water integrity
- Ease of Service, Installation and Maintenance
- Mixed model build enables “fastest in the industry” ship cycle times
- Outstanding Airflow Distribution
- ReliaTel™ Controls

Standard Features

Anti-Short Cycle Timer

Provides a 3 minute minimum “ON” time and 3 minute “OFF” time for compressors to enhance compressor reliability by assuring proper oil return.

Colored And Numbered Wiring

Save time and money tracing wires and diagnosing the unit.

Compressors

Precedent™ contains the best compressor technology available to achieve the highest possible performance.

Multi-stage compressors provide optimal performance during light load conditions.

Condenser Coil



Precedent™ boasts a patent-pending 1+1+1 condenser coil, permanently gapped for easy cleaning.

Controls – ReliaTel™

ReliaTel™ microprocessor controls provide unit control for heating, cooling and ventilating utilizing input from sensors that measure indoor and outdoor temperature and other zone sensors. ReliaTel™ also provides outputs for building automation systems and expanded diagnostics. For a complete list of ReliaTel™ offerings, refer to the “Other Benefits” section within the Features and Benefits section of this catalog.

Convertible Units



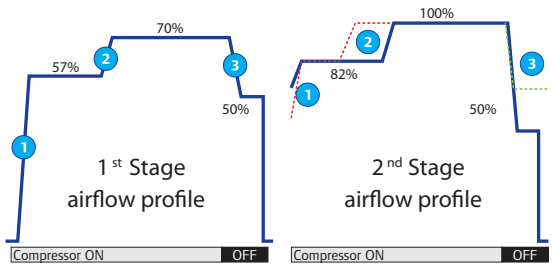
The units ship in a downflow configuration. They can be easily converted to horizontal by simply moving two panels.

Units come complete with horizontal duct flanges so the contractor doesn't have to field fabricate them. These duct flanges are a time and cost saver.

Crankcase Heaters

These band heaters provide improved compressor reliability by warming the oil to prevent migration during off-cycles or low ambient conditions.

Direct Drive Variable Speed Motors



Direct drive motor shall be variable speed with constant airflow settings. Motor will be ECM (Electronically Commutated Motor) as standard pre-programmed with enhanced airflow capabilities.

Note: *Available on indoor motors for high efficiency 3 to 5 tons units only.*

Drain Pan



Every Precedent™ unit has a plastic, removable, dual-sloped drain pan that's easy to clean and reversible to allow installation of drain trap on either side of the unit.

Dual Fuel

In heating mode, the unit control operates the heat pump in 1st stage heating. If the call for heat is not satisfied, heat pump 2nd stage is activated. If ambient is below lockout set point, the controller will activate auxiliary gas heat 1st stage, and heat pump operation will be terminated. A continued call for heat will cause the controller to activate auxiliary gas heat 2nd stage.

The indoor fan will continue to run and will switch to 100% during transition from heat pump to gas heat. If the controller initiates gas heat as the first heat source during a call for heat in constant volume, the blower is delayed 45 seconds to allow heat up of the gas heat exchanger.

If continuous fan operation is available and selected from the thermostat, the controller automatically adjusts fan speed for heat pump and gas heat operation.

During defrost mode, the controller will activate auxiliary gas heat to maintain comfort.

Easy Access Low Voltage Terminal Board

Precedent's™ low voltage terminal board is external to the electrical control cabinet. It is extremely easy to locate and attach the thermostat wire and test operation of all unit functions. This is another cost and time saving installation feature.

Foil Faced and Edge Captured Insulation

All panels in the evaporator section of the unit have cleanable foil-faced insulation. All edges are either captured or sealed to ensure no insulation fibers get into the airstream.

Heat Exchanger

The compact cabinet features a progressive tubular heat exchanger in low, medium and high heat capacities. The heat exchanger is fabricated using stainless steel burners and corrosion-resistant aluminized steel tubes as standard on all models. It has an induced draft blower to pull the gas mixture through the burner tubes. The heater has a direct spark ignition system which doubles as a safety device to prove the flame.

Low Ambient Cooling

All Precedent™ microprocessor units have cooling capabilities down to 0°F as standard.

Low Voltage Connections

The wiring of the low voltage connections to the unit and the zone sensors is as simple as 1-1, 2-2, and 3-3. This simplified system makes it easy for the installer to wire.

Phase Monitoring Protection

Precedent™ units with 3-phase power are equipped with phase monitoring protection as standard. These devices protect motors and compressors against problems caused by phase loss, phase imbalance and phase reversal indication.

Plenum Fan

Select 6 to 10 tons models are equipped with a direct drive plenum fan design. Plenum fan design shall include a backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor. All plenum fan designs will have a variable speed adjustment potentiometer located in the control box.

Quick-Access Panels

Remove two screws for access to the standard internal components and wiring.

Single Point Power

A single electrical connection powers the unit.

Standardized Components

Components are placed in the same location on all Precedent™ units. Due to standardized components throughout the Precedent™ line, contractors/owners can stock fewer parts.

Through-the-Base Condensate

Every unit includes provisions for through-the-base condensate drain connections. This allows the drain to be connected through the roof curb instead of a roof penetration.

Touch Safe Control Box

On 3 to 5 tons modes, low voltage and high voltage components are separated within the control box. High voltage components are located behind a door to provide an additional layer of safety.

Factory Installed Options

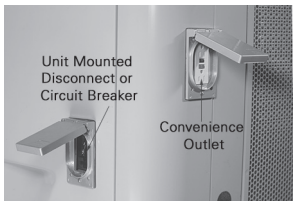
Black Epoxy Pre-Coated Coils

The pre-coated coils are an economical option for protection in mildly corrosive environments.

Circuit Breaker

This option is a factory installed thermal magnetic, molded case, HACR circuit breaker with provisions for through-the-base electrical connections.

Note: *Available on units equipped with through-the-base electrical.*



CO_2 Sensor Wiring

Factory-installed CO_2 sensor wiring saves time and ensures proper unit connections for the field installed CO_2 sensor kits.

Condensate Overflow Switch

A condensate overflow switch is available to shut the unit down in the event that the condensate drain line becomes clogged. This option protects the unit from water overflowing from the drain pan and entering the base of the unit.

Convenience Outlet



This option is a GFCI, 120V/15amp, 2 plug, convenience outlet, either powered or unpowered. This option can only be ordered when through-the-base electrical with either the disconnect switch or circuit breaker option is ordered.

Note: *Not available on 10 tons, 575V units.*

Disconnect Switch

Factory installed 3-pole, molded case, disconnect switch with provisions for through-the-base electrical connections are available.

Codes require a method of assured unit shutdown for servicing. Field-installed disconnects sometimes interfere with service access. Factory installation of unit disconnects reduces costs, assures proper mounting and provides the opportunity to upgrade to unit circuit breaker protection.

Note: *Available on units equipped with through-the-base electrical.*

Fault Detection and Diagnostics (FDD)

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit. This option provides detection of the following faults: Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements.

High Efficiency Filtration

Precedent™ units offer a variety of high efficiency filtration options. MERV 8 and MERV 13 filters provide additional filtration beyond the capabilities of typical 2-inch throwaway filters. Also, when MERV 8 or MERV 13 filters are ordered, units come equipped with a filter removal tool.

High Static Motor

Oversized motor for applications where higher external static pressure capability is required. Direct drive constant torque motors on 3 to 5 tons standard efficiency. Direct drive constant CFM motors on 3 to 5 tons high efficiency. A belt driven high static kit is available on standard efficiency 6 to 8.5 tons units.

Hinged Access Doors

These doors permit easy access to the filter, fan/heat and compressor/control sections. They reduce the potential roof damage from screws or sharp access door corners.

Note: *A compressor isolation panel is available for 3 to 5 tons units to ease commissioning and servicing of units.*



Human Interface - 5 Inch Color Touchscreen



The 5 inch Color Touchscreen Human Interface provides an intuitive user interface to the rooftop unit that speeds up unit commissioning, shortens unit troubleshooting times, and enhances preventative maintenance measures. The human interface includes several features such as:

- Data trending capabilities by means of time series graphs
- Historical alarm messages
- Real-time sensor measurements
- On board system setpoints
- USB port that enables the downloading of component runtime information as well as trended historical sensor data
- Customized reports

Note: *Refer to RT-SVX49*-EN for additional information.*

Multi-Speed Indoor Fan System

Multi-speed indoor fan system is designed for use in applications for meeting the minimum requirement of CA Title 24.

This system incorporates a multi-speed fan control to change the speed of the fan to 66% of full airflow based off of compressor stages.

Multiple-Zone VAV Control

A multiple-zone VAV (MZVAV) system consists of a packaged rooftop unit that serves several individually controlled zones. Each zone is equipped with a VAV terminal unit that varies the quantity of air delivered to maintain the desired temperature in that zone. The rooftop unit controller varies the speed of the indoor fan to maintain the static pressure in the supply ductwork at a setpoint, ensuring that all zones receive the necessary quantity of air. In addition, cooling capacity is cycled to maintain the supply air temperature at the desired setpoint.

For decades, Trane has been an industry leader in rooftop VAV systems. Now multiple-zone VAV control is available in high efficiency packaged heat pumps.

Single Zone VAV (SZVAV)

Single zone variable air volume is designed for use in single zone applications like gymnasiums, auditoriums, manufacturing facilities, retail box stores, and any large open spaces, where there is a lot of diversity in the load profile. SZVAV is an ideal replacement to “yesterday’s” constant volume (CV) systems, by reducing operating costs while improving occupant comfort. SZVAV systems combine Trane® application, control and system integration knowledge to exactly match fan speed with cooling and heating loads, regardless of the operating condition. Trane® algorithms meet/exceed ASHRAE 90.1- 2010, SZVAV energy-saving recommendations, and those of CA Title 24. The result is an optimized balance between zone temperature control and system energy savings. Depending on your specific application, energy savings can be as much as 20+%.

Note: *Building system modeling in energy simulation software like TRACE is recommended to evaluate performance improvements for your application.*

Single zone variable air volume is fully integrated into the ReliaTel™ control system and is available today. It provides the simplest and fastest commissioning in the industry through proven factory-installed, wired, and tested system controllers. All control modules, logic and sensors are factory installed, and tested to assure the highest quality and most reliable system available. This means no special programming of algorithms, or hunting at the jobsite for sensors, boards, etc. that need to be installed in the field. SZVAV is a quick and simple solution for many applications and is available from your most trusted rooftop VAV system solution provider - Trane®.

Stainless Steel Drain Pan

For excellent corrosion and oxidation resistance, the optional stainless steel drain pan provides a cleanable surface that complement other IAQ solutions such as high efficiency filtration (MERV 8 or 13) and demand control ventilation (CO_2).

Stainless Steel Heat Exchanger

The optional stainless steel heat exchanger is constructed of 409 stainless steel. It is resistant to corrosion and oxidation and easy to clean. The high strength to weight ratio allows for high ventilation rates with gas units. It is an excellent option to compliment the dehumidification option as a high outside air ventilation unit. With this option, a 10-year stainless steel heat exchanger warranty is standard.

Supply, Return, and Plenum Air Smoke Detector

With this option installed, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. In order for the supply air smoke detector or return air smoke detector to properly sense smoke in the supply air stream or the return air stream, the air velocity entering the smoke detector unit must be between 500 - 4000 feet per minute. Equipment covered in this manual will develop an airflow velocity that falls within these limits over the entire airflow range specified in the evaporator fan performance table. Supply and/or return smoke detectors may not be used with the plenum smoke detector.

Note: *Plenum smoke detectors have no auxiliary contacts for external connections.*

Figure 1. Supply/Return air smoke detector



Figure 2. Plenum air smoke detector



Through-the-Base Electrical Utility Access

An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through-the-base of the unit. Option will allow for field installation of liquid-tight conduit and an external field installed disconnect switch.

Factory provided through-the-base openings simplify wiring and piping. Because these utility openings frequently minimize the number of roof penetrations, the integrity of roofing materials is enhanced.



Through-the-Base Gas Access

Factory provided through-the-base openings simplify wiring and piping. Because these utility openings frequently minimize the number of roof penetrations, the integrity of roofing materials is enhanced.



Factory or Field Installed Options

Barometric Relief

Designed to be used on downflow units, barometric relief is an unpowered means of relieving excess building pressure.

Clogged Filter/Fan Failure Switch

A dedicated differential pressure switch is available to achieve active fan failure indication and/or clogged filter indication.

These sensors allow a zone sensor service light to indicate a dirty filter or a fan that's not working. The field installation charges for these valuable feedback devices often eliminate them from consideration. Factory installation can make such features a good investment.

Discharge Air Temperature Sensing Kit

Provides true discharge air temperature sensing in heating models. The kit is functional only with the ReliaTel™ options module.

Economizer (Standard)

This accessory shall be available with or without barometric relief. The assembly includes fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control. The barometric relief shall provide a pressure operated damper that shall be gravity closing and shall prohibit entrance of outside air during the equipment "off" cycle. Optional solid state or differential enthalpy control shall be available for either factory or field installation. The economizer arrives in the shipping position and shall be moved to the operating position by the installing contractor.

Electric Heaters

Electric heat modules are available within the basic unit. If ordering the through-the-base electrical option with an electrical heater, the heater must be factory installed.

Fresh Air Options – Dampers and Economizer

0 to 25% manual or 0 to 50% motorized outside air hoods are available.

Economizers are equipped with either dry bulb or reference or comparative enthalpy sensing. These economizers provide free cooling as the outdoor temperature and/or humidity decreases. Correctly installed, they offer a valuable energy savings. Factory-installed economizers save time and ensure proper installation.

Due to varying supply fan speed 0 to 50% motorized damper is not available with multi-speed or SZVAV applications.

The economizers come with three control options — dry bulb is standard, enthalpy and differential enthalpy are optional.

Frostat™

This capillary bulb embedded in the face of the evaporator coil monitors coil temperature to prevent evaporator icing and protect the compressor. Recommended for applications with low leaving air temperatures, low airflow and or high latent load applications.

Hail Guards

Hail protection quality coil guards protects the condenser coil from vandalism and/or hail damage.

Low Leak Economizer

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (4 cfm/ft^2@1" wg exterior air/return air). This option allows 100% outdoor air supply from 0 to 100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. This option can be paired with or without Fault Detection and Diagnostics (FDD) to meet current mandatory CA Title 24 requirements.

Note: *Available on downflow units only.*

Reference or Comparative Enthalpy

Measures and communicates humidity while maximizing comfort control.

Field Installed Options

CO_2 Sensing Kits

Two field installed kits are offered: CO_2 sensor and wiring or CO_2 sensor only. The CO_2 sensor only kit should be ordered with factory installed CO_2 sensor wiring. Factory installed CO_2 sensor wiring saves set-up time and ensures proper unit connections for the CO_2 sensor.

The CO_2 sensor has the ability to monitor space occupancy levels within the building by measuring the parts per million of CO_2 (Carbon Dioxide) in the air. As the CO_2 levels increase, the outside air damper modulates to meet the CO_2 space ventilation requirements.

High Altitude Kit

While recommended for units applied above 2000 feet, domestic contractors should consult with local authority on best practice. High altitude kits contain gas orifices that derate the gas input rate (Btu/hr) by 10%.

Low Leak Economizer - Field Installed

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (4 cfm/ft^2@1" wg exterior air/return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief.

Note: *Available on downflow units only.*

Outside Air Measuring/Monitoring Control (Traq Dampers)

Quantity of fresh air entering the unit will be measured and monitored via Trane UC400 controller and series of pressure sensing rings mounted at the outside air intake.

Quick Adapt Curbs

Enables easy conversion of existing Voyager™ 3 to 10 tons units to Precedent™ units on replacement jobs.

Roof Curbs

Available for downflow units. Only three roof curbs for the entire line simplifies curb selection.

Remote Potentiometer

When properly installed in the economizer control circuitry, this accessory provides a remote variable resistance to enable the operator to adjust the minimum damper position.

Ventilation Override Accessory

With the ventilation override accessory installed, the unit can be set to transition to up to 3 different pre-programmed sequences for smoke purge, pressurization, and exhaust. The transition occurs when a binary input on the RTOM is closed (shorted). This would typically be a hard wired relay output from a smoke detector or fire control panel. The ventilation override kit is available as a field installed accessory.

Other Benefits

Airflow Distribution

Airflow is outstanding. Precedent™ can replace an older machine with old ductwork and, in many cases, improve the comfort through better air distribution.

Cabinet Integrity

For added water integrity, Precedent™ has a raised 1 1/8-inch lip around the supply and return of the downflow units to prevent water from blowing into the ductwork.

The compact cabinet with rounded corners takes up less room. The beveled and ribbed top is aesthetically pleasing and designed to prevent water from pooling.



Easy to Install, Service and Maintain

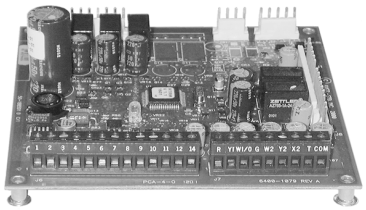
Because today's owners are very cost-conscious when it comes to service and maintenance, the Precedent™ unit was designed with direct input from service contractors. This valuable information helped to design a product that would get the service person off the job quicker and save the owner money. Precedent™ offers outstanding standard features enhanced by a variety of factory and field installed options, multiple control options, rigorously tested proven designs and superior product and technical support.

Flexibility

Precedent™ offers ultimate flexibility. Units are built to order in our standard "shortest in the industry" ship cycle time.

ReliaTel™ Controls

Figure 3. ReliaTel board



ReliaTel controls provide unit control for heating, cooling, and ventilating, utilizing input from sensors that measure outdoor and indoor temperature. ReliaTel also provides outputs for building automation systems and expanded diagnostics. Quality and reliability are enhanced through ReliaTel control and logic:

- Prevents the unit from short cycling, considerably improving compressor life.
- Ensures the compressor will run for a specific amount of time which allows oil to return for better lubrication, enhancing the reliability of the compressor.
- Reduces the number of components required to operate the unit, reducing possibilities for component failure.

ReliaTel Makes Installing and Servicing Easy

ReliaTel eliminates the need for field-installed, anti-short cycle timer and time delay relays. The wiring of the low voltage connections to the unit and the zone sensors is as easy as 1-1, 2-2, and 3-3. This simplified system makes wiring easier for the installer.

ReliaTel Makes Testing Easy

ReliaTel requires no special tools to run the unit through its paces. Simply place a jumper between Test 1 and Test 2 terminals on the Low Voltage Terminal Board and the unit will walk through its operational steps automatically. The unit automatically returns control to the zone sensor after stepping through the test mode a single time, even if the jumper is left on the unit. As long as the unit has power and the “system on” LED is lit, ReliaTel is operational. The light indicates that the controls are functioning properly. ReliaTel features expanded diagnostic capabilities when utilized with Trane Integrated Comfort™ Systems. Some zone sensor options have central control panel lights which indicate the mode the unit is in and possible diagnostic information (dirty filters for example).

ReliaTel Has Other Benefits

- The ReliaTel built-in anti-shortcycle timer, time delay relay and minimum “on” time control functions are factory tested to assure proper operation.
- ReliaTel softens electrical “spikes” by staging on fans, compressors and heaters.
- Intelligent Fallback is a benefit to the building occupant. If a component goes astray, the unit will continue to operate at predetermined temperature setpoint.
- Intelligent Anticipation is a standard feature. It functions continuously as ReliaTel and zone sensor(s) work together in harmony to provide much tighter comfort control than conventional electromechanical thermostats.
- The ReliaTel design is standardized across the board, ensuring a lower cost to owners.

Rigorous Testing

All of Precedent's™ designs were rigorously rain tested at the factory to ensure water integrity.

Actual shipping tests were performed to determine packaging requirements. Units were test shipped around the country to determine the best packaging. Factory shake and drop tests were used as part of the package design process to help assure that the unit arrives at the job site in top condition.

Rigging tests include lifting a unit into the air and letting it drop one foot, assuring that the lifting lugs and rails hold up under stress.

We perform a 100% coil leak test at the factory. The evaporator and condenser coils are leak tested at 600 psig. The assembled unit is leak tested to 465 psig.

All parts are inspected at the point of final assembly. Sub-standard parts are identified and rejected immediately.

Every unit receives a 100% unit run test before leaving the production line to make sure it meets rigorous requirements.

Application Considerations

Application of this product should be within the cataloged airflow and cooling considerations.

Auxiliary Gas Heating Operation

The heat exchanger is manufactured with aluminized steel. To prevent condensation within the heat exchanger, do not exceed 50%outside air or a minimum mixed air temperature of 40°F.

Barometric Relief

This product line offers an optional barometric relief damper for use in conjunction with economizer option. This accessory consists of gravity dampers which open with increased pressure. As the building air pressure increases, the pressure in the unit return air section also increases, opening the dampers and relieving the conditioned space.

Note: *The effectiveness of barometric relief damper during economizing operation is limited, depending on the pressure drop of the return-air path. For some applications, powered exhaust may be better suited for preventing over-pressurization when economizing.*

Black Epoxy Coil

The coils are manufactured with a thermoset, vinyl coating that is bonded to the aluminum fin stock prior to the fin stamping process. These coils are an economical option for protection in mildly corrosive environments.

Note: *Not to be used where seacoast applications exist.*

Clearance Requirements

The recommended clearances identified with unit dimensions should be maintained to assure adequate service maximum capacity and peak operating efficiency. Actual clearances which appear inadequate should be reviewed with the local Trane® sales personnel.

Model Number	Clearance required from duct to combustible surfaces (inches)
WSC036H	0
WSC048H	0
WSC060H	0
WSC092H	1
WSC102H	1
WSC120H	1
D/WHC036H	0
D/WHC048H	0
D/WHC060H	0
D/WHC074H	1
D/WHC092H	1
D/WHC102H	1
D/WHC120H	1

Condensate Trap

The evaporator is a draw-thru configuration. A trap must be field provided prior to start-up on the cooling cycle.

Low Ambient Cooling

The Precedent™ line features, with ReliaTel™ microprocessor controls, low ambient cooling down to 0°F. The following features or options need to be included/considered when low ambient applications are required: continuous fan operation, crankcase heaters, thermal expansion valves, frostat.

Contact a local Trane® representative for more assistance with low ambient cooling applications.

Optional Stainless Steel Heat Exchanger

The optional stainless steel heat exchanger is manufactured with 409 stainless steel. To prevent corrosion and prolong heat exchanger reliability, the minimum mixed air temperature allowed across the heat exchanger is 20°F.

The stainless steel heat exchanger option is an excellent option that compliments the dehumidification package. Whenever high outside air or outside applications exist, these options should be utilized.

Unit Pitch

The unit has a reversible sloped condensate drain pans. The unit must be installed level. Any unit slope must be toward the side of unit where condensate drain is connected.

Selection Procedure

Cooling Capacity

1. Calculate the building's total and sensible cooling loads at design conditions. Use the Trane® calculation methods or any other standard accepted method.

   Factors used in unit selection:

   - Total Cooling Load: 58 MBh
   - Sensible Cooling Load: 37 MBh
   - Airflow: 2000 cfm
   - Electrical Characteristics: 460/60/3
   - Summer Design Conditions: Entering
   - Evaporator Coil: 80 DB, 67 WB Outdoor Ambient: 95
   - External Static Pressure: 0.47 in. wg
   - Downflow Configuration
   - Economizer

2. As a starting point, a rough determination must be made of the size of the unit. The final selection will be made after examining the performance at the given conditions. Divide the total cooling load by nominal BTUH per ton (12 MBh per ton); then round up to the nearest unit size.

   58 MBh / 12 MBh = approx. 5 tons

3. Table 12, p. 37 shows that a WSC060H4 has a **gross** cooling capacity of 61.0 MBh and 48.8 MBh sensible capacity at 2000 cfm and 95 DB outdoor ambient with 80 DB, 67 WB air entering the evaporator.

   To Find Capacity at Intermediate Conditions not in the table

   When the design conditions are between two numbers that are in the capacity table, interpolation is required to approximate the capacity.

   Note: *Extrapolation outside of the table conditions is not recommended.*

4. In order to select the correct unit which meets the building's requirements, the fan motor heat must be deducted from the gross cooling capacity. The amount of heat that the fan motor generates is dependent on the effort by the motor - cfm and static pressure. To determine the total unit static pressure:

External Static Duct System	0.52 wg
Economizer from Table 83, p. 102 (100% Outside Air)	0.11 wg
Electric Heater Size 9 kW from Table 83, p. 102	0.02 wg
Total Static Pressure	0.65 wg

Note: Refer "Heating Capacity," p. 22 section on this page for determination of heater size.

With 2000 cfm and 0.65 wg. Table 35, p. 59 shows 0.44 bhp for this unit. Note below the table gives a formula to calculate Fan Motor Heat,

2.87 x bhp + 0.15 = MBh
2.87 x 0.44 + 0.15 = 1.41 MBh

Now subtract the fan motor heat from the gross cooling capacity of the unit:

Net Total Cooling Capacity
= 61.0 MBh - 1.41 = 59.59 MBh

Net Sensible Cooling Capacity
= 48.8 MBh - 1.41 = 47.39 MBh

5. Compare results to original load requirements. If the performance will not meet the required total or sensible cooling load, try a selection at the next higher size unit.

Heating Capacity

1. Calculate the building heating load using the Trane® calculation form or other standard accepted method.
2. Size the equipment using Table 86, p. 106 to match the heating loads at design conditions.

   Total heating load of 53 MBh

   Outdoor Ambient (Winter): 17 DB

   Indoor Return Temperature: 60 DB

   Airflow: 2000 cfm

   Use the integrated portion of Table 86, p. 106 for WSC060 to determine capacity at winter design conditions. The mechanical heating portion of the heat pump will provide 36.2 MBh.
3. Because 36.2 is less than the building's required heating capacity at winter design conditions, a supplementary heater must be selected.

   53 MBh - 36.2 MBh = 16.8 MBh

   The auxiliary electric heat capacities are listed in Table 104, p. 117. From the table, a 6 kW heater will deliver 20.48 MBh at 480 volts. In order to determine capacity at 460 volts, the heater voltage correction factor from Table 106, p. 118 must be used. Therefore, 20.48 MBh x .918 (voltage correction factor) = 18.8 MBh. A 6 kW heater should be selected.

Air Delivery Selection

External static pressure drop through the air distribution system has been calculated to be 0.65 inches of water. Enter Table 35, p. 59 for a WSC060H4 at 2000 cfm and 0.65 static pressure. The belt drive motor will give the desired airflow at a rated bhp of 0.44 and 766 rpm.

Model Number Descriptions

Digit 1 - Unit Type
W = Packaged Heat Pump[2]
D = Dual Fuel Heat Pump[2]

Digit 2 - Efficiency
S = Standard Efficiency
H = High Efficiency

Digit 3 - Airflow
C = Convertible

Digit 4,5,6 - Nominal Gross Cooling Capacity (MBh)
036 = 3 Ton
048 = 4 Ton
060 = 5 Ton
074 = 6 Ton
092 = 7.5 Ton
102 = 8.5 Ton
120 = 10 Ton

Digit 7 - Major Design Sequence

Digit 8 - Voltage Selection
3 = 208-230/60/3
4 = 460/60/3
W = 575/60/3

Digit 9 - Unit Controls
R = ReliaTel™ Microprocessor

Digit 10 - Heating Capacity
Note: *Applicable to Digit 1,W models only.*
0 = No Electric Heat
B = 6 kW
C = 9 kW
E = 12 kW
G = 18 kW
J = 23 kW
K = 27 kW
N = 36 kW
P = 54 kW

Note: *Applicable to Digit 1,D models only*
L = Low Heat
M = Medium Heat
H = High Heat
X = Low Heat, Stainless Steel Heat Exchanger
Y = Medium Heat, Stainless Steel Heat Exchanger
Z = High Heat, Stainless Steel Heat Exchanger

Digit 11 - Minor Design Sequence

Digit 12,13 - Service Sequence
** Factory Assigned

Digit 14 - Fresh Air Selection
0 = No Fresh Air
A = Manual Outside Air Damper 0-50%[1]
B = Motorized Outside Air Damper 0-50%[10]
C = Economizer, Dry Bulb 0-100% without Barometric Relief[4]
D = Economizer, Dry Bulb 0-100% with Barometric Relief[4]
E = Economizer, Reference Enthalpy 0-100% without Barometric Relief[4]
F = Economizer, Reference Enthalpy 0-100% with Barometric Relief[4]
G = Economizer, Comparative Enthalpy 0-100% without Barometric Relief[4]
H = Economizer, Comparative Enthalpy 0-100% with Barometric Relief[4]
K = Low Leak Economizer with Barometric Relief
M = Low Leak Economizer with Reference Enthalpy with Barometric Relief
P = Low Leak Economizer with Comparative Enthalpy with Barometric Relief

Digit 15 - Supply Fan/Drive Type/ Motor
0 = Standard Drive[3]
1 = Oversized Motor[3]
2 = Optional Belt Drive Motor
6 = Single Zone Variable Air Volume (SZVAV)[14]
7 = Multi-Speed Indoor Fan[12]
8 = Single Zone Variable Air Volume (SZVAV) w/Oversized Motor[14]
E = Multi-Zone Variable Air Volume (MZVAV)[14]
F = Multi-Zone Variable Air Volume (MZVAV) w/Oversized Motor[14]

Digit 16 - Hinged Service Access/ Filters
0 = Standard Panels/Standard Filters
A = Hinged Access Panels/Standard Filters
B = Standard Panels/2” MERV 8 Filters
C = Hinged Access Panels/2” MERV 8 Filters
D = Standard Panels/2” MERV 13 Filters
E = Hinged Access Panels/2” MERV 13 Filters

Digit 17 - Condenser Coil Protection
0 = Standard Coil
1 = Standard Coil with Hail Guard
2 = Black Epoxy Pre-Coated Condenser Coil
3 = Black Epoxy Pre-Coated Condenser Coil with Hail Guard

Digit 18 - Through-the-Base Provisions
0 = No Through-the-Base Provisions
A = Through-the-Base Electric[5]
B = Through-the-Base Gas Piping[17]
C = Through-the-Base Electric and Gas Piping[17]

Digit 19 - Disconnect/Circuit Breaker (three-phase only)
0 = No Disconnect/No Circuit Breaker
1 = Unit Mounted Non-Fused Disconnect[5]
2 = Unit Mounted Circuit Breaker[5]

Digit 20 - Convenience Outlet
0 = No Convenience Outlet
A = Unpowered Convenience Outlet
B = Powered Convenience Outlet (three-phase only)[6]

Digit 21 - Communications Options
0 = No Communications Interface
1 = Trane® Communications Interface
2 = LonTalk® Communications Interface
6 = BACnet® Communications Interface
7 = Air-Fi® Wireless Communications[15]

Digit 22 - Refrigeration System Option
0 = Standard Refrigeration System[7]

Digit 23 - Refrigeration Controls
0 = No Refrigeration Control[2]
1 = Frostat™[11]
2 = Crankcase Heater[16]
3 = Frostat and Crankcase Heater[11,16]

Digit 24 - Smoke Detector
0 = No Smoke Detector
A = Return Air Smoke Detector[8]
B = Supply Air Smoke Detector
C = Supply and Return Air Smoke Detectors[8]
D = Plenum Smoke Detector

Digit 25 - System Monitoring Controls
0 = No Monitoring Control
1 = Clogged Filter Switch
2 = Fan Failure Switch
3 = Discharge Air Sensing Tube
4 = Clogged Filter Switch and Fan Fail Switch
5 = Clogged Filter Switch and Discharge Air Sensing Tube
6 = Fan Fail Switch and Discharge AirSensing Tube
7 = Clogged Filter and Fan Fail Switches and Discharge Air Sensing Tube
A = Condensate Drain Pan Overflow Switch
B = Clogged Filter Switch and Condensate Drain Pan Overflow Switch
C = Fan Failure Switch and Condensate Drain Pan Overflow Switch
D = Discharge Air Sensing and Condensate Drain Pan Overflow

Switch
E = Clogged Filter Switch, Fan Failure Switch and Condensate Drain Pan Overflow Switch
F = Clogged Filter Switch, Discharge Air Sensing Tube and Condensate Drain Pan Overflow Switch
G = Fan Failure Switch, Discharge Air Sensing Tube and Condensate Drain Pan Overflow Switch
H = Clogged Filter Switch, Fan Failure Switch, Discharge Air Sensing and Condensate Drain Pan Overflow Switch

Digit 26 - System Monitoring Controls

0 = No Monitoring Controls
A = Demand Control Ventilation (CO_2)[13]
B = Low Leak Economizer with FDD (Fault Detection and Diagnostics)
C = FDD (Fault Detection and Diagnostics) with DCV (Demand Control Ventilation)

Digit 27 - Unit Hardware Enhancements

0 = No Enhancements
1 = Stainless Steel Drain Pan

Digit 31 - Advanced Unit Controls

0 = Standard Unit Controls
1 = Human Interface

Model Number Notes

1. Manual outside air damper will ship factory supplied within the unit, but must be field installed.
2. High pressure control is standard on all units.
3. Multi-stage, direct drive standard on 3 to 5 tons models. Belt drive standard on 6 to 8.5 tons standard efficiency models. Variable speed direct drive standard on 10 tons models and 6 to 8.5 tons high efficiency models.
4. Economizer with barometric relief is for downflow configured units only. Order economizer without barometric relief for horizontal configuration. Barometric relief for horizontal configured units must be ordered as field installed accessory.
5. Through-the-base electric required when ordering disconnect/circuit breaker options.
6. Requires use of disconnect or circuit breaker.
7. Standard metering devices are TXVs.
8. The return air smoke detector may not fit up or work properly on the Precedent™ units when used in conjunction with 3rd party accessories such as bolt on heat wheels, economizers and power exhaust. Do not order the return air smoke detectors when using this type of accessory.
9. Requires hinged access panels.
10. Motorized outside air damper is not available on Multi-Speed or SZVAV (Single Zone Variable Air Volume) or MZVAV (Multi Zone Variable Air Volume) products.
11. Frostat™ standard on 6 to 10 tons high efficiency heat pump, multi-speed and SZVAV (single zone variable air volume) products.
12. Multi-speed indoor fan available on 6, 7.5, 8.5 and 10 tons products.
13. Demand control ventilation option includes wiring only. The CO_2 sensor is a field-installed only option.
14. SZVAV/MZVAV is available on all high efficiency models. SZVAV is also available on 7.5 to 10 tons standard efficiency models.
15. Must be used with BACnet® open protocol.
16. Crankcase heater is standard on all 3 to 10 tons heat pumps.
17. Includes gas piping and shutoff (field assembly required).

General Data

Table 3. General data - 3 to 5 tons - standard efficiency

	3 Tons	4 Tons	5 Tons
	WSC036H3,4,W	**WSC048H3,4,W**	**WSC060H3,4,W**
Cooling Performance[a]			
Gross Cooling Capacity	39,500	50,000	61,000
EER/SEER[b]	3,4 = 12.1/14.3 W = 12.0/14.3	3,4 = 12.3/14.3 W = 12.2/14.3	3,4 = 12.3/14.3 W = 12.2/14.3
EER2/SEER2[c]	10.6/13.4	10.6/13.4	10.6/13.4
Nominal cfm/AHRI Rated cfm	1,200/1,200	1,600/1,600	2,000/2,000
AHRI Net Cooling Capacity	39,000	49,000	60,000
System Power (kW)	3.22	3.98	4.88
Heating Performance[d]			
High Temp. Btuh Rating	36,000	47,500	59,000
System Power kW/COP	3.01/3.50	3.98/3.50	4.94/3.50
System Power kW/COP2	3.22/3.40	3.92/3.50	4.86/3.50
Low Temp. Btuh Rating	20,600	26,000	35,000
System Power kW/COP	2.74/2.20	3.31/2.30	4.46/2.30
System Power kW/COP2	2.71/2.20	3.57/2.30	4.35/2.30
HSPF (Btu/Watts-hr)	8.00	8.20	8.20
HSPF2	7.20	7.20	7.20
Compressor			
Number/Type	1/Scroll	1/Scroll	1/Scroll
Sound			
Outdoor Sound Rating (dB)[e]	81	82	87
Outdoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.33	12.33	17.00
Rows/FPI	2/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	8.74	8.74	9.27
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan			
Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/22	1/22	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	3,600	4,050	5,130
Motor hp	0.25	0.33	0.40
Motor rpm	1,100	1,100	1,100

Table 3. General data - 3 to 5 tons - standard efficiency (continued)

	3 Tons	4 Tons	5 Tons
	WSC036H3,4,W	WSC048H3,4,W	WSC060H3,4,W
Indoor Fan			
Type (Standard)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1/11x11	1/11x11	1/11x11
Drive Type/No. Speeds/rpm	Direct/5(f)	Direct/5(f)	Direct/5(f)
Motor hp (standard/oversized)	0.75/1.5	1.0/1.5	1.0/1.5
Motor Frame Size (standard/oversized)	48/48	48/48	48/48
Filters(g)			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(2) 20x35x2	(2) 20x35x2	(4) 16x25x2
Refrigerant Charge(h)			
Pounds of R-410A	7.7	9.3	11.5

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) EER2 and SEER2 is rated at AHRI conditions and calculated in accordance with AHRI Standard 210/240-2023. Airflow and net cooling capacity not shown.
(d) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btuh rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(e) Outdoor sound rating shown is tested in accordance with AHRI Standard 270. For additional information reference the outdoor sound power level data in the performance section.
(f) For multispeed direct drive rpm values, reference the direct drive, evaporator fan performance table.
(g) Optional 2" MERV 8 and MERV 13 filters also available.
(h) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 4. General data - 6 to 10 tons - standard efficiency

	7.5 Tons	8.5 Tons	10 Tons
	WSC092H3,4,W	WSC102H3,4,W	WSC120H3,4,W
Cooling Performance(a)			
Gross Cooling Capacity	95,300	103,200	118,100
EER(b)	11.3	11.0	11.0
Nominal cfm/AHRI Rated cfm	3,000/3,000	3,400/3,315	4,000/4,000
AHRI Net Cooling Capacity	93,000	100,000	115,000
IEER(c)	14.1(d)	14.1(d)	14.1(d)
System Power (kW)	8.23	9.09	10.45
Heating Performance(e)			
High Temp. Btuh Rating	88,000(f)	92,000(f)	106,000
System Power kW/COP	7.59/3.40	7.93/3.40	9.14/3.40
Low Temp. Btuh Rating	48,000	48,500	58,500
System Power kW/COP	6.25/2.25	6.77/2.10	7.62/2.25
Compressor			
Number/Type	1/Scroll (2 Stage)	1/Scroll (2 Stage)	1/Scroll (2 Stage)
Sound			
Outdoor Sound Rating (dB)(g)	86	85	86

Table 4. General data - 6 to 10 tons - standard efficiency (continued)

	7.5 Tons	8.5 Tons	10 Tons
	WSC092H3,4,W	WSC102H3,4,W	WSC120H3,4,W
Outdoor Coil			
Type	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	19.83	23.34	23.34
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil			
Type	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.36	12.36	12.36
Rows/FPI	3/16	4/16	4/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan			
Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/26	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	6,200	6,200	6,200
Motor hp	0.70	0.70	0.70
Motor rpm	1,100	1,100	1,100
Indoor Fan			
Type	FC Centrifugal(h)	FC Centrifugal(h)	BC Plenum
Number Used/Diameter (in.)/Width (in.)	1/15 x 15(i)	1/15 x 15(i)	1/19.7x15
Drive Type/No. Speeds/rpm	Belt/ Variable/1,750(j)	Belt/ Variable/1,750(j)	Direct/Variable(k)
Motor hp (Standard/Oversized)	1.0/3.0(l)	2.0/3.0(l)	2.75/—
Motor Frame Size (Standard/Oversized)	56/56	56/56	—/—
Filters(m)			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2
Refrigerant Charge(n)			
Pounds of R-410A	14.6	18.0	16.3

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on ARI Standard 340/360.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) Integrated Efficiency Ratio (IEER) is rated in accordance with AHRI Standard 340/360. The IEER rating requires that the unit efficiency be determined at 100%, 75%, 50% and 25% load (net capacity) at the specified in AHRI Standard.
(d) 14.6 IEER for SZVAV and Title 24 2-speed fan option.
(e) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btu/h Rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 340/360.
(f) For SZVAV/Title 24 option, 8.5 tons high temp. Btuh rating = 89,000, 7.5 Tons high temp. Btuh rating = 87,000.
(g) Outdoor sound rating shown is tested in accordance with AHRI Standard 270-2015. For additional information reference the outdoor sound power level data in the performance section.
(h) For SZVAV/Title 24 option, backward airfoil plenum.
(i) For SZVAV/Title 24 option, 1/19.7X15.
(j) For SZVAV/Title 24 option, direct/variable.
(k) For multispeed direct drive rpm values, reference the direct drive, evaporator fan performance table.
(l) For SZVAV/Title 24 option, 2.75.

(m) Optional 2” MERV 8 and MERV 13 filters also available.
(n) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 5. General data - 3 to 5 tons - high efficiency

	3 Tons	4 Tons	5 Tons
	WHC036H3,4,W	WHC048H3,4,W	WHC060H3,4,W
Cooling Performance[a]			
Gross Cooling Capacity-High Stage	36,400	48,750	61,000
EER/SEER[b]	12.5/16.0	13.0/16.5	3=13.0/16.4 4,W=12.9/16.2
EER2/SEER2[c]	12.5/15.6	12.5/16.1	12.5/16.1
Nominal cfm-High Stage/AHRI Rated cfm	1,200/1,200	1,600/1,680	2,000/2,000
Nominal cfm-Low Stage/AHRI Rated cfm	840	1,120	1,400
AHRI Net Cooling Capacity-High Stage	36,000	48,000	60,000
System Power-High Stage (kW)	2.88	3.69	4.62
Heating Performance[d]			
High Temp. Btuh Rating-High Stage	32,200	44,000	57,000
System Power kW/COP-High Stage	2.62/3.60	3.58/3.60	4.64/3.60
System Power kW/COP2	2.71/3.50	3.53/3.60	4.41/3.60
Low Temp. Btuh Rating-High Stage	21,400	24,000	34,400
System Power kW/COP-High Stage	2.73/2.30	3.06/2.30	4.38/2.30
System Power kW/COP2	2.45/2.10	3.18/2.30	3.98/2.30
HSPF (Btu/Watts-hr)	8.80	8.80	9.00
HSPF2	8.00	8.40	8.50
Compressor			
Number/Type	1/Scroll (2-stage)	1/Scroll (2-stage)	1/Scroll (2-stage)
Sound			
Outdoor Sound Rating (dB)[e]	81	87	87
Outdoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.33	17.00	17.00
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	8.74	9.27	9.27
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan			
Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/22	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	3,600	5,130	5,130
Motor hp	0.25	0.40	0.40
Motor rpm	1,100	1,100	1,100

Table 5. General data - 3 to 5 tons - high efficiency (continued)

	3 Tons	4 Tons	5 Tons
	WHC036H3,4,W	**WHC048H3,4,W**	**WHC060H3,4,W**
Indoor Fan			
Type (Standard)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1/11x11	1/11x11	1/11x11
Drive Type/No. Speeds/rpm	Direct/Variable	Direct/Variable	Direct/Variable
Motor hp (standard/oversized)	0.75/1.5	1.0/1.5	1.0/1.5
Motor Frame Size (standard/oversized)	48/48	48/48	48/48
Filters[f]			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(2) 20x35x2	(4) 16x25x2	(4) 16x25x2
Refrigerant Charge[g]			
Pounds of R-410A	8.8	10.8	10.8

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) EER2 and SEER2 is rated at AHRI conditions and calculated in accordance with AHRI Standard 210/240-2023. Airflow and net cooling capacity not shown.
(d) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btuh rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(e) Outdoor sound rating shown is tested in accordance with AHRI Standard 270. For additional information reference the outdoor sound power level data in the performance section.
(f) Optional 2" MERV 8 and MERV 13 filters also available.
(g) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 6. General data - 6 to 10 tons - high efficiency

	6 Tons	7.5 Tons	8.5 Tons	10 Tons
	WHC074H3,4,W	**WHC092H3,4,W**	**WHC102H3,4,W**	**WHC120H3,4,W**
Cooling Performance[a]				
Gross Cooling Capacity - High Stage	78,900	96,200	105,900	123,600
EER[b]	12.1	11.8	3,4 = 12.0 / W = 11.8	11.5
Nominal CFM-High Stage / ARI Rated CFM	2,400 / 2,400	3,000 / 3,000	3,400 / 3,400	4,000 / 4,000
Nominal CFM-Low Stage / ARI Rated CFM	1,560	1,950	2,210	2,600
ARI Net Cooling Capacity - High Stage	78,000	95,000	104,000	121,000
IEER[c]	15.5[d]	15.5[d]	15.5[d]	15.5[d]
System Power - High Stage (kW)	6.45	8.05	8.67	10.52
Heating Performance[e]				
High Temp. Btuh Rating - High Stage	75,000	87,000	93,000	118,000
System Power kW/COP - High Stage	6.28 / 3,4 = 3.50 6.32 / W = 3.48	7.29 / 3,4 = 3.50 7.33 / W = 3.48	7.51 / 3,4 = 3.63 7.55 / W = 3.61	9.53 / 3,4 = 3.63 9.58 / W = 3.61
Low Temp. Btuh Rating - High Stage	40,000	49,000	57,000	61,000
System Power kW/COP - High Stage	5.21 / 2.25	6.38 / 2.25	7.42 / 2.25	7.95 / 2.25
Compressor				
Number/Type	2 / Scroll	2 / Scroll	2 / Scroll	2 / Scroll
Sound				
Outdoor Sound Rating (dB)[f]	86	86	85	85

Table 6. General data - 6 to 10 tons - high efficiency (continued)

	6 Tons	7.5 Tons	8.5 Tons	10 Tons
	WHC074H3,4,W	WHC092H3,4,W	WHC102H3,4,W	WHC120H3,4,W
Outdoor Coil				
Type	Lanced	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125	0.3125
Face Area (sq. ft.)	19.83	19.83	23.34	25.56
Rows/FPI	3 / 16	3 / 16	3 / 16	4 / 16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil				
Type	Lanced	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.36	12.36	12.36	16.59
Rows/FPI	3 / 16	3 / 16	4 / 16	4 / 16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan				
Type	Propeller	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1 / 26	1 / 26	1 / 26	1 / 30
Drive Type/No. Speeds	Direct / 1	Direct / 1	Direct / 1	Direct / 1
cfm	6200	6200	6200	6900
Motor hp	0.70	0.70	0.70	0.75
Motor rpm	1,100	1,100	1,100	1,100
Indoor Fan				
Type (Standard)	BC Plenum	BC Plenum	BC Plenum	BC Plenum
Number Used/Diameter (in.)/Width (in.)	1 / 19.7x15	1 / 19.7x15	1 / 19.7x15	1 / 19.7x15
Drive Type/No. Speeds/rpm	Direct/Variable(g)	Direct/Variable(g)	Direct/Variable(g)	Direct/Variable(g)
Motor hp (Standard/Oversized)	2.75 / -	2.75 / -	2.75 / -	2.75 / -
Motor Frame Size (Standard/Oversized)	- / -	- / -	- / -	- / -
Filters(h)				
Type Furnished	Throwaway	Throwaway	Throwaway	Throwaway
Number Size Recommended	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2	(3) 20x25x2 (2) 20x30x2
Refrigerant Charge(i)				
Pounds of R-410A	14.5	14.2	17.0	23.9

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on ARI Standard 340/360.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) Integrated Efficiency Ratio (IEER) is rated in accordance with AHRI Standard 340/360. The IEER rating requires that the unit efficiency be determined at 100%, 75%, 50% and 25% load (net capacity) at the specified in AHRI Standard.
(d) 16.5 IEER for SZ/MZVAV option, 16.0 IEER for Title24 2 speed fan option.
(e) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btu/h Rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 340/360.
(f) Outdoor sound rating shown is tested in accordance with AHRI Standard 270-2015. For additional information reference the outdoor sound power level data in the performance section.
(g) For multispeed direct drive rpm values, reference the direct drive, evaporator fan performance tables.
(h) Optional 2" MERV 8 and MERV 13 filters also available.
(i) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 7. General data - 3 to 5 tons - dual fuel efficiency

	3 Tons	4 Tons	5 Tons
	DHC036H3,4,W	DHC048H3,4,W	DHC060H3,4,W
Cooling Performance[a]			
Gross Cooling Capacity-High Stage	36,400	48,750	61,000
EER/SEER[b]	3=12.5/15.7 4,W=12.5/15.6	13.0/16.5	3=12.8/16.2 4,W=12.8/16.0
Nominal cfm-High Stage/AHRI Rated cfm	1,200/1,200	1,600/1,680	2,000/2,000
Nominal cfm-Low Stage/AHRI Rated cfm	840	1,120	1,400
AHRI Net Cooling Capacity-High Stage	36,000	48,000	60,000
System Power-High Stage (kW)	2.88	3.69	4.69
Heating Performance[c]			
High Temp. Btuh Rating-High Stage	32,200	44,000	57,000
System Power kW/COP-High Stage	2.62/3.60	3.58/3.60	4.64/3.60
Low Temp. Btuh Rating-High Stage	21,400	24,000	34,400
System Power kW/COP-High Stage	2.73/2.30	3.06/2.30	4.38/2.30
HSPF (Btu/Watts-hr)	8.80	8.80	8.90
Compressor			
Number/Type	1/Scroll (2-stage)	1/Scroll (2-stage)	1/Scroll (2-stage)
Sound			
Outdoor Sound Rating (dB)[d]	81	87	87
Outdoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.33	17.00	17.00
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	8.74	9.27	9.27
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan			
Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/22	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	3,600	5,130	5,130
Motor hp	0.25	0.40	0.40
Motor rpm	1,100	1,100	1,100
Indoor Fan			
Type (Standard)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1/11x11	1/11x11	1/11x11
Drive Type/No. Speeds/rpm	Direct/Variable	Direct/Variable	Direct/Variable
Motor hp (standard)	0.75	1.0	1.0
Motor Frame Size (standard)	48	48	48

Table 7. General data - 3 to 5 tons - dual fuel efficiency (continued)

	3 Tons	4 Tons	5 Tons
	DHC036H3,4,W	DHC048H3,4,W	DHC060H3,4,W
Filters[e]			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(2) 20x35x2	(4) 16x25x2	(4) 16x25x2
Refrigerant Charge[f]			
Pounds of R-410A	8.8	10.8	10.8
Gas Heating Performance (Dual Fuel Only)[g]			
Gas Heating Input (2nd stage/1st stage)			
Low Heat Input (Btu)	60,000/42,000	60,000/42,000	60,000/42,000
Mid Heat Input (Btu)	80,000/56,000	100,000/70,000	100,000/72,000
High Heat Input (Btu)	100,000/70,000	130,000/91,000	150,000/105,000
Gas Heating Output (2nd stage/1st stage)			
Low Heat Output (Btu)	48,600/34,020	48,600/34,020	48,600/34,020
Mid Heat Output (Btu)	64,800/45,360	81,000/56,700	81,000/58,320
High Heat Output (Btu)	81,000/56,700	105,300/73,710	121,500/85,050
Steady State Efficiency %	81%	81%	81%
No. Burners			
Low Heat Output (Btu)	2	2	2
Mid Heat Output (Btu)	2	3	3
High Heat Output (Btu)	3	3	4
No. Stages			
Low Heat Input (Btu)	2	2	2
Mid Heat Input (Btu)	2	2	2
High Heat Input (Btu)	2	2	2
Gas Supply Line Pressure			
Natural (minimum/maximum)	4.5/14.0	4.5/14.0	4.5/14.0
LP (minimum/maximum)	N/A	N/A	N/A
Gas Connection Pipe Size (in.)			
Low Heat	1/2	1/2	1/2
Mid Heat	1/2	1/2	1/2
High Heat	1/2	3/4	3/4

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btuh rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(d) Outdoor sound rating shown is tested in accordance with AHRI Standard 270. For additional information reference the outdoor sound power level data in the performance section.
(e) Optional 2" MERV 8 and MERV 13 filters also available.
(f) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.
(g) Heating performance limit settings and rating data were established and approved under laboratory test conditions using American National Standards Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level. Applicable to dual fuel units only.

Table 8. General data - 6 to 10 tons - dual fuel efficiency

	6 Tons	7.5 Tons	8.5 Tons	10 Tons
	DHC074H3,4,W	DHC092H3,4,W	DHC102H3,4,W	DHC120H3,4,W
Cooling Performance[a]				
Gross Cooling Capacity - High Stage	78,900	96,200	105,900	123,600
EER[b]	12.1	11.8	3,4 = 12.0 / W = 11.8	11.5
Nominal CFM-High Stage / ARI Rated CFM	2,400 / 2,400	3,000 / 3,000	3,400 / 3,400	4,000 / 4,000
Nominal CFM-Low Stage / ARI Rated CFM	1,560	1,950	2,210	2,600
ARI Net Cooling Capacity - High Stage	78,000	95,000	104,000	121,000
IEER[c]	15.5[d]	15.5[d]	15.5[d]	15.5[d]
System Power - High Stage (kW)	6.45	8.05	8.67	10.52
Heating Performance[e]				
High Temp. Btuh Rating - High Stage	75,000	87,000	93,000	118,000
System Power kW/COP - High Stage	6.28 / 3,4 = 3.50 6.32 / W = 3.48	7.29 / 3,4 = 3.50 7.33 / W = 3.48	7.51 / 3,4 = 3.63 7.55 / W = 3.61	9.53 / 3,4 = 3.63 9.58 / W = 3.61
Low Temp. Btuh Rating - High Stage	40,000	49,000	57,000	61,000
System Power kW/COP - High Stage	5.21 / 2.25	6.38 / 2.25	7.42 / 2.25	7.95 / 2.25
Compressor				
Number/Type	2 / Scroll	2 / Scroll	2 / Scroll	2 / Scroll
Sound				
Outdoor Sound Rating (dB)[f]	86	86	85	85
Outdoor Coil				
Type	Lanced	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125	0.3125
Face Area (sq. ft.)	19.83	19.83	23.34	25.56
Rows/FPI	3 / 16	3 / 16	3 / 16	4 / 16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil				
Type	Lanced	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.36	12.36	12.36	16.59
Rows/FPI	3 / 16	3 / 16	4 / 16	4 / 16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan				
Type	Propeller	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1 / 26	1 / 26	1 / 26	1 / 30
Drive Type/No. Speeds	Direct / 1	Direct / 1	Direct / 1	Direct / 1
cfm	6200	6200	6200	6900
Motor hp	0.70	0.70	0.70	0.75
Motor rpm	1,100	1,100	1,100	1,100

Table 8. General data - 6 to 10 tons - dual fuel efficiency (continued)

	6 Tons	7.5 Tons	8.5 Tons	10 Tons
	DHC074H3,4,W	DHC092H3,4,W	DHC102H3,4,W	DHC120H3,4,W
Indoor Fan				
Type (Standard)	BC Plenum	BC Plenum	BC Plenum	BC Plenum
Number Used/Diameter (in.)/Width (in.)	1 / 19.7x15	1 / 19.7x15	1 / 19.7x15	1 / 19.7x15
Drive Type/No. Speeds/rpm	Direct/Variable(g)	Direct/Variable(g)	Direct/Variable(g)	Direct/Variable(g)
Motor hp (Standard/Oversized)	2.75 / -	2.75 / -	2.75 / -	2.75 / -
Motor Frame Size (Standard/Oversized)	- / -	- / -	- / -	- / -
Filters(h)				
Type Furnished	Throwaway	Throwaway	Throwaway	Throwaway
Number Size Recommended	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2	(3) 20x25x2 (2) 20x30x2
Refrigerant Charge(i)				
Pounds of R-410A	14.5	14.2	17.0	23.9

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on ARI Standard 340/360.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) Integrated Efficiency Ratio (IEER) is rated in accordance with AHRI Standard 340/360. The IEER rating requires that the unit efficiency be determined at 100%, 75%, 50% and 25% load (net capacity) at the specified in AHRI Standard.
(d) 16.5 IEER for SZ/MZVAV option, 16.0 IEER for Title24 2 speed fan option.
(e) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btu/h Rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 340/360.
(f) Outdoor sound rating shown is tested in accordance with AHRI Standard 270-2015. For additional information reference the outdoor sound power level data in the performance section.
(g) For multispeed direct drive rpm values, reference the direct drive, evaporator fan performance tables.
(h) Optional 2" MERV 8 and MERV 13 filters also available.
(i) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 9. Heating Performance - 6 to 10 tons - dual fuel efficiency (gas/electric only)

	6 Tons			7.5 Tons			8.5 Tons			10 Tons		
	DHC074H3,4,W			DHC092H3,4,W			DHC102H3,4,W			DHC120H3,4,W		
Heating Models	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**
Heating Input (Btu)	80,000	120,000	150,000 / 105,000	120,000	150,000 / 105,000	200,000/ 140,000	120,000	150,000 / 105,000	200,000/ 140,000	150,000/ 105,000	200,000/ 140,000	250,000/ 175,000
Heating Output (Btu)	64,800	97,200	121,500 / 85,050	97,200	121,500 / 85,050	162,000/ 113,400	97,200	121,500 / 85,050	162,000/ 113,400	121,500 / 85,050	162,000/ 113,400	202,500/ 141,750
Steady State Efficiency %	81			81			81			81		
No. Burners	3	3	3	3	3	5	3	3	5	3	4	5
No. Stages	1	1	2	1	2	2	1	2	2	2	2	2
Gas Supply Line Pressure												
Natural (minimum/maximum) "w.c.	4.5 / 14.0			4.5 / 14.0			4.5 / 14.0			4.5 / 14.0		
LP (minimum/maximum) "w.c.	11.0 / 14.0			11.0 / 14.0			11.0 / 14.0			11.0 / 14.0		
Gas Connection Pipe Size (in)	1/2	1/2	3/4	1/2	3/4	3/4	1/2	3/4	3/4	3/4	3/4	3/4

Note: Heating performance limit settings and rating data were established and approved under laboratory test conditions using American National Standards Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level. Applicable to Gas/Electric units only.

Gross Cooling Capacities

Table 10. Gross cooling capacities 3 tons standard efficiency - three phase WSC036H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	36.0	28.2	40.5	22.2	45.2	15.9	33.6	26.8	37.8	20.9	42.3	14.7	31.0	25.4	35.1	19.5	39.3	13.3
960	80	36.0	33.2	40.6	27.3	45.3	21.1	33.6	31.7	38.0	26.0	42.4	19.8	31.1	30.3	35.2	24.7	39.4	18.5
960	85	36.2	36.2	40.7	32.4	45.4	26.3	34.1	34.1	38.0	31.1	42.5	25.0	32.1	32.1	35.3	29.7	39.5	23.6
960	90	38.2	38.2	40.7	37.4	45.5	31.4	36.2	36.2	38.1	36.1	42.6	30.1	34.1	34.1	35.4	34.6	39.6	28.8
1080	75	36.8	30.0	41.4	23.3	46.1	16.2	34.3	28.6	38.6	21.9	43.0	14.9	31.6	27.2	35.7	20.5	39.8	13.5
1080	80	36.9	35.5	41.5	29.0	46.2	22.0	34.4	34.1	38.7	27.7	43.1	20.7	31.8	31.8	35.8	26.3	40.0	19.4
1080	85	37.8	37.8	41.6	34.8	46.3	27.8	35.7	35.7	38.8	33.4	43.3	26.5	33.5	33.5	35.9	32.0	40.1	25.1
1080	90	40.1	40.1	41.7	40.3	46.4	33.6	38.0	38.0	39.0	38.9	43.4	32.3	35.7	35.7	36.2	36.2	40.2	30.9
1200	75	37.5	31.9	42.1	24.3	46.8	16.5	34.8	30.4	39.2	22.9	43.6	15.1	32.1	28.8	36.1	21.5	40.3	13.7
1200	80	37.7	37.7	42.2	30.7	46.9	23.0	35.1	35.1	39.3	29.3	43.7	21.6	32.5	32.5	36.3	27.9	40.4	20.2
1200	85	39.4	39.4	42.3	37.1	47.0	29.4	37.1	37.1	39.5	35.7	43.9	28.0	34.8	34.8	36.5	34.3	40.6	26.6
1200	90	41.8	41.8	42.6	42.6	47.1	35.8	39.5	39.5	39.8	39.8	44.0	34.4	37.1	37.1	37.1	37.1	40.7	33.0
1320	75	38.1	33.7	42.7	25.4	47.3	16.8	35.3	32.2	39.6	23.9	44.0	15.4	32.4	30.4	36.5	22.5	40.6	13.9
1320	80	38.5	38.5	42.8	32.4	47.4	23.9	35.9	35.9	39.8	31.0	44.1	22.5	33.5	33.5	36.7	29.5	40.8	21.0
1320	85	40.8	40.8	43.0	39.4	47.6	30.9	38.4	38.4	40.0	37.7	44.3	29.5	35.9	35.9	36.9	36.2	40.9	28.1
1320	90	43.3	43.3	43.5	43.5	47.7	38.0	40.8	40.8	40.9	40.9	44.5	36.6	38.2	38.2	38.3	38.3	41.1	35.1
1440	75	38.6	35.5	43.1	26.4	47.8	17.0	35.7	33.7	40.0	24.9	44.3	15.6	32.8	32.1	36.8	23.4	40.8	14.1
1440	80	39.3	39.3	43.3	34.1	47.9	24.7	36.9	36.9	40.2	32.6	44.5	23.3	34.4	34.4	37.0	31.1	41.0	21.8
1440	85	42.0	42.0	43.5	41.5	48.1	32.5	39.5	39.5	40.5	40.0	44.7	31.0	36.8	36.8	37.4	37.4	41.2	29.6
1440	90	44.5	44.5	44.6	44.6	48.2	40.1	41.9	41.9	42.0	42.0	44.9	38.7	39.2	39.2	39.3	39.3	41.4	37.3

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	28.4	24.0	32.2	18.2	36.1	12.0	25.7	22.6	29.3	16.8	32.8	10.6
960	80	28.5	28.5	32.4	23.3	36.2	17.2	25.8	25.8	29.4	21.9	33.0	15.8
960	85	29.9	29.9	32.4	28.4	36.4	22.3	27.7	27.7	29.5	26.9	33.1	20.9
960	90	31.9	31.9	32.6	32.6	36.5	27.4	29.6	29.6	29.7	29.7	33.2	26.0
1080	75	28.8	25.8	32.7	19.1	36.6	12.2	26.0	24.1	29.6	17.7	33.1	10.8
1080	80	29.2	29.2	32.9	24.9	36.7	18.0	26.8	26.8	29.7	23.4	33.3	16.6
1080	85	31.2	31.2	33.0	30.6	36.8	23.8	28.8	28.8	29.9	28.9	33.4	22.3
1080	90	33.3	33.3	33.4	33.4	37.0	29.5	30.8	30.8	30.9	30.9	33.6	28.1
1200	75	29.2	27.2	33.0	20.1	36.9	12.3	26.3	25.7	29.8	18.6	33.3	10.9
1200	80	30.2	30.2	33.2	26.5	37.0	18.8	27.7	27.7	30.0	25.0	33.5	17.3
1200	85	32.3	32.3	33.4	32.5	37.2	25.2	29.8	29.8	30.3	30.3	33.6	23.7
1200	90	34.5	34.5	34.6	34.6	37.3	31.6	31.8	31.8	31.9	31.9	33.8	30.1
1320	75	29.5	28.9	33.3	21.0	37.1	12.5	26.5	26.5	29.9	19.5	33.4	11.0
1320	80	31.0	31.0	33.5	28.0	37.3	19.6	28.4	28.4	30.1	26.5	33.6	18.1
1320	85	33.3	33.3	33.8	33.8	37.4	26.6	30.5	30.5	30.6	30.6	33.8	25.1
1320	90	35.5	35.5	35.6	35.6	37.6	33.7	32.7	32.7	32.7	32.7	34.0	31.8
1440	75	29.8	29.8	33.5	21.9	37.2	12.6	26.8	26.8	30.0	20.4	33.4	11.1
1440	80	31.7	31.7	33.7	29.6	37.4	20.4	28.9	28.9	30.2	27.7	33.7	18.8
1440	85	34.1	34.1	34.2	34.2	37.6	28.1	31.2	31.2	31.2	31.2	33.9	26.5
1440	90	36.4	36.4	36.4	36.4	37.9	35.4	33.3	33.3	33.4	33.4	34.2	33.8

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 11. Gross cooling capacities 4 tons standard efficiency - three phase WSC048H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1280	75	45.5	36.5	50.8	28.3	56.4	19.8	42.8	35.0	47.9	26.8	53.1	18.3	40.0	33.5	44.8	25.3	49.7	16.8
1280	80	45.9	43.3	51.0	35.2	56.6	26.8	43.3	41.7	48.1	33.7	53.3	25.3	40.6	40.2	45.0	32.2	49.9	23.8
1280	85	47.4	47.4	51.2	42.1	56.7	33.7	45.1	45.1	48.3	40.6	53.5	32.2	42.7	42.7	45.3	39.1	50.1	30.7
1280	90	50.1	50.1	51.7	48.8	56.9	40.6	47.8	47.8	48.9	47.3	53.7	39.1	45.3	45.3	45.9	45.7	50.4	37.6
1440	75	46.6	39.1	51.8	29.8	57.4	20.2	43.8	37.6	48.7	28.3	54.0	18.7	40.9	36.0	45.5	26.7	50.4	17.2
1440	80	47.3	46.7	52.0	37.5	57.5	28.0	44.6	44.6	49.0	36.0	54.2	26.5	41.8	41.8	45.8	34.5	50.7	25.0
1440	85	49.5	49.5	52.4	45.3	57.7	35.8	47.1	47.1	49.4	43.8	54.4	34.3	44.5	44.5	46.3	42.3	50.9	32.8
1440	90	52.4	52.4	53.2	52.9	58.0	43.6	49.9	49.9	50.3	50.3	54.7	42.1	47.2	47.2	47.3	47.3	51.2	40.5
1600	75	47.5	41.6	52.6	31.2	58.1	20.6	44.6	40.1	49.4	29.7	54.7	19.0	41.6	38.1	46.1	28.1	51.0	17.5
1600	80	48.5	48.5	52.9	39.8	58.3	29.2	45.8	45.8	49.8	38.3	54.9	27.7	43.2	43.2	46.5	36.7	51.3	26.2
1600	85	51.4	51.4	53.4	48.5	58.5	37.9	48.8	48.8	50.3	46.7	55.1	36.4	46.0	46.0	47.1	45.0	51.5	34.8
1600	90	54.4	54.4	54.6	54.6	58.9	46.6	51.7	51.7	51.8	51.8	55.6	45.1	48.9	48.9	49.0	49.0	52.0	43.5
1720	75	48.3	44.1	53.2	32.6	58.8	20.9	45.4	42.2	50.0	31.0	55.2	19.4	42.3	40.4	46.6	29.4	51.4	17.8
1720	80	49.8	49.8	53.6	42.1	59.0	30.5	47.2	47.2	50.4	40.6	55.5	28.9	44.4	44.4	47.0	39.0	51.7	27.3
1720	85	53.0	53.0	54.4	51.4	59.3	40.0	50.2	50.2	51.3	49.7	55.8	38.4	47.4	47.4	48.0	48.0	52.1	36.9
1720	90	56.1	56.1	56.2	56.2	59.8	49.6	53.3	53.3	53.4	53.4	56.3	48.0	50.3	50.3	50.4	50.4	52.7	46.4
1920	75	49.0	46.2	53.7	34.0	59.3	21.3	46.1	44.5	50.4	32.4	55.6	19.7	42.9	42.8	46.9	30.8	51.8	18.1
1920	80	51.1	51.1	54.3	44.4	59.5	31.7	48.4	48.4	51.0	42.8	55.9	30.1	45.5	45.5	47.5	41.2	52.1	28.5
1920	85	54.4	54.4	55.3	54.4	59.9	42.1	51.5	51.5	52.1	52.1	56.3	40.5	48.5	48.5	48.7	48.7	52.5	38.9
1920	90	57.6	57.6	57.7	57.7	60.5	52.5	54.7	54.7	54.8	54.8	57.0	51.0	51.5	51.5	51.6	51.6	53.2	48.9

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1280	75	37.0	31.9	41.5	23.7	46.1	15.4	33.9	30.2	38.0	22.0	42.2	13.6
1280	80	37.8	37.8	41.7	30.6	46.4	22.2	34.9	34.9	38.2	28.9	42.5	20.6
1280	85	40.1	40.1	42.1	37.5	46.6	29.1	37.3	37.3	38.6	35.5	42.7	27.5
1280	90	42.6	42.6	42.9	42.9	46.8	36.0	39.7	39.7	39.8	39.8	43.0	34.4
1440	75	37.8	34.0	42.1	25.1	46.7	15.6	34.5	32.3	38.5	23.4	42.7	13.9
1440	80	39.1	39.1	42.4	32.8	47.0	23.4	36.2	36.2	38.8	31.1	43.0	21.7
1440	85	41.7	41.7	42.9	40.3	47.2	31.2	38.7	38.7	39.4	38.5	43.2	29.5
1440	90	44.4	44.4	44.5	44.5	47.6	39.0	41.3	41.3	41.3	41.3	43.6	37.3
1600	75	38.5	36.4	42.6	26.4	47.2	15.9	35.2	34.5	38.9	24.7	43.0	14.2
1600	80	40.4	40.4	43.0	35.1	47.5	24.5	37.3	37.3	39.3	33.3	43.4	22.8
1600	85	43.1	43.1	43.8	43.3	47.7	33.2	39.9	39.9	40.2	40.2	43.7	31.5
1600	90	45.9	45.9	45.9	45.9	48.2	41.9	42.6	42.6	42.6	42.6	44.2	40.2
1720	75	39.1	38.7	43.0	27.8	47.5	16.2	35.7	35.7	39.2	26.0	43.3	14.4
1720	80	41.4	41.4	43.5	37.3	47.8	25.7	38.2	38.2	39.7	35.1	43.6	24.0
1720	85	44.3	44.3	44.5	44.5	48.2	35.2	41.0	41.0	41.0	41.0	44.0	33.5
1720	90	47.1	47.1	47.2	47.2	48.8	44.8	43.6	43.6	43.7	43.7	44.7	42.4
1920	75	39.7	39.7	43.3	29.1	47.8	16.4	36.2	36.2	39.4	27.3	43.5	14.7
1920	80	42.4	42.4	43.9	39.0	48.1	26.8	39.0	39.0	40.1	37.1	43.8	25.1
1920	85	45.3	45.3	45.4	45.4	48.6	37.3	41.8	41.8	41.9	41.9	44.3	35.5
1920	90	48.2	48.2	48.3	48.3	49.4	47.1	44.5	44.5	44.6	44.6	45.2	45.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 12. Gross cooling capacities 5 tons standard efficiency - three phase WSC060H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1600	75	56.3	46.5	63.0	35.9	70.1	24.9	52.8	44.7	59.1	34.1	65.7	23.1	49.0	42.7	54.9	32.2	61.2	21.2
1600	80	56.6	55.4	63.1	44.8	70.2	33.9	53.1	53.1	59.2	43.0	65.9	32.1	49.4	49.4	55.1	41.1	61.3	30.2
1600	85	58.0	58.0	63.3	53.7	70.3	42.9	55.0	55.0	59.4	51.9	66.0	41.1	51.9	51.9	55.3	50.0	61.5	39.2
1600	90	61.3	61.3	63.5	62.6	70.4	51.8	58.3	58.3	59.8	59.8	66.2	50.0	55.0	55.0	55.8	55.8	61.7	48.1
1800	75	57.5	49.7	64.2	37.8	71.3	25.4	53.7	47.8	60.0	35.9	66.7	23.5	49.8	45.8	55.7	33.9	61.9	21.6
1800	80	58.0	58.0	64.3	47.8	71.4	35.5	54.4	54.4	60.2	45.9	66.9	33.7	50.6	50.6	55.9	43.9	62.1	31.7
1800	85	60.5	60.5	64.5	57.8	71.5	45.6	57.3	57.3	60.5	55.9	67.1	43.8	53.9	53.9	56.2	54.0	62.3	41.8
1800	90	64.0	64.0	65.1	65.1	71.7	55.6	60.7	60.7	61.3	61.3	67.3	53.8	57.2	57.2	57.2	57.2	62.5	51.9
2000	75	58.4	52.9	65.1	39.6	72.2	25.9	54.5	50.9	60.8	37.6	67.5	24.0	50.5	48.6	56.3	35.6	62.5	22.0
2000	80	59.3	59.3	65.3	50.7	72.4	37.1	55.6	55.6	61.0	48.8	67.7	35.2	52.2	52.2	56.5	46.7	62.7	33.2
2000	85	62.6	62.6	65.6	61.8	72.5	48.3	59.2	59.2	61.4	59.9	67.9	46.4	55.6	55.6	57.0	57.0	62.9	44.4
2000	90	66.3	66.3	66.6	66.6	72.7	59.5	62.8	62.8	62.8	62.8	68.1	57.6	59.0	59.0	59.1	59.1	63.2	55.6
2200	75	59.2	56.0	65.9	41.4	73.0	26.3	55.2	54.0	61.4	39.3	68.1	24.3	51.0	51.0	56.7	37.3	63.0	22.3
2200	80	60.6	60.6	66.1	53.6	73.2	38.7	57.2	57.2	61.7	51.6	68.3	36.7	53.5	53.5	57.0	49.5	63.2	34.7
2200	85	64.5	64.5	66.5	65.9	73.4	51.0	60.9	60.9	62.3	62.3	68.6	49.0	57.1	57.1	57.8	57.8	63.4	47.0
2200	90	68.3	68.3	68.2	68.2	73.6	63.3	64.6	64.6	64.7	64.7	68.8	61.3	60.6	60.6	60.7	60.7	63.8	59.3
2400	75	59.9	59.2	66.5	43.1	73.7	26.8	55.8	55.8	61.9	41.1	68.6	24.7	51.5	51.5	57.1	38.9	63.4	22.6
2400	80	62.2	62.2	66.8	56.5	73.9	40.3	58.5	58.5	62.2	54.5	68.8	38.2	54.6	54.6	57.4	52.3	63.6	36.1
2400	85	66.2	66.2	67.4	67.4	74.1	53.7	62.4	62.4	63.1	63.1	69.1	51.7	58.3	58.3	58.5	58.5	63.8	49.6
2400	90	70.1	70.1	70.2	70.2	74.3	67.1	66.2	66.2	66.3	66.3	69.5	65.1	62.0	62.0	62.1	62.1	64.3	63.1

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1600	75	45.0	40.7	50.5	30.2	56.3	19.3	40.8	38.7	45.8	28.1	51.1	17.2
1600	80	45.6	45.6	50.7	39.1	56.5	28.3	41.9	41.9	46.0	37.0	51.3	26.2
1600	85	48.5	48.5	51.0	48.0	56.7	37.3	44.8	44.8	46.3	46.0	51.5	35.2
1600	90	51.5	51.5	51.7	51.7	56.8	46.2	47.7	47.7	47.8	47.8	51.7	44.2
1800	75	45.6	43.8	51.1	31.8	56.9	19.6	41.2	41.2	46.2	29.7	51.5	17.5
1800	80	47.1	47.1	51.3	41.9	57.1	29.7	43.3	43.3	46.4	39.8	51.7	27.6
1800	85	50.3	50.3	51.7	51.7	57.3	39.8	46.3	46.3	47.0	47.0	51.9	37.7
1800	90	53.4	53.4	53.5	53.5	57.5	49.9	49.3	49.3	49.4	49.4	52.2	47.8
2000	75	46.1	46.1	51.5	33.5	57.3	19.9	41.7	41.7	46.5	31.3	51.7	17.7
2000	80	48.4	48.4	51.8	44.7	57.5	31.2	44.4	44.4	46.7	42.5	51.9	29.0
2000	85	51.7	51.7	52.5	52.5	57.7	42.4	47.5	47.5	47.7	47.7	52.2	40.2
2000	90	55.0	55.0	55.1	55.1	58.0	53.6	50.7	50.7	50.7	50.7	52.6	51.4
2200	75	46.7	46.7	51.8	35.1	57.6	20.2	42.1	42.1	46.6	32.9	51.8	18.0
2200	80	49.5	49.5	52.1	47.4	57.8	32.6	45.3	45.3	47.0	45.2	52.1	30.4
2200	85	53.0	53.0	53.2	53.2	58.1	44.9	48.5	48.5	48.6	48.6	52.3	42.7
2200	90	56.4	56.4	56.5	56.5	58.5	57.3	51.8	51.8	51.8	51.8	52.9	52.9
2400	75	47.1	47.1	52.0	36.7	57.8	20.5	42.5	42.5	46.7	34.5	51.9	18.2
2400	80	50.5	50.5	52.4	50.2	58.1	34.0	46.0	46.0	47.2	47.2	52.2	31.7
2400	85	54.0	54.0	53.9	53.9	58.3	47.4	49.4	49.4	49.4	49.4	52.4	45.2
2400	90	57.5	57.5	57.6	57.6	59.0	59.0	52.7	52.7	52.7	52.7	53.3	53.3

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 13. Gross cooling capacities 7.5 tons standard efficiency - three phase WSC092H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2400	75	87.1	70.9	97.1	55.2	107.9	39.0	82.3	68.1	91.7	52.8	101.8	36.6	77.2	65.5	86.0	50.3	95.4	34.1
2400	80	88.0	83.4	97.4	68.3	108.1	52.2	83.3	81.0	92.0	65.9	102.1	49.8	78.4	78.4	86.4	63.4	95.8	47.3
2400	85	91.3	91.3	97.8	81.4	108.4	65.3	87.2	87.2	92.5	78.5	102.4	62.9	82.8	82.8	86.9	75.9	96.1	60.4
2400	90	96.5	96.5	98.8	93.9	108.6	78.4	92.3	92.2	93.6	91.4	102.7	76.0	87.7	87.7	88.2	88.2	96.4	73.5
2700	75	89.2	75.2	99.1	58.0	109.8	39.8	84.2	72.7	93.4	55.5	103.5	37.3	78.8	70.0	87.5	53.0	96.8	34.8
2700	80	90.5	89.8	99.4	72.7	110.1	54.6	85.7	85.7	93.8	70.3	103.8	52.1	81.1	81.1	87.9	67.7	97.2	49.6
2700	85	95.3	95.3	100.1	86.9	110.4	69.4	90.9	90.9	94.6	84.3	104.2	66.9	86.2	86.2	88.8	81.6	97.6	64.4
2700	90	100.8	100.8	101.6	101.5	110.8	84.1	96.2	96.2	96.4	96.4	104.6	81.7	91.3	91.3	91.5	91.5	98.1	79.2
3000	75	90.9	79.8	100.7	60.7	111.3	40.5	85.7	77.2	94.8	58.2	104.8	38.0	80.2	74.4	88.7	55.6	97.9	35.4
3000	80	93.0	93.0	101.1	77.1	111.7	57.0	88.5	88.5	95.3	74.6	105.2	54.5	83.7	83.7	89.2	71.3	98.4	51.9
3000	85	98.7	98.7	102.1	92.7	112.1	73.4	94.1	94.1	96.4	90.1	105.6	70.9	89.0	89.0	90.4	87.4	98.8	68.3
3000	90	104.5	104.5	104.6	104.6	112.6	89.8	99.6	99.6	99.8	99.8	106.3	86.6	94.4	94.4	94.5	94.5	99.6	83.9
3300	75	92.4	84.3	102.0	63.4	112.6	41.2	87.1	81.6	96.0	60.9	105.9	38.6	81.5	78.8	89.6	58.2	98.8	36.0
3300	80	95.8	95.8	102.5	81.4	113.1	59.3	91.1	91.1	96.6	78.1	106.4	56.8	86.0	86.0	90.3	75.3	99.4	54.2
3300	85	101.8	101.8	103.8	98.5	113.5	77.3	96.8	96.8	98.0	95.8	106.8	74.8	91.5	91.5	92.0	92.0	99.9	72.2
3300	90	107.7	107.7	107.9	107.9	114.2	94.6	102.6	102.6	102.7	102.7	107.7	91.9	97.0	97.0	97.2	97.2	100.8	89.2
3600	75	93.8	88.8	103.1	66.1	113.7	41.8	88.4	86.0	96.9	63.5	106.8	39.3	82.7	82.7	90.4	60.8	99.5	36.6
3600	80	98.3	98.3	103.8	84.9	114.2	61.6	93.3	93.3	97.7	82.2	107.4	59.1	88.0	88.0	91.3	79.3	100.2	56.4
3600	85	104.4	104.4	105.5	104.3	114.6	81.3	99.2	99.2	99.6	99.6	107.8	78.8	93.7	93.7	93.7	93.7	100.7	76.1
3600	90	110.6	110.6	110.7	110.7	115.6	99.9	105.1	105.1	105.3	105.3	108.9	97.2	99.3	99.3	99.5	99.5	101.9	94.4

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2400	75	71.8	62.7	80.0	47.7	88.7	31.5	66.2	59.9	73.6	44.9	81.4	28.8
2400	80	73.5	73.5	80.4	60.8	89.1	44.7	68.6	68.6	74.0	58.0	81.9	42.0
2400	85	78.1	78.1	81.0	73.2	89.4	57.9	73.0	73.0	74.8	70.3	82.3	55.1
2400	90	82.8	82.8	83.0	83.0	89.8	71.0	77.5	77.5	77.7	77.7	82.7	67.6
2700	75	73.3	67.2	81.2	50.3	89.8	32.1	67.4	64.2	74.6	47.5	82.4	29.4
2700	80	76.2	76.2	81.7	64.5	90.3	47.0	71.0	71.0	75.1	61.5	82.9	44.2
2700	85	81.1	81.1	82.7	78.9	90.7	61.8	75.7	75.7	76.3	76.0	83.3	59.0
2700	90	86.1	86.1	86.2	86.2	91.3	75.8	80.4	80.4	80.5	80.5	84.0	72.8
3000	75	74.5	71.5	82.2	52.9	90.7	32.7	68.5	68.5	75.3	50.1	83.0	29.9
3000	80	78.6	78.6	82.8	68.4	91.3	49.2	73.0	73.0	76.0	65.4	83.6	46.4
3000	85	83.7	83.7	84.3	84.3	91.7	65.7	77.9	77.9	78.0	78.0	84.1	62.9
3000	90	88.8	88.8	88.9	88.9	92.5	81.0	82.7	82.7	82.8	82.8	85.0	78.0
3300	75	75.7	75.7	82.9	55.5	91.4	33.3	69.7	69.7	75.9	52.6	83.6	30.5
3300	80	80.6	80.6	83.8	72.4	92.1	51.5	74.8	74.8	76.8	69.3	84.2	48.6
3300	85	85.9	85.9	85.9	85.9	92.6	69.5	79.7	79.7	79.8	79.8	84.8	65.6
3300	90	91.1	91.1	91.3	91.3	93.6	86.3	84.7	84.7	84.8	84.8	86.0	83.2
3600	75	76.9	76.9	83.6	58.0	92.0	33.9	71.1	71.1	76.3	55.1	84.0	31.0
3600	80	82.3	82.3	84.6	76.3	92.7	53.7	76.2	76.2	77.5	73.2	84.7	50.8
3600	85	87.7	87.7	87.9	87.9	93.3	72.3	81.3	81.3	81.4	81.4	85.4	69.1
3600	90	93.1	93.1	93.2	93.2	94.6	91.5	86.4	86.4	86.5	86.5	86.9	86.9

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 14. Gross cooling capacities 8.5 tons standard efficiency - three phase WSC102H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2720	75	94.0	78.7	104.8	60.7	116.6	42.1	89.2	76.4	99.5	58.3	110.6	39.7	84.1	73.8	93.9	55.8	104.2	37.2
2720	80	94.4	92.8	105.2	75.8	116.8	57.3	89.8	89.8	99.8	73.4	110.8	54.9	85.0	85.0	94.2	70.9	104.5	52.4
2720	85	97.5	97.5	105.4	90.8	117.1	72.4	93.5	93.5	100.1	88.4	111.1	70.0	89.2	89.2	94.5	85.9	104.9	67.6
2720	90	103.0	103.0	106.0	104.8	117.4	87.6	98.8	98.8	100.9	100.9	111.4	85.2	94.4	94.4	95.5	95.5	105.2	82.7
3060	75	96.0	84.3	106.9	63.9	118.7	43.0	90.9	81.8	101.3	61.4	112.4	40.5	85.7	79.2	95.4	58.9	105.7	37.9
3060	80	96.9	96.9	107.3	80.9	118.9	60.1	92.1	92.1	101.7	78.4	112.6	57.6	87.2	87.2	95.8	75.9	106.1	55.0
3060	85	101.6	101.6	107.6	97.8	119.3	77.1	97.3	97.3	102.1	95.3	113.1	74.7	92.7	92.7	96.3	91.5	106.5	72.1
3060	90	107.4	107.4	108.7	108.7	119.6	94.1	102.9	102.9	103.5	103.5	113.4	91.7	98.1	98.1	98.1	98.1	106.9	89.1
3400	75	97.6	89.7	108.6	67.1	120.4	43.8	92.3	85.9	102.8	64.5	113.8	41.3	87.0	83.2	96.7	61.9	106.9	38.6
3400	80	99.2	99.2	109.0	85.9	120.7	62.8	94.5	94.5	103.2	83.4	114.2	60.3	90.0	90.0	97.2	80.8	107.4	57.7
3400	85	105.1	105.1	109.4	103.4	121.1	81.8	100.5	100.5	103.8	100.7	114.6	79.3	95.6	95.6	97.8	97.8	107.9	76.7
3400	90	111.2	111.2	111.3	111.3	121.5	100.7	106.4	106.4	106.3	106.3	115.0	98.2	101.3	101.3	101.5	101.5	108.3	95.5
3740	75	99.0	93.7	110.1	70.2	121.8	44.6	93.7	91.0	104.0	67.6	115.0	42.0	88.1	88.1	97.7	64.9	107.9	39.3
3740	80	101.7	101.7	110.5	91.0	122.2	65.6	97.3	97.3	104.5	88.3	115.5	63.0	92.3	92.3	98.2	85.7	108.5	60.3
3740	85	108.2	108.2	111.1	110.0	122.6	86.4	103.3	103.3	105.3	105.3	116.0	83.8	98.2	98.2	99.3	99.3	109.0	81.2
3740	90	114.5	114.5	114.7	114.7	123.0	107.2	109.4	109.4	109.6	109.6	116.4	104.6	104.1	104.1	104.2	104.2	109.4	101.9
4080	75	100.3	98.8	111.3	73.3	122.9	45.4	94.9	94.9	105.1	70.6	115.9	42.7	89.2	89.2	98.6	67.9	108.6	40.0
4080	80	104.5	104.5	111.8	95.9	123.4	68.3	99.5	99.5	105.6	93.3	116.5	65.6	94.3	94.3	99.1	90.5	109.4	62.9
4080	85	110.9	110.9	112.7	112.7	123.9	91.0	105.8	105.8	106.8	106.8	117.1	88.4	100.4	100.4	100.7	100.7	109.9	85.7
4080	90	117.4	117.4	117.6	117.6	124.3	113.7	112.1	112.1	112.2	112.2	117.5	109.0	106.4	106.4	106.6	106.6	110.4	106.1

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2720	75	78.8	71.2	87.9	53.2	97.5	34.6	73.1	67.4	81.6	50.5	90.3	31.8
2720	80	79.9	79.9	88.3	68.3	97.9	49.8	74.9	74.9	82.0	65.6	90.8	47.1
2720	85	84.6	84.6	88.7	82.2	98.3	65.0	79.7	79.7	82.5	79.3	91.2	62.3
2720	90	89.7	89.7	90.0	90.0	98.6	80.1	84.5	84.5	84.6	84.6	91.6	77.4
3060	75	80.1	75.3	89.3	56.2	98.8	35.3	74.3	72.4	82.7	53.4	91.3	32.5
3060	80	82.5	82.5	89.7	73.2	99.2	52.4	77.4	77.4	83.1	70.4	91.9	49.6
3060	85	87.8	87.8	90.3	88.7	99.7	69.5	82.5	82.5	83.9	83.9	92.3	66.7
3060	90	93.0	93.0	93.2	93.2	100.0	86.5	87.5	87.5	87.6	87.6	92.7	83.7
3400	75	81.3	80.3	90.3	59.2	99.7	35.9	75.3	75.3	83.5	56.3	92.0	33.1
3400	80	85.0	85.0	90.8	78.1	100.3	55.0	79.6	79.6	84.0	75.2	92.7	52.2
3400	85	90.4	90.4	91.7	91.7	100.8	74.0	84.8	84.8	85.2	85.2	93.2	71.1
3400	90	95.9	95.9	96.0	96.0	101.2	92.9	90.0	90.0	90.1	90.1	93.7	88.1
3740	75	82.4	82.4	91.2	62.1	100.4	36.6	76.3	76.3	84.1	59.2	92.6	33.7
3740	80	87.0	87.0	91.6	82.9	101.2	57.6	81.4	81.4	84.6	78.1	93.4	54.7
3740	85	92.7	92.7	93.0	93.0	101.7	78.4	86.7	86.7	86.6	86.6	93.9	75.6
3740	90	98.3	98.3	98.4	98.4	102.2	97.1	92.1	92.1	92.1	92.1	94.5	94.0
4080	75	83.3	83.3	91.8	65.0	101.1	37.2	77.2	77.2	84.6	62.1	93.0	34.3
4080	80	88.8	88.8	92.4	85.7	101.9	60.1	82.9	82.9	85.2	82.5	93.9	57.2
4080	85	94.6	94.6	94.4	94.4	102.4	82.9	88.4	88.4	88.5	88.5	94.4	79.9
4080	90	100.4	100.4	100.5	100.5	103.1	103.1	93.8	93.8	93.9	93.9	95.3	95.3

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 15. Gross cooling capacities 10 tons standard efficiency - three phase WSC120H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
3200	75	109.4	92.2	121.1	70.6	133.2	48.3	103.1	89.2	114.2	67.6	125.6	45.3	96.4	85.9	106.7	64.4	117.3	42.2
3200	80	110.5	108.9	121.4	88.4	133.6	66.2	104.6	104.6	114.6	85.4	126.0	63.2	98.2	98.2	107.1	82.1	117.9	60.1
3200	85	115.3	115.3	121.9	106.0	134.0	84.0	110.0	110.0	115.1	102.0	126.5	81.0	104.1	104.1	107.8	98.7	118.3	77.9
3200	90	121.6	121.6	123.2	122.6	134.3	101.7	116.0	116.0	116.7	116.7	126.8	98.8	109.9	109.9	110.0	110.0	118.7	95.7
3600	75	111.6	98.7	123.2	74.3	135.2	49.2	105.1	94.4	116.1	71.3	127.3	46.2	98.2	90.9	108.3	68.0	118.7	43.0
3600	80	113.5	113.5	123.6	94.3	135.7	69.3	107.6	107.6	116.5	91.2	127.9	66.4	101.6	101.6	108.8	87.9	119.4	63.2
3600	85	119.8	119.8	124.3	113.0	136.2	89.4	114.1	114.1	117.4	109.7	128.4	86.4	107.8	107.8	109.9	106.3	119.9	83.2
3600	90	126.3	126.3	126.5	126.5	136.5	109.3	120.4	120.4	120.6	120.6	128.8	106.4	113.9	113.9	114.0	114.0	120.5	103.2
4000	75	113.5	103.7	124.9	78.0	136.8	50.1	106.9	100.3	117.6	74.8	128.7	47.1	99.8	96.7	109.6	71.5	119.9	43.8
4000	80	116.8	116.8	125.4	100.1	137.4	72.5	111.0	111.0	118.1	97.0	129.4	69.5	104.5	104.5	110.1	93.7	120.7	66.2
4000	85	123.6	123.6	126.5	120.7	137.9	94.7	117.5	117.5	119.4	117.4	129.9	91.7	110.9	110.9	111.7	111.7	121.2	88.5
4000	90	130.3	130.3	130.5	130.5	138.4	116.9	124.1	124.1	124.2	124.2	130.5	113.9	117.2	117.2	117.3	117.3	121.9	108.9
4400	75	115.2	109.7	126.4	81.6	138.1	51.0	108.4	106.2	118.8	78.4	129.8	47.9	101.2	101.2	110.6	75.0	120.8	44.6
4400	80	119.9	119.9	126.9	105.9	138.9	75.6	113.7	113.7	119.4	102.8	130.6	72.6	107.0	107.0	111.3	97.5	121.7	69.3
4400	85	126.8	126.8	128.4	128.4	139.4	100.1	120.5	120.5	121.2	121.2	131.2	97.0	113.5	113.5	113.6	113.6	122.3	93.8
4400	90	133.8	133.8	134.0	134.0	140.0	122.7	127.2	127.2	127.4	127.4	132.0	119.5	120.0	120.0	120.1	120.1	123.3	115.9
4800	75	116.7	115.6	127.6	85.1	139.3	51.9	109.9	109.9	119.8	81.9	130.7	48.8	102.5	102.5	111.5	78.5	121.5	45.4
4800	80	122.5	122.5	128.2	110.0	140.1	78.7	116.1	116.1	120.5	106.5	131.7	75.6	109.1	109.1	112.3	102.8	122.6	72.3
4800	85	129.7	129.7	130.3	130.3	140.6	105.4	123.0	123.0	123.1	123.1	132.2	102.3	115.8	115.8	115.9	115.9	123.1	99.0
4800	90	136.8	136.8	137.0	137.0	141.5	129.9	129.9	129.9	130.1	130.1	133.3	126.5	122.4	122.4	122.5	122.5	124.5	122.9

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
3200	75	89.4	81.4	98.9	61.1	108.5	38.9	82.3	77.8	90.7	57.7	99.2	35.5
3200	80	92.2	92.2	99.3	78.8	109.2	56.9	85.8	85.8	91.1	75.4	100.0	53.5
3200	85	97.8	97.8	100.2	95.2	109.7	74.7	91.1	91.1	92.2	91.5	100.5	71.3
3200	90	103.4	103.4	103.6	103.6	110.1	92.4	96.3	96.3	96.5	96.5	101.0	87.6
3600	75	91.0	87.2	100.2	64.6	109.6	39.7	83.6	83.5	91.7	61.2	100.1	36.3
3600	80	95.2	95.2	100.7	84.6	110.5	59.9	88.4	88.4	92.3	79.5	101.0	56.5
3600	85	101.1	101.1	102.0	102.0	111.0	79.9	93.9	93.9	94.0	94.0	101.5	76.5
3600	90	106.9	106.9	107.0	107.0	111.6	98.3	99.3	99.3	99.4	99.4	102.3	94.5
4000	75	92.4	92.4	101.2	68.1	110.5	40.5	85.0	85.0	92.5	64.6	100.7	37.0
4000	80	97.7	97.7	101.9	88.5	111.5	62.9	90.5	90.5	93.2	84.7	101.7	59.4
4000	85	103.8	103.8	103.9	103.9	112.0	85.2	96.2	96.2	96.3	96.3	102.3	81.7
4000	90	109.7	109.7	109.9	109.9	112.9	105.2	101.7	101.7	101.8	101.8	103.4	101.4
4400	75	93.8	93.8	102.0	71.5	111.3	41.2	86.5	86.5	93.1	68.0	101.2	37.7
4400	80	99.9	99.9	102.9	93.7	112.3	65.9	92.3	92.3	94.1	89.8	102.3	62.4
4400	85	106.1	106.1	106.2	106.2	112.9	90.4	98.0	98.0	98.1	98.1	102.9	84.5
4400	90	112.2	112.2	112.3	112.3	114.1	112.2	103.7	103.7	103.8	103.8	104.4	104.4
4800	75	95.2	95.2	102.7	75.0	111.8	42.0	87.9	87.9	93.5	71.3	101.6	38.4
4800	80	101.7	101.7	103.7	98.9	112.9	68.9	93.8	93.8	94.8	94.8	102.8	65.3
4800	85	108.0	108.0	108.1	108.1	113.5	93.2	99.6	99.6	99.7	99.7	103.5	89.1
4800	90	114.2	114.2	114.3	114.3	115.2	115.2	105.4	105.4	105.5	105.5	105.5	105.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 16. Gross cooling capacities 3 tons - high efficiency high stage - three phase W/DHC036H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	33.4	26.8	37.6	20.7	42.1	14.4	31.0	25.4	35.1	19.4	39.3	13.1	28.6	24.0	32.4	18.0	36.4	11.7
960	80	33.5	31.8	37.7	25.9	42.2	19.7	31.2	30.4	35.2	24.6	39.4	18.3	28.8	28.8	32.6	23.2	36.5	17.0
960	85	34.5	34.5	37.8	31.1	42.3	24.9	32.6	32.6	35.3	29.8	39.6	23.6	30.5	30.5	32.6	28.4	36.7	22.2
960	90	36.6	36.6	37.9	36.1	42.4	30.2	34.7	34.7	35.5	34.7	39.7	28.8	32.5	32.5	32.9	32.9	36.8	27.4
1080	75	34.1	28.7	38.4	21.8	42.8	14.7	31.7	27.3	35.7	20.4	39.9	13.3	29.1	25.6	33.0	19.0	36.9	11.9
1080	80	34.4	34.3	38.5	27.7	43.0	20.6	32.0	32.0	35.9	26.3	40.1	19.3	29.8	29.8	33.1	24.9	37.1	17.9
1080	85	36.2	36.2	38.6	33.5	43.1	26.6	34.1	34.1	36.0	31.9	40.3	25.2	31.9	31.9	33.3	30.5	37.3	23.8
1080	90	38.4	38.4	38.9	38.9	43.2	32.4	36.3	36.3	36.4	36.4	40.4	31.1	34.0	34.0	34.1	34.1	37.4	29.6
1200	75	34.7	30.4	39.0	22.9	43.5	15.0	32.2	28.9	36.2	21.5	40.4	13.6	29.6	27.4	33.4	20.0	37.3	12.1
1200	80	35.2	35.2	39.1	29.4	43.6	21.6	33.1	33.1	36.4	28.0	40.6	20.2	30.8	30.8	33.5	26.5	37.5	18.7
1200	85	37.6	37.6	39.3	35.7	43.8	28.2	35.4	35.4	36.6	34.2	40.8	26.8	33.0	33.0	33.8	32.7	37.7	25.3
1200	90	40.0	40.0	40.1	40.1	43.9	34.7	37.7	37.7	37.8	37.8	41.0	33.3	35.3	35.3	35.3	35.3	37.9	31.8
1320	75	35.3	32.1	39.5	24.0	43.9	15.3	32.7	30.6	36.7	22.5	40.8	13.8	30.0	29.1	33.7	21.0	37.6	12.3
1320	80	36.4	36.4	39.7	31.2	44.2	22.5	34.1	34.1	36.8	29.7	41.1	21.1	31.7	31.7	33.9	28.2	37.8	19.6
1320	85	38.9	38.9	40.0	38.0	44.4	29.8	36.5	36.5	37.2	36.5	41.3	28.3	34.0	34.0	34.3	34.3	38.0	26.8
1320	90	41.3	41.3	41.4	41.4	44.5	36.9	38.9	38.9	39.0	39.0	41.5	35.5	36.4	36.4	36.4	36.4	38.3	33.7
1440	75	35.7	33.9	39.9	25.0	44.4	15.5	33.1	32.4	37.0	23.5	41.2	14.1	30.3	30.3	33.9	22.0	37.8	12.6
1440	80	37.4	37.4	40.1	32.9	44.6	23.5	35.0	35.0	37.2	31.4	41.4	22.0	32.5	32.5	34.2	29.5	38.1	20.5
1440	85	40.0	40.0	40.6	40.3	44.8	31.3	37.5	37.5	37.7	37.7	41.6	29.9	34.9	34.9	34.9	34.9	38.3	28.3
1440	90	42.6	42.6	42.6	42.6	45.0	39.2	40.0	40.0	40.1	40.1	41.9	37.3	37.3	37.3	37.4	37.4	38.6	35.8

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	26.1	22.6	29.6	16.5	33.3	10.3	23.4	20.9	26.7	15.1	30.1	8.8
960	80	26.3	26.3	29.8	21.8	33.5	15.5	24.1	24.1	26.8	20.3	30.3	14.1
960	85	28.3	28.3	29.9	26.7	33.7	20.8	26.0	26.0	27.0	25.2	30.4	19.3
960	90	30.3	30.3	30.4	30.4	33.8	26.0	27.9	27.9	27.9	27.9	30.6	24.5
1080	75	26.5	24.1	30.1	17.5	33.7	10.5	23.7	22.5	27.0	16.0	30.4	9.0
1080	80	27.5	27.5	30.2	23.4	33.9	16.4	25.1	25.1	27.2	21.9	30.6	14.9
1080	85	29.5	29.5	30.4	29.0	34.1	22.3	27.0	27.0	27.4	27.4	30.8	20.8
1080	90	31.6	31.6	31.7	31.7	34.2	28.2	29.0	29.0	29.1	29.1	30.9	26.4
1200	75	26.9	25.8	30.4	18.5	34.0	10.7	24.0	24.0	27.2	16.9	30.5	9.1
1200	80	28.4	28.4	30.5	25.0	34.3	17.3	25.8	25.8	27.4	23.1	30.8	15.7
1200	85	30.6	30.6	30.9	30.9	34.5	23.8	27.9	27.9	27.9	27.9	31.0	22.3
1200	90	32.7	32.7	32.8	32.8	34.6	30.0	30.0	30.0	30.0	30.0	31.2	28.4
1320	75	27.2	27.2	30.6	19.5	34.2	10.8	24.3	24.3	27.3	17.9	30.6	9.3
1320	80	29.2	29.2	30.8	26.3	34.5	18.1	26.5	26.5	27.6	24.6	30.9	16.5
1320	85	31.4	31.4	31.5	31.5	34.7	25.3	28.6	28.6	28.7	28.7	31.1	23.7
1320	90	33.7	33.7	33.7	33.7	35.0	32.1	30.7	30.7	30.8	30.8	31.5	30.4
1440	75	27.5	27.5	30.7	20.4	34.4	11.0	24.8	24.8	27.4	18.8	30.7	9.4
1440	80	29.8	29.8	31.0	27.8	34.7	18.9	27.0	27.0	27.7	26.1	31.0	17.3
1440	85	32.2	32.2	32.2	32.2	34.9	26.8	29.2	29.2	29.3	29.3	31.3	24.7
1440	90	34.5	34.5	34.5	34.5	35.3	34.1	31.4	31.4	31.5	31.5	31.7	31.7

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 17. Gross cooling capacities 3 tons - high efficiency low stage - three phase W/DHC036H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
600	75	22.7	17.5	25.9	13.7	29.3	9.9	21.0	16.4	24.0	12.7	27.2	8.8
600	80	22.7	20.6	25.9	17.1	29.3	13.2	21.0	19.6	24.1	16.0	27.3	12.2
600	85	22.9	22.9	26.0	20.4	29.4	16.6	21.5	21.5	24.1	19.3	27.4	15.5
600	90	24.4	24.4	25.9	23.5	29.4	19.9	23.0	23.0	24.1	22.5	27.5	18.8
720	75	23.6	19.5	26.9	14.9	30.3	10.2	21.8	18.3	24.9	13.9	28.1	9.2
720	80	23.7	23.2	27.0	18.9	30.4	14.3	21.9	21.9	25.0	17.8	28.2	13.2
720	85	24.8	24.8	27.0	22.9	30.5	18.3	23.3	23.3	25.0	21.7	28.3	17.2
720	90	26.5	26.5	27.1	26.7	30.5	22.3	24.9	24.9	25.1	25.1	28.4	21.2
840	75	24.3	21.3	27.6	16.1	31.0	10.6	22.4	20.1	25.5	15.0	28.7	9.5
840	80	24.7	24.7	27.7	20.7	31.2	15.3	23.0	23.0	25.6	19.6	28.9	14.2
840	85	26.4	26.4	27.8	25.2	31.3	20.0	24.8	24.8	25.7	24.0	29.0	18.8
840	90	28.2	28.2	28.3	28.3	31.3	24.6	26.5	26.5	26.6	26.6	29.1	23.5
960	75	24.9	23.1	28.1	17.2	31.5	10.9	22.8	21.9	25.9	16.0	29.1	9.7
960	80	25.9	25.9	28.3	22.5	31.7	16.2	24.1	24.1	26.0	21.1	29.3	15.1
960	85	27.8	27.8	28.5	27.6	31.9	21.6	26.0	26.0	26.3	26.3	29.5	20.4
960	90	29.7	29.7	29.8	29.8	32.0	26.7	27.8	27.8	27.9	27.9	29.6	25.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 18. Gross cooling capacities 4 tons - high stage - three phase W/DHC048H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1280	75	45.0	37.2	50.3	28.7	55.8	19.9	42.1	35.7	47.0	27.2	52.2	18.4	38.9	34.1	43.6	25.6	48.3	16.8
1280	80	45.2	43.9	50.5	35.9	56.0	27.2	42.3	42.3	47.3	34.4	52.4	25.6	39.3	39.3	43.9	32.8	48.6	24.1
1280	85	46.3	46.3	50.7	43.1	56.2	34.4	43.9	43.9	47.5	41.6	52.7	32.9	41.3	41.3	44.1	40.0	48.9	31.3
1280	90	49.1	49.1	50.9	49.6	56.4	41.6	46.6	46.6	47.8	47.8	53.0	40.1	43.9	43.9	44.5	44.5	49.2	38.5
1440	75	45.9	39.8	51.2	30.2	56.7	20.3	42.8	38.2	47.8	28.7	52.9	18.7	39.5	36.6	44.2	27.0	48.8	17.1
1440	80	46.3	46.3	51.5	38.3	57.0	28.4	43.3	43.3	48.1	36.7	53.2	26.9	40.2	40.2	44.5	35.1	49.3	25.3
1440	85	48.4	48.4	51.7	46.4	57.2	36.6	45.8	45.8	48.3	44.2	53.5	35.0	43.0	43.0	44.8	42.5	49.6	33.4
1440	90	51.3	51.3	52.1	52.1	57.5	44.7	48.6	48.6	48.9	48.9	53.8	43.1	45.7	45.7	45.7	45.7	49.8	41.5
1600	75	46.7	42.4	52.0	31.7	57.4	20.6	43.4	40.7	48.4	30.1	53.4	19.0	40.1	38.1	44.7	28.4	49.3	17.4
1600	80	47.3	47.3	52.3	40.7	57.7	29.7	44.4	44.4	48.8	39.1	53.9	28.1	41.5	41.5	45.0	37.4	49.7	26.5
1600	85	50.2	50.2	52.5	49.0	58.0	38.7	47.4	47.4	49.1	47.3	54.2	37.2	44.4	44.4	45.4	45.4	50.1	35.5
1600	90	53.2	53.2	53.3	53.3	58.3	47.7	50.3	50.3	50.4	50.4	54.5	46.2	47.2	47.2	47.2	47.2	50.4	44.5
1760	75	47.3	44.9	52.6	33.1	57.9	21.0	44.0	42.4	48.9	31.5	53.9	19.4	40.5	40.5	45.1	29.8	49.6	17.7
1760	80	48.6	48.6	52.9	43.0	58.4	31.0	45.7	45.7	49.3	41.4	54.4	29.4	42.6	42.6	45.4	39.6	50.1	27.7
1760	85	51.7	51.7	53.3	52.1	58.7	40.9	48.7	48.7	49.8	49.8	54.7	39.3	45.5	45.5	46.0	46.0	50.5	37.6
1760	90	54.9	54.8	54.9	54.9	59.0	50.8	51.8	51.8	51.8	51.8	55.1	49.2	48.4	48.4	48.5	48.5	50.8	46.5
1920	75	47.9	46.6	53.1	34.6	58.4	21.3	44.5	44.5	49.3	32.9	54.2	19.7	40.9	40.9	45.3	31.1	49.8	17.9
1920	80	49.8	49.8	53.5	45.3	58.9	32.2	46.8	46.8	49.7	43.6	54.8	30.6	43.6	43.6	45.7	40.9	50.4	28.8
1920	85	53.1	53.1	54.0	54.0	59.3	43.1	49.9	49.9	50.4	50.4	55.2	41.4	46.6	46.6	46.6	46.6	50.8	39.7
1920	90	56.3	56.3	56.4	56.4	59.6	53.8	53.0	53.0	53.1	53.1	55.5	51.2	49.5	49.5	49.6	49.6	51.2	49.3

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1280	75	35.6	31.9	40.0	24.0	44.2	15.2	32.1	30.1	36.1	22.3	39.9	13.5
1280	80	36.1	36.1	40.3	31.2	44.6	22.5	33.2	33.2	36.4	29.5	40.3	20.8
1280	85	38.5	38.5	40.5	37.7	44.9	29.7	35.5	35.5	36.7	35.9	40.6	28.0
1280	90	41.0	41.0	41.0	41.0	45.2	36.9	37.8	37.8	37.9	37.9	40.9	35.2
1440	75	36.1	34.2	40.4	25.3	44.6	15.4	32.5	32.3	36.4	23.6	40.1	13.7
1440	80	37.4	37.4	40.8	33.4	45.1	23.6	34.2	34.2	36.7	31.7	40.6	21.9
1440	85	40.0	40.0	41.1	40.7	45.4	31.8	36.7	36.7	37.2	37.2	40.9	30.0
1440	90	42.5	42.5	42.6	42.6	45.7	39.9	39.1	39.1	39.2	39.2	41.2	37.2
1600	75	36.6	36.4	40.8	26.7	44.9	15.7	32.9	32.9	36.6	24.9	40.2	13.9
1600	80	38.4	38.4	41.1	35.7	45.4	24.8	35.1	35.1	36.9	32.9	40.8	23.0
1600	85	41.1	41.1	41.6	41.6	45.8	33.8	37.6	37.6	37.7	37.7	41.1	32.0
1600	90	43.8	43.8	43.9	43.9	46.1	41.9	40.1	40.1	40.2	40.2	41.5	39.9
1760	75	36.9	36.9	41.0	28.0	45.1	15.9	33.2	33.2	36.7	26.1	40.3	14.1
1760	80	39.4	39.4	41.3	36.9	45.7	25.9	35.8	35.8	37.1	34.9	40.9	24.1
1760	85	42.1	42.1	42.2	42.2	46.0	35.9	38.4	38.4	38.5	38.5	41.2	34.0
1760	90	44.9	44.9	44.9	44.9	46.4	44.6	41.0	41.0	41.0	41.0	41.7	41.7
1920	75	37.3	37.3	41.1	29.3	45.2	16.1	33.7	33.7	36.7	27.4	40.3	14.3
1920	80	40.1	40.1	41.6	39.0	45.8	27.1	36.4	36.4	37.2	36.8	40.9	25.2
1920	85	43.0	43.0	43.0	43.0	46.2	37.9	39.0	39.0	39.1	39.1	41.3	34.8
1920	90	45.8	45.8	45.8	45.8	46.7	46.7	41.6	41.6	41.7	41.7	42.0	42.0

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 19. Gross cooling capacities 4 tons - low stage - three phase W/DHC048H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
800	75	30.3	23.9	34.3	18.9	38.5	13.6	30.3	23.9	34.3	18.9	38.5	13.6
800	80	30.3	28.0	34.5	23.3	38.7	18.1	30.3	28.0	34.5	23.3	38.7	18.1
800	85	30.3	30.3	34.6	27.7	38.9	22.5	30.3	30.3	34.6	27.7	38.9	22.5
800	90	32.3	32.3	34.6	31.8	39.0	27.0	32.3	32.3	34.6	31.8	39.0	27.0
960	75	31.4	26.5	35.5	20.4	39.7	14.0	31.4	26.5	35.5	20.4	39.7	14.0
960	80	31.5	31.4	35.7	25.7	39.9	19.4	31.5	31.4	35.7	25.7	39.9	19.4
960	85	32.8	32.8	35.8	31.0	40.1	24.8	32.8	32.8	35.8	31.0	40.1	24.8
960	90	34.9	34.9	35.9	35.9	40.3	30.1	34.9	34.9	35.9	35.9	40.3	30.1
1120	75	32.2	28.6	36.3	21.8	40.4	14.4	32.2	28.6	36.3	21.8	40.4	14.4
1120	80	32.5	32.5	36.6	28.1	40.8	20.7	32.5	32.5	36.6	28.1	40.8	20.7
1120	85	34.8	34.8	36.8	33.8	41.1	26.9	34.8	34.8	36.8	33.8	41.1	26.9
1120	90	37.1	37.1	37.1	37.1	41.3	33.2	37.1	37.1	37.1	37.1	41.3	33.2
1280	75	32.9	31.0	37.0	23.3	41.0	14.7	32.9	31.0	37.0	23.3	41.0	14.7
1280	80	34.0	34.0	37.3	30.4	41.5	21.9	34.0	34.0	37.3	30.4	41.5	21.9
1280	85	36.4	36.4	37.5	36.9	41.8	29.1	36.4	36.4	37.5	36.9	41.8	29.1
1280	90	38.9	38.9	38.9	38.9	42.0	36.2	38.9	38.9	38.9	38.9	42.0	36.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 20. Gross cooling capacities 5 tons - high stage - three phase W/DHC060H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1600	75	56.2	46.7	62.8	36.0	69.9	25.0	52.7	44.9	59.0	34.2	65.6	23.2	49.1	43.0	54.9	32.3	61.0	21.3
1600	80	56.6	55.2	63.1	45.0	70.1	34.0	53.2	53.2	59.2	43.2	65.8	32.3	49.7	49.7	55.2	41.4	61.3	30.4
1600	85	58.5	58.5	63.2	54.0	70.3	43.1	55.6	55.6	59.5	52.2	66.0	41.3	52.5	52.5	55.4	50.4	61.5	39.5
1600	90	61.9	61.9	63.7	62.5	70.4	52.1	58.9	58.9	60.0	60.0	66.3	50.3	55.7	55.7	56.2	56.2	61.8	48.5
1800	75	57.3	49.9	64.0	37.9	71.1	25.5	53.7	48.1	60.0	36.0	66.6	23.6	49.9	46.2	55.7	34.1	61.8	21.7
1800	80	58.1	58.1	64.3	48.0	71.3	35.7	54.6	54.6	60.2	46.2	66.8	33.8	51.0	51.0	56.0	44.2	62.1	31.9
1800	85	61.0	61.0	64.5	58.1	71.5	45.8	57.9	57.9	60.6	56.3	67.1	44.0	54.5	54.5	56.4	53.8	62.3	42.1
1800	90	64.6	64.6	65.3	65.3	71.7	56.0	61.4	61.4	61.6	61.6	67.3	54.2	57.9	57.9	58.0	58.0	62.6	52.3
2000	75	58.3	53.1	64.9	39.7	72.0	25.9	54.5	51.2	60.7	37.8	67.3	24.0	50.6	48.4	56.3	35.8	62.3	22.0
2000	80	59.5	59.5	65.2	51.0	72.3	37.3	56.2	56.2	61.0	49.1	67.6	35.4	52.7	52.7	56.6	47.1	62.7	33.4
2000	85	63.2	63.2	65.7	62.2	72.5	48.6	59.8	59.8	61.6	59.7	67.9	46.7	56.2	56.2	57.3	57.3	63.0	44.7
2000	90	67.0	67.0	67.0	67.0	72.8	59.8	63.5	63.5	63.6	63.6	68.2	58.0	59.7	59.7	59.8	59.8	63.4	56.0
2200	75	59.2	56.3	65.7	41.5	72.8	26.4	55.3	53.7	61.4	39.6	67.9	24.4	51.2	51.2	56.8	37.5	62.8	22.4
2200	80	61.2	61.2	66.0	53.9	73.1	38.9	57.7	57.7	61.7	52.0	68.3	36.9	54.0	54.0	57.1	50.0	63.2	34.9
2200	85	65.1	65.1	66.7	65.6	73.4	51.3	61.5	61.5	62.5	62.5	68.6	49.4	57.7	57.7	58.1	58.1	63.5	47.4
2200	90	69.0	69.0	69.1	69.1	73.7	63.7	65.3	65.3	65.4	65.4	69.0	61.8	61.3	61.3	61.4	61.4	64.0	59.8
2400	75	59.9	58.8	66.4	43.3	73.4	26.8	56.0	56.0	61.9	41.3	68.4	24.8	51.8	51.8	57.1	39.2	63.1	22.7
2400	80	62.7	62.7	66.7	56.8	73.8	40.4	59.1	59.1	62.3	54.8	68.8	38.4	55.2	55.2	57.6	52.8	63.6	36.4
2400	85	66.7	66.7	67.7	67.7	74.1	54.0	63.0	63.0	63.4	63.4	69.1	52.0	58.9	58.9	59.0	59.0	63.9	50.0
2400	90	70.8	70.8	70.9	70.9	74.5	67.5	66.9	66.9	67.0	67.0	69.7	65.6	62.7	62.7	62.8	62.8	64.5	62.6

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1600	75	45.2	41.1	50.6	30.4	56.2	19.4	41.1	38.5	46.0	28.4	51.0	17.4
1600	80	46.0	46.0	50.9	39.4	56.5	28.5	42.6	42.6	46.3	37.4	51.3	26.5
1600	85	49.1	49.1	51.2	48.5	56.8	37.5	45.5	45.5	46.7	45.8	51.6	35.5
1600	90	52.2	52.2	52.3	52.3	57.0	46.6	48.4	48.4	48.5	48.5	51.9	44.6
1800	75	45.8	43.6	51.2	32.1	56.7	19.7	41.6	41.4	46.4	30.0	51.4	17.6
1800	80	47.7	47.7	51.5	42.3	57.1	30.0	43.9	43.9	46.7	40.2	51.7	27.9
1800	85	50.9	50.9	52.0	51.7	57.4	40.1	47.0	47.0	47.4	47.4	52.1	38.1
1800	90	54.1	54.1	54.2	54.2	57.7	50.3	50.0	50.0	50.1	50.1	52.4	48.3
2000	75	46.5	46.5	51.6	33.8	57.1	20.0	42.1	42.1	46.7	31.7	51.6	17.9
2000	80	49.0	49.0	52.0	45.1	57.5	31.4	45.0	45.0	47.1	43.0	52.0	29.3
2000	85	52.4	52.4	52.8	52.8	57.9	42.7	48.2	48.2	48.2	48.2	52.3	40.6
2000	90	55.7	55.7	55.8	55.8	58.3	54.0	51.3	51.3	51.4	51.4	52.8	51.0
2200	75	47.0	47.0	52.0	35.5	57.4	20.3	42.6	42.6	46.8	33.3	51.7	18.2
2200	80	50.2	50.2	52.4	47.9	57.9	32.9	45.9	45.9	47.3	44.8	52.2	30.7
2200	85	53.6	53.6	53.6	53.6	58.2	45.3	49.2	49.2	49.2	49.2	52.5	43.2
2200	90	57.1	57.1	57.1	57.1	58.8	56.8	52.4	52.4	52.4	52.4	53.3	53.3
2400	75	47.5	47.5	52.2	37.1	57.6	20.6	43.3	43.3	46.9	34.9	51.8	18.4
2400	80	51.1	51.1	52.7	49.7	58.1	34.3	46.7	46.7	47.6	47.3	52.3	32.1
2400	85	54.7	54.7	54.7	54.7	58.5	47.9	50.0	50.0	50.1	50.1	52.7	45.7
2400	90	58.2	58.2	58.3	58.3	59.3	59.3	53.3	53.3	53.3	53.3	53.6	53.6

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 21. Gross cooling capacities 5 tons - low stage - three phase W/DHC060H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1000	75	37.3	29.7	42.3	23.4	47.8	16.9	34.8	28.4	39.6	22.1	44.7	15.6
1000	80	37.3	35.2	42.4	29.0	47.9	22.5	34.8	33.6	39.7	27.7	44.8	21.1
1000	85	37.3	37.3	42.6	34.5	48.0	28.0	35.3	35.3	39.9	33.2	45.0	26.7
1000	90	39.6	39.6	42.5	39.9	48.1	33.6	37.6	37.6	39.9	38.6	45.1	32.3
1200	75	38.7	33.0	43.8	25.4	49.3	17.4	36.0	31.6	40.8	23.9	46.0	16.0
1200	80	38.8	38.8	44.0	32.0	49.4	24.2	36.1	36.1	41.0	30.6	46.1	22.7
1200	85	40.3	40.3	44.1	38.6	49.6	30.8	38.1	38.1	41.2	37.2	46.3	29.4
1200	90	42.9	42.9	44.2	44.2	49.7	37.5	40.6	40.6	41.4	41.4	46.5	36.1
1400	75	39.6	36.2	44.8	27.2	50.4	17.9	36.7	34.7	41.7	25.7	46.8	16.5
1400	80	40.1	40.1	45.1	35.0	50.6	25.8	37.6	37.6	41.9	33.5	47.1	24.3
1400	85	42.7	42.7	45.2	42.7	50.8	33.6	40.3	40.3	42.1	40.8	47.3	32.1
1400	90	45.5	45.5	45.8	45.8	51.0	41.4	43.0	43.0	43.1	43.1	47.5	39.9
1600	75	40.4	39.3	45.6	29.0	51.2	18.4	37.4	37.2	42.3	27.5	47.4	16.9
1600	80	41.8	41.8	45.9	37.9	51.4	27.4	39.2	39.2	42.6	36.3	47.7	25.8
1600	85	44.8	44.8	46.2	46.2	51.7	36.3	42.1	42.1	43.0	43.0	48.0	34.7
1600	90	47.8	47.8	47.9	47.9	51.9	45.2	45.0	45.0	45.1	45.1	48.3	43.6

Notes:
1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 22. Gross cooling capacities 6 tons high efficiency - stage 1 - three phase W/DHC074H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	29.6	25.5	33.6	19.8	37.7	13.5	27.6	24.4	31.4	18.8	35.3	12.4
	80	29.7	29.7	33.7	25.1	37.9	18.9	27.8	27.8	31.6	23.8	35.6	17.8
	85	31.4	31.4	33.8	29.9	38.1	24.2	29.8	29.8	31.6	28.9	35.8	23.2
	90	33.5	33.5	33.8	33.8	38.2	29.2	31.8	31.8	31.9	31.9	35.9	28.1
1200	75	30.8	29.1	34.8	22.0	38.8	14.1	28.7	28.0	32.4	21.0	36.2	13.0
	80	31.9	31.9	35.0	28.2	39.2	20.8	30.1	30.1	32.6	27.0	36.7	19.8
	85	34.2	34.2	35.1	34.6	39.4	27.5	32.4	32.4	32.9	32.9	36.9	26.5
	90	36.5	36.5	36.6	36.6	39.6	33.5	34.6	34.6	34.7	34.7	37.1	32.4
1440	75	31.7	31.7	35.5	24.2	39.5	14.6	29.5	29.5	33.1	22.5	36.8	13.5
	80	33.9	33.9	35.8	31.4	40.0	22.7	31.9	31.9	33.4	30.2	37.4	21.6
	85	36.4	36.4	36.4	36.4	40.3	30.1	34.3	34.3	34.4	34.4	37.7	28.9
	90	38.9	38.9	38.9	38.9	40.6	37.9	36.8	36.8	36.9	36.9	38.0	36.7
1680	75	32.8	32.8	36.1	25.6	40.0	15.1	30.7	30.7	33.5	24.3	37.1	14.0
	80	35.4	35.4	36.5	34.7	40.6	24.6	33.3	33.3	34.0	33.4	37.9	23.5
	85	38.1	38.1	38.1	38.1	41.0	33.0	35.9	35.9	35.9	35.9	38.3	31.8
	90	40.8	40.8	40.8	40.8	41.4	41.4	38.5	38.5	38.5	38.5	38.8	38.8
1920	75	33.9	33.9	36.5	27.4	40.3	15.6	31.7	31.7	33.9	26.1	37.3	14.4
	80	36.7	36.7	37.1	37.1	41.0	25.5	34.4	34.4	34.6	34.6	38.2	24.2
	85	39.5	39.5	39.5	39.5	41.5	36.0	37.1	37.1	37.1	37.1	38.7	34.7
	90	42.3	42.3	42.3	42.3	42.3	42.3	39.9	39.9	39.9	39.9	40.0	40.0
2100	75	34.6	34.6	36.8	28.8	40.5	16.0	32.3	32.3	34.1	27.4	37.4	14.8
	80	37.5	37.5	37.6	37.6	41.3	27.8	35.1	35.1	35.1	35.1	38.4	25.3
	85	40.3	40.3	40.4	40.4	41.8	38.1	37.9	37.9	37.9	37.9	39.0	36.8
	90	43.2	43.2	43.3	43.3	43.3	43.3	40.7	40.7	40.8	40.8	40.8	40.8

Notes:
1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 23. Gross cooling capacities 6 tons high efficiency - stage 2 - three phase W/DHC074H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	38.1	29.8	42.9	23.6	48.0	17.1	35.8	28.5	40.4	22.3	45.2	15.9
	80	38.0	34.7	43.0	28.9	48.1	22.5	35.8	33.4	40.5	27.7	45.2	21.2
	85	37.8	37.8	43.0	34.1	48.1	27.8	36.1	36.1	40.5	32.9	45.4	26.6
	90	40.0	40.0	43.0	39.0	48.2	33.1	38.2	38.2	40.5	37.8	45.5	31.9
1200	75	39.8	33.4	44.7	25.9	49.8	17.8	37.3	32.1	42.0	24.6	46.7	16.5
	80	39.9	39.8	44.9	32.5	49.9	24.5	37.5	37.5	42.1	31.2	46.9	23.2
	85	41.5	41.5	44.9	38.8	50.0	31.1	39.5	39.5	42.2	37.4	47.0	29.9
	90	44.0	44.0	45.0	45.0	50.2	37.8	41.9	41.9	42.4	42.4	47.1	36.5
1440	75	41.1	37.1	46.0	28.1	50.9	18.3	38.4	35.7	43.0	26.8	47.7	17.0
	80	41.7	41.7	46.1	36.1	51.1	26.4	39.5	39.5	43.2	34.3	48.0	25.1
	85	44.4	44.4	46.3	43.5	51.3	34.4	42.1	42.1	43.4	42.1	48.2	33.1
	90	47.1	47.1	47.2	47.2	51.4	41.9	44.7	44.7	44.8	44.8	48.3	40.5
1680	75	42.1	40.7	46.9	30.3	51.7	18.9	39.3	39.2	43.8	28.9	48.4	17.5
	80	43.8	43.8	47.1	39.1	52.0	28.3	41.4	41.4	44.0	37.6	48.7	26.9
	85	46.7	46.7	47.4	47.4	52.2	37.6	44.1	44.1	44.5	44.5	48.9	36.3
	90	49.5	49.5	49.6	49.6	52.4	46.2	46.9	46.9	47.0	47.0	49.2	44.8
1920	75	42.9	42.9	47.5	32.4	52.4	19.4	40.1	40.1	44.3	31.0	48.9	18.0
	80	45.5	45.5	47.8	42.3	52.7	30.1	42.9	42.9	44.6	40.8	49.3	28.7
	85	48.5	48.5	48.6	48.6	52.9	40.2	45.8	45.8	45.9	45.9	49.5	38.7
	90	51.5	51.5	51.6	51.6	53.3	50.6	48.7	48.7	48.8	48.8	49.9	49.1
2100	75	43.6	43.6	47.9	34.0	52.7	19.8	40.9	40.9	44.6	32.5	49.2	18.4
	80	46.6	46.6	48.3	44.8	53.1	31.5	43.9	43.9	45.0	43.2	49.6	30.1
	85	49.7	49.7	49.8	49.8	53.4	42.4	46.9	46.9	46.9	46.9	49.9	40.9
	90	52.8	52.8	52.8	52.8	53.8	53.8	49.9	49.9	49.9	49.9	50.5	50.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 24. Gross cooling capacities 6 tons - full load - three phase W/DHC074H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1920	75	72.1	56.8	80.7	44.8	89.7	32.2	68.0	54.7	76.0	42.6	84.5	30.0	63.6	52.4	71.2	40.4	79.0	27.8
	80	72.3	66.7	80.8	54.9	89.8	42.4	68.3	64.5	76.2	52.8	84.6	40.3	64.0	62.3	71.4	50.5	79.1	38.0
	85	73.6	73.6	80.9	65.0	89.9	52.6	70.2	70.2	76.4	62.9	84.7	50.4	66.6	66.6	71.5	60.6	79.3	48.2
	90	77.7	77.7	81.2	74.8	90.0	62.7	74.2	74.2	76.7	72.7	84.9	60.6	70.5	70.5	72.0	70.4	79.4	58.3
2160	75	73.8	60.6	82.4	47.0	91.4	32.8	69.5	58.4	77.5	44.7	85.9	30.6	64.9	56.1	72.4	42.4	80.2	28.3
	80	74.3	71.7	82.5	58.4	91.5	44.3	70.1	69.4	77.7	56.1	86.1	42.1	65.7	65.7	72.6	53.8	80.4	39.8
	85	77.0	77.0	82.7	69.7	91.6	55.7	73.3	73.3	78.0	67.5	86.2	53.5	69.4	69.4	72.9	64.9	80.5	51.2
	90	81.4	81.4	83.3	80.8	91.8	67.2	77.6	77.6	78.7	78.6	86.4	64.9	73.5	73.5	73.9	73.9	80.7	62.6
2400	75	75.2	64.3	83.8	49.1	92.8	33.3	70.7	62.0	78.7	46.8	87.1	31.1	66.0	59.3	73.4	44.5	81.2	28.7
	80	76.1	76.1	84.0	61.8	92.9	46.1	71.8	71.8	78.9	59.5	87.2	43.8	67.6	67.6	73.6	57.1	81.3	41.5
	85	80.0	80.0	84.3	74.1	93.1	58.8	76.0	76.0	79.3	71.8	87.4	56.6	71.8	71.8	74.1	69.4	81.5	54.2
	90	84.5	84.5	85.3	85.3	93.2	71.5	80.4	80.4	80.6	80.6	87.6	69.3	76.1	76.1	76.2	76.2	81.8	66.9
2640	75	76.4	67.6	84.9	51.2	93.9	33.9	71.8	65.2	79.7	48.8	88.0	31.5	66.9	62.7	74.2	46.4	81.9	29.2
	80	77.8	77.8	85.1	65.1	94.0	47.9	73.8	73.8	79.9	62.8	88.2	45.6	69.5	69.5	74.5	60.4	82.1	43.2
	85	82.5	82.5	85.7	78.7	94.2	61.9	78.4	78.4	80.6	76.3	88.4	59.6	73.9	73.9	75.2	73.8	82.3	57.2
	90	87.3	87.3	87.3	87.3	94.5	75.9	82.9	82.9	83.0	83.0	88.7	73.6	78.3	78.3	78.4	78.4	82.6	70.7
2880	75	77.5	71.1	85.9	53.2	94.8	34.4	72.7	68.7	80.5	50.8	88.8	32.0	67.7	66.2	74.8	48.4	82.5	29.6
	80	79.9	79.9	86.1	68.4	95.0	49.7	75.7	75.7	80.8	66.1	89.0	47.3	71.2	71.2	75.2	63.6	82.7	44.9
	85	84.8	84.8	86.9	83.2	95.2	65.0	80.4	80.4	81.7	80.8	89.2	62.6	75.7	75.7	76.2	76.2	82.9	60.2
	90	89.7	89.7	89.8	89.8	95.5	80.2	85.1	85.1	85.2	85.2	89.6	77.4	80.2	80.2	80.3	80.3	83.4	74.9

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1920	75	59.1	50.2	66.1	38.1	73.3	25.5	54.3	47.5	60.7	35.7	67.2	23.1
	80	59.6	59.6	66.3	48.2	73.4	35.7	55.1	55.1	60.9	45.8	67.3	33.3
	85	62.8	62.8	66.5	58.1	73.6	45.9	58.7	58.7	61.2	55.6	67.5	43.5
	90	66.5	66.5	67.1	67.1	73.8	56.0	62.2	62.2	62.3	62.3	67.7	53.6
2160	75	60.2	53.4	67.1	40.1	74.3	25.9	55.2	50.9	61.5	37.6	67.9	23.5
	80	61.4	61.4	67.3	51.5	74.4	37.4	57.1	57.1	61.7	49.0	68.0	35.0
	85	65.3	65.3	67.7	62.5	74.6	48.9	60.8	60.8	62.2	60.0	68.2	46.4
	90	69.2	69.2	69.3	69.3	74.8	60.3	64.4	64.4	64.6	64.6	68.5	57.8
2400	75	61.1	56.8	67.9	42.0	75.0	26.3	56.0	54.2	62.1	39.5	68.4	23.8
	80	63.4	63.4	68.1	54.7	75.1	39.1	58.8	58.8	62.3	52.2	68.6	36.6
	85	67.4	67.4	68.8	66.9	75.3	51.8	62.6	62.6	63.1	63.1	68.8	49.3
	90	71.4	71.4	71.5	71.5	75.6	64.5	66.3	66.3	66.4	66.4	69.1	61.5
2640	75	61.9	60.2	68.5	44.0	75.5	26.7	56.6	56.6	62.5	41.4	68.7	24.2
	80	65.1	65.1	68.8	57.9	75.7	40.8	60.2	60.2	62.8	54.9	68.9	38.2
	85	69.2	69.2	69.7	69.7	75.9	54.7	64.1	64.1	64.2	64.2	69.1	52.2
	90	73.3	73.3	73.4	73.4	76.3	68.2	67.9	67.9	68.0	68.0	69.7	65.5
2880	75	62.6	62.6	69.0	45.9	75.9	27.1	57.3	57.3	62.8	43.3	69.0	24.5
	80	66.5	66.5	69.4	60.6	76.2	42.4	61.4	61.4	63.3	57.9	69.2	39.8
	85	70.7	70.7	70.8	70.8	76.4	57.7	65.4	65.4	65.4	65.4	69.5	55.1
	90	74.9	74.9	75.0	75.0	77.0	72.3	69.2	69.2	69.2	69.2	70.2	69.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 25. Gross cooling capacities 7.5 tons high efficiency - stage 1 - three phase W/DHC092H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1200	75	33.1	29.8	37.2	23.1	41.5	15.1	31.2	28.8	35.2	22.1	39.2	14.1
	80	32.9	32.9	37.5	29.7	42.0	21.8	31.0	31.0	35.5	27.8	39.8	20.9
	85	34.2	34.2	37.8	35.3	42.3	28.5	32.7	32.7	35.7	34.2	40.1	27.6
	90	36.5	36.5	37.5	37.5	42.6	34.2	34.9	34.9	35.5	35.5	40.4	33.1
1500	75	34.2	34.2	38.4	25.8	42.5	15.8	32.2	32.2	36.2	24.8	40.0	14.7
	80	34.8	34.8	38.8	32.9	43.3	24.3	33.1	33.1	36.6	31.8	40.9	23.2
	85	37.3	37.3	39.0	39.0	43.7	32.7	35.5	35.5	36.8	36.8	41.3	31.7
	90	39.8	39.8	39.8	39.8	44.0	39.5	38.0	38.0	38.1	38.1	41.7	38.4
1800	75	35.0	35.0	39.2	28.5	43.2	16.4	32.9	32.9	36.9	27.4	40.5	15.3
	80	36.9	36.9	39.7	36.8	44.2	26.6	35.0	35.0	37.4	35.6	41.6	25.6
	85	39.6	39.6	40.1	40.1	44.6	36.7	37.7	37.7	37.8	37.8	42.2	33.9
	90	42.3	42.3	42.4	42.4	45.0	44.8	40.3	40.3	40.4	40.4	42.6	42.6
2100	75	35.8	35.8	39.8	29.5	43.6	17.1	33.7	33.7	37.4	28.2	40.8	15.9
	80	38.5	38.5	40.4	40.4	44.8	29.0	36.5	36.5	38.0	38.0	42.2	27.9
	85	41.4	41.4	41.5	41.5	45.4	38.6	39.3	39.3	39.4	39.4	42.8	37.4
	90	44.3	44.3	44.4	44.4	45.8	45.8	42.2	42.2	42.2	42.2	43.3	43.3
2400	75	36.9	36.9	40.3	31.6	43.9	17.7	34.8	34.8	37.8	30.2	41.0	16.5
	80	39.9	39.9	41.0	41.0	45.3	31.3	37.7	37.7	38.5	38.5	42.6	30.2
	85	42.9	42.9	42.9	42.9	46.0	42.1	40.7	40.7	40.7	40.7	43.3	40.8
	90	46.0	46.0	46.0	46.0	46.5	46.5	43.7	43.7	43.7	43.7	43.9	43.9
2625	75	37.6	37.6	40.6	33.2	44.0	18.1	35.4	35.4	38.0	31.7	41.0	16.9
	80	40.7	40.7	41.3	41.3	45.6	33.1	38.4	38.4	38.8	38.8	42.8	31.9
	85	43.8	43.8	43.9	43.9	46.3	44.7	41.5	41.5	41.5	41.5	43.6	43.4
	90	47.0	47.0	47.0	47.0	47.1	47.1	44.6	44.6	44.6	44.6	44.5	44.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 26. Gross cooling capacities 7.5 tons high efficiency - stage 2 - three phase W/DHC092H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1200	75	48.2	37.6	54.2	29.9	60.7	21.9	45.9	36.3	51.6	28.6	57.7	20.6
	80	48.4	43.7	54.5	36.6	61.0	28.6	46.0	42.4	51.9	35.3	58.1	27.3
	85	48.6	48.6	54.6	43.2	61.2	35.3	46.7	46.7	52.0	41.5	58.4	34.0
	90	51.5	51.5	54.7	49.2	61.4	42.0	49.5	49.5	52.2	47.9	58.6	40.7
1500	75	50.6	42.0	56.7	32.9	63.0	22.8	48.0	40.6	53.8	31.5	59.8	21.4
	80	51.0	50.1	57.0	41.2	63.6	31.2	48.5	48.5	54.1	39.8	60.4	29.9
	85	53.3	53.3	57.2	48.8	63.9	39.6	51.1	51.1	54.4	47.4	60.8	38.2
	90	56.6	56.6	57.7	56.9	64.2	47.9	54.3	54.3	55.0	55.0	61.0	46.0
1800	75	52.3	46.5	58.4	35.7	64.6	23.5	49.5	45.0	55.3	34.3	61.1	22.1
	80	53.4	53.4	58.7	44.9	65.4	33.7	51.1	51.1	55.7	43.4	62.0	32.3
	85	57.0	57.0	59.2	54.6	65.8	43.7	54.5	54.5	56.2	53.1	62.4	42.3
	90	60.6	60.6	60.7	60.7	66.1	52.8	58.1	58.1	58.2	58.2	62.8	51.3
2100	75	53.7	51.0	59.6	38.4	65.7	24.2	50.8	49.4	56.3	37.0	62.1	22.7
	80	56.2	56.2	60.1	49.0	66.7	36.1	54	53.6	56.9	47.4	63.1	34.6
	85	60.0	60.0	60.9	60.4	67.1	47.8	57.3	57.3	57.8	57.8	63.6	45.3
	90	63.8	63.8	63.9	63.9	67.7	58.2	61.1	61.1	61.2	61.2	64.2	56.6
2400	75	54.9	54.9	60.5	41.1	66.5	24.9	51.9	51.9	57.0	38.4	62.7	23.4
	80	58.4	58.4	61.2	53.0	67.7	38.4	55.6	55.6	57.9	51.3	63.9	36.9
	85	62.4	62.4	62.5	62.5	68.2	50.5	59.5	59.5	59.6	59.6	64.5	48.8
	90	66.5	66.5	66.6	66.6	69.0	63.5	63.5	63.5	63.6	63.6	65.4	61.8
2625	75	55.8	55.8	61.0	41.8	67.0	25.4	52.8	52.8	57.6	40.0	63.0	23.8
	80	59.8	59.8	61.9	55.9	68.3	40.2	56.9	56.9	58.5	54.2	64.4	38.6
	85	64.0	64.0	64.1	64.1	68.9	53.2	61.0	61.0	61.0	61.0	65.1	51.5
	90	68.3	68.3	68.3	68.3	69.8	67.4	65.1	65.1	65.2	65.2	66.1	65.8

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 27. Gross cooling capacities 7.5 tons high efficiency - full load - three phase W/DHC092H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2400	75	87.8	71.0	97.6	55.3	108.0	39.0	83.3	68.7	92.6	53.0	102.3	36.7	78.5	65.5	87.4	50.6	96.4	34.4
	80	88.4	83.0	98.0	68.4	108.3	52.2	84.0	80.6	93.0	66.1	102.8	49.9	79.5	78.1	87.8	63.7	97.0	47.6
	85	90.6	90.6	98.3	81.4	108.7	65.3	86.8	86.8	93.4	79.1	103.2	63.0	82.9	82.9	88.2	76.7	97.5	60.7
	90	95.6	95.6	99.0	93.3	109.1	78.4	91.7	91.7	94.2	90.9	103.6	76.1	87.6	87.6	89.2	88.4	97.8	73.8
2700	75	89.6	74.9	99.6	58.1	109.9	39.8	85.0	72.4	94.3	55.7	103.9	37.4	80.1	69.8	88.9	53.3	97.8	35.0
	80	90.7	89.2	100.0	72.8	110.3	54.6	86.2	86.2	94.8	70.4	104.5	52.2	81.5	81.5	89.4	68.0	98.5	49.8
	85	94.5	94.5	100.4	87.4	110.8	69.4	90.4	90.4	95.3	83.8	105.0	67.0	86.2	86.2	90.0	81.2	99.0	64.6
	90	99.8	99.8	101.5	100.7	111.2	84.1	95.6	95.6	96.6	96.6	105.4	81.7	91.2	91.2	91.5	91.5	99.4	79.3
3000	75	91.3	79.3	101.2	60.8	111.3	40.4	86.5	76.7	95.7	58.4	105.2	38.0	81.5	74.0	90.1	55.9	98.8	35.6
	80	92.8	92.8	101.7	77.1	112.0	56.9	88.3	88.3	96.2	74.7	105.9	54.5	83.8	83.8	90.6	72.2	99.7	52.1
	85	97.9	97.9	102.3	92.0	112.5	73.4	93.5	93.5	97.0	89.4	106.5	71.0	89.0	89.0	91.5	86.7	100.3	68.5
	90	103.4	103.4	104.0	104.0	112.9	89.7	98.9	98.9	99.0	99.0	106.9	87.3	94.2	94.2	94.3	94.3	100.7	83.2
3300	75	92.8	83.6	102.5	63.5	112.5	41.1	87.8	81.0	96.9	61.0	106.2	38.7	82.6	78.2	91.0	58.4	99.7	36.1
	80	95.0	95.0	103.0	81.4	113.3	59.3	90.7	90.7	97.4	78.9	107.1	56.8	86.0	86.0	91.6	74.8	100.6	54.3
	85	100.8	100.8	103.9	97.6	113.9	77.3	96.2	96.2	98.5	94.9	107.7	74.9	91.4	91.4	92.8	92.2	101.3	72.4
	90	106.6	106.6	106.5	106.5	114.4	93.7	101.8	101.8	101.9	101.9	108.2	91.1	96.8	96.8	96.9	96.9	101.9	88.3
3600	75	94.1	87.9	103.6	66.1	113.6	41.8	88.9	85.2	97.8	63.6	107.1	39.3	83.6	82.4	91.8	61.0	100.4	36.7
	80	97.5	97.5	104.2	84.2	114.5	61.6	92.8	92.8	98.4	81.4	108.1	59.1	88.0	88.0	92.5	78.6	101.4	56.5
	85	103.4	103.4	105.4	103.2	115.1	81.3	98.6	98.6	99.9	99.9	108.7	78.8	93.5	93.5	94.1	94.1	102.1	76.2
	90	109.3	109.3	109.5	109.5	115.7	98.9	104.3	104.3	104.4	104.4	109.4	96.2	99.0	99.0	99.1	99.1	102.9	93.4

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2400	75	73.7	62.9	81.9	48.2	90.2	31.9	68.5	60.1	76.1	45.6	83.6	29.4
	80	74.7	74.7	82.4	61.3	90.9	45.1	69.8	69.8	76.6	58.7	84.4	42.6
	85	78.7	78.7	82.9	73.1	91.4	58.3	74.1	74.1	77.2	70.3	84.9	55.7
	90	83.3	83.3	84.0	84.0	91.8	71.3	78.5	78.5	78.6	78.6	85.2	68.8
2700	75	75.1	67.1	83.2	50.8	91.3	32.5	69.7	64.2	77.1	48.2	84.5	29.9
	80	76.8	76.8	83.7	65.5	92.1	47.4	72.1	72.1	77.6	61.5	85.3	44.7
	85	81.6	81.6	84.4	78.5	92.7	62.1	76.7	76.7	78.5	75.7	85.9	59.5
	90	86.4	86.4	86.6	86.6	93.1	75.4	81.3	81.3	81.4	81.4	86.4	72.6
3000	75	76.2	71.2	84.2	53.3	92.2	33.0	70.7	68.3	77.9	50.6	85.1	30.4
	80	79.2	79.2	84.7	68.2	93.1	49.6	74.2	74.2	78.5	65.2	86.1	46.9
	85	84.2	84.2	85.7	84.0	93.7	66.0	78.9	78.9	79.7	79.7	86.7	63.3
	90	89.1	89.1	89.3	89.3	94.3	80.5	83.6	83.6	83.7	83.7	87.3	77.5
3300	75	77.2	75.4	84.9	55.8	92.9	33.6	71.5	71.5	78.5	53.1	85.6	30.8
	80	81.1	81.1	85.6	71.9	93.9	51.7	75.9	75.9	79.2	68.9	86.6	49.0
	85	86.3	86.3	87.0	87.0	94.5	69.8	80.7	80.7	80.9	80.9	87.2	65.1
	90	91.4	91.4	91.5	91.5	95.2	85.5	85.5	85.5	85.6	85.6	88.1	82.4
3600	75	78.1	78.1	85.6	58.3	93.4	34.1	72.4	72.4	78.9	55.5	85.9	31.3
	80	82.8	82.8	86.3	75.6	94.5	53.9	77.3	77.3	79.8	72.5	87.1	51.1
	85	88.1	88.1	88.2	88.2	95.1	71.6	82.3	82.3	82.4	82.4	87.7	68.4
	90	93.3	93.3	93.5	93.5	96.1	90.4	87.2	87.2	87.3	87.3	88.8	87.3

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 28. Gross cooling capacities 8.5 tons high efficiency - stage 1 - three phase W/DHC102H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1360	75	40.9	36.2	46.2	27.7	52.0	18.7	38.0	34.7	43.2	26.3	48.7	17.3
	80	41.8	41.8	46.3	35.2	52.2	26.3	39.4	39.4	43.3	33.8	48.9	24.9
	85	44.6	44.6	46.5	42.4	52.3	33.8	42.3	42.3	43.5	41.0	49.0	32.5
	90	47.5	47.5	47.7	47.7	52.4	41.3	45.1	45.1	45.2	45.2	49.1	40.0
1700	75	42.6	41.5	47.8	30.8	53.6	19.5	39.6	39.6	44.5	29.4	50.0	18.1
	80	45.1	45.1	48.0	40.0	53.8	29.0	42.5	42.5	44.8	38.5	50.3	27.6
	85	48.3	48.3	48.6	48.6	54.0	38.5	45.7	45.7	45.8	45.8	50.5	37.1
	90	51.6	51.6	51.7	51.7	54.3	47.6	48.9	48.9	49.0	49.0	50.8	46.2
2040	75	44.3	44.3	48.8	33.9	54.6	20.3	41.5	41.5	45.4	32.4	50.9	18.9
	80	47.7	47.7	49.2	44.8	55.0	31.7	44.9	44.9	45.9	43.3	51.3	30.3
	85	51.2	51.2	51.3	51.3	55.2	43.1	48.3	48.3	48.4	48.4	51.5	41.2
	90	54.7	54.7	54.8	54.8	55.8	53.9	51.7	51.7	51.8	51.8	52.3	52.3
2380	75	46.1	46.1	49.6	36.9	55.4	21.1	43.2	43.2	46.0	34.9	51.5	19.6
	80	49.8	49.8	50.3	49.6	55.8	34.4	46.7	46.7	46.9	46.9	51.9	32.9
	85	53.5	53.5	53.5	53.5	56.1	47.1	50.3	50.3	50.4	50.4	52.4	45.6
	90	57.2	57.2	57.3	57.3	57.3	57.3	54.0	54.0	54.1	54.1	54.1	54.1
2720	75	47.6	47.6	50.2	39.4	55.9	21.8	44.4	44.4	46.5	37.7	52.0	20.3
	80	51.4	51.4	51.4	51.4	56.3	37.0	48.2	48.2	48.2	48.2	52.4	35.5
	85	55.3	55.3	55.3	55.3	56.9	51.5	52.0	52.0	52.0	52.0	53.1	49.9
	90	59.2	59.2	59.3	59.3	59.3	59.3	55.8	55.8	55.8	55.8	55.9	55.9
2975	75	48.5	48.5	50.5	41.5	56.3	22.4	45.2	45.2	46.8	39.8	52.2	20.8
	80	52.4	52.4	52.5	52.5	56.7	39.0	49.1	49.1	49.1	49.1	52.7	36.8
	85	56.4	56.4	56.5	56.5	57.4	54.7	53.0	53.0	53.0	53.0	53.6	53.1
	90	60.5	60.5	60.5	60.5	60.6	60.6	56.9	56.9	57.0	57.0	57.0	57.0

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 29. Gross cooling capacities 8.5 tons high efficiency - stage 2 - three phase W/DHC102H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1360	75	50.6	40.8	57.2	32.0	64.2	22.9	47.7	39.2	53.9	30.5	60.6	21.4
	80	50.7	48.2	57.2	39.5	64.2	30.5	47.9	46.7	54.0	38.0	60.7	29.0
	85	52.4	52.4	57.2	47.0	64.2	38.0	50.1	50.1	54.0	45.5	60.7	36.6
	90	55.6	55.6	57.3	54.4	64.3	45.5	53.1	53.1	54.2	52.9	60.8	44.1
1700	75	52.9	46.3	59.5	35.3	66.6	23.9	49.7	44.8	56.0	33.7	62.8	22.3
	80	53.8	53.8	59.5	44.7	66.7	33.4	51.1	51.1	56.1	43.1	62.8	31.8
	85	57.2	57.2	59.7	54.0	66.7	42.8	54.5	54.5	56.3	52.4	62.9	41.2
	90	60.7	60.7	60.9	60.9	66.8	52.2	58.0	58.0	58.1	58.1	63.0	50.6
2040	75	54.6	51.7	61.1	38.4	68.2	24.7	51.3	50.1	57.4	36.8	64.2	23.1
	80	57.2	57.2	61.2	49.7	68.3	36.1	54.3	54.3	57.5	48.1	64.2	34.5
	85	61.0	61.0	61.8	61.0	68.4	47.4	58.0	58.0	58.3	58.3	64.4	45.8
	90	64.8	64.8	64.9	64.9	68.6	58.7	61.7	61.7	61.8	61.8	64.6	57.1
2380	75	56.1	56.1	62.2	41.5	69.4	25.5	52.9	52.9	58.3	39.8	65.1	23.9
	80	59.9	59.9	62.5	54.7	69.5	38.8	56.7	56.7	58.7	53.0	65.2	37.1
	85	64.0	64.0	63.8	63.8	69.6	52.0	60.7	60.7	60.8	60.8	65.4	50.3
	90	68.1	68.1	68.2	68.2	70.1	65.1	64.7	64.7	64.8	64.8	66.0	63.5
2720	75	57.9	57.9	63.0	44.5	70.3	26.3	54.7	54.7	59.0	42.8	65.9	24.6
	80	62.1	62.1	63.6	59.5	70.4	41.4	58.8	58.8	59.7	57.8	66.0	39.7
	85	66.4	66.4	66.1	66.1	70.6	56.5	62.9	62.9	63.0	63.0	66.3	54.8
	90	70.7	70.7	70.8	70.8	71.5	71.5	67.0	67.0	67.1	67.1	67.3	67.3
2975	75	59.2	59.2	63.6	46.8	70.8	26.8	55.8	55.8	59.4	45.0	66.3	25.1
	80	63.5	63.5	64.3	63.2	70.9	43.4	60.0	60.0	60.4	60.4	66.4	41.7
	85	68.0	68.0	68.0	68.0	71.3	60.0	64.3	64.3	64.3	64.3	66.8	58.2
	90	72.4	72.4	71.0	71.0	72.6	72.6	68.6	68.6	68.6	68.6	68.7	68.7

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 30. Gross cooling capacities 8.5 tons high efficiency - full load - three phase W/DHC102H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2720	75	97.4	79.6	108.2	61.7	119.6	43.1	92.1	76.9	102.3	59.0	113.0	40.5	86.5	74.2	96.1	56.3	106.2	37.8
	80	98.2	93.9	108.5	76.5	119.8	58.1	93.1	91.2	102.6	73.8	113.3	55.4	87.7	87.7	96.5	71.1	106.5	52.7
	85	101.7	101.7	108.8	91.3	120.1	72.9	97.2	97.2	103.0	88.6	113.6	70.3	92.4	92.4	97.0	85.9	106.8	67.6
	90	107.3	107.3	109.7	105.5	120.3	87.7	102.6	102.6	104.1	102.8	113.8	85.1	97.7	97.7	98.3	98.3	107.1	82.4
3060	75	99.5	85.0	110.2	64.8	121.6	43.9	94.0	82.3	104.1	62.1	114.8	41.2	88.2	79.5	97.7	59.3	107.6	38.5
	80	100.8	100.8	110.5	81.4	121.9	60.7	95.6	95.6	104.4	78.7	115.0	58.0	90.5	90.5	98.0	75.9	108.0	55.3
	85	105.9	105.9	111.1	98.1	122.2	77.5	101.1	101.1	105.1	94.7	115.4	74.8	96.0	96.0	98.8	91.8	108.3	72.0
	90	111.8	111.8	112.7	112.7	122.5	94.1	106.8	106.8	107.0	107.0	115.7	91.5	101.4	101.4	101.6	101.6	108.7	88.7
3400	75	101.3	90.4	111.9	67.8	123.2	44.7	95.6	86.8	105.5	65.1	116.1	42.0	89.6	83.8	98.9	62.2	108.7	39.2
	80	103.4	103.4	112.2	86.3	123.5	63.4	98.5	98.5	105.9	83.6	116.5	60.6	93.2	93.2	99.3	80.7	109.2	57.8
	85	109.5	109.5	113.1	104.1	123.9	81.9	104.4	104.4	106.9	101.2	116.8	79.2	98.9	98.9	100.5	98.3	109.5	76.4
	90	115.7	115.7	115.7	115.7	124.3	100.5	110.3	110.3	110.5	110.5	117.3	97.8	104.6	104.6	104.8	104.8	110.1	95.0
3740	75	102.8	94.8	113.3	70.9	124.5	45.4	97.0	91.8	106.7	68.0	117.2	42.7	90.9	88.7	99.8	65.1	109.6	39.8
	80	106.4	106.4	113.7	91.2	124.9	66.0	101.1	101.1	107.2	88.4	117.6	63.2	95.6	95.6	100.4	85.5	110.1	60.3
	85	112.7	112.7	114.9	110.6	125.3	86.4	107.2	107.2	108.6	107.7	118.0	83.6	101.5	101.5	102.1	102.1	110.5	80.8
	90	119.0	119.0	119.2	119.2	125.8	106.9	113.3	113.3	113.5	113.5	118.7	104.1	107.3	107.3	107.5	107.5	111.3	100.1
4080	75	104.3	99.8	114.4	73.8	125.6	46.2	98.3	96.8	107.6	70.9	118.1	43.3	92.1	92.1	100.6	68.0	110.3	40.4
	80	108.9	108.9	114.9	96.1	126.0	68.6	103.4	103.4	108.2	93.2	118.6	65.7	97.7	97.7	101.3	89.1	110.9	62.8
	85	115.4	115.4	116.6	116.6	126.4	90.9	109.7	109.7	110.2	110.2	119.0	88.0	103.7	103.7	103.7	103.7	111.3	85.1
	90	121.9	121.9	122.1	122.1	127.2	113.2	115.9	115.9	116.1	116.1	119.9	109.1	109.7	109.7	109.8	109.8	112.4	106.0

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2720	75	80.7	71.3	89.7	53.5	99.0	35.0	74.5	67.7	82.8	50.5	91.2	32.1
	80	82.3	82.3	90.0	68.3	99.3	49.9	77.0	77.0	83.1	65.3	91.6	47.0
	85	87.4	87.4	90.6	82.4	99.6	64.8	81.8	81.8	83.8	79.3	91.9	61.9
	90	92.4	92.4	92.6	92.6	100.0	79.6	86.6	86.6	86.8	86.8	92.3	76.7
3060	75	82.2	75.7	90.9	56.4	100.1	35.6	75.8	72.5	83.8	53.4	92.0	32.6
	80	85.2	85.2	91.3	73.0	100.5	52.4	79.6	79.6	84.2	70.0	92.5	49.4
	85	90.5	90.5	92.3	88.8	100.9	69.2	84.6	84.6	85.4	85.4	92.9	66.2
	90	95.8	95.8	95.9	95.9	101.4	85.9	89.5	89.5	89.7	89.7	93.4	81.9
3400	75	83.5	80.7	91.9	59.3	101.0	36.3	77.0	77.0	84.5	56.2	92.7	33.2
	80	87.7	87.7	92.4	77.8	101.5	54.9	81.7	81.7	85.1	73.7	93.3	51.9
	85	93.2	93.2	93.9	93.9	101.9	73.5	86.9	86.9	87.0	87.0	93.6	70.5
	90	98.6	98.6	98.7	98.7	102.5	91.0	91.9	91.9	92.1	92.1	94.5	87.8
3740	75	84.7	84.7	92.7	62.1	101.7	36.9	78.1	78.1	85.1	59.0	93.2	33.8
	80	89.8	89.8	93.3	81.4	102.2	57.4	83.5	83.5	85.8	78.1	93.8	54.3
	85	95.4	95.4	95.5	95.5	102.7	77.8	88.8	88.8	88.9	88.9	94.2	74.7
	90	100.9	100.9	101.1	101.1	103.6	96.9	93.9	93.9	94.0	94.0	95.4	93.6
4080	75	85.8	85.8	93.3	64.9	102.2	37.5	79.5	79.5	85.5	61.7	93.6	34.3
	80	91.6	91.6	94.2	85.9	102.8	59.9	84.9	84.9	86.5	82.4	94.2	56.7
	85	97.3	97.3	97.4	97.4	103.3	82.2	90.3	90.3	90.4	90.4	94.7	79.0
	90	102.9	102.9	103.1	103.1	104.6	102.8	95.6	95.6	95.7	95.7	96.2	96.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 31. Gross cooling capacities 10 tons high efficiency - stage 1 - three phase W/DHC120H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
3200	75	50.7	42.7	57.6	32.9	64.8	22.4	46.9	40.5	53.5	30.8	60.3	20.3
	80	51.0	51.0	57.8	41.7	65.2	31.4	47.6	47.6	53.7	39.6	60.8	29.3
	85	54.4	54.4	57.9	50.2	65.4	40.3	51.2	51.2	53.9	48.0	61.1	38.2
	90	58.0	58.0	58.3	58.3	65.5	49.1	54.7	54.7	54.9	54.9	61.2	47.0
3600	75	52.9	49.0	59.8	36.7	67.0	23.5	48.9	46.7	55.4	34.5	62.2	21.4
	80	55.3	55.3	60.0	47.4	67.6	34.7	51.8	51.8	55.7	45.1	62.9	32.6
	85	59.3	59.3	60.5	58.3	67.9	45.8	55.7	55.7	56.3	56.0	63.2	43.7
	90	63.4	63.4	63.5	63.5	68.1	56.5	59.7	59.7	59.9	59.9	63.5	54.2
4000	75	54.7	54.7	61.3	40.4	68.4	24.5	50.8	50.8	56.7	38.1	63.4	22.3
	80	58.8	58.8	61.7	53.0	69.2	38.0	55.0	55.0	57.2	50.7	64.2	35.8
	85	63.2	63.2	63.3	63.3	69.5	51.3	59.3	59.3	59.4	59.4	64.6	48.4
	90	67.6	67.6	67.7	67.7	70.0	63.9	63.6	63.6	63.7	63.7	65.3	61.6
4400	75	57.0	57.0	62.3	43.3	69.4	25.4	53.0	53.0	57.5	40.8	64.1	23.2
	80	61.6	61.6	63.1	58.6	70.3	41.1	57.5	57.5	58.4	56.1	65.2	38.9
	85	66.2	66.2	66.3	66.3	70.8	55.9	62.0	62.0	62.1	62.1	65.7	53.4
	90	70.9	70.9	71.0	71.0	71.7	71.3	66.6	66.6	66.7	66.7	66.9	66.9
	75	59.0	59.0	63.2	46.5	69.9	26.3	54.7	54.7	58.2	43.9	64.4	24.0
	80	63.8	63.8	64.3	64.1	71.1	44.3	59.5	59.5	59.6	59.6	65.8	41.9
	85	68.7	68.7	68.8	68.8	71.8	60.9	64.3	64.3	64.3	64.3	66.6	58.4
	90	73.7	73.7	73.8	73.8	73.9	73.9	69.1	69.1	69.2	69.2	69.3	69.3
	75	60.2	60.2	63.7	48.9	70.2	27.0	55.8	55.8	58.6	46.2	64.6	24.6
	80	65.2	65.2	65.2	65.2	71.6	45.4	60.7	60.7	60.8	60.8	66.2	42.7
	85	70.3	70.3	70.4	70.4	72.5	64.6	65.6	65.6	65.7	65.7	67.2	62.1
	90	75.4	75.4	75.5	75.5	75.6	75.6	70.6	70.6	70.7	70.7	70.8	70.8

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 32. Gross cooling capacities 10 tons high efficiency - stage 2 - three phase W/DHC120H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1600	75	57.4	46.0	64.5	35.6	72.1	24.9	53.7	43.8	60.5	33.5	67.7	22.8
	80	57.6	54.5	64.7	44.5	72.3	33.8	53.9	52.3	60.7	42.3	67.9	31.7
	85	59.5	59.5	64.7	53.2	72.5	42.7	56.4	56.4	60.7	51.1	68.0	40.6
	90	63.1	63.1	64.9	61.7	72.5	51.5	59.9	59.9	61.0	59.6	68.2	49.4
2000	75	59.9	52.2	67.1	39.5	74.7	26.0	56.0	49.9	62.7	37.2	69.8	23.8
	80	61.0	61.0	67.3	50.5	75.0	37.2	57.5	57.5	62.9	48.3	70.2	35.0
	85	64.9	64.9	67.6	61.2	75.2	48.3	61.4	61.4	63.3	58.9	70.4	46.1
	90	68.9	68.9	69.0	69.0	75.3	59.3	65.3	65.3	65.4	65.4	70.6	57.1
2400	75	61.8	58.4	68.8	43.2	76.4	27.0	57.6	56.0	64.2	40.8	71.3	24.7
	80	64.8	64.8	69.1	56.4	76.8	40.4	61.0	61.0	64.5	53.7	71.7	38.1
	85	69.1	69.1	69.8	69.1	77.0	53.7	65.2	65.2	65.3	65.3	72.0	51.5
	90	73.4	73.4	73.5	73.5	77.4	66.6	69.4	69.4	69.5	69.5	72.4	64.2
2800	75	63.4	63.4	70.0	46.8	77.5	27.9	59.4	59.4	65.2	44.4	72.2	25.6
	80	67.8	67.8	70.5	61.7	78.1	43.6	63.7	63.7	65.7	59.2	72.8	41.2
	85	72.4	72.4	72.5	72.5	78.4	59.1	68.2	68.2	68.3	68.3	73.1	56.8
	90	77.0	77.0	77.1	77.1	79.0	74.0	72.6	72.6	72.7	72.7	73.9	71.5
3200	75	65.5	65.5	71.0	50.3	78.4	28.8	61.3	61.3	65.9	47.9	72.9	26.4
	80	70.2	70.2	71.7	67.2	79.0	46.7	65.9	65.9	66.8	64.7	73.5	44.3
	85	75.1	75.1	75.2	75.2	79.5	63.8	70.6	70.6	70.7	70.7	74.0	61.3
	90	79.9	79.9	80.1	80.1	80.5	80.5	75.2	75.2	75.3	75.3	75.4	75.4
3500	75	66.9	66.9	71.5	52.9	78.9	29.5	62.5	62.5	66.4	49.7	73.3	27.0
	80	71.8	71.8	72.5	71.4	79.6	49.0	67.3	67.3	67.5	67.5	74.0	46.6
	85	76.8	76.8	76.9	76.9	80.1	67.6	72.1	72.1	72.1	72.1	74.6	65.0
	90	81.8	81.8	81.9	81.9	82.0	82.0	76.9	76.9	77.0	77.0	77.1	77.1

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 33. Gross cooling capacities 10 tons high efficiency - full load - three phase W/DHC120H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
3200	75	114.2	92.2	127.0	71.2	140.5	49.4	107.3	88.4	119.4	67.5	132.1	45.7	100.2	84.6	111.5	63.7	123.4	42.0
	80	114.9	109.0	127.3	88.5	140.7	66.9	108.2	105.2	119.7	84.8	132.3	63.3	101.2	101.2	111.9	81.1	123.7	59.5
	85	118.8	118.8	127.6	105.9	141.0	84.4	112.9	112.9	120.1	102.2	132.7	80.7	106.8	106.8	112.3	98.4	124.1	77.0
	90	125.4	125.4	128.4	122.7	141.2	101.7	119.3	119.3	121.1	118.9	132.9	98.1	112.9	112.9	113.6	113.6	124.4	94.4
3600	75	116.6	98.5	129.4	74.8	142.9	50.4	109.5	94.7	121.5	71.1	134.1	46.6	102.1	90.8	113.3	67.2	125.1	42.8
	80	117.9	117.5	129.8	94.4	143.2	70.1	111.1	111.1	121.9	90.6	134.5	66.3	104.5	104.5	113.7	86.7	125.5	62.6
	85	123.9	123.9	130.3	113.9	143.5	89.7	117.6	117.6	122.5	110.2	134.8	86.0	111.0	111.0	114.5	105.6	125.9	82.2
	90	130.8	130.8	131.8	131.8	143.8	109.3	124.3	124.3	124.5	124.5	135.2	105.6	117.5	117.5	117.7	117.7	126.3	101.8
4000	75	118.7	104.8	131.4	78.4	144.8	51.3	111.3	100.9	123.2	74.6	135.7	47.5	103.7	96.1	114.8	70.6	126.4	43.6
	80	121.0	121.0	131.8	100.1	145.1	73.2	114.6	114.6	123.6	96.3	136.1	69.4	107.9	107.9	115.2	92.4	126.9	65.5
	85	128.3	128.3	132.6	121.9	145.5	95.0	121.6	121.6	124.6	117.2	136.5	91.2	114.6	114.6	116.4	113.1	127.3	87.4
	90	135.5	135.5	135.7	135.7	145.9	116.8	128.6	128.6	128.8	128.8	137.1	113.0	121.3	121.3	121.5	121.5	127.9	109.2
4400	75	120.5	110.2	133.0	82.0	146.3	52.2	113.0	106.1	124.6	78.0	137.0	48.3	105.2	101.9	115.9	74.0	127.5	44.4
	80	124.6	124.6	133.5	105.9	146.8	76.3	117.8	117.8	125.1	101.9	137.5	72.4	110.7	110.7	116.5	98.0	128.0	68.5
	85	132.1	132.1	134.7	128.9	147.2	100.3	125.0	125.0	126.6	124.8	138.0	96.4	117.7	117.7	118.2	118.2	128.5	92.5
	90	139.6	139.6	139.8	139.8	147.8	124.2	132.2	132.2	132.4	132.4	138.7	120.4	124.6	124.6	124.8	124.8	129.3	115.4
4800	75	122.2	116.2	134.4	85.5	147.6	53.0	114.5	112.0	125.7	81.5	138.1	49.1	106.5	106.5	116.8	77.4	128.3	45.1
	80	127.7	127.7	135.0	111.6	148.1	79.3	120.6	120.6	126.4	107.6	138.7	75.4	113.2	113.2	117.5	102.5	128.9	71.4
	85	135.4	135.4	136.7	136.6	148.5	105.5	128.0	128.0	128.4	128.4	139.1	101.6	120.3	120.3	120.3	120.3	129.4	97.6
	90	143.1	143.1	143.3	143.3	149.4	131.7	135.4	135.4	135.6	135.6	140.1	126.6	127.4	127.4	127.6	127.6	130.6	122.5

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
3200	75	92.7	80.7	103.3	59.8	114.3	38.2	84.7	76.0	94.5	55.7	104.5	34.2
	80	94.2	94.2	103.7	77.2	114.7	55.7	87.4	87.4	94.9	73.1	104.9	51.7
	85	100.2	100.2	104.2	93.9	115.0	73.2	93.1	93.1	95.5	89.7	105.3	69.1
	90	106.2	106.2	106.4	106.4	115.4	90.6	98.8	98.8	99.0	99.0	105.7	86.5
3600	75	94.3	86.1	104.8	63.2	115.6	38.9	86.2	81.7	95.7	59.1	105.5	34.8
	80	97.8	97.8	105.2	82.8	116.1	58.7	90.5	90.5	96.1	78.6	106.1	54.6
	85	104.0	104.0	106.1	101.5	116.5	78.3	96.4	96.4	97.2	97.1	106.5	74.2
	90	110.2	110.2	110.4	110.4	117.0	97.9	102.3	102.3	102.4	102.4	107.0	93.8
4000	75	95.8	91.9	105.9	66.6	116.7	39.7	87.4	87.4	96.5	62.4	106.3	35.5
	80	100.7	100.7	106.5	88.3	117.3	61.6	93.0	93.0	97.1	83.2	106.9	57.4
	85	107.2	107.2	107.9	107.9	117.7	83.4	99.1	99.1	99.3	99.3	107.3	79.2
	90	113.6	113.6	113.8	113.8	118.4	104.2	105.2	105.2	105.3	105.3	108.2	99.8
4400	75	97.1	97.1	106.8	69.9	117.5	40.4	88.7	88.7	97.2	65.6	106.8	36.2
	80	103.2	103.2	107.5	92.9	118.1	64.5	95.1	95.1	98.0	88.3	107.5	60.2
	85	109.9	109.9	109.9	109.9	118.6	88.5	101.4	101.4	101.5	101.5	108.0	84.2
	90	116.5	116.5	116.6	116.6	119.6	111.2	107.6	107.6	107.7	107.7	109.2	106.7
4800	75	98.4	98.4	107.5	73.2	118.1	41.1	90.4	90.4	97.6	68.9	107.2	36.8
	80	105.3	105.3	108.4	98.1	118.8	67.4	96.9	96.9	98.7	93.4	108.0	63.1
	85	112.1	112.1	112.3	112.3	119.4	93.5	103.3	103.3	103.4	103.4	108.6	89.3
	90	118.9	118.9	119.1	119.1	120.7	118.2	109.6	109.6	109.8	109.8	110.2	110.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Evaporator Fan Performance

Table 34. Multispeed direct drive evaporator fan performance (standard motor) 3 to 5 tons - no electric heat WSC036/048/060H3,4,W

Tons	Unit Model Number	cfm	External Static Pressure (in./water) and Motor Power (Bhp)														
			Speed Set 1			Speed Set 2			Speed Set 3			Speed Set 4			Speed Set 5		
			ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp
3	WSC036H3,4,W Downflow Airflow	960	0.502	738	0.20	0.767	850	0.29	0.987	943	0.38	1.190	1029	0.47	-	-	-
		1020	0.419	717	0.19	0.683	829	0.28	0.904	923	0.37	1.107	1009	0.46	-	-	-
		1080	0.335	696	0.19	0.600	808	0.28	0.820	902	0.36	1.023	988	0.45	-	-	-
		1140	0.252	675	0.18	0.516	787	0.27	0.737	881	0.35	0.940	967	0.44	-	-	-
		1200	0.168	654	0.18	0.433	766	0.26	0.653	860	0.34	0.856	946	0.43	1.174	1080	0.58
		1260	0.084	633	0.17	0.349	746	0.25	0.570	839	0.34	0.773	925	0.42	1.090	1060	0.57
		1320	0.001	612.5	0.16	0.266	725	0.25	0.486	818	0.33	0.689	904	0.41	1.006	1039	0.56
		1380	-	-	-	0.182	704	0.24	0.403	797	0.32	0.605	883	0.40	0.923	1018	0.55
		1440	-	-	-	0.098	683	0.23	0.319	776	0.31	0.522	862	0.39	0.839	997	0.54
3	WSC036H3,4,WH orizontal Airflow	960	0.457	703	0.19	0.718	815	0.28	0.936	908	0.36	1.136	994	0.45	-	-	-
		1020	0.379	682	0.18	0.640	794	0.27	0.858	886	0.35	1.058	973	0.44	-	-	-
		1080	0.301	661	0.18	0.562	772	0.26	0.780	864	0.35	0.980	951	0.43	-	-	-
		1140	0.224	639	0.17	0.485	751	0.26	0.702	842	0.34	0.902	930	0.42	-	-	-
		1200	0.146	618	0.17	0.407	729	0.25	0.624	820	0.33	0.824	908	0.41	1.138	1042	0.56
		1260	0.068	596	0.16	0.329	708	0.24	0.546	798	0.32	0.746	887	0.40	1.060	1021	0.55
		1320	-	-	-	0.251	687	0.23	0.468	776	0.31	0.668	865	0.39	0.982	1000	0.54
		1380	-	-	-	0.173	665	0.23	0.390	754	0.30	0.591	844	0.38	0.904	978	0.53
		1440	-	-	-	0.095	644	0.22	0.312	731	0.29	0.513	823	0.37	0.826	957	0.52
4	WSC048H3,4,W Downflow Airflow	1280	0.72	918	0.38	0.96	1010	0.49	1.14	1077	0.58	-	-	-	-	-	-
		1360	0.57	885	0.37	0.82	977	0.47	1.00	1045	0.56	-	-	-	-	-	-
		1440	0.42	852	0.35	0.67	945	0.46	0.85	1012	0.54	-	-	-	-	-	-
		1520	0.27	819	0.34	0.52	912	0.44	0.70	979	0.52	1.13	1139	0.75	-	-	-
		1600	0.12	787	0.33	0.37	879	0.43	0.55	946	0.51	0.98	1106	0.72	1.19	1186	0.85
		1680	-	-	-	0.22	847	0.41	0.40	914	0.49	0.83	1073	0.70	1.05	1153	0.82
		1760	-	-	-	0.07	814	0.40	0.25	881	0.47	0.68	1040	0.68	0.90	1120	0.80
		1840	-	-	-	-	-	-	0.11	848	0.45	0.53	1008	0.66	0.75	1088	0.78
		1920	-	-	-	-	-	-	-	-	-	0.39	975	0.64	0.60	1055	0.75
4	WSC048H3,4,WH orizontal Airflow	1280	0.68	881	0.37	0.90	972	0.47	1.06	1038	0.56	-	-	-	-	-	-
		1360	0.56	849	0.35	0.78	940	0.46	0.94	1006	0.54	-	-	-	-	-	-
		1440	0.44	817	0.34	0.66	908	0.44	0.82	974	0.52	-	-	-	-	-	-
		1520	0.33	785	0.33	0.55	876	0.43	0.71	942	0.50	1.09	1099	0.72	-	-	-
		1600	0.21	754	0.31	0.43	845	0.41	0.59	911	0.49	0.97	1067	0.70	1.16	1146	0.82
		1680	0.09	722	0.30	0.31	813	0.39	0.47	879	0.47	0.85	1036	0.68	1.04	1114	0.80
		1760	-	-	-	0.19	781	0.38	0.35	847	0.45	0.73	1004	0.66	0.92	1082	0.77
		1840	-	-	-	0.07	749	0.36	0.23	815	0.44	0.61	972	0.64	0.80	1051	0.75
		1920	-	-	-	-	-	-	0.12	784	0.42	0.50	941	0.62	0.69	1019	0.73
5	WSC060H3,4,W Downflow Airflow	1600	0.87	830	0.46	1.00	909	0.53	1.20	996	0.64	-	-	-	-	-	-
		1700	0.73	795	0.44	0.86	873	0.51	1.05	960	0.62	-	-	-	-	-	-
		1800	0.59	759	0.42	0.72	837	0.49	0.91	924	0.59	1.12	1011	0.71	-	-	-
		1900	0.44	723	0.40	0.57	802	0.47	0.77	889	0.57	0.97	975	0.68	-	-	-
		2000	0.30	687	0.38	0.43	766	0.45	0.62	853	0.55	0.83	940	0.66	1.20	1086	0.88
		2100	0.16	651	0.36	0.29	730	0.43	0.48	817	0.52	0.69	904	0.63	1.05	1050	0.85
		2200	0.01	616	0.34	0.14	694	0.41	0.34	781	0.50	0.54	868	0.61	0.91	1014	0.82
		2300	-	-	-	0.00	658	0.39	0.19	745	0.48	0.40	832	0.58	0.77	979	0.79
		2400	-	-	-	-	-	-	0.05	710	0.46	0.26	796	0.56	0.62	943	0.76
5	WSC060H3,4,WH orizontal Airflow	1600	0.74	778	0.32	0.84	846	0.41	0.97	919	0.49	1.12	992	0.65	-	-	-
		1700	0.62	742	0.31	0.71	809	0.39	0.85	883	0.47	0.99	956	0.63	-	-	-
		1800	0.49	706	0.29	0.58	773	0.38	0.72	846	0.45	0.86	920	0.60	1.12	1042	0.84
		1900	0.36	669	0.28	0.45	737	0.36	0.59	810	0.43	0.74	883	0.58	0.99	1006	0.81
		2000	0.23	633	0.26	0.32	700	0.34	0.46	774	0.41	0.61	847	0.55	0.87	970	0.78
		2100	0.10	596	0.25	0.20	664	0.32	0.33	737	0.39	0.48	810	0.53	0.74	933	0.75
		2200	-	-	-	0.07	628	0.30	0.21	701	0.38	0.35	774	0.51	0.61	897	0.72
		2300	-	-	-	-	-	-	0.08	665	0.36	0.22	738	0.48	0.48	861	0.69
		2400	-	-	-	-	-	-	-	-	-	0.10	701	0.46	0.35	824	0.66

Notes:

1. For 036 models, fan motor heat (MBh) = 2.72 x Fan Bhp + 0.16. For 048 and 060 models, fan motor heat (MBh) = 2.87 x Fan Bhp + 0.15.
2. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
3. For electric heat applications minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temp rise table.
4. Data includes pressure drop due to wet coil and filters.

Table 35. Multispeed direct drive evaporator fan performance (oversized motor) 3 to 5 tons - no electric heat WSC036/048/060H3,4,W

Tons	Unit Model Number	cfm	External Static Pressure (in./water) and Motor Power (Bhp)														
			Speed Set 1			Speed Set 2			Speed Set 3			Speed Set 4			Speed Set 5		
			ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp
3	WSC036H3,4,W Downflow Airflow	960	1.15	963	0.44	-	-	-	-	-	-	-	-	-	-	-	-
		1020	1.06	942	0.43	-	-	-	-	-	-	-	-	-	-	-	-
		1080	0.97	921	0.42	1.51	1157	0.69	-	-	-	-	-	-	-	-	-
		1140	0.88	900	0.41	1.42	1133	0.67	-	-	-	-	-	-	-	-	-
		1200	0.79	879	0.40	1.33	1109	0.66	1.45	1155	0.73	-	-	-	-	-	-
		1260	0.70	859	0.39	1.24	1086	0.65	1.36	1131	0.71	-	-	-	-	-	-
		1320	0.61	838	0.38	1.15	1062	0.63	1.28	1107	0.70	1.49	1184	0.81	-	-	-
		1380	0.52	817	0.37	1.06	1038	0.62	1.19	1084	0.68	1.40	1160	0.79	1.51	1201	0.86
		1440	0.43	796	0.36	0.97	1015	0.60	1.10	1060	0.67	1.31	1136	0.78	1.42	1177	0.84
3	WSC036H3,4,WH orizontal Airflow	960	1.14	1111	0.50	1.50	1164	0.69	-	-	-	-	-	-	-	-	-
		1020	1.06	1088	0.49	1.43	1141	0.68	-	-	-	-	-	-	-	-	-
		1080	0.99	1065	0.48	1.35	1118	0.67	1.44	1131	0.71	-	-	-	-	-	-
		1140	0.91	1042	0.47	1.28	1095	0.65	1.36	1108	0.70	1.50	1128	0.77	-	-	-
		1200	0.84	1019	0.46	1.20	1072	0.64	1.29	1085	0.68	1.43	1105	0.76	1.50	1117	0.80
		1260	0.76	996	0.45	1.13	1049	0.62	1.21	1062	0.67	1.35	1082	0.74	1.43	1093	0.78
		1320	0.69	973	0.44	1.05	1026	0.61	1.14	1038	0.65	1.28	1059	0.72	1.35	1070	0.76
		1380	0.61	950	0.43	0.98	1003	0.60	1.06	1015	0.64	1.20	1036	0.71	1.28	1047	0.75
		1440	0.54	927	0.42	0.90	980	0.58	0.99	992	0.62	1.13	1013	0.69	1.20	1024	0.73
4	WSC048H3,4,W Downflow Airflow	1280	1.12	1016	0.58	1.50	1159	0.78	-	-	-	-	-	-	-	-	-
		1360	1.00	988	0.56	1.39	1131	0.76	-	-	-	-	-	-	-	-	-
		1440	0.88	961	0.55	1.27	1104	0.74	-	-	-	-	-	-	-	-	-
		1520	0.77	933	0.53	1.15	1076	0.73	-	-	-	-	-	-	-	-	-
		1600	0.65	905	0.52	1.04	1048	0.71	1.50	1218	0.97	-	-	-	-	-	-
		1680	0.54	877	0.50	0.92	1020	0.69	1.38	1190	0.95	-	-	-	-	-	-
		1760	0.42	850	0.49	0.81	993	0.67	1.26	1162	0.93	-	-	-	-	-	-
		1840	0.30	822	0.47	0.69	965	0.65	1.15	1134	0.90	1.50	1266	1.13	-	-	-
		1920	0.19	794	0.45	0.57	937	0.63	1.03	1107	0.88	1.39	1238	1.10	1.50	1279	1.18
4	WSC048H3,4,WH orizontal Airflow	1280	1.04	1077	0.62	1.30	1121	0.76	-	-	-	-	-	-	-	-	-
		1360	0.94	1047	0.60	1.20	1091	0.74	-	-	-	-	-	-	-	-	-
		1440	0.84	1016	0.58	1.10	1061	0.72	1.41	1287	1.03	-	-	-	-	-	-
		1520	0.74	986	0.56	1.00	1030	0.70	1.31	1257	1.00	-	-	-	-	-	-
		1600	0.64	956	0.55	0.90	1000	0.67	1.21	1226	0.98	1.45	1340	1.20	-	-	-
		1680	0.54	925	0.53	0.80	970	0.65	1.11	1196	0.95	1.35	1310	1.17	1.43	1346	1.24
		1760	0.44	895	0.51	0.70	939	0.63	1.01	1166	0.93	1.25	1280	1.14	1.33	1315	1.21
		1840	0.34	865	0.49	0.60	909	0.61	0.91	1135	0.91	1.15	1249	1.11	1.23	1285	1.18
		1920	0.24	834	0.48	0.50	879	0.59	0.81	1105	0.88	1.05	1219	1.09	1.13	1255	1.16
5	WSC060H3,4,W Downflow Airflow	1600	1.23	905	0.52	1.50	1048	0.71	-	-	-	-	-	-	-	-	-
		1700	1.08	870	0.50	1.35	1014	0.68	-	-	-	-	-	-	-	-	-
		1800	0.94	836	0.48	1.21	979	0.66	-	-	-	-	-	-	-	-	-
		1900	0.79	801	0.46	1.06	944	0.64	1.50	1113	0.89	-	-	-	-	-	-
		2000	0.65	766	0.44	0.92	909	0.61	1.35	1079	0.86	1.50	1210	1.08	-	-	-
		2100	0.50	732	0.42	0.77	875	0.59	1.21	1044	0.83	1.36	1176	1.05	-	-	-
		2200	0.36	697	0.40	0.63	840	0.57	1.06	1009	0.80	1.21	1141	1.02	1.50	1182	0.84
		2300	0.21	662	0.38	0.48	805	0.54	0.92	975	0.78	1.07	1106	0.99	1.36	1147	1.06
		2400	0.07	628	0.36	0.34	771	0.52	0.77	940	0.75	0.92	1072	0.96	1.21	1113	1.03
5	WSC060H3,4,WH orizontal Airflow	1600	1.03	1075	0.61	1.21	1119	0.75	1.51	1316	1.05	-	-	-	-	-	-
		1700	0.91	1037	0.59	1.09	1081	0.73	1.38	1278	1.02	1.49	1350	1.20	-	-	-
		1800	0.78	999	0.57	0.96	1043	0.70	1.26	1240	0.99	1.36	1312	1.17	-	-	-
		1900	0.66	961	0.55	0.84	1005	0.68	1.13	1202	0.96	1.24	1274	1.14	1.43	1347	1.24
		2000	0.53	923	0.53	0.71	967	0.65	1.01	1164	0.93	1.11	1236	1.10	1.31	1309	1.21
		2100	0.41	885	0.51	0.59	929	0.63	0.88	1126	0.90	0.99	1198	1.07	1.18	1271	1.17
		2200	0.28	847	0.48	0.46	891	0.60	0.76	1088	0.87	0.86	1160	1.04	1.06	1233	1.14
		2300	0.16	809	0.46	0.34	853	0.58	0.63	1050	0.84	0.74	1122	1.00	0.93	1195	1.10
		2400	0.03	771	0.44	0.21	816	0.55	0.51	1013	0.81	0.61	1084	0.97	0.81	1157	1.07

Notes:

1. For 036 models, fan motor heat (MBh) = 2.72 x Fan Bhp + 0.16. For 048 and 060 models, fan motor heat (MBh) = 2.87 x Fan Bhp + 0.15.
2. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
3. For electric heat applications minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temp rise table.
4. Data includes pressure drop due to wet coil and filters.

Evaporator Fan Performance

Table 36. Belt drive evaporator fan performance - 7.5 tons standard efficiency - WSC092H3,H4,HW downflow airflow

External Static Pressure (Inches of Water Gauge)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	1-hp Standard Motor and Field Supplied Low Static Drive[a]										1-hp Standard Motor and Drive									
2400	—	—	474	0.36	524	0.44	570	0.52	611	0.59	650	0.68	686	0.76	720	0.84	752	0.93	783	1.02
2700	458	0.39	508	0.47	554	0.55	598	0.64	638	0.73	676	0.82	711	0.91	745	1.00	776	1.09	806	1.19
3000	498	0.52	544	0.60	587	0.69	628	0.78	666	0.88	704	0.98	738	1.08	770	1.18	801	1.28	831	1.38
3300	539	0.67	581	0.76	621	0.85	660	0.96	696	1.06	732	1.17	766	1.28	797	1.39	828	1.49	856	1.60
3600	580	0.85	620	0.95	657	1.05	693	1.16	728	1.27	761	1.38	794	1.50	825	1.62	855	1.74	882	1.85
															3-hp Oversized Motor and Drive[b]					

External Static Pressure (Inches of Water Gauge)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	1-hp Standard Motor and Drive										3-hp Oversized Motor and Drive[b]									
2400	813	1.10	841	1.19	868	1.28	894	1.37	920	1.46	943	1.54	967	1.63	990	1.72	1012	1.81	1035	1.90
2700	836	1.29	864	1.39	891	1.48	917	1.58	942	1.68	966	1.78	990	1.88	1012	1.97	1035	2.07	1056	2.17
3000	860	1.49	887	1.60	914	1.70	940	1.81	964	1.92	988	2.03	1012	2.13	1035	2.24	1056	2.35	1079	2.46
3300	885	1.72	911	1.83	938	1.94	963	2.06	988	2.18	1012	2.30	1035	2.42	1057	2.54	1079	2.65	1100	2.77
3600	910	1.97	937	2.09	963	2.22	988	2.34	1012	2.46	1035	2.59	1059	2.72	1081	2.85	1104	2.98	1124	3.11
									3-hp Oversized Motor and Drive and Field Supplied High Static Drive[c]											

Notes:

1. For standard evaporator fan speed (rpm), reference the standard motor and sheave/fan speed applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. 1-hp fan motor heat (MBh) = 2.829 x fan bhp +.4024. 3-hp fan motor heat (MBh) = 2.900 x Fan bhp -.3800
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) BAYLSDR009A
(b) BAYHSMT400A
(c) Field Supplied AK56 x 1 in. fan sheave required.

Table 37. Belt drive evaporator fan performance - 7.5 tons standard efficiency - WSC092H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water Gauge)																				
	.10"		.20"		.30"		.40"		.50"		.60"		.70"		.80"		.90"		1.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	1-hp Standard Motor and Field Supplied Low Static Drive[a]								1-hp Standard Motor and Drive											
2400	478	0.36	528	0.43	576	0.52	626	0.62	681	0.75	731	0.88	778	1.02	821	1.15	862	1.29	901	1.43
2700	526	0.49	570	0.57	614	0.66	656	0.76	701	0.88	751	1.02	797	1.17	840	1.32	880	1.47	920	1.63
3000	575	0.65	615	0.74	655	0.84	694	0.94	731	1.05	770	1.17	817	1.34	859	1.50	900	1.67	938	1.83
3300	624	0.84	661	0.94	698	1.04	734	1.15	768	1.27	802	1.39	838	1.52	878	1.69	919	1.87	957	2.05
3600	675	1.07	709	1.17	742	1.28	776	1.41	809	1.53	840	1.65	871	1.79	903	1.92	939	2.10	977	2.29
											3-hp Oversized Motor and Drive[b]									

External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	3-hp Oversized Motor and Drive[b]																			
2400	938	1.57	973	1.71	1007	1.86	1038	1.99	1070	2.14	1101	2.29	1130	2.44	1159	2.59	1187	2.74	1214	2.89
2700	956	1.78	991	1.93	1024	2.08	1057	2.25	1088	2.40	1119	2.56	1149	2.73	1177	2.89	1206	3.06	1233	3.22
3000	975	2.00	1009	2.16	1044	2.34	1075	2.51	1108	2.69	1138	2.86	1167	3.03	1195	3.21	1222	3.38	—	—
3300	994	2.24	1028	2.42	1063	2.61	1094	2.79	1126	2.98	1155	3.16	1185	3.35	—	—	—	—	—	—
3600	1013	2.49	1048	2.69	1081	2.88	1114	3.09	1145	3.29	—	—	—	—	—	—	—	—	—	—
							3-hp Oversized Motor and Field Supplied High Static Drive[c]													

Notes:

1. For standard evaporator fan speed (rpm), reference the standard motor and sheave/fan speed applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. 1-hp fan motor heat (MBh) = 2.829 x fan bhp +.4024. 3-hp fan motor heat (MBh) = 2.900 x Fan bhp -.3800.
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) BAYLSDR009A
(b) BAYHSMT400A
(c) Field Supplied AK56 x 1 in. fan sheave required.

Evaporator Fan Performance

Table 38. Direct drive evaporator fan performance - 7.5 tons standard efficiency Title 24 single zone VAV - WSC092H3,H4,HW downflow airflow

External Static Pressure (Inches of Water Gauge)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	713	0.21	763	0.26	807	0.32	851	0.39	892	0.45	924	0.50	957	0.56	991	0.62	1024	0.68	1054	0.74
2700	792	0.28	834	0.34	880	0.41	914	0.47	955	0.54	992	0.62	1023	0.68	1051	0.74	1081	0.81	1112	0.88
3000	871	0.36	908	0.43	949	0.51	987	0.58	1018	0.65	1054	0.73	1090	0.81	1120	0.89	1145	0.96	1171	1.02
3300	950	0.47	985	0.54	1020	0.62	1058	0.71	1090	0.79	1118	0.86	1151	0.95	1184	1.04	1214	1.13	1240	1.21
3600	1030	0.60	1062	0.67	1094	0.76	1128	0.84	1162	0.94	1191	1.03	1216	1.10	1245	1.20	1276	1.30	1305	1.40
External Static Pressure (Inches of Water Gauge)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1084	0.79	1113	0.85	1141	0.90	1168	0.95	1194	1.00	1218	1.05	1243	1.10	1267	1.14	1290	1.19	1314	1.23
2700	1140	0.94	1169	1.01	1195	1.07	1222	1.13	1248	1.20	1273	1.25	1296	1.31	1321	1.37	1343	1.43	1366	1.48
3000	1198	1.10	1225	1.18	1252	1.25	1278	1.32	1303	1.40	1328	1.47	1351	1.54	1375	1.61	1398	1.67	1419	1.74
3300	1262	1.28	1285	1.35	1309	1.43	1335	1.52	1360	1.60	1384	1.69	1407	1.77	1429	1.84	1452	1.92	1475	2.00
3600	1331	1.49	1355	1.58	1375	1.65	1396	1.74	1418	1.82	1441	1.91	1464	2.01	1487	2.10	1509	2.19	1530	2.27

Notes:
1. For direct drive fan speed (rpm), reference the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388.
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 39. Direct drive evaporator fan performance - 7.5 tons standard efficiency Title 24 single zone VAV - WSC092H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water Gauge)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	720	0.21	769	0.27	817	0.33	856	0.39	894	0.44	929	0.50	964	0.56	997	0.62	1028	0.69	1060	0.75
2700	800	0.29	841	0.34	888	0.42	927	0.48	962	0.55	995	0.61	1027	0.67	1058	0.74	1088	0.81	1118	0.88
3000	880	0.38	917	0.44	956	0.51	999	0.59	1032	0.67	1063	0.74	1094	0.81	1123	0.88	1151	0.95	1178	1.02
3300	961	0.49	994	0.55	1028	0.63	1067	0.72	1104	0.80	1133	0.88	1162	0.96	1190	1.04	1218	1.12	1243	1.19
3600	1042	0.62	1073	0.69	1104	0.77	1136	0.85	1173	0.95	1205	1.05	1233	1.13	1259	1.22	1285	1.30	1310	1.39
External Static Pressure (Inches of Water Gauge)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1090	0.82	1119	0.89	1147	0.96	1174	1.03	1200	1.10	1226	1.18	1251	1.25	1276	1.33	1299	1.41	1323	1.49
2700	1147	0.95	1175	1.02	1202	1.10	1228	1.17	1254	1.25	1279	1.33	1304	1.41	1327	1.49	1350	1.57	1374	1.66
3000	1206	1.10	1233	1.18	1259	1.26	1285	1.34	1309	1.42	1333	1.50	1359	1.59	1381	1.67	1405	1.76	1427	1.85
3300	1269	1.27	1294	1.35	1320	1.44	1344	1.52	1367	1.61	1391	1.70	1414	1.78	1438	1.88	1460	1.97	1482	2.06
3600	1335	1.48	1359	1.56	1382	1.64	1405	1.73	1428	1.82	1451	1.91	1473	2.01	1496	2.10	1518	2.20	1538	2.29

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388.
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 40. Belt drive evaporator fan performance - 8.5 tons standard efficiency - WSC102H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10"		.20"		.30"		.40"		.50"		.60"		.70"		.80"		.90"		1.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	2-hp Standard Motor and Field Supplied Low Static Drive[a]																			
2720	-	-	519	0.43	563	0.50	603	0.57	644	0.65	681	0.73	716	0.81	749	0.88	780	0.96	809	1.03
3060	513	0.48	558	0.56	604	0.65	640	0.73	676	0.81	713	0.90	747	0.99	779	1.07	810	1.16	840	1.25
3400	558	0.63	600	0.72	643	0.82	681	0.92	714	1.00	745	1.09	779	1.19	811	1.29	841	1.39	870	1.49
3740	605	0.82	645	0.92	683	1.02	722	1.13	754	1.24	783	1.33	811	1.42	842	1.53	872	1.64	901	1.75
4080	654	1.04	691	1.16	724	1.26	760	1.38	795	1.50	824	1.61	851	1.71	876	1.81	904	1.92	932	2.04
									2-hp Standard Motor and Drive											

External Static Pressure (Inches of Water)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	2-hp Standard Motor and Drive																			
2720	838	1.11	865	1.18	891	1.26	916	1.33	940	1.40	963	1.47	986	1.54	1008	1.61	1030	1.69	1051	1.76
3060	867	1.33	893	1.41	919	1.50	945	1.59	968	1.66	992	1.75	1014	1.83	1037	1.91	1058	2.00	1079	2.08
3400	897	1.58	923	1.68	949	1.77	974	1.87	997	1.96	1020	2.05	1044	2.15	1065	2.24	1087	2.33	1107	2.42
3740	928	1.86	954	1.96	980	2.07	1003	2.18	1027	2.28	1050	2.39	1072	2.49	1094	2.59	1115	2.70	1136	2.80
4080	959	2.16	985	2.29	1010	2.40	1034	2.52	1058	2.64	1079	2.75	1102	2.87	1124	2.98	1145	3.10	1165	3.21
									3-hp Oversized Motor and Drive[b]											

Notes:

1. For standard evaporator fan speed (rpm), reference the standard motor and sheave/fan speed applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. 1-hp fan motor heat (MBh) = 2.829 x fan bhp + .4024. 2-hp fan motor heat (MBh) = 2.000 x fan bhp +.5000. 3-hp fan motor heat (MBh) = 2.900 x fan bhp +.4750
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
6. For electric heat applications, minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temperature rise table.

(a) BAYLSDR009A
(b) BAYHSMT097A

Table 41. Belt drive evaporator fan performance - 8.5 tons standard efficiency - WSC102H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10"		.20"		.30"		.40"		.50"		.60"		.70"		.80"		.90"		1.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	2-hp Standard Motor and Field Supplied Low Static Drive Accessory Kit[a]																			
2720	523	0.43	571	0.50	619	0.59	676	0.69	721	0.80	759	0.90	795	1.00	830	1.10	862	1.20	893	1.30
3060	578	0.59	625	0.68	659	0.75	706	0.86	757	0.98	800	1.10	834	1.21	866	1.33	899	1.44	929	1.55
3400	633	0.79	673	0.88	710	0.97	744	1.07	788	1.19	833	1.32	874	1.46	907	1.58	937	1.71	967	1.84
3740	690	1.03	723	1.12	764	1.24	791	1.33	825	1.44	864	1.57	907	1.72	945	1.87	979	2.02	1007	2.15
4080	747	1.31	777	1.41	812	1.53	844	1.65	869	1.75	901	1.87	938	2.02	976	2.18	1013	2.35	1048	2.51
	2-hp Standard Motor and Drive																			

External Static Pressure (Inches of Water)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	2-hp Standard Motor and Drive																			
2720	924	1.40	952	1.50	980	1.60	1006	1.70	1032	1.81	1057	1.91	1081	2.01	1105	2.11	1127	2.21	1150	2.31
3060	959	1.66	987	1.77	1014	1.89	1041	2.01	1066	2.11	1091	2.23	1115	2.34	1138	2.46	1161	2.57	1184	2.69
3400	995	1.96	1024	2.09	1051	2.21	1077	2.34	1102	2.46	1126	2.59	1150	2.72	1173	2.84	1196	2.97	1217	3.09
3740	1034	2.29	1060	2.43	1087	2.57	1113	2.71	1138	2.84	1162	2.98	1185	3.12	1208	3.25	1230	3.39	-	-
4080	1076	2.66	1101	2.81	1126	2.96	1150	3.11	1175	3.26	1198	3.41	-	-	-	-	-	-	-	-
	3-hp Oversized Motor and Drive[b]																			

Notes:

1. For standard evaporator fan speed (rpm), reference the standard motor and sheave/fan speed applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. 1-hp fan motor heat (MBh) = 2.829 x fan bhp + .4024. 2-hp fan motor heat (MBh) = 2.000 x fan bhp +.5000. 3-hp fan motor heat (MBh) = 2.900 x fan bhp +.4750
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
6. For electric heat applications, minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temperature rise table.

(a) BAYLSDR009A
(b) BAYHSMT097A

Evaporator Fan Performance

Table 42. Direct drive evaporator fan performance - 8.5 tons standard efficiency Title 24 single zone VAV - WSC102H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	812	0.31	857	0.37	899	0.44	935	0.50	976	0.58	1011	0.65	1040	0.72	1068	0.78	1099	0.85	1129	0.92
3060	904	0.42	942	0.49	983	0.57	1017	0.64	1049	0.71	1086	0.80	1119	0.89	1149	0.96	1174	1.03	1197	1.10
3400	997	0.55	1030	0.63	1066	0.71	1103	0.81	1132	0.89	1160	0.96	1193	1.06	1225	1.16	1254	1.25	1279	1.33
3740	1090	0.72	1120	0.80	1152	0.89	1185	0.99	1218	1.09	1244	1.17	1269	1.25	1298	1.36	1329	1.47	1356	1.57
4080	1183	0.92	1211	1.01	1240	1.10	1270	1.20	1301	1.31	1330	1.42	1354	1.51	1377	1.60	1402	1.70	1430	1.82
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1158	0.99	1186	1.05	1213	1.11	1238	1.18	1264	1.24	1289	1.30	1313	1.36	1336	1.42	1359	1.47	1382	1.53
3060	1226	1.18	1253	1.26	1279	1.33	1305	1.41	1329	1.48	1353	1.55	1377	1.63	1400	1.70	1422	1.76	1444	1.83
3400	1301	1.40	1323	1.48	1347	1.56	1372	1.65	1396	1.74	1421	1.83	1444	1.91	1465	1.99	1487	2.07	1509	2.15
3740	1382	1.67	1406	1.76	1426	1.84	1445	1.92	1465	2.01	1489	2.11	1510	2.20	1533	2.30	1554	2.39	1576	2.49
4080	1457	1.94	1482	2.05	1506	2.16	1527	2.26	1546	2.35	1565	2.44	1583	2.53	1602	2.63	1623	2.73	1643	2.84

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 43. Direct drive evaporator fan performance - 8.5 tons standard efficiency Title 24 single zone VAV - WSC102H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	821	0.31	864	0.38	911	0.45	947	0.52	982	0.58	1015	0.65	1046	0.71	1077	0.78	1107	0.85	1137	0.93
3060	914	0.43	951	0.50	993	0.58	1032	0.66	1063	0.73	1095	0.81	1125	0.88	1153	0.95	1181	1.03	1208	1.10
3400	1008	0.57	1041	0.64	1076	0.73	1115	0.82	1148	0.91	1177	0.99	1204	1.07	1232	1.15	1259	1.24	1284	1.32
3740	1103	0.75	1132	0.82	1163	0.91	1197	1.01	1232	1.11	1262	1.21	1288	1.30	1313	1.38	1339	1.47	1364	1.57
4080	1198	0.95	1225	1.04	1253	1.13	1281	1.22	1314	1.33	1345	1.45	1372	1.55	1397	1.65	1420	1.75	1444	1.84
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1165	1.00	1193	1.07	1220	1.15	1245	1.22	1271	1.30	1296	1.38	1322	1.47	1344	1.55	1368	1.63	1391	1.72
3060	1235	1.18	1261	1.26	1288	1.34	1313	1.43	1337	1.51	1361	1.59	1385	1.68	1408	1.77	1431	1.86	1453	1.95
3400	1310	1.40	1334	1.48	1359	1.57	1382	1.66	1406	1.75	1430	1.84	1453	1.93	1474	2.02	1496	2.12	1518	2.21
3740	1388	1.66	1411	1.75	1433	1.83	1456	1.93	1477	2.02	1500	2.11	1522	2.21	1544	2.31	1565	2.41	1586	2.51
4080	1467	1.95	1489	2.04	1512	2.14	1533	2.24	1554	2.34	1575	2.43	1594	2.53	1616	2.64	1636	2.74	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 44. Direct drive evaporator fan performance - 10 tons standard efficiency - WSC120H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	942	0.47	978	0.54	1017	0.63	1053	0.71	1082	0.78	1116	0.87	1150	0.96	1181	1.04	1207	1.12	1231	1.19
3600	1051	0.65	1083	0.73	1116	0.81	1152	0.91	1183	1.00	1209	1.08	1237	1.17	1268	1.27	1298	1.38	1325	1.47
4000	1161	0.87	1190	0.96	1219	1.05	1249	1.15	1282	1.26	1310	1.36	1334	1.45	1357	1.54	1385	1.65	1412	1.76
4400	1272	1.13	1298	1.23	1324	1.33	1351	1.44	1379	1.54	1409	1.67	1435	1.79	1457	1.88	1478	1.98	1501	2.08
4800	1383	1.45	1407	1.56	1431	1.66	1455	1.78	1480	1.89	1506	2.01	1532	2.14	1558	2.28	1579	2.39	1599	2.49
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1254	1.26	1282	1.35	1307	1.43	1332	1.51	1357	1.59	1381	1.66	1404	1.74	1427	1.82	1449	1.89	1471	1.96
3600	1350	1.56	1372	1.64	1392	1.72	1412	1.80	1437	1.90	1460	1.99	1483	2.08	1504	2.17	1526	2.26	1548	2.35
4000	1440	1.88	1464	1.98	1488	2.08	1508	2.18	1527	2.26	1545	2.35	1564	2.44	1586	2.55	1606	2.65	1627	2.75
4400	1526	2.20	1552	2.33	1576	2.46	1600	2.58	1621	2.69	1642	2.80	1660	2.90	-	-	-	-	-	-
4800	1618	2.60	1639	2.71	1663	2.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.8623 x fan bhp + 0.1504
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 45. Direct drive evaporator fan performance - 10 tons standard efficiency - WSC120H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	953	0.48	988	0.55	1027	0.64	1067	0.73	1098	0.80	1128	0.88	1157	0.96	1186	1.03	1213	1.11	1239	1.19
3600	1064	0.67	1095	0.75	1126	0.83	1163	0.93	1198	1.03	1226	1.11	1253	1.20	1280	1.29	1306	1.37	1331	1.46
4000	1175	0.90	1203	0.98	1231	1.07	1260	1.17	1294	1.28	1327	1.39	1353	1.49	1377	1.58	1401	1.68	1425	1.78
4400	1288	1.18	1313	1.27	1338	1.36	1364	1.46	1392	1.57	1422	1.70	1452	1.82	1477	1.93	1500	2.04	1522	2.14
4800	1400	1.51	1423	1.61	1446	1.71	1470	1.82	1494	1.93	1519	2.05	1547	2.18	1575	2.32	1600	2.45	1622	2.56
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1265	1.27	1291	1.35	1316	1.43	1342	1.52	1365	1.60	1389	1.69	1412	1.78	1435	1.87	1458	1.96	1479	2.05
3600	1355	1.54	1378	1.63	1401	1.72	1425	1.81	1447	1.90	1471	2.00	1492	2.09	1515	2.19	1536	2.28	1557	2.38
4000	1448	1.87	1471	1.97	1494	2.07	1515	2.16	1536	2.26	1557	2.36	1578	2.46	1598	2.56	1619	2.66	1640	2.77
4400	1543	2.24	1565	2.35	1586	2.46	1607	2.56	1628	2.67	1647	2.77	1667	2.88	1686	2.98	-	-	-	-
4800	1642	2.68	1662	2.79	1682	2.91	1701	3.02	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.8623 x fan bhp + 0.1504
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 46. Direct drive evaporator fan performance - 3 tons high efficiency - W/DHC036H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
960	539	0.11	585	0.15	632	0.18	679	0.22	725	0.26	772	0.29	819	0.33	865	0.37	912	0.41	927	0.44
1080	566	0.16	613	0.20	659	0.24	706	0.27	753	0.31	800	0.35	846	0.38	893	0.42	940	0.46	948	0.49
1200	594	0.21	640	0.25	687	0.29	734	0.32	780	0.36	827	0.40	874	0.43	920	0.47	930	0.51	968	0.54
1320	621	0.26	668	0.30	714	0.34	761	0.37	808	0.41	854	0.45	901	0.49	948	0.52	950	0.56	988	0.60
1440	648	0.31	695	0.35	742	0.39	789	0.43	835	0.46	882	0.50	929	0.54	932	0.57	971	0.61	1009	0.65
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
960	965	0.48	1004	0.52	1042	0.55	1080	0.59	1118	0.63
1080	986	0.53	1024	0.57	1062	0.60	1100	0.64	1139	0.67
1200	1006	0.58	1044	0.62	1083	0.66	1121	0.70	1159	0.74
1320	1027	0.63	1065	0.67	1103	0.70	1141	0.73	1179	0.76
1440	1047	0.68	1085	0.70	1123	0.74	1162	0.77	1200	0.80

Notes:
1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp + 0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Table 47. Direct drive evaporator fan performance - 3 tons high efficiency - W/DHC036H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
960	-	-	515	0.15	565	0.18	614	0.22	663	0.26	713	0.29	762	0.33	812	0.37	861	0.41	921	0.44
1080	-	-	541	0.20	590	0.24	640	0.27	689	0.31	738	0.35	788	0.38	837	0.42	887	0.46	940	0.49
1200	517	0.21	566	0.25	616	0.29	665	0.32	715	0.36	764	0.40	813	0.43	863	0.47	921	0.51	959	0.54
1320	543	0.26	592	0.30	641	0.34	691	0.37	740	0.41	790	0.45	839	0.49	888	0.52	940	0.56	978	0.60
1440	568	0.31	618	0.35	667	0.39	716	0.43	766	0.46	815	0.50	865	0.54	922	0.57	960	0.61	997	0.65
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
960	958	0.48	995	0.52	1033	0.55	1070	0.59	1108	0.63
1080	977	0.53	1015	0.57	1052	0.60	1089	0.64	1127	0.67
1200	996	0.58	1034	0.62	1071	0.66	1108	0.70	1146	0.74
1320	1015	0.63	1053	0.67	1090	0.70	1127	0.73	1165	0.76
1440	1034	0.68	1072	0.70	1109	0.74	1147	0.77	1184	0.80

Notes:

1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp + 0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Evaporator Fan Performance

Table 48. Direct drive evaporator fan performance - 4 tons high efficiency - W/DHC048H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
1280	541	0.07	585	0.12	628	0.18	672	0.23	715	0.28	759	0.33	802	0.39	846	0.44	889	0.49	905	0.55
1440	564	0.15	608	0.2	651	0.25	695	0.3	738	0.36	782	0.41	825	0.46	869	0.51	912	0.57	925	0.62
1600	587	0.22	631	0.27	674	0.33	718	0.38	761	0.43	805	0.48	848	0.54	892	0.59	901	0.64	945	0.70
1760	610	0.3	654	0.35	697	0.4	741	0.45	784	0.51	828	0.56	871	0.61	915	0.66	921	0.72	965	0.77
1920	634	0.37	677	0.42	721	0.48	764	0.53	808	0.58	851	0.63	895	0.69	898	0.74	941	0.79	985	0.85
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
1280	949	0.60	992	0.65	1036	0.70	1079	0.76	1123	0.81
1440	969	0.67	1012	0.73	1056	0.78	1099	0.83	1143	0.88
1600	989	0.75	1032	0.80	1076	0.85	1119	0.91	1163	0.96
1760	1009	0.82	1052	0.88	1096	0.93	1139	0.98	1183	1.03
1920	1029	0.90	1072	0.95	1116	1.00	1159	1.06	1203	1.11

Notes:
1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp + 0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Table 49. Direct drive evaporator fan performance - 4 tons high efficiency - W/DHC048H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
1280	591	0.07	632	0.12	674	0.18	715	0.23	756	0.28	798	0.33	839	0.39	880	0.44	922	0.49	968	0.55
1440	621	0.15	663	0.2	704	0.25	745	0.3	787	0.36	828	0.41	869	0.46	911	0.51	952	0.57	1005	0.62
1600	652	0.22	693	0.27	734	0.33	776	0.38	817	0.43	858	0.48	900	0.54	941	0.59	1008	0.64	1041	0.70
1760	682	0.3	723	0.35	765	0.4	806	0.45	847	0.51	889	0.56	930	0.61	971	0.66	1045	0.72	1078	0.77
1920	712	0.37	754	0.42	795	0.48	836	0.53	878	0.58	919	0.63	960	0.69	1048	0.74	1082	0.79	1115	0.85
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
1280	1001	0.60	1034	0.65	1067	0.70	1101	0.76	1134	0.81
1440	1038	0.67	1071	0.73	1104	0.78	1137	0.83	1170	0.88
1600	1075	0.75	1108	0.80	1141	0.85	1174	0.91	1207	0.96
1760	1111	0.82	1144	0.88	1177	0.93	1210	0.98	1244	1.03
1920	1148	0.90	1181	0.95	1214	1.00	1247	1.06	1280	1.11

Notes:
1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp +0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Evaporator Fan Performance

Table 50. Direct drive evaporator fan performance - 5 tons high efficiency - W/DHC060H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
1600	618	0.13	656	0.18	693	0.23	731	0.28	769	0.33	806	0.38	844	0.43	881	0.48	919	0.53	932	0.58
1800	651	0.24	689	0.29	727	0.34	764	0.39	802	0.44	839	0.49	877	0.54	915	0.59	957	0.64	961	0.69
2000	685	0.35	722	0.4	760	0.45	798	0.5	835	0.55	873	0.6	910	0.65	948	0.7	952	0.75	991	0.80
2200	718	0.46	756	0.51	793	0.56	831	0.61	869	0.66	906	0.71	944	0.76	981	0.81	981	0.86	1021	0.91
2400	752	0.57	789	0.62	827	0.67	864	0.72	902	0.77	940	0.82	977	0.87	971	0.92	1011	0.97	1050	1.02
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
1600	971	0.63	1011	0.68	1050	0.73	1089	0.79	1129	0.84
1800	1001	0.74	1040	0.79	1080	0.84	1119	0.89	1158	0.92
2000	1030	0.85	1070	0.90	1109	0.95	1149	0.99	1188	1.02
2200	1060	0.96	1099	1.01	1139	1.04	1178	1.06	1218	1.09
2400	1090	1.05	1129	1.07	1168	1.10	1208	1.13	1247	1.16

Notes:

1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp +0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Table 51. Direct drive evaporator fan performance - 5 tons high efficiency - W/DHC060H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
1600	680	0.14	717	0.19	753	0.25	790	0.31	827	0.36	864	0.42	901	0.47	937	0.48	974	0.53	1047	0.58
1800	716	0.27	753	0.32	789	0.38	826	0.44	863	0.49	900	0.55	937	0.61	973	0.59	1010	0.64	1084	0.69
2000	752	0.4	789	0.46	825	0.51	862	0.57	899	0.63	936	0.68	973	0.74	1009	0.7	1084	0.75	1120	0.80
2200	788	0.53	825	0.59	861	0.65	898	0.7	935	0.76	972	0.82	1009	0.87	1045	0.81	1121	0.86	1156	0.91
2400	824	0.67	861	0.72	897	0.78	934	0.84	971	0.89	1008	0.95	1045	1.01	1121	0.92	1157	0.97	1193	1.02
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
1600	1083	0.63	1119	0.68	1155	0.73	1191	0.79	1227	0.84
1800	1120	0.74	1155	0.79	1191	0.84	1227	0.89	1263	0.92
2000	1156	0.85	1192	0.90	1228	0.95	1264	0.99	1300	1.02
2200	1192	0.96	1228	1.01	1264	1.04	1300	1.06	1336	1.09
2400	1229	1.05	1265	1.07	1301	1.10	1336	1.13	1372	1.16

Notes:
1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp +0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Evaporator Fan Performance

Table 52. Direct drive evaporator fan performance - 6 tons high efficiency - WHC074H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	598	0.10	649	0.14	695	0.18	736	0.23	773	0.27	808	0.32	841	0.37	872	0.41	901	0.46	930	0.52
2160	660	0.14	707	0.18	750	0.23	789	0.27	825	0.32	859	0.37	891	0.42	921	0.47	950	0.53	977	0.58
2400	722	0.18	767	0.23	807	0.27	844	0.32	879	0.38	912	0.43	943	0.48	972	0.54	1000	0.60	1027	0.66
2640	785	0.23	827	0.28	865	0.33	900	0.38	934	0.44	965	0.50	995	0.56	1024	0.62	1051	0.68	1077	0.74
2880	848	0.28	888	0.34	924	0.40	958	0.45	990	0.51	1020	0.58	1049	0.64	1077	0.70	1103	0.77	1129	0.83
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	957	0.57	983	0.63	1009	0.68	1032	0.74	1056	0.8	1079	0.85	1101	0.92	1122	0.98	1143	1.04	1164	1.1
2160	1004	0.64	1029	0.7	1055	0.76	1078	0.82	1101	0.88	1124	0.94	1146	1	1167	1.07	1188	1.13	1209	1.2
2400	1053	0.72	1077	0.78	1102	0.84	1125	0.9	1148	0.97	1171	1.04	1192	1.1	1213	1.17	1234	1.24	1254	1.31
2640	1103	0.8	1127	0.87	1151	0.93	1174	1	1196	1.07	1218	1.14	1239	1.21	1260	1.28	1280	1.35	1300	1.42
2880	1154	0.9	1177	0.97	1201	1.04	1223	1.11	1245	1.18	1267	1.25	1287	1.32	1308	1.4	1328	1.47	1348	1.55

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 53. Direct drive evaporator fan performance - 6 tons high efficiency - WHC074H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	583	0.07	638	0.10	686	0.12	729	0.15	768	0.18	805	0.21	839	0.24	871	0.27	902	0.30	931	0.33
2160	642	0.09	693	0.12	739	0.15	780	0.18	818	0.21	853	0.24	887	0.28	918	0.31	948	0.34	977	0.38
2400	702	0.11	750	0.15	793	0.19	832	0.22	869	0.25	903	0.29	935	0.32	966	0.35	996	0.39	1023	0.43
2640	762	0.14	807	0.19	848	0.23	886	0.26	921	0.30	954	0.33	986	0.37	1015	0.41	1043	0.45	1071	0.48
2880	823	0.17	865	0.22	904	0.27	940	0.31	974	0.35	1006	0.39	1037	0.43	1066	0.47	1094	0.51	1121	0.55
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	960	0.36	986	0.40	1013	0.43	1038	0.46	1062	0.50	1085	0.54	1108	0.57	1131	0.61	1153	0.65	1175	0.69
2160	1004	0.41	1031	0.45	1057	0.48	1082	0.52	1106	0.56	1129	0.59	1152	0.63	1173	0.67	1194	0.71	1216	0.75
2400	1051	0.47	1077	0.50	1102	0.54	1126	0.58	1150	0.62	1173	0.66	1195	0.70	1217	0.74	1238	0.78	1259	0.83
2640	1098	0.52	1123	0.56	1148	0.61	1172	0.65	1195	0.69	1218	0.73	1240	0.77	1261	0.82	1282	0.86	1303	0.91
2880	1147	0.59	1171	0.63	1195	0.68	1219	0.72	1242	0.76	1264	0.81	1286	0.85	1307	0.9	1328	0.95	1348	0.99

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 54. Direct drive evaporator fan performance - 6 tons high efficiency dual fuel low/medium heat - DHC074H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	625	0.15	678	0.20	727	0.25	770	0.30	810	0.35	847	0.41	882	0.46	915	0.52	947	0.58	976	0.64
2160	691	0.20	737	0.25	784	0.31	826	0.37	864	0.42	900	0.48	934	0.54	966	0.61	997	0.67	1026	0.73
2400	757	0.26	799	0.32	842	0.38	882	0.44	919	0.51	955	0.57	987	0.64	1018	0.70	1049	0.77	1077	0.84
2640	824	0.34	864	0.40	901	0.46	941	0.53	977	0.60	1010	0.67	1042	0.74	1073	0.81	1101	0.88	1129	0.96
2880	892	0.42	929	0.49	963	0.55	999	0.63	1034	0.71	1067	0.78	1098	0.86	1127	0.94	1155	1.01	1183	1.09
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	1005	0.70	1033	0.76	1060	0.83	1086	0.89	1111	0.96	1135	1.03	1158	1.09	1181	1.17	1203	1.23	1225	1.31
2160	1054	0.80	1082	0.87	1107	0.93	1133	1.00	1158	1.08	1182	1.15	1205	1.22	1228	1.29	1250	1.37	1272	1.45
2400	1105	0.91	1131	0.98	1157	1.05	1182	1.13	1206	1.20	1229	1.28	1252	1.35	1275	1.43	1297	1.51	1318	1.59
2640	1156	1.03	1183	1.11	1208	1.19	1232	1.27	1255	1.34	1279	1.42	1302	1.51	1323	1.59	1344	1.67	1365	1.75
2880	1209	1.17	1234	1.25	1259	1.34	1283	1.42	1306	1.50	1330	1.59	1351	1.67	1373	1.76	1394	1.84	1414	1.93

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 55. Direct drive evaporator fan performance - 6 tons high efficiency dual fuel low/medium heat - DHC074H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	583	0.07	638	0.10	686	0.12	729	0.15	768	0.18	805	0.21	839	0.24	871	0.27	902	0.30	931	0.33
2160	642	0.09	693	0.12	739	0.15	780	0.18	818	0.21	853	0.24	887	0.28	918	0.31	948	0.34	977	0.38
2400	702	0.11	750	0.15	793	0.19	832	0.22	869	0.25	903	0.29	935	0.32	966	0.35	996	0.39	1023	0.43
2640	762	0.14	807	0.19	848	0.23	886	0.26	921	0.30	954	0.33	986	0.37	1015	0.41	1043	0.45	1071	0.48
2880	823	0.17	865	0.22	904	0.27	940	0.31	974	0.35	1006	0.39	1037	0.43	1066	0.47	1094	0.51	1121	0.55
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	960	0.36	986	0.40	1013	0.43	1038	0.46	1062	0.50	1085	0.54	1108	0.57	1131	0.61	1153	0.65	1175	0.69
2160	1004	0.41	1031	0.45	1057	0.48	1082	0.52	1106	0.56	1129	0.59	1152	0.63	1173	0.67	1194	0.71	1216	0.75
2400	1051	0.47	1077	0.50	1102	0.54	1126	0.58	1150	0.62	1173	0.66	1195	0.70	1217	0.74	1238	0.78	1259	0.83
2640	1098	0.52	1123	0.56	1148	0.61	1172	0.65	1195	0.69	1218	0.73	1240	0.77	1261	0.82	1282	0.86	1303	0.91
2880	1147	0.59	1171	0.63	1195	0.68	1219	0.72	1242	0.76	1264	0.81	1286	0.85	1307	0.90	1328	0.95	1348	0.99

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 56. Direct drive evaporator fan performance - 6 tons high efficiency dual fuel high heat - DHC074H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	611	0.15	665	0.20	709	0.25	759	0.31	800	0.36	839	0.41	877	0.47	915	0.53	949	0.59	982	0.66
2160	674	0.20	724	0.26	765	0.31	807	0.37	851	0.43	888	0.49	922	0.55	959	0.62	992	0.68	1025	0.75
2400	739	0.26	783	0.32	826	0.39	860	0.44	899	0.51	938	0.58	974	0.65	1006	0.71	1037	0.78	1068	0.85
2640	804	0.34	844	0.40	886	0.47	920	0.54	951	0.60	987	0.67	1024	0.75	1058	0.83	1087	0.90	1114	0.97
2880	870	0.42	907	0.49	944	0.57	982	0.64	1011	0.71	1039	0.78	1073	0.86	1106	0.95	1138	1.04	1167	1.12
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	1014	0.72	1044	0.78	1073	0.85	1101	0.91	1128	0.98	1155	1.05	1180	1.11	1205	1.18	1230	1.26	1253	1.33
2160	1056	0.82	1085	0.89	1114	0.96	1142	1.03	1170	1.10	1195	1.17	1221	1.25	1246	1.32	1270	1.40	1293	1.47
2400	1098	0.93	1128	1.00	1156	1.08	1184	1.15	1210	1.23	1237	1.31	1262	1.39	1287	1.47	1310	1.55	1334	1.63
2640	1144	1.05	1173	1.13	1201	1.21	1228	1.29	1253	1.38	1279	1.46	1304	1.54	1329	1.63	1352	1.72	1375	1.80
2880	1193	1.19	1219	1.27	1245	1.35	1272	1.44	1298	1.53	1322	1.62	1348	1.71	1372	1.80	1395	1.89	1418	1.99

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 57. Direct drive evaporator fan performance - 6 tons high efficiency dual fuel high heat - DHC074H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	601	0.14	657	0.19	707	0.24	754	0.29	797	0.35	839	0.41	879	0.47	916	0.53	951	0.59	984	0.66
2160	663	0.18	712	0.24	762	0.30	804	0.35	846	0.41	884	0.47	922	0.54	958	0.61	993	0.68	1026	0.74
2400	725	0.24	770	0.29	816	0.36	858	0.43	896	0.49	933	0.55	969	0.62	1003	0.69	1036	0.76	1069	0.84
2640	789	0.30	831	0.36	871	0.43	913	0.51	950	0.58	983	0.64	1018	0.72	1052	0.80	1082	0.87	1112	0.95
2880	852	0.38	892	0.45	929	0.52	966	0.59	1004	0.68	1038	0.76	1069	0.83	1101	0.91	1131	0.99	1161	1.07
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	1016	0.72	1047	0.79	1078	0.87	1106	0.94	1134	1.01	1162	1.09	1187	1.16	1213	1.24	1237	1.31	1261	1.39
2160	1058	0.82	1089	0.89	1117	0.96	1146	1.04	1173	1.12	1201	1.20	1227	1.28	1252	1.36	1276	1.44	1300	1.52
2400	1100	0.92	1130	0.99	1159	1.07	1187	1.15	1214	1.24	1241	1.32	1266	1.40	1292	1.49	1316	1.58	1339	1.66
2640	1143	1.03	1173	1.11	1201	1.19	1230	1.28	1256	1.37	1282	1.45	1308	1.54	1332	1.63	1356	1.72	1379	1.81
2880	1189	1.15	1216	1.24	1245	1.33	1271	1.41	1298	1.51	1324	1.60	1349	1.69	1374	1.79	1398	1.88	1421	1.98

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 58. Direct drive evaporator fan performance - 7.5 tons high efficiency - WHC092H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	706	0.17	752	0.21	792	0.26	830	0.31	865	0.36	897	0.41	928	0.47	958	0.52	987	0.58	1013	0.64
2700	784	0.22	825	0.27	863	0.33	898	0.38	932	0.44	963	0.49	993	0.55	1021	0.61	1049	0.67	1075	0.74
3000	862	0.29	900	0.35	936	0.41	969	0.46	1001	0.53	1031	0.59	1059	0.65	1086	0.72	1113	0.78	1138	0.85
3300	941	0.37	975	0.44	1009	0.50	1040	0.56	1070	0.63	1099	0.70	1127	0.76	1153	0.83	1178	0.90	1203	0.97
3600	1021	0.47	1052	0.54	1083	0.61	1113	0.68	1142	0.75	1169	0.82	1195	0.89	1221	0.97	1245	1.04	1268	1.12
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1039	0.70	1065	0.76	1089	0.82	1112	0.88	1135	0.95	1157	1.01	1178	1.08	1199	1.15	1221	1.22	1240	1.28
2700	1100	0.80	1125	0.87	1148	0.93	1171	1.00	1193	1.07	1215	1.14	1236	1.21	1257	1.28	1276	1.35	1296	1.42
3000	1162	0.91	1187	0.99	1209	1.05	1232	1.13	1254	1.20	1275	1.27	1295	1.35	1315	1.42	1335	1.50	1354	1.58
3300	1227	1.05	1249	1.12	1272	1.20	1293	1.27	1314	1.35	1335	1.43	1356	1.50	1376	1.59	1396	1.67	1415	1.75
3600	1292	1.20	1315	1.27	1335	1.35	1357	1.43	1377	1.51	1398	1.60	1418	1.68	1437	1.76	1457	1.85	1475	1.93

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 59. Direct drive evaporator fan performance - 7.5 tons high efficiency - WHC092H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	697	0.20	741	0.25	785	0.31	823	0.37	862	0.43	898	0.49	932	0.55	964	0.61	994	0.68	1024	0.74
2700	772	0.27	813	0.33	853	0.39	890	0.45	924	0.52	959	0.59	992	0.66	1023	0.72	1052	0.79	1081	0.86
3000	849	0.35	886	0.42	921	0.49	958	0.55	991	0.63	1022	0.70	1053	0.78	1083	0.85	1112	0.93	1140	1.00
3300	926	0.45	961	0.53	993	0.60	1026	0.67	1060	0.74	1089	0.83	1117	0.91	1145	0.99	1173	1.08	1200	1.16
3600	1004	0.58	1037	0.65	1067	0.73	1096	0.81	1126	0.89	1157	0.97	1184	1.06	1210	1.15	1235	1.24	1262	1.34
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1051	0.81	1079	0.88	1105	0.95	1130	1.02	1154	1.09	1179	1.16	1202	1.24	1225	1.31	1246	1.39	1268	1.46
2700	1109	0.94	1135	1.01	1161	1.08	1185	1.16	1210	1.24	1233	1.31	1256	1.39	1278	1.47	1299	1.55	1321	1.64
3000	1167	1.08	1193	1.16	1217	1.24	1241	1.32	1266	1.40	1287	1.48	1310	1.56	1333	1.65	1354	1.74	1375	1.83
3300	1226	1.24	1251	1.33	1275	1.41	1299	1.49	1322	1.58	1345	1.67	1367	1.76	1388	1.85	1410	1.94	1430	2.03
3600	1286	1.42	1312	1.51	1335	1.60	1359	1.70	1381	1.79	1403	1.88	1425	1.98	1446	2.07	1467	2.17	1487	2.26

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 60. Direct drive evaporator fan performance - 7.5 tons high efficiency dual fuel low/medium heat - DHC092H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	742	0.24	786	0.30	826	0.36	869	0.42	906	0.48	942	0.55	975	0.61	1006	0.68	1036	0.74	1065	0.81
2700	823	0.33	864	0.39	900	0.45	938	0.52	975	0.59	1009	0.66	1041	0.73	1071	0.81	1100	0.88	1129	0.95
3000	905	0.43	944	0.51	978	0.57	1009	0.64	1045	0.72	1078	0.80	1109	0.88	1138	0.96	1166	1.04	1194	1.12
3300	988	0.55	1025	0.64	1057	0.72	1086	0.79	1115	0.87	1147	0.96	1178	1.05	1206	1.13	1234	1.22	1260	1.30
3600	1071	0.70	1105	0.80	1137	0.89	1165	0.97	1192	1.05	1218	1.13	1248	1.23	1276	1.33	1303	1.42	1328	1.51
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1093	0.88	1119	0.95	1145	1.02	1171	1.10	1195	1.17	1219	1.25	1241	1.32	1264	1.40	1286	1.48	1308	1.56
2700	1156	1.03	1181	1.10	1207	1.18	1232	1.26	1255	1.34	1278	1.42	1301	1.50	1323	1.58	1344	1.67	1365	1.75
3000	1219	1.20	1245	1.28	1270	1.36	1294	1.45	1318	1.53	1340	1.62	1362	1.71	1384	1.79	1406	1.88	1426	1.97
3300	1286	1.39	1310	1.48	1335	1.57	1358	1.66	1381	1.75	1403	1.84	1425	1.93	1446	2.03	1467	2.12	1487	2.21
3600	1353	1.61	1377	1.70	1400	1.79	1424	1.89	1445	1.99	1467	2.08	1488	2.18	1509	2.28	1530	2.38	1550	2.49

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 61. Direct drive evaporator fan performance - 7.5 tons high efficiency dual fuel low/medium heat - DHC092H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	718	0.22	762	0.27	805	0.33	844	0.39	881	0.45	915	0.51	947	0.57	978	0.64	1007	0.70	1035	0.77
2700	796	0.30	836	0.36	875	0.42	913	0.49	947	0.55	980	0.62	1011	0.69	1041	0.76	1069	0.83	1096	0.90
3000	876	0.39	913	0.46	948	0.53	983	0.60	1016	0.67	1047	0.75	1077	0.82	1106	0.90	1133	0.97	1160	1.05
3300	956	0.51	990	0.58	1022	0.65	1055	0.73	1086	0.81	1116	0.89	1145	0.98	1172	1.06	1198	1.14	1224	1.22
3600	1037	0.64	1069	0.73	1099	0.81	1128	0.88	1157	0.96	1186	1.05	1213	1.14	1240	1.23	1266	1.33	1290	1.41
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1062	0.84	1089	0.91	1114	0.98	1138	1.05	1162	1.12	1185	1.19	1208	1.27	1230	1.34	1250	1.41	1271	1.49
2700	1123	0.97	1149	1.05	1173	1.12	1197	1.20	1220	1.28	1243	1.35	1266	1.43	1287	1.51	1307	1.59	1329	1.68
3000	1185	1.13	1210	1.21	1234	1.29	1257	1.37	1280	1.45	1302	1.53	1324	1.62	1345	1.71	1366	1.79	1386	1.88
3300	1249	1.30	1273	1.39	1297	1.47	1319	1.56	1342	1.65	1363	1.74	1384	1.83	1406	1.92	1425	2.01	1445	2.10
3600	1314	1.50	1338	1.59	1361	1.69	1383	1.78	1405	1.87	1425	1.96	1446	2.06	1467	2.16	1487	2.26	1506	2.35

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 62. Direct drive evaporator fan performance - 7.5 tons high efficiency dual fuel high heat - DHC092H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	759	0.29	800	0.34	845	0.41	884	0.47	920	0.53	956	0.60	989	0.66	1022	0.73	1053	0.80	1083	0.87
2700	844	0.39	879	0.45	918	0.52	958	0.60	992	0.66	1024	0.74	1057	0.81	1087	0.88	1117	0.95	1145	1.03
3000	931	0.52	962	0.59	995	0.66	1031	0.74	1067	0.82	1098	0.90	1127	0.98	1156	1.06	1184	1.14	1211	1.22
3300	1018	0.68	1046	0.75	1075	0.82	1107	0.91	1140	1.00	1172	1.09	1201	1.17	1227	1.26	1254	1.35	1279	1.43
3600	1106	0.87	1132	0.95	1157	1.02	1185	1.11	1215	1.21	1245	1.30	1275	1.40	1301	1.49	1326	1.59	1350	1.68
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1113	0.94	1141	1.02	1169	1.09	1194	1.17	1220	1.24	1245	1.32	1270	1.40	1292	1.48	1315	1.56	1338	1.64
2700	1174	1.11	1202	1.19	1228	1.27	1254	1.35	1278	1.43	1303	1.52	1328	1.60	1350	1.68	1373	1.77	1395	1.86
3000	1238	1.30	1264	1.38	1289	1.47	1314	1.55	1339	1.64	1363	1.73	1386	1.82	1409	1.92	1431	2.01	1454	2.10
3300	1306	1.52	1330	1.61	1355	1.70	1378	1.79	1402	1.88	1425	1.98	1448	2.08	1470	2.17	1492	2.27	1513	2.37
3600	1374	1.78	1398	1.87	1422	1.97	1445	2.06	1467	2.16	1489	2.26	1510	2.36	1532	2.46	1553	2.56	1575	2.67

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 63. Direct drive evaporator fan performance - 7.5 tons high efficiency dual fuel high heat - DHC092H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	719	0.24	765	0.30	811	0.36	853	0.42	883	0.47	888	0.48	981	0.66	1003	0.71	1020	0.75	1033	0.78
2700	797	0.32	840	0.38	880	0.46	920	0.53	958	0.60	992	0.67	996	0.68	1072	0.85	1107	0.94	1126	1.00
3000	875	0.42	916	0.49	952	0.57	989	0.65	1025	0.73	1059	0.80	1091	0.89	1105	0.93	1108	0.94	1198	1.19
3300	955	0.55	993	0.62	1027	0.70	1060	0.79	1093	0.88	1126	0.96	1157	1.05	1186	1.13	1213	1.22	1216	1.24
3600	1035	0.69	1070	0.77	1103	0.86	1133	0.95	1163	1.05	1194	1.15	1224	1.24	1253	1.33	1280	1.42	1306	1.52
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1045	0.81	1055	0.84	1065	0.87	1074	0.90	1083	0.92	1091	0.95	1099	0.97	1106	1.00	1113	1.02	1119	1.04
2700	1142	1.04	1154	1.09	1166	1.12	1176	1.16	1186	1.19	1195	1.22	1203	1.26	1211	1.28	1218	1.31	1226	1.34
3000	1228	1.29	1247	1.35	1261	1.40	1274	1.45	1285	1.50	1295	1.54	1304	1.58	1313	1.61	1321	1.65	1329	1.69
3300	1220	1.25	1314	1.57	1345	1.69	1363	1.76	1377	1.83	1391	1.89	1402	1.94	1412	1.98	1421	2.03	1430	2.08
3600	1324	1.59	1327	1.61	1330	1.63	1333	1.64	1456	2.14	1476	2.24	1492	2.31	1505	2.38	1516	2.44	1527	2.50

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 64. Direct drive evaporator fan performance - 8.5 tons high efficiency - WHC102H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	812	0.31	857	0.37	899	0.44	935	0.50	976	0.58	1011	0.65	1040	0.72	1068	0.78	1099	0.85	1129	0.92
3060	904	0.42	942	0.49	983	0.57	1017	0.64	1049	0.71	1086	0.80	1119	0.89	1149	0.96	1174	1.03	1197	1.10
3400	997	0.55	1030	0.63	1066	0.71	1103	0.81	1132	0.89	1160	0.96	1193	1.06	1225	1.16	1254	1.25	1279	1.33
3740	1090	0.72	1120	0.80	1152	0.89	1185	0.99	1218	1.09	1244	1.17	1269	1.25	1298	1.36	1329	1.47	1356	1.57
4080	1183	0.92	1211	1.01	1240	1.10	1270	1.20	1301	1.31	1330	1.42	1354	1.51	1377	1.60	1402	1.70	1430	1.82
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1158	0.99	1186	1.05	1213	1.11	1238	1.18	1264	1.24	1289	1.30	1313	1.36	1336	1.42	1359	1.47	1382	1.53
3060	1226	1.18	1253	1.26	1279	1.33	1305	1.41	1329	1.48	1353	1.55	1377	1.63	1400	1.70	1422	1.76	1444	1.83
3400	1301	1.40	1323	1.48	1347	1.56	1372	1.65	1396	1.74	1421	1.83	1444	1.91	1465	1.99	1487	2.07	1509	2.15
3740	1382	1.67	1406	1.76	1426	1.84	1445	1.92	1465	2.01	1489	2.11	1510	2.20	1533	2.30	1554	2.39	1576	2.49
4080	1457	1.94	1482	2.05	1506	2.16	1527	2.26	1546	2.35	1565	2.44	1583	2.53	1602	2.63	1623	2.73	1643	2.84

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 65. Direct drive evaporator fan performance - 8.5 tons high efficiency - WHC102H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	821	0.31	864	0.38	911	0.45	947	0.52	982	0.58	1015	0.65	1046	0.71	1077	0.78	1107	0.85	1137	0.93
3060	914	0.43	951	0.50	993	0.58	1032	0.66	1063	0.73	1095	0.81	1125	0.88	1153	0.95	1181	1.03	1208	1.10
3400	1008	0.57	1041	0.64	1076	0.73	1115	0.82	1148	0.91	1177	0.99	1204	1.07	1232	1.15	1259	1.24	1284	1.32
3740	1103	0.75	1132	0.82	1163	0.91	1197	1.01	1232	1.11	1262	1.21	1288	1.30	1313	1.38	1339	1.47	1364	1.57
4080	1198	0.95	1225	1.04	1253	1.13	1281	1.22	1314	1.33	1345	1.45	1372	1.55	1397	1.65	1420	1.75	1444	1.84
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1165	1.00	1193	1.07	1220	1.15	1245	1.22	1271	1.30	1296	1.38	1322	1.47	1344	1.55	1368	1.63	1391	1.72
3060	1235	1.18	1261	1.26	1288	1.34	1313	1.43	1337	1.51	1361	1.59	1385	1.68	1408	1.77	1431	1.86	1453	1.95
3400	1310	1.40	1334	1.48	1359	1.57	1382	1.66	1406	1.75	1430	1.84	1453	1.93	1474	2.02	1496	2.12	1518	2.21
3740	1388	1.66	1411	1.75	1433	1.83	1456	1.93	1477	2.02	1500	2.11	1522	2.21	1544	2.31	1565	2.41	1586	2.51
4080	1467	1.95	1489	2.04	1512	2.14	1533	2.24	1554	2.34	1575	2.43	1594	2.53	1616	2.64	1636	2.74	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 66. Direct drive evaporator fan performance - 8.5 tons high efficiency dual fuel low/medium heat - DHC102H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	804	0.27	849	0.31	889	0.36	927	0.42	962	0.47	995	0.52	1027	0.58	1057	0.64	1085	0.70	1113	0.76
3060	894	0.37	934	0.41	972	0.47	1007	0.53	1040	0.59	1072	0.65	1102	0.71	1131	0.77	1159	0.83	1186	0.90
3400	984	0.49	1021	0.54	1056	0.60	1090	0.66	1121	0.73	1151	0.80	1180	0.87	1207	0.93	1234	0.99	1260	1.06
3740	1075	0.64	1110	0.70	1142	0.76	1173	0.82	1203	0.89	1232	0.97	1260	1.05	1286	1.12	1312	1.19	1336	1.26
4080	1166	0.82	1198	0.88	1229	0.94	1259	1.01	1287	1.09	1314	1.16	1340	1.24	1366	1.33	1390	1.42	1414	1.49
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1140	0.82	1165	0.87	1191	0.93	1215	0.99	1238	1.05	1261	1.11	1284	1.18	1305	1.25	1327	1.32	1347	1.39
3060	1211	0.96	1237	1.04	1260	1.10	1284	1.17	1307	1.23	1329	1.29	1351	1.35	1372	1.42	1393	1.49	1414	1.57
3400	1284	1.13	1309	1.20	1332	1.28	1356	1.36	1378	1.44	1400	1.51	1420	1.58	1442	1.65	1461	1.72	1481	1.79
3740	1360	1.33	1383	1.40	1406	1.48	1428	1.56	1451	1.64	1472	1.73	1492	1.81	1512	1.90	1532	1.98	1551	2.06
4080	1437	1.56	1460	1.64	1482	1.72	1503	1.80	1525	1.88	1545	1.97	1565	2.05	1586	2.15	1604	2.23	1623	2.33

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 67. Direct drive evaporator fan performance - 8.5 tons high efficiency dual fuel low/medium heat - DHC102H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	815	0.33	847	0.40	886	0.47	926	0.54	962	0.61	995	0.69	1027	0.76	1058	0.84	1090	0.91	1122	0.99
3060	909	0.45	938	0.52	968	0.60	1004	0.68	1040	0.76	1072	0.84	1103	0.93	1132	1.01	1160	1.10	1187	1.18
3400	1003	0.59	1030	0.68	1056	0.76	1085	0.85	1118	0.94	1150	1.03	1179	1.12	1207	1.21	1234	1.30	1261	1.40
3740	1099	0.77	1123	0.86	1147	0.96	1170	1.05	1198	1.15	1227	1.24	1257	1.34	1285	1.44	1311	1.54	1336	1.64
4080	1194	0.98	1217	1.08	1239	1.18	1260	1.28	1282	1.39	1308	1.50	1335	1.60	1363	1.71	1388	1.81	1413	1.92
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1154	1.07	1184	1.15	1212	1.23	1238	1.31	1262	1.39	1285	1.47	1307	1.55	1329	1.63	1352	1.71	1373	1.79
3060	1214	1.27	1244	1.35	1273	1.44	1301	1.53	1327	1.62	1353	1.72	1376	1.80	1398	1.89	1420	1.98	1440	2.07
3400	1285	1.49	1310	1.59	1335	1.69	1360	1.78	1387	1.87	1412	1.97	1439	2.07	1462	2.17	1486	2.27	1508	2.38
3740	1361	1.75	1384	1.85	1407	1.96	1430	2.06	1452	2.17	1474	2.27	1498	2.37	1522	2.48	1545	2.58	1569	2.70
4080	1437	2.03	1460	2.14	1482	2.26	1503	2.37	1524	2.48	1546	2.60	1566	2.71	1587	2.83	1608	2.95	-	-

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 68. Direct drive evaporator fan performance - 8.5 tons high efficiency dual fuel high heat - DHC102H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	850	0.40	884	0.46	923	0.53	963	0.61	998	0.68	1029	0.75	1061	0.82	1091	0.89	1121	0.96	1149	1.04
3060	948	0.55	978	0.62	1011	0.69	1046	0.77	1081	0.86	1112	0.94	1141	1.02	1169	1.09	1198	1.18	1224	1.26
3400	1047	0.74	1074	0.81	1102	0.88	1132	0.97	1165	1.07	1196	1.16	1226	1.25	1251	1.34	1277	1.42	1302	1.51
3740	1147	0.96	1171	1.04	1196	1.12	1222	1.21	1250	1.31	1280	1.42	1309	1.52	1336	1.62	1361	1.72	1384	1.81
4080	1246	1.23	1269	1.32	1292	1.41	1315	1.50	1339	1.60	1365	1.71	1392	1.82	1419	1.94	1445	2.05	1468	2.15
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1178	1.12	1205	1.20	1232	1.28	1258	1.37	1283	1.45	1307	1.53	1330	1.62	1354	1.71	1377	1.79	1399	1.88
3060	1251	1.34	1276	1.43	1302	1.51	1327	1.60	1352	1.69	1376	1.79	1398	1.88	1422	1.97	1444	2.07	1465	2.16
3400	1327	1.60	1352	1.69	1377	1.79	1400	1.88	1423	1.98	1446	2.07	1468	2.17	1490	2.27	1513	2.38	1533	2.47
3740	1407	1.91	1431	2.01	1454	2.10	1476	2.20	1498	2.30	1519	2.40	1541	2.51	1562	2.61	1582	2.72	-	-
4080	1491	2.26	1512	2.36	1533	2.47	1554	2.57	1576	2.68	1597	2.79	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 69. Direct drive evaporator fan performance - 8.5 tons high efficiency dual fuel high heat - DHC102H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	817	0.35	858	0.41	897	0.48	937	0.56	975	0.64	1009	0.71	1042	0.78	1073	0.86	1106	0.94	1137	1.02
3060	908	0.47	947	0.55	980	0.62	1016	0.70	1052	0.79	1086	0.88	1117	0.96	1147	1.04	1176	1.13	1204	1.22
3400	1001	0.62	1037	0.71	1068	0.79	1099	0.88	1131	0.97	1164	1.07	1195	1.17	1224	1.26	1251	1.35	1277	1.44
3740	1094	0.81	1127	0.91	1158	1.00	1185	1.09	1214	1.19	1243	1.29	1272	1.39	1301	1.50	1329	1.61	1354	1.71
4080	1188	1.03	1218	1.14	1248	1.24	1274	1.34	1299	1.44	1325	1.54	1352	1.66	1379	1.77	1406	1.89	1432	2.01
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1166	1.10	1193	1.18	1220	1.26	1245	1.34	1269	1.42	1294	1.50	1318	1.59	1340	1.67	1364	1.76	1385	1.84
3060	1233	1.31	1261	1.40	1288	1.49	1314	1.58	1338	1.67	1362	1.76	1384	1.85	1408	1.94	1429	2.03	1450	2.12
3400	1304	1.54	1329	1.63	1355	1.73	1380	1.83	1406	1.94	1430	2.04	1453	2.14	1475	2.23	1497	2.34	1518	2.43
3740	1378	1.81	1402	1.91	1426	2.01	1450	2.12	1473	2.22	1496	2.33	1520	2.45	1542	2.55	1565	2.67	1587	2.78
4080	1457	2.12	1479	2.23	1502	2.34	1524	2.45	1546	2.56	1567	2.68	1590	2.79	-	-	-	-	-	-

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 70. Direct drive evaporator fan performance - 10 tons high efficiency - WHC120H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	942	0.47	978	0.54	1017	0.63	1053	0.71	1082	0.78	1116	0.87	1150	0.96	1181	1.04	1207	1.12	1231	1.19
3600	1051	0.65	1083	0.73	1116	0.81	1152	0.91	1183	1.00	1209	1.08	1237	1.17	1268	1.27	1298	1.38	1325	1.47
4000	1161	0.87	1190	0.96	1219	1.05	1249	1.15	1282	1.26	1310	1.36	1334	1.45	1357	1.54	1385	1.65	1412	1.76
4400	1272	1.13	1298	1.23	1324	1.33	1351	1.44	1379	1.54	1409	1.67	1435	1.79	1457	1.88	1478	1.98	1501	2.08
4800	1383	1.45	1407	1.56	1431	1.66	1455	1.78	1480	1.89	1506	2.01	1532	2.14	1558	2.28	1579	2.39	1599	2.49
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1254	1.26	1282	1.35	1307	1.43	1332	1.51	1357	1.59	1381	1.66	1404	1.74	1427	1.82	1449	1.89	1471	1.96
3600	1350	1.56	1372	1.64	1392	1.72	1412	1.80	1437	1.90	1460	1.99	1483	2.08	1504	2.17	1526	2.26	1548	2.35
4000	1440	1.88	1464	1.98	1488	2.08	1508	2.18	1527	2.26	1545	2.35	1564	2.44	1586	2.55	1606	2.65	1627	2.75
4400	1526	2.20	1552	2.33	1576	2.46	1600	2.58	1621	2.69	1642	2.80	1660	2.90	-	-	-	-	-	-
4800	1618	2.60	1639	2.71	1663	2.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
6. For electric heat applications, minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temperature rise table.

Table 71. Direct drive evaporator fan performance - 10 tons high efficiency - WHC120H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	953	0.48	988	0.55	1027	0.64	1067	0.73	1098	0.80	1128	0.88	1157	0.96	1186	1.03	1213	1.11	1239	1.19
3600	1064	0.67	1095	0.75	1126	0.83	1163	0.93	1198	1.03	1226	1.11	1253	1.20	1280	1.29	1306	1.37	1331	1.46
4000	1175	0.90	1203	0.98	1231	1.07	1260	1.17	1294	1.28	1327	1.39	1353	1.49	1377	1.58	1401	1.68	1425	1.78
4400	1288	1.18	1313	1.27	1338	1.36	1364	1.46	1392	1.57	1422	1.70	1452	1.82	1477	1.93	1500	2.04	1522	2.14
4800	1400	1.51	1423	1.61	1446	1.71	1470	1.82	1494	1.93	1519	2.05	1547	2.18	1575	2.32	1600	2.45	1622	2.56
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1265	1.27	1291	1.35	1316	1.43	1342	1.52	1365	1.60	1389	1.69	1412	1.78	1435	1.87	1458	1.96	1479	2.05
3600	1355	1.54	1378	1.63	1401	1.72	1425	1.81	1447	1.90	1471	2.00	1492	2.09	1515	2.19	1536	2.28	1557	2.38
4000	1448	1.87	1471	1.97	1494	2.07	1515	2.16	1536	2.26	1557	2.36	1578	2.46	1598	2.56	1619	2.66	1640	2.77
4400	1543	2.24	1565	2.35	1586	2.46	1607	2.56	1628	2.67	1647	2.77	1667	2.88	1686	2.98	-	-	-	-
4800	1642	2.68	1662	2.79	1682	2.91	1701	3.02	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
6. For electric heat applications, minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temperature rise table.

Evaporator Fan Performance

Table 72. Direct drive evaporator fan performance - 10 tons high efficiency dual fuel low/medium heat - DHC120H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	905	0.22	944	0.28	980	0.33	1015	0.39	1047	0.43	1077	0.47	1106	0.51	1135	0.56	1162	0.60	1187	0.65
3600	1008	0.30	1044	0.36	1077	0.43	1109	0.49	1140	0.55	1168	0.59	1196	0.64	1222	0.69	1249	0.74	1273	0.79
4000	1112	0.40	1145	0.47	1176	0.54	1205	0.60	1234	0.67	1261	0.74	1288	0.79	1313	0.85	1338	0.90	1362	0.95
4400	1217	0.52	1247	0.59	1276	0.67	1304	0.74	1330	0.82	1356	0.89	1381	0.97	1406	1.03	1429	1.09	1451	1.14
4800	1322	0.66	1350	0.74	1377	0.82	1403	0.90	1428	0.98	1452	1.07	1476	1.15	1499	1.23	1522	1.31	1543	1.37
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1213	0.69	1236	0.74	1260	0.78	1283	0.83	1306	0.88	1328	0.93	1348	0.97	1369	1.02	1389	1.07	1409	1.12
3600	1297	0.84	1321	0.89	1343	0.94	1365	0.99	1387	1.04	1409	1.09	1429	1.14	1449	1.20	1469	1.25	1488	1.30
4000	1385	1.01	1407	1.06	1429	1.12	1450	1.17	1471	1.23	1491	1.28	1512	1.34	1531	1.39	1550	1.45	1570	1.51
4400	1474	1.20	1495	1.26	1516	1.32	1537	1.38	1557	1.44	1577	1.50	1596	1.56	1615	1.62	1634	1.68	1653	1.75
4800	1564	1.43	1586	1.49	1606	1.56	1626	1.62	1645	1.68	1665	1.75	1683	1.81	1702	1.88	1720	1.95	1738	2.01

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 73. Direct drive evaporator fan performance - 10 tons high efficiency dual fuel low/medium heat - DHC120H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	853	0.34	896	0.42	935	0.50	970	0.57	1004	0.65	1037	0.73	1070	0.81	1101	0.90	1130	0.98	1160	1.07
3600	950	0.47	988	0.55	1025	0.64	1058	0.72	1089	0.81	1120	0.89	1149	0.98	1180	1.08	1209	1.17	1235	1.26
4000	1049	0.63	1081	0.71	1116	0.81	1148	0.91	1177	1.00	1206	1.09	1233	1.19	1260	1.28	1286	1.38	1314	1.49
4400	1148	0.81	1176	0.90	1208	1.01	1239	1.12	1267	1.22	1294	1.33	1320	1.42	1344	1.53	1369	1.63	1394	1.74
4800	1247	1.04	1273	1.14	1301	1.24	1330	1.36	1357	1.48	1384	1.59	1408	1.70	1432	1.81	1455	1.92	1478	2.04
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1191	1.16	1221	1.25	1248	1.35	1275	1.44	1300	1.53	1325	1.62	1349	1.72	1373	1.81	1396	1.91	1418	2.01
3600	1261	1.36	1287	1.45	1315	1.55	1342	1.66	1367	1.76	1394	1.87	1417	1.97	1441	2.08	1463	2.18	1484	2.28
4000	1339	1.60	1364	1.70	1388	1.80	1411	1.90	1435	2.01	1460	2.12	1484	2.24	1508	2.36	1530	2.47	1553	2.59
4400	1419	1.86	1443	1.98	1466	2.09	1489	2.20	1510	2.31	1532	2.43	1553	2.54	1575	2.65	1597	2.78	1619	2.9
4800	1500	2.16	1523	2.28	1546	2.40	1567	2.52	1589	2.65	1611	2.78	1631	2.9	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 74. Direct drive evaporator fan performance - 10 tons high efficiency dual fuel high heat - DHC120H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	900	0.42	939	0.50	972	0.57	1004	0.64	1037	0.72	1069	0.80	1099	0.88	1127	0.95	1155	1.03	1184	1.12
3600	1005	0.58	1037	0.66	1071	0.74	1099	0.82	1128	0.90	1157	0.99	1186	1.08	1214	1.17	1240	1.26	1265	1.35
4000	1110	0.77	1138	0.86	1170	0.96	1198	1.05	1223	1.13	1249	1.22	1275	1.32	1302	1.42	1327	1.52	1352	1.62
4400	1215	1.01	1241	1.10	1268	1.20	1297	1.31	1321	1.41	1344	1.50	1367	1.60	1391	1.71	1415	1.82	1439	1.93
4800	1321	1.29	1345	1.39	1369	1.49	1395	1.61	1420	1.73	1442	1.83	1463	1.94	1484	2.04	1506	2.16	1529	2.28
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1212	1.21	1239	1.29	1266	1.38	1291	1.47	1316	1.56	1342	1.65	1367	1.75	1392	1.84	1415	1.94	1438	2.03
3600	1290	1.44	1316	1.53	1341	1.63	1365	1.72	1390	1.82	1414	1.92	1436	2.02	1459	2.12	1482	2.22	1506	2.33
4000	1375	1.72	1398	1.81	1420	1.91	1443	2.01	1466	2.12	1488	2.23	1511	2.33	1534	2.45	1554	2.55	1575	2.66
4400	1462	2.03	1485	2.15	1506	2.25	1527	2.36	1548	2.47	1567	2.57	1588	2.69	1609	2.80	1631	2.93	-	-
4800	1550	2.39	1572	2.51	1593	2.63	1614	2.75	1634	2.87	-	-	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 75. Direct drive evaporator fan performance - 10 tons high efficiency dual fuel high heat - DHC120H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	868	0.37	906	0.44	943	0.51	980	0.59	1014	0.67	1046	0.74	1078	0.82	1109	0.91	1139	0.99	1168	1.08
3600	969	0.50	1001	0.58	1035	0.66	1068	0.74	1100	0.83	1131	0.92	1160	1.01	1189	1.10	1217	1.19	1244	1.28
4000	1070	0.67	1098	0.75	1129	0.84	1159	0.93	1188	1.02	1218	1.12	1245	1.22	1272	1.32	1298	1.41	1324	1.52
4400	1172	0.87	1197	0.96	1224	1.06	1251	1.16	1279	1.26	1306	1.36	1332	1.46	1358	1.57	1383	1.68	1407	1.79
4800	1274	1.12	1297	1.21	1321	1.31	1346	1.42	1371	1.53	1396	1.64	1421	1.75	1445	1.86	1469	1.98	1493	2.10
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1196	1.16	1225	1.25	1254	1.34	1280	1.43	1306	1.52	1330	1.61	1355	1.71	1378	1.80	1400	1.89	1424	1.99
3600	1271	1.37	1297	1.47	1323	1.57	1347	1.66	1374	1.77	1398	1.86	1423	1.97	1447	2.07	1470	2.17	1492	2.27
4000	1349	1.62	1375	1.72	1399	1.83	1422	1.93	1445	2.03	1468	2.14	1491	2.25	1514	2.36	1538	2.48	1561	2.59
4400	1431	1.90	1455	2.01	1478	2.12	1499	2.23	1523	2.35	1544	2.46	1565	2.57	1587	2.69	1608	2.81	1629	2.92
4800	1515	2.21	1537	2.33	1559	2.45	1581	2.57	1602	2.69	1623	2.82	1643	2.94	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Fan Performance

Table 76. Standard motor and sheave/fan speed (rpm)

Tons	Unit Model Number	Fan Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
7.5	WSC092H	AK64x1”	N/A	695	751	807	863	919	975
8.5	WSC102H	AK64x1”	N/A	767	807	847	888	928	1036

Note: Factory set at 3 turns open.

Table 77. Standard motor and low static drive accessory sheave/fan speed (rpm)

Tons	Unit Model Number	Fan Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
7.5	WSC092H	AK79x1”	N/A	581	626	671	716	761	805
7.5	WSC092H	AK99x1”	N/A	462	497	533	569	604	640
8.5	WSC102H	AK79x1”	N/A	631	676	721	766	811	856
8.5	WSC102H	AK99x1”	N/A	512	548	583	619	654	690

Note: Factory set at 3 turns open.

Table 78. Oversized motor and drive sheave/fan speed (rpm)

Tons	Unit Model Number	Fan Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
7.5	WSC092H	AK64x1”	N/A	835	891	946	1002	1057	1113
8.5	WSC102H	AK56x1”	N/A	998	1050	1103	1155	1207	1260

Note: Factory set at 3 turns open.

Table 79. Oversized motor and high static drive sheave/fan speed (rpm)

Tons	Unit Model Number	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
7.5	WSC092H	N/A	908	968	1029	1090	1150	1211

Note: Factory set at 3 turns open.

Table 80. Direct drive plenum fan settings (rpm vs. voltage)

Potentiometer Voltage	Motor RPM
1	N/A
1.25	N/A
1.5	N/A
1.75	N/A
2	N/A
2.25	325
2.5	402
2.75	465
3	544
3.25	630
3.5	716
3.75	775
4	845
4.25	912
4.5	976
4.75	1044
5	1115
5.25	1203
5.5	1253
5.75	1312
6	1368
6.25	1425
6.5	1475
6.75	1533
7	1581
7.25	1615
7.5	1615

Table 81. Voltage vs. CFM table

PWM% Value	Potentiometer Voltage (Vdc)	CFM/Ton
70	<0.1	320
75	0.7	347
80	1.25	373
85	1.65	400
90	1.95	427
95	2.17	453
100	>2.4	480

Note: Applicable to W/DHC036-060H models

Table 82. Outdoor sound power level - dB (ref. 10 - 12 W)

Tons	Unit Model Number	Octave Center Frequency								Overall
		63	125	250	500	1000	2000	4000	8000	dBA
3	WSC036H	84	81	80	79	76	74	69	63	81
4	WSC048H	81	85	81	81	77	72	69	65	82
5	WSC060H	90	90	84	85	83	78	73	68	87
3	W/DHC036H	84	81	80	79	76	74	69	63	81
4	W/DHC048H	90	90	84	85	83	78	73	68	87
5	W/DHC060H	90	90	84	85	83	78	73	68	87
7.5	WSC092H	85	86	84	84	81	76	72	66	86
8.5	WSC102H	81	89	83	83	81	76	72	66	85
10	WSC120H	86	90	85	83	81	76	72	66	86
6	W/DHC074H	87	87	84	84	81	75	71	66	86
7.5	W/DHC092H	82	89	85	84	81	76	72	67	86
8.5	W/DHC102H	83	87	85	83	80	75	70	65	85
10	W/DHC120H	88	86	87	83	79	75	70	63	85

Note: Tests follow AHRI270-2015.

Table 83. Static pressure drop through accessories (inches water column)

Tons	Unit Model Number	cfm	Standard Filters[a]	2" MERV 8 Filter	2" MERV 13 Filter	Economizer with OA/RA Dampers[b]						Electric Heater Accessory (kW)[c],[d]			
						100% OA	100% RA	100% OA	100% RA	100% OA	100% RA	5-6	9-18	23-36	54
						Downflow		Low Leak[e]		Horizontal					
3	WSC036H	960	0.02	0.03	0.03	0.05	0.01	0.09	0.03	0.05	0.01	0.01	0.02	0.02	—
3	WSC036H	1200	0.03	0.05	0.04	0.07	0.02	0.13	0.05	0.07	0.01	0.02	0.03	0.03	—
3	WSC036H	1440	0.03	0.06	0.04	0.10	0.03	0.19	0.07	0.10	0.01	0.03	0.04	0.04	—
4	WSC048H	1280	0.03	0.06	0.04	0.10	0.03	0.15	0.05	0.09	0.01	0.02	0.03	0.03	—
4	WSC048H	1600	0.04	0.07	0.07	0.13	0.04	0.24	0.08	0.13	0.02	0.04	0.05	0.05	—
4	WSC048H	1920	0.06	0.10	0.08	0.17	0.06	0.34	0.11	0.17	0.02	0.05	0.06	0.08	—
5	WSC060H	1600	0.03	0.06	0.05	0.09	0.01	0.10	0.05	0.05	0.01	0.01	0.01	0.02	—
5	WSC060H	2000	0.05	0.08	0.07	0.11	0.01	0.16	0.08	0.07	0.02	0.02	0.01	0.03	—
5	WSC060H	2400	0.07	0.10	0.10	0.12	0.03	0.23	0.12	0.09	0.03	0.03	0.02	0.04	—
7.5	WSC092H	2400	0.04	0.06	0.12	0.11	0.02	0.23	0.12	0.08	0.02	—	0.02	0.02	—
7.5	WSC092H	3000	0.06	0.09	0.13	0.14	0.05	0.37	0.19	0.12	0.05	—	0.03	0.03	—
7.5	WSC092H	3600	0.09	0.13	0.15	0.21	0.07	0.54	0.27	0.25	0.08	—	0.04	0.05	—
8.5	WSC102H	2720	0.05	0.08	0.13	0.12	0.03	0.30	0.16	0.09	0.04	—	0.02	0.03	—
8.5	WSC102H	3400	0.08	0.11	0.14	0.19	0.06	0.48	0.24	0.18	0.06	—	0.03	0.04	—
8.5	WSC102H	4080	0.12	0.16	0.16	0.30	0.07	0.71	0.35	0.31	0.09	—	0.05	0.06	—
10	WSC120H	3200	0.07	0.10	0.14	0.17	0.05	0.42	0.22	0.14	0.05	—	0.02	0.03	0.05
10	WSC120H	4000	0.11	0.15	0.16	0.26	0.07	0.68	0.34	0.30	0.08	—	0.02	0.03	0.05
10	WSC120H	4800	0.16	0.20	0.18	0.34	0.09	0.99	0.48	0.35	0.10	—	0.03	0.04	0.06
3	D/WHC036H	960	0.02	0.03	0.03	0.05	0.01	0.09	0.03	0.05	0.01	0.01	0.02	0.02	—
3	D/WHC036H	1200	0.03	0.05	0.04	0.07	0.02	0.13	0.05	0.07	0.01	0.02	0.03	0.03	—
3	D/WHC036H	1440	0.03	0.06	0.04	0.10	0.03	0.19	0.07	0.10	0.01	0.03	0.04	0.04	—
4	D/WHC048H	1280	0.03	0.06	0.04	0.10	0.03	0.07	0.03	0.09	0.01	0.02	0.03	0.03	—

Table 83. Static pressure drop through accessories (inches water column) (continued)

Tons	Unit Model Number	cfm	Standard Filters[a]	2" MERV 8 Filter	2" MERV 13 Filter	Economizer with OA/RA Dampers[b]						Electric Heater Accessory (kW)[c],[d]			
						100% OA	100% RA	100% OA	100% RA	100% OA	100% RA	5-6	9-18	23-36	54
						Downflow		Low Leak[e]		Horizontal					
4	D/WHC048H	1600	0.04	0.07	0.07	0.13	0.04	0.10	0.05	0.13	0.02	0.04	0.05	0.05	—
4	D/WHC048H	1920	0.06	0.10	0.08	0.17	0.06	0.15	0.08	0.17	0.02	0.05	0.06	0.08	—
5	D/WHC060H	1600	0.03	0.06	0.05	0.09	0.01	0.10	0.05	0.05	0.01	0.01	0.01	0.02	—
5	D/WHC060H	2000	0.05	0.08	0.07	0.11	0.01	0.16	0.08	0.07	0.02	0.02	0.01	0.03	—
5	D/WHC060H	2400	0.07	0.10	0.10	0.12	0.03	0.23	0.12	0.09	0.03	0.03	0.02	0.04	—
6	W/DHC074	1920	0.03	0.04	0.10	0.09	0.01	0.15	0.08	0.06	0.01	—	0.01	0.01	—
6	W/DHC074	2400	0.04	0.06	0.12	0.11	0.02	0.23	0.12	0.08	0.02	—	0.01	0.01	—
6	W/DHC074	2880	0.06	0.08	0.13	0.13	0.04	0.34	0.18	0.11	0.04	—	0.01	0.02	—
7.5	W/DHC092	1500	0.02	0.03	0.08	0.07	0.01	0.09	0.05	0.04	0.01	—	—	—	—
7.5	W/DHC092	2400	0.04	0.06	0.12	0.11	0.02	0.23	0.12	0.08	0.02	—	0.01	0.01	—
7.5	W/DHC092	3000	0.06	0.09	0.13	0.14	0.05	0.37	0.19	0.12	0.05	—	0.01	0.02	—
7.5	W/DHC092	3600	0.09	0.13	0.15	0.21	0.07	0.54	0.27	0.25	0.08	—	0.02	0.03	—
8.5	W/DHC102	1700	0.02	0.05	0.11	0.07	0.01	0.11	0.06	0.05	0.02	—	—	—	—
8.5	W/DHC102	2720	0.05	0.08	0.13	0.12	0.03	0.30	0.16	0.09	0.04	—	0.01	0.02	—
8.5	W/DHC102	3400	0.08	0.11	0.14	0.19	0.06	0.48	0.24	0.18	0.06	—	0.02	0.02	—
8.5	W/DHC102	4080	0.12	0.16	0.16	0.30	0.07	0.71	0.35	0.31	0.09	—	0.03	0.03	—
10	W/DHC120	2000	0.03	0.06	0.11	0.08	0.03	0.16	0.08	0.07	0.02	—	—	—	—
10	W/DHC120	3200	0.07	0.10	0.14	0.17	0.05	0.42	0.22	0.14	0.05	—	0.02	0.03	0.05
10	W/DHC120	4000	0.11	0.15	0.16	0.26	0.07	0.68	0.34	0.30	0.08	—	0.02	0.03	0.05
10	W/DHC120	4800	0.16	0.20	0.18	0.34	0.09	0.99	0.48	0.35	0.10	—	0.03	0.04	0.06

(a) Tested with standard filters. Difference in pressure drop should be considered when utilizing optional 2" MERV 8 and MERV 13 filters.
(b) OA = Outside Air and RA = Return Air.
(c) Nominal kW ratings at 240, 480, 600 volts.
(d) Electric heaters restricted on applications below 320 cfm/ton.
(e) Low Leak - Downflow only.

Heating Performance Data

Table 84. 3 tons three phase heating capacities (net) WSC036H3,4,W at 1200 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	12.7	12.1	11.7	11.4	2.4	2.6	2.8	2.9
-3	14.5	13.8	13.5	13.1	2.4	2.7	2.8	3.0
2	16.5	15.7	15.3	15.0	2.5	2.7	2.9	3.0
7	18.5	17.7	17.3	16.9	2.5	2.8	2.9	3.1
12	20.7	19.8	19.4	18.9	2.5	2.8	3.0	3.1
17	22.9	22.0	21.5	21.1	2.6	2.9	3.0	3.1
22	25.3	24.3	23.8	23.3	2.6	2.9	3.0	3.2
27	27.6	26.6	26.0	25.5	2.7	2.9	3.1	3.2
32	30.1	28.9	28.3	27.8	2.7	3.0	3.1	3.3
37	32.5	31.3	30.7	30.1	2.7	3.0	3.2	3.3
42	35.0	33.7	33.0	32.4	2.8	3.0	3.2	3.3
47	37.4	36.0	35.3	34.6	2.8	3.1	3.2	3.4
52	39.8	38.3	37.5	36.8	2.8	3.1	3.3	3.4
57	42.1	40.5	39.7	38.8	2.9	3.1	3.3	3.4
62	44.2	42.5	41.6	40.7	2.9	3.2	3.3	3.5
67	45.9	43.9	43.1	42.1	2.9	3.2	3.3	3.5
72	47.4	45.1	46.1	42.4	2.9	3.2	3.4	3.5

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 85. 4 tons three phase heating capacities (net) WSC048H3,4,W at 1600 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	15.8	15.4	15.0	14.6	3.2	3.4	3.6	3.8
-3	18.6	17.8	17.4	17.0	3.1	3.4	3.6	3.8
2	21.2	20.4	20.0	19.6	3.2	3.5	3.7	3.9
7	23.8	23.0	22.4	22.4	3.2	3.6	3.8	4.0
12	26.6	25.8	25.3	24.9	3.3	3.6	3.8	4.0
17	29.4	28.6	28.1	27.7	3.3	3.7	3.9	4.1
22	32.4	31.5	31.0	30.5	3.4	3.7	3.9	4.1
27	35.4	34.4	33.9	33.4	3.4	3.8	4.0	4.2
32	38.5	37.5	36.9	36.4	3.5	3.8	4.0	4.2
37	41.6	40.5	40.0	39.4	3.5	3.9	4.1	4.3
42	44.8	43.7	43.1	42.5	3.5	3.9	4.1	4.4
47	48.1	46.8	46.2	45.6	3.6	4.0	4.2	4.4
52	51.3	50.0	49.3	48.7	3.7	4.0	4.2	4.5
57	54.6	53.1	52.4	51.7	3.7	4.1	4.3	4.5
62	58.0	56.3	55.6	54.6	3.8	4.2	4.4	4.6
67	61.4	59.6	58.7	57.8	3.8	4.2	4.4	4.6
72	64.6	62.0	61.6	60.6	3.9	4.2	4.4	4.7

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 86. 5 tons three phase heating capacities (net) WSC060H3,4,W at 2000 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	18.2	17.2	16.8	16.3	3.7	4.1	4.3	4.5
-3	21.6	20.5	20.0	19.6	3.8	4.2	4.4	4.6
2	25.0	24.0	23.5	23.0	3.8	4.2	4.5	4.7
7	28.6	27.5	26.9	26.2	3.9	4.3	4.6	4.8
12	32.4	31.2	30.6	30.1	4.0	4.4	4.6	4.9
17	36.2	35.0	34.4	33.8	4.0	4.5	4.7	5.0
22	40.1	38.8	38.2	37.6	4.1	4.6	4.8	5.1
27	44.1	42.7	42.1	41.4	4.2	4.6	4.9	5.1
32	47.9	46.7	46.0	45.3	4.2	4.7	4.9	5.2
37	52.0	50.4	50.0	49.2	4.3	4.8	5.0	5.3
42	56.1	54.4	54.0	53.2	4.4	4.8	5.1	5.4
47	60.5	59.0	57.8	56.9	4.5	4.9	5.2	5.5
52	64.8	62.9	62.0	61.1	4.6	5.0	5.3	5.6
57	69.2	67.2	66.2	65.2	4.6	5.1	5.4	5.6
62	73.5	71.3	70.2	69.2	4.7	5.2	5.5	5.7
67	77.7	75.3	74.2	73.0	4.8	5.3	5.6	5.8
72	81.6	79.1	77.9	76.6	4.9	5.4	5.7	5.9

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 87. 7.5 tons three phase heating capacities (net) WSC092H3,4,W at 3000 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (MBh) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	32.0	31.3	31.1	31.0	5.8	6.3	6.7	7.0
-3	36.4	35.7	35.5	35.3	5.9	6.5	6.8	7.2
2	40.9	40.3	40.0	39.8	6.0	6.6	6.9	7.3
7	45.8	44.8	44.4	44.2	6.1	6.7	7.0	7.4
12	50.4	49.8	49.5	49.1	6.2	6.8	7.2	7.5
17	55.5	54.5	54.0	53.7	6.3	6.9	7.3	7.7
22	60.8	59.6	59.1	58.7	6.4	7.0	7.4	7.8
27	66.4	65.0	64.4	63.8	6.5	7.1	7.5	7.9
32	72.1	70.6	69.9	69.2	6.6	7.3	7.6	8.0
37	77.8	76.1	75.3	74.5	6.7	7.4	7.7	8.1
42	83.5	81.7	80.8	79.9	6.8	7.5	7.8	8.2
47	89.5	87.5	86.5	85.6	6.9	7.6	7.9	8.3
52	95.7	93.5	92.4	91.3	7.0	7.7	8.1	8.4
57	101.9	99.5	98.2	97.0	7.1	7.8	8.2	8.6
62	108.1	105.3	103.9	102.6	7.3	7.9	8.3	8.7
67	114.0	110.9	109.4	107.9	7.4	8.1	8.4	8.8
72	119.9	116.2	114.4	112.7	7.5	8.2	8.5	8.9

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 88. 8.5 tons three phase high stage heating capacities (net) WSC102H3,4,W at 3400 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	34.2	33.6	33.2	32.6	6.1	6.7	7.0	7.3
-3	38.5	37.8	37.7	37.0	6.2	6.8	7.1	7.5
2	43.0	42.3	41.9	41.5	6.3	6.9	7.3	7.6
7	48.2	47.4	46.6	46.1	6.4	7.1	7.4	7.7
12	52.9	51.9	51.5	51.0	6.5	7.2	7.5	7.9
17	58.0	57.0	56.5	56.0	6.6	7.3	7.6	8.0
22	63.5	62.4	61.8	61.2	6.7	7.4	7.7	8.1
27	69.2	67.9	67.2	66.7	6.8	7.5	7.8	8.2
32	75.1	73.7	73.0	72.3	6.9	7.6	8.0	8.3
37	81.2	79.5	78.7	77.9	7.0	7.7	8.1	8.4
42	87.2	85.5	84.6	83.7	7.2	7.8	8.2	8.6
47	93.6	91.7	90.7	89.7	7.3	7.9	8.3	8.7
52	100.4	98.2	97.1	96.1	7.4	8.1	8.4	8.8
57	107.4	105.0	103.8	102.6	7.5	8.2	8.6	8.9
62	114.7	111.9	110.6	109.3	7.7	8.3	8.7	9.1
67	122.0	119.0	117.5	116.0	7.8	8.5	8.9	9.2
72	129.4	126.0	124.3	122.7	8.0	8.6	9.0	9.4

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 89. 10 tons three phase heating capacities (net) WSC120H3,4,W at 4000 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	35.0	32.5	31.2	30.0	7.4	8.1	8.6	9.0
-3	40.4	38.1	37.0	35.8	7.4	8.2	8.6	9.1
2	46.2	43.9	42.7	41.6	7.5	8.3	8.7	9.2
7	52.5	50.4	49.2	48.1	7.6	8.3	8.8	9.2
12	58.3	56.2	55.0	53.9	7.7	8.4	8.9	9.3
17	64.7	62.6	61.5	60.3	7.7	8.5	8.9	9.4
22	71.3	69.3	68.1	66.9	7.8	8.6	9.0	9.5
27	78.1	76.2	75.0	73.8	7.9	8.7	9.1	9.6
32	85.3	83.4	82.2	80.9	8.0	8.8	9.2	9.7
37	92.5	90.5	89.3	87.9	8.1	8.9	9.3	9.8
42	99.8	97.8	96.5	95.1	8.2	9.0	9.4	9.9
47	107.4	105.4	104.0	102.5	8.3	9.1	9.5	10.0
52	115.3	113.3	111.8	110.3	8.5	9.3	9.7	10.1
57	123.6	121.4	119.9	118.2	8.6	9.4	9.8	10.3
62	132.0	129.6	128.0	126.2	8.8	9.6	10.0	10.4
67	140.4	137.8	136.0	134.0	8.9	9.7	10.1	10.6
72	148.7	145.6	143.7	141.5	9.1	9.9	10.3	10.7

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 90. 3 tons three phase high stage heating capacities (net) W/DHC036H3,H4,HW at 1200 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[(a)] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	8.0	7.2	6.7	6.3	1.9	2.1	2.2	2.4
-3	10.0	9.1	8.6	8.1	2.0	2.2	2.3	2.4
2	12.0	11.6	10.5	10.0	2.0	2.3	2.4	2.5
7	14.1	13.1	12.6	12.0	2.1	2.3	2.4	2.5
12	16.2	15.2	14.7	14.1	2.1	2.4	2.5	2.6
17	18.5	17.4	16.8	16.3	2.2	2.4	2.5	2.6
22	20.8	19.7	19.1	18.5	2.2	2.4	2.6	2.7
27	23.2	22.0	21.4	20.8	2.2	2.5	2.6	2.7
32	25.4	24.3	23.7	23.1	2.3	2.5	2.6	2.8
37	28.1	26.8	26.1	25.4	2.3	2.5	2.7	2.8
42	30.7	29.3	28.6	27.9	2.3	2.6	2.7	2.8
47	33.4	32.2	31.3	30.5	2.4	2.6	2.7	2.9
52	36.3	34.8	34.0	33.2	2.4	2.7	2.8	2.9
57	38.5	37.0	36.3	35.5	2.5	2.7	2.8	3.0
62	41.1	39.6	38.8	38.0	2.5	2.7	2.9	3.0
67	43.7	42.1	41.3	40.5	2.5	2.8	2.9	3.0
72	46.3	44.6	43.8	43.0	2.6	2.8	3.0	3.1

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 91. 3 tons three phase low stage heating capacities (net) W/DHC036H3,H4,HW at 840 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp [(a)](°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	13.5	12.4	11.9	11.3	1.72	1.88	1.97	2.06
27	15.3	14.3	13.7	13.2	1.73	1.89	1.98	2.07
32	17.2	16.1	15.6	15.0	1.73	1.90	1.99	2.08
37	19.1	18.0	17.5	16.9	1.74	1.91	2.00	2.09
42	21.1	20.0	19.4	18.8	1.75	1.92	2.00	2.10
47	22.9	21.9	21.3	20.7	1.75	1.92	2.01	2.11
52	25.0	23.8	23.2	22.6	1.76	1.93	2.02	2.11
57	27.0	25.7	25.1	24.4	1.76	1.93	2.02	2.12
62	28.9	27.6	27.0	26.3	1.76	1.93	2.03	2.12
67	30.8	29.4	28.7	27.9	1.76	1.94	2.03	2.13
72	32.8	31.2	30.5	29.7	1.76	1.93	2.03	2.13

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 92. 4 tons three phase high stage heating capacities (net) W/DHC048H3,H4,HW at 1600 cfm

Outdoor Temp (°F)	Instantaneous Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	10.51	9.90	9.68	9.22	2.76	3.02	3.17	3.33
-3	13.12	12.67	12.22	11.86	2.80	3.07	3.22	3.38
2	16.15	15.40	15.02	14.62	2.83	3.11	3.27	3.43
7	19.14	18.13	17.84	17.43	2.88	3.17	3.32	3.49
12	22.20	21.29	20.77	20.32	2.92	3.21	3.37	3.54
17	25.33	24.33	23.84	23.36	2.97	3.26	3.42	3.60
22	28.53	27.46	26.93	26.41	3.01	3.31	3.48	3.65
27	31.78	30.64	30.07	29.52	3.06	3.36	3.53	3.71
32	35.07	33.86	32.99	32.66	3.10	3.42	3.59	3.77
37	38.20	37.08	36.40	35.83	3.16	3.47	3.64	3.82
42	41.69	40.34	39.40	39.03	3.20	3.52	3.70	3.88
47	45.01	43.78	42.92	42.02	3.26	3.59	3.75	3.95
52	48.53	46.91	46.12	45.33	3.32	3.64	3.82	4.01
57	51.57	49.99	49.21	48.44	3.35	3.68	3.86	4.05
62	54.71	53.06	52.23	51.41	3.40	3.73	3.91	4.10
67	57.72	56.57	56.30	54.20	3.44	3.80	3.99	4.15
72	61.43	59.39	57.64	57.02	3.51	3.84	4.02	4.25

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 93. 4 tons three phase low stage heating capacities (net) W/DHC048H3,H4,HW at 1120 cfm

Outdoor Temp (°F)	Instantaneous Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	18.20	17.05	16.45	15.82	2.24	2.51	2.65	2.80
27	20.73	19.57	18.97	18.34	2.26	2.53	2.68	2.83
32	23.30	22.13	21.52	20.90	2.27	2.55	2.70	2.85
37	25.90	24.72	24.10	23.47	2.28	2.57	2.72	2.88
42	28.53	27.32	26.69	26.05	2.30	2.58	2.74	2.90
47	31.14	29.89	29.25	28.60	2.31	2.60	2.76	2.92
52	33.70	32.40	31.75	31.08	2.32	2.61	2.77	2.93
57	36.18	34.82	34.14	33.45	2.32	2.62	2.78	2.94
62	38.27	37.12	36.40	35.68	2.33	2.62	2.78	2.94
67	40.75	39.20	38.42	37.67	2.31	2.60	2.76	2.93
72	42.51	41.00	40.18	39.36	2.29	2.58	2.73	2.90

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 94. 5 tons three phase high stage heating capacities (net) W/DHC060H3,H4,HW at 2000 cfm

Outdoor Temp (°F)	Instantaneous Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	17.63	16.83	16.42	15.98	3.37	3.69	3.88	4.07
-3	20.85	20.00	19.56	19.13	3.43	3.76	3.95	4.15
2	24.19	23.28	22.81	22.35	3.48	3.83	4.02	4.22
7	27.58	26.40	26.76	25.81	3.54	3.89	4.08	4.29
12	31.23	30.17	29.65	29.12	3.59	3.95	4.14	4.36
17	34.92	33.79	33.21	32.65	3.64	4.01	4.20	4.42
22	38.71	37.50	36.88	36.28	3.70	4.06	4.26	4.48
27	42.59	41.29	40.64	39.99	3.75	4.12	4.32	4.54
32	46.54	44.87	44.47	43.78	3.80	4.18	4.38	4.60
37	50.28	48.78	48.32	47.60	3.86	4.24	4.44	4.66
42	54.34	52.70	52.26	51.50	3.92	4.30	4.51	4.73
47	58.65	57.22	56.00	55.12	3.99	4.38	4.59	4.81
52	63.03	61.12	60.17	59.22	4.06	4.45	4.66	4.89
57	67.39	65.36	64.33	63.19	4.14	4.53	4.74	4.95
62	71.78	69.55	68.44	66.99	4.22	4.61	4.83	5.03
67	76.09	73.66	72.45	71.27	4.31	4.70	4.92	5.14
72	80.14	77.61	75.30	74.75	4.40	4.80	4.99	5.28

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 95. 5 tons three phase low stage heating capacities (net) W/DHC060H3,H4,HW at 1400 cfm

Outdoor Temp (°F)	Instantaneous Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	24.25	23.31	22.79	22.25	2.88	3.21	3.39	3.57
27	27.16	26.16	25.62	25.06	2.90	3.23	3.41	3.60
32	30.12	29.06	28.49	27.91	2.91	3.24	3.43	3.62
37	33.10	31.97	31.38	30.77	2.92	3.26	3.44	3.64
42	36.14	34.94	34.31	33.67	2.94	3.28	3.46	3.65
47	39.17	37.89	37.23	36.55	2.95	3.29	3.48	3.67
52	41.92	40.47	40.09	39.14	2.97	3.31	3.49	3.68
57	45.15	43.67	42.93	42.17	2.97	3.31	3.49	3.68
62	48.11	46.42	45.57	44.87	2.98	3.32	3.50	3.68
67	51.09	49.26	48.34	47.41	2.97	3.30	3.48	3.67
72	53.97	51.92	50.93	49.92	2.95	3.28	3.46	3.64

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 96. 6 tons three phase low stage heating capacities (net) W/DHC074H3,4,W at 1680 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	25.2	24.2	23.7	23.2	2.91	3.18	3.33	3.48
27	28.1	27.0	26.4	25.9	2.92	3.20	3.34	3.50
32	31.0	29.8	29.2	28.7	2.93	3.21	3.36	3.51
37	33.7	32.7	32.1	31.4	2.95	3.22	3.36	3.52
42	36.6	35.4	34.9	34.2	2.96	3.23	3.37	3.53
47	39.7	38.3	37.5	36.8	2.95	3.23	3.37	3.53
52	42.3	40.7	39.9	39.1	2.95	3.22	3.37	3.52
57	44.6	42.9	42.0	41.2	2.96	3.22	3.36	3.51
62	47.6	45.8	44.8	43.9	2.98	3.25	3.39	3.54
67	50.6	48.6	47.5	46.4	3.00	3.27	3.43	3.58
72	53.4	51.3	50.2	49.1	3.02	3.29	3.43	3.60

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 97. 6 tons three phase high stage heating capacities (net) W/DHC074H3,4,W at 2400 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	23.0	22.4	22.1	21.9	4.78	5.33	5.62	5.93
-3	27.1	26.4	26.1	25.8	4.89	5.45	5.74	6.05
2	31.4	30.7	30.3	30.0	5.00	5.55	5.85	6.16
7	35.6	34.8	34.6	34.2	5.10	5.66	5.95	6.27
12	40.5	39.6	39.1	38.7	5.18	5.74	6.04	6.36
17	44.9	43.9	43.5	43.3	5.27	5.84	6.14	6.45
22	49.9	48.7	48.2	47.7	5.36	5.92	6.22	6.54
27	55.0	53.7	53.1	52.5	5.43	6.00	6.30	6.62
32	59.8	58.8	58.1	57.5	5.49	6.07	6.38	6.70
37	65.6	64.0	63.3	62.5	5.57	6.14	6.45	6.77
42	70.9	69.2	68.4	67.5	5.63	6.20	6.51	6.83
47	76.5	74.6	73.6	72.7	5.70	6.27	6.58	6.91
52	82.1	80.0	78.9	77.9	5.77	6.34	6.65	6.97
57	87.6	85.3	84.1	83.0	5.84	6.41	6.71	7.03
62	93.0	90.4	89.1	87.8	5.90	6.46	6.77	7.09
67	98.0	95.1	93.6	92.2	5.96	6.51	6.81	7.13
72	102.7	99.5	97.8	96.2	6.02	6.58	6.87	7.18

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 98. 7.5 tons three phase low stage heating capacities (net) W/DHC092H3,4,W at 2100 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	31.5	29.9	29.1	28.3	3.40	3.73	3.91	4.10
27	35.1	33.4	32.6	31.7	3.43	3.77	3.95	4.13
32	38.7	37.0	36.1	35.2	3.46	3.80	3.98	4.17
37	42.3	40.5	39.6	38.7	3.49	3.83	4.01	4.20
42	46.0	44.2	43.2	42.3	3.52	3.87	4.05	4.24
47	49.8	47.8	46.8	45.8	3.55	3.90	4.08	4.27
52	53.5	51.4	50.4	49.3	3.58	3.93	4.11	4.30
57	57.1	54.9	53.8	52.7	3.61	3.96	4.14	4.33
62	60.9	58.5	57.3	56.0	3.65	4.00	4.18	4.37
67	64.4	61.7	60.3	59.0	3.69	4.04	4.22	4.41
72	67.3	64.3	62.7	61.2	3.70	4.05	4.23	4.42

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 99. 7.5 tons three phase high stage heating capacities (net) W/DHC092H3,4,W at 3000 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	27.5	26.6	26.1	25.6	5.58	6.19	6.51	6.86
-3	32.4	31.4	30.9	30.3	5.67	6.28	6.62	6.97
2	37.3	36.3	35.8	35.2	5.76	6.38	6.72	7.08
7	42.6	41.3	40.7	40.1	5.85	6.48	6.83	7.19
12	47.7	46.4	46	45.4	5.95	6.58	6.93	7.30
17	53.2	51.8	51.1	50.4	6.04	6.68	7.03	7.41
22	58.8	57.3	56.6	55.8	6.13	6.78	7.14	7.51
27	64.7	63	62.2	61.4	6.22	6.88	7.24	7.62
32	70.2	68.9	68	67.1	6.30	6.98	7.34	7.73
37	76.6	74.7	73.7	72.7	6.40	7.07	7.44	7.83
42	82.7	80.6	79.5	78.4	6.49	7.17	7.54	7.93
47	88.9	86.6	85.4	84.3	6.59	7.28	7.65	8.04
52	95.2	92.7	91.4	90.2	6.69	7.38	7.75	8.14
57	101.4	98.7	97.4	96	6.79	7.48	7.85	8.24
62	107.7	104.7	103.1	101.6	6.89	7.58	7.95	8.34
67	114.1	110.6	108.9	107.2	7.01	7.69	8.06	8.44
72	120	116.3	114.4	112.4	7.12	7.80	8.17	8.56

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 100. 8.5 tons three phase low stage heating capacities (net) W/DHC102H3,4,W at 2380 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	31.6	29.8	28.8	27.8	3.12	3.43	3.60	3.77
27	35.2	33.3	32.3	31.3	3.14	3.46	3.62	3.79
32	38.8	36.8	35.8	34.8	3.16	3.48	3.65	3.82
37	42.4	40.4	39.5	38.3	3.18	3.50	3.67	3.84
42	46.3	44.2	43.2	42.0	3.21	3.52	3.69	3.87
47	50.2	48.0	47.0	45.7	3.23	3.55	3.72	3.90
52	54.3	51.9	50.7	49.4	3.25	3.58	3.75	3.92
57	58.4	56.0	54.7	53.4	3.27	3.59	3.77	3.95
62	62.5	59.9	58.6	57.3	3.29	3.62	3.79	3.97
67	66.5	64.2	62.7	61.2	3.31	3.66	3.83	4.01
72	71.3	68.3	66.8	65.2	3.35	3.68	3.86	4.04

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 101. 8.5 tons three phase high stage heating capacities (net) W/DHC102H3,4,W at 3400 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	30.3	28.3	27.0	25.8	5.65	6.27	6.59	6.93
-3	35.2	33.1	31.9	30.8	5.77	6.40	6.73	7.07
2	40.2	38.1	37.0	35.7	5.89	6.52	6.86	7.21
7	45.7	43.6	42.5	41.2	5.99	6.63	6.98	7.33
12	51.0	48.8	47.7	46.4	6.10	6.75	7.10	7.46
17	56.7	54.5	53.3	52.1	6.21	6.86	7.21	7.58
22	62.7	60.4	59.2	57.9	6.31	6.97	7.33	7.70
27	68.9	66.5	65.3	64.0	6.41	7.08	7.44	7.82
32	74.6	72.9	71.6	70.2	6.49	7.19	7.55	7.93
37	81.9	79.2	77.9	76.5	6.60	7.29	7.66	8.04
42	88.5	85.7	84.3	82.8	6.70	7.39	7.76	8.15
47	95.4	92.4	90.9	89.4	6.80	7.50	7.87	8.27
52	102.6	99.5	97.9	96.2	6.91	7.61	7.99	8.39
57	109.9	106.5	104.8	103.1	7.02	7.73	8.11	8.51
62	117.3	113.7	111.9	110.0	7.13	7.84	8.23	8.63
67	124.7	120.8	118.8	116.9	7.25	7.96	8.34	8.75
72	131.9	127.9	125.7	123.6	7.36	8.08	8.46	8.87

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 102. 10 tons three phase low stage heating capacities (net) W/DHC120H3,4,W at 2800 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	40.5	39.1	38.4	37.6	3.72	4.08	4.27	4.48
27	44.4	42.9	42.1	41.3	3.74	4.11	4.30	4.51
32	48.4	46.8	45.9	45.1	3.77	4.14	4.34	4.55
37	52.4	50.7	49.8	48.9	3.80	4.17	4.37	4.59
42	56.4	54.8	53.8	52.9	3.84	4.21	4.41	4.63
47	60.6	58.8	57.9	56.9	3.88	4.25	4.45	4.67
52	64.8	63.0	61.9	60.9	3.92	4.29	4.50	4.72
57	69.3	67.1	66.0	64.8	3.96	4.34	4.55	4.76
62	73.5	71.1	69.9	68.7	4.01	4.39	4.60	4.82
67	77.6	75.1	73.8	72.5	4.06	4.45	4.65	4.87
72	82.0	79.1	77.6	76.1	4.15	4.53	4.74	4.95

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 103. 10 tons three phase high stage heating capacities (net) W/DHC120H3,4,W at 4000 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	44.6	43.7	43.5	42.9	7.40	8.17	8.60	9.05
-3	50.6	49.3	49.2	48.6	7.50	8.30	8.73	9.20
2	56.0	55.0	54.5	54.0	7.60	8.42	8.87	9.34
7	62.6	61.6	61.0	59.9	7.69	8.53	9.00	9.49
12	68.4	67.2	66.7	66.1	7.80	8.66	9.13	9.63
17	75.1	73.8	73.1	72.5	7.90	8.77	9.25	9.76
22	82.0	80.6	79.9	79.2	8.00	8.89	9.38	9.90
27	89.3	87.7	86.9	86.1	8.11	9.01	9.51	10.03
32	96.8	95.0	94.2	93.3	8.22	9.13	9.64	10.17
37	104.2	102.3	101.3	100.4	8.33	9.26	9.76	10.30
42	111.8	109.7	108.6	107.6	8.44	9.38	9.89	10.43
47	119.7	117.4	116.2	115.1	8.56	9.52	10.03	10.58
52	127.9	125.3	124.1	122.8	8.70	9.66	10.18	10.74
57	136.3	133.4	132.0	130.6	8.85	9.82	10.34	10.89
62	144.8	141.5	139.9	138.4	9.01	9.98	10.50	11.05
67	153.2	149.5	147.7	145.9	9.18	10.14	10.66	11.21
72	161.0	157.1	155.1	153.1	9.34	10.31	10.83	11.37

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 104.Auxiliary electric heat capacity[a]

Tons	Unit Model Number	Total[b]		No. of Stages	Stage1		Stage 2	
		kW Input[c]	MBh Output		kW Input	MBh Output	kW Input	MBh Output
3	W*C036H3,4,W	6.00	20.48	1	6.00	20.48	—	—
3	W*C036H3,4,W	12.00	40.97	2	6.00	20.48	6.00	20.48
3	W*C036H3,4,W	17.40	59.40	2	8.70	29.70	8.70	29.70
4	W*C048H3,4,W	6.00	20.48	1	6.00	20.48	—	—
4	W*C048H3,4,W	12.00	40.97	2	6.00	20.48	6.00	20.48
4	W*C048H3,4,W	17.40	59.40	2	8.70	29.70	8.70	29.70
5	W*C060H3,4,W	6.00	20.48	1	6.00	20.48	—	—
5	W*C060H3,4,W	12.00	40.97	2	6.00	20.48	6.00	20.48
5	W*C060H3,4,W	17.40	59.40	2	8.70	29.70	8.70	29.70
5	W*C060H3,4,W	23.00	78.52	2	8.70	29.70	14.30	48.82
7.5	WSC092H3,4/WHC092H3,4,W	9	30.73	1	9	30.73	—	—
7.5	WSC092H3,4/WHC092H3,4,W	18	61.45	1	18	61.45	—	—
7.5	WSC092H3,4/WHC092H3,4,W	27	92.18	2	18	61.45	9	30.73
7.5	WSC092H3,4/WHC092H3,4,W	36	122.9	2	18	61.45	18	61.45
8.5	WSC102H3,4/WHC102H3,4	9	30.73	1	9	30.73	—	—
8.5	WSC102H3,4,W/WHC102H3,4,W	18	61.45	1	18	61.45	—	—
8.5	WSC102H3,4,W/WHC102H3,4,W	27	92.18	2	18	61.45	9	30.73
8.5	WSC102H3,4,W/WHC102H3,4,W	36	122.9	2	18	61.45	18	61.45
10	WSC120H3,4,W/WHC120H3,4,W	18	61.45	1	18	61.45	—	—
10	WSC120H3,4,W/WHC120H3,4,W	27	92.18	2	18	61.45	9	30.73
10	WSC120H3,4,W/WHC120H3,4,W	36	122.9	2	18	61.45	18	61.45
10	WSC120H3,4,W/WHC120H3,4,W	54	184.36	2	36	122.9	18	61.45

(a) 600V is not available on high efficiency units.
(b) Heaters are rated at 240V,380V,480V and 600V. For other than rated voltage, CAP= (voltage/rated voltage)^2 x rated cap.
(c) All input/output does not include indoor fan power or heat.

Table 105.Auxiliary gas fired heating capacities - high efficiency

Tons	Unit Model Number	Heating Input MBh[a]	Heating Output MBh	Air Temp Rise, °F
3	DHC036H(3,4,W)*(L,X)	60/42	48.6/34	20-50
3	DHC036H(3,4,W)*(M,Y)	80/56	64.8/45.3	35-65
3	DHC036H(3,4,W)*(H,Z)	100/70	81/56.7	45-75
4	DHC048H(3,4,W)*(L,X)	60/42	48.6/34	15-45
4	DHC048H(3,4,W)*(M,Y)	100/70	81/56.7	30-60
4	DHC048H(3,4,W)*(H,Z)	130/91	105.3/73.7	45-75
5	DHC060H(3,4,W)*(L,X)	60/42	48.6/34	10-40
5	DHC060H(3,4,W)*(M,Y)	100/70	81/56.7	25-55
5	DHC060H(3,4,W)*(H,Z)	150/105	121.5/85	40-70
6	DHC074H(3,4,W)*(L,X)	80/80	64.8	15-45
6	DHC074H(3,4,W)*(M,Y)	120/120	97.2	20-50
6	DHC074H(3,4,W)*(H,Z)	150/105	121.5/85.05	25-55
7.5	DHC092H(3,4,W)*(L,X)	120/120	97.2	20-50
7.5	DHC092H(3,4,W)*(M,Y)	150/105	121.5/85.05	20-50

Table 105.Auxiliary gas fired heating capacities - high efficiency (continued)

Tons	Unit Model Number	Heating Input MBh[(a)]	Heating Output MBh	Air Temp Rise, °F
7.5	DHC092H(3,4,W)*(H,Z)	200/140	162/113.4	35-65
8.5	DHC102H(3,4,W)*(L,X)	120/120	97.2	20-50
8.5	DHC102H(3,4,W)*(M,Y)	150/105	121.5/85.05	20-50
8.5	DHC102H(3,4,W)*(H,Z)	200/140	162/113.4	35-65
10	DHC120H(3,4,W)*(L,X)	150/105	121.5/85.05	20-50
10	DHC120H(3,4,W)*(M,Y)	200/140	162/113.4	25-55
10	DHC120H(3,4,W)*(H,Z)	250/175	202.5/141.75	35-65

Note: Ratings shown are for elevations up to 2,000 ft. For higher elevations, reduce ratings at a rate of 4% per 1,000 ft. elevation.

(a) For two stage heaters (input or output), second stage is total heating capacity (Second Stage/First Stage).

Table 106.Electric heater voltage correction factors (applicable to auxiliary heat capacity)

Nominal Voltage	Distribution Voltage	Capacity Multiplier
240	208	0.751
240	230	0.918
240	240	1.000
480	440	0.840
480	460	0.918
480	480	1.000
600	540	0.810
600	575	0.918
600	600	1.000

Table 107. 3 to 5 tons air temperature rise across electric heaters (°F)

		3 Tons[(a)] 1200 cfm	4 Tons 1600 cfm	5 Tons[(b)] 2000 cfm
kW	Stages	Three Phase W*C036H3,4,W	Three Phase W*C048H3,4,W	Three Phase W*C060H3,4,W
6.00	1	18.5	10.5	11.4
12.00	2	36.2	22.3	21.5
17.40	2	48.2	33.0	30.0
17.60	2	—	—	—
23.0	2	—	—	38.8

Notes:
1. For minimum design airflow, see airflow performance table for each unit.
2. To calculate temp rise at different airflow, use the following formula: Temp. rise across electric heater = kWx3414/1.08xCFM.

(a) The minimum allowable airflow for a 3 ton with a 17.4 kW heater is 1080 cfm.
(b) The minimum allowable airflow for a 5 ton unit with a 23.0 kW heater is 1900 cfm.

Table 108. 6 to 10 tons air temperature rise across electric heaters (°F)

kW	Stages	6 Tons 2000 cfm WHC074H3,4,W	7.5 Tons 3000 cfm WSC092H3,4,W WHC092H3,4,W	8.5 Tons 3400 cfm WSC102H3,4,W WHC102H3,4,W	10 Tons 4000 cfm[(a)] WSC120H3,4,W WHC120H3,4,W
9.0	1	14.2	9.5	9.5	—
18.0	1	28.5	19.0	19.0	14.2
27.0	2	42.7	28.5	28.5	21.3
36.0	2	56.9	37.9	37.9	28.5
54.0	2	—	—	—	42.7

Notes:
1. For minimum design airflow, see airflow performance table for each unit.
2. To calculate temp rise at different airflow, use the following formula: Temp. rise across electric heater = kWx3414/1.08xCFM.

(a) Minimum allowable airflow with a 54 kW heater for the WSC120H is 4000 cfm.

Controls

ReliaTel™

Zone sensors re the building occupant's comfort control devices. The following zone sensor options are available for units with ReliaTel™ control.

Note: *Zone sensor required for units configured for single zone VAV indoor fan control to enable single zone VAV functionality.*

Economizer Controls

The standard equipment offering is a fixed dry bulb changeover control. In addition, there are two optional controls, enthalpy and differential enthalpy control.

Enthalpy Control

Replaces the dry bulb control with a wet bulb changeover controller which has a fully adjustable setpoint. Enthalpy control offers a higher level of comfort control, along with energy savings potential, than the standard dry bulb control. This is due to the additional wet bulb sensing capability.

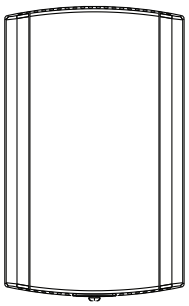
Differential Enthalpy

Differential enthalpy replaces the standard dry bulb control with two enthalpy sensors that compare total heat content of the indoor air and outdoor air to determine the most efficient air source. This control option offers the highest level of comfort control, plus energy efficiency, available.

Remote Potentiometer

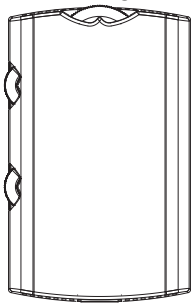
Minimum position setting of economizer can be remotely adjusted with this accessory.

Remote Sensor



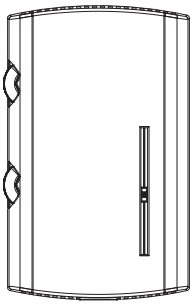
Sensor(s) available for all zone sensors to provide remote sensing capabilities.

Manual Changeover



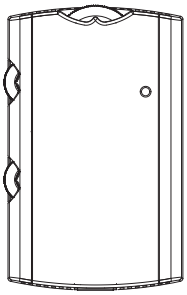
Heat, Cool or Off System Switch. Fan Auto or Off Switch. One temperature setpoint lever.

Manual/Automatic Changeover



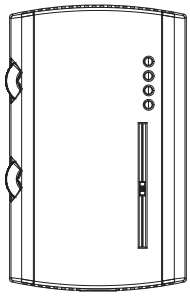
Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers.

Manual/Automatic Changeover - Status Indicator



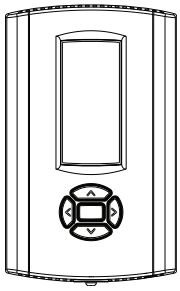
Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers. Includes a status indicator.

Manual/Automatic Changeover



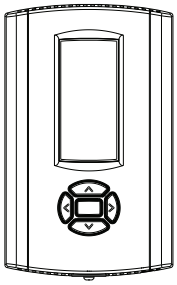
Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers. Status Indication LED lights, System On, Heat, Cool, or Service.

Digital Display Programmable Thermostat (1H/1C)



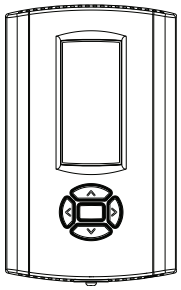
One heat/One Cool Auto changeover digital display thermostat.

Digital Display Thermostat (3H/2C)



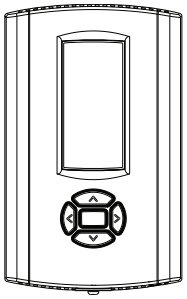
Three Heat, Two Cool Auto changeover digital display thermostat.

Digital Display Programmable Thermostat (3H/2C)



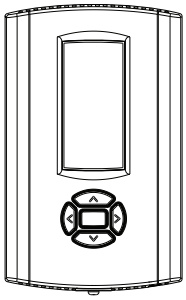
Three Heat/Two Cool Auto changeover digital display thermostat. 7-day programmable stat with night setback is available.

Programmable Night Setback



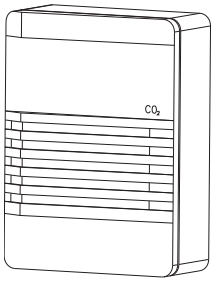
Auto or manual changeover with seven-day programming. Keyboard selection of Heat, Cool, Fan, Auto, or On. All programmable sensors have System On, Heat, Cool, Service LED/indicators as standard. Night Setback Sensors have one (1) Occupied, one (1) Un-occupied, and one (1) Override program per day.

Wireless Zone Sensor



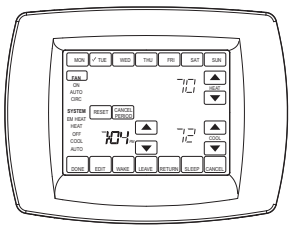
LCD display that provides heat, cool, auto or off. Includes two temperature setpoints and a lockable setting with °F or °C indicators.

CO_2 Sensing



The CO_2 sensor shall have the ability to monitor space occupancy levels within the building by measuring the parts per million of CO_2 (Carbon Dioxide) in the air. As the CO_2 levels increase, the outside air damper modulates to meet the CO_2 space ventilation requirements. The CO_2 accessory shall be available as field installed.

Touchscreen Programmable Thermostat (2H/2C)



Two Heat/Two Cool programmable thermostat with touch screen digital display. Menu-driven programming. Effortless set-up. Program each day separately with no need to copy multiple days. All programming can be done on one screen. Easy to read and use. Large, clear backlit digital display.

Digital Display Programmable Thermostat with Built-In Relative Humidity Sensing (3H/2C)



Three Heat, Two Cool digital display thermostat with built-in humidity control and display. This thermostat combines both humidity and dry bulb into one. Fully programmable with night setback.

Differential Pressure Switches

This factory or field-installed option allows individual fan failure and dirty filter indication. The fan failure switch will disable all unit functions and “flash” the Service LED on the zone sensor. The dirty filter switch will light the Service LED on the zone sensor and will allow continued unit operation.

RA Remote Sensor

Return air remote sensor which can be mounted in the return air duct to report return air temperature.

Room Remote Sensor

Space remote sensor which can be mounted on the wall to report/control from a remote location in the space.

Communication Interfaces

BACnet® Communication Interface

This option shall be provided to allow the unit to communicate directly with a generic open protocol BACnet® MS/TP Network Building Automation System Controls.

Trane® Air-Fi® Wireless Communication - Factory Installed

Air-Fi Wireless communication shall be factory installed and tested. Air-Fi Wireless conforms to ANSI/ASHRAE Standard 135-2016 (BACnet®/ZigBee®[1]).

Trane® Communication Interface (TCI)

This factory or field-installed micro-processor interface allows the unit to communicate to Trane® Integrated Comfort™ system.

[1] ZigBee is a registered trademark of the ZigBee Alliance.

LonTalk® Communications Interface - Factory or Field Installed

The LonTalk® communications interface allows the unit to communicate as a Tracer® LCI-V device or directly with a generic open protocol BACnet® MS/TP Network Building Automation System Controls.

Electrical Data

Table 109.Unit wiring - standard efficiency

Tons	Unit Model Number	Voltage Range	Standard Indoor Fan Motor[a]		Oversized Indoor Fan Motor		Optional EBM Indoor Fan Motor	
			MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
3	WSC036H3	187-253	26	40	29	40	-	-
3	WSC036H4	414-506	11	15	13	15	-	-
3	WSC036HW	517-633	11	15	11	15	-	-
4	WSC048H3	187-253	27	40	28	40	-	-
4	WSC048H4	414-506	12	15	13	15	-	-
4	WSC048HW	517-633	12	15	12	15	-	-
5	WSC060H3	187-253	31	45	32	45	-	-
5	WSC060H4	414-506	15	20	15	20	-	-
5	WSC060HW	517-633	13	15	13	15	-	-
7.5	WSC092H3	187-253	40	60	46	70	44	60
7.5	WSC092H4	414-506	18	25	21	30	20	30
7.5	WSC092HW	517-633	14	20	16	20	20	25
8.5	WSC102H3	187-253	45	70	48	70	46	70
8.5	WSC102H4	414-506	20	30	22	30	21	30
8.5	WSC102HW	517-633	16	20	17	25	21	25
10	WSC120H3	187-253	54	80	-	-	-	-
10	WSC120H4	414-506	24	35	-	-	-	-
10	WSC120HW	517-633	23	30	-	-	-	-

(a) The standard motor for 3-phase models (3 to 5 and 10 ton) is a multispeed, direct drive motor. The standard motor for 3-phase (7.5 to 8.5 tons) is a belt drive motor.

Table 110. Unit wiring - high efficiency

Tons	Unit Model Number	Voltage Range	Standard Indoor Fan Motor[a]		Oversized Indoor Fan Motor	
			MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
3	W/DHC036H3	187-253	23	30	20	30
3	W/DHC036H4	414-506	13	15	10	15
3	W/DHC036HW	517-633	9	15	—	—
4	W/DHC048H3	187-253	29	40	24	35
4	W/DHC048H4	414-506	14	15	11	15
4	W/DHC048HW	517-633	10	15	—	—
5	W/DHC060H3	187-253	32	45	27	40
5	W/DHC060H4	414-506	15	20	12	15
5	W/DHC060HW	517-633	12	15	—	—
6	W/DHC074H3	187-253	42	50	-	-
6	W/DHC074H4	414-506	19	25	-	-
6	W/DHC074HW	517-633	21	25	-	-
7.5	W/DHC092H3	187-253	43	50	-	-
7.5	W/DHC092H4	414-506	20	25	-	-
7.5	W/DHC092HW	517-633	22	25	-	-
8.5	W/DHC102H3	187-253	46	60	-	-

Table 110. Unit wiring - high efficiency (continued)

Tons	Unit Model Number	Voltage Range	Standard Indoor Fan Motor[a]		Oversized Indoor Fan Motor	
			MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
8.5	W/DHC102H4	414-506	22	25	-	-
8.5	W/DHC102HW	517-633	23	25	-	-
10	W/DHC120H3	187-253	49	60	-	-
10	W/DHC120H4	414-506	24	30	-	-
10	W/DHC120HW	517-633	23	30	-	-

(a) The standard motor for all models is a multispeed, direct drive motor.

Table 111.Unit wiring with electric heat (single point connection) - standard efficiency

Tons	Unit Model Number	Heater Model Number	Heater kW Rating[a]	Control Stages	Standard Indoor Fan Motor		Oversized Indoor Fan Motor		Optional EBM Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
208/230 Volts Three Phase										
3	WSC036H3	BAYHTRE306*	4.5/6.0	1	42/44	50/50	44/47	50/50	-	-
3	WSC036H3	BAYHTRE312*	9.0/12.0	2	57/62	60/70	60/65	60/70	-	-
3	WSC036H3	BAYHTRY317*	13.1/17.4	2	71/78	80/80	74/81	80/90	-	-
4	WSC048H3	BAYHTRE306*	4.5/6.0	1	43/45	50/50	44/46	50/50	-	-
4	WSC048H3	BAYHTRE312*	9.0/12.0	2	58/63	60/70	63/68	60/70	-	-
4	WSC048H3	BAYHTRY317*	13.1/17.4	2	72/79	80/80	74/84	80/90	-	-
5	WSC060H3	BAYHTRX306*	4.5/6.0	1	47/50	60/60	48/50	60/60	-	-
5	WSC060H3	BAYHTRX312*	9.0/12.0	2	63/68	70/70	63/68	70/70	-	-
5	WSC060H3	BAYHTRY318*	13.1/17.4	2	77/84	80/90	77/84	80/90	-	-
5	WSC060H3	BAYHTRY323	17.3/23.0	2	91/101	100/110	92/101	100/110	-	-
7.5	WSC092H3	BAYHTRU309*	6.8/9.0	1	63/67	80/80	69/73	90/90		
7.5	WSC092H3	BAYHTRA309*	6.8/9.0	1	-	-	-	-	67/71	80/90
7.5	WSC092H3	BAYHTRU318*	13.5/18.0	1	87/94	100/100	93/100	100/110	-	-
7.5	WSC092H3	BAYHTRA318*	13.5/18.0	1	-	-	-	-	91/98	100/110
7.5	WSC092H3	BAYHTRU327*	20.3/27.0	2	110/121	110/125	116/127	125/150	-	-
7.5	WSC092H3	BAYHTRA327*	20.3/27.0	2	-	-	-	-	114/125	125/125
7.5	WSC092H3	BAYHTRU336*	27.0/36.0	2	134/148	150/150	140/154	150/175		
7.5	WSC092H3	BAYHTRA336*	27.0/36.0	2	-	-	-	-	138/152	150/175
8.5	WSC102H3	BAYHTRU309*	6.8/9.0	1	68/72	90/90	71/75	90/90	-	-
8.5	WSC102H3	BAYHTRA309*	6.8/9.0	1	-	-	-	-	69/73	90/90
8.5	WSC102H3	BAYHTRU318*	13.5/18.0	1	92/99	100/110	95/102	110/110	-	-
8.5	WSC102H3	BAYHTRA318*	13.5/18.0	1	-	-	-	-	93/100	110/110
8.5	WSC102H3	BAYHTRU327*	20.3/27.0	2	115/126	125/150	118/129	125/150	-	-
8.5	WSC102H3	BAYHTRA327*	20.3/27.0	2	-	-	-	-	116/127	125/150
8.5	WSC102H3	BAYHTRU336*	27.0/36.0	2	138/153	150/175	142/156	150/175	-	-
8.5	WSC102H3	BAYHTRA336*	27.0/36.0	2	-	-	-	-	139/154	150/175
10	WSC120H3	BAYHTRA318*	13.5/18.0	1	101/108	110/125	-	-	-	-

Table 111.Unit wiring with electric heat (single point connection) - standard efficiency (continued)

Tons	Unit Model Number	Heater Model Number	Heater kW Rating[a]	Control Stages	Standard Indoor Fan Motor		Oversized Indoor Fan Motor		Optional EBM Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
10	WSC120H3	BAYHTRA327*	20.3/27.0	2	124/135	125/150	-	-	-	-
10	WSC120H3	BAYHTRA336*	27.0/36.0	2	147/162	150/175	-	-	-	-
10	WSC120H3	BAYHTRA354*	40.6/54.0	2	194/184	200/200	-	-	-	-
460 Volts Three Phase										
3	WSC036H4	BAYHTRE406*	6	1	20	20	23	25	-	-
3	WSC036H4	BAYHTRE412*	12	2	29	30	32	35	-	-
3	WSC036H4	BAYHTRY417*	17.4	2	37	40	40	40	-	-
4	WSC048H4	BAYHTRE406*	6	1	21	25	22	25	-	-
4	WSC048H4	BAYHTRE412*	12	2	30	30	32	35	-	-
4	WSC048H4	BAYHTRY417*	17.4	2	38	40	40	40	-	-
5	WSC060H4	BAYHTRX406*	6	1	24	25	25	30	-	-
5	WSC060H4	BAYHTRX412*	12	2	33	35	34	35	-	-
5	WSC060H4	BAYHTRY418*	17.4	2	41	45	42	45	-	-
5	WSC060H4	BAYHTRY423*	23	2	50	50	51	60	-	-
7.5	WSC092H4	BAYHTRU409*	9	1	32	40	35	40	-	-
7.5	WSC092H4	BAYHTRA409*	9	1	-	-	-	-	34	40
7.5	WSC092H4	BAYHTRU418*	18	1	45	50	48	50	-	-
7.5	WSC092H4	BAYHTRA418*	18	1	-	-	-	-	47	50
7.5	WSC092H4	BAYHTRU427*	27	2	59	60	62	70	-	-
7.5	WSC092H4	BAYHTRA427*	27	2	-	-	-	-	61	70
7.5	WSC092H4	BAYHTRU436*	36	2	72	80	75	80	-	-
7.5	WSC092H4	BAYHTRA436*	36	2	-	-	-	-	74	80
8.5	WSC102H4	BAYHTRU409*	9	1	34	40	35	40	-	-
8.5	WSC102H4	BAYHTRA409*	9	1	-	-	-	-	34	40
8.5	WSC102H4	BAYHTRU418*	18	1	47	50	49	50	-	-
8.5	WSC102H4	BAYHTRA418*	18	1	-	-	-	-	48	50
8.5	WSC102H4	BAYHTRU427*	27	2	61	70	62	70	-	-
8.5	WSC102H4	BAYHTRA427*	27	2	-	-	-	-	61	70
8.5	WSC102H4	BAYHTRU436*	36	2	74	80	76	80	-	-
8.5	WSC102H4	BAYHTRA436*	36	2	-	-	-	-	75	80
10	WSC120H4	BAYHTRA418*	18	1	51	60	-	-	-	-
10	WSC120H4	BAYHTRA427*	27	2	64	70	-	-	-	-
10	WSC120H4	BAYHTRA436*	36	2	78	80	-	-	-	-
10	WSC120H4	BAYHTRA454*	54	2	89	100	-	-	-	-

Table 111.Unit wiring with electric heat (single point connection) - standard efficiency (continued)

Tons	Unit Model Number	Heater Model Number	Heater kW Rating[a]	Control Stages	Standard Indoor Fan Motor		Oversized Indoor Fan Motor		Optional EBM Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
575 Volts Three Phase										
3	WSC036HW	BAYHTREW06*	6	1	19	20	19	20	-	-
3	WSC036HW	BAYHTREW12*	12	2	26	30	26	30	-	-
3	WSC036HW	BAYHTRYW17*	17.4	2	32	35	32	35	-	-
4	WSC048HW	BAYHTREW06*	6	1	19	20	19	20	-	-
4	WSC048HW	BAYHTREW12*	12	2	26	30	26	30	-	-
4	WSC048HW	BAYHTRYW17*	17.4	2	33	35	33	35	-	-
5	WSC060HW	BAYHTREW06*	6	1	20	20	20	20	-	-
5	WSC060HW	BAYHTREW12*	12	2	27	30	27	30	-	-
5	WSC060HW	BAYHTREW18*	17.4	2	33	35	33	35	-	-
5	WSC060HW	BAYHTREW23*	23	2	40	40	40	40	-	-
7.5	WSC092HW	BAYHTRUW18*	18	1	36	40	38	40	-	-
7.5	WSC092HW	BAYHTRAW18*	18	1	-	-	-	-	42	45
7.5	WSC092HW	BAYHTRUW27*	27	2	47	50	49	50	-	-
7.5	WSC092HW	BAYHTRAW27*	27	2	-	-	-	-	53	60
7.5	WSC092HW	BAYHTRUW36*	36	2	58	60	60	60	-	-
7.5	WSC092HW	BAYHTRAW36*	36	2	-	-	-	-	64	70
8.5	WSC102HW	BAYHTRUW18*	18	1	38	40	39	40	-	-
8.5	WSC102HW	BAYHTRAW18*	18	1	-	-	-	-	43	45
8.5	WSC102HW	BAYHTRUW27*	27	2	49	50	49	50	-	-
8.5	WSC102HW	BAYHTRAW27*	27	2	-	-	-	-	54	60
8.5	WSC102HW	BAYHTRUW36*	36	2	59	60	60	60	-	-
8.5	WSC102HW	BAYHTRAW36*	36	2	-	-	-	-	64	70
10	WSC120HW	BAYHTRAW18*	18	1	44	50	-	-	-	-
10	WSC120HW	BAYHTRAW27*	27	2	55	60	-	-	-	-
10	WSC120HW	BAYHTRAW36*	36	2	66	70	-	-	-	-
10	WSC120HW	BAYHTRAW54*	54	2	75	80	-	-	-	-

(a) The standard motor for 3-phase models (3 to 5 and 10 ton) is a multispeed, direct drive motor. The standard motor for 3-phase (7.5 to 8.5 tons) is a belt drive motor.

Table 112.Unit wiring with electric heat (single point connection) - high efficiency

Tons	Unit Model Number	Heater Model Number	Heater kW Rating[a]	Control Stages	Standard Indoor Fan Motor		Oversized Indoor Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
208/230 Volts Three Phase								
3	WHC036H3	BAYHTRE306*	4.5/6.0	1	39/41	45/45	36/38	40/45
3	WHC036H3	BAYHTRE312*	9.0/12.0	2	55/59	60/60	52/56	60/60
3	WHC036H3	BAYHTRY317*	13.1/17.4	2	69/76	70/80	66/73	70/80
4	WHC048H3	BAYHTRX306*	4.5/6.0	1	45/47	50/50	39/42	45/50
4	WHC048H3	BAYHTRX312*	9.0/12.0	2	60/65	60/70	55/60	60/60
4	WHC048H3	BAYHTRY318*	13.1/17.4	2	74/81	80/90	69/76	70/80
5	WHC060H3	BAYHTRX306*	4.5/6.0	1	48/50	60/60	43/45	50/50
5	WHC060H3	BAYHTRX312*	9.0/12.0	2	63/68	70/70	58/63	60/70
5	WHC060H3	BAYHTRY318*	13.1/17.4	2	77/84	80/90	72/79	80/80
5	WHC060H3	BAYHTRY323*	17.3/23.0	2	92/101	100/110	87/96	90/100
6	WHC074H3	BAYHTRA309*	6.8/9.0	1	65/69	70/70	-	-
6	WHC074H3	BAYHTRA318*	13.5/18.0	1	89/96	90/100	-	-
6	WHC074H3	BAYHTRA327*	20.3/27.0	2	112/123	125/125	-	-
6	WHC074H3	BAYHTRA336*	27.0/36.0	2	136/150	150/150	-	-
7.5	WHC092H3	BAYHTRA309*	6.8/9.0	1	67/70	70/70	-	-
7.5	WHC092H3	BAYHTRA318*	13.5/18.0	1	90/97	90/100	-	-
7.5	WHC092H3	BAYHTRA327*	20.3/27.0	2	113/124	125/125	-	-
7.5	WHC092H3	BAYHTRA336*	27.0/36.0	2	137/151	150/175	-	-
8.5	WHC102H3	BAYHTRA309*	6.8/9.0	1	69/73	80/80	-	-
8.5	WHC102H3	BAYHTRA318*	13.5/18.0	1	93/100	100/100	-	-
8.5	WHC102H3	BAYHTRA327*	20.3/27.0	2	116/127	125/150	-	-
8.5	WHC102H3	BAYHTRA336*	27.0/36.0	2	140/154	150/175	-	-
10	WHC120H3	BAYHTRB318*	13.5/18.0	1	96/103	100/110	-	-
10	WHC120H3	BAYHTRB327*	20.3/27.0	2	119/130	125/150	-	-
10	WHC120H3	BAYHTRB336*	27.0/36.0	2	142/157	150/175	-	-
10	WHC120H3	BAYHTRB354*	40.6/54.0	2	189/179	200/200	-	-
460 Volts Three Phase								
3	WHC036H4	BAYHRTE406*	6	1	22	25	19	20
3	WHC036H4	BAYHTRE412*	12	2	31	35	28	30
3	WHC036H4	BAYHTRY417*	17.4	2	39	40	36	40
4	WHC048H4	BAYHTRX406*	6	1	23	25	20	20
4	WHC048H4	BAYHTRX412*	12	2	32	35	29	30
4	WHC048H4	BAYHTRY418*	17.4	2	40	40	37	40
5	WHC060H4	BAYHTRX406*	6	1	24	25	21	25
5	WHC060H4	BAYHTRX412*	12	2	33	35	30	30
5	WHC060H4	BAYHTRY418*	17.4	2	41	45	38	40
5	WHC060H4	BAYHTRY423*	23	2	49	50	47	50

Table 112.Unit wiring with electric heat (single point connection) - high efficiency (continued)

Tons	Unit Model Number	Heater Model Number	Heater kW Rating[a]	Control Stages	Standard Indoor Fan Motor		Oversized Indoor Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
6	WHC074H4	BAYHTRA409*	9	1	33	35	-	-
6	WHC074H4	BAYHTRA418*	18	1	47	50	-	-
6	WHC074H4	BAYHTRA427*	27	2	60	60	-	-
6	WHC074H4	BAYHTRA436*	36	2	74	80	-	-
7.5	WHC092H4	BAYHTRA409*	9	1	34	35	-	-
7.5	WHC092H4	BAYHTRA418*	18	1	47	50	-	-
7.5	WHC092H4	BAYHTRA427*	27	2	61	70	-	-
7.5	WHC092H4	BAYHTRA436*	36	2	74	80	-	-
8.5	WHC102H4	BAYHTRA409*	9	1	35	35	-	-
8.5	WHC102H4	BAYHTRA418*	18	1	49	50	-	-
8.5	WHC102H4	BAYHTRA427*	27	2	62	70	-	-
8.5	WHC102H4	BAYHTRA436*	36	2	76	80	-	-
10	WHC120H4	BAYHTRB418*	18	1	51	60	-	-
10	WHC120H4	BAYHTRB427*	27	2	64	70	-	-
10	WHC120H4	BAYHTRB436*	36	2	78	80	-	-
10	WHC120H4	BAYHTRB454*	54	2	89	90	-	-
575 Volts Three Phase								
3	WHC036HW	BAYHTREW12*	12	2	24	25	-	-
3	WHC036HW	BAYHTRYW17*	17.4	2	30	30	-	-
4	WHC048HW	BAYHTRXW06*	6	1	18	20	-	-
4	WHC048HW	BAYHTRXW12*	12	2	25	25	-	-
4	WHC048HW	BAYHTRYW18*	17.4	2	31	35	-	-
5	WHC060HW	BAYHTRXW06*	6	1	19	20	-	-
5	WHC060HW	BAYHTRXW12*	12	2	26	30	-	-
5	WHC060HW	BAYHTRYW18*	17.4	2	32	35	-	-
5	WHC060HW	BAYHTRYW23*	23	2	39	40	-	-
6	WHC074HW	BAYHTRAW18*	18	1	42	45	-	-
6	WHC074HW	BAYHTRAW27*	27	2	52	60		
6	WHC074HW	BAYHTRAW36*	36	2	63	70	-	-
7.5	WHC092HW	BAYHTRAW18*	18	1	43	45	-	-
7.5	WHC092HW	BAYHTRAW27*	27	2	54	60		
7.5	WHC092HW	BAYHTRAW36*	36	2	64	70	-	-
8.5	WHC102HW	BAYHTRAW18*	18	1	44	45	-	-
8.5	WHC102HW	BAYHTRAW27*	27	2	54	60		
8.5	WHC102HW	BAYHTRAW36*	36	2	65	70	-	-
10	WHC120HW	BAYHTRBW18*	18	1	45	45	-	-
10	WHC120HW	BAYHTRBW36*	36	2	66	70	-	-
10	WHC120HW	BAYHTRBW54*	54	2	74	80	-	-

(a) The standard motor for all models is a multispeed, direct drive motor.

Table 113.Electrical characteristics - compressor motor and condenser motor - 60 cycle - standard efficiency

Tons	Unit Model Number	Compressor Motors							Condenser Fan Motors					
		No.	Volts	Phase	hp[a]	rpm	Amps[b]		No.	Volts	Phase	hp	Amps[b]	
							RLA	LRA					FLA	LRA
3	WSC036H3	1	208-230	3	3.2	3500	15	88	1	208-230	3	0.25	1.1	3.6
3	WSC036H4	1	460	3	3.2	3500	6.6	44	1	460	3	0.25	0.55	1.8
3	WSC036HW	1	575	3	3.2	3500	5.5	34	1	575	3	0.25	0.45	1.4
4	WSC048H3	1	208-230	3	3.8	3500	14.5	98	1	208-230	3	0.33	1.4	4.6
4	WSC048H4	1	460	3	3.8	3500	6.3	55	1	460	3	0.33	0.7	2.3
4	WSC048HW	1	575	3	3.8	3500	6	41	1	575	3	0.33	0.55	1.8
5	WSC060H3	1	208-230	3	4.7	3500	17.5	110	1	208-230	3	0.40	1.5	5.6
5	WSC060H4	1	460	3	4.7	3500	7.88	52	1	460	3	0.40	1.8	2.8
5	WSC060HW	1	575	3	4.7	3500	6.3	39	1	575	3	0.40	0.65	2.3
7.5	WSC092H3	1	208-230	3	8.6	3500	26.09	164	1	208-230	3	0.7	3.3	12.3
7.5	WSC092H4	1	460	3	8.6	3500	11.67	94	1	460	3	0.7	1.6	6.1
7.5	WSC092HW	1	575	3	8.6	3500	8.72	65	1	575	3	0.7	1.4	5.1
8.5	WSC102H3	1	208-230	3	9.2	3500	27.63	223	1	208-230	3	0.7	3.3	12.3
8.5	WSC102H4	1	460	3	9.2	3500	12.12	100	1	460	3	0.7	1.6	6.1
8.5	WSC102HW	1	575	3	9.2	3500	9.36	70	1	575	3	0.7	1.4	5.1
10	WSC120H3	1	208-230	3	10.5	3500	34	240	1	208-230	3	0.7	3.3	12.3
10	WSC120H4	1	460	3	10.5	3500	14.42	130	1	460	3	0.7	1.6	6.1
10	WSC120HW	1	575	3	10.5	3500	10.77	84	1	460	3	0.7	1.4	5.1

(a) hp for each compressor.
(b) Amp draw for each motor; multiply value by number of motors to determine total amps.

Table 114.Electrical characteristics - compressor motor - 60 cycle - high efficiency

Tons	Unit Model Number	No.	Voltage	Phase	hp[a]	Compressor Rated		
						LRA	RLA	MCC
3	W/DHC036H3	1	208-230	3	3.9	73	11.6	18.1
3	W/DHC036H4	1	460	3	3.8	38	5.7	8.9
3	W/DHC036HW	1	575	3	3.8	25.6	4	6.2
4	W/DHC048H3	1	208-230	3	4.3	83.1	14	21.9
4	W/DHC048H4	1	460	3	4.3	41	6.4	10
4	W/DHC048HW	1	575	3	4.3	33	4.6	7.1
5	W/DHC060H3	1	208-230	3	5.3	110	16.5	25.8
5	W/DHC060H4	1	460	3	5.3	52	7.2	11.3
5	W/DHC060HW	1	575	3	5.3	38.9	5.5	8.6
6	W/DHC074H3	2	208-230	3	2.3/4.5	88/88	14.2/13.2	22.1/20.6
6	W/DHC074H4	2	460	3	2.3/4.5	44/44	6.2/6	9.7/9.3
6	W/DHC074HW	2	575	3	2.3/4.5	30/30	5.1/4.2	7.9/6.5
7.5	W/DHC092H3	2	208-230	3	5.2/5.6	83.1/98	14/14.5	21.9/22.6
7.5	W/DHC092H4	2	460	3	5.2/5.6	41/55	6.4/6.3	10/9.9

Table 114.Electrical characteristics - compressor motor - 60 cycle - high efficiency (continued)

Tons	Unit Model Number	No.	Voltage	Phase	hp[a]	Compressor Rated		
						LRA	RLA	MCC
7.5	W/DHC092HW	2	575	3	5.2/5.6	33/41	4.6/6	7.1/9.4
8.5	W/DHC102H3	2	208-230	3	6/5.6	110/98	16.22/14.5	25.3/22.6
8.5	W/DHC102H4	2	460	3	6/5.6	52/55	7.63/6.3	11.9/9.9
8.5	W/DHC102HW	2	575	3	6/5.6	38.9/41	5.32/6	8.3/9.4
10	W/DHC120H3	2	208-230	3	7.5/6.5	136/110	17.56/16	27.4/24.9
10	W/DHC120H4	2	460	3	7.5/6.5	66.1/52	8.46/7.8	13.20/12.1
10	W/DHC120HW	2	575	3	7.5/6.5	55.3/38.9	6.35/5.7	9.9/8.9

(a) hp for each compressor.

Table 115.Electrical characteristics - condenser fan motor - 60 cycle - high efficiency

Tons	Unit Model Number	Motor Voltage	Motor Hz	Motor Phase	Condenser Rated		
					LRA	FLA	Bhp
3	W/DHC036H3	208-230	60	3	3.6	1.1	0.25
3	W/DHC036H4	460	60	3	1.8	0.55	0.25
3	W/DHC036HW	575	60	3	1.4	0.45	0.25
4	W/DHC048H3	208-230	60	3	5.6	1.5	0.4
4	W/DHC048H4	460	60	3	2.8	0.8	0.4
4	W/DHC048HW	575	60	3	2.3	0.65	0.4
5	W/DHC060H3	208-230	60	3	5.6	1.5	0.4
5	W/DHC060H4	460	60	3	2.8	0.8	0.4
5	W/DHC060HW	575	60	3	2.3	0.65	0.4
6	W/DHC074H3	208-230	60	3	12.3	3.3	0.7
6	W/DHC074H4	460	60	3	6.1	1.6	0.7
6	W/DHC074HW	575	60	3	5.1	1.4	0.7
7.5	W/DHC092H3	208-230	60	3	12.3	3.3	0.7
7.5	W/DHC092H4	460	60	3	6.1	1.6	0.7
7.5	W/DHC092HW	575	60	3	5.1	1.4	0.7
8.5	W/DHC102H3	208-230	60	3	12.3	3.3	0.7
8.5	W/DHC102H4	460	60	3	6.1	1.6	0.7
8.5	W/DHC102HW	575	60	3	5.1	1.4	0.7
10	W/DHC120H3	208-230	60	3	10.4	2.8	0.75
10	W/DHC120H4	460	60	3	5.2	1.4	0.75
10	W/DHC120HW	575	60	3	5.2	1.4	0.75

Note: Precedent™ unit nameplate FLA and catalog FLA may be different than actual condenser motor nameplate FLA for two reasons:
If multiple vendors for approved motor size are used, the highest FLA is used.
Actual condenser motor FLA may be determined through unit temperature and pressure testing.

Table 116.Electrical characteristics - standard evaporator fan motor - 60 cycle - direct or belt drive standard efficiency

Tons	Unit Model Number	Direct or Belt Drive	No.	Volts	Phase	hp	Amps	
							FLA	LRA
3	WSC036H3	Direct Drive	1	208-230	1	0.75	5.7	-
3	WSC036H4	Direct Drive	1	460	1	0.75	1.7	-
3	WSC036HW	Direct Drive	1	575	1	0.75	5.7	-
4	WSC048H3	Direct Drive	1	208-230	1	1.0	6.9	-
4	WSC048H4	Direct Drive	1	460	1	1.0	2.5	-
4	WSC048HW	Direct Drive	1	575	1	1.0	6.9	-
5	WSC060H3	Direct Drive	1	208-230	1	1.0	7.6	-
5	WSC060H4	Direct Drive	1	460	1	1.0	4.0	-
5	WSC060HW	Direct Drive	1	575	1	1.0	7.6	-
7.5	WSC092H3	Belt Drive	1	208-230	3	1	3.3	12.5
7.5	WSC092H4	Belt Drive	1	460	3	1	1.6	12.5
7.5	WSC092HW	Belt Drive	1	575	3	1	1.4	10
7.5	WSC092H3	Direct Drive	1	208-230	3	2.75	7.3	-
7.5	WSC092H4	Direct Drive	1	460	3	2.75	3.6	-
7.5	WSC092HW	Direct Drive	1	575	3	2.75	7.5	-
8.5	WSC102H3	Belt Drive	1	208-230	3	1	6.3	12.5
8.5	WSC102H4	Belt Drive	1	460	3	1	3.1	12.5
8.5	WSC102HW	Belt Drive	1	575	3	1	2.5	10
8.5	WSC102H3	Direct Drive	1	208-230	3	2.75	7.3	-
8.5	WSC102H4	Direct Drive	1	460	3	2.75	3.6	-
8.5	WSC102HW	Direct Drive	1	575	3	2.75	7.5	-
10	WSC120H3	Direct Drive	1	208-230	3	2.75	7.3	-
10	WSC120H4	Direct Drive	1	460	3	2.75	3.6	-
10	WSC120HW	Direct Drive	1	460	3	2.75	7.5	-

Note: WSC(036,048,060)HW utilize 230V evaporator motors.

Table 117.Electrical characteristics - standard evaporator fan motor - 60 cycle - high efficiency

Tons	Unit Model Number	Motor Voltage	Motor Hz	Phase	No.	Motor Rating		
						FLA	LRA	HP
3	W/DHC036H3	208-230	60	1	1	7.3	—	0.75
3	W/DHC036H4	460[a]	60	1	1	4.3	—	0.75
3	W/DHC036HW	575[b]	60	1	1	3.5	—	0.75
4	W/DHC048H3	208-230	60	1	1	9.4	—	1.00
4	W/DHC048H4	460[a]	60	1	1	4.3	—	1.00
4	W/DHC048HW	575[b]	60	1	1	3.5	—	1.00
5	W/DHC060H3	208-230	60	1	1	9.4	—	1.00
5	W/DHC060H4	460[a]	60	1	1	4.3	—	1.00
5	W/DHC060HW	575[b]	60	1	1	3.5	—	1.00
6	W/DHC074H3	208-230	60	1	1	7.3	-	2.75

Table 117.Electrical characteristics - standard evaporator fan motor - 60 cycle - high efficiency (continued)

Tons	Unit Model Number	Motor Voltage	Motor Hz	Phase	No.	Motor Rating		
						FLA	LRA	HP
6	W/DHC074H4	460	60	1	1	3.6	-	2.75
6	W/DHC074HW	575(c)	60	1	1	7.5	-	2.75
7.5	W/DHC092H3	208-230	60	1	1	7.3	-	2.75
7.5	W/DHC092H4	460	60	1	1	3.6	-	2.75
7.5	W/DHC092HW	575(c)	60	1	1	7.5	-	2.75
8.5	W/DHC102H3	208-230	60	1	1	7.3	-	2.75
8.5	W/DHC102H4	460	60	1	1	3.6	-	2.75
8.5	W/DHC102HW	575(c)	60	1	1	7.5	-	2.75
10	W/DHC120H3	208-230	60	1	1	7.3	-	2.75
10	W/DHC120H4	460	60	1	1	3.6	-	2.75
10	W/DHC120HW	575(c)	60	1	1	7.5	-	2.75

Note: Precedent™ unit nameplate FLA and catalog FLA may be different than actual evaporator motor nameplate FLA for two reasons:
If multiple vendors for approved motor size are used, the highest FLA is used.
Actual evaporator motor FLA may be determined through unit temperature and pressure testing.

(a) Precedent 460V rated units utilize a high efficiency 230V evaporator fan motor powered through 480/240V transformer. Fan voltage/FLA rated at transformer input.
(b) Precedent 575V rated units utilize a high efficiency 230V evaporator fan motor powered through 575/240V transformer. Fan voltage/FLA rated at transformer input.
(c) Precedent 575V rated units utilize a high efficiency 460V evaporator fan motor powered through 575/460V transformer. Fan voltage/FLA rated at transformer input.

Table 118.Electrical characteristics - oversized evaporator fan motor - 60 cycle - belt drive - standard efficiency

Tons	Unit Model Number	Direct or Belt Drive	No.	Volts	Phase	hp	Amps	
							FLA	LRA
3	WSC036H3	Direct Drive	1	208-230	1	1.5	8.2	-
3	WSC036H4	Direct Drive	1	460	1	1.5	4.2	-
3	WSC036HW	Direct Drive	1	575	1	1.5	3.5	-
4	WSC048H3	Direct Drive	1	208-230	1	1.5	8.2	-
4	WSC048H4	Direct Drive	1	460	1	1.5	4.2	-
4	WSC048HW	Direct Drive	1	575	1	1.5	3.5	-
5	WSC060H3	Direct Drive	1	208-230	1	1.5	8.2	-
5	WSC060H4	Direct Drive	1	460	1	1.5	4.2	-
5	WSC060HW	Direct Drive	1	575	1	1.5	3.5	-
7.5	WSC092H3	Belt Drive	1	208-230	3	3	9.4	52.4
7.5	WSC092H4	Belt Drive	1	460	3	3	4.6	26.3
7.5	WSC092HW	Belt Drive	1	575	3	3	3.4	29.4
8.5	WSC102H3	Belt Drive	1	208-230	3	3	9.4	52.4
8.5	WSC102H4	Belt Drive	1	460	3	3	4.6	26.3
8.5	WSC102HW	Belt Drive	1	575	3	3	3.4	29.4

Note: WSC(036,048,060)HW utilize 230V evaporator motors.

Table 119.Electrical characteristics - oversized evaporator fan motor - 60 cycle - high efficiency

Tons	Unit Model Number	Motor Voltage	Motor Hz	Phase	No.	Motor Rating		
						FLA	LRA	HP
3	W/DHC036H3	208-230	60	3	1	4.3	—	1.50
3	W/DHC036H4	460	60	3	1	1.9	—	1.50
4	W/DHC048H3	208-230	60	3	1	4.3	—	1.50
4	W/DHC048H4	460	60	3	1	1.9	—	1.50
5	W/DHC060H3	208-230	60	3	1	4.3	—	1.50
5	W/DHC060H4	460	60	3	1	1.9	—	1.50

Notes:
1. Precedent oversized evaporator available only on 230V and 460V.
2. Precedent™ unit nameplate FLA and catalog FLA may be different than actual evaporator motor nameplate FLA for two reasons:
   If multiple vendors for approved motor size are used, the highest FLA is used.
   Actual evaporator motor FLA may be determined through unit temperature and pressure testing.

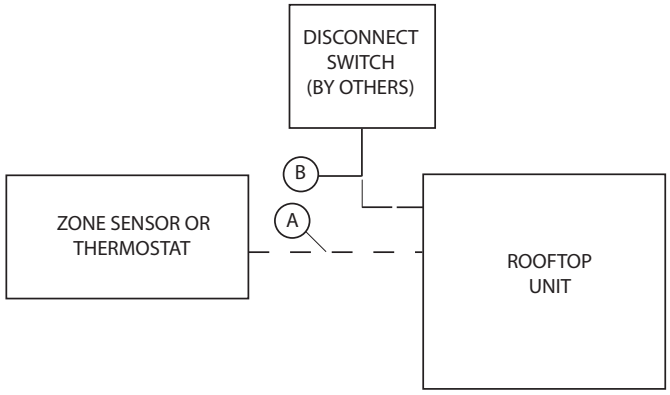
Table 120.Electrical characteristics - inducer motor

Unit Model Number	Stages	hp	rpm	volts	phase	LRA
DHC(036-120)H(3,4,W)*(L,X,M,Y,H,Z)	2	1/50	3200/3500	208-230	1	0.68
DHC074**(L,M,X,Y) DHC(092-102)**(L,X)	1	1/35	3000	208-230	1	0.6
DHC074**(H,Z) DHC(092-102)**(M,H,Y,Z) DHC120	2	1/15	3000/3350	208-230	1	0.4

Jobsite Connections

Table 121.Typical Number of Wires

Zone Sensors		
A	Manual Changeover.....	4
	Manual/Auto Changeover.....	5
	Manual/Auto Changeover with Status Indication LED's.....	10
	Programmable Night Setback with Status Indication LED's.....	7
Thermostats		
A	3 Wires, 24V, Cooling only	
	4 Wires, 24V, with Electric Heat	
B	3 Power Wires + 1 Ground Wire (3-phase)	
	2 Power Wires + 1 Ground Wire (1-phase)	



For specific wiring information, see the installation instructions.
All wiring except power wire is low voltage.
All customer supplied wiring to be copper and must conform to applicable electrical codes (such as NEC or CEC) and local electric codes. Wiring shown dotted is to be furnished and installed by the customer.

Dimensional Data

Figure 4. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency

Note: 2” electrical connection: single point power when heat installed (W*C)

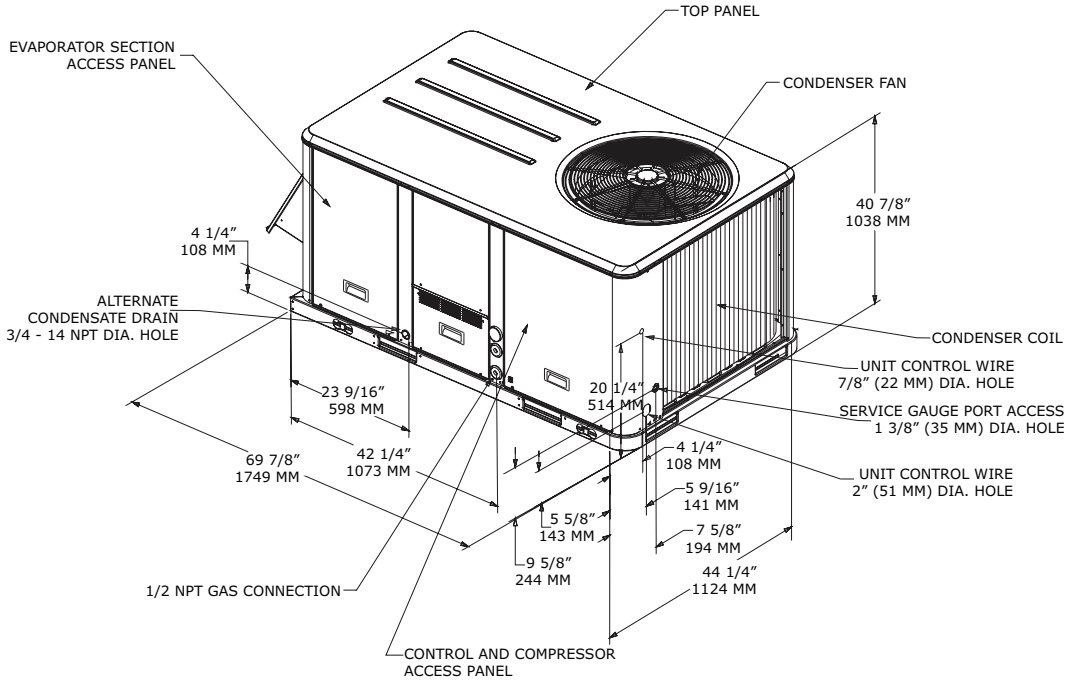


Figure 5. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - downflow airflow supply/return - through-the-base utilities

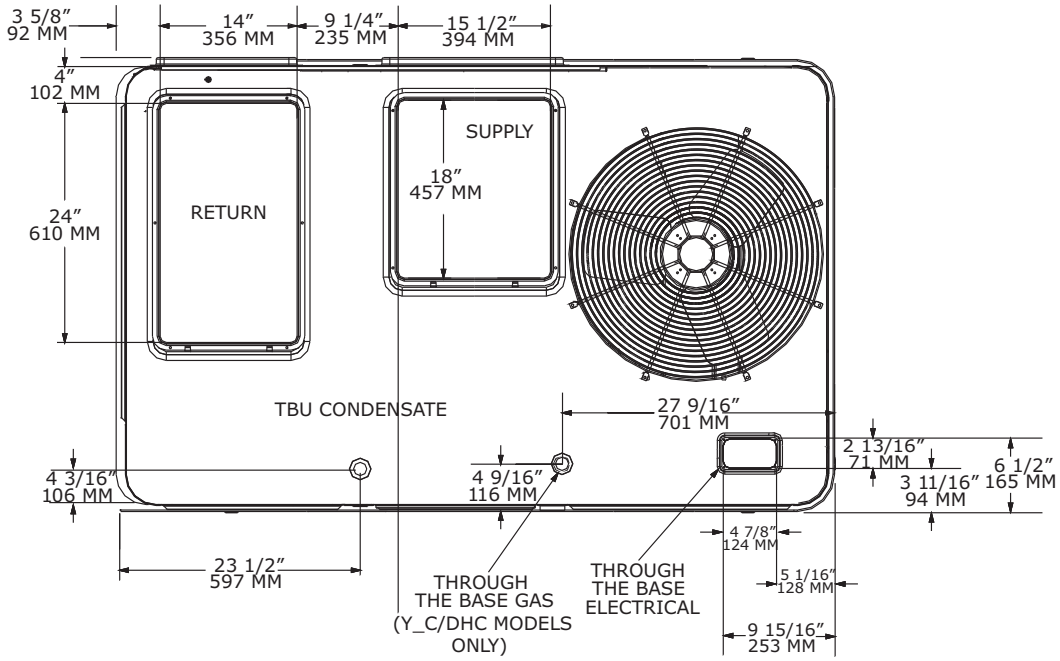


Figure 6. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - horizontal airflow supply/return

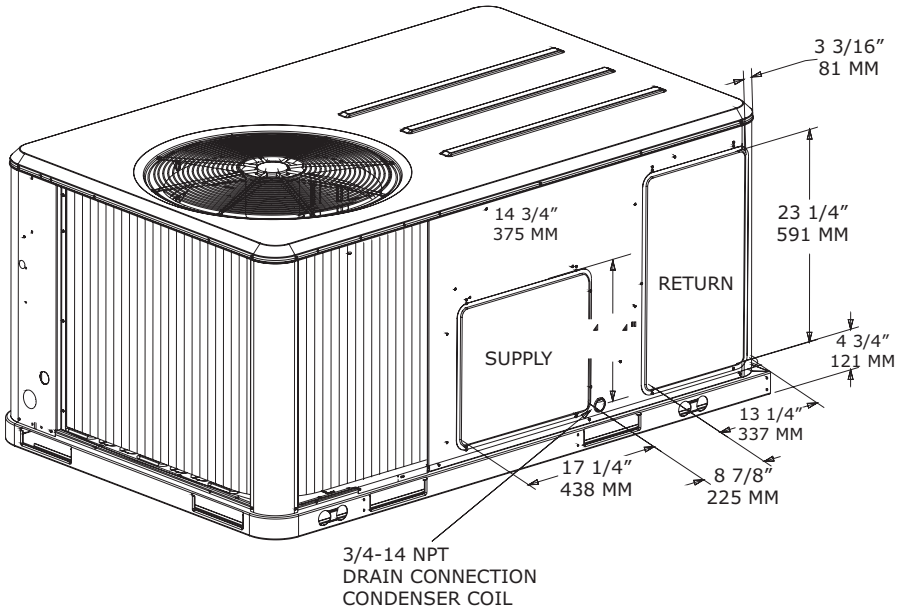


Figure 7. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - unit clearance and roof opening

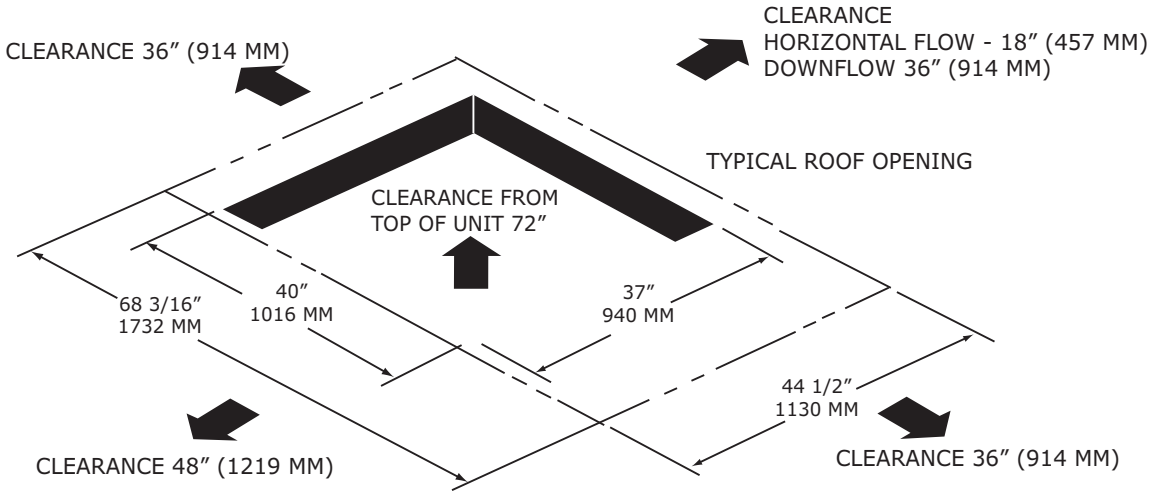


Figure 8. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - roof curb

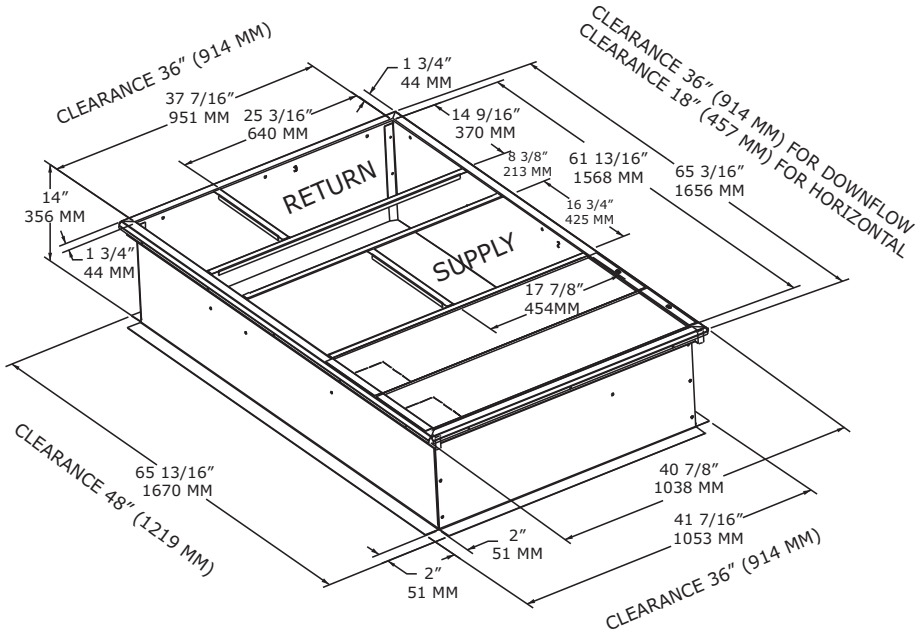


Figure 9. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - downflow duct connections - field fabricated

Note: Reference tabular information for duct clearance to combustible materials in the application consideration chapter.

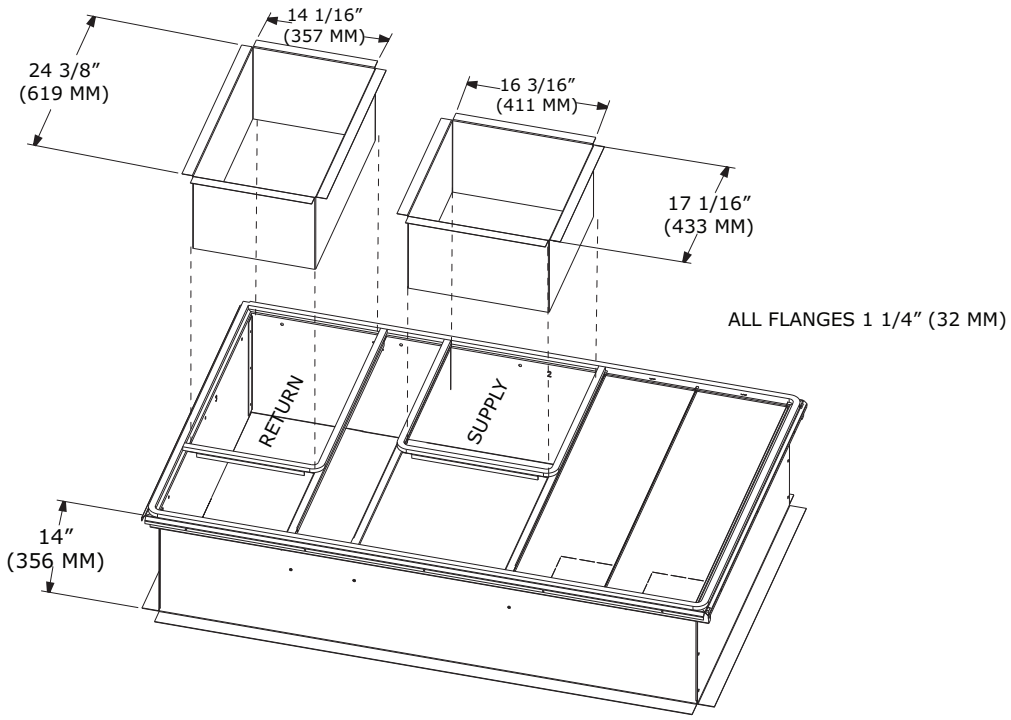


Figure 10. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - economizer, manual or motorized fresh air damper; power exhaust

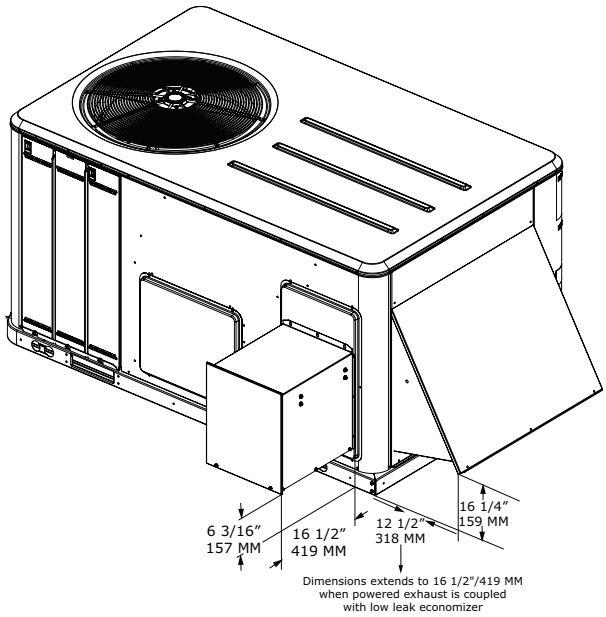


Figure 11. Heat pump 3 to 4 tons standard efficiency, 3 ton high efficiency - economizer and barometric relief damper hood

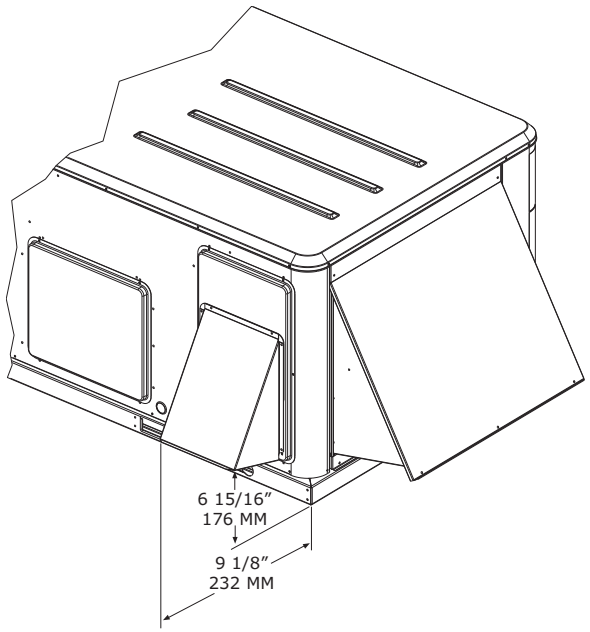


Figure 12. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - swing diameter for hinged door(s) option

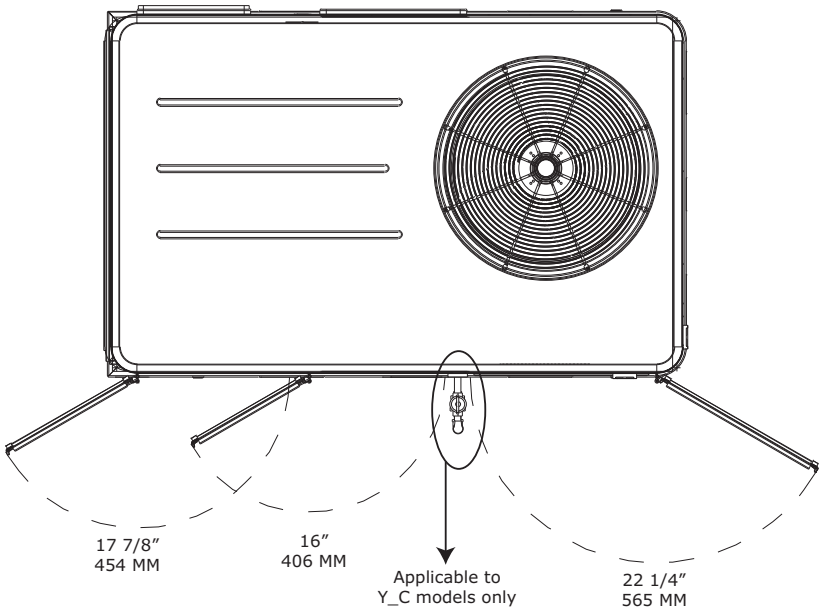


Figure 13. Heat pump - 5 tons standard efficiency, 4 to 5 tons high efficiency

Note: 2” electrical connection: single point power when heat installed (W*C)

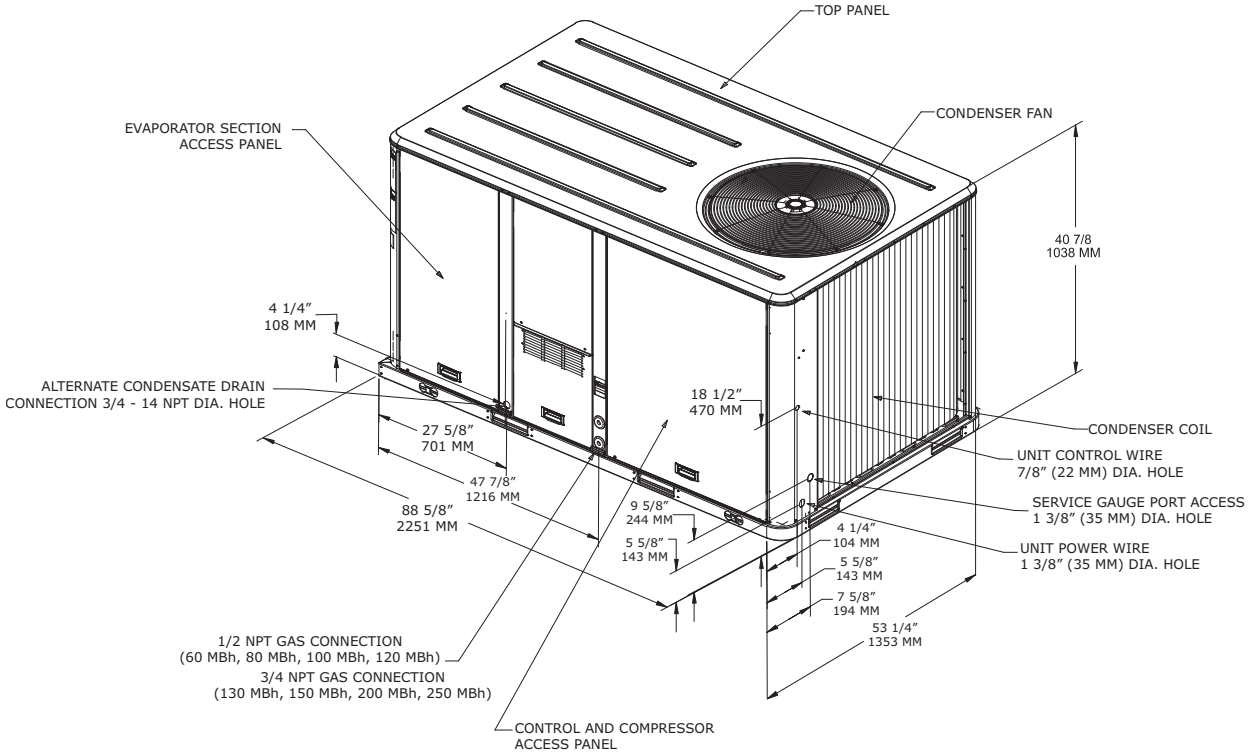


Figure 14. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - downflow airflow supply/return - through-the-base utilities

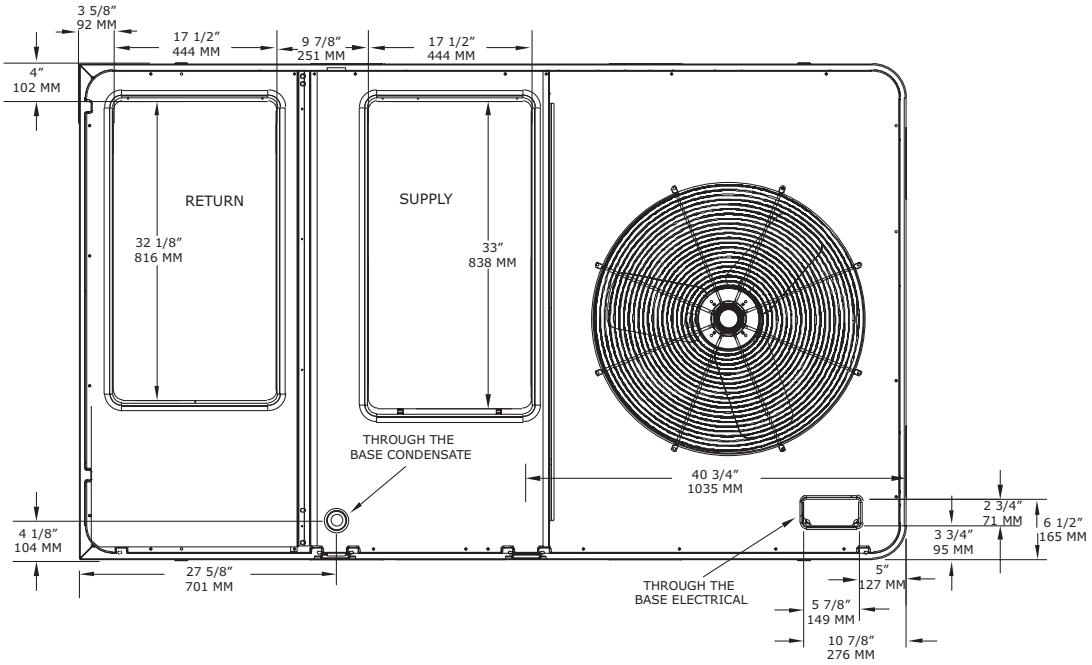


Figure 15. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - horizontal airflow supply and return

Note: All dimensions are in inches/millimeters.

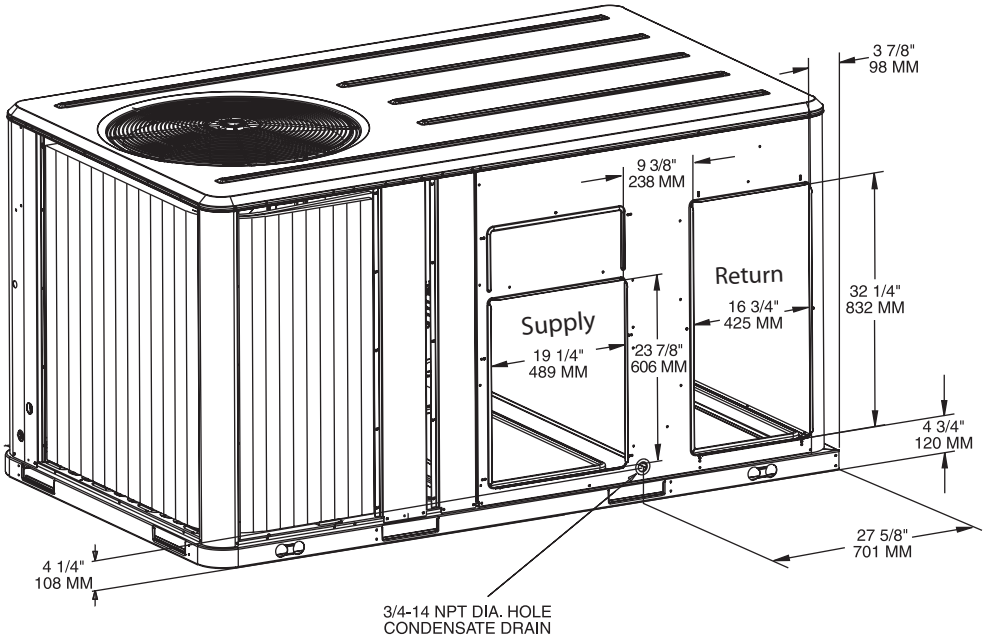


Figure 16. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - unit clearance and roof opening

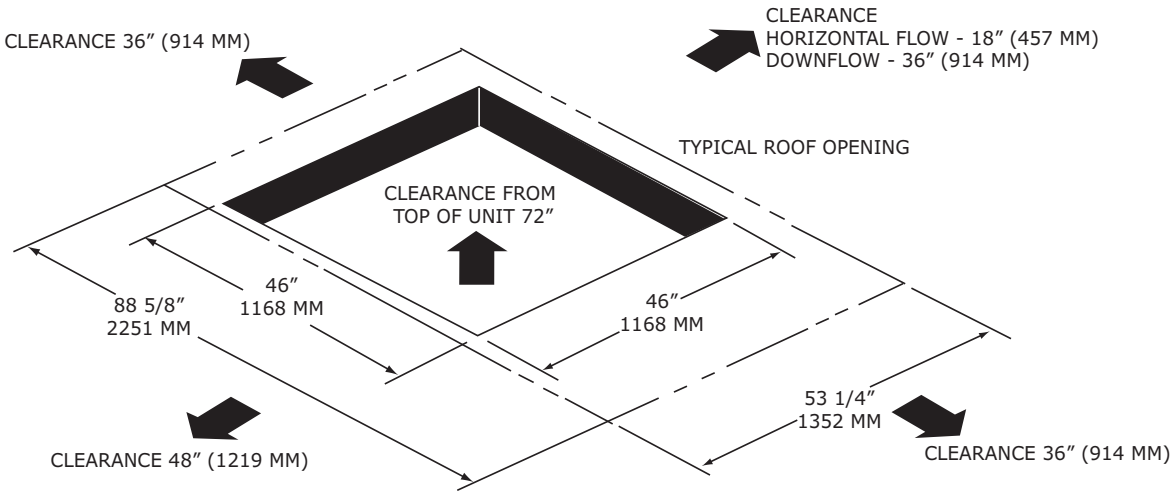


Figure 17. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - roof curb

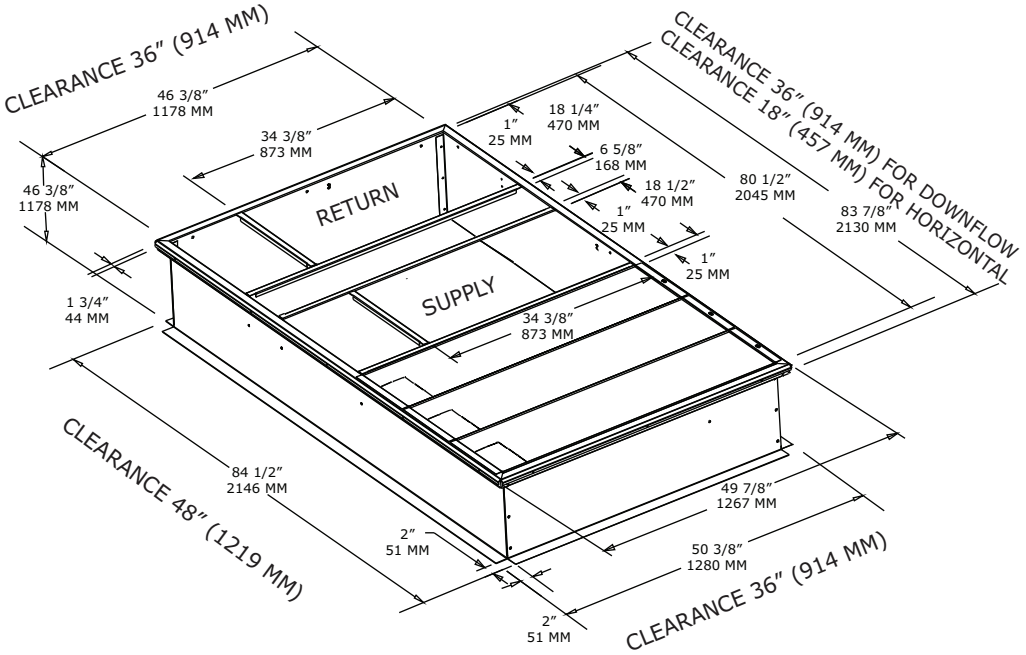


Figure 18. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - downflow duct connections field fabricated

Note: Reference tabular information for duct clearance to combustible materials in the application consideration chapter.

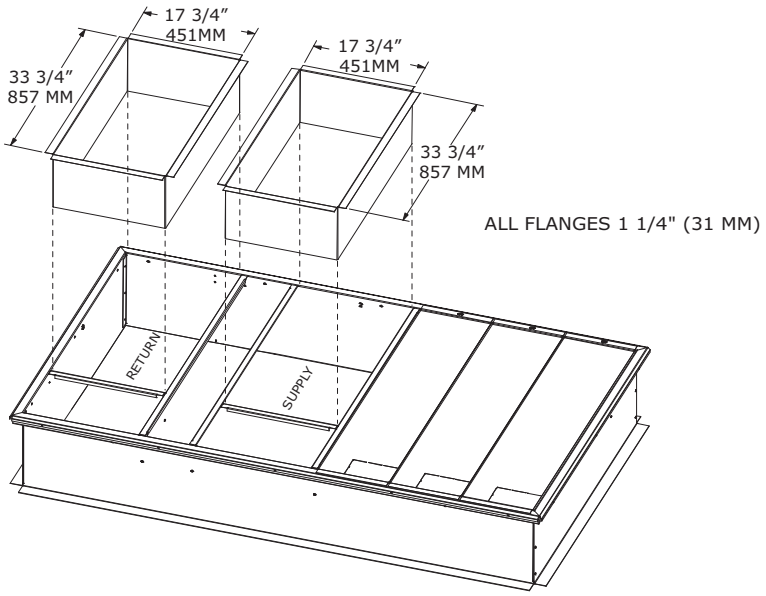


Figure 19. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - power exhaust

Note: Reference tabular information

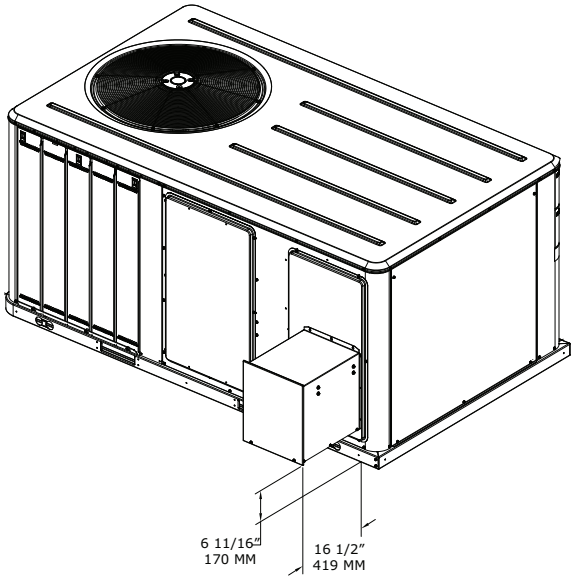


Figure 20. Heat pumps - 5 to 10 tons standard efficiency, 4 to 10 tons high efficiency - economizer, manual or motorized fresh air damper

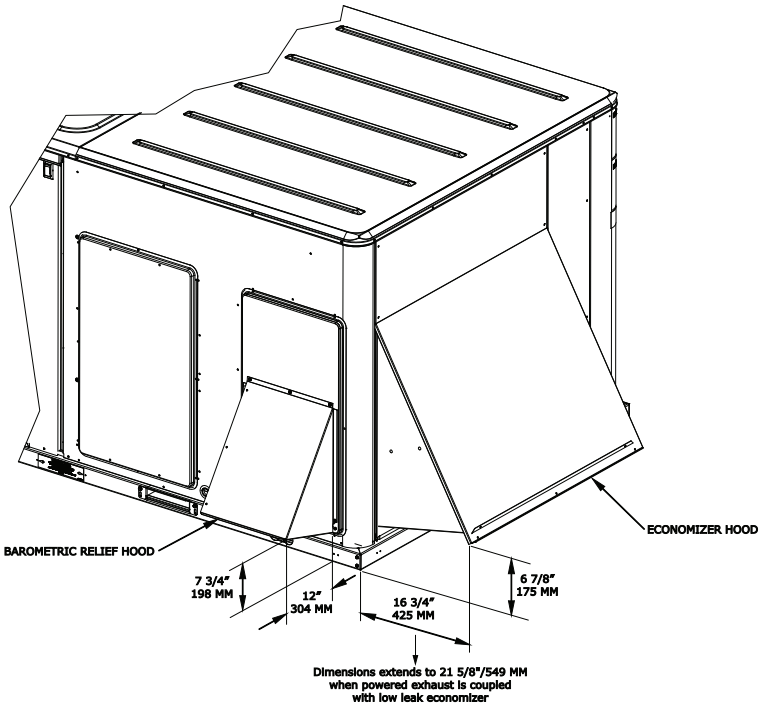


Figure 21. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - swing diameter for hinged door(s) option

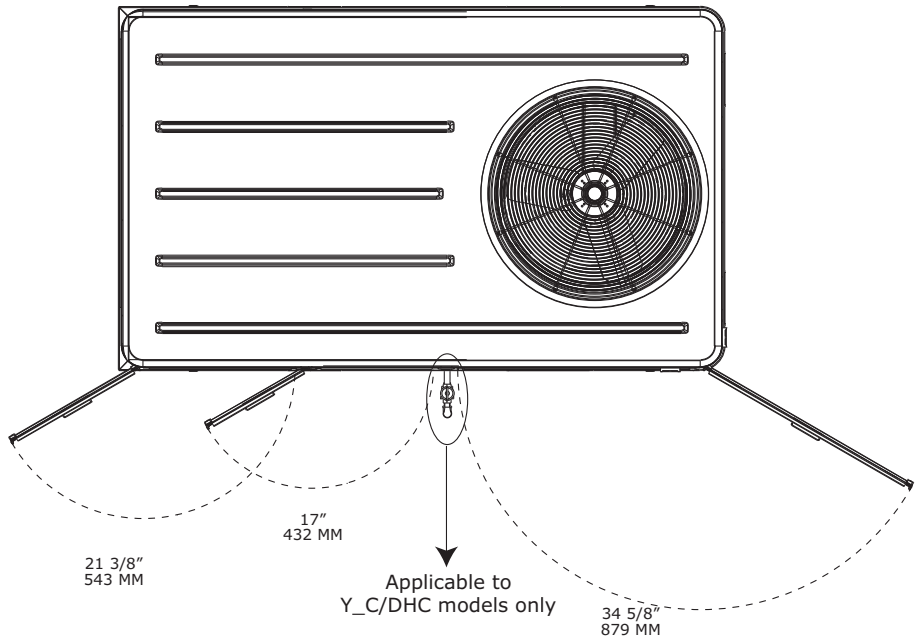


Figure 22. Heat pump - 7.5 to 10 tons standard efficiency and 7.5 to 8.5 tons high efficiency

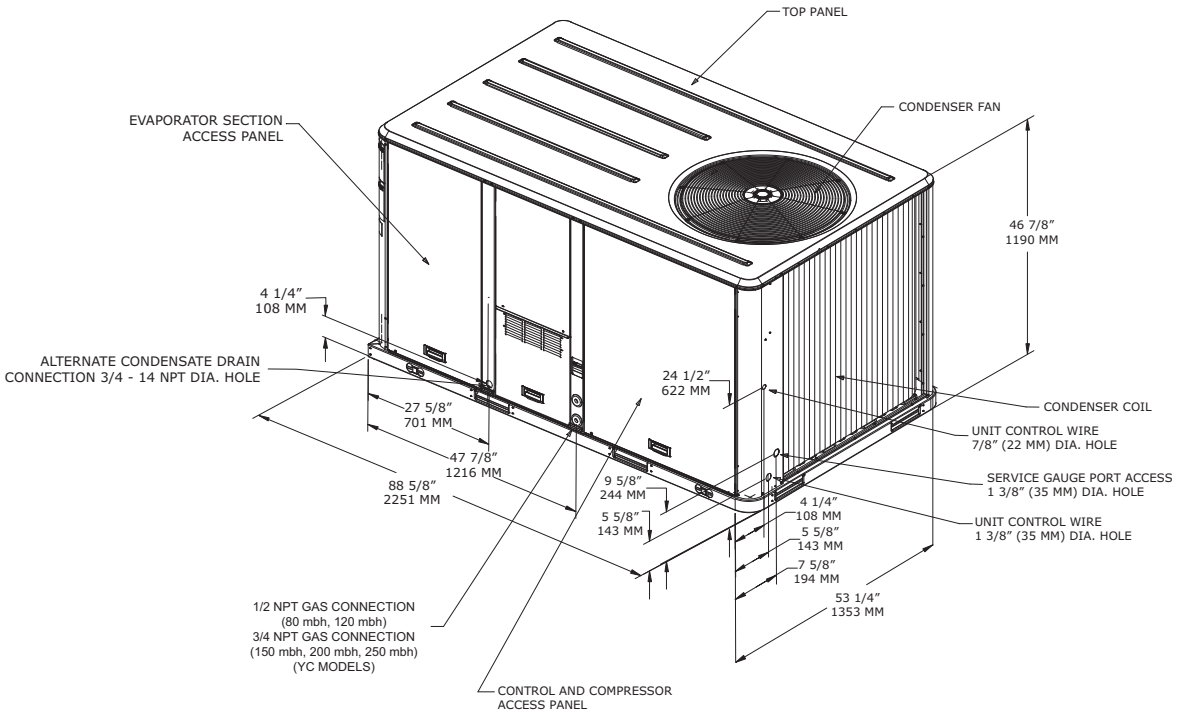


Figure 23. Heat pump - 10 tons high efficiency - downflow airflow supply/return through-the-base utilities

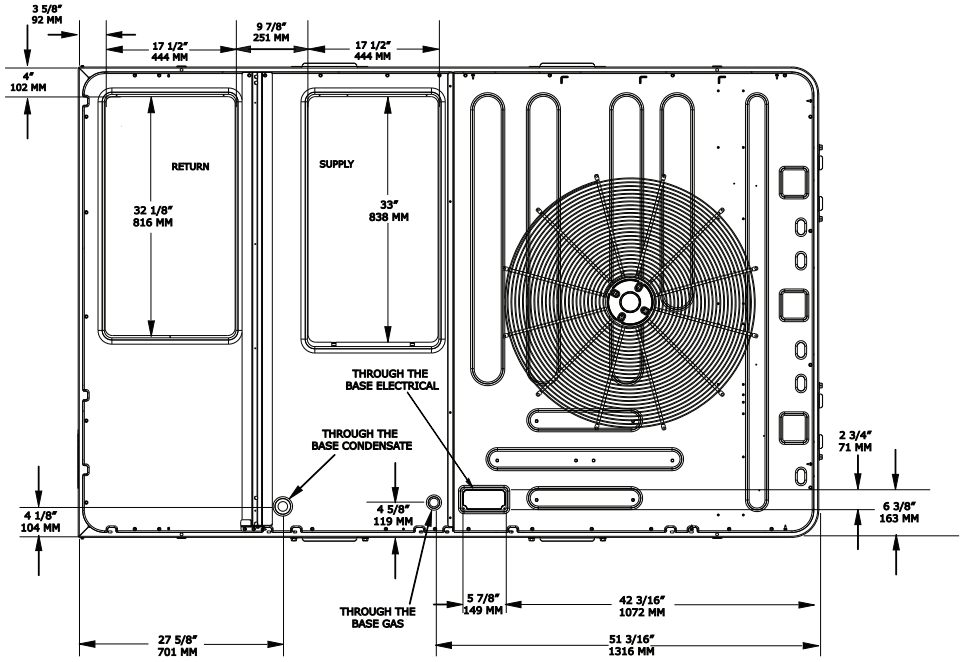


Figure 24. Heat pump - 10 tons high efficiency

Note: 2" Electrical Connection: Single Point Power When Heat Installed.

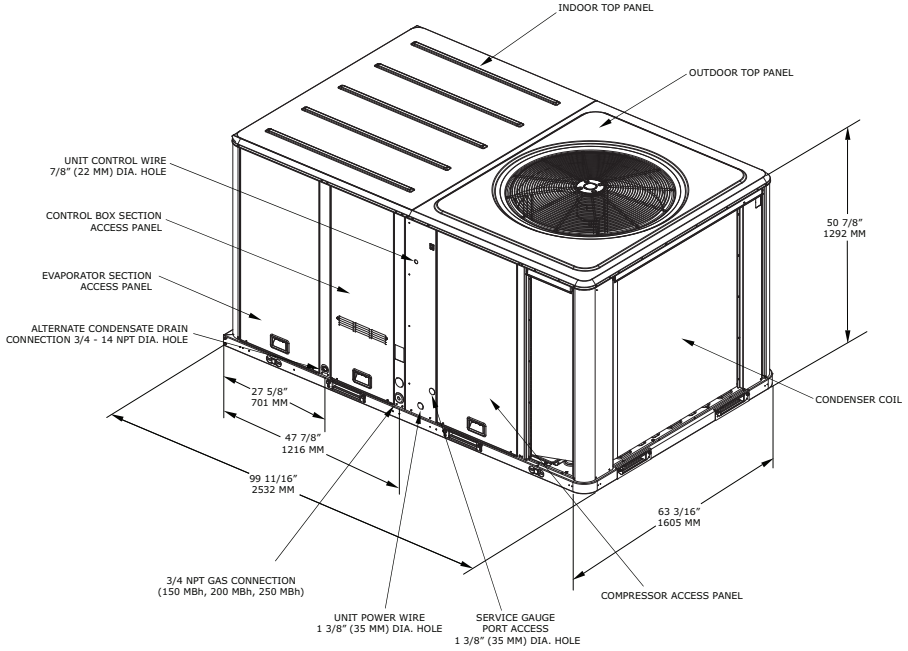


Figure 25. Heat pump - 10 tons high efficiency - unit clearance and roof opening

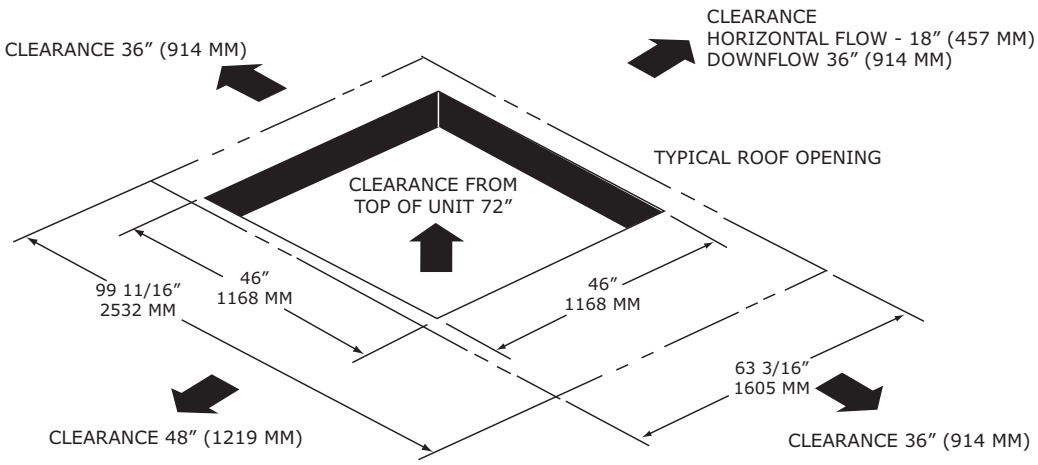


Figure 26. Heat pump - 10 tons high efficiency - roof curb

Note: 2" Electrical Connection: Single Point Power When Heat Installed.

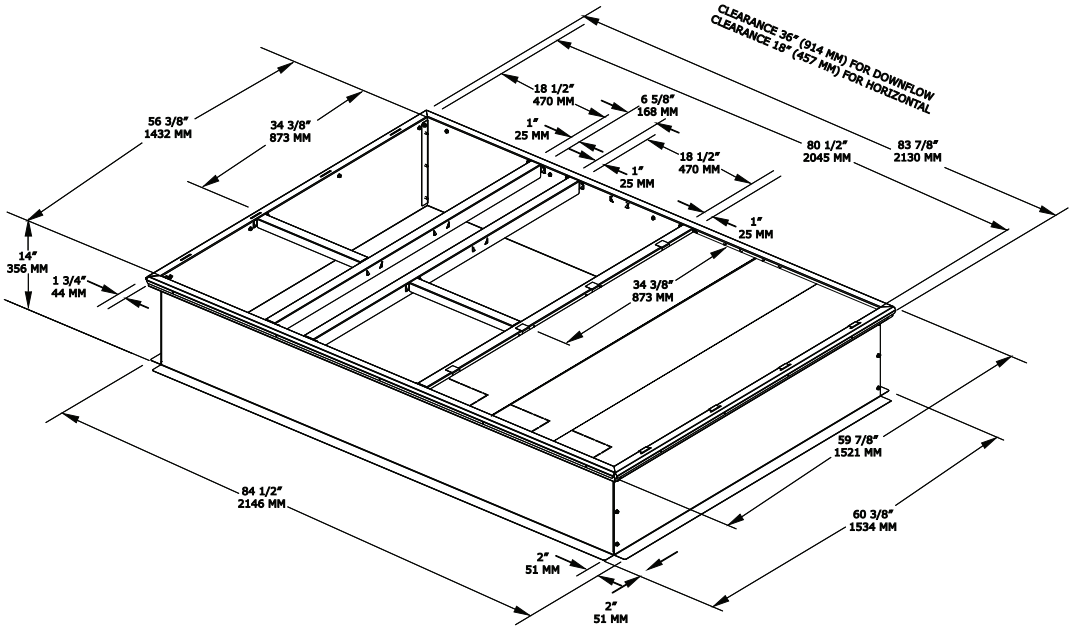


Figure 27. Heat pump - 10 tons high efficiency - horizontal airflow supply and return

Note: All dimensions are in inches/millimeters.

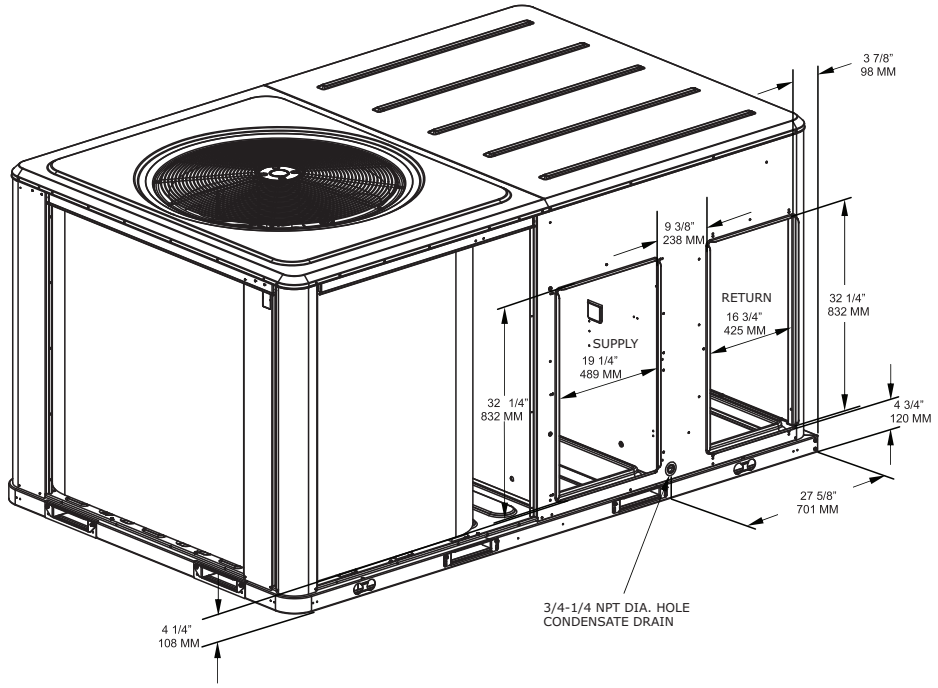


Figure 28. Heat pump - 10 tons high efficiency - downflow duct connections (field fabricated)

Note: Reference tabular information for duct clearance to combustible materials in the application consideration chapter.

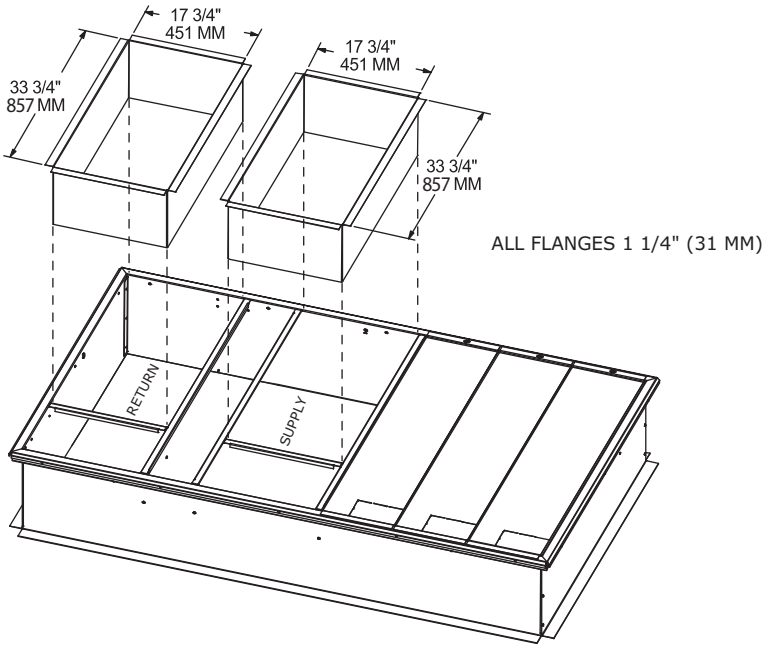


Figure 29. Heat pump - 10 tons high efficiency - power exhaust

Note: Reference tabular information

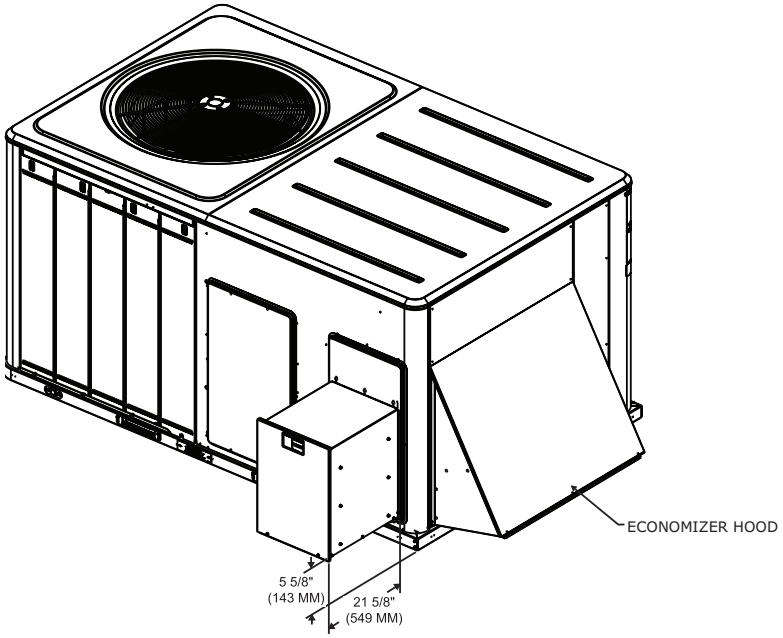
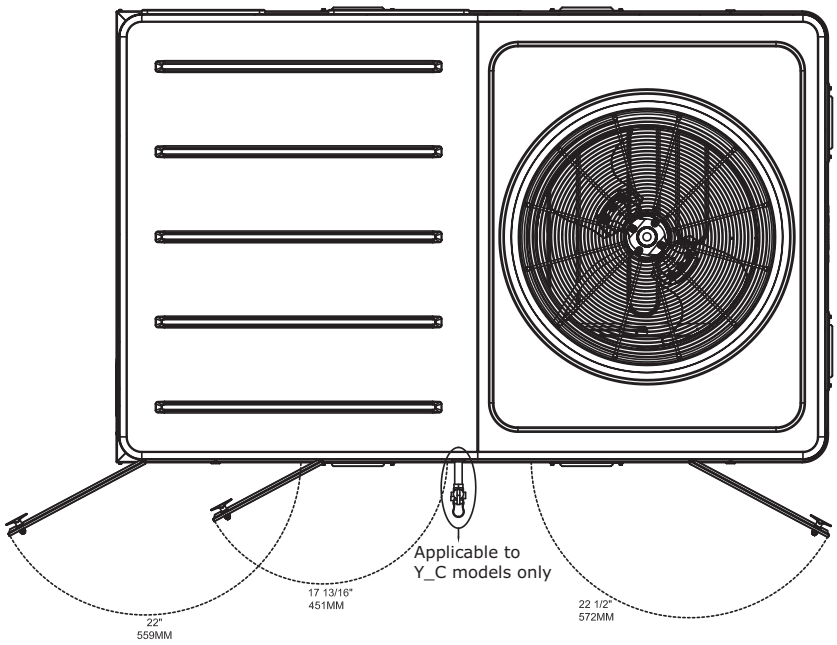


Figure 30. Heat pump - 10 tons high efficiency - swing diameter for hinged door(s) option



Weights

Table 122.Maximum unit and corner weights (lbs) and center of gravity dimensions (in.)

	Unit	Maximum Model Weights[a]		Corner Weights[b]				Center of Gravity (in.)	
Tons	Model No.	Shipping	Net	A	B	C	D	Length	Width
3	WSC036H	612	507	144	122	110	130	32	21
4	WSC048H	645	540	165	131	108	136	31	20
5	WSC060H	777	682	228	177	114	163	38	22
7.5	WSC092H	894	796	252	204	163	177	41	23
8.5	WSC102H	927	829	286	183	195	164	40	23
10	WSC120H	948	850	303	170	218	159	40	24
3	WHC036H	619	514	142	120	111	142	31	22
4	WHC048H	768	673	222	175	114	162	38	22
5	WHC060H	773	678	225	176	114	162	38	22
3	DHC036H	658	553	145	137	125	145	33	22
4	DHC048H	845	750	234	192	146	178	40	23
5	DHC060H	849	754	235	193	147	179	40	23
6	WHC074H	927	829	193	295	65	276	38	22
7.5	WHC092H	927	829	193	295	65	276	38	22
8.5	WHC102H	953	855	199	306	67	283	39	22
10	WHC120H	1433	1228	357	343	259	269	49	27
6	DHC074H	990	892	216	324	69	283	39	21
7.5	DHC092H	1004	906	218	330	70	288	39	21
8.5	DHC102H	1016	918	220	336	70	292	39	21
10	DHC120H	1499	1294	402	313	290	289	47	28

(a) Weights are approximate.
(b) Corner weights are given for information only.

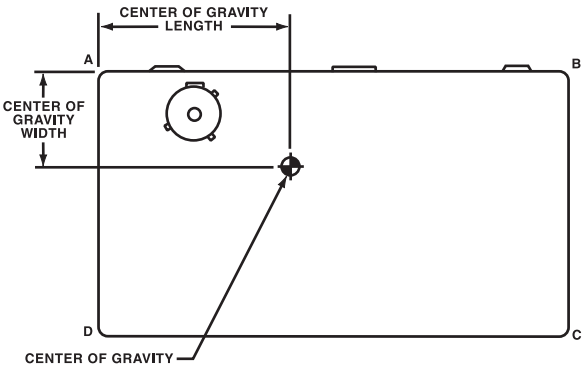


Table 123.Factory installed options (fiops)/accessory net weights (lbs)[a],[b]

Accessory	WSC036H-048H, D/WHC036H Net Weight 3 to 4 Tons	WSC060H, D/WHC048-060H Net Weight 4 to 5 Tons	WSC092H-120H W/DHC074-102H Net Weight 6 to 10 Tons	D/WHC120H Net Weight 10 Tons
460V/575V IDM Transformer[c]	29	29	—	—
Barometric Relief	7	10	10	10
Coil Guards	12	20	20	30
Economizer	26	36	36	36
Electric Heaters[d]	15	30	30/44[e]	50
Hinged Doors	10	12	12	12
Low Leak Economizer	70	91	91	91
Manual Outside Air Damper	16	26	26	26
Motorized Outside Air Damper	20	30	30	30
Oversized Motor	5	8	8	—
Powered Convenience Outlet	38	38	38	50
Powered Exhaust	40	80	80	80
Roof Curb	61	105	105	111
Smoke Detector, Supply	5	5	5	5
Smoke Detector, Return	7	7	7	7
Stainless Steel Heat Exchanger[f]	4	6	—	—
Through-the-Base Electrical	8	13	13	13
Through-the-Base Gas[f]	5	5	—	—
Traq Dampers	10	15	15	15
Unit Mounted Circuit Breaker	5	5	5	5
Unit Mounted Disconnect	5	5	5	5

(a) Weights for options not listed are <5 lbs.
(b) Net weight should be added to unit weight when ordering factory-installed accessories.
(c) Applicable to D/WHC 460/575V units.
(d) Applicable to heat pump units only (W*C).
(e) Larger weight applies to units with variable speed fan.
(f) Applicable to dual fuel units only (D*C).

Mechanical Specifications

Standard

General

Packaged rooftop units cooling, heating capacities, and efficiencies are AHRI Certified within scope of AHRI Standard 210-240 for 3 to 5 tons units or 340-360 (I-P) or 6 to 10 tons units and ANSIZ21.47 and 10 CFR Part 431 pertaining to Commercial Warm Air Furnaces (all gas heating units). The units shall be convertible airflow. The operating range shall be between 115°F and 0°F in cooling as standard from the factory for units with microprocessor controls. All units shall be factory assembled, internally wired, fully charged with R-410A, and 100 percent run tested to check cooling operation, fan and blower rotation, and control sequence before leaving the factory. Wiring internal to the unit shall be colored and numbered for simplified identification. Units shall be cULus listed and labeled, classified in accordance for Central Cooling Air Conditioners.

Casing

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel. Exterior surfaces shall be cleaned, phosphatized, and finished with a weather-resistant baked enamel finish. Unit's surface shall be tested 500 hours in a salt spray test in compliance with ASTM B117. Cabinet construction shall allow for all maintenance on one side of the unit. Service panels shall have lifting handles and be removed and reinstalled by removing two fasteners while providing a water and air tight seal. All exposed vertical panels and top covers in the indoor air section shall be insulated with a cleanable foil-faced, fire-retardant permanent, odorless glass fiber material. The base of the unit shall be insulated with 1/8 inch, foil-faced, closed-cell insulation. All insulation edges shall be either captured or sealed. The unit's base pan shall have no penetrations within the perimeter of the curb other than the raised 1 1/8 inch high downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up. The base of the unit shall have provisions for forklift and crane lifting, with forklift capabilities on three sides of the unit.

Compressors

All units shall have direct-drive, hermetic, scroll type compressors with centrifugal type oil pumps. Motor shall be suction gas-cooled and shall have a voltage utilization range of plus or minus 10 percent of unit nameplate voltage. Internal overloads shall be provided with the scroll compressors.

Crankcase Heaters

These band heaters provide improved compressor reliability by warming the oil to prevent migration during off-cycles or low ambient conditions.

Controls

Unit shall be completely factory-wired with necessary controls and contactor pressure lugs or terminal block for power wiring. Unit shall provide an external location for mounting a fused disconnect device.

Microprocessor controls shall be standard.

Microprocessor controls provide for all 24V control functions. The resident control algorithms shall make all heating, cooling, and/or ventilating decisions in response to electronic signals from sensors measuring indoor and outdoor temperatures. The control algorithm maintains accurate temperature control, minimizes drift from set point, and provides better building comfort. A centralized microprocessor shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection.

Units shall have single point power entry as standard.

Evaporator and Condenser Coils

Internally finned, 5/16-inch copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 600 psig. The assembled unit shall be leak tested to 465 psig. The condenser coil shall have a patent pending 1+1+1 hybrid coil designed with slight gaps for ease of cleaning. A plastic, dual-sloped, removable and reversible condensate drain pan with through-the-base condensate drain is standard.

Filters

Throwaway filters shall be standard on all units. Optional 2-inch MERV 8 and MERV 13 filters shall also be available.

High Pressure Control

All units include High Pressure Cutout as standard.

Indoor Fan

Standard efficiency 6 to 8.5 tons units come standard with belt drive motors with an adjustable idler-arm assembly for quick-adjustment to fan belts and motor sheaves. All high efficiency and 10 tons standard efficiency shall have variable speed direct drive motors. All motors shall be thermally protected. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

Outdoor Fans

The outdoor fan shall be direct-drive, statically balanced, draw-through in the vertical discharge position. The fan motor shall be permanently lubricated and shall have built-in thermal overload protection.

Phase Monitoring Protection

Precedent™ units with 3-phase power are equipped with phase monitoring protection as standard. These devices protect motors and compressors against problems caused by phase loss, phase imbalance and phase reversal indication.

Plenum Fan

Select 6 to 10 tons models are equipped with a direct drive plenum fan design. Plenum fan design shall include a backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor. All plenum fan designs will have a variable speed adjustment potentiometer located in the control box.

Refrigerant Circuits

Each refrigerant circuit offer thermal expansion valve as standard. Service pressure ports, and refrigerant line filter driers are factory-installed as standard. An area shall be provided for replacement suction line driers.

Unit Top

The top cover shall be one piece construction or where seams exist, it shall be double-hemmed and gasket-sealed. The ribbed top adds extra strength and prevents water from pooling on unit top.

Factory Installed Options

Black Epoxy Pre-Coated Coils

The black epoxy coils have a thermoset vinyl coating that is bonded to the aluminum fin stock prior to the fin-stamping process. The pre-coated coils are an economical option for protection in mildly corrosive environments.

CO_2 Sensor Wiring

Factory-installed CO_2 sensor wiring saves time and ensures proper unit connections for the field installed CO_2 sensor kits.

Condensate Overflow Switch

This option shall shut the unit down in the event that a clogged condensate drain line prevents proper condensate removal from the unit.

Fault Detection and Diagnostics (FDD)

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit. This option provides detection of the following faults: Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements.

Gas Heating Section

Note: *Applicable to Dual Fuel units.*

The heating section has a progressive tubular heat exchanger design using stainless steel burners and corrosion resistant steel throughout. An induced draft combustion blower is used to pull the combustion products through the firing tubes. The heater uses a direct spark ignition (DSI) system, on initial call for heat, the combustion blower purges the heat exchanger for 20 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system will be locked out until manually reset at the thermostat/zone sensor.

Important: *For installation in SCAQMD only (3 to 5 tons only): This furnace does not meet the SCAQMD Rule 1111 14 ng/J NOx emission limit, and thus is subject to a mitigation fee of up to $450. This furnace is not eligible for the Clean Air Furnace Rebate Program: www.CleanAirFurnaceRebate.com*

Hinged Access Doors

Sheet metal hinges are available on the filter/evaporator, supply fan/heat, and the compressor/control access doors. A compressor isolation panel is included to ease commissioning and servicing of units.

High Static Motor

Oversized motor for applications where higher external static pressure capability is required. 3 to 5 tons standard efficiency units shall offer direct drive constant torque motors. 3 to 5 tons high efficiency shall offer direct drive constant CFM motors. 6 to 8.5 tons standard efficiency units shall offer belt drive motors.

Human Interface

The Human Interface shall have a 5 inch color touchscreen display that conforms to FCC Part 15 Class B with an Ingress Protection Rating of IP24.The display text shall be readable by a person with 20/20 vision at a distance of 3 feet and 60° angle at lighting levels ranging from 100 lux - 25,000 lux. Also, the display shall operate at temperatures of -40° C to 70° C. Firmware and unit configurations shall be able to be restored via a USB storage device.

Multiple-Zone VAV Control

Multiple-zone VAV control shall vary the speed of the indoor fan to maintain the duct static pressure at a setpoint. In cooling mode, the compressors shall be cycled (or economizer modulated) to maintain the supply air temperature (SAT) at the desired setpoint. In heating mode, the indoor fan shall operate at maximum speed whenever the heater operating.VAV units cannot be controlled by a thermostat.

Powered or Unpowered Convenience Outlet

This is a GFCI, 120V/15amp, 2 plug, convenience outlet, either powered or unpowered. When the convenience outlet is powered, a service receptacle disconnect will be available. The convenience outlet is powered from the line side of the disconnect or circuit breaker, and therefore will not be affected by the position of the disconnect or circuit breaker. This option can only be ordered when the Through-the-Base Electrical with either the Disconnect Switch or Circuit Breaker option is ordered.

Single Zone VAV – One Zone Variable Air Volume Mode

Single-zone VAV shall vary the indoor fan speed as the zone cooling or heating load changes, while cooling or heating capacity is cycled to maintain the supply air temperature at setpoint.The indoor fan shall operate at maximum speed whenever the heater is operating.

Note: *SZVAV requires the use of a zone temperature sensor. If a unit is configured for SZVAV, but is connected to a conventional thermostat, the unit will revert to multiple-speed (two-speed) indoor fan control.*

Multi-Speed Indoor Fan System

Multi-speed indoor fan system is designed for use in applications for meeting the minimum requirement of CA Title 24. This system incorporates a multi-speed fan control to change the speed of the fan to 66% of full airflow based off compressor stages.

Stainless Steel Drain Pan

This option provides excellent corrosion and oxidation resistance. The drain pan shall be reversible and constructed of 304 stainless steel.

Stainless Steel Heat Exchanger

The optional stainless steel heat exchanger is constructed of 409 stainless steel. It is resistant to corrosion and oxidation and easy to clean. The high strength to weight ratio allows for high ventilation rates with gas units. It is an excellent option to compliment the dehumidification option as a high outside air ventilation unit. With this option, a 10-year stainless steel heat exchanger warranty is standard.

Supply, Return, and Plenum Air Smoke Detector

With this option, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. In order for the supply air smoke detector or return air smoke detector to properly sense smoke in the supply air stream or the return air stream, the air velocity entering the smoke detector unit must be between 500 - 4000 feet per minute. Equipment covered in this manual will develop an airflow velocity that falls within these limits over the entire airflow range specified in the evaporator fan performance table. Supply and/or Return Smoke Detectors may not be used with the Plenum Smoke Detector.

Thermal Expansion Valve

Thermal Expansion Valve is standard for all models.

Through-the-Base Electrical Access

An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through-the-base of the unit. Option will allow for field installation of liquid-tight conduit and an external field-installed disconnect switch.

Through-the-Base Electrical with Circuit Breaker

This option is a thermal magnetic, molded case, HACR Circuit Breaker with provisions for through-the-base electrical connections. The circuit breaker will be installed in a water tight enclosure in the unit with access through a swinging door. Wiring will be provided from the switch to the unit high voltage terminal block. The circuit breaker will provide overcurrent protection, be sized per NEC and cULus guidelines, and be agency recognized by cULus.

Through-the-Base Electrical with Disconnect Switch

This 3-pole, molded case, disconnect switch with provisions for through-the-base electrical connections are available. The disconnect switch will be installed in the unit in a water tight enclosure with access through a swinging door. Wiring will be provided from the switch to the unit high voltage terminal block. The switch will be cULus agency recognized.

Note: *The disconnect switch will be sized per NEC and cULus guidelines but will not be used in place of unit overcurrent protection.*

Through-the-Base Gas Piping

The unit includes a standard through-the-base gas provision. This option has all piping necessary including black steel pipe segments, manual gas shut-off valve, elbows, and union. The manual shutoff valve includes a 1/8” NPT pressure tap. This assembly will require minor field labor to install (dual fuel only).

Trane® Air-Fi® Wireless

Air-Fi® wireless communication shall be factory installed and tested. Air-Fi Wireless conforms to ANSI/ASHRAE Standard 135-2016 (BACnet®/ZigBee®[1]).

Two-Inch Filters

Two-inch MERV 8 and MERV 13 media filters shall be available on all models. When ordered, units come equipped with a filter removal tool.

Factory or Field Installed Options

Clogged Filter/Fan Failure Switch

A dedicated differential pressure switch is available to achieve active fan failure indication and/or clogged filter indication. These indications will be registered with a zone sensor with status indication lights. This option is available for microprocessor controlled units.

Differential Pressure Switches

These sensors allow individual fan failure and dirty filter indication for microprocessor controlled units. The fan failure switch will disable all unit functions and “flash” the Service LED on the zone sensor. The dirty filter switch will light the Service LED on the zone sensor and will allow continued unit operation.

Discharge Air Temperature Sensing

This option provides true discharge air temperature sensing in heating models. This option is available for microprocessor controlled units.

Economizer (Standard)

This accessory shall be available with or without barometric relief. The assembly includes fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control. The barometric relief shall provide a pressure operated damper that shall be gravity closing and shall prohibit entrance of outside air during the equipment “off” cycle. Optional solid state or differential enthalpy control shall be available for either factory or field installation. The economizer arrives in the shipping position and shall be moved to the operating position by the installing contractor.

[1] ZigBee is a registered trademark of the ZigBee Alliance.

Electric Heaters

Electric heat modules shall be available for installation within basic unit. Electric heater elements shall be constructed of heavy-duty nickel chromium elements internally delta connected for 240 volt, wye connected for 480 and 600 V. Staging shall be achieved through ReliaTel™. Each heater package shall have automatically reset high limit control operating through heating element contactors. All heaters shall be individually fused from the factory, where required, and shall meet all NEC and CEC requirements when properly installed. Power assemblies shall provide single-point connection. Electric heat modules shall be cULus listed.

Frostat™

This option is to be utilized as a safety device. The Frostat™ opens when temperatures on the evaporator coil fall below 10°F. The temperature will need to rise to 50°F before closing. This option should be utilized in low airflow or high outside air applications (cooling only).

Hail Guards

Hail protection quality coil guards are available for condenser coil protection.

LonTalk® Communication Interface

This option shall be provided to allow the unit to communicate as a Tracer® LCI-R device or directly with generic LonTalk® Network Building Automation System Controls.

Low Leak Economizer

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (4 cfm/ft^2@1" wg exterior air/return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. This option can be paired with or without Fault Detection and Diagnostics (FDD) to meet current mandatory CA Title 24 requirements.

Note: *Available on downflow units only.*

BACnet® Communication Interface

This option shall be provided to allow the unit to communicate directly with a generic open protocol BACnet® MS/TP Network Building Automation System Controls.

Reference or Comparative Enthalpy

Reference Enthalpy is used to measure and communicate outdoor humidity. The unit receives and uses this information to provide improved comfort cooling while using the economizer. Comparative Enthalpy measures and communicates humidity for both outdoor and return air conditions, and return air temperature. The unit receives and uses this information to maximize use of economizer cooling, and to provide maximum occupant comfort control. Reference or Comparative Enthalpy option shall be available when a factory or field installed Downflow Economizer is ordered. This option is available on all downflow models.

Trane® Communication Interface

This option shall be provided to interface ReliaTel™ controlled units with the Trane® Integrated Comfort™ systems.

Field Installed Options

CO_2 Sensing

The CO_2 sensor shall have the ability to monitor space occupancy levels within the building by measuring the parts per million of CO_2 (Carbon Dioxide) in the air. As the CO_2 levels increase, the outside air damper modulates to meet the CO_2 space ventilation requirements.

Two field installed kits are offered: CO_2 sensor and wiring or CO_2 sensor only. The CO_2 sensor only kit should be ordered with factory installed CO_2 Sensor wiring. Factory installed CO_2 sensor wiring saves set-up time and ensures proper unit connections for the CO_2 sensor.

Low Leak Economizer

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (4 cfm/ft^2@1" wg exterior air/return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief.

Note: *Available on downflow units only.*

Manual Outside Air Damper

This rain hood and screen shall provide up to 50 percent outside air.

Motorized Outside Air Damper

Manually set outdoor air dampers shall provide up to 50 percent outside air. Once set, outdoor air dampers shall open to set position when indoor fan starts. The damper shall close to the full closed position when indoor fan shuts down.

Outside Air Measuring/Monitoring Control (Traq Dampers)

- Requires Low Leak Economizer (Factory or Field Installed)
- Includes
  - UC400 Controller
  - Damper Actuator
  - Pressure Sensors

Powered Exhaust

The powered exhaust, available for 6 to 10 tons units, shall provide exhaust of return air, when using an economizer, to maintain better building pressurization.

Programmable Night Setback

Auto or manual changeover with seven-day programming. Keyboard selection of Heat, Cool, Fan, Auto, or On. All programmable sensors have System On, Heat, Cool, Service LED/indicators as standard. Night Setback Sensors have one (1) Occupied, one (1) Un-occupied, and one (1) Override program per day.

Remote Potentiometer

The minimum position setting of the economizer shall be adjusted with this accessory.

Roof Curb

The roof curb shall be designed to mate with the unit's downflow supply and return and provide support and a water tight installation when installed properly. The roof curb design shall allow field-fabricated rectangular supply/return ductwork to be connected directly to the curb. Curb shall be shipped knocked down for field assembly and shall include wood nailer strips.

Thermostat

Two stage heating and cooling operation or one stage heating and cooling shall be available in either manual or automatic changeover. Automatic programmable electronic with night set back shall also be available.

Ventilation Override Accessory

With the Ventilation Override Accessory installed, the unit can be set to transition up to 3 different pre-programmed sequences for Smoke Purge, Pressurization, and Exhaust. The transition occurs when a binary input on the RTOM is closed (shorted). This would typically be a hard wired relay output from a smoke detector or fire control panel. The ventilation override accessory shall be available as field installed.

Zone Sensor

This control shall be provided to interface with the Micro equipped units and shall be available in either manual, automatic programmable with night setback, with system malfunction lights, or remote sensor options.







The AHRI Certified mark indicates Trane U.S. Inc. participation in the AHRI Certification program. For verification of individual certified products, go to ahridirectory.org.

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

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PKGP-PRC013AA-EN 20 Dec 2022
Supersedes PKGP-PRC013Y-EN (Sep 2022)

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Product Catalog

Packaged Rooftop Air Conditioners
Precedent™ — Heat Pump

3 to 10 Tons — 60 Hz



December 2022 **PKGP-PRC013AA-EN**

Introduction

Packaged Heat Pumps

Trane® customers demand products that provide exceptional reliability, meet stringent performance requirements, and are competitively priced.

Precedent™ features cutting edge technologies: reliable compressors, Trane® engineered ReliaTel™ controls, computer-aided run testing, and Integrated Comfort™ Systems. So, whether you're the contractor, the engineer, or the owner you can be certain Precedent™ Products are built to meet your needs.

Through the years, Trane® has designed and developed the most complete line of Packaged Rooftop products available in the market today. Trane® was the first to introduce the Micro—microelectronic unit controls—and has continued to improve and revolutionize this design concept.

The ReliaTel™ control platform offers the same great features and functionality as the original Micro, with additional benefits for greater application flexibility.

With its sleek, compact cabinet, Precedent™ continues to provide the highest standards in quality and reliability, comfort, ease of service, and the performance of Trane® light commercial products.

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Revision History

- Added EER2/SEER2, Low/High temp COP2 and HSPF2 data and footnote in the General Data chapter.
- Updated the Roof Curb values in Factory installed options table in the Weights chapter.

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Features and Benefits

Table 1. Precedent™ options — standard and optional

	Standard Features	Options[a]		
		Factory Installed	Factory or Field Installed	Field Installed
1-year Limited Parts Warranty	X			
2” MERV 8 Filters or 2” MERV 13 Filters with Filter Removal Tool		X		
5-year Limited Compressor Warranty	X			
5-year Limited Heat Exchanger Warranty	X			
Anti-Short Cycle Timer (Standard with ReliaTel™)	X			
Auxiliary Gas Heat (High Efficiency Models Only)		X		
Barometric Relief			X	
Black Epoxy Pre-Coated Coils		X		
CO_2 Sensor Only Kit / CO_2 Sensor and Wiring Kit				X
CO_2 Sensor (Wiring Only)		X		
Clogged Filter/Fan Failure Switch			X	
Colored and Numbered Wiring	X			
Condensate Overflow Switch		X		
Convertible Airflow	X			
Crankcase Heaters	X			
Direct Drive Variable Speed Motors	X			
Discharge Air Temperature Sensing Kit			X	
Easy Access Low Voltage Terminal Board (LTB)	X			
Economizer: Low Leak				X
Economizer: Standard and Low Leak			X	
Electric Heaters			X	
Fault Detection and Diagnostics (FDD); Meets CA Title 24 Requirements		X		
Filters are Standard on all Units	X			
Foil-Faced and Edge Captured Insulation	X			
Frostat™			X	
Hail Guards			X	
Heat Exchanger	X			
High Altitude Kit				X
High Pressure Control	X			
High Static Motor			X	
Hinged Access Doors		X		
IAQ Dual Sloped, Plastic, Removable, Reversible Drain Pan	X			
Liquid Line Refrigerant Drier	X			
Low Ambient Cooling to 0°F	X			
Low Pressure Control	X			
Manual Outside Air Damper				X
Motorized Outside Air Dampers				X
Multispeed Direct Drive Motors on Select Models	X			
Multispeed Indoor Fan System		X		
Operating Charge of R-410A	X			
Outside Air Measuring/Monitoring Control (Traq Dampers)				X
Patent-Pending Hybrid Condenser Coil for easy cleaning	X			

Table 1. Precedent™ options — standard and optional (continued)

	Standard Features	Options[a]		
		Factory Installed	Factory or Field Installed	Field Installed
Phase Loss Protection	X			
Phase Monitor	X			
Phase Reversal Protection	X			
Phase Balance Protection	X			
Plenum Fan on Select Models	X			
Powered Exhaust				X
Powered or Unpowered Convenience Outlet		X		
Provisions for Through-the-Base Condensate Drain Connections	X			
Quick Access Panels	X			
Quick Adapt Curbs				X
Quick Start Kit				X
Reference or Comparative Enthalpy			X	
Remote Potentiometer				X
Roof Curb				X
Single Point Power	X			
Single Side Service	X			
Single Zone Variable Air Volume (SZVAV)		X		
Stainless Steel Drain Pan		X		
Stainless Steel Heat Exchanger		X		
Standardized Components	X			
Supply, Return or Plenum Air Smoke Detector		X		
Thermal Expansion Valve	X			
Through-the-Base Electrical Access		X		
Through-the-Base Electrical with Circuit Breaker		X		
Through-the-Base Electrical with Disconnect Switch		X		
Touch Safe Control Box	X			
Ventilation Override Accessory				X

(a) Refer to model number description for option availability

Table 2. Precedent™ control options — standard and optional

	Standard Features	Options[a]		
		Factory Installed	Factory or Field Installed	Field Installed
BACnet® Communications Interface (BCI)			X	
Dual Thermistor Remote Zone Sensor				X
Human Interface		X		
LonTalk® Communications Interface (LCI)			X	
ReliaTel™ Microprocessor Controls	X			
Thermostat				X
Trane® Air-Fi® Wireless Communication Interface		X		
Trane® Communications Interface (TCI)			X	
Zone Sensor				X

(a) Refer to model number description for option availability.

Other Benefits

- Cabinet design ensures water integrity
- Ease of Service, Installation and Maintenance
- Mixed model build enables “fastest in the industry” ship cycle times
- Outstanding Airflow Distribution
- ReliaTel™ Controls

Standard Features

Anti-Short Cycle Timer

Provides a 3 minute minimum “ON” time and 3 minute “OFF” time for compressors to enhance compressor reliability by assuring proper oil return.

Colored And Numbered Wiring

Save time and money tracing wires and diagnosing the unit.

Compressors

Precedent™ contains the best compressor technology available to achieve the highest possible performance.

Multi-stage compressors provide optimal performance during light load conditions.

Condenser Coil



Precedent™ boasts a patent-pending 1+1+1 condenser coil, permanently gapped for easy cleaning.

Controls – ReliaTel™

ReliaTel™ microprocessor controls provide unit control for heating, cooling and ventilating utilizing input from sensors that measure indoor and outdoor temperature and other zone sensors. ReliaTel™ also provides outputs for building automation systems and expanded diagnostics. For a complete list of ReliaTel™ offerings, refer to the “Other Benefits” section within the Features and Benefits section of this catalog.

Convertible Units



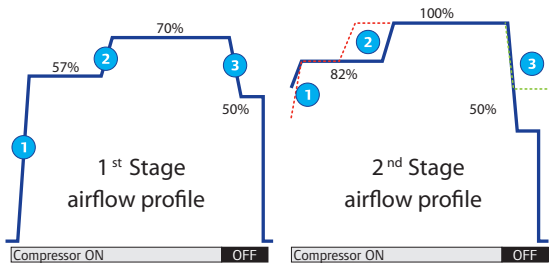
The units ship in a downflow configuration. They can be easily converted to horizontal by simply moving two panels.

Units come complete with horizontal duct flanges so the contractor doesn't have to field fabricate them. These duct flanges are a time and cost saver.

Crankcase Heaters

These band heaters provide improved compressor reliability by warming the oil to prevent migration during off-cycles or low ambient conditions.

Direct Drive Variable Speed Motors



Direct drive motor shall be variable speed with constant airflow settings. Motor will be ECM (Electronically Commutated Motor) as standard pre-programmed with enhanced airflow capabilities.

Note: *Available on indoor motors for high efficiency 3 to 5 tons units only.*

Drain Pan



Every Precedent™ unit has a plastic, removable, dual-sloped drain pan that's easy to clean and reversible to allow installation of drain trap on either side of the unit.

Dual Fuel

In heating mode, the unit control operates the heat pump in 1st stage heating. If the call for heat is not satisfied, heat pump 2nd stage is activated. If ambient is below lockout set point, the controller will activate auxiliary gas heat 1st stage, and heat pump operation will be terminated. A continued call for heat will cause the controller to activate auxiliary gas heat 2nd stage.

The indoor fan will continue to run and will switch to 100% during transition from heat pump to gas heat. If the controller initiates gas heat as the first heat source during a call for heat in constant volume, the blower is delayed 45 seconds to allow heat up of the gas heat exchanger.

If continuous fan operation is available and selected from the thermostat, the controller automatically adjusts fan speed for heat pump and gas heat operation.

During defrost mode, the controller will activate auxiliary gas heat to maintain comfort.

Easy Access Low Voltage Terminal Board

Precedent's™ low voltage terminal board is external to the electrical control cabinet. It is extremely easy to locate and attach the thermostat wire and test operation of all unit functions. This is another cost and time saving installation feature.

Foil Faced and Edge Captured Insulation

All panels in the evaporator section of the unit have cleanable foil-faced insulation. All edges are either captured or sealed to ensure no insulation fibers get into the airstream.

Heat Exchanger

The compact cabinet features a progressive tubular heat exchanger in low, medium and high heat capacities. The heat exchanger is fabricated using stainless steel burners and corrosion-resistant aluminized steel tubes as standard on all models. It has an induced draft blower to pull the gas mixture through the burner tubes. The heater has a direct spark ignition system which doubles as a safety device to prove the flame.

Low Ambient Cooling

All Precedent™ microprocessor units have cooling capabilities down to 0°F as standard.

Low Voltage Connections

The wiring of the low voltage connections to the unit and the zone sensors is as simple as 1-1, 2-2, and 3-3. This simplified system makes it easy for the installer to wire.

Phase Monitoring Protection

Precedent™ units with 3-phase power are equipped with phase monitoring protection as standard. These devices protect motors and compressors against problems caused by phase loss, phase imbalance and phase reversal indication.

Plenum Fan

Select 6 to 10 tons models are equipped with a direct drive plenum fan design. Plenum fan design shall include a backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor. All plenum fan designs will have a variable speed adjustment potentiometer located in the control box.

Quick-Access Panels

Remove two screws for access to the standard internal components and wiring.

Single Point Power

A single electrical connection powers the unit.

Standardized Components

Components are placed in the same location on all Precedent™ units. Due to standardized components throughout the Precedent™ line, contractors/owners can stock fewer parts.

Through-the-Base Condensate

Every unit includes provisions for through-the-base condensate drain connections. This allows the drain to be connected through the roof curb instead of a roof penetration.

Touch Safe Control Box

On 3 to 5 tons modes, low voltage and high voltage components are separated within the control box. High voltage components are located behind a door to provide an additional layer of safety.

Factory Installed Options

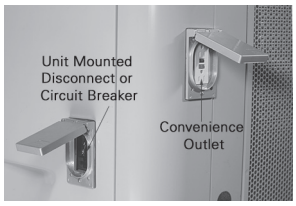
Black Epoxy Pre-Coated Coils

The pre-coated coils are an economical option for protection in mildly corrosive environments.

Circuit Breaker

This option is a factory installed thermal magnetic, molded case, HACR circuit breaker with provisions for through-the-base electrical connections.

Note: *Available on units equipped with through-the-base electrical.*



CO_2 Sensor Wiring

Factory-installed CO_2 sensor wiring saves time and ensures proper unit connections for the field installed CO_2 sensor kits.

Condensate Overflow Switch

A condensate overflow switch is available to shut the unit down in the event that the condensate drain line becomes clogged. This option protects the unit from water overflowing from the drain pan and entering the base of the unit.

Convenience Outlet



This option is a GFCI, 120V/15amp, 2 plug, convenience outlet, either powered or unpowered. This option can only be ordered when through-the-base electrical with either the disconnect switch or circuit breaker option is ordered.

Note: *Not available on 10 tons, 575V units.*

Disconnect Switch

Factory installed 3-pole, molded case, disconnect switch with provisions for through-the-base electrical connections are available.

Codes require a method of assured unit shutdown for servicing. Field-installed disconnects sometimes interfere with service access. Factory installation of unit disconnects reduces costs, assures proper mounting and provides the opportunity to upgrade to unit circuit breaker protection.

Note: *Available on units equipped with through-the-base electrical.*

Fault Detection and Diagnostics (FDD)

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit. This option provides detection of the following faults: Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements.

High Efficiency Filtration

Precedent™ units offer a variety of high efficiency filtration options. MERV 8 and MERV 13 filters provide additional filtration beyond the capabilities of typical 2-inch throwaway filters. Also, when MERV 8 or MERV 13 filters are ordered, units come equipped with a filter removal tool.

High Static Motor

Oversized motor for applications where higher external static pressure capability is required. Direct drive constant torque motors on 3 to 5 tons standard efficiency. Direct drive constant CFM motors on 3 to 5 tons high efficiency. A belt driven high static kit is available on standard efficiency 6 to 8.5 tons units.

Hinged Access Doors

These doors permit easy access to the filter, fan/heat and compressor/control sections. They reduce the potential roof damage from screws or sharp access door corners.

Note: *A compressor isolation panel is available for 3 to 5 tons units to ease commissioning and servicing of units.*



Human Interface - 5 Inch Color Touchscreen



The 5 inch Color Touchscreen Human Interface provides an intuitive user interface to the rooftop unit that speeds up unit commissioning, shortens unit troubleshooting times, and enhances preventative maintenance measures. The human interface includes several features such as:

- Data trending capabilities by means of time series graphs
- Historical alarm messages
- Real-time sensor measurements
- On board system setpoints
- USB port that enables the downloading of component runtime information as well as trended historical sensor data
- Customized reports

Note: *Refer to RT-SVX49*-EN for additional information.*

Multi-Speed Indoor Fan System

Multi-speed indoor fan system is designed for use in applications for meeting the minimum requirement of CA Title 24.

This system incorporates a multi-speed fan control to change the speed of the fan to 66% of full airflow based off of compressor stages.

Multiple-Zone VAV Control

A multiple-zone VAV (MZVAV) system consists of a packaged rooftop unit that serves several individually controlled zones. Each zone is equipped with a VAV terminal unit that varies the quantity of air delivered to maintain the desired temperature in that zone. The rooftop unit controller varies the speed of the indoor fan to maintain the static pressure in the supply ductwork at a setpoint, ensuring that all zones receive the necessary quantity of air. In addition, cooling capacity is cycled to maintain the supply air temperature at the desired setpoint.

For decades, Trane has been an industry leader in rooftop VAV systems. Now multiple-zone VAV control is available in high efficiency packaged heat pumps.

Single Zone VAV (SZVAV)

Single zone variable air volume is designed for use in single zone applications like gymnasiums, auditoriums, manufacturing facilities, retail box stores, and any large open spaces, where there is a lot of diversity in the load profile. SZVAV is an ideal replacement to “yesterday’s” constant volume (CV) systems, by reducing operating costs while improving occupant comfort. SZVAV systems combine Trane® application, control and system integration knowledge to exactly match fan speed with cooling and heating loads, regardless of the operating condition. Trane® algorithms meet/exceed ASHRAE 90.1- 2010, SZVAV energy-saving recommendations, and those of CA Title 24. The result is an optimized balance between zone temperature control and system energy savings. Depending on your specific application, energy savings can be as much as 20+%.

Note: *Building system modeling in energy simulation software like TRACE is recommended to evaluate performance improvements for your application.*

Single zone variable air volume is fully integrated into the ReliaTel™ control system and is available today. It provides the simplest and fastest commissioning in the industry through proven factory-installed, wired, and tested system controllers. All control modules, logic and sensors are factory installed, and tested to assure the highest quality and most reliable system available. This means no special programming of algorithms, or hunting at the jobsite for sensors, boards, etc. that need to be installed in the field. SZVAV is a quick and simple solution for many applications and is available from your most trusted rooftop VAV system solution provider - Trane®.

Stainless Steel Drain Pan

For excellent corrosion and oxidation resistance, the optional stainless steel drain pan provides a cleanable surface that complement other IAQ solutions such as high efficiency filtration (MERV 8 or 13) and demand control ventilation (CO_2).

Stainless Steel Heat Exchanger

The optional stainless steel heat exchanger is constructed of 409 stainless steel. It is resistant to corrosion and oxidation and easy to clean. The high strength to weight ratio allows for high ventilation rates with gas units. It is an excellent option to compliment the dehumidification option as a high outside air ventilation unit. With this option, a 10-year stainless steel heat exchanger warranty is standard.

Supply, Return, and Plenum Air Smoke Detector

With this option installed, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. In order for the supply air smoke detector or return air smoke detector to properly sense smoke in the supply air stream or the return air stream, the air velocity entering the smoke detector unit must be between 500 - 4000 feet per minute. Equipment covered in this manual will develop an airflow velocity that falls within these limits over the entire airflow range specified in the evaporator fan performance table. Supply and/or return smoke detectors may not be used with the plenum smoke detector.

Note: *Plenum smoke detectors have no auxiliary contacts for external connections.*

Figure 1. Supply/Return air smoke detector



Figure 2. Plenum air smoke detector



Through-the-Base Electrical Utility Access

An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through-the-base of the unit. Option will allow for field installation of liquid-tight conduit and an external field installed disconnect switch.

Factory provided through-the-base openings simplify wiring and piping. Because these utility openings frequently minimize the number of roof penetrations, the integrity of roofing materials is enhanced.



Through-the-Base Gas Access

Factory provided through-the-base openings simplify wiring and piping. Because these utility openings frequently minimize the number of roof penetrations, the integrity of roofing materials is enhanced.



Factory or Field Installed Options

Barometric Relief

Designed to be used on downflow units, barometric relief is an unpowered means of relieving excess building pressure.

Clogged Filter/Fan Failure Switch

A dedicated differential pressure switch is available to achieve active fan failure indication and/or clogged filter indication.

These sensors allow a zone sensor service light to indicate a dirty filter or a fan that's not working. The field installation charges for these valuable feedback devices often eliminate them from consideration. Factory installation can make such features a good investment.

Discharge Air Temperature Sensing Kit

Provides true discharge air temperature sensing in heating models. The kit is functional only with the ReliaTel™ options module.

Economizer (Standard)

This accessory shall be available with or without barometric relief. The assembly includes fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control. The barometric relief shall provide a pressure operated damper that shall be gravity closing and shall prohibit entrance of outside air during the equipment "off" cycle. Optional solid state or differential enthalpy control shall be available for either factory or field installation. The economizer arrives in the shipping position and shall be moved to the operating position by the installing contractor.

Electric Heaters

Electric heat modules are available within the basic unit. If ordering the through-the-base electrical option with an electrical heater, the heater must be factory installed.

Fresh Air Options – Dampers and Economizer

0 to 25% manual or 0 to 50% motorized outside air hoods are available.

Economizers are equipped with either dry bulb or reference or comparative enthalpy sensing. These economizers provide free cooling as the outdoor temperature and/or humidity decreases. Correctly installed, they offer a valuable energy savings. Factory-installed economizers save time and ensure proper installation.

Due to varying supply fan speed 0 to 50% motorized damper is not available with multi-speed or SZVAV applications.

The economizers come with three control options — dry bulb is standard, enthalpy and differential enthalpy are optional.

Frostat™

This capillary bulb embedded in the face of the evaporator coil monitors coil temperature to prevent evaporator icing and protect the compressor. Recommended for applications with low leaving air temperatures, low airflow and or high latent load applications.

Hail Guards

Hail protection quality coil guards protects the condenser coil from vandalism and/or hail damage.

Low Leak Economizer

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (4 cfm/ft^2@1" wg exterior air/return air). This option allows 100% outdoor air supply from 0 to 100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. This option can be paired with or without Fault Detection and Diagnostics (FDD) to meet current mandatory CA Title 24 requirements.

Note: *Available on downflow units only.*

Reference or Comparative Enthalpy

Measures and communicates humidity while maximizing comfort control.

Field Installed Options

CO_2 Sensing Kits

Two field installed kits are offered: CO_2 sensor and wiring or CO_2 sensor only. The CO_2 sensor only kit should be ordered with factory installed CO_2 sensor wiring. Factory installed CO_2 sensor wiring saves set-up time and ensures proper unit connections for the CO_2 sensor.

The CO_2 sensor has the ability to monitor space occupancy levels within the building by measuring the parts per million of CO_2 (Carbon Dioxide) in the air. As the CO_2 levels increase, the outside air damper modulates to meet the CO_2 space ventilation requirements.

High Altitude Kit

While recommended for units applied above 2000 feet, domestic contractors should consult with local authority on best practice. High altitude kits contain gas orifices that derate the gas input rate (Btu/hr) by 10%.

Low Leak Economizer - Field Installed

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (4 cfm/ft^2@1" wg exterior air/return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief.

Note: *Available on downflow units only.*

Outside Air Measuring/Monitoring Control (Traq Dampers)

Quantity of fresh air entering the unit will be measured and monitored via Trane UC400 controller and series of pressure sensing rings mounted at the outside air intake.

Quick Adapt Curbs

Enables easy conversion of existing Voyager™ 3 to 10 tons units to Precedent™ units on replacement jobs.

Roof Curbs

Available for downflow units. Only three roof curbs for the entire line simplifies curb selection.

Remote Potentiometer

When properly installed in the economizer control circuitry, this accessory provides a remote variable resistance to enable the operator to adjust the minimum damper position.

Ventilation Override Accessory

With the ventilation override accessory installed, the unit can be set to transition to up to 3 different pre-programmed sequences for smoke purge, pressurization, and exhaust. The transition occurs when a binary input on the RTOM is closed (shorted). This would typically be a hard wired relay output from a smoke detector or fire control panel. The ventilation override kit is available as a field installed accessory.

Other Benefits

Airflow Distribution

Airflow is outstanding. Precedent™ can replace an older machine with old ductwork and, in many cases, improve the comfort through better air distribution.

Cabinet Integrity

For added water integrity, Precedent™ has a raised 1 1/8-inch lip around the supply and return of the downflow units to prevent water from blowing into the ductwork.

The compact cabinet with rounded corners takes up less room. The beveled and ribbed top is aesthetically pleasing and designed to prevent water from pooling.



Easy to Install, Service and Maintain

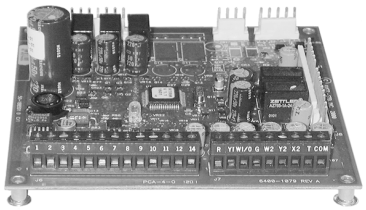
Because today's owners are very cost-conscious when it comes to service and maintenance, the Precedent™ unit was designed with direct input from service contractors. This valuable information helped to design a product that would get the service person off the job quicker and save the owner money. Precedent™ offers outstanding standard features enhanced by a variety of factory and field installed options, multiple control options, rigorously tested proven designs and superior product and technical support.

Flexibility

Precedent™ offers ultimate flexibility. Units are built to order in our standard "shortest in the industry" ship cycle time.

ReliaTel™ Controls

Figure 3. ReliaTel board



ReliaTel controls provide unit control for heating, cooling, and ventilating, utilizing input from sensors that measure outdoor and indoor temperature. ReliaTel also provides outputs for building automation systems and expanded diagnostics. Quality and reliability are enhanced through ReliaTel control and logic:

- Prevents the unit from short cycling, considerably improving compressor life.
- Ensures the compressor will run for a specific amount of time which allows oil to return for better lubrication, enhancing the reliability of the compressor.
- Reduces the number of components required to operate the unit, reducing possibilities for component failure.

ReliaTel Makes Installing and Servicing Easy

ReliaTel eliminates the need for field-installed, anti-short cycle timer and time delay relays. The wiring of the low voltage connections to the unit and the zone sensors is as easy as 1-1, 2-2, and 3-3. This simplified system makes wiring easier for the installer.

ReliaTel Makes Testing Easy

ReliaTel requires no special tools to run the unit through its paces. Simply place a jumper between Test 1 and Test 2 terminals on the Low Voltage Terminal Board and the unit will walk through its operational steps automatically. The unit automatically returns control to the zone sensor after stepping through the test mode a single time, even if the jumper is left on the unit. As long as the unit has power and the “system on” LED is lit, ReliaTel is operational. The light indicates that the controls are functioning properly. ReliaTel features expanded diagnostic capabilities when utilized with Trane Integrated Comfort™ Systems. Some zone sensor options have central control panel lights which indicate the mode the unit is in and possible diagnostic information (dirty filters for example).

ReliaTel Has Other Benefits

- The ReliaTel built-in anti-shortcycle timer, time delay relay and minimum “on” time control functions are factory tested to assure proper operation.
- ReliaTel softens electrical “spikes” by staging on fans, compressors and heaters.
- Intelligent Fallback is a benefit to the building occupant. If a component goes astray, the unit will continue to operate at predetermined temperature setpoint.
- Intelligent Anticipation is a standard feature. It functions continuously as ReliaTel and zone sensor(s) work together in harmony to provide much tighter comfort control than conventional electromechanical thermostats.
- The ReliaTel design is standardized across the board, ensuring a lower cost to owners.

Rigorous Testing

All of Precedent's™ designs were rigorously rain tested at the factory to ensure water integrity.

Actual shipping tests were performed to determine packaging requirements. Units were test shipped around the country to determine the best packaging. Factory shake and drop tests were used as part of the package design process to help assure that the unit arrives at the job site in top condition.

Rigging tests include lifting a unit into the air and letting it drop one foot, assuring that the lifting lugs and rails hold up under stress.

We perform a 100% coil leak test at the factory. The evaporator and condenser coils are leak tested at 600 psig. The assembled unit is leak tested to 465 psig.

All parts are inspected at the point of final assembly. Sub-standard parts are identified and rejected immediately.

Every unit receives a 100% unit run test before leaving the production line to make sure it meets rigorous requirements.

Application Considerations

Application of this product should be within the cataloged airflow and cooling considerations.

Auxiliary Gas Heating Operation

The heat exchanger is manufactured with aluminized steel. To prevent condensation within the heat exchanger, do not exceed 50%outside air or a minimum mixed air temperature of 40°F.

Barometric Relief

This product line offers an optional barometric relief damper for use in conjunction with economizer option. This accessory consists of gravity dampers which open with increased pressure. As the building air pressure increases, the pressure in the unit return air section also increases, opening the dampers and relieving the conditioned space.

Note: *The effectiveness of barometric relief damper during economizing operation is limited, depending on the pressure drop of the return-air path. For some applications, powered exhaust may be better suited for preventing over-pressurization when economizing.*

Black Epoxy Coil

The coils are manufactured with a thermoset, vinyl coating that is bonded to the aluminum fin stock prior to the fin stamping process. These coils are an economical option for protection in mildly corrosive environments.

Note: *Not to be used where seacoast applications exist.*

Clearance Requirements

The recommended clearances identified with unit dimensions should be maintained to assure adequate service maximum capacity and peak operating efficiency. Actual clearances which appear inadequate should be reviewed with the local Trane® sales personnel.

Model Number	Clearance required from duct to combustible surfaces (inches)
WSC036H	0
WSC048H	0
WSC060H	0
WSC092H	1
WSC102H	1
WSC120H	1
D/WHC036H	0
D/WHC048H	0
D/WHC060H	0
D/WHC074H	1
D/WHC092H	1
D/WHC102H	1
D/WHC120H	1

Condensate Trap

The evaporator is a draw-thru configuration. A trap must be field provided prior to start-up on the cooling cycle.

Low Ambient Cooling

The Precedent™ line features, with ReliaTel™ microprocessor controls, low ambient cooling down to 0°F. The following features or options need to be included/considered when low ambient applications are required: continuous fan operation, crankcase heaters, thermal expansion valves, frostat.

Contact a local Trane® representative for more assistance with low ambient cooling applications.

Optional Stainless Steel Heat Exchanger

The optional stainless steel heat exchanger is manufactured with 409 stainless steel. To prevent corrosion and prolong heat exchanger reliability, the minimum mixed air temperature allowed across the heat exchanger is 20°F.

The stainless steel heat exchanger option is an excellent option that compliments the dehumidification package. Whenever high outside air or outside applications exist, these options should be utilized.

Unit Pitch

The unit has a reversible sloped condensate drain pans. The unit must be installed level. Any unit slope must be toward the side of unit where condensate drain is connected.

Selection Procedure

Cooling Capacity

1. Calculate the building's total and sensible cooling loads at design conditions. Use the Trane® calculation methods or any other standard accepted method.

   Factors used in unit selection:

   - Total Cooling Load: 58 MBh
   - Sensible Cooling Load: 37 MBh
   - Airflow: 2000 cfm
   - Electrical Characteristics: 460/60/3
   - Summer Design Conditions: Entering
   - Evaporator Coil: 80 DB, 67 WB Outdoor Ambient: 95
   - External Static Pressure: 0.47 in. wg
   - Downflow Configuration
   - Economizer

2. As a starting point, a rough determination must be made of the size of the unit. The final selection will be made after examining the performance at the given conditions. Divide the total cooling load by nominal BTUH per ton (12 MBh per ton); then round up to the nearest unit size.

   58 MBh / 12 MBh = approx. 5 tons

3. Table 12, p. 37 shows that a WSC060H4 has a **gross** cooling capacity of 61.0 MBh and 48.8 MBh sensible capacity at 2000 cfm and 95 DB outdoor ambient with 80 DB, 67 WB air entering the evaporator.

   To Find Capacity at Intermediate Conditions not in the table

   When the design conditions are between two numbers that are in the capacity table, interpolation is required to approximate the capacity.

   Note: *Extrapolation outside of the table conditions is not recommended.*

4. In order to select the correct unit which meets the building's requirements, the fan motor heat must be deducted from the gross cooling capacity. The amount of heat that the fan motor generates is dependent on the effort by the motor - cfm and static pressure. To determine the total unit static pressure:

External Static Duct System	0.52 wg
Economizer from Table 83, p. 102 (100% Outside Air)	0.11 wg
Electric Heater Size 9 kW from Table 83, p. 102	0.02 wg
Total Static Pressure	0.65 wg

Note: Refer "Heating Capacity," p. 22 section on this page for determination of heater size.

With 2000 cfm and 0.65 wg. Table 35, p. 59 shows 0.44 bhp for this unit. Note below the table gives a formula to calculate Fan Motor Heat,

2.87 x bhp + 0.15 = MBh
2.87 x 0.44 + 0.15 = 1.41 MBh

Now subtract the fan motor heat from the gross cooling capacity of the unit:

Net Total Cooling Capacity
= 61.0 MBh - 1.41 = 59.59 MBh

Net Sensible Cooling Capacity
= 48.8 MBh - 1.41 = 47.39 MBh

5. Compare results to original load requirements. If the performance will not meet the required total or sensible cooling load, try a selection at the next higher size unit.

Heating Capacity

1. Calculate the building heating load using the Trane® calculation form or other standard accepted method.
2. Size the equipment using Table 86, p. 106 to match the heating loads at design conditions.

   Total heating load of 53 MBh

   Outdoor Ambient (Winter): 17 DB

   Indoor Return Temperature: 60 DB

   Airflow: 2000 cfm

   Use the integrated portion of Table 86, p. 106 for WSC060 to determine capacity at winter design conditions. The mechanical heating portion of the heat pump will provide 36.2 MBh.
3. Because 36.2 is less than the building's required heating capacity at winter design conditions, a supplementary heater must be selected.

   53 MBh - 36.2 MBh = 16.8 MBh

   The auxiliary electric heat capacities are listed in Table 104, p. 117. From the table, a 6 kW heater will deliver 20.48 MBh at 480 volts. In order to determine capacity at 460 volts, the heater voltage correction factor from Table 106, p. 118 must be used. Therefore, 20.48 MBh x .918 (voltage correction factor) = 18.8 MBh. A 6 kW heater should be selected.

Air Delivery Selection

External static pressure drop through the air distribution system has been calculated to be 0.65 inches of water. Enter Table 35, p. 59 for a WSC060H4 at 2000 cfm and 0.65 static pressure. The belt drive motor will give the desired airflow at a rated bhp of 0.44 and 766 rpm.

Model Number Descriptions

Digit 1 - Unit Type
W = Packaged Heat Pump[2]
D = Dual Fuel Heat Pump[2]

Digit 2 - Efficiency
S = Standard Efficiency
H = High Efficiency

Digit 3 - Airflow
C = Convertible

Digit 4,5,6 - Nominal Gross Cooling Capacity (MBh)
036 = 3 Ton
048 = 4 Ton
060 = 5 Ton
074 = 6 Ton
092 = 7.5 Ton
102 = 8.5 Ton
120 = 10 Ton

Digit 7 - Major Design Sequence

Digit 8 - Voltage Selection
3 = 208-230/60/3
4 = 460/60/3
W = 575/60/3

Digit 9 - Unit Controls
R = ReliaTel™ Microprocessor

Digit 10 - Heating Capacity
Note: *Applicable to Digit 1,W models only.*
0 = No Electric Heat
B = 6 kW
C = 9 kW
E = 12 kW
G = 18 kW
J = 23 kW
K = 27 kW
N = 36 kW
P = 54 kW

Note: *Applicable to Digit 1,D models only*
L = Low Heat
M = Medium Heat
H = High Heat
X = Low Heat, Stainless Steel Heat Exchanger
Y = Medium Heat, Stainless Steel Heat Exchanger
Z = High Heat, Stainless Steel Heat Exchanger

Digit 11 - Minor Design Sequence

Digit 12,13 - Service Sequence
** Factory Assigned

Digit 14 - Fresh Air Selection
0 = No Fresh Air
A = Manual Outside Air Damper 0-50%[1]
B = Motorized Outside Air Damper 0-50%[10]
C = Economizer, Dry Bulb 0-100% without Barometric Relief[4]
D = Economizer, Dry Bulb 0-100% with Barometric Relief[4]
E = Economizer, Reference Enthalpy 0-100% without Barometric Relief[4]
F = Economizer, Reference Enthalpy 0-100% with Barometric Relief[4]
G = Economizer, Comparative Enthalpy 0-100% without Barometric Relief[4]
H = Economizer, Comparative Enthalpy 0-100% with Barometric Relief[4]
K = Low Leak Economizer with Barometric Relief
M = Low Leak Economizer with Reference Enthalpy with Barometric Relief
P = Low Leak Economizer with Comparative Enthalpy with Barometric Relief

Digit 15 - Supply Fan/Drive Type/ Motor
0 = Standard Drive[3]
1 = Oversized Motor[3]
2 = Optional Belt Drive Motor
6 = Single Zone Variable Air Volume (SZVAV)[14]
7 = Multi-Speed Indoor Fan[12]
8 = Single Zone Variable Air Volume (SZVAV) w/Oversized Motor[14]
E = Multi-Zone Variable Air Volume (MZVAV)[14]
F = Multi-Zone Variable Air Volume (MZVAV) w/Oversized Motor[14]

Digit 16 - Hinged Service Access/ Filters
0 = Standard Panels/Standard Filters
A = Hinged Access Panels/Standard Filters
B = Standard Panels/2” MERV 8 Filters
C = Hinged Access Panels/2” MERV 8 Filters
D = Standard Panels/2” MERV 13 Filters
E = Hinged Access Panels/2” MERV 13 Filters

Digit 17 - Condenser Coil Protection
0 = Standard Coil
1 = Standard Coil with Hail Guard
2 = Black Epoxy Pre-Coated Condenser Coil
3 = Black Epoxy Pre-Coated Condenser Coil with Hail Guard

Digit 18 - Through-the-Base Provisions
0 = No Through-the-Base Provisions
A = Through-the-Base Electric[5]
B = Through-the-Base Gas Piping[17]
C = Through-the-Base Electric and Gas Piping[17]

Digit 19 - Disconnect/Circuit Breaker (three-phase only)
0 = No Disconnect/No Circuit Breaker
1 = Unit Mounted Non-Fused Disconnect[5]
2 = Unit Mounted Circuit Breaker[5]

Digit 20 - Convenience Outlet
0 = No Convenience Outlet
A = Unpowered Convenience Outlet
B = Powered Convenience Outlet (three-phase only)[6]

Digit 21 - Communications Options
0 = No Communications Interface
1 = Trane® Communications Interface
2 = LonTalk® Communications Interface
6 = BACnet® Communications Interface
7 = Air-Fi® Wireless Communications[15]

Digit 22 - Refrigeration System Option
0 = Standard Refrigeration System[7]

Digit 23 - Refrigeration Controls
0 = No Refrigeration Control[2]
1 = Frostat™[11]
2 = Crankcase Heater[16]
3 = Frostat and Crankcase Heater[11,16]

Digit 24 - Smoke Detector
0 = No Smoke Detector
A = Return Air Smoke Detector[8]
B = Supply Air Smoke Detector
C = Supply and Return Air Smoke Detectors[8]
D = Plenum Smoke Detector

Digit 25 - System Monitoring Controls
0 = No Monitoring Control
1 = Clogged Filter Switch
2 = Fan Failure Switch
3 = Discharge Air Sensing Tube
4 = Clogged Filter Switch and Fan Fail Switch
5 = Clogged Filter Switch and Discharge Air Sensing Tube
6 = Fan Fail Switch and Discharge AirSensing Tube
7 = Clogged Filter and Fan Fail Switches and Discharge Air Sensing Tube
A = Condensate Drain Pan Overflow Switch
B = Clogged Filter Switch and Condensate Drain Pan Overflow Switch
C = Fan Failure Switch and Condensate Drain Pan Overflow Switch
D = Discharge Air Sensing and Condensate Drain Pan Overflow

Switch
E = Clogged Filter Switch, Fan Failure Switch and Condensate Drain Pan Overflow Switch
F = Clogged Filter Switch, Discharge Air Sensing Tube and Condensate Drain Pan Overflow Switch
G = Fan Failure Switch, Discharge Air Sensing Tube and Condensate Drain Pan Overflow Switch
H = Clogged Filter Switch, Fan Failure Switch, Discharge Air Sensing and Condensate Drain Pan Overflow Switch

Digit 26 - System Monitoring Controls

0 = No Monitoring Controls
A = Demand Control Ventilation (CO_2)[13]
B = Low Leak Economizer with FDD (Fault Detection and Diagnostics)
C = FDD (Fault Detection and Diagnostics) with DCV (Demand Control Ventilation)

Digit 27 - Unit Hardware Enhancements

0 = No Enhancements
1 = Stainless Steel Drain Pan

Digit 31 - Advanced Unit Controls

0 = Standard Unit Controls
1 = Human Interface

Model Number Notes

1. Manual outside air damper will ship factory supplied within the unit, but must be field installed.
2. High pressure control is standard on all units.
3. Multi-stage, direct drive standard on 3 to 5 tons models. Belt drive standard on 6 to 8.5 tons standard efficiency models. Variable speed direct drive standard on 10 tons models and 6 to 8.5 tons high efficiency models.
4. Economizer with barometric relief is for downflow configured units only. Order economizer without barometric relief for horizontal configuration. Barometric relief for horizontal configured units must be ordered as field installed accessory.
5. Through-the-base electric required when ordering disconnect/circuit breaker options.
6. Requires use of disconnect or circuit breaker.
7. Standard metering devices are TXVs.
8. The return air smoke detector may not fit up or work properly on the Precedent™ units when used in conjunction with 3rd party accessories such as bolt on heat wheels, economizers and power exhaust. Do not order the return air smoke detectors when using this type of accessory.
9. Requires hinged access panels.
10. Motorized outside air damper is not available on Multi-Speed or SZVAV (Single Zone Variable Air Volume) or MZVAV (Multi Zone Variable Air Volume) products.
11. Frostat™ standard on 6 to 10 tons high efficiency heat pump, multi-speed and SZVAV (single zone variable air volume) products.
12. Multi-speed indoor fan available on 6, 7.5, 8.5 and 10 tons products.
13. Demand control ventilation option includes wiring only. The CO_2 sensor is a field-installed only option.
14. SZVAV/MZVAV is available on all high efficiency models. SZVAV is also available on 7.5 to 10 tons standard efficiency models.
15. Must be used with BACnet® open protocol.
16. Crankcase heater is standard on all 3 to 10 tons heat pumps.
17. Includes gas piping and shutoff (field assembly required).

General Data

Table 3. General data - 3 to 5 tons - standard efficiency

	3 Tons	4 Tons	5 Tons
	WSC036H3,4,W	**WSC048H3,4,W**	**WSC060H3,4,W**
Cooling Performance[a]			
Gross Cooling Capacity	39,500	50,000	61,000
EER/SEER[b]	3,4 = 12.1/14.3 W = 12.0/14.3	3,4 = 12.3/14.3 W = 12.2/14.3	3,4 = 12.3/14.3 W = 12.2/14.3
EER2/SEER2[c]	10.6/13.4	10.6/13.4	10.6/13.4
Nominal cfm/AHRI Rated cfm	1,200/1,200	1,600/1,600	2,000/2,000
AHRI Net Cooling Capacity	39,000	49,000	60,000
System Power (kW)	3.22	3.98	4.88
Heating Performance[d]			
High Temp. Btuh Rating	36,000	47,500	59,000
System Power kW/COP	3.01/3.50	3.98/3.50	4.94/3.50
System Power kW/COP2	3.22/3.40	3.92/3.50	4.86/3.50
Low Temp. Btuh Rating	20,600	26,000	35,000
System Power kW/COP	2.74/2.20	3.31/2.30	4.46/2.30
System Power kW/COP2	2.71/2.20	3.57/2.30	4.35/2.30
HSPF (Btu/Watts-hr)	8.00	8.20	8.20
HSPF2	7.20	7.20	7.20
Compressor			
Number/Type	1/Scroll	1/Scroll	1/Scroll
Sound			
Outdoor Sound Rating (dB)[e]	81	82	87
Outdoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.33	12.33	17.00
Rows/FPI	2/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	8.74	8.74	9.27
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan			
Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/22	1/22	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	3,600	4,050	5,130
Motor hp	0.25	0.33	0.40
Motor rpm	1,100	1,100	1,100

Table 3. General data - 3 to 5 tons - standard efficiency (continued)

	3 Tons	4 Tons	5 Tons
	WSC036H3,4,W	WSC048H3,4,W	WSC060H3,4,W
Indoor Fan			
Type (Standard)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1/11x11	1/11x11	1/11x11
Drive Type/No. Speeds/rpm	Direct/5(f)	Direct/5(f)	Direct/5(f)
Motor hp (standard/oversized)	0.75/1.5	1.0/1.5	1.0/1.5
Motor Frame Size (standard/oversized)	48/48	48/48	48/48
Filters(g)			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(2) 20x35x2	(2) 20x35x2	(4) 16x25x2
Refrigerant Charge(h)			
Pounds of R-410A	7.7	9.3	11.5

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) EER2 and SEER2 is rated at AHRI conditions and calculated in accordance with AHRI Standard 210/240-2023. Airflow and net cooling capacity not shown.
(d) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btuh rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(e) Outdoor sound rating shown is tested in accordance with AHRI Standard 270. For additional information reference the outdoor sound power level data in the performance section.
(f) For multispeed direct drive rpm values, reference the direct drive, evaporator fan performance table.
(g) Optional 2" MERV 8 and MERV 13 filters also available.
(h) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 4. General data - 6 to 10 tons - standard efficiency

	7.5 Tons	8.5 Tons	10 Tons
	WSC092H3,4,W	WSC102H3,4,W	WSC120H3,4,W
Cooling Performance(a)			
Gross Cooling Capacity	95,300	103,200	118,100
EER(b)	11.3	11.0	11.0
Nominal cfm/AHRI Rated cfm	3,000/3,000	3,400/3,315	4,000/4,000
AHRI Net Cooling Capacity	93,000	100,000	115,000
IEER(c)	14.1(d)	14.1(d)	14.1(d)
System Power (kW)	8.23	9.09	10.45
Heating Performance(e)			
High Temp. Btuh Rating	88,000(f)	92,000(f)	106,000
System Power kW/COP	7.59/3.40	7.93/3.40	9.14/3.40
Low Temp. Btuh Rating	48,000	48,500	58,500
System Power kW/COP	6.25/2.25	6.77/2.10	7.62/2.25
Compressor			
Number/Type	1/Scroll (2 Stage)	1/Scroll (2 Stage)	1/Scroll (2 Stage)
Sound			
Outdoor Sound Rating (dB)(g)	86	85	86

Table 4. General data - 6 to 10 tons - standard efficiency (continued)

	7.5 Tons	8.5 Tons	10 Tons
	WSC092H3,4,W	WSC102H3,4,W	WSC120H3,4,W
Outdoor Coil			
Type	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	19.83	23.34	23.34
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil			
Type	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.36	12.36	12.36
Rows/FPI	3/16	4/16	4/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan			
Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/26	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	6,200	6,200	6,200
Motor hp	0.70	0.70	0.70
Motor rpm	1,100	1,100	1,100
Indoor Fan			
Type	FC Centrifugal(h)	FC Centrifugal(h)	BC Plenum
Number Used/Diameter (in.)/Width (in.)	1/15 x 15(i)	1/15 x 15(i)	1/19.7x15
Drive Type/No. Speeds/rpm	Belt/ Variable/1,750(j)	Belt/ Variable/1,750(j)	Direct/Variable(k)
Motor hp (Standard/Oversized)	1.0/3.0(l)	2.0/3.0(l)	2.75/—
Motor Frame Size (Standard/Oversized)	56/56	56/56	—/—
Filters(m)			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2
Refrigerant Charge(n)			
Pounds of R-410A	14.6	18.0	16.3

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on ARI Standard 340/360.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) Integrated Efficiency Ratio (IEER) is rated in accordance with AHRI Standard 340/360. The IEER rating requires that the unit efficiency be determined at 100%, 75%, 50% and 25% load (net capacity) at the specified in AHRI Standard.
(d) 14.6 IEER for SZVAV and Title 24 2-speed fan option.
(e) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btu/h Rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 340/360.
(f) For SZVAV/Title 24 option, 8.5 tons high temp. Btuh rating = 89,000, 7.5 Tons high temp. Btuh rating = 87,000.
(g) Outdoor sound rating shown is tested in accordance with AHRI Standard 270-2015. For additional information reference the outdoor sound power level data in the performance section.
(h) For SZVAV/Title 24 option, backward airfoil plenum.
(i) For SZVAV/Title 24 option, 1/19.7X15.
(j) For SZVAV/Title 24 option, direct/variable.
(k) For multispeed direct drive rpm values, reference the direct drive, evaporator fan performance table.
(l) For SZVAV/Title 24 option, 2.75.

(m) Optional 2” MERV 8 and MERV 13 filters also available.
(n) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 5. General data - 3 to 5 tons - high efficiency

	3 Tons	4 Tons	5 Tons
	WHC036H3,4,W	WHC048H3,4,W	WHC060H3,4,W
Cooling Performance[a]			
Gross Cooling Capacity-High Stage	36,400	48,750	61,000
EER/SEER[b]	12.5/16.0	13.0/16.5	3=13.0/16.4 4,W=12.9/16.2
EER2/SEER2[c]	12.5/15.6	12.5/16.1	12.5/16.1
Nominal cfm-High Stage/AHRI Rated cfm	1,200/1,200	1,600/1,680	2,000/2,000
Nominal cfm-Low Stage/AHRI Rated cfm	840	1,120	1,400
AHRI Net Cooling Capacity-High Stage	36,000	48,000	60,000
System Power-High Stage (kW)	2.88	3.69	4.62
Heating Performance[d]			
High Temp. Btuh Rating-High Stage	32,200	44,000	57,000
System Power kW/COP-High Stage	2.62/3.60	3.58/3.60	4.64/3.60
System Power kW/COP2	2.71/3.50	3.53/3.60	4.41/3.60
Low Temp. Btuh Rating-High Stage	21,400	24,000	34,400
System Power kW/COP-High Stage	2.73/2.30	3.06/2.30	4.38/2.30
System Power kW/COP2	2.45/2.10	3.18/2.30	3.98/2.30
HSPF (Btu/Watts-hr)	8.80	8.80	9.00
HSPF2	8.00	8.40	8.50
Compressor			
Number/Type	1/Scroll (2-stage)	1/Scroll (2-stage)	1/Scroll (2-stage)
Sound			
Outdoor Sound Rating (dB)[e]	81	87	87
Outdoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.33	17.00	17.00
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	8.74	9.27	9.27
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan			
Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/22	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	3,600	5,130	5,130
Motor hp	0.25	0.40	0.40
Motor rpm	1,100	1,100	1,100

Table 5. General data - 3 to 5 tons - high efficiency (continued)

	3 Tons	4 Tons	5 Tons
	WHC036H3,4,W	**WHC048H3,4,W**	**WHC060H3,4,W**
Indoor Fan			
Type (Standard)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1/11x11	1/11x11	1/11x11
Drive Type/No. Speeds/rpm	Direct/Variable	Direct/Variable	Direct/Variable
Motor hp (standard/oversized)	0.75/1.5	1.0/1.5	1.0/1.5
Motor Frame Size (standard/oversized)	48/48	48/48	48/48
Filters[f]			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(2) 20x35x2	(4) 16x25x2	(4) 16x25x2
Refrigerant Charge[g]			
Pounds of R-410A	8.8	10.8	10.8

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) EER2 and SEER2 is rated at AHRI conditions and calculated in accordance with AHRI Standard 210/240-2023. Airflow and net cooling capacity not shown.
(d) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btuh rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(e) Outdoor sound rating shown is tested in accordance with AHRI Standard 270. For additional information reference the outdoor sound power level data in the performance section.
(f) Optional 2" MERV 8 and MERV 13 filters also available.
(g) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 6. General data - 6 to 10 tons - high efficiency

	6 Tons	7.5 Tons	8.5 Tons	10 Tons
	WHC074H3,4,W	**WHC092H3,4,W**	**WHC102H3,4,W**	**WHC120H3,4,W**
Cooling Performance[a]				
Gross Cooling Capacity - High Stage	78,900	96,200	105,900	123,600
EER[b]	12.1	11.8	3,4 = 12.0 / W = 11.8	11.5
Nominal CFM-High Stage / ARI Rated CFM	2,400 / 2,400	3,000 / 3,000	3,400 / 3,400	4,000 / 4,000
Nominal CFM-Low Stage / ARI Rated CFM	1,560	1,950	2,210	2,600
ARI Net Cooling Capacity - High Stage	78,000	95,000	104,000	121,000
IEER[c]	15.5[d]	15.5[d]	15.5[d]	15.5[d]
System Power - High Stage (kW)	6.45	8.05	8.67	10.52
Heating Performance[e]				
High Temp. Btuh Rating - High Stage	75,000	87,000	93,000	118,000
System Power kW/COP - High Stage	6.28 / 3,4 = 3.50 6.32 / W = 3.48	7.29 / 3,4 = 3.50 7.33 / W = 3.48	7.51 / 3,4 = 3.63 7.55 / W = 3.61	9.53 / 3,4 = 3.63 9.58 / W = 3.61
Low Temp. Btuh Rating - High Stage	40,000	49,000	57,000	61,000
System Power kW/COP - High Stage	5.21 / 2.25	6.38 / 2.25	7.42 / 2.25	7.95 / 2.25
Compressor				
Number/Type	2 / Scroll	2 / Scroll	2 / Scroll	2 / Scroll
Sound				
Outdoor Sound Rating (dB)[f]	86	86	85	85

Table 6. General data - 6 to 10 tons - high efficiency (continued)

	6 Tons	7.5 Tons	8.5 Tons	10 Tons
	WHC074H3,4,W	WHC092H3,4,W	WHC102H3,4,W	WHC120H3,4,W
Outdoor Coil				
Type	Lanced	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125	0.3125
Face Area (sq. ft.)	19.83	19.83	23.34	25.56
Rows/FPI	3 / 16	3 / 16	3 / 16	4 / 16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil				
Type	Lanced	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.36	12.36	12.36	16.59
Rows/FPI	3 / 16	3 / 16	4 / 16	4 / 16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan				
Type	Propeller	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1 / 26	1 / 26	1 / 26	1 / 30
Drive Type/No. Speeds	Direct / 1	Direct / 1	Direct / 1	Direct / 1
cfm	6200	6200	6200	6900
Motor hp	0.70	0.70	0.70	0.75
Motor rpm	1,100	1,100	1,100	1,100
Indoor Fan				
Type (Standard)	BC Plenum	BC Plenum	BC Plenum	BC Plenum
Number Used/Diameter (in.)/Width (in.)	1 / 19.7x15	1 / 19.7x15	1 / 19.7x15	1 / 19.7x15
Drive Type/No. Speeds/rpm	Direct/Variable(g)	Direct/Variable(g)	Direct/Variable(g)	Direct/Variable(g)
Motor hp (Standard/Oversized)	2.75 / -	2.75 / -	2.75 / -	2.75 / -
Motor Frame Size (Standard/Oversized)	- / -	- / -	- / -	- / -
Filters(h)				
Type Furnished	Throwaway	Throwaway	Throwaway	Throwaway
Number Size Recommended	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2	(3) 20x25x2 (2) 20x30x2
Refrigerant Charge(i)				
Pounds of R-410A	14.5	14.2	17.0	23.9

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on ARI Standard 340/360.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) Integrated Efficiency Ratio (IEER) is rated in accordance with AHRI Standard 340/360. The IEER rating requires that the unit efficiency be determined at 100%, 75%, 50% and 25% load (net capacity) at the specified in AHRI Standard.
(d) 16.5 IEER for SZ/MZVAV option, 16.0 IEER for Title24 2 speed fan option.
(e) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btu/h Rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 340/360.
(f) Outdoor sound rating shown is tested in accordance with AHRI Standard 270-2015. For additional information reference the outdoor sound power level data in the performance section.
(g) For multispeed direct drive rpm values, reference the direct drive, evaporator fan performance tables.
(h) Optional 2" MERV 8 and MERV 13 filters also available.
(i) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 7. General data - 3 to 5 tons - dual fuel efficiency

	3 Tons	4 Tons	5 Tons
	DHC036H3,4,W	DHC048H3,4,W	DHC060H3,4,W
Cooling Performance[a]			
Gross Cooling Capacity-High Stage	36,400	48,750	61,000
EER/SEER[b]	3=12.5/15.7 4,W=12.5/15.6	13.0/16.5	3=12.8/16.2 4,W=12.8/16.0
Nominal cfm-High Stage/AHRI Rated cfm	1,200/1,200	1,600/1,680	2,000/2,000
Nominal cfm-Low Stage/AHRI Rated cfm	840	1,120	1,400
AHRI Net Cooling Capacity-High Stage	36,000	48,000	60,000
System Power-High Stage (kW)	2.88	3.69	4.69
Heating Performance[c]			
High Temp. Btuh Rating-High Stage	32,200	44,000	57,000
System Power kW/COP-High Stage	2.62/3.60	3.58/3.60	4.64/3.60
Low Temp. Btuh Rating-High Stage	21,400	24,000	34,400
System Power kW/COP-High Stage	2.73/2.30	3.06/2.30	4.38/2.30
HSPF (Btu/Watts-hr)	8.80	8.80	8.90
Compressor			
Number/Type	1/Scroll (2-stage)	1/Scroll (2-stage)	1/Scroll (2-stage)
Sound			
Outdoor Sound Rating (dB)[d]	81	87	87
Outdoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.33	17.00	17.00
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil			
Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	8.74	9.27	9.27
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan			
Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/22	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	3,600	5,130	5,130
Motor hp	0.25	0.40	0.40
Motor rpm	1,100	1,100	1,100
Indoor Fan			
Type (Standard)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1/11x11	1/11x11	1/11x11
Drive Type/No. Speeds/rpm	Direct/Variable	Direct/Variable	Direct/Variable
Motor hp (standard)	0.75	1.0	1.0
Motor Frame Size (standard)	48	48	48

Table 7. General data - 3 to 5 tons - dual fuel efficiency (continued)

	3 Tons	4 Tons	5 Tons
	DHC036H3,4,W	DHC048H3,4,W	DHC060H3,4,W
Filters[e]			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(2) 20x35x2	(4) 16x25x2	(4) 16x25x2
Refrigerant Charge[f]			
Pounds of R-410A	8.8	10.8	10.8
Gas Heating Performance (Dual Fuel Only)[g]			
Gas Heating Input (2nd stage/1st stage)			
Low Heat Input (Btu)	60,000/42,000	60,000/42,000	60,000/42,000
Mid Heat Input (Btu)	80,000/56,000	100,000/70,000	100,000/72,000
High Heat Input (Btu)	100,000/70,000	130,000/91,000	150,000/105,000
Gas Heating Output (2nd stage/1st stage)			
Low Heat Output (Btu)	48,600/34,020	48,600/34,020	48,600/34,020
Mid Heat Output (Btu)	64,800/45,360	81,000/56,700	81,000/58,320
High Heat Output (Btu)	81,000/56,700	105,300/73,710	121,500/85,050
Steady State Efficiency %	81%	81%	81%
No. Burners			
Low Heat Output (Btu)	2	2	2
Mid Heat Output (Btu)	2	3	3
High Heat Output (Btu)	3	3	4
No. Stages			
Low Heat Input (Btu)	2	2	2
Mid Heat Input (Btu)	2	2	2
High Heat Input (Btu)	2	2	2
Gas Supply Line Pressure			
Natural (minimum/maximum)	4.5/14.0	4.5/14.0	4.5/14.0
LP (minimum/maximum)	N/A	N/A	N/A
Gas Connection Pipe Size (in.)			
Low Heat	1/2	1/2	1/2
Mid Heat	1/2	1/2	1/2
High Heat	1/2	3/4	3/4

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btuh rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 210/240.
(d) Outdoor sound rating shown is tested in accordance with AHRI Standard 270. For additional information reference the outdoor sound power level data in the performance section.
(e) Optional 2" MERV 8 and MERV 13 filters also available.
(f) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.
(g) Heating performance limit settings and rating data were established and approved under laboratory test conditions using American National Standards Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level. Applicable to dual fuel units only.

Table 8. General data - 6 to 10 tons - dual fuel efficiency

	6 Tons	7.5 Tons	8.5 Tons	10 Tons
	DHC074H3,4,W	DHC092H3,4,W	DHC102H3,4,W	DHC120H3,4,W
Cooling Performance[a]				
Gross Cooling Capacity - High Stage	78,900	96,200	105,900	123,600
EER[b]	12.1	11.8	3,4 = 12.0 / W = 11.8	11.5
Nominal CFM-High Stage / ARI Rated CFM	2,400 / 2,400	3,000 / 3,000	3,400 / 3,400	4,000 / 4,000
Nominal CFM-Low Stage / ARI Rated CFM	1,560	1,950	2,210	2,600
ARI Net Cooling Capacity - High Stage	78,000	95,000	104,000	121,000
IEER[c]	15.5[d]	15.5[d]	15.5[d]	15.5[d]
System Power - High Stage (kW)	6.45	8.05	8.67	10.52
Heating Performance[e]				
High Temp. Btuh Rating - High Stage	75,000	87,000	93,000	118,000
System Power kW/COP - High Stage	6.28 / 3,4 = 3.50 6.32 / W = 3.48	7.29 / 3,4 = 3.50 7.33 / W = 3.48	7.51 / 3,4 = 3.63 7.55 / W = 3.61	9.53 / 3,4 = 3.63 9.58 / W = 3.61
Low Temp. Btuh Rating - High Stage	40,000	49,000	57,000	61,000
System Power kW/COP - High Stage	5.21 / 2.25	6.38 / 2.25	7.42 / 2.25	7.95 / 2.25
Compressor				
Number/Type	2 / Scroll	2 / Scroll	2 / Scroll	2 / Scroll
Sound				
Outdoor Sound Rating (dB)[f]	86	86	85	85
Outdoor Coil				
Type	Lanced	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125	0.3125
Face Area (sq. ft.)	19.83	19.83	23.34	25.56
Rows/FPI	3 / 16	3 / 16	3 / 16	4 / 16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil				
Type	Lanced	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.36	12.36	12.36	16.59
Rows/FPI	3 / 16	3 / 16	4 / 16	4 / 16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan				
Type	Propeller	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1 / 26	1 / 26	1 / 26	1 / 30
Drive Type/No. Speeds	Direct / 1	Direct / 1	Direct / 1	Direct / 1
cfm	6200	6200	6200	6900
Motor hp	0.70	0.70	0.70	0.75
Motor rpm	1,100	1,100	1,100	1,100

Table 8. General data - 6 to 10 tons - dual fuel efficiency (continued)

	6 Tons	7.5 Tons	8.5 Tons	10 Tons
	DHC074H3,4,W	DHC092H3,4,W	DHC102H3,4,W	DHC120H3,4,W
Indoor Fan				
Type (Standard)	BC Plenum	BC Plenum	BC Plenum	BC Plenum
Number Used/Diameter (in.)/Width (in.)	1 / 19.7x15	1 / 19.7x15	1 / 19.7x15	1 / 19.7x15
Drive Type/No. Speeds/rpm	Direct/Variable(g)	Direct/Variable(g)	Direct/Variable(g)	Direct/Variable(g)
Motor hp (Standard/Oversized)	2.75 / -	2.75 / -	2.75 / -	2.75 / -
Motor Frame Size (Standard/Oversized)	- / -	- / -	- / -	- / -
Filters(h)				
Type Furnished	Throwaway	Throwaway	Throwaway	Throwaway
Number Size Recommended	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2	(3) 20x25x2 (2) 20x30x2
Refrigerant Charge(i)				
Pounds of R-410A	14.5	14.2	17.0	23.9

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on ARI Standard 340/360.
(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
(c) Integrated Efficiency Ratio (IEER) is rated in accordance with AHRI Standard 340/360. The IEER rating requires that the unit efficiency be determined at 100%, 75%, 50% and 25% load (net capacity) at the specified in AHRI Standard.
(d) 16.5 IEER for SZ/MZVAV option, 16.0 IEER for Title24 2 speed fan option.
(e) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High temp. Btu/h Rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 340/360.
(f) Outdoor sound rating shown is tested in accordance with AHRI Standard 270-2015. For additional information reference the outdoor sound power level data in the performance section.
(g) For multispeed direct drive rpm values, reference the direct drive, evaporator fan performance tables.
(h) Optional 2" MERV 8 and MERV 13 filters also available.
(i) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 9. Heating Performance - 6 to 10 tons - dual fuel efficiency (gas/electric only)

	6 Tons			7.5 Tons			8.5 Tons			10 Tons		
	DHC074H3,4,W			DHC092H3,4,W			DHC102H3,4,W			DHC120H3,4,W		
Heating Models	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**
Heating Input (Btu)	80,000	120,000	150,000 / 105,000	120,000	150,000 / 105,000	200,000/ 140,000	120,000	150,000 / 105,000	200,000/ 140,000	150,000/ 105,000	200,000/ 140,000	250,000/ 175,000
Heating Output (Btu)	64,800	97,200	121,500 / 85,050	97,200	121,500 / 85,050	162,000/ 113,400	97,200	121,500 / 85,050	162,000/ 113,400	121,500 / 85,050	162,000/ 113,400	202,500/ 141,750
Steady State Efficiency %	81			81			81			81		
No. Burners	3	3	3	3	3	5	3	3	5	3	4	5
No. Stages	1	1	2	1	2	2	1	2	2	2	2	2
Gas Supply Line Pressure												
Natural (minimum/maximum) "w.c.	4.5 / 14.0			4.5 / 14.0			4.5 / 14.0			4.5 / 14.0		
LP (minimum/maximum) "w.c.	11.0 / 14.0			11.0 / 14.0			11.0 / 14.0			11.0 / 14.0		
Gas Connection Pipe Size (in)	1/2	1/2	3/4	1/2	3/4	3/4	1/2	3/4	3/4	3/4	3/4	3/4

Note: Heating performance limit settings and rating data were established and approved under laboratory test conditions using American National Standards Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level. Applicable to Gas/Electric units only.

Gross Cooling Capacities

Table 10. Gross cooling capacities 3 tons standard efficiency - three phase WSC036H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	36.0	28.2	40.5	22.2	45.2	15.9	33.6	26.8	37.8	20.9	42.3	14.7	31.0	25.4	35.1	19.5	39.3	13.3
960	80	36.0	33.2	40.6	27.3	45.3	21.1	33.6	31.7	38.0	26.0	42.4	19.8	31.1	30.3	35.2	24.7	39.4	18.5
960	85	36.2	36.2	40.7	32.4	45.4	26.3	34.1	34.1	38.0	31.1	42.5	25.0	32.1	32.1	35.3	29.7	39.5	23.6
960	90	38.2	38.2	40.7	37.4	45.5	31.4	36.2	36.2	38.1	36.1	42.6	30.1	34.1	34.1	35.4	34.6	39.6	28.8
1080	75	36.8	30.0	41.4	23.3	46.1	16.2	34.3	28.6	38.6	21.9	43.0	14.9	31.6	27.2	35.7	20.5	39.8	13.5
1080	80	36.9	35.5	41.5	29.0	46.2	22.0	34.4	34.1	38.7	27.7	43.1	20.7	31.8	31.8	35.8	26.3	40.0	19.4
1080	85	37.8	37.8	41.6	34.8	46.3	27.8	35.7	35.7	38.8	33.4	43.3	26.5	33.5	33.5	35.9	32.0	40.1	25.1
1080	90	40.1	40.1	41.7	40.3	46.4	33.6	38.0	38.0	39.0	38.9	43.4	32.3	35.7	35.7	36.2	36.2	40.2	30.9
1200	75	37.5	31.9	42.1	24.3	46.8	16.5	34.8	30.4	39.2	22.9	43.6	15.1	32.1	28.8	36.1	21.5	40.3	13.7
1200	80	37.7	37.7	42.2	30.7	46.9	23.0	35.1	35.1	39.3	29.3	43.7	21.6	32.5	32.5	36.3	27.9	40.4	20.2
1200	85	39.4	39.4	42.3	37.1	47.0	29.4	37.1	37.1	39.5	35.7	43.9	28.0	34.8	34.8	36.5	34.3	40.6	26.6
1200	90	41.8	41.8	42.6	42.6	47.1	35.8	39.5	39.5	39.8	39.8	44.0	34.4	37.1	37.1	37.1	37.1	40.7	33.0
1320	75	38.1	33.7	42.7	25.4	47.3	16.8	35.3	32.2	39.6	23.9	44.0	15.4	32.4	30.4	36.5	22.5	40.6	13.9
1320	80	38.5	38.5	42.8	32.4	47.4	23.9	35.9	35.9	39.8	31.0	44.1	22.5	33.5	33.5	36.7	29.5	40.8	21.0
1320	85	40.8	40.8	43.0	39.4	47.6	30.9	38.4	38.4	40.0	37.7	44.3	29.5	35.9	35.9	36.9	36.2	40.9	28.1
1320	90	43.3	43.3	43.5	43.5	47.7	38.0	40.8	40.8	40.9	40.9	44.5	36.6	38.2	38.2	38.3	38.3	41.1	35.1
1440	75	38.6	35.5	43.1	26.4	47.8	17.0	35.7	33.7	40.0	24.9	44.3	15.6	32.8	32.1	36.8	23.4	40.8	14.1
1440	80	39.3	39.3	43.3	34.1	47.9	24.7	36.9	36.9	40.2	32.6	44.5	23.3	34.4	34.4	37.0	31.1	41.0	21.8
1440	85	42.0	42.0	43.5	41.5	48.1	32.5	39.5	39.5	40.5	40.0	44.7	31.0	36.8	36.8	37.4	37.4	41.2	29.6
1440	90	44.5	44.5	44.6	44.6	48.2	40.1	41.9	41.9	42.0	42.0	44.9	38.7	39.2	39.2	39.3	39.3	41.4	37.3

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	28.4	24.0	32.2	18.2	36.1	12.0	25.7	22.6	29.3	16.8	32.8	10.6
960	80	28.5	28.5	32.4	23.3	36.2	17.2	25.8	25.8	29.4	21.9	33.0	15.8
960	85	29.9	29.9	32.4	28.4	36.4	22.3	27.7	27.7	29.5	26.9	33.1	20.9
960	90	31.9	31.9	32.6	32.6	36.5	27.4	29.6	29.6	29.7	29.7	33.2	26.0
1080	75	28.8	25.8	32.7	19.1	36.6	12.2	26.0	24.1	29.6	17.7	33.1	10.8
1080	80	29.2	29.2	32.9	24.9	36.7	18.0	26.8	26.8	29.7	23.4	33.3	16.6
1080	85	31.2	31.2	33.0	30.6	36.8	23.8	28.8	28.8	29.9	28.9	33.4	22.3
1080	90	33.3	33.3	33.4	33.4	37.0	29.5	30.8	30.8	30.9	30.9	33.6	28.1
1200	75	29.2	27.2	33.0	20.1	36.9	12.3	26.3	25.7	29.8	18.6	33.3	10.9
1200	80	30.2	30.2	33.2	26.5	37.0	18.8	27.7	27.7	30.0	25.0	33.5	17.3
1200	85	32.3	32.3	33.4	32.5	37.2	25.2	29.8	29.8	30.3	30.3	33.6	23.7
1200	90	34.5	34.5	34.6	34.6	37.3	31.6	31.8	31.8	31.9	31.9	33.8	30.1
1320	75	29.5	28.9	33.3	21.0	37.1	12.5	26.5	26.5	29.9	19.5	33.4	11.0
1320	80	31.0	31.0	33.5	28.0	37.3	19.6	28.4	28.4	30.1	26.5	33.6	18.1
1320	85	33.3	33.3	33.8	33.8	37.4	26.6	30.5	30.5	30.6	30.6	33.8	25.1
1320	90	35.5	35.5	35.6	35.6	37.6	33.7	32.7	32.7	32.7	32.7	34.0	31.8
1440	75	29.8	29.8	33.5	21.9	37.2	12.6	26.8	26.8	30.0	20.4	33.4	11.1
1440	80	31.7	31.7	33.7	29.6	37.4	20.4	28.9	28.9	30.2	27.7	33.7	18.8
1440	85	34.1	34.1	34.2	34.2	37.6	28.1	31.2	31.2	31.2	31.2	33.9	26.5
1440	90	36.4	36.4	36.4	36.4	37.9	35.4	33.3	33.3	33.4	33.4	34.2	33.8

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 11. Gross cooling capacities 4 tons standard efficiency - three phase WSC048H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1280	75	45.5	36.5	50.8	28.3	56.4	19.8	42.8	35.0	47.9	26.8	53.1	18.3	40.0	33.5	44.8	25.3	49.7	16.8
1280	80	45.9	43.3	51.0	35.2	56.6	26.8	43.3	41.7	48.1	33.7	53.3	25.3	40.6	40.2	45.0	32.2	49.9	23.8
1280	85	47.4	47.4	51.2	42.1	56.7	33.7	45.1	45.1	48.3	40.6	53.5	32.2	42.7	42.7	45.3	39.1	50.1	30.7
1280	90	50.1	50.1	51.7	48.8	56.9	40.6	47.8	47.8	48.9	47.3	53.7	39.1	45.3	45.3	45.9	45.7	50.4	37.6
1440	75	46.6	39.1	51.8	29.8	57.4	20.2	43.8	37.6	48.7	28.3	54.0	18.7	40.9	36.0	45.5	26.7	50.4	17.2
1440	80	47.3	46.7	52.0	37.5	57.5	28.0	44.6	44.6	49.0	36.0	54.2	26.5	41.8	41.8	45.8	34.5	50.7	25.0
1440	85	49.5	49.5	52.4	45.3	57.7	35.8	47.1	47.1	49.4	43.8	54.4	34.3	44.5	44.5	46.3	42.3	50.9	32.8
1440	90	52.4	52.4	53.2	52.9	58.0	43.6	49.9	49.9	50.3	50.3	54.7	42.1	47.2	47.2	47.3	47.3	51.2	40.5
1600	75	47.5	41.6	52.6	31.2	58.1	20.6	44.6	40.1	49.4	29.7	54.7	19.0	41.6	38.1	46.1	28.1	51.0	17.5
1600	80	48.5	48.5	52.9	39.8	58.3	29.2	45.8	45.8	49.8	38.3	54.9	27.7	43.2	43.2	46.5	36.7	51.3	26.2
1600	85	51.4	51.4	53.4	48.5	58.5	37.9	48.8	48.8	50.3	46.7	55.1	36.4	46.0	46.0	47.1	45.0	51.5	34.8
1600	90	54.4	54.4	54.6	54.6	58.9	46.6	51.7	51.7	51.8	51.8	55.6	45.1	48.9	48.9	49.0	49.0	52.0	43.5
1720	75	48.3	44.1	53.2	32.6	58.8	20.9	45.4	42.2	50.0	31.0	55.2	19.4	42.3	40.4	46.6	29.4	51.4	17.8
1720	80	49.8	49.8	53.6	42.1	59.0	30.5	47.2	47.2	50.4	40.6	55.5	28.9	44.4	44.4	47.0	39.0	51.7	27.3
1720	85	53.0	53.0	54.4	51.4	59.3	40.0	50.2	50.2	51.3	49.7	55.8	38.4	47.4	47.4	48.0	48.0	52.1	36.9
1720	90	56.1	56.1	56.2	56.2	59.8	49.6	53.3	53.3	53.4	53.4	56.3	48.0	50.3	50.3	50.4	50.4	52.7	46.4
1920	75	49.0	46.2	53.7	34.0	59.3	21.3	46.1	44.5	50.4	32.4	55.6	19.7	42.9	42.8	46.9	30.8	51.8	18.1
1920	80	51.1	51.1	54.3	44.4	59.5	31.7	48.4	48.4	51.0	42.8	55.9	30.1	45.5	45.5	47.5	41.2	52.1	28.5
1920	85	54.4	54.4	55.3	54.4	59.9	42.1	51.5	51.5	52.1	52.1	56.3	40.5	48.5	48.5	48.7	48.7	52.5	38.9
1920	90	57.6	57.6	57.7	57.7	60.5	52.5	54.7	54.7	54.8	54.8	57.0	51.0	51.5	51.5	51.6	51.6	53.2	48.9

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1280	75	37.0	31.9	41.5	23.7	46.1	15.4	33.9	30.2	38.0	22.0	42.2	13.6
1280	80	37.8	37.8	41.7	30.6	46.4	22.2	34.9	34.9	38.2	28.9	42.5	20.6
1280	85	40.1	40.1	42.1	37.5	46.6	29.1	37.3	37.3	38.6	35.5	42.7	27.5
1280	90	42.6	42.6	42.9	42.9	46.8	36.0	39.7	39.7	39.8	39.8	43.0	34.4
1440	75	37.8	34.0	42.1	25.1	46.7	15.6	34.5	32.3	38.5	23.4	42.7	13.9
1440	80	39.1	39.1	42.4	32.8	47.0	23.4	36.2	36.2	38.8	31.1	43.0	21.7
1440	85	41.7	41.7	42.9	40.3	47.2	31.2	38.7	38.7	39.4	38.5	43.2	29.5
1440	90	44.4	44.4	44.5	44.5	47.6	39.0	41.3	41.3	41.3	41.3	43.6	37.3
1600	75	38.5	36.4	42.6	26.4	47.2	15.9	35.2	34.5	38.9	24.7	43.0	14.2
1600	80	40.4	40.4	43.0	35.1	47.5	24.5	37.3	37.3	39.3	33.3	43.4	22.8
1600	85	43.1	43.1	43.8	43.3	47.7	33.2	39.9	39.9	40.2	40.2	43.7	31.5
1600	90	45.9	45.9	45.9	45.9	48.2	41.9	42.6	42.6	42.6	42.6	44.2	40.2
1720	75	39.1	38.7	43.0	27.8	47.5	16.2	35.7	35.7	39.2	26.0	43.3	14.4
1720	80	41.4	41.4	43.5	37.3	47.8	25.7	38.2	38.2	39.7	35.1	43.6	24.0
1720	85	44.3	44.3	44.5	44.5	48.2	35.2	41.0	41.0	41.0	41.0	44.0	33.5
1720	90	47.1	47.1	47.2	47.2	48.8	44.8	43.6	43.6	43.7	43.7	44.7	42.4
1920	75	39.7	39.7	43.3	29.1	47.8	16.4	36.2	36.2	39.4	27.3	43.5	14.7
1920	80	42.4	42.4	43.9	39.0	48.1	26.8	39.0	39.0	40.1	37.1	43.8	25.1
1920	85	45.3	45.3	45.4	45.4	48.6	37.3	41.8	41.8	41.9	41.9	44.3	35.5
1920	90	48.2	48.2	48.3	48.3	49.4	47.1	44.5	44.5	44.6	44.6	45.2	45.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 12. Gross cooling capacities 5 tons standard efficiency - three phase WSC060H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1600	75	56.3	46.5	63.0	35.9	70.1	24.9	52.8	44.7	59.1	34.1	65.7	23.1	49.0	42.7	54.9	32.2	61.2	21.2
1600	80	56.6	55.4	63.1	44.8	70.2	33.9	53.1	53.1	59.2	43.0	65.9	32.1	49.4	49.4	55.1	41.1	61.3	30.2
1600	85	58.0	58.0	63.3	53.7	70.3	42.9	55.0	55.0	59.4	51.9	66.0	41.1	51.9	51.9	55.3	50.0	61.5	39.2
1600	90	61.3	61.3	63.5	62.6	70.4	51.8	58.3	58.3	59.8	59.8	66.2	50.0	55.0	55.0	55.8	55.8	61.7	48.1
1800	75	57.5	49.7	64.2	37.8	71.3	25.4	53.7	47.8	60.0	35.9	66.7	23.5	49.8	45.8	55.7	33.9	61.9	21.6
1800	80	58.0	58.0	64.3	47.8	71.4	35.5	54.4	54.4	60.2	45.9	66.9	33.7	50.6	50.6	55.9	43.9	62.1	31.7
1800	85	60.5	60.5	64.5	57.8	71.5	45.6	57.3	57.3	60.5	55.9	67.1	43.8	53.9	53.9	56.2	54.0	62.3	41.8
1800	90	64.0	64.0	65.1	65.1	71.7	55.6	60.7	60.7	61.3	61.3	67.3	53.8	57.2	57.2	57.2	57.2	62.5	51.9
2000	75	58.4	52.9	65.1	39.6	72.2	25.9	54.5	50.9	60.8	37.6	67.5	24.0	50.5	48.6	56.3	35.6	62.5	22.0
2000	80	59.3	59.3	65.3	50.7	72.4	37.1	55.6	55.6	61.0	48.8	67.7	35.2	52.2	52.2	56.5	46.7	62.7	33.2
2000	85	62.6	62.6	65.6	61.8	72.5	48.3	59.2	59.2	61.4	59.9	67.9	46.4	55.6	55.6	57.0	57.0	62.9	44.4
2000	90	66.3	66.3	66.6	66.6	72.7	59.5	62.8	62.8	62.8	62.8	68.1	57.6	59.0	59.0	59.1	59.1	63.2	55.6
2200	75	59.2	56.0	65.9	41.4	73.0	26.3	55.2	54.0	61.4	39.3	68.1	24.3	51.0	51.0	56.7	37.3	63.0	22.3
2200	80	60.6	60.6	66.1	53.6	73.2	38.7	57.2	57.2	61.7	51.6	68.3	36.7	53.5	53.5	57.0	49.5	63.2	34.7
2200	85	64.5	64.5	66.5	65.9	73.4	51.0	60.9	60.9	62.3	62.3	68.6	49.0	57.1	57.1	57.8	57.8	63.4	47.0
2200	90	68.3	68.3	68.2	68.2	73.6	63.3	64.6	64.6	64.7	64.7	68.8	61.3	60.6	60.6	60.7	60.7	63.8	59.3
2400	75	59.9	59.2	66.5	43.1	73.7	26.8	55.8	55.8	61.9	41.1	68.6	24.7	51.5	51.5	57.1	38.9	63.4	22.6
2400	80	62.2	62.2	66.8	56.5	73.9	40.3	58.5	58.5	62.2	54.5	68.8	38.2	54.6	54.6	57.4	52.3	63.6	36.1
2400	85	66.2	66.2	67.4	67.4	74.1	53.7	62.4	62.4	63.1	63.1	69.1	51.7	58.3	58.3	58.5	58.5	63.8	49.6
2400	90	70.1	70.1	70.2	70.2	74.3	67.1	66.2	66.2	66.3	66.3	69.5	65.1	62.0	62.0	62.1	62.1	64.3	63.1

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1600	75	45.0	40.7	50.5	30.2	56.3	19.3	40.8	38.7	45.8	28.1	51.1	17.2
1600	80	45.6	45.6	50.7	39.1	56.5	28.3	41.9	41.9	46.0	37.0	51.3	26.2
1600	85	48.5	48.5	51.0	48.0	56.7	37.3	44.8	44.8	46.3	46.0	51.5	35.2
1600	90	51.5	51.5	51.7	51.7	56.8	46.2	47.7	47.7	47.8	47.8	51.7	44.2
1800	75	45.6	43.8	51.1	31.8	56.9	19.6	41.2	41.2	46.2	29.7	51.5	17.5
1800	80	47.1	47.1	51.3	41.9	57.1	29.7	43.3	43.3	46.4	39.8	51.7	27.6
1800	85	50.3	50.3	51.7	51.7	57.3	39.8	46.3	46.3	47.0	47.0	51.9	37.7
1800	90	53.4	53.4	53.5	53.5	57.5	49.9	49.3	49.3	49.4	49.4	52.2	47.8
2000	75	46.1	46.1	51.5	33.5	57.3	19.9	41.7	41.7	46.5	31.3	51.7	17.7
2000	80	48.4	48.4	51.8	44.7	57.5	31.2	44.4	44.4	46.7	42.5	51.9	29.0
2000	85	51.7	51.7	52.5	52.5	57.7	42.4	47.5	47.5	47.7	47.7	52.2	40.2
2000	90	55.0	55.0	55.1	55.1	58.0	53.6	50.7	50.7	50.7	50.7	52.6	51.4
2200	75	46.7	46.7	51.8	35.1	57.6	20.2	42.1	42.1	46.6	32.9	51.8	18.0
2200	80	49.5	49.5	52.1	47.4	57.8	32.6	45.3	45.3	47.0	45.2	52.1	30.4
2200	85	53.0	53.0	53.2	53.2	58.1	44.9	48.5	48.5	48.6	48.6	52.3	42.7
2200	90	56.4	56.4	56.5	56.5	58.5	57.3	51.8	51.8	51.8	51.8	52.9	52.9
2400	75	47.1	47.1	52.0	36.7	57.8	20.5	42.5	42.5	46.7	34.5	51.9	18.2
2400	80	50.5	50.5	52.4	50.2	58.1	34.0	46.0	46.0	47.2	47.2	52.2	31.7
2400	85	54.0	54.0	53.9	53.9	58.3	47.4	49.4	49.4	49.4	49.4	52.4	45.2
2400	90	57.5	57.5	57.6	57.6	59.0	59.0	52.7	52.7	52.7	52.7	53.3	53.3

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 13. Gross cooling capacities 7.5 tons standard efficiency - three phase WSC092H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2400	75	87.1	70.9	97.1	55.2	107.9	39.0	82.3	68.1	91.7	52.8	101.8	36.6	77.2	65.5	86.0	50.3	95.4	34.1
2400	80	88.0	83.4	97.4	68.3	108.1	52.2	83.3	81.0	92.0	65.9	102.1	49.8	78.4	78.4	86.4	63.4	95.8	47.3
2400	85	91.3	91.3	97.8	81.4	108.4	65.3	87.2	87.2	92.5	78.5	102.4	62.9	82.8	82.8	86.9	75.9	96.1	60.4
2400	90	96.5	96.5	98.8	93.9	108.6	78.4	92.3	92.2	93.6	91.4	102.7	76.0	87.7	87.7	88.2	88.2	96.4	73.5
2700	75	89.2	75.2	99.1	58.0	109.8	39.8	84.2	72.7	93.4	55.5	103.5	37.3	78.8	70.0	87.5	53.0	96.8	34.8
2700	80	90.5	89.8	99.4	72.7	110.1	54.6	85.7	85.7	93.8	70.3	103.8	52.1	81.1	81.1	87.9	67.7	97.2	49.6
2700	85	95.3	95.3	100.1	86.9	110.4	69.4	90.9	90.9	94.6	84.3	104.2	66.9	86.2	86.2	88.8	81.6	97.6	64.4
2700	90	100.8	100.8	101.6	101.5	110.8	84.1	96.2	96.2	96.4	96.4	104.6	81.7	91.3	91.3	91.5	91.5	98.1	79.2
3000	75	90.9	79.8	100.7	60.7	111.3	40.5	85.7	77.2	94.8	58.2	104.8	38.0	80.2	74.4	88.7	55.6	97.9	35.4
3000	80	93.0	93.0	101.1	77.1	111.7	57.0	88.5	88.5	95.3	74.6	105.2	54.5	83.7	83.7	89.2	71.3	98.4	51.9
3000	85	98.7	98.7	102.1	92.7	112.1	73.4	94.1	94.1	96.4	90.1	105.6	70.9	89.0	89.0	90.4	87.4	98.8	68.3
3000	90	104.5	104.5	104.6	104.6	112.6	89.8	99.6	99.6	99.8	99.8	106.3	86.6	94.4	94.4	94.5	94.5	99.6	83.9
3300	75	92.4	84.3	102.0	63.4	112.6	41.2	87.1	81.6	96.0	60.9	105.9	38.6	81.5	78.8	89.6	58.2	98.8	36.0
3300	80	95.8	95.8	102.5	81.4	113.1	59.3	91.1	91.1	96.6	78.1	106.4	56.8	86.0	86.0	90.3	75.3	99.4	54.2
3300	85	101.8	101.8	103.8	98.5	113.5	77.3	96.8	96.8	98.0	95.8	106.8	74.8	91.5	91.5	92.0	92.0	99.9	72.2
3300	90	107.7	107.7	107.9	107.9	114.2	94.6	102.6	102.6	102.7	102.7	107.7	91.9	97.0	97.0	97.2	97.2	100.8	89.2
3600	75	93.8	88.8	103.1	66.1	113.7	41.8	88.4	86.0	96.9	63.5	106.8	39.3	82.7	82.7	90.4	60.8	99.5	36.6
3600	80	98.3	98.3	103.8	84.9	114.2	61.6	93.3	93.3	97.7	82.2	107.4	59.1	88.0	88.0	91.3	79.3	100.2	56.4
3600	85	104.4	104.4	105.5	104.3	114.6	81.3	99.2	99.2	99.6	99.6	107.8	78.8	93.7	93.7	93.7	93.7	100.7	76.1
3600	90	110.6	110.6	110.7	110.7	115.6	99.9	105.1	105.1	105.3	105.3	108.9	97.2	99.3	99.3	99.5	99.5	101.9	94.4

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2400	75	71.8	62.7	80.0	47.7	88.7	31.5	66.2	59.9	73.6	44.9	81.4	28.8
2400	80	73.5	73.5	80.4	60.8	89.1	44.7	68.6	68.6	74.0	58.0	81.9	42.0
2400	85	78.1	78.1	81.0	73.2	89.4	57.9	73.0	73.0	74.8	70.3	82.3	55.1
2400	90	82.8	82.8	83.0	83.0	89.8	71.0	77.5	77.5	77.7	77.7	82.7	67.6
2700	75	73.3	67.2	81.2	50.3	89.8	32.1	67.4	64.2	74.6	47.5	82.4	29.4
2700	80	76.2	76.2	81.7	64.5	90.3	47.0	71.0	71.0	75.1	61.5	82.9	44.2
2700	85	81.1	81.1	82.7	78.9	90.7	61.8	75.7	75.7	76.3	76.0	83.3	59.0
2700	90	86.1	86.1	86.2	86.2	91.3	75.8	80.4	80.4	80.5	80.5	84.0	72.8
3000	75	74.5	71.5	82.2	52.9	90.7	32.7	68.5	68.5	75.3	50.1	83.0	29.9
3000	80	78.6	78.6	82.8	68.4	91.3	49.2	73.0	73.0	76.0	65.4	83.6	46.4
3000	85	83.7	83.7	84.3	84.3	91.7	65.7	77.9	77.9	78.0	78.0	84.1	62.9
3000	90	88.8	88.8	88.9	88.9	92.5	81.0	82.7	82.7	82.8	82.8	85.0	78.0
3300	75	75.7	75.7	82.9	55.5	91.4	33.3	69.7	69.7	75.9	52.6	83.6	30.5
3300	80	80.6	80.6	83.8	72.4	92.1	51.5	74.8	74.8	76.8	69.3	84.2	48.6
3300	85	85.9	85.9	85.9	85.9	92.6	69.5	79.7	79.7	79.8	79.8	84.8	65.6
3300	90	91.1	91.1	91.3	91.3	93.6	86.3	84.7	84.7	84.8	84.8	86.0	83.2
3600	75	76.9	76.9	83.6	58.0	92.0	33.9	71.1	71.1	76.3	55.1	84.0	31.0
3600	80	82.3	82.3	84.6	76.3	92.7	53.7	76.2	76.2	77.5	73.2	84.7	50.8
3600	85	87.7	87.7	87.9	87.9	93.3	72.3	81.3	81.3	81.4	81.4	85.4	69.1
3600	90	93.1	93.1	93.2	93.2	94.6	91.5	86.4	86.4	86.5	86.5	86.9	86.9

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 14. Gross cooling capacities 8.5 tons standard efficiency - three phase WSC102H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2720	75	94.0	78.7	104.8	60.7	116.6	42.1	89.2	76.4	99.5	58.3	110.6	39.7	84.1	73.8	93.9	55.8	104.2	37.2
2720	80	94.4	92.8	105.2	75.8	116.8	57.3	89.8	89.8	99.8	73.4	110.8	54.9	85.0	85.0	94.2	70.9	104.5	52.4
2720	85	97.5	97.5	105.4	90.8	117.1	72.4	93.5	93.5	100.1	88.4	111.1	70.0	89.2	89.2	94.5	85.9	104.9	67.6
2720	90	103.0	103.0	106.0	104.8	117.4	87.6	98.8	98.8	100.9	100.9	111.4	85.2	94.4	94.4	95.5	95.5	105.2	82.7
3060	75	96.0	84.3	106.9	63.9	118.7	43.0	90.9	81.8	101.3	61.4	112.4	40.5	85.7	79.2	95.4	58.9	105.7	37.9
3060	80	96.9	96.9	107.3	80.9	118.9	60.1	92.1	92.1	101.7	78.4	112.6	57.6	87.2	87.2	95.8	75.9	106.1	55.0
3060	85	101.6	101.6	107.6	97.8	119.3	77.1	97.3	97.3	102.1	95.3	113.1	74.7	92.7	92.7	96.3	91.5	106.5	72.1
3060	90	107.4	107.4	108.7	108.7	119.6	94.1	102.9	102.9	103.5	103.5	113.4	91.7	98.1	98.1	98.1	98.1	106.9	89.1
3400	75	97.6	89.7	108.6	67.1	120.4	43.8	92.3	85.9	102.8	64.5	113.8	41.3	87.0	83.2	96.7	61.9	106.9	38.6
3400	80	99.2	99.2	109.0	85.9	120.7	62.8	94.5	94.5	103.2	83.4	114.2	60.3	90.0	90.0	97.2	80.8	107.4	57.7
3400	85	105.1	105.1	109.4	103.4	121.1	81.8	100.5	100.5	103.8	100.7	114.6	79.3	95.6	95.6	97.8	97.8	107.9	76.7
3400	90	111.2	111.2	111.3	111.3	121.5	100.7	106.4	106.4	106.3	106.3	115.0	98.2	101.3	101.3	101.5	101.5	108.3	95.5
3740	75	99.0	93.7	110.1	70.2	121.8	44.6	93.7	91.0	104.0	67.6	115.0	42.0	88.1	88.1	97.7	64.9	107.9	39.3
3740	80	101.7	101.7	110.5	91.0	122.2	65.6	97.3	97.3	104.5	88.3	115.5	63.0	92.3	92.3	98.2	85.7	108.5	60.3
3740	85	108.2	108.2	111.1	110.0	122.6	86.4	103.3	103.3	105.3	105.3	116.0	83.8	98.2	98.2	99.3	99.3	109.0	81.2
3740	90	114.5	114.5	114.7	114.7	123.0	107.2	109.4	109.4	109.6	109.6	116.4	104.6	104.1	104.1	104.2	104.2	109.4	101.9
4080	75	100.3	98.8	111.3	73.3	122.9	45.4	94.9	94.9	105.1	70.6	115.9	42.7	89.2	89.2	98.6	67.9	108.6	40.0
4080	80	104.5	104.5	111.8	95.9	123.4	68.3	99.5	99.5	105.6	93.3	116.5	65.6	94.3	94.3	99.1	90.5	109.4	62.9
4080	85	110.9	110.9	112.7	112.7	123.9	91.0	105.8	105.8	106.8	106.8	117.1	88.4	100.4	100.4	100.7	100.7	109.9	85.7
4080	90	117.4	117.4	117.6	117.6	124.3	113.7	112.1	112.1	112.2	112.2	117.5	109.0	106.4	106.4	106.6	106.6	110.4	106.1

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2720	75	78.8	71.2	87.9	53.2	97.5	34.6	73.1	67.4	81.6	50.5	90.3	31.8
2720	80	79.9	79.9	88.3	68.3	97.9	49.8	74.9	74.9	82.0	65.6	90.8	47.1
2720	85	84.6	84.6	88.7	82.2	98.3	65.0	79.7	79.7	82.5	79.3	91.2	62.3
2720	90	89.7	89.7	90.0	90.0	98.6	80.1	84.5	84.5	84.6	84.6	91.6	77.4
3060	75	80.1	75.3	89.3	56.2	98.8	35.3	74.3	72.4	82.7	53.4	91.3	32.5
3060	80	82.5	82.5	89.7	73.2	99.2	52.4	77.4	77.4	83.1	70.4	91.9	49.6
3060	85	87.8	87.8	90.3	88.7	99.7	69.5	82.5	82.5	83.9	83.9	92.3	66.7
3060	90	93.0	93.0	93.2	93.2	100.0	86.5	87.5	87.5	87.6	87.6	92.7	83.7
3400	75	81.3	80.3	90.3	59.2	99.7	35.9	75.3	75.3	83.5	56.3	92.0	33.1
3400	80	85.0	85.0	90.8	78.1	100.3	55.0	79.6	79.6	84.0	75.2	92.7	52.2
3400	85	90.4	90.4	91.7	91.7	100.8	74.0	84.8	84.8	85.2	85.2	93.2	71.1
3400	90	95.9	95.9	96.0	96.0	101.2	92.9	90.0	90.0	90.1	90.1	93.7	88.1
3740	75	82.4	82.4	91.2	62.1	100.4	36.6	76.3	76.3	84.1	59.2	92.6	33.7
3740	80	87.0	87.0	91.6	82.9	101.2	57.6	81.4	81.4	84.6	78.1	93.4	54.7
3740	85	92.7	92.7	93.0	93.0	101.7	78.4	86.7	86.7	86.6	86.6	93.9	75.6
3740	90	98.3	98.3	98.4	98.4	102.2	97.1	92.1	92.1	92.1	92.1	94.5	94.0
4080	75	83.3	83.3	91.8	65.0	101.1	37.2	77.2	77.2	84.6	62.1	93.0	34.3
4080	80	88.8	88.8	92.4	85.7	101.9	60.1	82.9	82.9	85.2	82.5	93.9	57.2
4080	85	94.6	94.6	94.4	94.4	102.4	82.9	88.4	88.4	88.5	88.5	94.4	79.9
4080	90	100.4	100.4	100.5	100.5	103.1	103.1	93.8	93.8	93.9	93.9	95.3	95.3

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 15. Gross cooling capacities 10 tons standard efficiency - three phase WSC120H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
3200	75	109.4	92.2	121.1	70.6	133.2	48.3	103.1	89.2	114.2	67.6	125.6	45.3	96.4	85.9	106.7	64.4	117.3	42.2
3200	80	110.5	108.9	121.4	88.4	133.6	66.2	104.6	104.6	114.6	85.4	126.0	63.2	98.2	98.2	107.1	82.1	117.9	60.1
3200	85	115.3	115.3	121.9	106.0	134.0	84.0	110.0	110.0	115.1	102.0	126.5	81.0	104.1	104.1	107.8	98.7	118.3	77.9
3200	90	121.6	121.6	123.2	122.6	134.3	101.7	116.0	116.0	116.7	116.7	126.8	98.8	109.9	109.9	110.0	110.0	118.7	95.7
3600	75	111.6	98.7	123.2	74.3	135.2	49.2	105.1	94.4	116.1	71.3	127.3	46.2	98.2	90.9	108.3	68.0	118.7	43.0
3600	80	113.5	113.5	123.6	94.3	135.7	69.3	107.6	107.6	116.5	91.2	127.9	66.4	101.6	101.6	108.8	87.9	119.4	63.2
3600	85	119.8	119.8	124.3	113.0	136.2	89.4	114.1	114.1	117.4	109.7	128.4	86.4	107.8	107.8	109.9	106.3	119.9	83.2
3600	90	126.3	126.3	126.5	126.5	136.5	109.3	120.4	120.4	120.6	120.6	128.8	106.4	113.9	113.9	114.0	114.0	120.5	103.2
4000	75	113.5	103.7	124.9	78.0	136.8	50.1	106.9	100.3	117.6	74.8	128.7	47.1	99.8	96.7	109.6	71.5	119.9	43.8
4000	80	116.8	116.8	125.4	100.1	137.4	72.5	111.0	111.0	118.1	97.0	129.4	69.5	104.5	104.5	110.1	93.7	120.7	66.2
4000	85	123.6	123.6	126.5	120.7	137.9	94.7	117.5	117.5	119.4	117.4	129.9	91.7	110.9	110.9	111.7	111.7	121.2	88.5
4000	90	130.3	130.3	130.5	130.5	138.4	116.9	124.1	124.1	124.2	124.2	130.5	113.9	117.2	117.2	117.3	117.3	121.9	108.9
4400	75	115.2	109.7	126.4	81.6	138.1	51.0	108.4	106.2	118.8	78.4	129.8	47.9	101.2	101.2	110.6	75.0	120.8	44.6
4400	80	119.9	119.9	126.9	105.9	138.9	75.6	113.7	113.7	119.4	102.8	130.6	72.6	107.0	107.0	111.3	97.5	121.7	69.3
4400	85	126.8	126.8	128.4	128.4	139.4	100.1	120.5	120.5	121.2	121.2	131.2	97.0	113.5	113.5	113.6	113.6	122.3	93.8
4400	90	133.8	133.8	134.0	134.0	140.0	122.7	127.2	127.2	127.4	127.4	132.0	119.5	120.0	120.0	120.1	120.1	123.3	115.9
4800	75	116.7	115.6	127.6	85.1	139.3	51.9	109.9	109.9	119.8	81.9	130.7	48.8	102.5	102.5	111.5	78.5	121.5	45.4
4800	80	122.5	122.5	128.2	110.0	140.1	78.7	116.1	116.1	120.5	106.5	131.7	75.6	109.1	109.1	112.3	102.8	122.6	72.3
4800	85	129.7	129.7	130.3	130.3	140.6	105.4	123.0	123.0	123.1	123.1	132.2	102.3	115.8	115.8	115.9	115.9	123.1	99.0
4800	90	136.8	136.8	137.0	137.0	141.5	129.9	129.9	129.9	130.1	130.1	133.3	126.5	122.4	122.4	122.5	122.5	124.5	122.9

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
3200	75	89.4	81.4	98.9	61.1	108.5	38.9	82.3	77.8	90.7	57.7	99.2	35.5
3200	80	92.2	92.2	99.3	78.8	109.2	56.9	85.8	85.8	91.1	75.4	100.0	53.5
3200	85	97.8	97.8	100.2	95.2	109.7	74.7	91.1	91.1	92.2	91.5	100.5	71.3
3200	90	103.4	103.4	103.6	103.6	110.1	92.4	96.3	96.3	96.5	96.5	101.0	87.6
3600	75	91.0	87.2	100.2	64.6	109.6	39.7	83.6	83.5	91.7	61.2	100.1	36.3
3600	80	95.2	95.2	100.7	84.6	110.5	59.9	88.4	88.4	92.3	79.5	101.0	56.5
3600	85	101.1	101.1	102.0	102.0	111.0	79.9	93.9	93.9	94.0	94.0	101.5	76.5
3600	90	106.9	106.9	107.0	107.0	111.6	98.3	99.3	99.3	99.4	99.4	102.3	94.5
4000	75	92.4	92.4	101.2	68.1	110.5	40.5	85.0	85.0	92.5	64.6	100.7	37.0
4000	80	97.7	97.7	101.9	88.5	111.5	62.9	90.5	90.5	93.2	84.7	101.7	59.4
4000	85	103.8	103.8	103.9	103.9	112.0	85.2	96.2	96.2	96.3	96.3	102.3	81.7
4000	90	109.7	109.7	109.9	109.9	112.9	105.2	101.7	101.7	101.8	101.8	103.4	101.4
4400	75	93.8	93.8	102.0	71.5	111.3	41.2	86.5	86.5	93.1	68.0	101.2	37.7
4400	80	99.9	99.9	102.9	93.7	112.3	65.9	92.3	92.3	94.1	89.8	102.3	62.4
4400	85	106.1	106.1	106.2	106.2	112.9	90.4	98.0	98.0	98.1	98.1	102.9	84.5
4400	90	112.2	112.2	112.3	112.3	114.1	112.2	103.7	103.7	103.8	103.8	104.4	104.4
4800	75	95.2	95.2	102.7	75.0	111.8	42.0	87.9	87.9	93.5	71.3	101.6	38.4
4800	80	101.7	101.7	103.7	98.9	112.9	68.9	93.8	93.8	94.8	94.8	102.8	65.3
4800	85	108.0	108.0	108.1	108.1	113.5	93.2	99.6	99.6	99.7	99.7	103.5	89.1
4800	90	114.2	114.2	114.3	114.3	115.2	115.2	105.4	105.4	105.5	105.5	105.5	105.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 16. Gross cooling capacities 3 tons - high efficiency high stage - three phase W/DHC036H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	33.4	26.8	37.6	20.7	42.1	14.4	31.0	25.4	35.1	19.4	39.3	13.1	28.6	24.0	32.4	18.0	36.4	11.7
960	80	33.5	31.8	37.7	25.9	42.2	19.7	31.2	30.4	35.2	24.6	39.4	18.3	28.8	28.8	32.6	23.2	36.5	17.0
960	85	34.5	34.5	37.8	31.1	42.3	24.9	32.6	32.6	35.3	29.8	39.6	23.6	30.5	30.5	32.6	28.4	36.7	22.2
960	90	36.6	36.6	37.9	36.1	42.4	30.2	34.7	34.7	35.5	34.7	39.7	28.8	32.5	32.5	32.9	32.9	36.8	27.4
1080	75	34.1	28.7	38.4	21.8	42.8	14.7	31.7	27.3	35.7	20.4	39.9	13.3	29.1	25.6	33.0	19.0	36.9	11.9
1080	80	34.4	34.3	38.5	27.7	43.0	20.6	32.0	32.0	35.9	26.3	40.1	19.3	29.8	29.8	33.1	24.9	37.1	17.9
1080	85	36.2	36.2	38.6	33.5	43.1	26.6	34.1	34.1	36.0	31.9	40.3	25.2	31.9	31.9	33.3	30.5	37.3	23.8
1080	90	38.4	38.4	38.9	38.9	43.2	32.4	36.3	36.3	36.4	36.4	40.4	31.1	34.0	34.0	34.1	34.1	37.4	29.6
1200	75	34.7	30.4	39.0	22.9	43.5	15.0	32.2	28.9	36.2	21.5	40.4	13.6	29.6	27.4	33.4	20.0	37.3	12.1
1200	80	35.2	35.2	39.1	29.4	43.6	21.6	33.1	33.1	36.4	28.0	40.6	20.2	30.8	30.8	33.5	26.5	37.5	18.7
1200	85	37.6	37.6	39.3	35.7	43.8	28.2	35.4	35.4	36.6	34.2	40.8	26.8	33.0	33.0	33.8	32.7	37.7	25.3
1200	90	40.0	40.0	40.1	40.1	43.9	34.7	37.7	37.7	37.8	37.8	41.0	33.3	35.3	35.3	35.3	35.3	37.9	31.8
1320	75	35.3	32.1	39.5	24.0	43.9	15.3	32.7	30.6	36.7	22.5	40.8	13.8	30.0	29.1	33.7	21.0	37.6	12.3
1320	80	36.4	36.4	39.7	31.2	44.2	22.5	34.1	34.1	36.8	29.7	41.1	21.1	31.7	31.7	33.9	28.2	37.8	19.6
1320	85	38.9	38.9	40.0	38.0	44.4	29.8	36.5	36.5	37.2	36.5	41.3	28.3	34.0	34.0	34.3	34.3	38.0	26.8
1320	90	41.3	41.3	41.4	41.4	44.5	36.9	38.9	38.9	39.0	39.0	41.5	35.5	36.4	36.4	36.4	36.4	38.3	33.7
1440	75	35.7	33.9	39.9	25.0	44.4	15.5	33.1	32.4	37.0	23.5	41.2	14.1	30.3	30.3	33.9	22.0	37.8	12.6
1440	80	37.4	37.4	40.1	32.9	44.6	23.5	35.0	35.0	37.2	31.4	41.4	22.0	32.5	32.5	34.2	29.5	38.1	20.5
1440	85	40.0	40.0	40.6	40.3	44.8	31.3	37.5	37.5	37.7	37.7	41.6	29.9	34.9	34.9	34.9	34.9	38.3	28.3
1440	90	42.6	42.6	42.6	42.6	45.0	39.2	40.0	40.0	40.1	40.1	41.9	37.3	37.3	37.3	37.4	37.4	38.6	35.8

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	26.1	22.6	29.6	16.5	33.3	10.3	23.4	20.9	26.7	15.1	30.1	8.8
960	80	26.3	26.3	29.8	21.8	33.5	15.5	24.1	24.1	26.8	20.3	30.3	14.1
960	85	28.3	28.3	29.9	26.7	33.7	20.8	26.0	26.0	27.0	25.2	30.4	19.3
960	90	30.3	30.3	30.4	30.4	33.8	26.0	27.9	27.9	27.9	27.9	30.6	24.5
1080	75	26.5	24.1	30.1	17.5	33.7	10.5	23.7	22.5	27.0	16.0	30.4	9.0
1080	80	27.5	27.5	30.2	23.4	33.9	16.4	25.1	25.1	27.2	21.9	30.6	14.9
1080	85	29.5	29.5	30.4	29.0	34.1	22.3	27.0	27.0	27.4	27.4	30.8	20.8
1080	90	31.6	31.6	31.7	31.7	34.2	28.2	29.0	29.0	29.1	29.1	30.9	26.4
1200	75	26.9	25.8	30.4	18.5	34.0	10.7	24.0	24.0	27.2	16.9	30.5	9.1
1200	80	28.4	28.4	30.5	25.0	34.3	17.3	25.8	25.8	27.4	23.1	30.8	15.7
1200	85	30.6	30.6	30.9	30.9	34.5	23.8	27.9	27.9	27.9	27.9	31.0	22.3
1200	90	32.7	32.7	32.8	32.8	34.6	30.0	30.0	30.0	30.0	30.0	31.2	28.4
1320	75	27.2	27.2	30.6	19.5	34.2	10.8	24.3	24.3	27.3	17.9	30.6	9.3
1320	80	29.2	29.2	30.8	26.3	34.5	18.1	26.5	26.5	27.6	24.6	30.9	16.5
1320	85	31.4	31.4	31.5	31.5	34.7	25.3	28.6	28.6	28.7	28.7	31.1	23.7
1320	90	33.7	33.7	33.7	33.7	35.0	32.1	30.7	30.7	30.8	30.8	31.5	30.4
1440	75	27.5	27.5	30.7	20.4	34.4	11.0	24.8	24.8	27.4	18.8	30.7	9.4
1440	80	29.8	29.8	31.0	27.8	34.7	18.9	27.0	27.0	27.7	26.1	31.0	17.3
1440	85	32.2	32.2	32.2	32.2	34.9	26.8	29.2	29.2	29.3	29.3	31.3	24.7
1440	90	34.5	34.5	34.5	34.5	35.3	34.1	31.4	31.4	31.5	31.5	31.7	31.7

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 17. Gross cooling capacities 3 tons - high efficiency low stage - three phase W/DHC036H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
600	75	22.7	17.5	25.9	13.7	29.3	9.9	21.0	16.4	24.0	12.7	27.2	8.8
600	80	22.7	20.6	25.9	17.1	29.3	13.2	21.0	19.6	24.1	16.0	27.3	12.2
600	85	22.9	22.9	26.0	20.4	29.4	16.6	21.5	21.5	24.1	19.3	27.4	15.5
600	90	24.4	24.4	25.9	23.5	29.4	19.9	23.0	23.0	24.1	22.5	27.5	18.8
720	75	23.6	19.5	26.9	14.9	30.3	10.2	21.8	18.3	24.9	13.9	28.1	9.2
720	80	23.7	23.2	27.0	18.9	30.4	14.3	21.9	21.9	25.0	17.8	28.2	13.2
720	85	24.8	24.8	27.0	22.9	30.5	18.3	23.3	23.3	25.0	21.7	28.3	17.2
720	90	26.5	26.5	27.1	26.7	30.5	22.3	24.9	24.9	25.1	25.1	28.4	21.2
840	75	24.3	21.3	27.6	16.1	31.0	10.6	22.4	20.1	25.5	15.0	28.7	9.5
840	80	24.7	24.7	27.7	20.7	31.2	15.3	23.0	23.0	25.6	19.6	28.9	14.2
840	85	26.4	26.4	27.8	25.2	31.3	20.0	24.8	24.8	25.7	24.0	29.0	18.8
840	90	28.2	28.2	28.3	28.3	31.3	24.6	26.5	26.5	26.6	26.6	29.1	23.5
960	75	24.9	23.1	28.1	17.2	31.5	10.9	22.8	21.9	25.9	16.0	29.1	9.7
960	80	25.9	25.9	28.3	22.5	31.7	16.2	24.1	24.1	26.0	21.1	29.3	15.1
960	85	27.8	27.8	28.5	27.6	31.9	21.6	26.0	26.0	26.3	26.3	29.5	20.4
960	90	29.7	29.7	29.8	29.8	32.0	26.7	27.8	27.8	27.9	27.9	29.6	25.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 18. Gross cooling capacities 4 tons - high stage - three phase W/DHC048H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1280	75	45.0	37.2	50.3	28.7	55.8	19.9	42.1	35.7	47.0	27.2	52.2	18.4	38.9	34.1	43.6	25.6	48.3	16.8
1280	80	45.2	43.9	50.5	35.9	56.0	27.2	42.3	42.3	47.3	34.4	52.4	25.6	39.3	39.3	43.9	32.8	48.6	24.1
1280	85	46.3	46.3	50.7	43.1	56.2	34.4	43.9	43.9	47.5	41.6	52.7	32.9	41.3	41.3	44.1	40.0	48.9	31.3
1280	90	49.1	49.1	50.9	49.6	56.4	41.6	46.6	46.6	47.8	47.8	53.0	40.1	43.9	43.9	44.5	44.5	49.2	38.5
1440	75	45.9	39.8	51.2	30.2	56.7	20.3	42.8	38.2	47.8	28.7	52.9	18.7	39.5	36.6	44.2	27.0	48.8	17.1
1440	80	46.3	46.3	51.5	38.3	57.0	28.4	43.3	43.3	48.1	36.7	53.2	26.9	40.2	40.2	44.5	35.1	49.3	25.3
1440	85	48.4	48.4	51.7	46.4	57.2	36.6	45.8	45.8	48.3	44.2	53.5	35.0	43.0	43.0	44.8	42.5	49.6	33.4
1440	90	51.3	51.3	52.1	52.1	57.5	44.7	48.6	48.6	48.9	48.9	53.8	43.1	45.7	45.7	45.7	45.7	49.8	41.5
1600	75	46.7	42.4	52.0	31.7	57.4	20.6	43.4	40.7	48.4	30.1	53.4	19.0	40.1	38.1	44.7	28.4	49.3	17.4
1600	80	47.3	47.3	52.3	40.7	57.7	29.7	44.4	44.4	48.8	39.1	53.9	28.1	41.5	41.5	45.0	37.4	49.7	26.5
1600	85	50.2	50.2	52.5	49.0	58.0	38.7	47.4	47.4	49.1	47.3	54.2	37.2	44.4	44.4	45.4	45.4	50.1	35.5
1600	90	53.2	53.2	53.3	53.3	58.3	47.7	50.3	50.3	50.4	50.4	54.5	46.2	47.2	47.2	47.2	47.2	50.4	44.5
1760	75	47.3	44.9	52.6	33.1	57.9	21.0	44.0	42.4	48.9	31.5	53.9	19.4	40.5	40.5	45.1	29.8	49.6	17.7
1760	80	48.6	48.6	52.9	43.0	58.4	31.0	45.7	45.7	49.3	41.4	54.4	29.4	42.6	42.6	45.4	39.6	50.1	27.7
1760	85	51.7	51.7	53.3	52.1	58.7	40.9	48.7	48.7	49.8	49.8	54.7	39.3	45.5	45.5	46.0	46.0	50.5	37.6
1760	90	54.9	54.8	54.9	54.9	59.0	50.8	51.8	51.8	51.8	51.8	55.1	49.2	48.4	48.4	48.5	48.5	50.8	46.5
1920	75	47.9	46.6	53.1	34.6	58.4	21.3	44.5	44.5	49.3	32.9	54.2	19.7	40.9	40.9	45.3	31.1	49.8	17.9
1920	80	49.8	49.8	53.5	45.3	58.9	32.2	46.8	46.8	49.7	43.6	54.8	30.6	43.6	43.6	45.7	40.9	50.4	28.8
1920	85	53.1	53.1	54.0	54.0	59.3	43.1	49.9	49.9	50.4	50.4	55.2	41.4	46.6	46.6	46.6	46.6	50.8	39.7
1920	90	56.3	56.3	56.4	56.4	59.6	53.8	53.0	53.0	53.1	53.1	55.5	51.2	49.5	49.5	49.6	49.6	51.2	49.3

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1280	75	35.6	31.9	40.0	24.0	44.2	15.2	32.1	30.1	36.1	22.3	39.9	13.5
1280	80	36.1	36.1	40.3	31.2	44.6	22.5	33.2	33.2	36.4	29.5	40.3	20.8
1280	85	38.5	38.5	40.5	37.7	44.9	29.7	35.5	35.5	36.7	35.9	40.6	28.0
1280	90	41.0	41.0	41.0	41.0	45.2	36.9	37.8	37.8	37.9	37.9	40.9	35.2
1440	75	36.1	34.2	40.4	25.3	44.6	15.4	32.5	32.3	36.4	23.6	40.1	13.7
1440	80	37.4	37.4	40.8	33.4	45.1	23.6	34.2	34.2	36.7	31.7	40.6	21.9
1440	85	40.0	40.0	41.1	40.7	45.4	31.8	36.7	36.7	37.2	37.2	40.9	30.0
1440	90	42.5	42.5	42.6	42.6	45.7	39.9	39.1	39.1	39.2	39.2	41.2	37.2
1600	75	36.6	36.4	40.8	26.7	44.9	15.7	32.9	32.9	36.6	24.9	40.2	13.9
1600	80	38.4	38.4	41.1	35.7	45.4	24.8	35.1	35.1	36.9	32.9	40.8	23.0
1600	85	41.1	41.1	41.6	41.6	45.8	33.8	37.6	37.6	37.7	37.7	41.1	32.0
1600	90	43.8	43.8	43.9	43.9	46.1	41.9	40.1	40.1	40.2	40.2	41.5	39.9
1760	75	36.9	36.9	41.0	28.0	45.1	15.9	33.2	33.2	36.7	26.1	40.3	14.1
1760	80	39.4	39.4	41.3	36.9	45.7	25.9	35.8	35.8	37.1	34.9	40.9	24.1
1760	85	42.1	42.1	42.2	42.2	46.0	35.9	38.4	38.4	38.5	38.5	41.2	34.0
1760	90	44.9	44.9	44.9	44.9	46.4	44.6	41.0	41.0	41.0	41.0	41.7	41.7
1920	75	37.3	37.3	41.1	29.3	45.2	16.1	33.7	33.7	36.7	27.4	40.3	14.3
1920	80	40.1	40.1	41.6	39.0	45.8	27.1	36.4	36.4	37.2	36.8	40.9	25.2
1920	85	43.0	43.0	43.0	43.0	46.2	37.9	39.0	39.0	39.1	39.1	41.3	34.8
1920	90	45.8	45.8	45.8	45.8	46.7	46.7	41.6	41.6	41.7	41.7	42.0	42.0

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 19. Gross cooling capacities 4 tons - low stage - three phase W/DHC048H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
800	75	30.3	23.9	34.3	18.9	38.5	13.6	30.3	23.9	34.3	18.9	38.5	13.6
800	80	30.3	28.0	34.5	23.3	38.7	18.1	30.3	28.0	34.5	23.3	38.7	18.1
800	85	30.3	30.3	34.6	27.7	38.9	22.5	30.3	30.3	34.6	27.7	38.9	22.5
800	90	32.3	32.3	34.6	31.8	39.0	27.0	32.3	32.3	34.6	31.8	39.0	27.0
960	75	31.4	26.5	35.5	20.4	39.7	14.0	31.4	26.5	35.5	20.4	39.7	14.0
960	80	31.5	31.4	35.7	25.7	39.9	19.4	31.5	31.4	35.7	25.7	39.9	19.4
960	85	32.8	32.8	35.8	31.0	40.1	24.8	32.8	32.8	35.8	31.0	40.1	24.8
960	90	34.9	34.9	35.9	35.9	40.3	30.1	34.9	34.9	35.9	35.9	40.3	30.1
1120	75	32.2	28.6	36.3	21.8	40.4	14.4	32.2	28.6	36.3	21.8	40.4	14.4
1120	80	32.5	32.5	36.6	28.1	40.8	20.7	32.5	32.5	36.6	28.1	40.8	20.7
1120	85	34.8	34.8	36.8	33.8	41.1	26.9	34.8	34.8	36.8	33.8	41.1	26.9
1120	90	37.1	37.1	37.1	37.1	41.3	33.2	37.1	37.1	37.1	37.1	41.3	33.2
1280	75	32.9	31.0	37.0	23.3	41.0	14.7	32.9	31.0	37.0	23.3	41.0	14.7
1280	80	34.0	34.0	37.3	30.4	41.5	21.9	34.0	34.0	37.3	30.4	41.5	21.9
1280	85	36.4	36.4	37.5	36.9	41.8	29.1	36.4	36.4	37.5	36.9	41.8	29.1
1280	90	38.9	38.9	38.9	38.9	42.0	36.2	38.9	38.9	38.9	38.9	42.0	36.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 20. Gross cooling capacities 5 tons - high stage - three phase W/DHC060H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1600	75	56.2	46.7	62.8	36.0	69.9	25.0	52.7	44.9	59.0	34.2	65.6	23.2	49.1	43.0	54.9	32.3	61.0	21.3
1600	80	56.6	55.2	63.1	45.0	70.1	34.0	53.2	53.2	59.2	43.2	65.8	32.3	49.7	49.7	55.2	41.4	61.3	30.4
1600	85	58.5	58.5	63.2	54.0	70.3	43.1	55.6	55.6	59.5	52.2	66.0	41.3	52.5	52.5	55.4	50.4	61.5	39.5
1600	90	61.9	61.9	63.7	62.5	70.4	52.1	58.9	58.9	60.0	60.0	66.3	50.3	55.7	55.7	56.2	56.2	61.8	48.5
1800	75	57.3	49.9	64.0	37.9	71.1	25.5	53.7	48.1	60.0	36.0	66.6	23.6	49.9	46.2	55.7	34.1	61.8	21.7
1800	80	58.1	58.1	64.3	48.0	71.3	35.7	54.6	54.6	60.2	46.2	66.8	33.8	51.0	51.0	56.0	44.2	62.1	31.9
1800	85	61.0	61.0	64.5	58.1	71.5	45.8	57.9	57.9	60.6	56.3	67.1	44.0	54.5	54.5	56.4	53.8	62.3	42.1
1800	90	64.6	64.6	65.3	65.3	71.7	56.0	61.4	61.4	61.6	61.6	67.3	54.2	57.9	57.9	58.0	58.0	62.6	52.3
2000	75	58.3	53.1	64.9	39.7	72.0	25.9	54.5	51.2	60.7	37.8	67.3	24.0	50.6	48.4	56.3	35.8	62.3	22.0
2000	80	59.5	59.5	65.2	51.0	72.3	37.3	56.2	56.2	61.0	49.1	67.6	35.4	52.7	52.7	56.6	47.1	62.7	33.4
2000	85	63.2	63.2	65.7	62.2	72.5	48.6	59.8	59.8	61.6	59.7	67.9	46.7	56.2	56.2	57.3	57.3	63.0	44.7
2000	90	67.0	67.0	67.0	67.0	72.8	59.8	63.5	63.5	63.6	63.6	68.2	58.0	59.7	59.7	59.8	59.8	63.4	56.0
2200	75	59.2	56.3	65.7	41.5	72.8	26.4	55.3	53.7	61.4	39.6	67.9	24.4	51.2	51.2	56.8	37.5	62.8	22.4
2200	80	61.2	61.2	66.0	53.9	73.1	38.9	57.7	57.7	61.7	52.0	68.3	36.9	54.0	54.0	57.1	50.0	63.2	34.9
2200	85	65.1	65.1	66.7	65.6	73.4	51.3	61.5	61.5	62.5	62.5	68.6	49.4	57.7	57.7	58.1	58.1	63.5	47.4
2200	90	69.0	69.0	69.1	69.1	73.7	63.7	65.3	65.3	65.4	65.4	69.0	61.8	61.3	61.3	61.4	61.4	64.0	59.8
2400	75	59.9	58.8	66.4	43.3	73.4	26.8	56.0	56.0	61.9	41.3	68.4	24.8	51.8	51.8	57.1	39.2	63.1	22.7
2400	80	62.7	62.7	66.7	56.8	73.8	40.4	59.1	59.1	62.3	54.8	68.8	38.4	55.2	55.2	57.6	52.8	63.6	36.4
2400	85	66.7	66.7	67.7	67.7	74.1	54.0	63.0	63.0	63.4	63.4	69.1	52.0	58.9	58.9	59.0	59.0	63.9	50.0
2400	90	70.8	70.8	70.9	70.9	74.5	67.5	66.9	66.9	67.0	67.0	69.7	65.6	62.7	62.7	62.8	62.8	64.5	62.6

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1600	75	45.2	41.1	50.6	30.4	56.2	19.4	41.1	38.5	46.0	28.4	51.0	17.4
1600	80	46.0	46.0	50.9	39.4	56.5	28.5	42.6	42.6	46.3	37.4	51.3	26.5
1600	85	49.1	49.1	51.2	48.5	56.8	37.5	45.5	45.5	46.7	45.8	51.6	35.5
1600	90	52.2	52.2	52.3	52.3	57.0	46.6	48.4	48.4	48.5	48.5	51.9	44.6
1800	75	45.8	43.6	51.2	32.1	56.7	19.7	41.6	41.4	46.4	30.0	51.4	17.6
1800	80	47.7	47.7	51.5	42.3	57.1	30.0	43.9	43.9	46.7	40.2	51.7	27.9
1800	85	50.9	50.9	52.0	51.7	57.4	40.1	47.0	47.0	47.4	47.4	52.1	38.1
1800	90	54.1	54.1	54.2	54.2	57.7	50.3	50.0	50.0	50.1	50.1	52.4	48.3
2000	75	46.5	46.5	51.6	33.8	57.1	20.0	42.1	42.1	46.7	31.7	51.6	17.9
2000	80	49.0	49.0	52.0	45.1	57.5	31.4	45.0	45.0	47.1	43.0	52.0	29.3
2000	85	52.4	52.4	52.8	52.8	57.9	42.7	48.2	48.2	48.2	48.2	52.3	40.6
2000	90	55.7	55.7	55.8	55.8	58.3	54.0	51.3	51.3	51.4	51.4	52.8	51.0
2200	75	47.0	47.0	52.0	35.5	57.4	20.3	42.6	42.6	46.8	33.3	51.7	18.2
2200	80	50.2	50.2	52.4	47.9	57.9	32.9	45.9	45.9	47.3	44.8	52.2	30.7
2200	85	53.6	53.6	53.6	53.6	58.2	45.3	49.2	49.2	49.2	49.2	52.5	43.2
2200	90	57.1	57.1	57.1	57.1	58.8	56.8	52.4	52.4	52.4	52.4	53.3	53.3
2400	75	47.5	47.5	52.2	37.1	57.6	20.6	43.3	43.3	46.9	34.9	51.8	18.4
2400	80	51.1	51.1	52.7	49.7	58.1	34.3	46.7	46.7	47.6	47.3	52.3	32.1
2400	85	54.7	54.7	54.7	54.7	58.5	47.9	50.0	50.0	50.1	50.1	52.7	45.7
2400	90	58.2	58.2	58.3	58.3	59.3	59.3	53.3	53.3	53.3	53.3	53.6	53.6

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 21. Gross cooling capacities 5 tons - low stage - three phase W/DHC060H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1000	75	37.3	29.7	42.3	23.4	47.8	16.9	34.8	28.4	39.6	22.1	44.7	15.6
1000	80	37.3	35.2	42.4	29.0	47.9	22.5	34.8	33.6	39.7	27.7	44.8	21.1
1000	85	37.3	37.3	42.6	34.5	48.0	28.0	35.3	35.3	39.9	33.2	45.0	26.7
1000	90	39.6	39.6	42.5	39.9	48.1	33.6	37.6	37.6	39.9	38.6	45.1	32.3
1200	75	38.7	33.0	43.8	25.4	49.3	17.4	36.0	31.6	40.8	23.9	46.0	16.0
1200	80	38.8	38.8	44.0	32.0	49.4	24.2	36.1	36.1	41.0	30.6	46.1	22.7
1200	85	40.3	40.3	44.1	38.6	49.6	30.8	38.1	38.1	41.2	37.2	46.3	29.4
1200	90	42.9	42.9	44.2	44.2	49.7	37.5	40.6	40.6	41.4	41.4	46.5	36.1
1400	75	39.6	36.2	44.8	27.2	50.4	17.9	36.7	34.7	41.7	25.7	46.8	16.5
1400	80	40.1	40.1	45.1	35.0	50.6	25.8	37.6	37.6	41.9	33.5	47.1	24.3
1400	85	42.7	42.7	45.2	42.7	50.8	33.6	40.3	40.3	42.1	40.8	47.3	32.1
1400	90	45.5	45.5	45.8	45.8	51.0	41.4	43.0	43.0	43.1	43.1	47.5	39.9
1600	75	40.4	39.3	45.6	29.0	51.2	18.4	37.4	37.2	42.3	27.5	47.4	16.9
1600	80	41.8	41.8	45.9	37.9	51.4	27.4	39.2	39.2	42.6	36.3	47.7	25.8
1600	85	44.8	44.8	46.2	46.2	51.7	36.3	42.1	42.1	43.0	43.0	48.0	34.7
1600	90	47.8	47.8	47.9	47.9	51.9	45.2	45.0	45.0	45.1	45.1	48.3	43.6

Notes:
1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 22. Gross cooling capacities 6 tons high efficiency - stage 1 - three phase W/DHC074H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	29.6	25.5	33.6	19.8	37.7	13.5	27.6	24.4	31.4	18.8	35.3	12.4
	80	29.7	29.7	33.7	25.1	37.9	18.9	27.8	27.8	31.6	23.8	35.6	17.8
	85	31.4	31.4	33.8	29.9	38.1	24.2	29.8	29.8	31.6	28.9	35.8	23.2
	90	33.5	33.5	33.8	33.8	38.2	29.2	31.8	31.8	31.9	31.9	35.9	28.1
1200	75	30.8	29.1	34.8	22.0	38.8	14.1	28.7	28.0	32.4	21.0	36.2	13.0
	80	31.9	31.9	35.0	28.2	39.2	20.8	30.1	30.1	32.6	27.0	36.7	19.8
	85	34.2	34.2	35.1	34.6	39.4	27.5	32.4	32.4	32.9	32.9	36.9	26.5
	90	36.5	36.5	36.6	36.6	39.6	33.5	34.6	34.6	34.7	34.7	37.1	32.4
1440	75	31.7	31.7	35.5	24.2	39.5	14.6	29.5	29.5	33.1	22.5	36.8	13.5
	80	33.9	33.9	35.8	31.4	40.0	22.7	31.9	31.9	33.4	30.2	37.4	21.6
	85	36.4	36.4	36.4	36.4	40.3	30.1	34.3	34.3	34.4	34.4	37.7	28.9
	90	38.9	38.9	38.9	38.9	40.6	37.9	36.8	36.8	36.9	36.9	38.0	36.7
1680	75	32.8	32.8	36.1	25.6	40.0	15.1	30.7	30.7	33.5	24.3	37.1	14.0
	80	35.4	35.4	36.5	34.7	40.6	24.6	33.3	33.3	34.0	33.4	37.9	23.5
	85	38.1	38.1	38.1	38.1	41.0	33.0	35.9	35.9	35.9	35.9	38.3	31.8
	90	40.8	40.8	40.8	40.8	41.4	41.4	38.5	38.5	38.5	38.5	38.8	38.8
1920	75	33.9	33.9	36.5	27.4	40.3	15.6	31.7	31.7	33.9	26.1	37.3	14.4
	80	36.7	36.7	37.1	37.1	41.0	25.5	34.4	34.4	34.6	34.6	38.2	24.2
	85	39.5	39.5	39.5	39.5	41.5	36.0	37.1	37.1	37.1	37.1	38.7	34.7
	90	42.3	42.3	42.3	42.3	42.3	42.3	39.9	39.9	39.9	39.9	40.0	40.0
2100	75	34.6	34.6	36.8	28.8	40.5	16.0	32.3	32.3	34.1	27.4	37.4	14.8
	80	37.5	37.5	37.6	37.6	41.3	27.8	35.1	35.1	35.1	35.1	38.4	25.3
	85	40.3	40.3	40.4	40.4	41.8	38.1	37.9	37.9	37.9	37.9	39.0	36.8
	90	43.2	43.2	43.3	43.3	43.3	43.3	40.7	40.7	40.8	40.8	40.8	40.8

Notes:
1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 23. Gross cooling capacities 6 tons high efficiency - stage 2 - three phase W/DHC074H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
960	75	38.1	29.8	42.9	23.6	48.0	17.1	35.8	28.5	40.4	22.3	45.2	15.9
	80	38.0	34.7	43.0	28.9	48.1	22.5	35.8	33.4	40.5	27.7	45.2	21.2
	85	37.8	37.8	43.0	34.1	48.1	27.8	36.1	36.1	40.5	32.9	45.4	26.6
	90	40.0	40.0	43.0	39.0	48.2	33.1	38.2	38.2	40.5	37.8	45.5	31.9
1200	75	39.8	33.4	44.7	25.9	49.8	17.8	37.3	32.1	42.0	24.6	46.7	16.5
	80	39.9	39.8	44.9	32.5	49.9	24.5	37.5	37.5	42.1	31.2	46.9	23.2
	85	41.5	41.5	44.9	38.8	50.0	31.1	39.5	39.5	42.2	37.4	47.0	29.9
	90	44.0	44.0	45.0	45.0	50.2	37.8	41.9	41.9	42.4	42.4	47.1	36.5
1440	75	41.1	37.1	46.0	28.1	50.9	18.3	38.4	35.7	43.0	26.8	47.7	17.0
	80	41.7	41.7	46.1	36.1	51.1	26.4	39.5	39.5	43.2	34.3	48.0	25.1
	85	44.4	44.4	46.3	43.5	51.3	34.4	42.1	42.1	43.4	42.1	48.2	33.1
	90	47.1	47.1	47.2	47.2	51.4	41.9	44.7	44.7	44.8	44.8	48.3	40.5
1680	75	42.1	40.7	46.9	30.3	51.7	18.9	39.3	39.2	43.8	28.9	48.4	17.5
	80	43.8	43.8	47.1	39.1	52.0	28.3	41.4	41.4	44.0	37.6	48.7	26.9
	85	46.7	46.7	47.4	47.4	52.2	37.6	44.1	44.1	44.5	44.5	48.9	36.3
	90	49.5	49.5	49.6	49.6	52.4	46.2	46.9	46.9	47.0	47.0	49.2	44.8
1920	75	42.9	42.9	47.5	32.4	52.4	19.4	40.1	40.1	44.3	31.0	48.9	18.0
	80	45.5	45.5	47.8	42.3	52.7	30.1	42.9	42.9	44.6	40.8	49.3	28.7
	85	48.5	48.5	48.6	48.6	52.9	40.2	45.8	45.8	45.9	45.9	49.5	38.7
	90	51.5	51.5	51.6	51.6	53.3	50.6	48.7	48.7	48.8	48.8	49.9	49.1
2100	75	43.6	43.6	47.9	34.0	52.7	19.8	40.9	40.9	44.6	32.5	49.2	18.4
	80	46.6	46.6	48.3	44.8	53.1	31.5	43.9	43.9	45.0	43.2	49.6	30.1
	85	49.7	49.7	49.8	49.8	53.4	42.4	46.9	46.9	46.9	46.9	49.9	40.9
	90	52.8	52.8	52.8	52.8	53.8	53.8	49.9	49.9	49.9	49.9	50.5	50.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 24. Gross cooling capacities 6 tons - full load - three phase W/DHC074H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1920	75	72.1	56.8	80.7	44.8	89.7	32.2	68.0	54.7	76.0	42.6	84.5	30.0	63.6	52.4	71.2	40.4	79.0	27.8
	80	72.3	66.7	80.8	54.9	89.8	42.4	68.3	64.5	76.2	52.8	84.6	40.3	64.0	62.3	71.4	50.5	79.1	38.0
	85	73.6	73.6	80.9	65.0	89.9	52.6	70.2	70.2	76.4	62.9	84.7	50.4	66.6	66.6	71.5	60.6	79.3	48.2
	90	77.7	77.7	81.2	74.8	90.0	62.7	74.2	74.2	76.7	72.7	84.9	60.6	70.5	70.5	72.0	70.4	79.4	58.3
2160	75	73.8	60.6	82.4	47.0	91.4	32.8	69.5	58.4	77.5	44.7	85.9	30.6	64.9	56.1	72.4	42.4	80.2	28.3
	80	74.3	71.7	82.5	58.4	91.5	44.3	70.1	69.4	77.7	56.1	86.1	42.1	65.7	65.7	72.6	53.8	80.4	39.8
	85	77.0	77.0	82.7	69.7	91.6	55.7	73.3	73.3	78.0	67.5	86.2	53.5	69.4	69.4	72.9	64.9	80.5	51.2
	90	81.4	81.4	83.3	80.8	91.8	67.2	77.6	77.6	78.7	78.6	86.4	64.9	73.5	73.5	73.9	73.9	80.7	62.6
2400	75	75.2	64.3	83.8	49.1	92.8	33.3	70.7	62.0	78.7	46.8	87.1	31.1	66.0	59.3	73.4	44.5	81.2	28.7
	80	76.1	76.1	84.0	61.8	92.9	46.1	71.8	71.8	78.9	59.5	87.2	43.8	67.6	67.6	73.6	57.1	81.3	41.5
	85	80.0	80.0	84.3	74.1	93.1	58.8	76.0	76.0	79.3	71.8	87.4	56.6	71.8	71.8	74.1	69.4	81.5	54.2
	90	84.5	84.5	85.3	85.3	93.2	71.5	80.4	80.4	80.6	80.6	87.6	69.3	76.1	76.1	76.2	76.2	81.8	66.9
2640	75	76.4	67.6	84.9	51.2	93.9	33.9	71.8	65.2	79.7	48.8	88.0	31.5	66.9	62.7	74.2	46.4	81.9	29.2
	80	77.8	77.8	85.1	65.1	94.0	47.9	73.8	73.8	79.9	62.8	88.2	45.6	69.5	69.5	74.5	60.4	82.1	43.2
	85	82.5	82.5	85.7	78.7	94.2	61.9	78.4	78.4	80.6	76.3	88.4	59.6	73.9	73.9	75.2	73.8	82.3	57.2
	90	87.3	87.3	87.3	87.3	94.5	75.9	82.9	82.9	83.0	83.0	88.7	73.6	78.3	78.3	78.4	78.4	82.6	70.7
2880	75	77.5	71.1	85.9	53.2	94.8	34.4	72.7	68.7	80.5	50.8	88.8	32.0	67.7	66.2	74.8	48.4	82.5	29.6
	80	79.9	79.9	86.1	68.4	95.0	49.7	75.7	75.7	80.8	66.1	89.0	47.3	71.2	71.2	75.2	63.6	82.7	44.9
	85	84.8	84.8	86.9	83.2	95.2	65.0	80.4	80.4	81.7	80.8	89.2	62.6	75.7	75.7	76.2	76.2	82.9	60.2
	90	89.7	89.7	89.8	89.8	95.5	80.2	85.1	85.1	85.2	85.2	89.6	77.4	80.2	80.2	80.3	80.3	83.4	74.9

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1920	75	59.1	50.2	66.1	38.1	73.3	25.5	54.3	47.5	60.7	35.7	67.2	23.1
	80	59.6	59.6	66.3	48.2	73.4	35.7	55.1	55.1	60.9	45.8	67.3	33.3
	85	62.8	62.8	66.5	58.1	73.6	45.9	58.7	58.7	61.2	55.6	67.5	43.5
	90	66.5	66.5	67.1	67.1	73.8	56.0	62.2	62.2	62.3	62.3	67.7	53.6
2160	75	60.2	53.4	67.1	40.1	74.3	25.9	55.2	50.9	61.5	37.6	67.9	23.5
	80	61.4	61.4	67.3	51.5	74.4	37.4	57.1	57.1	61.7	49.0	68.0	35.0
	85	65.3	65.3	67.7	62.5	74.6	48.9	60.8	60.8	62.2	60.0	68.2	46.4
	90	69.2	69.2	69.3	69.3	74.8	60.3	64.4	64.4	64.6	64.6	68.5	57.8
2400	75	61.1	56.8	67.9	42.0	75.0	26.3	56.0	54.2	62.1	39.5	68.4	23.8
	80	63.4	63.4	68.1	54.7	75.1	39.1	58.8	58.8	62.3	52.2	68.6	36.6
	85	67.4	67.4	68.8	66.9	75.3	51.8	62.6	62.6	63.1	63.1	68.8	49.3
	90	71.4	71.4	71.5	71.5	75.6	64.5	66.3	66.3	66.4	66.4	69.1	61.5
2640	75	61.9	60.2	68.5	44.0	75.5	26.7	56.6	56.6	62.5	41.4	68.7	24.2
	80	65.1	65.1	68.8	57.9	75.7	40.8	60.2	60.2	62.8	54.9	68.9	38.2
	85	69.2	69.2	69.7	69.7	75.9	54.7	64.1	64.1	64.2	64.2	69.1	52.2
	90	73.3	73.3	73.4	73.4	76.3	68.2	67.9	67.9	68.0	68.0	69.7	65.5
2880	75	62.6	62.6	69.0	45.9	75.9	27.1	57.3	57.3	62.8	43.3	69.0	24.5
	80	66.5	66.5	69.4	60.6	76.2	42.4	61.4	61.4	63.3	57.9	69.2	39.8
	85	70.7	70.7	70.8	70.8	76.4	57.7	65.4	65.4	65.4	65.4	69.5	55.1
	90	74.9	74.9	75.0	75.0	77.0	72.3	69.2	69.2	69.2	69.2	70.2	69.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 25. Gross cooling capacities 7.5 tons high efficiency - stage 1 - three phase W/DHC092H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1200	75	33.1	29.8	37.2	23.1	41.5	15.1	31.2	28.8	35.2	22.1	39.2	14.1
	80	32.9	32.9	37.5	29.7	42.0	21.8	31.0	31.0	35.5	27.8	39.8	20.9
	85	34.2	34.2	37.8	35.3	42.3	28.5	32.7	32.7	35.7	34.2	40.1	27.6
	90	36.5	36.5	37.5	37.5	42.6	34.2	34.9	34.9	35.5	35.5	40.4	33.1
1500	75	34.2	34.2	38.4	25.8	42.5	15.8	32.2	32.2	36.2	24.8	40.0	14.7
	80	34.8	34.8	38.8	32.9	43.3	24.3	33.1	33.1	36.6	31.8	40.9	23.2
	85	37.3	37.3	39.0	39.0	43.7	32.7	35.5	35.5	36.8	36.8	41.3	31.7
	90	39.8	39.8	39.8	39.8	44.0	39.5	38.0	38.0	38.1	38.1	41.7	38.4
1800	75	35.0	35.0	39.2	28.5	43.2	16.4	32.9	32.9	36.9	27.4	40.5	15.3
	80	36.9	36.9	39.7	36.8	44.2	26.6	35.0	35.0	37.4	35.6	41.6	25.6
	85	39.6	39.6	40.1	40.1	44.6	36.7	37.7	37.7	37.8	37.8	42.2	33.9
	90	42.3	42.3	42.4	42.4	45.0	44.8	40.3	40.3	40.4	40.4	42.6	42.6
2100	75	35.8	35.8	39.8	29.5	43.6	17.1	33.7	33.7	37.4	28.2	40.8	15.9
	80	38.5	38.5	40.4	40.4	44.8	29.0	36.5	36.5	38.0	38.0	42.2	27.9
	85	41.4	41.4	41.5	41.5	45.4	38.6	39.3	39.3	39.4	39.4	42.8	37.4
	90	44.3	44.3	44.4	44.4	45.8	45.8	42.2	42.2	42.2	42.2	43.3	43.3
2400	75	36.9	36.9	40.3	31.6	43.9	17.7	34.8	34.8	37.8	30.2	41.0	16.5
	80	39.9	39.9	41.0	41.0	45.3	31.3	37.7	37.7	38.5	38.5	42.6	30.2
	85	42.9	42.9	42.9	42.9	46.0	42.1	40.7	40.7	40.7	40.7	43.3	40.8
	90	46.0	46.0	46.0	46.0	46.5	46.5	43.7	43.7	43.7	43.7	43.9	43.9
2625	75	37.6	37.6	40.6	33.2	44.0	18.1	35.4	35.4	38.0	31.7	41.0	16.9
	80	40.7	40.7	41.3	41.3	45.6	33.1	38.4	38.4	38.8	38.8	42.8	31.9
	85	43.8	43.8	43.9	43.9	46.3	44.7	41.5	41.5	41.5	41.5	43.6	43.4
	90	47.0	47.0	47.0	47.0	47.1	47.1	44.6	44.6	44.6	44.6	44.5	44.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 26. Gross cooling capacities 7.5 tons high efficiency - stage 2 - three phase W/DHC092H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1200	75	48.2	37.6	54.2	29.9	60.7	21.9	45.9	36.3	51.6	28.6	57.7	20.6
	80	48.4	43.7	54.5	36.6	61.0	28.6	46.0	42.4	51.9	35.3	58.1	27.3
	85	48.6	48.6	54.6	43.2	61.2	35.3	46.7	46.7	52.0	41.5	58.4	34.0
	90	51.5	51.5	54.7	49.2	61.4	42.0	49.5	49.5	52.2	47.9	58.6	40.7
1500	75	50.6	42.0	56.7	32.9	63.0	22.8	48.0	40.6	53.8	31.5	59.8	21.4
	80	51.0	50.1	57.0	41.2	63.6	31.2	48.5	48.5	54.1	39.8	60.4	29.9
	85	53.3	53.3	57.2	48.8	63.9	39.6	51.1	51.1	54.4	47.4	60.8	38.2
	90	56.6	56.6	57.7	56.9	64.2	47.9	54.3	54.3	55.0	55.0	61.0	46.0
1800	75	52.3	46.5	58.4	35.7	64.6	23.5	49.5	45.0	55.3	34.3	61.1	22.1
	80	53.4	53.4	58.7	44.9	65.4	33.7	51.1	51.1	55.7	43.4	62.0	32.3
	85	57.0	57.0	59.2	54.6	65.8	43.7	54.5	54.5	56.2	53.1	62.4	42.3
	90	60.6	60.6	60.7	60.7	66.1	52.8	58.1	58.1	58.2	58.2	62.8	51.3
2100	75	53.7	51.0	59.6	38.4	65.7	24.2	50.8	49.4	56.3	37.0	62.1	22.7
	80	56.2	56.2	60.1	49.0	66.7	36.1	54	53.6	56.9	47.4	63.1	34.6
	85	60.0	60.0	60.9	60.4	67.1	47.8	57.3	57.3	57.8	57.8	63.6	45.3
	90	63.8	63.8	63.9	63.9	67.7	58.2	61.1	61.1	61.2	61.2	64.2	56.6
2400	75	54.9	54.9	60.5	41.1	66.5	24.9	51.9	51.9	57.0	38.4	62.7	23.4
	80	58.4	58.4	61.2	53.0	67.7	38.4	55.6	55.6	57.9	51.3	63.9	36.9
	85	62.4	62.4	62.5	62.5	68.2	50.5	59.5	59.5	59.6	59.6	64.5	48.8
	90	66.5	66.5	66.6	66.6	69.0	63.5	63.5	63.5	63.6	63.6	65.4	61.8
2625	75	55.8	55.8	61.0	41.8	67.0	25.4	52.8	52.8	57.6	40.0	63.0	23.8
	80	59.8	59.8	61.9	55.9	68.3	40.2	56.9	56.9	58.5	54.2	64.4	38.6
	85	64.0	64.0	64.1	64.1	68.9	53.2	61.0	61.0	61.0	61.0	65.1	51.5
	90	68.3	68.3	68.3	68.3	69.8	67.4	65.1	65.1	65.2	65.2	66.1	65.8

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 27. Gross cooling capacities 7.5 tons high efficiency - full load - three phase W/DHC092H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2400	75	87.8	71.0	97.6	55.3	108.0	39.0	83.3	68.7	92.6	53.0	102.3	36.7	78.5	65.5	87.4	50.6	96.4	34.4
	80	88.4	83.0	98.0	68.4	108.3	52.2	84.0	80.6	93.0	66.1	102.8	49.9	79.5	78.1	87.8	63.7	97.0	47.6
	85	90.6	90.6	98.3	81.4	108.7	65.3	86.8	86.8	93.4	79.1	103.2	63.0	82.9	82.9	88.2	76.7	97.5	60.7
	90	95.6	95.6	99.0	93.3	109.1	78.4	91.7	91.7	94.2	90.9	103.6	76.1	87.6	87.6	89.2	88.4	97.8	73.8
2700	75	89.6	74.9	99.6	58.1	109.9	39.8	85.0	72.4	94.3	55.7	103.9	37.4	80.1	69.8	88.9	53.3	97.8	35.0
	80	90.7	89.2	100.0	72.8	110.3	54.6	86.2	86.2	94.8	70.4	104.5	52.2	81.5	81.5	89.4	68.0	98.5	49.8
	85	94.5	94.5	100.4	87.4	110.8	69.4	90.4	90.4	95.3	83.8	105.0	67.0	86.2	86.2	90.0	81.2	99.0	64.6
	90	99.8	99.8	101.5	100.7	111.2	84.1	95.6	95.6	96.6	96.6	105.4	81.7	91.2	91.2	91.5	91.5	99.4	79.3
3000	75	91.3	79.3	101.2	60.8	111.3	40.4	86.5	76.7	95.7	58.4	105.2	38.0	81.5	74.0	90.1	55.9	98.8	35.6
	80	92.8	92.8	101.7	77.1	112.0	56.9	88.3	88.3	96.2	74.7	105.9	54.5	83.8	83.8	90.6	72.2	99.7	52.1
	85	97.9	97.9	102.3	92.0	112.5	73.4	93.5	93.5	97.0	89.4	106.5	71.0	89.0	89.0	91.5	86.7	100.3	68.5
	90	103.4	103.4	104.0	104.0	112.9	89.7	98.9	98.9	99.0	99.0	106.9	87.3	94.2	94.2	94.3	94.3	100.7	83.2
3300	75	92.8	83.6	102.5	63.5	112.5	41.1	87.8	81.0	96.9	61.0	106.2	38.7	82.6	78.2	91.0	58.4	99.7	36.1
	80	95.0	95.0	103.0	81.4	113.3	59.3	90.7	90.7	97.4	78.9	107.1	56.8	86.0	86.0	91.6	74.8	100.6	54.3
	85	100.8	100.8	103.9	97.6	113.9	77.3	96.2	96.2	98.5	94.9	107.7	74.9	91.4	91.4	92.8	92.2	101.3	72.4
	90	106.6	106.6	106.5	106.5	114.4	93.7	101.8	101.8	101.9	101.9	108.2	91.1	96.8	96.8	96.9	96.9	101.9	88.3
3600	75	94.1	87.9	103.6	66.1	113.6	41.8	88.9	85.2	97.8	63.6	107.1	39.3	83.6	82.4	91.8	61.0	100.4	36.7
	80	97.5	97.5	104.2	84.2	114.5	61.6	92.8	92.8	98.4	81.4	108.1	59.1	88.0	88.0	92.5	78.6	101.4	56.5
	85	103.4	103.4	105.4	103.2	115.1	81.3	98.6	98.6	99.9	99.9	108.7	78.8	93.5	93.5	94.1	94.1	102.1	76.2
	90	109.3	109.3	109.5	109.5	115.7	98.9	104.3	104.3	104.4	104.4	109.4	96.2	99.0	99.0	99.1	99.1	102.9	93.4

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2400	75	73.7	62.9	81.9	48.2	90.2	31.9	68.5	60.1	76.1	45.6	83.6	29.4
	80	74.7	74.7	82.4	61.3	90.9	45.1	69.8	69.8	76.6	58.7	84.4	42.6
	85	78.7	78.7	82.9	73.1	91.4	58.3	74.1	74.1	77.2	70.3	84.9	55.7
	90	83.3	83.3	84.0	84.0	91.8	71.3	78.5	78.5	78.6	78.6	85.2	68.8
2700	75	75.1	67.1	83.2	50.8	91.3	32.5	69.7	64.2	77.1	48.2	84.5	29.9
	80	76.8	76.8	83.7	65.5	92.1	47.4	72.1	72.1	77.6	61.5	85.3	44.7
	85	81.6	81.6	84.4	78.5	92.7	62.1	76.7	76.7	78.5	75.7	85.9	59.5
	90	86.4	86.4	86.6	86.6	93.1	75.4	81.3	81.3	81.4	81.4	86.4	72.6
3000	75	76.2	71.2	84.2	53.3	92.2	33.0	70.7	68.3	77.9	50.6	85.1	30.4
	80	79.2	79.2	84.7	68.2	93.1	49.6	74.2	74.2	78.5	65.2	86.1	46.9
	85	84.2	84.2	85.7	84.0	93.7	66.0	78.9	78.9	79.7	79.7	86.7	63.3
	90	89.1	89.1	89.3	89.3	94.3	80.5	83.6	83.6	83.7	83.7	87.3	77.5
3300	75	77.2	75.4	84.9	55.8	92.9	33.6	71.5	71.5	78.5	53.1	85.6	30.8
	80	81.1	81.1	85.6	71.9	93.9	51.7	75.9	75.9	79.2	68.9	86.6	49.0
	85	86.3	86.3	87.0	87.0	94.5	69.8	80.7	80.7	80.9	80.9	87.2	65.1
	90	91.4	91.4	91.5	91.5	95.2	85.5	85.5	85.5	85.6	85.6	88.1	82.4
3600	75	78.1	78.1	85.6	58.3	93.4	34.1	72.4	72.4	78.9	55.5	85.9	31.3
	80	82.8	82.8	86.3	75.6	94.5	53.9	77.3	77.3	79.8	72.5	87.1	51.1
	85	88.1	88.1	88.2	88.2	95.1	71.6	82.3	82.3	82.4	82.4	87.7	68.4
	90	93.3	93.3	93.5	93.5	96.1	90.4	87.2	87.2	87.3	87.3	88.8	87.3

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 28. Gross cooling capacities 8.5 tons high efficiency - stage 1 - three phase W/DHC102H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1360	75	40.9	36.2	46.2	27.7	52.0	18.7	38.0	34.7	43.2	26.3	48.7	17.3
	80	41.8	41.8	46.3	35.2	52.2	26.3	39.4	39.4	43.3	33.8	48.9	24.9
	85	44.6	44.6	46.5	42.4	52.3	33.8	42.3	42.3	43.5	41.0	49.0	32.5
	90	47.5	47.5	47.7	47.7	52.4	41.3	45.1	45.1	45.2	45.2	49.1	40.0
1700	75	42.6	41.5	47.8	30.8	53.6	19.5	39.6	39.6	44.5	29.4	50.0	18.1
	80	45.1	45.1	48.0	40.0	53.8	29.0	42.5	42.5	44.8	38.5	50.3	27.6
	85	48.3	48.3	48.6	48.6	54.0	38.5	45.7	45.7	45.8	45.8	50.5	37.1
	90	51.6	51.6	51.7	51.7	54.3	47.6	48.9	48.9	49.0	49.0	50.8	46.2
2040	75	44.3	44.3	48.8	33.9	54.6	20.3	41.5	41.5	45.4	32.4	50.9	18.9
	80	47.7	47.7	49.2	44.8	55.0	31.7	44.9	44.9	45.9	43.3	51.3	30.3
	85	51.2	51.2	51.3	51.3	55.2	43.1	48.3	48.3	48.4	48.4	51.5	41.2
	90	54.7	54.7	54.8	54.8	55.8	53.9	51.7	51.7	51.8	51.8	52.3	52.3
2380	75	46.1	46.1	49.6	36.9	55.4	21.1	43.2	43.2	46.0	34.9	51.5	19.6
	80	49.8	49.8	50.3	49.6	55.8	34.4	46.7	46.7	46.9	46.9	51.9	32.9
	85	53.5	53.5	53.5	53.5	56.1	47.1	50.3	50.3	50.4	50.4	52.4	45.6
	90	57.2	57.2	57.3	57.3	57.3	57.3	54.0	54.0	54.1	54.1	54.1	54.1
2720	75	47.6	47.6	50.2	39.4	55.9	21.8	44.4	44.4	46.5	37.7	52.0	20.3
	80	51.4	51.4	51.4	51.4	56.3	37.0	48.2	48.2	48.2	48.2	52.4	35.5
	85	55.3	55.3	55.3	55.3	56.9	51.5	52.0	52.0	52.0	52.0	53.1	49.9
	90	59.2	59.2	59.3	59.3	59.3	59.3	55.8	55.8	55.8	55.8	55.9	55.9
2975	75	48.5	48.5	50.5	41.5	56.3	22.4	45.2	45.2	46.8	39.8	52.2	20.8
	80	52.4	52.4	52.5	52.5	56.7	39.0	49.1	49.1	49.1	49.1	52.7	36.8
	85	56.4	56.4	56.5	56.5	57.4	54.7	53.0	53.0	53.0	53.0	53.6	53.1
	90	60.5	60.5	60.5	60.5	60.6	60.6	56.9	56.9	57.0	57.0	57.0	57.0

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 29. Gross cooling capacities 8.5 tons high efficiency - stage 2 - three phase W/DHC102H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1360	75	50.6	40.8	57.2	32.0	64.2	22.9	47.7	39.2	53.9	30.5	60.6	21.4
	80	50.7	48.2	57.2	39.5	64.2	30.5	47.9	46.7	54.0	38.0	60.7	29.0
	85	52.4	52.4	57.2	47.0	64.2	38.0	50.1	50.1	54.0	45.5	60.7	36.6
	90	55.6	55.6	57.3	54.4	64.3	45.5	53.1	53.1	54.2	52.9	60.8	44.1
1700	75	52.9	46.3	59.5	35.3	66.6	23.9	49.7	44.8	56.0	33.7	62.8	22.3
	80	53.8	53.8	59.5	44.7	66.7	33.4	51.1	51.1	56.1	43.1	62.8	31.8
	85	57.2	57.2	59.7	54.0	66.7	42.8	54.5	54.5	56.3	52.4	62.9	41.2
	90	60.7	60.7	60.9	60.9	66.8	52.2	58.0	58.0	58.1	58.1	63.0	50.6
2040	75	54.6	51.7	61.1	38.4	68.2	24.7	51.3	50.1	57.4	36.8	64.2	23.1
	80	57.2	57.2	61.2	49.7	68.3	36.1	54.3	54.3	57.5	48.1	64.2	34.5
	85	61.0	61.0	61.8	61.0	68.4	47.4	58.0	58.0	58.3	58.3	64.4	45.8
	90	64.8	64.8	64.9	64.9	68.6	58.7	61.7	61.7	61.8	61.8	64.6	57.1
2380	75	56.1	56.1	62.2	41.5	69.4	25.5	52.9	52.9	58.3	39.8	65.1	23.9
	80	59.9	59.9	62.5	54.7	69.5	38.8	56.7	56.7	58.7	53.0	65.2	37.1
	85	64.0	64.0	63.8	63.8	69.6	52.0	60.7	60.7	60.8	60.8	65.4	50.3
	90	68.1	68.1	68.2	68.2	70.1	65.1	64.7	64.7	64.8	64.8	66.0	63.5
2720	75	57.9	57.9	63.0	44.5	70.3	26.3	54.7	54.7	59.0	42.8	65.9	24.6
	80	62.1	62.1	63.6	59.5	70.4	41.4	58.8	58.8	59.7	57.8	66.0	39.7
	85	66.4	66.4	66.1	66.1	70.6	56.5	62.9	62.9	63.0	63.0	66.3	54.8
	90	70.7	70.7	70.8	70.8	71.5	71.5	67.0	67.0	67.1	67.1	67.3	67.3
2975	75	59.2	59.2	63.6	46.8	70.8	26.8	55.8	55.8	59.4	45.0	66.3	25.1
	80	63.5	63.5	64.3	63.2	70.9	43.4	60.0	60.0	60.4	60.4	66.4	41.7
	85	68.0	68.0	68.0	68.0	71.3	60.0	64.3	64.3	64.3	64.3	66.8	58.2
	90	72.4	72.4	71.0	71.0	72.6	72.6	68.6	68.6	68.6	68.6	68.7	68.7

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 30. Gross cooling capacities 8.5 tons high efficiency - full load - three phase W/DHC102H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2720	75	97.4	79.6	108.2	61.7	119.6	43.1	92.1	76.9	102.3	59.0	113.0	40.5	86.5	74.2	96.1	56.3	106.2	37.8
	80	98.2	93.9	108.5	76.5	119.8	58.1	93.1	91.2	102.6	73.8	113.3	55.4	87.7	87.7	96.5	71.1	106.5	52.7
	85	101.7	101.7	108.8	91.3	120.1	72.9	97.2	97.2	103.0	88.6	113.6	70.3	92.4	92.4	97.0	85.9	106.8	67.6
	90	107.3	107.3	109.7	105.5	120.3	87.7	102.6	102.6	104.1	102.8	113.8	85.1	97.7	97.7	98.3	98.3	107.1	82.4
3060	75	99.5	85.0	110.2	64.8	121.6	43.9	94.0	82.3	104.1	62.1	114.8	41.2	88.2	79.5	97.7	59.3	107.6	38.5
	80	100.8	100.8	110.5	81.4	121.9	60.7	95.6	95.6	104.4	78.7	115.0	58.0	90.5	90.5	98.0	75.9	108.0	55.3
	85	105.9	105.9	111.1	98.1	122.2	77.5	101.1	101.1	105.1	94.7	115.4	74.8	96.0	96.0	98.8	91.8	108.3	72.0
	90	111.8	111.8	112.7	112.7	122.5	94.1	106.8	106.8	107.0	107.0	115.7	91.5	101.4	101.4	101.6	101.6	108.7	88.7
3400	75	101.3	90.4	111.9	67.8	123.2	44.7	95.6	86.8	105.5	65.1	116.1	42.0	89.6	83.8	98.9	62.2	108.7	39.2
	80	103.4	103.4	112.2	86.3	123.5	63.4	98.5	98.5	105.9	83.6	116.5	60.6	93.2	93.2	99.3	80.7	109.2	57.8
	85	109.5	109.5	113.1	104.1	123.9	81.9	104.4	104.4	106.9	101.2	116.8	79.2	98.9	98.9	100.5	98.3	109.5	76.4
	90	115.7	115.7	115.7	115.7	124.3	100.5	110.3	110.3	110.5	110.5	117.3	97.8	104.6	104.6	104.8	104.8	110.1	95.0
3740	75	102.8	94.8	113.3	70.9	124.5	45.4	97.0	91.8	106.7	68.0	117.2	42.7	90.9	88.7	99.8	65.1	109.6	39.8
	80	106.4	106.4	113.7	91.2	124.9	66.0	101.1	101.1	107.2	88.4	117.6	63.2	95.6	95.6	100.4	85.5	110.1	60.3
	85	112.7	112.7	114.9	110.6	125.3	86.4	107.2	107.2	108.6	107.7	118.0	83.6	101.5	101.5	102.1	102.1	110.5	80.8
	90	119.0	119.0	119.2	119.2	125.8	106.9	113.3	113.3	113.5	113.5	118.7	104.1	107.3	107.3	107.5	107.5	111.3	100.1
4080	75	104.3	99.8	114.4	73.8	125.6	46.2	98.3	96.8	107.6	70.9	118.1	43.3	92.1	92.1	100.6	68.0	110.3	40.4
	80	108.9	108.9	114.9	96.1	126.0	68.6	103.4	103.4	108.2	93.2	118.6	65.7	97.7	97.7	101.3	89.1	110.9	62.8
	85	115.4	115.4	116.6	116.6	126.4	90.9	109.7	109.7	110.2	110.2	119.0	88.0	103.7	103.7	103.7	103.7	111.3	85.1
	90	121.9	121.9	122.1	122.1	127.2	113.2	115.9	115.9	116.1	116.1	119.9	109.1	109.7	109.7	109.8	109.8	112.4	106.0

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
2720	75	80.7	71.3	89.7	53.5	99.0	35.0	74.5	67.7	82.8	50.5	91.2	32.1
	80	82.3	82.3	90.0	68.3	99.3	49.9	77.0	77.0	83.1	65.3	91.6	47.0
	85	87.4	87.4	90.6	82.4	99.6	64.8	81.8	81.8	83.8	79.3	91.9	61.9
	90	92.4	92.4	92.6	92.6	100.0	79.6	86.6	86.6	86.8	86.8	92.3	76.7
3060	75	82.2	75.7	90.9	56.4	100.1	35.6	75.8	72.5	83.8	53.4	92.0	32.6
	80	85.2	85.2	91.3	73.0	100.5	52.4	79.6	79.6	84.2	70.0	92.5	49.4
	85	90.5	90.5	92.3	88.8	100.9	69.2	84.6	84.6	85.4	85.4	92.9	66.2
	90	95.8	95.8	95.9	95.9	101.4	85.9	89.5	89.5	89.7	89.7	93.4	81.9
3400	75	83.5	80.7	91.9	59.3	101.0	36.3	77.0	77.0	84.5	56.2	92.7	33.2
	80	87.7	87.7	92.4	77.8	101.5	54.9	81.7	81.7	85.1	73.7	93.3	51.9
	85	93.2	93.2	93.9	93.9	101.9	73.5	86.9	86.9	87.0	87.0	93.6	70.5
	90	98.6	98.6	98.7	98.7	102.5	91.0	91.9	91.9	92.1	92.1	94.5	87.8
3740	75	84.7	84.7	92.7	62.1	101.7	36.9	78.1	78.1	85.1	59.0	93.2	33.8
	80	89.8	89.8	93.3	81.4	102.2	57.4	83.5	83.5	85.8	78.1	93.8	54.3
	85	95.4	95.4	95.5	95.5	102.7	77.8	88.8	88.8	88.9	88.9	94.2	74.7
	90	100.9	100.9	101.1	101.1	103.6	96.9	93.9	93.9	94.0	94.0	95.4	93.6
4080	75	85.8	85.8	93.3	64.9	102.2	37.5	79.5	79.5	85.5	61.7	93.6	34.3
	80	91.6	91.6	94.2	85.9	102.8	59.9	84.9	84.9	86.5	82.4	94.2	56.7
	85	97.3	97.3	97.4	97.4	103.3	82.2	90.3	90.3	90.4	90.4	94.7	79.0
	90	102.9	102.9	103.1	103.1	104.6	102.8	95.6	95.6	95.7	95.7	96.2	96.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 31. Gross cooling capacities 10 tons high efficiency - stage 1 - three phase W/DHC120H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
3200	75	50.7	42.7	57.6	32.9	64.8	22.4	46.9	40.5	53.5	30.8	60.3	20.3
	80	51.0	51.0	57.8	41.7	65.2	31.4	47.6	47.6	53.7	39.6	60.8	29.3
	85	54.4	54.4	57.9	50.2	65.4	40.3	51.2	51.2	53.9	48.0	61.1	38.2
	90	58.0	58.0	58.3	58.3	65.5	49.1	54.7	54.7	54.9	54.9	61.2	47.0
3600	75	52.9	49.0	59.8	36.7	67.0	23.5	48.9	46.7	55.4	34.5	62.2	21.4
	80	55.3	55.3	60.0	47.4	67.6	34.7	51.8	51.8	55.7	45.1	62.9	32.6
	85	59.3	59.3	60.5	58.3	67.9	45.8	55.7	55.7	56.3	56.0	63.2	43.7
	90	63.4	63.4	63.5	63.5	68.1	56.5	59.7	59.7	59.9	59.9	63.5	54.2
4000	75	54.7	54.7	61.3	40.4	68.4	24.5	50.8	50.8	56.7	38.1	63.4	22.3
	80	58.8	58.8	61.7	53.0	69.2	38.0	55.0	55.0	57.2	50.7	64.2	35.8
	85	63.2	63.2	63.3	63.3	69.5	51.3	59.3	59.3	59.4	59.4	64.6	48.4
	90	67.6	67.6	67.7	67.7	70.0	63.9	63.6	63.6	63.7	63.7	65.3	61.6
4400	75	57.0	57.0	62.3	43.3	69.4	25.4	53.0	53.0	57.5	40.8	64.1	23.2
	80	61.6	61.6	63.1	58.6	70.3	41.1	57.5	57.5	58.4	56.1	65.2	38.9
	85	66.2	66.2	66.3	66.3	70.8	55.9	62.0	62.0	62.1	62.1	65.7	53.4
	90	70.9	70.9	71.0	71.0	71.7	71.3	66.6	66.6	66.7	66.7	66.9	66.9
	75	59.0	59.0	63.2	46.5	69.9	26.3	54.7	54.7	58.2	43.9	64.4	24.0
	80	63.8	63.8	64.3	64.1	71.1	44.3	59.5	59.5	59.6	59.6	65.8	41.9
	85	68.7	68.7	68.8	68.8	71.8	60.9	64.3	64.3	64.3	64.3	66.6	58.4
	90	73.7	73.7	73.8	73.8	73.9	73.9	69.1	69.1	69.2	69.2	69.3	69.3
	75	60.2	60.2	63.7	48.9	70.2	27.0	55.8	55.8	58.6	46.2	64.6	24.6
	80	65.2	65.2	65.2	65.2	71.6	45.4	60.7	60.7	60.8	60.8	66.2	42.7
	85	70.3	70.3	70.4	70.4	72.5	64.6	65.6	65.6	65.7	65.7	67.2	62.1
	90	75.4	75.4	75.5	75.5	75.6	75.6	70.6	70.6	70.7	70.7	70.8	70.8

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Gross Cooling Capacities

Table 32. Gross cooling capacities 10 tons high efficiency - stage 2 - three phase W/DHC120H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95					
	Ent DB	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1600	75	57.4	46.0	64.5	35.6	72.1	24.9	53.7	43.8	60.5	33.5	67.7	22.8
	80	57.6	54.5	64.7	44.5	72.3	33.8	53.9	52.3	60.7	42.3	67.9	31.7
	85	59.5	59.5	64.7	53.2	72.5	42.7	56.4	56.4	60.7	51.1	68.0	40.6
	90	63.1	63.1	64.9	61.7	72.5	51.5	59.9	59.9	61.0	59.6	68.2	49.4
2000	75	59.9	52.2	67.1	39.5	74.7	26.0	56.0	49.9	62.7	37.2	69.8	23.8
	80	61.0	61.0	67.3	50.5	75.0	37.2	57.5	57.5	62.9	48.3	70.2	35.0
	85	64.9	64.9	67.6	61.2	75.2	48.3	61.4	61.4	63.3	58.9	70.4	46.1
	90	68.9	68.9	69.0	69.0	75.3	59.3	65.3	65.3	65.4	65.4	70.6	57.1
2400	75	61.8	58.4	68.8	43.2	76.4	27.0	57.6	56.0	64.2	40.8	71.3	24.7
	80	64.8	64.8	69.1	56.4	76.8	40.4	61.0	61.0	64.5	53.7	71.7	38.1
	85	69.1	69.1	69.8	69.1	77.0	53.7	65.2	65.2	65.3	65.3	72.0	51.5
	90	73.4	73.4	73.5	73.5	77.4	66.6	69.4	69.4	69.5	69.5	72.4	64.2
2800	75	63.4	63.4	70.0	46.8	77.5	27.9	59.4	59.4	65.2	44.4	72.2	25.6
	80	67.8	67.8	70.5	61.7	78.1	43.6	63.7	63.7	65.7	59.2	72.8	41.2
	85	72.4	72.4	72.5	72.5	78.4	59.1	68.2	68.2	68.3	68.3	73.1	56.8
	90	77.0	77.0	77.1	77.1	79.0	74.0	72.6	72.6	72.7	72.7	73.9	71.5
3200	75	65.5	65.5	71.0	50.3	78.4	28.8	61.3	61.3	65.9	47.9	72.9	26.4
	80	70.2	70.2	71.7	67.2	79.0	46.7	65.9	65.9	66.8	64.7	73.5	44.3
	85	75.1	75.1	75.2	75.2	79.5	63.8	70.6	70.6	70.7	70.7	74.0	61.3
	90	79.9	79.9	80.1	80.1	80.5	80.5	75.2	75.2	75.3	75.3	75.4	75.4
3500	75	66.9	66.9	71.5	52.9	78.9	29.5	62.5	62.5	66.4	49.7	73.3	27.0
	80	71.8	71.8	72.5	71.4	79.6	49.0	67.3	67.3	67.5	67.5	74.0	46.6
	85	76.8	76.8	76.9	76.9	80.1	67.6	72.1	72.1	72.1	72.1	74.6	65.0
	90	81.8	81.8	81.9	81.9	82.0	82.0	76.9	76.9	77.0	77.0	77.1	77.1

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Table 33. Gross cooling capacities 10 tons high efficiency - full load - three phase W/DHC120H3,4,W

		Ambient Temperature (°F)						Ambient Temperature (°F)						Ambient Temperature (°F)					
		85						95						105					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
3200	75	114.2	92.2	127.0	71.2	140.5	49.4	107.3	88.4	119.4	67.5	132.1	45.7	100.2	84.6	111.5	63.7	123.4	42.0
	80	114.9	109.0	127.3	88.5	140.7	66.9	108.2	105.2	119.7	84.8	132.3	63.3	101.2	101.2	111.9	81.1	123.7	59.5
	85	118.8	118.8	127.6	105.9	141.0	84.4	112.9	112.9	120.1	102.2	132.7	80.7	106.8	106.8	112.3	98.4	124.1	77.0
	90	125.4	125.4	128.4	122.7	141.2	101.7	119.3	119.3	121.1	118.9	132.9	98.1	112.9	112.9	113.6	113.6	124.4	94.4
3600	75	116.6	98.5	129.4	74.8	142.9	50.4	109.5	94.7	121.5	71.1	134.1	46.6	102.1	90.8	113.3	67.2	125.1	42.8
	80	117.9	117.5	129.8	94.4	143.2	70.1	111.1	111.1	121.9	90.6	134.5	66.3	104.5	104.5	113.7	86.7	125.5	62.6
	85	123.9	123.9	130.3	113.9	143.5	89.7	117.6	117.6	122.5	110.2	134.8	86.0	111.0	111.0	114.5	105.6	125.9	82.2
	90	130.8	130.8	131.8	131.8	143.8	109.3	124.3	124.3	124.5	124.5	135.2	105.6	117.5	117.5	117.7	117.7	126.3	101.8
4000	75	118.7	104.8	131.4	78.4	144.8	51.3	111.3	100.9	123.2	74.6	135.7	47.5	103.7	96.1	114.8	70.6	126.4	43.6
	80	121.0	121.0	131.8	100.1	145.1	73.2	114.6	114.6	123.6	96.3	136.1	69.4	107.9	107.9	115.2	92.4	126.9	65.5
	85	128.3	128.3	132.6	121.9	145.5	95.0	121.6	121.6	124.6	117.2	136.5	91.2	114.6	114.6	116.4	113.1	127.3	87.4
	90	135.5	135.5	135.7	135.7	145.9	116.8	128.6	128.6	128.8	128.8	137.1	113.0	121.3	121.3	121.5	121.5	127.9	109.2
4400	75	120.5	110.2	133.0	82.0	146.3	52.2	113.0	106.1	124.6	78.0	137.0	48.3	105.2	101.9	115.9	74.0	127.5	44.4
	80	124.6	124.6	133.5	105.9	146.8	76.3	117.8	117.8	125.1	101.9	137.5	72.4	110.7	110.7	116.5	98.0	128.0	68.5
	85	132.1	132.1	134.7	128.9	147.2	100.3	125.0	125.0	126.6	124.8	138.0	96.4	117.7	117.7	118.2	118.2	128.5	92.5
	90	139.6	139.6	139.8	139.8	147.8	124.2	132.2	132.2	132.4	132.4	138.7	120.4	124.6	124.6	124.8	124.8	129.3	115.4
4800	75	122.2	116.2	134.4	85.5	147.6	53.0	114.5	112.0	125.7	81.5	138.1	49.1	106.5	106.5	116.8	77.4	128.3	45.1
	80	127.7	127.7	135.0	111.6	148.1	79.3	120.6	120.6	126.4	107.6	138.7	75.4	113.2	113.2	117.5	102.5	128.9	71.4
	85	135.4	135.4	136.7	136.6	148.5	105.5	128.0	128.0	128.4	128.4	139.1	101.6	120.3	120.3	120.3	120.3	129.4	97.6
	90	143.1	143.1	143.3	143.3	149.4	131.7	135.4	135.4	135.6	135.6	140.1	126.6	127.4	127.4	127.6	127.6	130.6	122.5

		Ambient Temperature (°F)						Ambient Temperature (°F)					
		115						125					
	Ent	Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
	DB	61		67		73		61		67		73	
cfm	(°F)	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
3200	75	92.7	80.7	103.3	59.8	114.3	38.2	84.7	76.0	94.5	55.7	104.5	34.2
	80	94.2	94.2	103.7	77.2	114.7	55.7	87.4	87.4	94.9	73.1	104.9	51.7
	85	100.2	100.2	104.2	93.9	115.0	73.2	93.1	93.1	95.5	89.7	105.3	69.1
	90	106.2	106.2	106.4	106.4	115.4	90.6	98.8	98.8	99.0	99.0	105.7	86.5
3600	75	94.3	86.1	104.8	63.2	115.6	38.9	86.2	81.7	95.7	59.1	105.5	34.8
	80	97.8	97.8	105.2	82.8	116.1	58.7	90.5	90.5	96.1	78.6	106.1	54.6
	85	104.0	104.0	106.1	101.5	116.5	78.3	96.4	96.4	97.2	97.1	106.5	74.2
	90	110.2	110.2	110.4	110.4	117.0	97.9	102.3	102.3	102.4	102.4	107.0	93.8
4000	75	95.8	91.9	105.9	66.6	116.7	39.7	87.4	87.4	96.5	62.4	106.3	35.5
	80	100.7	100.7	106.5	88.3	117.3	61.6	93.0	93.0	97.1	83.2	106.9	57.4
	85	107.2	107.2	107.9	107.9	117.7	83.4	99.1	99.1	99.3	99.3	107.3	79.2
	90	113.6	113.6	113.8	113.8	118.4	104.2	105.2	105.2	105.3	105.3	108.2	99.8
4400	75	97.1	97.1	106.8	69.9	117.5	40.4	88.7	88.7	97.2	65.6	106.8	36.2
	80	103.2	103.2	107.5	92.9	118.1	64.5	95.1	95.1	98.0	88.3	107.5	60.2
	85	109.9	109.9	109.9	109.9	118.6	88.5	101.4	101.4	101.5	101.5	108.0	84.2
	90	116.5	116.5	116.6	116.6	119.6	111.2	107.6	107.6	107.7	107.7	109.2	106.7
4800	75	98.4	98.4	107.5	73.2	118.1	41.1	90.4	90.4	97.6	68.9	107.2	36.8
	80	105.3	105.3	108.4	98.1	118.8	67.4	96.9	96.9	98.7	93.4	108.0	63.1
	85	112.1	112.1	112.3	112.3	119.4	93.5	103.3	103.3	103.4	103.4	108.6	89.3
	90	118.9	118.9	119.1	119.1	120.7	118.2	109.6	109.6	109.8	109.8	110.2	110.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

Evaporator Fan Performance

Table 34. Multispeed direct drive evaporator fan performance (standard motor) 3 to 5 tons - no electric heat WSC036/048/060H3,4,W

Tons	Unit Model Number	cfm	External Static Pressure (in./water) and Motor Power (Bhp)														
			Speed Set 1			Speed Set 2			Speed Set 3			Speed Set 4			Speed Set 5		
			ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp
3	WSC036H3,4,W Downflow Airflow	960	0.502	738	0.20	0.767	850	0.29	0.987	943	0.38	1.190	1029	0.47	-	-	-
		1020	0.419	717	0.19	0.683	829	0.28	0.904	923	0.37	1.107	1009	0.46	-	-	-
		1080	0.335	696	0.19	0.600	808	0.28	0.820	902	0.36	1.023	988	0.45	-	-	-
		1140	0.252	675	0.18	0.516	787	0.27	0.737	881	0.35	0.940	967	0.44	-	-	-
		1200	0.168	654	0.18	0.433	766	0.26	0.653	860	0.34	0.856	946	0.43	1.174	1080	0.58
		1260	0.084	633	0.17	0.349	746	0.25	0.570	839	0.34	0.773	925	0.42	1.090	1060	0.57
		1320	0.001	612.5	0.16	0.266	725	0.25	0.486	818	0.33	0.689	904	0.41	1.006	1039	0.56
		1380	-	-	-	0.182	704	0.24	0.403	797	0.32	0.605	883	0.40	0.923	1018	0.55
		1440	-	-	-	0.098	683	0.23	0.319	776	0.31	0.522	862	0.39	0.839	997	0.54
3	WSC036H3,4,WH orizontal Airflow	960	0.457	703	0.19	0.718	815	0.28	0.936	908	0.36	1.136	994	0.45	-	-	-
		1020	0.379	682	0.18	0.640	794	0.27	0.858	886	0.35	1.058	973	0.44	-	-	-
		1080	0.301	661	0.18	0.562	772	0.26	0.780	864	0.35	0.980	951	0.43	-	-	-
		1140	0.224	639	0.17	0.485	751	0.26	0.702	842	0.34	0.902	930	0.42	-	-	-
		1200	0.146	618	0.17	0.407	729	0.25	0.624	820	0.33	0.824	908	0.41	1.138	1042	0.56
		1260	0.068	596	0.16	0.329	708	0.24	0.546	798	0.32	0.746	887	0.40	1.060	1021	0.55
		1320	-	-	-	0.251	687	0.23	0.468	776	0.31	0.668	865	0.39	0.982	1000	0.54
		1380	-	-	-	0.173	665	0.23	0.390	754	0.30	0.591	844	0.38	0.904	978	0.53
		1440	-	-	-	0.095	644	0.22	0.312	731	0.29	0.513	823	0.37	0.826	957	0.52
4	WSC048H3,4,W Downflow Airflow	1280	0.72	918	0.38	0.96	1010	0.49	1.14	1077	0.58	-	-	-	-	-	-
		1360	0.57	885	0.37	0.82	977	0.47	1.00	1045	0.56	-	-	-	-	-	-
		1440	0.42	852	0.35	0.67	945	0.46	0.85	1012	0.54	-	-	-	-	-	-
		1520	0.27	819	0.34	0.52	912	0.44	0.70	979	0.52	1.13	1139	0.75	-	-	-
		1600	0.12	787	0.33	0.37	879	0.43	0.55	946	0.51	0.98	1106	0.72	1.19	1186	0.85
		1680	-	-	-	0.22	847	0.41	0.40	914	0.49	0.83	1073	0.70	1.05	1153	0.82
		1760	-	-	-	0.07	814	0.40	0.25	881	0.47	0.68	1040	0.68	0.90	1120	0.80
		1840	-	-	-	-	-	-	0.11	848	0.45	0.53	1008	0.66	0.75	1088	0.78
		1920	-	-	-	-	-	-	-	-	-	0.39	975	0.64	0.60	1055	0.75
4	WSC048H3,4,WH orizontal Airflow	1280	0.68	881	0.37	0.90	972	0.47	1.06	1038	0.56	-	-	-	-	-	-
		1360	0.56	849	0.35	0.78	940	0.46	0.94	1006	0.54	-	-	-	-	-	-
		1440	0.44	817	0.34	0.66	908	0.44	0.82	974	0.52	-	-	-	-	-	-
		1520	0.33	785	0.33	0.55	876	0.43	0.71	942	0.50	1.09	1099	0.72	-	-	-
		1600	0.21	754	0.31	0.43	845	0.41	0.59	911	0.49	0.97	1067	0.70	1.16	1146	0.82
		1680	0.09	722	0.30	0.31	813	0.39	0.47	879	0.47	0.85	1036	0.68	1.04	1114	0.80
		1760	-	-	-	0.19	781	0.38	0.35	847	0.45	0.73	1004	0.66	0.92	1082	0.77
		1840	-	-	-	0.07	749	0.36	0.23	815	0.44	0.61	972	0.64	0.80	1051	0.75
		1920	-	-	-	-	-	-	0.12	784	0.42	0.50	941	0.62	0.69	1019	0.73
5	WSC060H3,4,W Downflow Airflow	1600	0.87	830	0.46	1.00	909	0.53	1.20	996	0.64	-	-	-	-	-	-
		1700	0.73	795	0.44	0.86	873	0.51	1.05	960	0.62	-	-	-	-	-	-
		1800	0.59	759	0.42	0.72	837	0.49	0.91	924	0.59	1.12	1011	0.71	-	-	-
		1900	0.44	723	0.40	0.57	802	0.47	0.77	889	0.57	0.97	975	0.68	-	-	-
		2000	0.30	687	0.38	0.43	766	0.45	0.62	853	0.55	0.83	940	0.66	1.20	1086	0.88
		2100	0.16	651	0.36	0.29	730	0.43	0.48	817	0.52	0.69	904	0.63	1.05	1050	0.85
		2200	0.01	616	0.34	0.14	694	0.41	0.34	781	0.50	0.54	868	0.61	0.91	1014	0.82
		2300	-	-	-	0.00	658	0.39	0.19	745	0.48	0.40	832	0.58	0.77	979	0.79
		2400	-	-	-	-	-	-	0.05	710	0.46	0.26	796	0.56	0.62	943	0.76
5	WSC060H3,4,WH orizontal Airflow	1600	0.74	778	0.32	0.84	846	0.41	0.97	919	0.49	1.12	992	0.65	-	-	-
		1700	0.62	742	0.31	0.71	809	0.39	0.85	883	0.47	0.99	956	0.63	-	-	-
		1800	0.49	706	0.29	0.58	773	0.38	0.72	846	0.45	0.86	920	0.60	1.12	1042	0.84
		1900	0.36	669	0.28	0.45	737	0.36	0.59	810	0.43	0.74	883	0.58	0.99	1006	0.81
		2000	0.23	633	0.26	0.32	700	0.34	0.46	774	0.41	0.61	847	0.55	0.87	970	0.78
		2100	0.10	596	0.25	0.20	664	0.32	0.33	737	0.39	0.48	810	0.53	0.74	933	0.75
		2200	-	-	-	0.07	628	0.30	0.21	701	0.38	0.35	774	0.51	0.61	897	0.72
		2300	-	-	-	-	-	-	0.08	665	0.36	0.22	738	0.48	0.48	861	0.69
		2400	-	-	-	-	-	-	-	-	-	0.10	701	0.46	0.35	824	0.66

Notes:

1. For 036 models, fan motor heat (MBh) = 2.72 x Fan Bhp + 0.16. For 048 and 060 models, fan motor heat (MBh) = 2.87 x Fan Bhp + 0.15.
2. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
3. For electric heat applications minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temp rise table.
4. Data includes pressure drop due to wet coil and filters.

Table 35. Multispeed direct drive evaporator fan performance (oversized motor) 3 to 5 tons - no electric heat WSC036/048/060H3,4,W

Tons	Unit Model Number	cfm	External Static Pressure (in./water) and Motor Power (Bhp)														
			Speed Set 1			Speed Set 2			Speed Set 3			Speed Set 4			Speed Set 5		
			ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp	ESP	rpm	Bhp
3	WSC036H3,4,W Downflow Airflow	960	1.15	963	0.44	-	-	-	-	-	-	-	-	-	-	-	-
		1020	1.06	942	0.43	-	-	-	-	-	-	-	-	-	-	-	-
		1080	0.97	921	0.42	1.51	1157	0.69	-	-	-	-	-	-	-	-	-
		1140	0.88	900	0.41	1.42	1133	0.67	-	-	-	-	-	-	-	-	-
		1200	0.79	879	0.40	1.33	1109	0.66	1.45	1155	0.73	-	-	-	-	-	-
		1260	0.70	859	0.39	1.24	1086	0.65	1.36	1131	0.71	-	-	-	-	-	-
		1320	0.61	838	0.38	1.15	1062	0.63	1.28	1107	0.70	1.49	1184	0.81	-	-	-
		1380	0.52	817	0.37	1.06	1038	0.62	1.19	1084	0.68	1.40	1160	0.79	1.51	1201	0.86
		1440	0.43	796	0.36	0.97	1015	0.60	1.10	1060	0.67	1.31	1136	0.78	1.42	1177	0.84
3	WSC036H3,4,WH orizontal Airflow	960	1.14	1111	0.50	1.50	1164	0.69	-	-	-	-	-	-	-	-	-
		1020	1.06	1088	0.49	1.43	1141	0.68	-	-	-	-	-	-	-	-	-
		1080	0.99	1065	0.48	1.35	1118	0.67	1.44	1131	0.71	-	-	-	-	-	-
		1140	0.91	1042	0.47	1.28	1095	0.65	1.36	1108	0.70	1.50	1128	0.77	-	-	-
		1200	0.84	1019	0.46	1.20	1072	0.64	1.29	1085	0.68	1.43	1105	0.76	1.50	1117	0.80
		1260	0.76	996	0.45	1.13	1049	0.62	1.21	1062	0.67	1.35	1082	0.74	1.43	1093	0.78
		1320	0.69	973	0.44	1.05	1026	0.61	1.14	1038	0.65	1.28	1059	0.72	1.35	1070	0.76
		1380	0.61	950	0.43	0.98	1003	0.60	1.06	1015	0.64	1.20	1036	0.71	1.28	1047	0.75
		1440	0.54	927	0.42	0.90	980	0.58	0.99	992	0.62	1.13	1013	0.69	1.20	1024	0.73
4	WSC048H3,4,W Downflow Airflow	1280	1.12	1016	0.58	1.50	1159	0.78	-	-	-	-	-	-	-	-	-
		1360	1.00	988	0.56	1.39	1131	0.76	-	-	-	-	-	-	-	-	-
		1440	0.88	961	0.55	1.27	1104	0.74	-	-	-	-	-	-	-	-	-
		1520	0.77	933	0.53	1.15	1076	0.73	-	-	-	-	-	-	-	-	-
		1600	0.65	905	0.52	1.04	1048	0.71	1.50	1218	0.97	-	-	-	-	-	-
		1680	0.54	877	0.50	0.92	1020	0.69	1.38	1190	0.95	-	-	-	-	-	-
		1760	0.42	850	0.49	0.81	993	0.67	1.26	1162	0.93	-	-	-	-	-	-
		1840	0.30	822	0.47	0.69	965	0.65	1.15	1134	0.90	1.50	1266	1.13	-	-	-
		1920	0.19	794	0.45	0.57	937	0.63	1.03	1107	0.88	1.39	1238	1.10	1.50	1279	1.18
4	WSC048H3,4,WH orizontal Airflow	1280	1.04	1077	0.62	1.30	1121	0.76	-	-	-	-	-	-	-	-	-
		1360	0.94	1047	0.60	1.20	1091	0.74	-	-	-	-	-	-	-	-	-
		1440	0.84	1016	0.58	1.10	1061	0.72	1.41	1287	1.03	-	-	-	-	-	-
		1520	0.74	986	0.56	1.00	1030	0.70	1.31	1257	1.00	-	-	-	-	-	-
		1600	0.64	956	0.55	0.90	1000	0.67	1.21	1226	0.98	1.45	1340	1.20	-	-	-
		1680	0.54	925	0.53	0.80	970	0.65	1.11	1196	0.95	1.35	1310	1.17	1.43	1346	1.24
		1760	0.44	895	0.51	0.70	939	0.63	1.01	1166	0.93	1.25	1280	1.14	1.33	1315	1.21
		1840	0.34	865	0.49	0.60	909	0.61	0.91	1135	0.91	1.15	1249	1.11	1.23	1285	1.18
		1920	0.24	834	0.48	0.50	879	0.59	0.81	1105	0.88	1.05	1219	1.09	1.13	1255	1.16
5	WSC060H3,4,W Downflow Airflow	1600	1.23	905	0.52	1.50	1048	0.71	-	-	-	-	-	-	-	-	-
		1700	1.08	870	0.50	1.35	1014	0.68	-	-	-	-	-	-	-	-	-
		1800	0.94	836	0.48	1.21	979	0.66	-	-	-	-	-	-	-	-	-
		1900	0.79	801	0.46	1.06	944	0.64	1.50	1113	0.89	-	-	-	-	-	-
		2000	0.65	766	0.44	0.92	909	0.61	1.35	1079	0.86	1.50	1210	1.08	-	-	-
		2100	0.50	732	0.42	0.77	875	0.59	1.21	1044	0.83	1.36	1176	1.05	-	-	-
		2200	0.36	697	0.40	0.63	840	0.57	1.06	1009	0.80	1.21	1141	1.02	1.50	1182	0.84
		2300	0.21	662	0.38	0.48	805	0.54	0.92	975	0.78	1.07	1106	0.99	1.36	1147	1.06
		2400	0.07	628	0.36	0.34	771	0.52	0.77	940	0.75	0.92	1072	0.96	1.21	1113	1.03
5	WSC060H3,4,WH orizontal Airflow	1600	1.03	1075	0.61	1.21	1119	0.75	1.51	1316	1.05	-	-	-	-	-	-
		1700	0.91	1037	0.59	1.09	1081	0.73	1.38	1278	1.02	1.49	1350	1.20	-	-	-
		1800	0.78	999	0.57	0.96	1043	0.70	1.26	1240	0.99	1.36	1312	1.17	-	-	-
		1900	0.66	961	0.55	0.84	1005	0.68	1.13	1202	0.96	1.24	1274	1.14	1.43	1347	1.24
		2000	0.53	923	0.53	0.71	967	0.65	1.01	1164	0.93	1.11	1236	1.10	1.31	1309	1.21
		2100	0.41	885	0.51	0.59	929	0.63	0.88	1126	0.90	0.99	1198	1.07	1.18	1271	1.17
		2200	0.28	847	0.48	0.46	891	0.60	0.76	1088	0.87	0.86	1160	1.04	1.06	1233	1.14
		2300	0.16	809	0.46	0.34	853	0.58	0.63	1050	0.84	0.74	1122	1.00	0.93	1195	1.10
		2400	0.03	771	0.44	0.21	816	0.55	0.51	1013	0.81	0.61	1084	0.97	0.81	1157	1.07

Notes:

1. For 036 models, fan motor heat (MBh) = 2.72 x Fan Bhp + 0.16. For 048 and 060 models, fan motor heat (MBh) = 2.87 x Fan Bhp + 0.15.
2. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
3. For electric heat applications minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temp rise table.
4. Data includes pressure drop due to wet coil and filters.

Evaporator Fan Performance

Table 36. Belt drive evaporator fan performance - 7.5 tons standard efficiency - WSC092H3,H4,HW downflow airflow

External Static Pressure (Inches of Water Gauge)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	1-hp Standard Motor and Field Supplied Low Static Drive[a]										1-hp Standard Motor and Drive									
2400	—	—	474	0.36	524	0.44	570	0.52	611	0.59	650	0.68	686	0.76	720	0.84	752	0.93	783	1.02
2700	458	0.39	508	0.47	554	0.55	598	0.64	638	0.73	676	0.82	711	0.91	745	1.00	776	1.09	806	1.19
3000	498	0.52	544	0.60	587	0.69	628	0.78	666	0.88	704	0.98	738	1.08	770	1.18	801	1.28	831	1.38
3300	539	0.67	581	0.76	621	0.85	660	0.96	696	1.06	732	1.17	766	1.28	797	1.39	828	1.49	856	1.60
3600	580	0.85	620	0.95	657	1.05	693	1.16	728	1.27	761	1.38	794	1.50	825	1.62	855	1.74	882	1.85
															3-hp Oversized Motor and Drive[b]					

External Static Pressure (Inches of Water Gauge)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	1-hp Standard Motor and Drive										3-hp Oversized Motor and Drive[b]									
2400	813	1.10	841	1.19	868	1.28	894	1.37	920	1.46	943	1.54	967	1.63	990	1.72	1012	1.81	1035	1.90
2700	836	1.29	864	1.39	891	1.48	917	1.58	942	1.68	966	1.78	990	1.88	1012	1.97	1035	2.07	1056	2.17
3000	860	1.49	887	1.60	914	1.70	940	1.81	964	1.92	988	2.03	1012	2.13	1035	2.24	1056	2.35	1079	2.46
3300	885	1.72	911	1.83	938	1.94	963	2.06	988	2.18	1012	2.30	1035	2.42	1057	2.54	1079	2.65	1100	2.77
3600	910	1.97	937	2.09	963	2.22	988	2.34	1012	2.46	1035	2.59	1059	2.72	1081	2.85	1104	2.98	1124	3.11
									3-hp Oversized Motor and Drive and Field Supplied High Static Drive[c]											

Notes:

1. For standard evaporator fan speed (rpm), reference the standard motor and sheave/fan speed applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. 1-hp fan motor heat (MBh) = 2.829 x fan bhp +.4024. 3-hp fan motor heat (MBh) = 2.900 x Fan bhp -.3800
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) BAYLSDR009A
(b) BAYHSMT400A
(c) Field Supplied AK56 x 1 in. fan sheave required.

Table 37. Belt drive evaporator fan performance - 7.5 tons standard efficiency - WSC092H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water Gauge)																				
	.10"		.20"		.30"		.40"		.50"		.60"		.70"		.80"		.90"		1.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	1-hp Standard Motor and Field Supplied Low Static Drive[a]								1-hp Standard Motor and Drive											
2400	478	0.36	528	0.43	576	0.52	626	0.62	681	0.75	731	0.88	778	1.02	821	1.15	862	1.29	901	1.43
2700	526	0.49	570	0.57	614	0.66	656	0.76	701	0.88	751	1.02	797	1.17	840	1.32	880	1.47	920	1.63
3000	575	0.65	615	0.74	655	0.84	694	0.94	731	1.05	770	1.17	817	1.34	859	1.50	900	1.67	938	1.83
3300	624	0.84	661	0.94	698	1.04	734	1.15	768	1.27	802	1.39	838	1.52	878	1.69	919	1.87	957	2.05
3600	675	1.07	709	1.17	742	1.28	776	1.41	809	1.53	840	1.65	871	1.79	903	1.92	939	2.10	977	2.29
											3-hp Oversized Motor and Drive[b]									

External Static Pressure (Inches of Water Gauge)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	3-hp Oversized Motor and Drive[b]																			
2400	938	1.57	973	1.71	1007	1.86	1038	1.99	1070	2.14	1101	2.29	1130	2.44	1159	2.59	1187	2.74	1214	2.89
2700	956	1.78	991	1.93	1024	2.08	1057	2.25	1088	2.40	1119	2.56	1149	2.73	1177	2.89	1206	3.06	1233	3.22
3000	975	2.00	1009	2.16	1044	2.34	1075	2.51	1108	2.69	1138	2.86	1167	3.03	1195	3.21	1222	3.38	—	—
3300	994	2.24	1028	2.42	1063	2.61	1094	2.79	1126	2.98	1155	3.16	1185	3.35	—	—	—	—	—	—
3600	1013	2.49	1048	2.69	1081	2.88	1114	3.09	1145	3.29	—	—	—	—	—	—	—	—	—	—
							3-hp Oversized Motor and Field Supplied High Static Drive[c]													

Notes:

1. For standard evaporator fan speed (rpm), reference the standard motor and sheave/fan speed applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. 1-hp fan motor heat (MBh) = 2.829 x fan bhp +.4024. 3-hp fan motor heat (MBh) = 2.900 x Fan bhp -.3800.
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) BAYLSDR009A
(b) BAYHSMT400A
(c) Field Supplied AK56 x 1 in. fan sheave required.

Evaporator Fan Performance

Table 38. Direct drive evaporator fan performance - 7.5 tons standard efficiency Title 24 single zone VAV - WSC092H3,H4,HW downflow airflow

External Static Pressure (Inches of Water Gauge)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	713	0.21	763	0.26	807	0.32	851	0.39	892	0.45	924	0.50	957	0.56	991	0.62	1024	0.68	1054	0.74
2700	792	0.28	834	0.34	880	0.41	914	0.47	955	0.54	992	0.62	1023	0.68	1051	0.74	1081	0.81	1112	0.88
3000	871	0.36	908	0.43	949	0.51	987	0.58	1018	0.65	1054	0.73	1090	0.81	1120	0.89	1145	0.96	1171	1.02
3300	950	0.47	985	0.54	1020	0.62	1058	0.71	1090	0.79	1118	0.86	1151	0.95	1184	1.04	1214	1.13	1240	1.21
3600	1030	0.60	1062	0.67	1094	0.76	1128	0.84	1162	0.94	1191	1.03	1216	1.10	1245	1.20	1276	1.30	1305	1.40
External Static Pressure (Inches of Water Gauge)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1084	0.79	1113	0.85	1141	0.90	1168	0.95	1194	1.00	1218	1.05	1243	1.10	1267	1.14	1290	1.19	1314	1.23
2700	1140	0.94	1169	1.01	1195	1.07	1222	1.13	1248	1.20	1273	1.25	1296	1.31	1321	1.37	1343	1.43	1366	1.48
3000	1198	1.10	1225	1.18	1252	1.25	1278	1.32	1303	1.40	1328	1.47	1351	1.54	1375	1.61	1398	1.67	1419	1.74
3300	1262	1.28	1285	1.35	1309	1.43	1335	1.52	1360	1.60	1384	1.69	1407	1.77	1429	1.84	1452	1.92	1475	2.00
3600	1331	1.49	1355	1.58	1375	1.65	1396	1.74	1418	1.82	1441	1.91	1464	2.01	1487	2.10	1509	2.19	1530	2.27

Notes:
1. For direct drive fan speed (rpm), reference the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils. No accessories or options are included in pressure drop data.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388.
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 39. Direct drive evaporator fan performance - 7.5 tons standard efficiency Title 24 single zone VAV - WSC092H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water Gauge)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	720	0.21	769	0.27	817	0.33	856	0.39	894	0.44	929	0.50	964	0.56	997	0.62	1028	0.69	1060	0.75
2700	800	0.29	841	0.34	888	0.42	927	0.48	962	0.55	995	0.61	1027	0.67	1058	0.74	1088	0.81	1118	0.88
3000	880	0.38	917	0.44	956	0.51	999	0.59	1032	0.67	1063	0.74	1094	0.81	1123	0.88	1151	0.95	1178	1.02
3300	961	0.49	994	0.55	1028	0.63	1067	0.72	1104	0.80	1133	0.88	1162	0.96	1190	1.04	1218	1.12	1243	1.19
3600	1042	0.62	1073	0.69	1104	0.77	1136	0.85	1173	0.95	1205	1.05	1233	1.13	1259	1.22	1285	1.30	1310	1.39
External Static Pressure (Inches of Water Gauge)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1090	0.82	1119	0.89	1147	0.96	1174	1.03	1200	1.10	1226	1.18	1251	1.25	1276	1.33	1299	1.41	1323	1.49
2700	1147	0.95	1175	1.02	1202	1.10	1228	1.17	1254	1.25	1279	1.33	1304	1.41	1327	1.49	1350	1.57	1374	1.66
3000	1206	1.10	1233	1.18	1259	1.26	1285	1.34	1309	1.42	1333	1.50	1359	1.59	1381	1.67	1405	1.76	1427	1.85
3300	1269	1.27	1294	1.35	1320	1.44	1344	1.52	1367	1.61	1391	1.70	1414	1.78	1438	1.88	1460	1.97	1482	2.06
3600	1335	1.48	1359	1.56	1382	1.64	1405	1.73	1428	1.82	1451	1.91	1473	2.01	1496	2.10	1518	2.20	1538	2.29

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388.
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 40. Belt drive evaporator fan performance - 8.5 tons standard efficiency - WSC102H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10"		.20"		.30"		.40"		.50"		.60"		.70"		.80"		.90"		1.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	2-hp Standard Motor and Field Supplied Low Static Drive[a]																			
2720	-	-	519	0.43	563	0.50	603	0.57	644	0.65	681	0.73	716	0.81	749	0.88	780	0.96	809	1.03
3060	513	0.48	558	0.56	604	0.65	640	0.73	676	0.81	713	0.90	747	0.99	779	1.07	810	1.16	840	1.25
3400	558	0.63	600	0.72	643	0.82	681	0.92	714	1.00	745	1.09	779	1.19	811	1.29	841	1.39	870	1.49
3740	605	0.82	645	0.92	683	1.02	722	1.13	754	1.24	783	1.33	811	1.42	842	1.53	872	1.64	901	1.75
4080	654	1.04	691	1.16	724	1.26	760	1.38	795	1.50	824	1.61	851	1.71	876	1.81	904	1.92	932	2.04
									2-hp Standard Motor and Drive											

External Static Pressure (Inches of Water)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	2-hp Standard Motor and Drive																			
2720	838	1.11	865	1.18	891	1.26	916	1.33	940	1.40	963	1.47	986	1.54	1008	1.61	1030	1.69	1051	1.76
3060	867	1.33	893	1.41	919	1.50	945	1.59	968	1.66	992	1.75	1014	1.83	1037	1.91	1058	2.00	1079	2.08
3400	897	1.58	923	1.68	949	1.77	974	1.87	997	1.96	1020	2.05	1044	2.15	1065	2.24	1087	2.33	1107	2.42
3740	928	1.86	954	1.96	980	2.07	1003	2.18	1027	2.28	1050	2.39	1072	2.49	1094	2.59	1115	2.70	1136	2.80
4080	959	2.16	985	2.29	1010	2.40	1034	2.52	1058	2.64	1079	2.75	1102	2.87	1124	2.98	1145	3.10	1165	3.21
									3-hp Oversized Motor and Drive[b]											

Notes:

1. For standard evaporator fan speed (rpm), reference the standard motor and sheave/fan speed applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. 1-hp fan motor heat (MBh) = 2.829 x fan bhp + .4024. 2-hp fan motor heat (MBh) = 2.000 x fan bhp +.5000. 3-hp fan motor heat (MBh) = 2.900 x fan bhp +.4750
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
6. For electric heat applications, minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temperature rise table.

(a) BAYLSDR009A
(b) BAYHSMT097A

Table 41. Belt drive evaporator fan performance - 8.5 tons standard efficiency - WSC102H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10"		.20"		.30"		.40"		.50"		.60"		.70"		.80"		.90"		1.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	2-hp Standard Motor and Field Supplied Low Static Drive Accessory Kit[a]																			
2720	523	0.43	571	0.50	619	0.59	676	0.69	721	0.80	759	0.90	795	1.00	830	1.10	862	1.20	893	1.30
3060	578	0.59	625	0.68	659	0.75	706	0.86	757	0.98	800	1.10	834	1.21	866	1.33	899	1.44	929	1.55
3400	633	0.79	673	0.88	710	0.97	744	1.07	788	1.19	833	1.32	874	1.46	907	1.58	937	1.71	967	1.84
3740	690	1.03	723	1.12	764	1.24	791	1.33	825	1.44	864	1.57	907	1.72	945	1.87	979	2.02	1007	2.15
4080	747	1.31	777	1.41	812	1.53	844	1.65	869	1.75	901	1.87	938	2.02	976	2.18	1013	2.35	1048	2.51
	2-hp Standard Motor and Drive																			

External Static Pressure (Inches of Water)																				
	1.10"		1.20"		1.30"		1.40"		1.50"		1.60"		1.70"		1.80"		1.90"		2.00"	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	2-hp Standard Motor and Drive																			
2720	924	1.40	952	1.50	980	1.60	1006	1.70	1032	1.81	1057	1.91	1081	2.01	1105	2.11	1127	2.21	1150	2.31
3060	959	1.66	987	1.77	1014	1.89	1041	2.01	1066	2.11	1091	2.23	1115	2.34	1138	2.46	1161	2.57	1184	2.69
3400	995	1.96	1024	2.09	1051	2.21	1077	2.34	1102	2.46	1126	2.59	1150	2.72	1173	2.84	1196	2.97	1217	3.09
3740	1034	2.29	1060	2.43	1087	2.57	1113	2.71	1138	2.84	1162	2.98	1185	3.12	1208	3.25	1230	3.39	-	-
4080	1076	2.66	1101	2.81	1126	2.96	1150	3.11	1175	3.26	1198	3.41	-	-	-	-	-	-	-	-
	3-hp Oversized Motor and Drive[b]																			

Notes:

1. For standard evaporator fan speed (rpm), reference the standard motor and sheave/fan speed applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. 1-hp fan motor heat (MBh) = 2.829 x fan bhp + .4024. 2-hp fan motor heat (MBh) = 2.000 x fan bhp +.5000. 3-hp fan motor heat (MBh) = 2.900 x fan bhp +.4750
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
6. For electric heat applications, minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temperature rise table.

(a) BAYLSDR009A
(b) BAYHSMT097A

Evaporator Fan Performance

Table 42. Direct drive evaporator fan performance - 8.5 tons standard efficiency Title 24 single zone VAV - WSC102H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	812	0.31	857	0.37	899	0.44	935	0.50	976	0.58	1011	0.65	1040	0.72	1068	0.78	1099	0.85	1129	0.92
3060	904	0.42	942	0.49	983	0.57	1017	0.64	1049	0.71	1086	0.80	1119	0.89	1149	0.96	1174	1.03	1197	1.10
3400	997	0.55	1030	0.63	1066	0.71	1103	0.81	1132	0.89	1160	0.96	1193	1.06	1225	1.16	1254	1.25	1279	1.33
3740	1090	0.72	1120	0.80	1152	0.89	1185	0.99	1218	1.09	1244	1.17	1269	1.25	1298	1.36	1329	1.47	1356	1.57
4080	1183	0.92	1211	1.01	1240	1.10	1270	1.20	1301	1.31	1330	1.42	1354	1.51	1377	1.60	1402	1.70	1430	1.82
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1158	0.99	1186	1.05	1213	1.11	1238	1.18	1264	1.24	1289	1.30	1313	1.36	1336	1.42	1359	1.47	1382	1.53
3060	1226	1.18	1253	1.26	1279	1.33	1305	1.41	1329	1.48	1353	1.55	1377	1.63	1400	1.70	1422	1.76	1444	1.83
3400	1301	1.40	1323	1.48	1347	1.56	1372	1.65	1396	1.74	1421	1.83	1444	1.91	1465	1.99	1487	2.07	1509	2.15
3740	1382	1.67	1406	1.76	1426	1.84	1445	1.92	1465	2.01	1489	2.11	1510	2.20	1533	2.30	1554	2.39	1576	2.49
4080	1457	1.94	1482	2.05	1506	2.16	1527	2.26	1546	2.35	1565	2.44	1583	2.53	1602	2.63	1623	2.73	1643	2.84

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 43. Direct drive evaporator fan performance - 8.5 tons standard efficiency Title 24 single zone VAV - WSC102H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	821	0.31	864	0.38	911	0.45	947	0.52	982	0.58	1015	0.65	1046	0.71	1077	0.78	1107	0.85	1137	0.93
3060	914	0.43	951	0.50	993	0.58	1032	0.66	1063	0.73	1095	0.81	1125	0.88	1153	0.95	1181	1.03	1208	1.10
3400	1008	0.57	1041	0.64	1076	0.73	1115	0.82	1148	0.91	1177	0.99	1204	1.07	1232	1.15	1259	1.24	1284	1.32
3740	1103	0.75	1132	0.82	1163	0.91	1197	1.01	1232	1.11	1262	1.21	1288	1.30	1313	1.38	1339	1.47	1364	1.57
4080	1198	0.95	1225	1.04	1253	1.13	1281	1.22	1314	1.33	1345	1.45	1372	1.55	1397	1.65	1420	1.75	1444	1.84
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1165	1.00	1193	1.07	1220	1.15	1245	1.22	1271	1.30	1296	1.38	1322	1.47	1344	1.55	1368	1.63	1391	1.72
3060	1235	1.18	1261	1.26	1288	1.34	1313	1.43	1337	1.51	1361	1.59	1385	1.68	1408	1.77	1431	1.86	1453	1.95
3400	1310	1.40	1334	1.48	1359	1.57	1382	1.66	1406	1.75	1430	1.84	1453	1.93	1474	2.02	1496	2.12	1518	2.21
3740	1388	1.66	1411	1.75	1433	1.83	1456	1.93	1477	2.02	1500	2.11	1522	2.21	1544	2.31	1565	2.41	1586	2.51
4080	1467	1.95	1489	2.04	1512	2.14	1533	2.24	1554	2.34	1575	2.43	1594	2.53	1616	2.64	1636	2.74	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 44. Direct drive evaporator fan performance - 10 tons standard efficiency - WSC120H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	942	0.47	978	0.54	1017	0.63	1053	0.71	1082	0.78	1116	0.87	1150	0.96	1181	1.04	1207	1.12	1231	1.19
3600	1051	0.65	1083	0.73	1116	0.81	1152	0.91	1183	1.00	1209	1.08	1237	1.17	1268	1.27	1298	1.38	1325	1.47
4000	1161	0.87	1190	0.96	1219	1.05	1249	1.15	1282	1.26	1310	1.36	1334	1.45	1357	1.54	1385	1.65	1412	1.76
4400	1272	1.13	1298	1.23	1324	1.33	1351	1.44	1379	1.54	1409	1.67	1435	1.79	1457	1.88	1478	1.98	1501	2.08
4800	1383	1.45	1407	1.56	1431	1.66	1455	1.78	1480	1.89	1506	2.01	1532	2.14	1558	2.28	1579	2.39	1599	2.49
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1254	1.26	1282	1.35	1307	1.43	1332	1.51	1357	1.59	1381	1.66	1404	1.74	1427	1.82	1449	1.89	1471	1.96
3600	1350	1.56	1372	1.64	1392	1.72	1412	1.80	1437	1.90	1460	1.99	1483	2.08	1504	2.17	1526	2.26	1548	2.35
4000	1440	1.88	1464	1.98	1488	2.08	1508	2.18	1527	2.26	1545	2.35	1564	2.44	1586	2.55	1606	2.65	1627	2.75
4400	1526	2.20	1552	2.33	1576	2.46	1600	2.58	1621	2.69	1642	2.80	1660	2.90	-	-	-	-	-	-
4800	1618	2.60	1639	2.71	1663	2.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.8623 x fan bhp + 0.1504
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 45. Direct drive evaporator fan performance - 10 tons standard efficiency - WSC120H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	953	0.48	988	0.55	1027	0.64	1067	0.73	1098	0.80	1128	0.88	1157	0.96	1186	1.03	1213	1.11	1239	1.19
3600	1064	0.67	1095	0.75	1126	0.83	1163	0.93	1198	1.03	1226	1.11	1253	1.20	1280	1.29	1306	1.37	1331	1.46
4000	1175	0.90	1203	0.98	1231	1.07	1260	1.17	1294	1.28	1327	1.39	1353	1.49	1377	1.58	1401	1.68	1425	1.78
4400	1288	1.18	1313	1.27	1338	1.36	1364	1.46	1392	1.57	1422	1.70	1452	1.82	1477	1.93	1500	2.04	1522	2.14
4800	1400	1.51	1423	1.61	1446	1.71	1470	1.82	1494	1.93	1519	2.05	1547	2.18	1575	2.32	1600	2.45	1622	2.56
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1265	1.27	1291	1.35	1316	1.43	1342	1.52	1365	1.60	1389	1.69	1412	1.78	1435	1.87	1458	1.96	1479	2.05
3600	1355	1.54	1378	1.63	1401	1.72	1425	1.81	1447	1.90	1471	2.00	1492	2.09	1515	2.19	1536	2.28	1557	2.38
4000	1448	1.87	1471	1.97	1494	2.07	1515	2.16	1536	2.26	1557	2.36	1578	2.46	1598	2.56	1619	2.66	1640	2.77
4400	1543	2.24	1565	2.35	1586	2.46	1607	2.56	1628	2.67	1647	2.77	1667	2.88	1686	2.98	-	-	-	-
4800	1642	2.68	1662	2.79	1682	2.91	1701	3.02	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.8623 x fan bhp + 0.1504
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 46. Direct drive evaporator fan performance - 3 tons high efficiency - W/DHC036H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
960	539	0.11	585	0.15	632	0.18	679	0.22	725	0.26	772	0.29	819	0.33	865	0.37	912	0.41	927	0.44
1080	566	0.16	613	0.20	659	0.24	706	0.27	753	0.31	800	0.35	846	0.38	893	0.42	940	0.46	948	0.49
1200	594	0.21	640	0.25	687	0.29	734	0.32	780	0.36	827	0.40	874	0.43	920	0.47	930	0.51	968	0.54
1320	621	0.26	668	0.30	714	0.34	761	0.37	808	0.41	854	0.45	901	0.49	948	0.52	950	0.56	988	0.60
1440	648	0.31	695	0.35	742	0.39	789	0.43	835	0.46	882	0.50	929	0.54	932	0.57	971	0.61	1009	0.65
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
960	965	0.48	1004	0.52	1042	0.55	1080	0.59	1118	0.63
1080	986	0.53	1024	0.57	1062	0.60	1100	0.64	1139	0.67
1200	1006	0.58	1044	0.62	1083	0.66	1121	0.70	1159	0.74
1320	1027	0.63	1065	0.67	1103	0.70	1141	0.73	1179	0.76
1440	1047	0.68	1085	0.70	1123	0.74	1162	0.77	1200	0.80

Notes:
1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp + 0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Table 47. Direct drive evaporator fan performance - 3 tons high efficiency - W/DHC036H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
960	-	-	515	0.15	565	0.18	614	0.22	663	0.26	713	0.29	762	0.33	812	0.37	861	0.41	921	0.44
1080	-	-	541	0.20	590	0.24	640	0.27	689	0.31	738	0.35	788	0.38	837	0.42	887	0.46	940	0.49
1200	517	0.21	566	0.25	616	0.29	665	0.32	715	0.36	764	0.40	813	0.43	863	0.47	921	0.51	959	0.54
1320	543	0.26	592	0.30	641	0.34	691	0.37	740	0.41	790	0.45	839	0.49	888	0.52	940	0.56	978	0.60
1440	568	0.31	618	0.35	667	0.39	716	0.43	766	0.46	815	0.50	865	0.54	922	0.57	960	0.61	997	0.65
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
960	958	0.48	995	0.52	1033	0.55	1070	0.59	1108	0.63
1080	977	0.53	1015	0.57	1052	0.60	1089	0.64	1127	0.67
1200	996	0.58	1034	0.62	1071	0.66	1108	0.70	1146	0.74
1320	1015	0.63	1053	0.67	1090	0.70	1127	0.73	1165	0.76
1440	1034	0.68	1072	0.70	1109	0.74	1147	0.77	1184	0.80

Notes:

1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp + 0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Evaporator Fan Performance

Table 48. Direct drive evaporator fan performance - 4 tons high efficiency - W/DHC048H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
1280	541	0.07	585	0.12	628	0.18	672	0.23	715	0.28	759	0.33	802	0.39	846	0.44	889	0.49	905	0.55
1440	564	0.15	608	0.2	651	0.25	695	0.3	738	0.36	782	0.41	825	0.46	869	0.51	912	0.57	925	0.62
1600	587	0.22	631	0.27	674	0.33	718	0.38	761	0.43	805	0.48	848	0.54	892	0.59	901	0.64	945	0.70
1760	610	0.3	654	0.35	697	0.4	741	0.45	784	0.51	828	0.56	871	0.61	915	0.66	921	0.72	965	0.77
1920	634	0.37	677	0.42	721	0.48	764	0.53	808	0.58	851	0.63	895	0.69	898	0.74	941	0.79	985	0.85
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
1280	949	0.60	992	0.65	1036	0.70	1079	0.76	1123	0.81
1440	969	0.67	1012	0.73	1056	0.78	1099	0.83	1143	0.88
1600	989	0.75	1032	0.80	1076	0.85	1119	0.91	1163	0.96
1760	1009	0.82	1052	0.88	1096	0.93	1139	0.98	1183	1.03
1920	1029	0.90	1072	0.95	1116	1.00	1159	1.06	1203	1.11

Notes:
1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp + 0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Table 49. Direct drive evaporator fan performance - 4 tons high efficiency - W/DHC048H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
1280	591	0.07	632	0.12	674	0.18	715	0.23	756	0.28	798	0.33	839	0.39	880	0.44	922	0.49	968	0.55
1440	621	0.15	663	0.2	704	0.25	745	0.3	787	0.36	828	0.41	869	0.46	911	0.51	952	0.57	1005	0.62
1600	652	0.22	693	0.27	734	0.33	776	0.38	817	0.43	858	0.48	900	0.54	941	0.59	1008	0.64	1041	0.70
1760	682	0.3	723	0.35	765	0.4	806	0.45	847	0.51	889	0.56	930	0.61	971	0.66	1045	0.72	1078	0.77
1920	712	0.37	754	0.42	795	0.48	836	0.53	878	0.58	919	0.63	960	0.69	1048	0.74	1082	0.79	1115	0.85
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
1280	1001	0.60	1034	0.65	1067	0.70	1101	0.76	1134	0.81
1440	1038	0.67	1071	0.73	1104	0.78	1137	0.83	1170	0.88
1600	1075	0.75	1108	0.80	1141	0.85	1174	0.91	1207	0.96
1760	1111	0.82	1144	0.88	1177	0.93	1210	0.98	1244	1.03
1920	1148	0.90	1181	0.95	1214	1.00	1247	1.06	1280	1.11

Notes:
1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp +0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Evaporator Fan Performance

Table 50. Direct drive evaporator fan performance - 5 tons high efficiency - W/DHC060H3,H4,HW downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
1600	618	0.13	656	0.18	693	0.23	731	0.28	769	0.33	806	0.38	844	0.43	881	0.48	919	0.53	932	0.58
1800	651	0.24	689	0.29	727	0.34	764	0.39	802	0.44	839	0.49	877	0.54	915	0.59	957	0.64	961	0.69
2000	685	0.35	722	0.4	760	0.45	798	0.5	835	0.55	873	0.6	910	0.65	948	0.7	952	0.75	991	0.80
2200	718	0.46	756	0.51	793	0.56	831	0.61	869	0.66	906	0.71	944	0.76	981	0.81	981	0.86	1021	0.91
2400	752	0.57	789	0.62	827	0.67	864	0.72	902	0.77	940	0.82	977	0.87	971	0.92	1011	0.97	1050	1.02
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
1600	971	0.63	1011	0.68	1050	0.73	1089	0.79	1129	0.84
1800	1001	0.74	1040	0.79	1080	0.84	1119	0.89	1158	0.92
2000	1030	0.85	1070	0.90	1109	0.95	1149	0.99	1188	1.02
2200	1060	0.96	1099	1.01	1139	1.04	1178	1.06	1218	1.09
2400	1090	1.05	1129	1.07	1168	1.10	1208	1.13	1247	1.16

Notes:

1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp +0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Table 51. Direct drive evaporator fan performance - 5 tons high efficiency - W/DHC060H3,H4,HW horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	Standard Static Motor																			
1600	680	0.14	717	0.19	753	0.25	790	0.31	827	0.36	864	0.42	901	0.47	937	0.48	974	0.53	1047	0.58
1800	716	0.27	753	0.32	789	0.38	826	0.44	863	0.49	900	0.55	937	0.61	973	0.59	1010	0.64	1084	0.69
2000	752	0.4	789	0.46	825	0.51	862	0.57	899	0.63	936	0.68	973	0.74	1009	0.7	1084	0.75	1120	0.80
2200	788	0.53	825	0.59	861	0.65	898	0.7	935	0.76	972	0.82	1009	0.87	1045	0.81	1121	0.86	1156	0.91
2400	824	0.67	861	0.72	897	0.78	934	0.84	971	0.89	1008	0.95	1045	1.01	1121	0.92	1157	0.97	1193	1.02
															High Static Motor Option[a]					

External Static Pressure (Inches of Water)										
	1.10”		1.20”		1.30”		1.40”		1.50”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
	High Static Motor Option[a]									
1600	1083	0.63	1119	0.68	1155	0.73	1191	0.79	1227	0.84
1800	1120	0.74	1155	0.79	1191	0.84	1227	0.89	1263	0.92
2000	1156	0.85	1192	0.90	1228	0.95	1264	0.99	1300	1.02
2200	1192	0.96	1228	1.01	1264	1.04	1300	1.06	1336	1.09
2400	1229	1.05	1265	1.07	1301	1.10	1336	1.13	1372	1.16

Notes:
1. For constant cfm direct drive fan, refer to the voltage vs. cfm table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.9245 x fan bhp +0.055
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

(a) High Static Motor Option not available on DHC models.

Evaporator Fan Performance

Table 52. Direct drive evaporator fan performance - 6 tons high efficiency - WHC074H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	598	0.10	649	0.14	695	0.18	736	0.23	773	0.27	808	0.32	841	0.37	872	0.41	901	0.46	930	0.52
2160	660	0.14	707	0.18	750	0.23	789	0.27	825	0.32	859	0.37	891	0.42	921	0.47	950	0.53	977	0.58
2400	722	0.18	767	0.23	807	0.27	844	0.32	879	0.38	912	0.43	943	0.48	972	0.54	1000	0.60	1027	0.66
2640	785	0.23	827	0.28	865	0.33	900	0.38	934	0.44	965	0.50	995	0.56	1024	0.62	1051	0.68	1077	0.74
2880	848	0.28	888	0.34	924	0.40	958	0.45	990	0.51	1020	0.58	1049	0.64	1077	0.70	1103	0.77	1129	0.83
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	957	0.57	983	0.63	1009	0.68	1032	0.74	1056	0.8	1079	0.85	1101	0.92	1122	0.98	1143	1.04	1164	1.1
2160	1004	0.64	1029	0.7	1055	0.76	1078	0.82	1101	0.88	1124	0.94	1146	1	1167	1.07	1188	1.13	1209	1.2
2400	1053	0.72	1077	0.78	1102	0.84	1125	0.9	1148	0.97	1171	1.04	1192	1.1	1213	1.17	1234	1.24	1254	1.31
2640	1103	0.8	1127	0.87	1151	0.93	1174	1	1196	1.07	1218	1.14	1239	1.21	1260	1.28	1280	1.35	1300	1.42
2880	1154	0.9	1177	0.97	1201	1.04	1223	1.11	1245	1.18	1267	1.25	1287	1.32	1308	1.4	1328	1.47	1348	1.55

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 53. Direct drive evaporator fan performance - 6 tons high efficiency - WHC074H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	583	0.07	638	0.10	686	0.12	729	0.15	768	0.18	805	0.21	839	0.24	871	0.27	902	0.30	931	0.33
2160	642	0.09	693	0.12	739	0.15	780	0.18	818	0.21	853	0.24	887	0.28	918	0.31	948	0.34	977	0.38
2400	702	0.11	750	0.15	793	0.19	832	0.22	869	0.25	903	0.29	935	0.32	966	0.35	996	0.39	1023	0.43
2640	762	0.14	807	0.19	848	0.23	886	0.26	921	0.30	954	0.33	986	0.37	1015	0.41	1043	0.45	1071	0.48
2880	823	0.17	865	0.22	904	0.27	940	0.31	974	0.35	1006	0.39	1037	0.43	1066	0.47	1094	0.51	1121	0.55
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	960	0.36	986	0.40	1013	0.43	1038	0.46	1062	0.50	1085	0.54	1108	0.57	1131	0.61	1153	0.65	1175	0.69
2160	1004	0.41	1031	0.45	1057	0.48	1082	0.52	1106	0.56	1129	0.59	1152	0.63	1173	0.67	1194	0.71	1216	0.75
2400	1051	0.47	1077	0.50	1102	0.54	1126	0.58	1150	0.62	1173	0.66	1195	0.70	1217	0.74	1238	0.78	1259	0.83
2640	1098	0.52	1123	0.56	1148	0.61	1172	0.65	1195	0.69	1218	0.73	1240	0.77	1261	0.82	1282	0.86	1303	0.91
2880	1147	0.59	1171	0.63	1195	0.68	1219	0.72	1242	0.76	1264	0.81	1286	0.85	1307	0.9	1328	0.95	1348	0.99

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 54. Direct drive evaporator fan performance - 6 tons high efficiency dual fuel low/medium heat - DHC074H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	625	0.15	678	0.20	727	0.25	770	0.30	810	0.35	847	0.41	882	0.46	915	0.52	947	0.58	976	0.64
2160	691	0.20	737	0.25	784	0.31	826	0.37	864	0.42	900	0.48	934	0.54	966	0.61	997	0.67	1026	0.73
2400	757	0.26	799	0.32	842	0.38	882	0.44	919	0.51	955	0.57	987	0.64	1018	0.70	1049	0.77	1077	0.84
2640	824	0.34	864	0.40	901	0.46	941	0.53	977	0.60	1010	0.67	1042	0.74	1073	0.81	1101	0.88	1129	0.96
2880	892	0.42	929	0.49	963	0.55	999	0.63	1034	0.71	1067	0.78	1098	0.86	1127	0.94	1155	1.01	1183	1.09
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	1005	0.70	1033	0.76	1060	0.83	1086	0.89	1111	0.96	1135	1.03	1158	1.09	1181	1.17	1203	1.23	1225	1.31
2160	1054	0.80	1082	0.87	1107	0.93	1133	1.00	1158	1.08	1182	1.15	1205	1.22	1228	1.29	1250	1.37	1272	1.45
2400	1105	0.91	1131	0.98	1157	1.05	1182	1.13	1206	1.20	1229	1.28	1252	1.35	1275	1.43	1297	1.51	1318	1.59
2640	1156	1.03	1183	1.11	1208	1.19	1232	1.27	1255	1.34	1279	1.42	1302	1.51	1323	1.59	1344	1.67	1365	1.75
2880	1209	1.17	1234	1.25	1259	1.34	1283	1.42	1306	1.50	1330	1.59	1351	1.67	1373	1.76	1394	1.84	1414	1.93

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 55. Direct drive evaporator fan performance - 6 tons high efficiency dual fuel low/medium heat - DHC074H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	583	0.07	638	0.10	686	0.12	729	0.15	768	0.18	805	0.21	839	0.24	871	0.27	902	0.30	931	0.33
2160	642	0.09	693	0.12	739	0.15	780	0.18	818	0.21	853	0.24	887	0.28	918	0.31	948	0.34	977	0.38
2400	702	0.11	750	0.15	793	0.19	832	0.22	869	0.25	903	0.29	935	0.32	966	0.35	996	0.39	1023	0.43
2640	762	0.14	807	0.19	848	0.23	886	0.26	921	0.30	954	0.33	986	0.37	1015	0.41	1043	0.45	1071	0.48
2880	823	0.17	865	0.22	904	0.27	940	0.31	974	0.35	1006	0.39	1037	0.43	1066	0.47	1094	0.51	1121	0.55
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	960	0.36	986	0.40	1013	0.43	1038	0.46	1062	0.50	1085	0.54	1108	0.57	1131	0.61	1153	0.65	1175	0.69
2160	1004	0.41	1031	0.45	1057	0.48	1082	0.52	1106	0.56	1129	0.59	1152	0.63	1173	0.67	1194	0.71	1216	0.75
2400	1051	0.47	1077	0.50	1102	0.54	1126	0.58	1150	0.62	1173	0.66	1195	0.70	1217	0.74	1238	0.78	1259	0.83
2640	1098	0.52	1123	0.56	1148	0.61	1172	0.65	1195	0.69	1218	0.73	1240	0.77	1261	0.82	1282	0.86	1303	0.91
2880	1147	0.59	1171	0.63	1195	0.68	1219	0.72	1242	0.76	1264	0.81	1286	0.85	1307	0.90	1328	0.95	1348	0.99

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 56. Direct drive evaporator fan performance - 6 tons high efficiency dual fuel high heat - DHC074H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	611	0.15	665	0.20	709	0.25	759	0.31	800	0.36	839	0.41	877	0.47	915	0.53	949	0.59	982	0.66
2160	674	0.20	724	0.26	765	0.31	807	0.37	851	0.43	888	0.49	922	0.55	959	0.62	992	0.68	1025	0.75
2400	739	0.26	783	0.32	826	0.39	860	0.44	899	0.51	938	0.58	974	0.65	1006	0.71	1037	0.78	1068	0.85
2640	804	0.34	844	0.40	886	0.47	920	0.54	951	0.60	987	0.67	1024	0.75	1058	0.83	1087	0.90	1114	0.97
2880	870	0.42	907	0.49	944	0.57	982	0.64	1011	0.71	1039	0.78	1073	0.86	1106	0.95	1138	1.04	1167	1.12
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	1014	0.72	1044	0.78	1073	0.85	1101	0.91	1128	0.98	1155	1.05	1180	1.11	1205	1.18	1230	1.26	1253	1.33
2160	1056	0.82	1085	0.89	1114	0.96	1142	1.03	1170	1.10	1195	1.17	1221	1.25	1246	1.32	1270	1.40	1293	1.47
2400	1098	0.93	1128	1.00	1156	1.08	1184	1.15	1210	1.23	1237	1.31	1262	1.39	1287	1.47	1310	1.55	1334	1.63
2640	1144	1.05	1173	1.13	1201	1.21	1228	1.29	1253	1.38	1279	1.46	1304	1.54	1329	1.63	1352	1.72	1375	1.80
2880	1193	1.19	1219	1.27	1245	1.35	1272	1.44	1298	1.53	1322	1.62	1348	1.71	1372	1.80	1395	1.89	1418	1.99

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 57. Direct drive evaporator fan performance - 6 tons high efficiency dual fuel high heat - DHC074H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	601	0.14	657	0.19	707	0.24	754	0.29	797	0.35	839	0.41	879	0.47	916	0.53	951	0.59	984	0.66
2160	663	0.18	712	0.24	762	0.30	804	0.35	846	0.41	884	0.47	922	0.54	958	0.61	993	0.68	1026	0.74
2400	725	0.24	770	0.29	816	0.36	858	0.43	896	0.49	933	0.55	969	0.62	1003	0.69	1036	0.76	1069	0.84
2640	789	0.30	831	0.36	871	0.43	913	0.51	950	0.58	983	0.64	1018	0.72	1052	0.80	1082	0.87	1112	0.95
2880	852	0.38	892	0.45	929	0.52	966	0.59	1004	0.68	1038	0.76	1069	0.83	1101	0.91	1131	0.99	1161	1.07
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1920	1016	0.72	1047	0.79	1078	0.87	1106	0.94	1134	1.01	1162	1.09	1187	1.16	1213	1.24	1237	1.31	1261	1.39
2160	1058	0.82	1089	0.89	1117	0.96	1146	1.04	1173	1.12	1201	1.20	1227	1.28	1252	1.36	1276	1.44	1300	1.52
2400	1100	0.92	1130	0.99	1159	1.07	1187	1.15	1214	1.24	1241	1.32	1266	1.40	1292	1.49	1316	1.58	1339	1.66
2640	1143	1.03	1173	1.11	1201	1.19	1230	1.28	1256	1.37	1282	1.45	1308	1.54	1332	1.63	1356	1.72	1379	1.81
2880	1189	1.15	1216	1.24	1245	1.33	1271	1.41	1298	1.51	1324	1.60	1349	1.69	1374	1.79	1398	1.88	1421	1.98

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 58. Direct drive evaporator fan performance - 7.5 tons high efficiency - WHC092H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	706	0.17	752	0.21	792	0.26	830	0.31	865	0.36	897	0.41	928	0.47	958	0.52	987	0.58	1013	0.64
2700	784	0.22	825	0.27	863	0.33	898	0.38	932	0.44	963	0.49	993	0.55	1021	0.61	1049	0.67	1075	0.74
3000	862	0.29	900	0.35	936	0.41	969	0.46	1001	0.53	1031	0.59	1059	0.65	1086	0.72	1113	0.78	1138	0.85
3300	941	0.37	975	0.44	1009	0.50	1040	0.56	1070	0.63	1099	0.70	1127	0.76	1153	0.83	1178	0.90	1203	0.97
3600	1021	0.47	1052	0.54	1083	0.61	1113	0.68	1142	0.75	1169	0.82	1195	0.89	1221	0.97	1245	1.04	1268	1.12
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1039	0.70	1065	0.76	1089	0.82	1112	0.88	1135	0.95	1157	1.01	1178	1.08	1199	1.15	1221	1.22	1240	1.28
2700	1100	0.80	1125	0.87	1148	0.93	1171	1.00	1193	1.07	1215	1.14	1236	1.21	1257	1.28	1276	1.35	1296	1.42
3000	1162	0.91	1187	0.99	1209	1.05	1232	1.13	1254	1.20	1275	1.27	1295	1.35	1315	1.42	1335	1.50	1354	1.58
3300	1227	1.05	1249	1.12	1272	1.20	1293	1.27	1314	1.35	1335	1.43	1356	1.50	1376	1.59	1396	1.67	1415	1.75
3600	1292	1.20	1315	1.27	1335	1.35	1357	1.43	1377	1.51	1398	1.60	1418	1.68	1437	1.76	1457	1.85	1475	1.93

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 59. Direct drive evaporator fan performance - 7.5 tons high efficiency - WHC092H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	697	0.20	741	0.25	785	0.31	823	0.37	862	0.43	898	0.49	932	0.55	964	0.61	994	0.68	1024	0.74
2700	772	0.27	813	0.33	853	0.39	890	0.45	924	0.52	959	0.59	992	0.66	1023	0.72	1052	0.79	1081	0.86
3000	849	0.35	886	0.42	921	0.49	958	0.55	991	0.63	1022	0.70	1053	0.78	1083	0.85	1112	0.93	1140	1.00
3300	926	0.45	961	0.53	993	0.60	1026	0.67	1060	0.74	1089	0.83	1117	0.91	1145	0.99	1173	1.08	1200	1.16
3600	1004	0.58	1037	0.65	1067	0.73	1096	0.81	1126	0.89	1157	0.97	1184	1.06	1210	1.15	1235	1.24	1262	1.34
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1051	0.81	1079	0.88	1105	0.95	1130	1.02	1154	1.09	1179	1.16	1202	1.24	1225	1.31	1246	1.39	1268	1.46
2700	1109	0.94	1135	1.01	1161	1.08	1185	1.16	1210	1.24	1233	1.31	1256	1.39	1278	1.47	1299	1.55	1321	1.64
3000	1167	1.08	1193	1.16	1217	1.24	1241	1.32	1266	1.40	1287	1.48	1310	1.56	1333	1.65	1354	1.74	1375	1.83
3300	1226	1.24	1251	1.33	1275	1.41	1299	1.49	1322	1.58	1345	1.67	1367	1.76	1388	1.85	1410	1.94	1430	2.03
3600	1286	1.42	1312	1.51	1335	1.60	1359	1.70	1381	1.79	1403	1.88	1425	1.98	1446	2.07	1467	2.17	1487	2.26

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 60. Direct drive evaporator fan performance - 7.5 tons high efficiency dual fuel low/medium heat - DHC092H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	742	0.24	786	0.30	826	0.36	869	0.42	906	0.48	942	0.55	975	0.61	1006	0.68	1036	0.74	1065	0.81
2700	823	0.33	864	0.39	900	0.45	938	0.52	975	0.59	1009	0.66	1041	0.73	1071	0.81	1100	0.88	1129	0.95
3000	905	0.43	944	0.51	978	0.57	1009	0.64	1045	0.72	1078	0.80	1109	0.88	1138	0.96	1166	1.04	1194	1.12
3300	988	0.55	1025	0.64	1057	0.72	1086	0.79	1115	0.87	1147	0.96	1178	1.05	1206	1.13	1234	1.22	1260	1.30
3600	1071	0.70	1105	0.80	1137	0.89	1165	0.97	1192	1.05	1218	1.13	1248	1.23	1276	1.33	1303	1.42	1328	1.51
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1093	0.88	1119	0.95	1145	1.02	1171	1.10	1195	1.17	1219	1.25	1241	1.32	1264	1.40	1286	1.48	1308	1.56
2700	1156	1.03	1181	1.10	1207	1.18	1232	1.26	1255	1.34	1278	1.42	1301	1.50	1323	1.58	1344	1.67	1365	1.75
3000	1219	1.20	1245	1.28	1270	1.36	1294	1.45	1318	1.53	1340	1.62	1362	1.71	1384	1.79	1406	1.88	1426	1.97
3300	1286	1.39	1310	1.48	1335	1.57	1358	1.66	1381	1.75	1403	1.84	1425	1.93	1446	2.03	1467	2.12	1487	2.21
3600	1353	1.61	1377	1.70	1400	1.79	1424	1.89	1445	1.99	1467	2.08	1488	2.18	1509	2.28	1530	2.38	1550	2.49

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 61. Direct drive evaporator fan performance - 7.5 tons high efficiency dual fuel low/medium heat - DHC092H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	718	0.22	762	0.27	805	0.33	844	0.39	881	0.45	915	0.51	947	0.57	978	0.64	1007	0.70	1035	0.77
2700	796	0.30	836	0.36	875	0.42	913	0.49	947	0.55	980	0.62	1011	0.69	1041	0.76	1069	0.83	1096	0.90
3000	876	0.39	913	0.46	948	0.53	983	0.60	1016	0.67	1047	0.75	1077	0.82	1106	0.90	1133	0.97	1160	1.05
3300	956	0.51	990	0.58	1022	0.65	1055	0.73	1086	0.81	1116	0.89	1145	0.98	1172	1.06	1198	1.14	1224	1.22
3600	1037	0.64	1069	0.73	1099	0.81	1128	0.88	1157	0.96	1186	1.05	1213	1.14	1240	1.23	1266	1.33	1290	1.41
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1062	0.84	1089	0.91	1114	0.98	1138	1.05	1162	1.12	1185	1.19	1208	1.27	1230	1.34	1250	1.41	1271	1.49
2700	1123	0.97	1149	1.05	1173	1.12	1197	1.20	1220	1.28	1243	1.35	1266	1.43	1287	1.51	1307	1.59	1329	1.68
3000	1185	1.13	1210	1.21	1234	1.29	1257	1.37	1280	1.45	1302	1.53	1324	1.62	1345	1.71	1366	1.79	1386	1.88
3300	1249	1.30	1273	1.39	1297	1.47	1319	1.56	1342	1.65	1363	1.74	1384	1.83	1406	1.92	1425	2.01	1445	2.10
3600	1314	1.50	1338	1.59	1361	1.69	1383	1.78	1405	1.87	1425	1.96	1446	2.06	1467	2.16	1487	2.26	1506	2.35

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 62. Direct drive evaporator fan performance - 7.5 tons high efficiency dual fuel high heat - DHC092H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	759	0.29	800	0.34	845	0.41	884	0.47	920	0.53	956	0.60	989	0.66	1022	0.73	1053	0.80	1083	0.87
2700	844	0.39	879	0.45	918	0.52	958	0.60	992	0.66	1024	0.74	1057	0.81	1087	0.88	1117	0.95	1145	1.03
3000	931	0.52	962	0.59	995	0.66	1031	0.74	1067	0.82	1098	0.90	1127	0.98	1156	1.06	1184	1.14	1211	1.22
3300	1018	0.68	1046	0.75	1075	0.82	1107	0.91	1140	1.00	1172	1.09	1201	1.17	1227	1.26	1254	1.35	1279	1.43
3600	1106	0.87	1132	0.95	1157	1.02	1185	1.11	1215	1.21	1245	1.30	1275	1.40	1301	1.49	1326	1.59	1350	1.68
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1113	0.94	1141	1.02	1169	1.09	1194	1.17	1220	1.24	1245	1.32	1270	1.40	1292	1.48	1315	1.56	1338	1.64
2700	1174	1.11	1202	1.19	1228	1.27	1254	1.35	1278	1.43	1303	1.52	1328	1.60	1350	1.68	1373	1.77	1395	1.86
3000	1238	1.30	1264	1.38	1289	1.47	1314	1.55	1339	1.64	1363	1.73	1386	1.82	1409	1.92	1431	2.01	1454	2.10
3300	1306	1.52	1330	1.61	1355	1.70	1378	1.79	1402	1.88	1425	1.98	1448	2.08	1470	2.17	1492	2.27	1513	2.37
3600	1374	1.78	1398	1.87	1422	1.97	1445	2.06	1467	2.16	1489	2.26	1510	2.36	1532	2.46	1553	2.56	1575	2.67

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 63. Direct drive evaporator fan performance - 7.5 tons high efficiency dual fuel high heat - DHC092H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	719	0.24	765	0.30	811	0.36	853	0.42	883	0.47	888	0.48	981	0.66	1003	0.71	1020	0.75	1033	0.78
2700	797	0.32	840	0.38	880	0.46	920	0.53	958	0.60	992	0.67	996	0.68	1072	0.85	1107	0.94	1126	1.00
3000	875	0.42	916	0.49	952	0.57	989	0.65	1025	0.73	1059	0.80	1091	0.89	1105	0.93	1108	0.94	1198	1.19
3300	955	0.55	993	0.62	1027	0.70	1060	0.79	1093	0.88	1126	0.96	1157	1.05	1186	1.13	1213	1.22	1216	1.24
3600	1035	0.69	1070	0.77	1103	0.86	1133	0.95	1163	1.05	1194	1.15	1224	1.24	1253	1.33	1280	1.42	1306	1.52
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2400	1045	0.81	1055	0.84	1065	0.87	1074	0.90	1083	0.92	1091	0.95	1099	0.97	1106	1.00	1113	1.02	1119	1.04
2700	1142	1.04	1154	1.09	1166	1.12	1176	1.16	1186	1.19	1195	1.22	1203	1.26	1211	1.28	1218	1.31	1226	1.34
3000	1228	1.29	1247	1.35	1261	1.40	1274	1.45	1285	1.50	1295	1.54	1304	1.58	1313	1.61	1321	1.65	1329	1.69
3300	1220	1.25	1314	1.57	1345	1.69	1363	1.76	1377	1.83	1391	1.89	1402	1.94	1412	1.98	1421	2.03	1430	2.08
3600	1324	1.59	1327	1.61	1330	1.63	1333	1.64	1456	2.14	1476	2.24	1492	2.31	1505	2.38	1516	2.44	1527	2.50

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 64. Direct drive evaporator fan performance - 8.5 tons high efficiency - WHC102H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	812	0.31	857	0.37	899	0.44	935	0.50	976	0.58	1011	0.65	1040	0.72	1068	0.78	1099	0.85	1129	0.92
3060	904	0.42	942	0.49	983	0.57	1017	0.64	1049	0.71	1086	0.80	1119	0.89	1149	0.96	1174	1.03	1197	1.10
3400	997	0.55	1030	0.63	1066	0.71	1103	0.81	1132	0.89	1160	0.96	1193	1.06	1225	1.16	1254	1.25	1279	1.33
3740	1090	0.72	1120	0.80	1152	0.89	1185	0.99	1218	1.09	1244	1.17	1269	1.25	1298	1.36	1329	1.47	1356	1.57
4080	1183	0.92	1211	1.01	1240	1.10	1270	1.20	1301	1.31	1330	1.42	1354	1.51	1377	1.60	1402	1.70	1430	1.82
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1158	0.99	1186	1.05	1213	1.11	1238	1.18	1264	1.24	1289	1.30	1313	1.36	1336	1.42	1359	1.47	1382	1.53
3060	1226	1.18	1253	1.26	1279	1.33	1305	1.41	1329	1.48	1353	1.55	1377	1.63	1400	1.70	1422	1.76	1444	1.83
3400	1301	1.40	1323	1.48	1347	1.56	1372	1.65	1396	1.74	1421	1.83	1444	1.91	1465	1.99	1487	2.07	1509	2.15
3740	1382	1.67	1406	1.76	1426	1.84	1445	1.92	1465	2.01	1489	2.11	1510	2.20	1533	2.30	1554	2.39	1576	2.49
4080	1457	1.94	1482	2.05	1506	2.16	1527	2.26	1546	2.35	1565	2.44	1583	2.53	1602	2.63	1623	2.73	1643	2.84

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 65. Direct drive evaporator fan performance - 8.5 tons high efficiency - WHC102H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	821	0.31	864	0.38	911	0.45	947	0.52	982	0.58	1015	0.65	1046	0.71	1077	0.78	1107	0.85	1137	0.93
3060	914	0.43	951	0.50	993	0.58	1032	0.66	1063	0.73	1095	0.81	1125	0.88	1153	0.95	1181	1.03	1208	1.10
3400	1008	0.57	1041	0.64	1076	0.73	1115	0.82	1148	0.91	1177	0.99	1204	1.07	1232	1.15	1259	1.24	1284	1.32
3740	1103	0.75	1132	0.82	1163	0.91	1197	1.01	1232	1.11	1262	1.21	1288	1.30	1313	1.38	1339	1.47	1364	1.57
4080	1198	0.95	1225	1.04	1253	1.13	1281	1.22	1314	1.33	1345	1.45	1372	1.55	1397	1.65	1420	1.75	1444	1.84
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1165	1.00	1193	1.07	1220	1.15	1245	1.22	1271	1.30	1296	1.38	1322	1.47	1344	1.55	1368	1.63	1391	1.72
3060	1235	1.18	1261	1.26	1288	1.34	1313	1.43	1337	1.51	1361	1.59	1385	1.68	1408	1.77	1431	1.86	1453	1.95
3400	1310	1.40	1334	1.48	1359	1.57	1382	1.66	1406	1.75	1430	1.84	1453	1.93	1474	2.02	1496	2.12	1518	2.21
3740	1388	1.66	1411	1.75	1433	1.83	1456	1.93	1477	2.02	1500	2.11	1522	2.21	1544	2.31	1565	2.41	1586	2.51
4080	1467	1.95	1489	2.04	1512	2.14	1533	2.24	1554	2.34	1575	2.43	1594	2.53	1616	2.64	1636	2.74	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 66. Direct drive evaporator fan performance - 8.5 tons high efficiency dual fuel low/medium heat - DHC102H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	804	0.27	849	0.31	889	0.36	927	0.42	962	0.47	995	0.52	1027	0.58	1057	0.64	1085	0.70	1113	0.76
3060	894	0.37	934	0.41	972	0.47	1007	0.53	1040	0.59	1072	0.65	1102	0.71	1131	0.77	1159	0.83	1186	0.90
3400	984	0.49	1021	0.54	1056	0.60	1090	0.66	1121	0.73	1151	0.80	1180	0.87	1207	0.93	1234	0.99	1260	1.06
3740	1075	0.64	1110	0.70	1142	0.76	1173	0.82	1203	0.89	1232	0.97	1260	1.05	1286	1.12	1312	1.19	1336	1.26
4080	1166	0.82	1198	0.88	1229	0.94	1259	1.01	1287	1.09	1314	1.16	1340	1.24	1366	1.33	1390	1.42	1414	1.49
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1140	0.82	1165	0.87	1191	0.93	1215	0.99	1238	1.05	1261	1.11	1284	1.18	1305	1.25	1327	1.32	1347	1.39
3060	1211	0.96	1237	1.04	1260	1.10	1284	1.17	1307	1.23	1329	1.29	1351	1.35	1372	1.42	1393	1.49	1414	1.57
3400	1284	1.13	1309	1.20	1332	1.28	1356	1.36	1378	1.44	1400	1.51	1420	1.58	1442	1.65	1461	1.72	1481	1.79
3740	1360	1.33	1383	1.40	1406	1.48	1428	1.56	1451	1.64	1472	1.73	1492	1.81	1512	1.90	1532	1.98	1551	2.06
4080	1437	1.56	1460	1.64	1482	1.72	1503	1.80	1525	1.88	1545	1.97	1565	2.05	1586	2.15	1604	2.23	1623	2.33

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 67. Direct drive evaporator fan performance - 8.5 tons high efficiency dual fuel low/medium heat - DHC102H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	815	0.33	847	0.40	886	0.47	926	0.54	962	0.61	995	0.69	1027	0.76	1058	0.84	1090	0.91	1122	0.99
3060	909	0.45	938	0.52	968	0.60	1004	0.68	1040	0.76	1072	0.84	1103	0.93	1132	1.01	1160	1.10	1187	1.18
3400	1003	0.59	1030	0.68	1056	0.76	1085	0.85	1118	0.94	1150	1.03	1179	1.12	1207	1.21	1234	1.30	1261	1.40
3740	1099	0.77	1123	0.86	1147	0.96	1170	1.05	1198	1.15	1227	1.24	1257	1.34	1285	1.44	1311	1.54	1336	1.64
4080	1194	0.98	1217	1.08	1239	1.18	1260	1.28	1282	1.39	1308	1.50	1335	1.60	1363	1.71	1388	1.81	1413	1.92
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1154	1.07	1184	1.15	1212	1.23	1238	1.31	1262	1.39	1285	1.47	1307	1.55	1329	1.63	1352	1.71	1373	1.79
3060	1214	1.27	1244	1.35	1273	1.44	1301	1.53	1327	1.62	1353	1.72	1376	1.80	1398	1.89	1420	1.98	1440	2.07
3400	1285	1.49	1310	1.59	1335	1.69	1360	1.78	1387	1.87	1412	1.97	1439	2.07	1462	2.17	1486	2.27	1508	2.38
3740	1361	1.75	1384	1.85	1407	1.96	1430	2.06	1452	2.17	1474	2.27	1498	2.37	1522	2.48	1545	2.58	1569	2.70
4080	1437	2.03	1460	2.14	1482	2.26	1503	2.37	1524	2.48	1546	2.60	1566	2.71	1587	2.83	1608	2.95	-	-

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 68. Direct drive evaporator fan performance - 8.5 tons high efficiency dual fuel high heat - DHC102H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	850	0.40	884	0.46	923	0.53	963	0.61	998	0.68	1029	0.75	1061	0.82	1091	0.89	1121	0.96	1149	1.04
3060	948	0.55	978	0.62	1011	0.69	1046	0.77	1081	0.86	1112	0.94	1141	1.02	1169	1.09	1198	1.18	1224	1.26
3400	1047	0.74	1074	0.81	1102	0.88	1132	0.97	1165	1.07	1196	1.16	1226	1.25	1251	1.34	1277	1.42	1302	1.51
3740	1147	0.96	1171	1.04	1196	1.12	1222	1.21	1250	1.31	1280	1.42	1309	1.52	1336	1.62	1361	1.72	1384	1.81
4080	1246	1.23	1269	1.32	1292	1.41	1315	1.50	1339	1.60	1365	1.71	1392	1.82	1419	1.94	1445	2.05	1468	2.15
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1178	1.12	1205	1.20	1232	1.28	1258	1.37	1283	1.45	1307	1.53	1330	1.62	1354	1.71	1377	1.79	1399	1.88
3060	1251	1.34	1276	1.43	1302	1.51	1327	1.60	1352	1.69	1376	1.79	1398	1.88	1422	1.97	1444	2.07	1465	2.16
3400	1327	1.60	1352	1.69	1377	1.79	1400	1.88	1423	1.98	1446	2.07	1468	2.17	1490	2.27	1513	2.38	1533	2.47
3740	1407	1.91	1431	2.01	1454	2.10	1476	2.20	1498	2.30	1519	2.40	1541	2.51	1562	2.61	1582	2.72	-	-
4080	1491	2.26	1512	2.36	1533	2.47	1554	2.57	1576	2.68	1597	2.79	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 69. Direct drive evaporator fan performance - 8.5 tons high efficiency dual fuel high heat - DHC102H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	817	0.35	858	0.41	897	0.48	937	0.56	975	0.64	1009	0.71	1042	0.78	1073	0.86	1106	0.94	1137	1.02
3060	908	0.47	947	0.55	980	0.62	1016	0.70	1052	0.79	1086	0.88	1117	0.96	1147	1.04	1176	1.13	1204	1.22
3400	1001	0.62	1037	0.71	1068	0.79	1099	0.88	1131	0.97	1164	1.07	1195	1.17	1224	1.26	1251	1.35	1277	1.44
3740	1094	0.81	1127	0.91	1158	1.00	1185	1.09	1214	1.19	1243	1.29	1272	1.39	1301	1.50	1329	1.61	1354	1.71
4080	1188	1.03	1218	1.14	1248	1.24	1274	1.34	1299	1.44	1325	1.54	1352	1.66	1379	1.77	1406	1.89	1432	2.01
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2720	1166	1.10	1193	1.18	1220	1.26	1245	1.34	1269	1.42	1294	1.50	1318	1.59	1340	1.67	1364	1.76	1385	1.84
3060	1233	1.31	1261	1.40	1288	1.49	1314	1.58	1338	1.67	1362	1.76	1384	1.85	1408	1.94	1429	2.03	1450	2.12
3400	1304	1.54	1329	1.63	1355	1.73	1380	1.83	1406	1.94	1430	2.04	1453	2.14	1475	2.23	1497	2.34	1518	2.43
3740	1378	1.81	1402	1.91	1426	2.01	1450	2.12	1473	2.22	1496	2.33	1520	2.45	1542	2.55	1565	2.67	1587	2.78
4080	1457	2.12	1479	2.23	1502	2.34	1524	2.45	1546	2.56	1567	2.68	1590	2.79	-	-	-	-	-	-

Notes:
1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 70. Direct drive evaporator fan performance - 10 tons high efficiency - WHC120H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	942	0.47	978	0.54	1017	0.63	1053	0.71	1082	0.78	1116	0.87	1150	0.96	1181	1.04	1207	1.12	1231	1.19
3600	1051	0.65	1083	0.73	1116	0.81	1152	0.91	1183	1.00	1209	1.08	1237	1.17	1268	1.27	1298	1.38	1325	1.47
4000	1161	0.87	1190	0.96	1219	1.05	1249	1.15	1282	1.26	1310	1.36	1334	1.45	1357	1.54	1385	1.65	1412	1.76
4400	1272	1.13	1298	1.23	1324	1.33	1351	1.44	1379	1.54	1409	1.67	1435	1.79	1457	1.88	1478	1.98	1501	2.08
4800	1383	1.45	1407	1.56	1431	1.66	1455	1.78	1480	1.89	1506	2.01	1532	2.14	1558	2.28	1579	2.39	1599	2.49
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1254	1.26	1282	1.35	1307	1.43	1332	1.51	1357	1.59	1381	1.66	1404	1.74	1427	1.82	1449	1.89	1471	1.96
3600	1350	1.56	1372	1.64	1392	1.72	1412	1.80	1437	1.90	1460	1.99	1483	2.08	1504	2.17	1526	2.26	1548	2.35
4000	1440	1.88	1464	1.98	1488	2.08	1508	2.18	1527	2.26	1545	2.35	1564	2.44	1586	2.55	1606	2.65	1627	2.75
4400	1526	2.20	1552	2.33	1576	2.46	1600	2.58	1621	2.69	1642	2.80	1660	2.90	-	-	-	-	-	-
4800	1618	2.60	1639	2.71	1663	2.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
6. For electric heat applications, minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temperature rise table.

Table 71. Direct drive evaporator fan performance - 10 tons high efficiency - WHC120H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	953	0.48	988	0.55	1027	0.64	1067	0.73	1098	0.80	1128	0.88	1157	0.96	1186	1.03	1213	1.11	1239	1.19
3600	1064	0.67	1095	0.75	1126	0.83	1163	0.93	1198	1.03	1226	1.11	1253	1.20	1280	1.29	1306	1.37	1331	1.46
4000	1175	0.90	1203	0.98	1231	1.07	1260	1.17	1294	1.28	1327	1.39	1353	1.49	1377	1.58	1401	1.68	1425	1.78
4400	1288	1.18	1313	1.27	1338	1.36	1364	1.46	1392	1.57	1422	1.70	1452	1.82	1477	1.93	1500	2.04	1522	2.14
4800	1400	1.51	1423	1.61	1446	1.71	1470	1.82	1494	1.93	1519	2.05	1547	2.18	1575	2.32	1600	2.45	1622	2.56
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1265	1.27	1291	1.35	1316	1.43	1342	1.52	1365	1.60	1389	1.69	1412	1.78	1435	1.87	1458	1.96	1479	2.05
3600	1355	1.54	1378	1.63	1401	1.72	1425	1.81	1447	1.90	1471	2.00	1492	2.09	1515	2.19	1536	2.28	1557	2.38
4000	1448	1.87	1471	1.97	1494	2.07	1515	2.16	1536	2.26	1557	2.36	1578	2.46	1598	2.56	1619	2.66	1640	2.77
4400	1543	2.24	1565	2.35	1586	2.46	1607	2.56	1628	2.67	1647	2.77	1667	2.88	1686	2.98	-	-	-	-
4800	1642	2.68	1662	2.79	1682	2.91	1701	3.02	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
6. For electric heat applications, minimum airflow is set to 320 cfm/ton, unless specified otherwise, values found in electric heat temperature rise table.

Evaporator Fan Performance

Table 72. Direct drive evaporator fan performance - 10 tons high efficiency dual fuel low/medium heat - DHC120H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	905	0.22	944	0.28	980	0.33	1015	0.39	1047	0.43	1077	0.47	1106	0.51	1135	0.56	1162	0.60	1187	0.65
3600	1008	0.30	1044	0.36	1077	0.43	1109	0.49	1140	0.55	1168	0.59	1196	0.64	1222	0.69	1249	0.74	1273	0.79
4000	1112	0.40	1145	0.47	1176	0.54	1205	0.60	1234	0.67	1261	0.74	1288	0.79	1313	0.85	1338	0.90	1362	0.95
4400	1217	0.52	1247	0.59	1276	0.67	1304	0.74	1330	0.82	1356	0.89	1381	0.97	1406	1.03	1429	1.09	1451	1.14
4800	1322	0.66	1350	0.74	1377	0.82	1403	0.90	1428	0.98	1452	1.07	1476	1.15	1499	1.23	1522	1.31	1543	1.37
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1213	0.69	1236	0.74	1260	0.78	1283	0.83	1306	0.88	1328	0.93	1348	0.97	1369	1.02	1389	1.07	1409	1.12
3600	1297	0.84	1321	0.89	1343	0.94	1365	0.99	1387	1.04	1409	1.09	1429	1.14	1449	1.20	1469	1.25	1488	1.30
4000	1385	1.01	1407	1.06	1429	1.12	1450	1.17	1471	1.23	1491	1.28	1512	1.34	1531	1.39	1550	1.45	1570	1.51
4400	1474	1.20	1495	1.26	1516	1.32	1537	1.38	1557	1.44	1577	1.50	1596	1.56	1615	1.62	1634	1.68	1653	1.75
4800	1564	1.43	1586	1.49	1606	1.56	1626	1.62	1645	1.68	1665	1.75	1683	1.81	1702	1.88	1720	1.95	1738	2.01

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 73. Direct drive evaporator fan performance - 10 tons high efficiency dual fuel low/medium heat - DHC120H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	853	0.34	896	0.42	935	0.50	970	0.57	1004	0.65	1037	0.73	1070	0.81	1101	0.90	1130	0.98	1160	1.07
3600	950	0.47	988	0.55	1025	0.64	1058	0.72	1089	0.81	1120	0.89	1149	0.98	1180	1.08	1209	1.17	1235	1.26
4000	1049	0.63	1081	0.71	1116	0.81	1148	0.91	1177	1.00	1206	1.09	1233	1.19	1260	1.28	1286	1.38	1314	1.49
4400	1148	0.81	1176	0.90	1208	1.01	1239	1.12	1267	1.22	1294	1.33	1320	1.42	1344	1.53	1369	1.63	1394	1.74
4800	1247	1.04	1273	1.14	1301	1.24	1330	1.36	1357	1.48	1384	1.59	1408	1.70	1432	1.81	1455	1.92	1478	2.04
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1191	1.16	1221	1.25	1248	1.35	1275	1.44	1300	1.53	1325	1.62	1349	1.72	1373	1.81	1396	1.91	1418	2.01
3600	1261	1.36	1287	1.45	1315	1.55	1342	1.66	1367	1.76	1394	1.87	1417	1.97	1441	2.08	1463	2.18	1484	2.28
4000	1339	1.60	1364	1.70	1388	1.80	1411	1.90	1435	2.01	1460	2.12	1484	2.24	1508	2.36	1530	2.47	1553	2.59
4400	1419	1.86	1443	1.98	1466	2.09	1489	2.20	1510	2.31	1532	2.43	1553	2.54	1575	2.65	1597	2.78	1619	2.9
4800	1500	2.16	1523	2.28	1546	2.40	1567	2.52	1589	2.65	1611	2.78	1631	2.9	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Evaporator Fan Performance

Table 74. Direct drive evaporator fan performance - 10 tons high efficiency dual fuel high heat - DHC120H3,4,W downflow airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	900	0.42	939	0.50	972	0.57	1004	0.64	1037	0.72	1069	0.80	1099	0.88	1127	0.95	1155	1.03	1184	1.12
3600	1005	0.58	1037	0.66	1071	0.74	1099	0.82	1128	0.90	1157	0.99	1186	1.08	1214	1.17	1240	1.26	1265	1.35
4000	1110	0.77	1138	0.86	1170	0.96	1198	1.05	1223	1.13	1249	1.22	1275	1.32	1302	1.42	1327	1.52	1352	1.62
4400	1215	1.01	1241	1.10	1268	1.20	1297	1.31	1321	1.41	1344	1.50	1367	1.60	1391	1.71	1415	1.82	1439	1.93
4800	1321	1.29	1345	1.39	1369	1.49	1395	1.61	1420	1.73	1442	1.83	1463	1.94	1484	2.04	1506	2.16	1529	2.28
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1212	1.21	1239	1.29	1266	1.38	1291	1.47	1316	1.56	1342	1.65	1367	1.75	1392	1.84	1415	1.94	1438	2.03
3600	1290	1.44	1316	1.53	1341	1.63	1365	1.72	1390	1.82	1414	1.92	1436	2.02	1459	2.12	1482	2.22	1506	2.33
4000	1375	1.72	1398	1.81	1420	1.91	1443	2.01	1466	2.12	1488	2.23	1511	2.33	1534	2.45	1554	2.55	1575	2.66
4400	1462	2.03	1485	2.15	1506	2.25	1527	2.36	1548	2.47	1567	2.57	1588	2.69	1609	2.80	1631	2.93	-	-
4800	1550	2.39	1572	2.51	1593	2.63	1614	2.75	1634	2.87	-	-	-	-	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 75. Direct drive evaporator fan performance - 10 tons high efficiency dual fuel high heat - DHC120H3,4,W horizontal airflow

External Static Pressure (Inches of Water)																				
	.10”		.20”		.30”		.40”		.50”		.60”		.70”		.80”		.90”		1.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	868	0.37	906	0.44	943	0.51	980	0.59	1014	0.67	1046	0.74	1078	0.82	1109	0.91	1139	0.99	1168	1.08
3600	969	0.50	1001	0.58	1035	0.66	1068	0.74	1100	0.83	1131	0.92	1160	1.01	1189	1.10	1217	1.19	1244	1.28
4000	1070	0.67	1098	0.75	1129	0.84	1159	0.93	1188	1.02	1218	1.12	1245	1.22	1272	1.32	1298	1.41	1324	1.52
4400	1172	0.87	1197	0.96	1224	1.06	1251	1.16	1279	1.26	1306	1.36	1332	1.46	1358	1.57	1383	1.68	1407	1.79
4800	1274	1.12	1297	1.21	1321	1.31	1346	1.42	1371	1.53	1396	1.64	1421	1.75	1445	1.86	1469	1.98	1493	2.10
External Static Pressure (Inches of Water)																				
	1.10”		1.20”		1.30”		1.40”		1.50”		1.60”		1.70”		1.80”		1.90”		2.00”	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3200	1196	1.16	1225	1.25	1254	1.34	1280	1.43	1306	1.52	1330	1.61	1355	1.71	1378	1.80	1400	1.89	1424	1.99
3600	1271	1.37	1297	1.47	1323	1.57	1347	1.66	1374	1.77	1398	1.86	1423	1.97	1447	2.07	1470	2.17	1492	2.27
4000	1349	1.62	1375	1.72	1399	1.83	1422	1.93	1445	2.03	1468	2.14	1491	2.25	1514	2.36	1538	2.48	1561	2.59
4400	1431	1.90	1455	2.01	1478	2.12	1499	2.23	1523	2.35	1544	2.46	1565	2.57	1587	2.69	1608	2.81	1629	2.92
4800	1515	2.21	1537	2.33	1559	2.45	1581	2.57	1602	2.69	1623	2.82	1643	2.94	-	-	-	-	-	-

Notes:

1. For direct drive evaporator fan speed (rpm), refer to the applicable table in the fan performance section.
2. Data includes pressure drop due to standard filters and wet coils.
3. To determine static pressure drop due to other options/accessories, refer to the applicable table in the fan performance section.
4. Direct drive fan motor heat (MBh) = 2.7912 x fan bhp + 0.1388
5. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Fan Performance

Table 76. Standard motor and sheave/fan speed (rpm)

Tons	Unit Model Number	Fan Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
7.5	WSC092H	AK64x1”	N/A	695	751	807	863	919	975
8.5	WSC102H	AK64x1”	N/A	767	807	847	888	928	1036

Note: Factory set at 3 turns open.

Table 77. Standard motor and low static drive accessory sheave/fan speed (rpm)

Tons	Unit Model Number	Fan Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
7.5	WSC092H	AK79x1”	N/A	581	626	671	716	761	805
7.5	WSC092H	AK99x1”	N/A	462	497	533	569	604	640
8.5	WSC102H	AK79x1”	N/A	631	676	721	766	811	856
8.5	WSC102H	AK99x1”	N/A	512	548	583	619	654	690

Note: Factory set at 3 turns open.

Table 78. Oversized motor and drive sheave/fan speed (rpm)

Tons	Unit Model Number	Fan Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
7.5	WSC092H	AK64x1”	N/A	835	891	946	1002	1057	1113
8.5	WSC102H	AK56x1”	N/A	998	1050	1103	1155	1207	1260

Note: Factory set at 3 turns open.

Table 79. Oversized motor and high static drive sheave/fan speed (rpm)

Tons	Unit Model Number	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
7.5	WSC092H	N/A	908	968	1029	1090	1150	1211

Note: Factory set at 3 turns open.

Table 80. Direct drive plenum fan settings (rpm vs. voltage)

Potentiometer Voltage	Motor RPM
1	N/A
1.25	N/A
1.5	N/A
1.75	N/A
2	N/A
2.25	325
2.5	402
2.75	465
3	544
3.25	630
3.5	716
3.75	775
4	845
4.25	912
4.5	976
4.75	1044
5	1115
5.25	1203
5.5	1253
5.75	1312
6	1368
6.25	1425
6.5	1475
6.75	1533
7	1581
7.25	1615
7.5	1615

Table 81. Voltage vs. CFM table

PWM% Value	Potentiometer Voltage (Vdc)	CFM/Ton
70	<0.1	320
75	0.7	347
80	1.25	373
85	1.65	400
90	1.95	427
95	2.17	453
100	>2.4	480

Note: Applicable to W/DHC036-060H models

Table 82. Outdoor sound power level - dB (ref. 10 - 12 W)

Tons	Unit Model Number	Octave Center Frequency								Overall
		63	125	250	500	1000	2000	4000	8000	dBA
3	WSC036H	84	81	80	79	76	74	69	63	81
4	WSC048H	81	85	81	81	77	72	69	65	82
5	WSC060H	90	90	84	85	83	78	73	68	87
3	W/DHC036H	84	81	80	79	76	74	69	63	81
4	W/DHC048H	90	90	84	85	83	78	73	68	87
5	W/DHC060H	90	90	84	85	83	78	73	68	87
7.5	WSC092H	85	86	84	84	81	76	72	66	86
8.5	WSC102H	81	89	83	83	81	76	72	66	85
10	WSC120H	86	90	85	83	81	76	72	66	86
6	W/DHC074H	87	87	84	84	81	75	71	66	86
7.5	W/DHC092H	82	89	85	84	81	76	72	67	86
8.5	W/DHC102H	83	87	85	83	80	75	70	65	85
10	W/DHC120H	88	86	87	83	79	75	70	63	85

Note: Tests follow AHRI270-2015.

Table 83. Static pressure drop through accessories (inches water column)

Tons	Unit Model Number	cfm	Standard Filters[a]	2" MERV 8 Filter	2" MERV 13 Filter	Economizer with OA/RA Dampers[b]						Electric Heater Accessory (kW)[c],[d]			
						100% OA	100% RA	100% OA	100% RA	100% OA	100% RA	5-6	9-18	23-36	54
						Downflow		Low Leak[e]		Horizontal					
3	WSC036H	960	0.02	0.03	0.03	0.05	0.01	0.09	0.03	0.05	0.01	0.01	0.02	0.02	—
3	WSC036H	1200	0.03	0.05	0.04	0.07	0.02	0.13	0.05	0.07	0.01	0.02	0.03	0.03	—
3	WSC036H	1440	0.03	0.06	0.04	0.10	0.03	0.19	0.07	0.10	0.01	0.03	0.04	0.04	—
4	WSC048H	1280	0.03	0.06	0.04	0.10	0.03	0.15	0.05	0.09	0.01	0.02	0.03	0.03	—
4	WSC048H	1600	0.04	0.07	0.07	0.13	0.04	0.24	0.08	0.13	0.02	0.04	0.05	0.05	—
4	WSC048H	1920	0.06	0.10	0.08	0.17	0.06	0.34	0.11	0.17	0.02	0.05	0.06	0.08	—
5	WSC060H	1600	0.03	0.06	0.05	0.09	0.01	0.10	0.05	0.05	0.01	0.01	0.01	0.02	—
5	WSC060H	2000	0.05	0.08	0.07	0.11	0.01	0.16	0.08	0.07	0.02	0.02	0.01	0.03	—
5	WSC060H	2400	0.07	0.10	0.10	0.12	0.03	0.23	0.12	0.09	0.03	0.03	0.02	0.04	—
7.5	WSC092H	2400	0.04	0.06	0.12	0.11	0.02	0.23	0.12	0.08	0.02	—	0.02	0.02	—
7.5	WSC092H	3000	0.06	0.09	0.13	0.14	0.05	0.37	0.19	0.12	0.05	—	0.03	0.03	—
7.5	WSC092H	3600	0.09	0.13	0.15	0.21	0.07	0.54	0.27	0.25	0.08	—	0.04	0.05	—
8.5	WSC102H	2720	0.05	0.08	0.13	0.12	0.03	0.30	0.16	0.09	0.04	—	0.02	0.03	—
8.5	WSC102H	3400	0.08	0.11	0.14	0.19	0.06	0.48	0.24	0.18	0.06	—	0.03	0.04	—
8.5	WSC102H	4080	0.12	0.16	0.16	0.30	0.07	0.71	0.35	0.31	0.09	—	0.05	0.06	—
10	WSC120H	3200	0.07	0.10	0.14	0.17	0.05	0.42	0.22	0.14	0.05	—	0.02	0.03	0.05
10	WSC120H	4000	0.11	0.15	0.16	0.26	0.07	0.68	0.34	0.30	0.08	—	0.02	0.03	0.05
10	WSC120H	4800	0.16	0.20	0.18	0.34	0.09	0.99	0.48	0.35	0.10	—	0.03	0.04	0.06
3	D/WHC036H	960	0.02	0.03	0.03	0.05	0.01	0.09	0.03	0.05	0.01	0.01	0.02	0.02	—
3	D/WHC036H	1200	0.03	0.05	0.04	0.07	0.02	0.13	0.05	0.07	0.01	0.02	0.03	0.03	—
3	D/WHC036H	1440	0.03	0.06	0.04	0.10	0.03	0.19	0.07	0.10	0.01	0.03	0.04	0.04	—
4	D/WHC048H	1280	0.03	0.06	0.04	0.10	0.03	0.07	0.03	0.09	0.01	0.02	0.03	0.03	—

Table 83. Static pressure drop through accessories (inches water column) (continued)

Tons	Unit Model Number	cfm	Standard Filters[a]	2" MERV 8 Filter	2" MERV 13 Filter	Economizer with OA/RA Dampers[b]						Electric Heater Accessory (kW)[c],[d]			
						100% OA	100% RA	100% OA	100% RA	100% OA	100% RA	5-6	9-18	23-36	54
						Downflow		Low Leak[e]		Horizontal					
4	D/WHC048H	1600	0.04	0.07	0.07	0.13	0.04	0.10	0.05	0.13	0.02	0.04	0.05	0.05	—
4	D/WHC048H	1920	0.06	0.10	0.08	0.17	0.06	0.15	0.08	0.17	0.02	0.05	0.06	0.08	—
5	D/WHC060H	1600	0.03	0.06	0.05	0.09	0.01	0.10	0.05	0.05	0.01	0.01	0.01	0.02	—
5	D/WHC060H	2000	0.05	0.08	0.07	0.11	0.01	0.16	0.08	0.07	0.02	0.02	0.01	0.03	—
5	D/WHC060H	2400	0.07	0.10	0.10	0.12	0.03	0.23	0.12	0.09	0.03	0.03	0.02	0.04	—
6	W/DHC074	1920	0.03	0.04	0.10	0.09	0.01	0.15	0.08	0.06	0.01	—	0.01	0.01	—
6	W/DHC074	2400	0.04	0.06	0.12	0.11	0.02	0.23	0.12	0.08	0.02	—	0.01	0.01	—
6	W/DHC074	2880	0.06	0.08	0.13	0.13	0.04	0.34	0.18	0.11	0.04	—	0.01	0.02	—
7.5	W/DHC092	1500	0.02	0.03	0.08	0.07	0.01	0.09	0.05	0.04	0.01	—	—	—	—
7.5	W/DHC092	2400	0.04	0.06	0.12	0.11	0.02	0.23	0.12	0.08	0.02	—	0.01	0.01	—
7.5	W/DHC092	3000	0.06	0.09	0.13	0.14	0.05	0.37	0.19	0.12	0.05	—	0.01	0.02	—
7.5	W/DHC092	3600	0.09	0.13	0.15	0.21	0.07	0.54	0.27	0.25	0.08	—	0.02	0.03	—
8.5	W/DHC102	1700	0.02	0.05	0.11	0.07	0.01	0.11	0.06	0.05	0.02	—	—	—	—
8.5	W/DHC102	2720	0.05	0.08	0.13	0.12	0.03	0.30	0.16	0.09	0.04	—	0.01	0.02	—
8.5	W/DHC102	3400	0.08	0.11	0.14	0.19	0.06	0.48	0.24	0.18	0.06	—	0.02	0.02	—
8.5	W/DHC102	4080	0.12	0.16	0.16	0.30	0.07	0.71	0.35	0.31	0.09	—	0.03	0.03	—
10	W/DHC120	2000	0.03	0.06	0.11	0.08	0.03	0.16	0.08	0.07	0.02	—	—	—	—
10	W/DHC120	3200	0.07	0.10	0.14	0.17	0.05	0.42	0.22	0.14	0.05	—	0.02	0.03	0.05
10	W/DHC120	4000	0.11	0.15	0.16	0.26	0.07	0.68	0.34	0.30	0.08	—	0.02	0.03	0.05
10	W/DHC120	4800	0.16	0.20	0.18	0.34	0.09	0.99	0.48	0.35	0.10	—	0.03	0.04	0.06

(a) Tested with standard filters. Difference in pressure drop should be considered when utilizing optional 2" MERV 8 and MERV 13 filters.
(b) OA = Outside Air and RA = Return Air.
(c) Nominal kW ratings at 240, 480, 600 volts.
(d) Electric heaters restricted on applications below 320 cfm/ton.
(e) Low Leak - Downflow only.

Heating Performance Data

Table 84. 3 tons three phase heating capacities (net) WSC036H3,4,W at 1200 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	12.7	12.1	11.7	11.4	2.4	2.6	2.8	2.9
-3	14.5	13.8	13.5	13.1	2.4	2.7	2.8	3.0
2	16.5	15.7	15.3	15.0	2.5	2.7	2.9	3.0
7	18.5	17.7	17.3	16.9	2.5	2.8	2.9	3.1
12	20.7	19.8	19.4	18.9	2.5	2.8	3.0	3.1
17	22.9	22.0	21.5	21.1	2.6	2.9	3.0	3.1
22	25.3	24.3	23.8	23.3	2.6	2.9	3.0	3.2
27	27.6	26.6	26.0	25.5	2.7	2.9	3.1	3.2
32	30.1	28.9	28.3	27.8	2.7	3.0	3.1	3.3
37	32.5	31.3	30.7	30.1	2.7	3.0	3.2	3.3
42	35.0	33.7	33.0	32.4	2.8	3.0	3.2	3.3
47	37.4	36.0	35.3	34.6	2.8	3.1	3.2	3.4
52	39.8	38.3	37.5	36.8	2.8	3.1	3.3	3.4
57	42.1	40.5	39.7	38.8	2.9	3.1	3.3	3.4
62	44.2	42.5	41.6	40.7	2.9	3.2	3.3	3.5
67	45.9	43.9	43.1	42.1	2.9	3.2	3.3	3.5
72	47.4	45.1	46.1	42.4	2.9	3.2	3.4	3.5

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 85. 4 tons three phase heating capacities (net) WSC048H3,4,W at 1600 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	15.8	15.4	15.0	14.6	3.2	3.4	3.6	3.8
-3	18.6	17.8	17.4	17.0	3.1	3.4	3.6	3.8
2	21.2	20.4	20.0	19.6	3.2	3.5	3.7	3.9
7	23.8	23.0	22.4	22.4	3.2	3.6	3.8	4.0
12	26.6	25.8	25.3	24.9	3.3	3.6	3.8	4.0
17	29.4	28.6	28.1	27.7	3.3	3.7	3.9	4.1
22	32.4	31.5	31.0	30.5	3.4	3.7	3.9	4.1
27	35.4	34.4	33.9	33.4	3.4	3.8	4.0	4.2
32	38.5	37.5	36.9	36.4	3.5	3.8	4.0	4.2
37	41.6	40.5	40.0	39.4	3.5	3.9	4.1	4.3
42	44.8	43.7	43.1	42.5	3.5	3.9	4.1	4.4
47	48.1	46.8	46.2	45.6	3.6	4.0	4.2	4.4
52	51.3	50.0	49.3	48.7	3.7	4.0	4.2	4.5
57	54.6	53.1	52.4	51.7	3.7	4.1	4.3	4.5
62	58.0	56.3	55.6	54.6	3.8	4.2	4.4	4.6
67	61.4	59.6	58.7	57.8	3.8	4.2	4.4	4.6
72	64.6	62.0	61.6	60.6	3.9	4.2	4.4	4.7

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 86. 5 tons three phase heating capacities (net) WSC060H3,4,W at 2000 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	18.2	17.2	16.8	16.3	3.7	4.1	4.3	4.5
-3	21.6	20.5	20.0	19.6	3.8	4.2	4.4	4.6
2	25.0	24.0	23.5	23.0	3.8	4.2	4.5	4.7
7	28.6	27.5	26.9	26.2	3.9	4.3	4.6	4.8
12	32.4	31.2	30.6	30.1	4.0	4.4	4.6	4.9
17	36.2	35.0	34.4	33.8	4.0	4.5	4.7	5.0
22	40.1	38.8	38.2	37.6	4.1	4.6	4.8	5.1
27	44.1	42.7	42.1	41.4	4.2	4.6	4.9	5.1
32	47.9	46.7	46.0	45.3	4.2	4.7	4.9	5.2
37	52.0	50.4	50.0	49.2	4.3	4.8	5.0	5.3
42	56.1	54.4	54.0	53.2	4.4	4.8	5.1	5.4
47	60.5	59.0	57.8	56.9	4.5	4.9	5.2	5.5
52	64.8	62.9	62.0	61.1	4.6	5.0	5.3	5.6
57	69.2	67.2	66.2	65.2	4.6	5.1	5.4	5.6
62	73.5	71.3	70.2	69.2	4.7	5.2	5.5	5.7
67	77.7	75.3	74.2	73.0	4.8	5.3	5.6	5.8
72	81.6	79.1	77.9	76.6	4.9	5.4	5.7	5.9

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 87. 7.5 tons three phase heating capacities (net) WSC092H3,4,W at 3000 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (MBh) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	32.0	31.3	31.1	31.0	5.8	6.3	6.7	7.0
-3	36.4	35.7	35.5	35.3	5.9	6.5	6.8	7.2
2	40.9	40.3	40.0	39.8	6.0	6.6	6.9	7.3
7	45.8	44.8	44.4	44.2	6.1	6.7	7.0	7.4
12	50.4	49.8	49.5	49.1	6.2	6.8	7.2	7.5
17	55.5	54.5	54.0	53.7	6.3	6.9	7.3	7.7
22	60.8	59.6	59.1	58.7	6.4	7.0	7.4	7.8
27	66.4	65.0	64.4	63.8	6.5	7.1	7.5	7.9
32	72.1	70.6	69.9	69.2	6.6	7.3	7.6	8.0
37	77.8	76.1	75.3	74.5	6.7	7.4	7.7	8.1
42	83.5	81.7	80.8	79.9	6.8	7.5	7.8	8.2
47	89.5	87.5	86.5	85.6	6.9	7.6	7.9	8.3
52	95.7	93.5	92.4	91.3	7.0	7.7	8.1	8.4
57	101.9	99.5	98.2	97.0	7.1	7.8	8.2	8.6
62	108.1	105.3	103.9	102.6	7.3	7.9	8.3	8.7
67	114.0	110.9	109.4	107.9	7.4	8.1	8.4	8.8
72	119.9	116.2	114.4	112.7	7.5	8.2	8.5	8.9

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 88. 8.5 tons three phase high stage heating capacities (net) WSC102H3,4,W at 3400 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	34.2	33.6	33.2	32.6	6.1	6.7	7.0	7.3
-3	38.5	37.8	37.7	37.0	6.2	6.8	7.1	7.5
2	43.0	42.3	41.9	41.5	6.3	6.9	7.3	7.6
7	48.2	47.4	46.6	46.1	6.4	7.1	7.4	7.7
12	52.9	51.9	51.5	51.0	6.5	7.2	7.5	7.9
17	58.0	57.0	56.5	56.0	6.6	7.3	7.6	8.0
22	63.5	62.4	61.8	61.2	6.7	7.4	7.7	8.1
27	69.2	67.9	67.2	66.7	6.8	7.5	7.8	8.2
32	75.1	73.7	73.0	72.3	6.9	7.6	8.0	8.3
37	81.2	79.5	78.7	77.9	7.0	7.7	8.1	8.4
42	87.2	85.5	84.6	83.7	7.2	7.8	8.2	8.6
47	93.6	91.7	90.7	89.7	7.3	7.9	8.3	8.7
52	100.4	98.2	97.1	96.1	7.4	8.1	8.4	8.8
57	107.4	105.0	103.8	102.6	7.5	8.2	8.6	8.9
62	114.7	111.9	110.6	109.3	7.7	8.3	8.7	9.1
67	122.0	119.0	117.5	116.0	7.8	8.5	8.9	9.2
72	129.4	126.0	124.3	122.7	8.0	8.6	9.0	9.4

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 89. 10 tons three phase heating capacities (net) WSC120H3,4,W at 4000 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[a] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	35.0	32.5	31.2	30.0	7.4	8.1	8.6	9.0
-3	40.4	38.1	37.0	35.8	7.4	8.2	8.6	9.1
2	46.2	43.9	42.7	41.6	7.5	8.3	8.7	9.2
7	52.5	50.4	49.2	48.1	7.6	8.3	8.8	9.2
12	58.3	56.2	55.0	53.9	7.7	8.4	8.9	9.3
17	64.7	62.6	61.5	60.3	7.7	8.5	8.9	9.4
22	71.3	69.3	68.1	66.9	7.8	8.6	9.0	9.5
27	78.1	76.2	75.0	73.8	7.9	8.7	9.1	9.6
32	85.3	83.4	82.2	80.9	8.0	8.8	9.2	9.7
37	92.5	90.5	89.3	87.9	8.1	8.9	9.3	9.8
42	99.8	97.8	96.5	95.1	8.2	9.0	9.4	9.9
47	107.4	105.4	104.0	102.5	8.3	9.1	9.5	10.0
52	115.3	113.3	111.8	110.3	8.5	9.3	9.7	10.1
57	123.6	121.4	119.9	118.2	8.6	9.4	9.8	10.3
62	132.0	129.6	128.0	126.2	8.8	9.6	10.0	10.4
67	140.4	137.8	136.0	134.0	8.9	9.7	10.1	10.6
72	148.7	145.6	143.7	141.5	9.1	9.9	10.3	10.7

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 90. 3 tons three phase high stage heating capacities (net) W/DHC036H3,H4,HW at 1200 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp[(a)] (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	8.0	7.2	6.7	6.3	1.9	2.1	2.2	2.4
-3	10.0	9.1	8.6	8.1	2.0	2.2	2.3	2.4
2	12.0	11.6	10.5	10.0	2.0	2.3	2.4	2.5
7	14.1	13.1	12.6	12.0	2.1	2.3	2.4	2.5
12	16.2	15.2	14.7	14.1	2.1	2.4	2.5	2.6
17	18.5	17.4	16.8	16.3	2.2	2.4	2.5	2.6
22	20.8	19.7	19.1	18.5	2.2	2.4	2.6	2.7
27	23.2	22.0	21.4	20.8	2.2	2.5	2.6	2.7
32	25.4	24.3	23.7	23.1	2.3	2.5	2.6	2.8
37	28.1	26.8	26.1	25.4	2.3	2.5	2.7	2.8
42	30.7	29.3	28.6	27.9	2.3	2.6	2.7	2.8
47	33.4	32.2	31.3	30.5	2.4	2.6	2.7	2.9
52	36.3	34.8	34.0	33.2	2.4	2.7	2.8	2.9
57	38.5	37.0	36.3	35.5	2.5	2.7	2.8	3.0
62	41.1	39.6	38.8	38.0	2.5	2.7	2.9	3.0
67	43.7	42.1	41.3	40.5	2.5	2.8	2.9	3.0
72	46.3	44.6	43.8	43.0	2.6	2.8	3.0	3.1

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 91. 3 tons three phase low stage heating capacities (net) W/DHC036H3,H4,HW at 840 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp [(a)](°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	13.5	12.4	11.9	11.3	1.72	1.88	1.97	2.06
27	15.3	14.3	13.7	13.2	1.73	1.89	1.98	2.07
32	17.2	16.1	15.6	15.0	1.73	1.90	1.99	2.08
37	19.1	18.0	17.5	16.9	1.74	1.91	2.00	2.09
42	21.1	20.0	19.4	18.8	1.75	1.92	2.00	2.10
47	22.9	21.9	21.3	20.7	1.75	1.92	2.01	2.11
52	25.0	23.8	23.2	22.6	1.76	1.93	2.02	2.11
57	27.0	25.7	25.1	24.4	1.76	1.93	2.02	2.12
62	28.9	27.6	27.0	26.3	1.76	1.93	2.03	2.12
67	30.8	29.4	28.7	27.9	1.76	1.94	2.03	2.13
72	32.8	31.2	30.5	29.7	1.76	1.93	2.03	2.13

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

(a) Integrated heating capacities and powers include the effects of defrost in the frost region. All heating capacities and power (kw) are at 70% OD relative humidity and demand defrost cycle.

Table 92. 4 tons three phase high stage heating capacities (net) W/DHC048H3,H4,HW at 1600 cfm

Outdoor Temp (°F)	Instantaneous Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	10.51	9.90	9.68	9.22	2.76	3.02	3.17	3.33
-3	13.12	12.67	12.22	11.86	2.80	3.07	3.22	3.38
2	16.15	15.40	15.02	14.62	2.83	3.11	3.27	3.43
7	19.14	18.13	17.84	17.43	2.88	3.17	3.32	3.49
12	22.20	21.29	20.77	20.32	2.92	3.21	3.37	3.54
17	25.33	24.33	23.84	23.36	2.97	3.26	3.42	3.60
22	28.53	27.46	26.93	26.41	3.01	3.31	3.48	3.65
27	31.78	30.64	30.07	29.52	3.06	3.36	3.53	3.71
32	35.07	33.86	32.99	32.66	3.10	3.42	3.59	3.77
37	38.20	37.08	36.40	35.83	3.16	3.47	3.64	3.82
42	41.69	40.34	39.40	39.03	3.20	3.52	3.70	3.88
47	45.01	43.78	42.92	42.02	3.26	3.59	3.75	3.95
52	48.53	46.91	46.12	45.33	3.32	3.64	3.82	4.01
57	51.57	49.99	49.21	48.44	3.35	3.68	3.86	4.05
62	54.71	53.06	52.23	51.41	3.40	3.73	3.91	4.10
67	57.72	56.57	56.30	54.20	3.44	3.80	3.99	4.15
72	61.43	59.39	57.64	57.02	3.51	3.84	4.02	4.25

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 93. 4 tons three phase low stage heating capacities (net) W/DHC048H3,H4,HW at 1120 cfm

Outdoor Temp (°F)	Instantaneous Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	18.20	17.05	16.45	15.82	2.24	2.51	2.65	2.80
27	20.73	19.57	18.97	18.34	2.26	2.53	2.68	2.83
32	23.30	22.13	21.52	20.90	2.27	2.55	2.70	2.85
37	25.90	24.72	24.10	23.47	2.28	2.57	2.72	2.88
42	28.53	27.32	26.69	26.05	2.30	2.58	2.74	2.90
47	31.14	29.89	29.25	28.60	2.31	2.60	2.76	2.92
52	33.70	32.40	31.75	31.08	2.32	2.61	2.77	2.93
57	36.18	34.82	34.14	33.45	2.32	2.62	2.78	2.94
62	38.27	37.12	36.40	35.68	2.33	2.62	2.78	2.94
67	40.75	39.20	38.42	37.67	2.31	2.60	2.76	2.93
72	42.51	41.00	40.18	39.36	2.29	2.58	2.73	2.90

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 94. 5 tons three phase high stage heating capacities (net) W/DHC060H3,H4,HW at 2000 cfm

Outdoor Temp (°F)	Instantaneous Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	17.63	16.83	16.42	15.98	3.37	3.69	3.88	4.07
-3	20.85	20.00	19.56	19.13	3.43	3.76	3.95	4.15
2	24.19	23.28	22.81	22.35	3.48	3.83	4.02	4.22
7	27.58	26.40	26.76	25.81	3.54	3.89	4.08	4.29
12	31.23	30.17	29.65	29.12	3.59	3.95	4.14	4.36
17	34.92	33.79	33.21	32.65	3.64	4.01	4.20	4.42
22	38.71	37.50	36.88	36.28	3.70	4.06	4.26	4.48
27	42.59	41.29	40.64	39.99	3.75	4.12	4.32	4.54
32	46.54	44.87	44.47	43.78	3.80	4.18	4.38	4.60
37	50.28	48.78	48.32	47.60	3.86	4.24	4.44	4.66
42	54.34	52.70	52.26	51.50	3.92	4.30	4.51	4.73
47	58.65	57.22	56.00	55.12	3.99	4.38	4.59	4.81
52	63.03	61.12	60.17	59.22	4.06	4.45	4.66	4.89
57	67.39	65.36	64.33	63.19	4.14	4.53	4.74	4.95
62	71.78	69.55	68.44	66.99	4.22	4.61	4.83	5.03
67	76.09	73.66	72.45	71.27	4.31	4.70	4.92	5.14
72	80.14	77.61	75.30	74.75	4.40	4.80	4.99	5.28

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 95. 5 tons three phase low stage heating capacities (net) W/DHC060H3,H4,HW at 1400 cfm

Outdoor Temp (°F)	Instantaneous Heating Capacity (Btuh/1000) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	24.25	23.31	22.79	22.25	2.88	3.21	3.39	3.57
27	27.16	26.16	25.62	25.06	2.90	3.23	3.41	3.60
32	30.12	29.06	28.49	27.91	2.91	3.24	3.43	3.62
37	33.10	31.97	31.38	30.77	2.92	3.26	3.44	3.64
42	36.14	34.94	34.31	33.67	2.94	3.28	3.46	3.65
47	39.17	37.89	37.23	36.55	2.95	3.29	3.48	3.67
52	41.92	40.47	40.09	39.14	2.97	3.31	3.49	3.68
57	45.15	43.67	42.93	42.17	2.97	3.31	3.49	3.68
62	48.11	46.42	45.57	44.87	2.98	3.32	3.50	3.68
67	51.09	49.26	48.34	47.41	2.97	3.30	3.48	3.67
72	53.97	51.92	50.93	49.92	2.95	3.28	3.46	3.64

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 96. 6 tons three phase low stage heating capacities (net) W/DHC074H3,4,W at 1680 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	25.2	24.2	23.7	23.2	2.91	3.18	3.33	3.48
27	28.1	27.0	26.4	25.9	2.92	3.20	3.34	3.50
32	31.0	29.8	29.2	28.7	2.93	3.21	3.36	3.51
37	33.7	32.7	32.1	31.4	2.95	3.22	3.36	3.52
42	36.6	35.4	34.9	34.2	2.96	3.23	3.37	3.53
47	39.7	38.3	37.5	36.8	2.95	3.23	3.37	3.53
52	42.3	40.7	39.9	39.1	2.95	3.22	3.37	3.52
57	44.6	42.9	42.0	41.2	2.96	3.22	3.36	3.51
62	47.6	45.8	44.8	43.9	2.98	3.25	3.39	3.54
67	50.6	48.6	47.5	46.4	3.00	3.27	3.43	3.58
72	53.4	51.3	50.2	49.1	3.02	3.29	3.43	3.60

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 97. 6 tons three phase high stage heating capacities (net) W/DHC074H3,4,W at 2400 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	23.0	22.4	22.1	21.9	4.78	5.33	5.62	5.93
-3	27.1	26.4	26.1	25.8	4.89	5.45	5.74	6.05
2	31.4	30.7	30.3	30.0	5.00	5.55	5.85	6.16
7	35.6	34.8	34.6	34.2	5.10	5.66	5.95	6.27
12	40.5	39.6	39.1	38.7	5.18	5.74	6.04	6.36
17	44.9	43.9	43.5	43.3	5.27	5.84	6.14	6.45
22	49.9	48.7	48.2	47.7	5.36	5.92	6.22	6.54
27	55.0	53.7	53.1	52.5	5.43	6.00	6.30	6.62
32	59.8	58.8	58.1	57.5	5.49	6.07	6.38	6.70
37	65.6	64.0	63.3	62.5	5.57	6.14	6.45	6.77
42	70.9	69.2	68.4	67.5	5.63	6.20	6.51	6.83
47	76.5	74.6	73.6	72.7	5.70	6.27	6.58	6.91
52	82.1	80.0	78.9	77.9	5.77	6.34	6.65	6.97
57	87.6	85.3	84.1	83.0	5.84	6.41	6.71	7.03
62	93.0	90.4	89.1	87.8	5.90	6.46	6.77	7.09
67	98.0	95.1	93.6	92.2	5.96	6.51	6.81	7.13
72	102.7	99.5	97.8	96.2	6.02	6.58	6.87	7.18

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 98. 7.5 tons three phase low stage heating capacities (net) W/DHC092H3,4,W at 2100 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	31.5	29.9	29.1	28.3	3.40	3.73	3.91	4.10
27	35.1	33.4	32.6	31.7	3.43	3.77	3.95	4.13
32	38.7	37.0	36.1	35.2	3.46	3.80	3.98	4.17
37	42.3	40.5	39.6	38.7	3.49	3.83	4.01	4.20
42	46.0	44.2	43.2	42.3	3.52	3.87	4.05	4.24
47	49.8	47.8	46.8	45.8	3.55	3.90	4.08	4.27
52	53.5	51.4	50.4	49.3	3.58	3.93	4.11	4.30
57	57.1	54.9	53.8	52.7	3.61	3.96	4.14	4.33
62	60.9	58.5	57.3	56.0	3.65	4.00	4.18	4.37
67	64.4	61.7	60.3	59.0	3.69	4.04	4.22	4.41
72	67.3	64.3	62.7	61.2	3.70	4.05	4.23	4.42

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 99. 7.5 tons three phase high stage heating capacities (net) W/DHC092H3,4,W at 3000 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	27.5	26.6	26.1	25.6	5.58	6.19	6.51	6.86
-3	32.4	31.4	30.9	30.3	5.67	6.28	6.62	6.97
2	37.3	36.3	35.8	35.2	5.76	6.38	6.72	7.08
7	42.6	41.3	40.7	40.1	5.85	6.48	6.83	7.19
12	47.7	46.4	46	45.4	5.95	6.58	6.93	7.30
17	53.2	51.8	51.1	50.4	6.04	6.68	7.03	7.41
22	58.8	57.3	56.6	55.8	6.13	6.78	7.14	7.51
27	64.7	63	62.2	61.4	6.22	6.88	7.24	7.62
32	70.2	68.9	68	67.1	6.30	6.98	7.34	7.73
37	76.6	74.7	73.7	72.7	6.40	7.07	7.44	7.83
42	82.7	80.6	79.5	78.4	6.49	7.17	7.54	7.93
47	88.9	86.6	85.4	84.3	6.59	7.28	7.65	8.04
52	95.2	92.7	91.4	90.2	6.69	7.38	7.75	8.14
57	101.4	98.7	97.4	96	6.79	7.48	7.85	8.24
62	107.7	104.7	103.1	101.6	6.89	7.58	7.95	8.34
67	114.1	110.6	108.9	107.2	7.01	7.69	8.06	8.44
72	120	116.3	114.4	112.4	7.12	7.80	8.17	8.56

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 100. 8.5 tons three phase low stage heating capacities (net) W/DHC102H3,4,W at 2380 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	31.6	29.8	28.8	27.8	3.12	3.43	3.60	3.77
27	35.2	33.3	32.3	31.3	3.14	3.46	3.62	3.79
32	38.8	36.8	35.8	34.8	3.16	3.48	3.65	3.82
37	42.4	40.4	39.5	38.3	3.18	3.50	3.67	3.84
42	46.3	44.2	43.2	42.0	3.21	3.52	3.69	3.87
47	50.2	48.0	47.0	45.7	3.23	3.55	3.72	3.90
52	54.3	51.9	50.7	49.4	3.25	3.58	3.75	3.92
57	58.4	56.0	54.7	53.4	3.27	3.59	3.77	3.95
62	62.5	59.9	58.6	57.3	3.29	3.62	3.79	3.97
67	66.5	64.2	62.7	61.2	3.31	3.66	3.83	4.01
72	71.3	68.3	66.8	65.2	3.35	3.68	3.86	4.04

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 101. 8.5 tons three phase high stage heating capacities (net) W/DHC102H3,4,W at 3400 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	30.3	28.3	27.0	25.8	5.65	6.27	6.59	6.93
-3	35.2	33.1	31.9	30.8	5.77	6.40	6.73	7.07
2	40.2	38.1	37.0	35.7	5.89	6.52	6.86	7.21
7	45.7	43.6	42.5	41.2	5.99	6.63	6.98	7.33
12	51.0	48.8	47.7	46.4	6.10	6.75	7.10	7.46
17	56.7	54.5	53.3	52.1	6.21	6.86	7.21	7.58
22	62.7	60.4	59.2	57.9	6.31	6.97	7.33	7.70
27	68.9	66.5	65.3	64.0	6.41	7.08	7.44	7.82
32	74.6	72.9	71.6	70.2	6.49	7.19	7.55	7.93
37	81.9	79.2	77.9	76.5	6.60	7.29	7.66	8.04
42	88.5	85.7	84.3	82.8	6.70	7.39	7.76	8.15
47	95.4	92.4	90.9	89.4	6.80	7.50	7.87	8.27
52	102.6	99.5	97.9	96.2	6.91	7.61	7.99	8.39
57	109.9	106.5	104.8	103.1	7.02	7.73	8.11	8.51
62	117.3	113.7	111.9	110.0	7.13	7.84	8.23	8.63
67	124.7	120.8	118.8	116.9	7.25	7.96	8.34	8.75
72	131.9	127.9	125.7	123.6	7.36	8.08	8.46	8.87

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 102. 10 tons three phase low stage heating capacities (net) W/DHC120H3,4,W at 2800 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
22	40.5	39.1	38.4	37.6	3.72	4.08	4.27	4.48
27	44.4	42.9	42.1	41.3	3.74	4.11	4.30	4.51
32	48.4	46.8	45.9	45.1	3.77	4.14	4.34	4.55
37	52.4	50.7	49.8	48.9	3.80	4.17	4.37	4.59
42	56.4	54.8	53.8	52.9	3.84	4.21	4.41	4.63
47	60.6	58.8	57.9	56.9	3.88	4.25	4.45	4.67
52	64.8	63.0	61.9	60.9	3.92	4.29	4.50	4.72
57	69.3	67.1	66.0	64.8	3.96	4.34	4.55	4.76
62	73.5	71.1	69.9	68.7	4.01	4.39	4.60	4.82
67	77.6	75.1	73.8	72.5	4.06	4.45	4.65	4.87
72	82.0	79.1	77.6	76.1	4.15	4.53	4.74	4.95

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 103. 10 tons three phase high stage heating capacities (net) W/DHC120H3,4,W at 4000 cfm

Outdoor Temp (°F)	Integrated Heating Capacity (Mbh) at Indicated Indoor Dry Bulb Temp (°F)				Total Power in Kilowatts at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	44.6	43.7	43.5	42.9	7.40	8.17	8.60	9.05
-3	50.6	49.3	49.2	48.6	7.50	8.30	8.73	9.20
2	56.0	55.0	54.5	54.0	7.60	8.42	8.87	9.34
7	62.6	61.6	61.0	59.9	7.69	8.53	9.00	9.49
12	68.4	67.2	66.7	66.1	7.80	8.66	9.13	9.63
17	75.1	73.8	73.1	72.5	7.90	8.77	9.25	9.76
22	82.0	80.6	79.9	79.2	8.00	8.89	9.38	9.90
27	89.3	87.7	86.9	86.1	8.11	9.01	9.51	10.03
32	96.8	95.0	94.2	93.3	8.22	9.13	9.64	10.17
37	104.2	102.3	101.3	100.4	8.33	9.26	9.76	10.30
42	111.8	109.7	108.6	107.6	8.44	9.38	9.89	10.43
47	119.7	117.4	116.2	115.1	8.56	9.52	10.03	10.58
52	127.9	125.3	124.1	122.8	8.70	9.66	10.18	10.74
57	136.3	133.4	132.0	130.6	8.85	9.82	10.34	10.89
62	144.8	141.5	139.9	138.4	9.01	9.98	10.50	11.05
67	153.2	149.5	147.7	145.9	9.18	10.14	10.66	11.21
72	161.0	157.1	155.1	153.1	9.34	10.31	10.83	11.37

Note: Net heating capacity and power input includes indoor fan heat at AHRI esp. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.

Table 104.Auxiliary electric heat capacity[a]

Tons	Unit Model Number	Total[b]		No. of Stages	Stage1		Stage 2	
		kW Input[c]	MBh Output		kW Input	MBh Output	kW Input	MBh Output
3	W*C036H3,4,W	6.00	20.48	1	6.00	20.48	—	—
3	W*C036H3,4,W	12.00	40.97	2	6.00	20.48	6.00	20.48
3	W*C036H3,4,W	17.40	59.40	2	8.70	29.70	8.70	29.70
4	W*C048H3,4,W	6.00	20.48	1	6.00	20.48	—	—
4	W*C048H3,4,W	12.00	40.97	2	6.00	20.48	6.00	20.48
4	W*C048H3,4,W	17.40	59.40	2	8.70	29.70	8.70	29.70
5	W*C060H3,4,W	6.00	20.48	1	6.00	20.48	—	—
5	W*C060H3,4,W	12.00	40.97	2	6.00	20.48	6.00	20.48
5	W*C060H3,4,W	17.40	59.40	2	8.70	29.70	8.70	29.70
5	W*C060H3,4,W	23.00	78.52	2	8.70	29.70	14.30	48.82
7.5	WSC092H3,4/WHC092H3,4,W	9	30.73	1	9	30.73	—	—
7.5	WSC092H3,4/WHC092H3,4,W	18	61.45	1	18	61.45	—	—
7.5	WSC092H3,4/WHC092H3,4,W	27	92.18	2	18	61.45	9	30.73
7.5	WSC092H3,4/WHC092H3,4,W	36	122.9	2	18	61.45	18	61.45
8.5	WSC102H3,4/WHC102H3,4	9	30.73	1	9	30.73	—	—
8.5	WSC102H3,4,W/WHC102H3,4,W	18	61.45	1	18	61.45	—	—
8.5	WSC102H3,4,W/WHC102H3,4,W	27	92.18	2	18	61.45	9	30.73
8.5	WSC102H3,4,W/WHC102H3,4,W	36	122.9	2	18	61.45	18	61.45
10	WSC120H3,4,W/WHC120H3,4,W	18	61.45	1	18	61.45	—	—
10	WSC120H3,4,W/WHC120H3,4,W	27	92.18	2	18	61.45	9	30.73
10	WSC120H3,4,W/WHC120H3,4,W	36	122.9	2	18	61.45	18	61.45
10	WSC120H3,4,W/WHC120H3,4,W	54	184.36	2	36	122.9	18	61.45

(a) 600V is not available on high efficiency units.
(b) Heaters are rated at 240V,380V,480V and 600V. For other than rated voltage, CAP= (voltage/rated voltage)^2 x rated cap.
(c) All input/output does not include indoor fan power or heat.

Table 105.Auxiliary gas fired heating capacities - high efficiency

Tons	Unit Model Number	Heating Input MBh[a]	Heating Output MBh	Air Temp Rise, °F
3	DHC036H(3,4,W)*(L,X)	60/42	48.6/34	20-50
3	DHC036H(3,4,W)*(M,Y)	80/56	64.8/45.3	35-65
3	DHC036H(3,4,W)*(H,Z)	100/70	81/56.7	45-75
4	DHC048H(3,4,W)*(L,X)	60/42	48.6/34	15-45
4	DHC048H(3,4,W)*(M,Y)	100/70	81/56.7	30-60
4	DHC048H(3,4,W)*(H,Z)	130/91	105.3/73.7	45-75
5	DHC060H(3,4,W)*(L,X)	60/42	48.6/34	10-40
5	DHC060H(3,4,W)*(M,Y)	100/70	81/56.7	25-55
5	DHC060H(3,4,W)*(H,Z)	150/105	121.5/85	40-70
6	DHC074H(3,4,W)*(L,X)	80/80	64.8	15-45
6	DHC074H(3,4,W)*(M,Y)	120/120	97.2	20-50
6	DHC074H(3,4,W)*(H,Z)	150/105	121.5/85.05	25-55
7.5	DHC092H(3,4,W)*(L,X)	120/120	97.2	20-50
7.5	DHC092H(3,4,W)*(M,Y)	150/105	121.5/85.05	20-50

Table 105.Auxiliary gas fired heating capacities - high efficiency (continued)

Tons	Unit Model Number	Heating Input MBh[(a)]	Heating Output MBh	Air Temp Rise, °F
7.5	DHC092H(3,4,W)*(H,Z)	200/140	162/113.4	35-65
8.5	DHC102H(3,4,W)*(L,X)	120/120	97.2	20-50
8.5	DHC102H(3,4,W)*(M,Y)	150/105	121.5/85.05	20-50
8.5	DHC102H(3,4,W)*(H,Z)	200/140	162/113.4	35-65
10	DHC120H(3,4,W)*(L,X)	150/105	121.5/85.05	20-50
10	DHC120H(3,4,W)*(M,Y)	200/140	162/113.4	25-55
10	DHC120H(3,4,W)*(H,Z)	250/175	202.5/141.75	35-65

Note: Ratings shown are for elevations up to 2,000 ft. For higher elevations, reduce ratings at a rate of 4% per 1,000 ft. elevation.

(a) For two stage heaters (input or output), second stage is total heating capacity (Second Stage/First Stage).

Table 106.Electric heater voltage correction factors (applicable to auxiliary heat capacity)

Nominal Voltage	Distribution Voltage	Capacity Multiplier
240	208	0.751
240	230	0.918
240	240	1.000
480	440	0.840
480	460	0.918
480	480	1.000
600	540	0.810
600	575	0.918
600	600	1.000

Table 107. 3 to 5 tons air temperature rise across electric heaters (°F)

		3 Tons[(a)] 1200 cfm	4 Tons 1600 cfm	5 Tons[(b)] 2000 cfm
kW	Stages	Three Phase W*C036H3,4,W	Three Phase W*C048H3,4,W	Three Phase W*C060H3,4,W
6.00	1	18.5	10.5	11.4
12.00	2	36.2	22.3	21.5
17.40	2	48.2	33.0	30.0
17.60	2	—	—	—
23.0	2	—	—	38.8

Notes:
1. For minimum design airflow, see airflow performance table for each unit.
2. To calculate temp rise at different airflow, use the following formula: Temp. rise across electric heater = kWx3414/1.08xCFM.

(a) The minimum allowable airflow for a 3 ton with a 17.4 kW heater is 1080 cfm.
(b) The minimum allowable airflow for a 5 ton unit with a 23.0 kW heater is 1900 cfm.

Table 108. 6 to 10 tons air temperature rise across electric heaters (°F)

kW	Stages	6 Tons 2000 cfm WHC074H3,4,W	7.5 Tons 3000 cfm WSC092H3,4,W WHC092H3,4,W	8.5 Tons 3400 cfm WSC102H3,4,W WHC102H3,4,W	10 Tons 4000 cfm[(a)] WSC120H3,4,W WHC120H3,4,W
9.0	1	14.2	9.5	9.5	—
18.0	1	28.5	19.0	19.0	14.2
27.0	2	42.7	28.5	28.5	21.3
36.0	2	56.9	37.9	37.9	28.5
54.0	2	—	—	—	42.7

Notes:
1. For minimum design airflow, see airflow performance table for each unit.
2. To calculate temp rise at different airflow, use the following formula: Temp. rise across electric heater = kWx3414/1.08xCFM.

(a) Minimum allowable airflow with a 54 kW heater for the WSC120H is 4000 cfm.

Controls

ReliaTel™

Zone sensors re the building occupant's comfort control devices. The following zone sensor options are available for units with ReliaTel™ control.

Note: *Zone sensor required for units configured for single zone VAV indoor fan control to enable single zone VAV functionality.*

Economizer Controls

The standard equipment offering is a fixed dry bulb changeover control. In addition, there are two optional controls, enthalpy and differential enthalpy control.

Enthalpy Control

Replaces the dry bulb control with a wet bulb changeover controller which has a fully adjustable setpoint. Enthalpy control offers a higher level of comfort control, along with energy savings potential, than the standard dry bulb control. This is due to the additional wet bulb sensing capability.

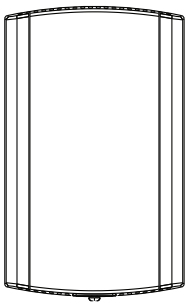
Differential Enthalpy

Differential enthalpy replaces the standard dry bulb control with two enthalpy sensors that compare total heat content of the indoor air and outdoor air to determine the most efficient air source. This control option offers the highest level of comfort control, plus energy efficiency, available.

Remote Potentiometer

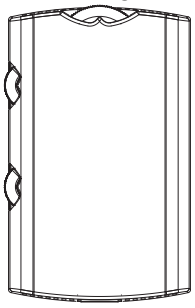
Minimum position setting of economizer can be remotely adjusted with this accessory.

Remote Sensor



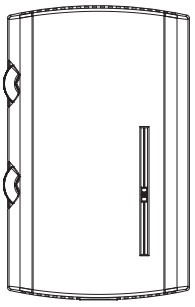
Sensor(s) available for all zone sensors to provide remote sensing capabilities.

Manual Changeover



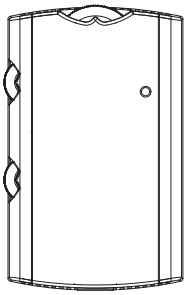
Heat, Cool or Off System Switch. Fan Auto or Off Switch. One temperature setpoint lever.

Manual/Automatic Changeover



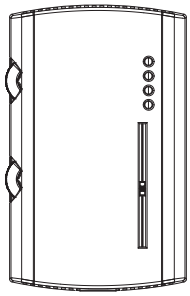
Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers.

Manual/Automatic Changeover - Status Indicator



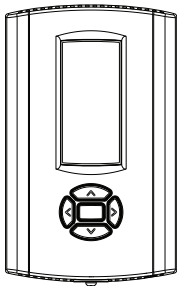
Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers. Includes a status indicator.

Manual/Automatic Changeover



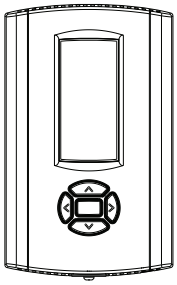
Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers. Status Indication LED lights, System On, Heat, Cool, or Service.

Digital Display Programmable Thermostat (1H/1C)



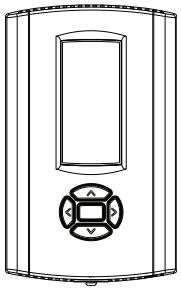
One heat/One Cool Auto changeover digital display thermostat.

Digital Display Thermostat (3H/2C)



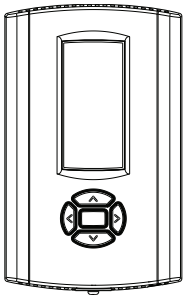
Three Heat, Two Cool Auto changeover digital display thermostat.

Digital Display Programmable Thermostat (3H/2C)



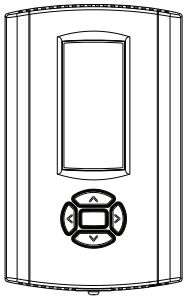
Three Heat/Two Cool Auto changeover digital display thermostat. 7-day programmable stat with night setback is available.

Programmable Night Setback



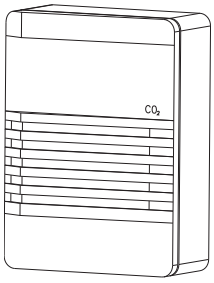
Auto or manual changeover with seven-day programming. Keyboard selection of Heat, Cool, Fan, Auto, or On. All programmable sensors have System On, Heat, Cool, Service LED/indicators as standard. Night Setback Sensors have one (1) Occupied, one (1) Un-occupied, and one (1) Override program per day.

Wireless Zone Sensor



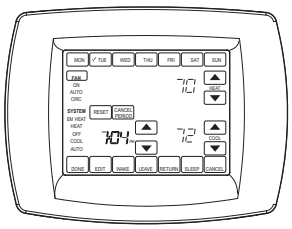
LCD display that provides heat, cool, auto or off. Includes two temperature setpoints and a lockable setting with °F or °C indicators.

CO_2 Sensing



The CO_2 sensor shall have the ability to monitor space occupancy levels within the building by measuring the parts per million of CO_2 (Carbon Dioxide) in the air. As the CO_2 levels increase, the outside air damper modulates to meet the CO_2 space ventilation requirements. The CO_2 accessory shall be available as field installed.

Touchscreen Programmable Thermostat (2H/2C)



Two Heat/Two Cool programmable thermostat with touch screen digital display. Menu-driven programming. Effortless set-up. Program each day separately with no need to copy multiple days. All programming can be done on one screen. Easy to read and use. Large, clear backlit digital display.

Digital Display Programmable Thermostat with Built-In Relative Humidity Sensing (3H/2C)



Three Heat, Two Cool digital display thermostat with built-in humidity control and display. This thermostat combines both humidity and dry bulb into one. Fully programmable with night setback.

Differential Pressure Switches

This factory or field-installed option allows individual fan failure and dirty filter indication. The fan failure switch will disable all unit functions and “flash” the Service LED on the zone sensor. The dirty filter switch will light the Service LED on the zone sensor and will allow continued unit operation.

RA Remote Sensor

Return air remote sensor which can be mounted in the return air duct to report return air temperature.

Room Remote Sensor

Space remote sensor which can be mounted on the wall to report/control from a remote location in the space.

Communication Interfaces

BACnet® Communication Interface

This option shall be provided to allow the unit to communicate directly with a generic open protocol BACnet® MS/TP Network Building Automation System Controls.

Trane® Air-Fi® Wireless Communication - Factory Installed

Air-Fi Wireless communication shall be factory installed and tested. Air-Fi Wireless conforms to ANSI/ASHRAE Standard 135-2016 (BACnet®/ZigBee®[1]).

Trane® Communication Interface (TCI)

This factory or field-installed micro-processor interface allows the unit to communicate to Trane® Integrated Comfort™ system.

[1] ZigBee is a registered trademark of the ZigBee Alliance.

LonTalk® Communications Interface - Factory or Field Installed

The LonTalk® communications interface allows the unit to communicate as a Tracer® LCI-V device or directly with a generic open protocol BACnet® MS/TP Network Building Automation System Controls.

Electrical Data

Table 109.Unit wiring - standard efficiency

Tons	Unit Model Number	Voltage Range	Standard Indoor Fan Motor[a]		Oversized Indoor Fan Motor		Optional EBM Indoor Fan Motor	
			MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
3	WSC036H3	187-253	26	40	29	40	-	-
3	WSC036H4	414-506	11	15	13	15	-	-
3	WSC036HW	517-633	11	15	11	15	-	-
4	WSC048H3	187-253	27	40	28	40	-	-
4	WSC048H4	414-506	12	15	13	15	-	-
4	WSC048HW	517-633	12	15	12	15	-	-
5	WSC060H3	187-253	31	45	32	45	-	-
5	WSC060H4	414-506	15	20	15	20	-	-
5	WSC060HW	517-633	13	15	13	15	-	-
7.5	WSC092H3	187-253	40	60	46	70	44	60
7.5	WSC092H4	414-506	18	25	21	30	20	30
7.5	WSC092HW	517-633	14	20	16	20	20	25
8.5	WSC102H3	187-253	45	70	48	70	46	70
8.5	WSC102H4	414-506	20	30	22	30	21	30
8.5	WSC102HW	517-633	16	20	17	25	21	25
10	WSC120H3	187-253	54	80	-	-	-	-
10	WSC120H4	414-506	24	35	-	-	-	-
10	WSC120HW	517-633	23	30	-	-	-	-

(a) The standard motor for 3-phase models (3 to 5 and 10 ton) is a multispeed, direct drive motor. The standard motor for 3-phase (7.5 to 8.5 tons) is a belt drive motor.

Table 110. Unit wiring - high efficiency

Tons	Unit Model Number	Voltage Range	Standard Indoor Fan Motor[a]		Oversized Indoor Fan Motor	
			MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
3	W/DHC036H3	187-253	23	30	20	30
3	W/DHC036H4	414-506	13	15	10	15
3	W/DHC036HW	517-633	9	15	—	—
4	W/DHC048H3	187-253	29	40	24	35
4	W/DHC048H4	414-506	14	15	11	15
4	W/DHC048HW	517-633	10	15	—	—
5	W/DHC060H3	187-253	32	45	27	40
5	W/DHC060H4	414-506	15	20	12	15
5	W/DHC060HW	517-633	12	15	—	—
6	W/DHC074H3	187-253	42	50	-	-
6	W/DHC074H4	414-506	19	25	-	-
6	W/DHC074HW	517-633	21	25	-	-
7.5	W/DHC092H3	187-253	43	50	-	-
7.5	W/DHC092H4	414-506	20	25	-	-
7.5	W/DHC092HW	517-633	22	25	-	-
8.5	W/DHC102H3	187-253	46	60	-	-

Table 110. Unit wiring - high efficiency (continued)

Tons	Unit Model Number	Voltage Range	Standard Indoor Fan Motor[a]		Oversized Indoor Fan Motor	
			MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
8.5	W/DHC102H4	414-506	22	25	-	-
8.5	W/DHC102HW	517-633	23	25	-	-
10	W/DHC120H3	187-253	49	60	-	-
10	W/DHC120H4	414-506	24	30	-	-
10	W/DHC120HW	517-633	23	30	-	-

(a) The standard motor for all models is a multispeed, direct drive motor.

Table 111.Unit wiring with electric heat (single point connection) - standard efficiency

Tons	Unit Model Number	Heater Model Number	Heater kW Rating[a]	Control Stages	Standard Indoor Fan Motor		Oversized Indoor Fan Motor		Optional EBM Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
208/230 Volts Three Phase										
3	WSC036H3	BAYHTRE306*	4.5/6.0	1	42/44	50/50	44/47	50/50	-	-
3	WSC036H3	BAYHTRE312*	9.0/12.0	2	57/62	60/70	60/65	60/70	-	-
3	WSC036H3	BAYHTRY317*	13.1/17.4	2	71/78	80/80	74/81	80/90	-	-
4	WSC048H3	BAYHTRE306*	4.5/6.0	1	43/45	50/50	44/46	50/50	-	-
4	WSC048H3	BAYHTRE312*	9.0/12.0	2	58/63	60/70	63/68	60/70	-	-
4	WSC048H3	BAYHTRY317*	13.1/17.4	2	72/79	80/80	74/84	80/90	-	-
5	WSC060H3	BAYHTRX306*	4.5/6.0	1	47/50	60/60	48/50	60/60	-	-
5	WSC060H3	BAYHTRX312*	9.0/12.0	2	63/68	70/70	63/68	70/70	-	-
5	WSC060H3	BAYHTRY318*	13.1/17.4	2	77/84	80/90	77/84	80/90	-	-
5	WSC060H3	BAYHTRY323	17.3/23.0	2	91/101	100/110	92/101	100/110	-	-
7.5	WSC092H3	BAYHTRU309*	6.8/9.0	1	63/67	80/80	69/73	90/90		
7.5	WSC092H3	BAYHTRA309*	6.8/9.0	1	-	-	-	-	67/71	80/90
7.5	WSC092H3	BAYHTRU318*	13.5/18.0	1	87/94	100/100	93/100	100/110	-	-
7.5	WSC092H3	BAYHTRA318*	13.5/18.0	1	-	-	-	-	91/98	100/110
7.5	WSC092H3	BAYHTRU327*	20.3/27.0	2	110/121	110/125	116/127	125/150	-	-
7.5	WSC092H3	BAYHTRA327*	20.3/27.0	2	-	-	-	-	114/125	125/125
7.5	WSC092H3	BAYHTRU336*	27.0/36.0	2	134/148	150/150	140/154	150/175		
7.5	WSC092H3	BAYHTRA336*	27.0/36.0	2	-	-	-	-	138/152	150/175
8.5	WSC102H3	BAYHTRU309*	6.8/9.0	1	68/72	90/90	71/75	90/90	-	-
8.5	WSC102H3	BAYHTRA309*	6.8/9.0	1	-	-	-	-	69/73	90/90
8.5	WSC102H3	BAYHTRU318*	13.5/18.0	1	92/99	100/110	95/102	110/110	-	-
8.5	WSC102H3	BAYHTRA318*	13.5/18.0	1	-	-	-	-	93/100	110/110
8.5	WSC102H3	BAYHTRU327*	20.3/27.0	2	115/126	125/150	118/129	125/150	-	-
8.5	WSC102H3	BAYHTRA327*	20.3/27.0	2	-	-	-	-	116/127	125/150
8.5	WSC102H3	BAYHTRU336*	27.0/36.0	2	138/153	150/175	142/156	150/175	-	-
8.5	WSC102H3	BAYHTRA336*	27.0/36.0	2	-	-	-	-	139/154	150/175
10	WSC120H3	BAYHTRA318*	13.5/18.0	1	101/108	110/125	-	-	-	-

Table 111.Unit wiring with electric heat (single point connection) - standard efficiency (continued)

Tons	Unit Model Number	Heater Model Number	Heater kW Rating[a]	Control Stages	Standard Indoor Fan Motor		Oversized Indoor Fan Motor		Optional EBM Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
10	WSC120H3	BAYHTRA327*	20.3/27.0	2	124/135	125/150	-	-	-	-
10	WSC120H3	BAYHTRA336*	27.0/36.0	2	147/162	150/175	-	-	-	-
10	WSC120H3	BAYHTRA354*	40.6/54.0	2	194/184	200/200	-	-	-	-
460 Volts Three Phase										
3	WSC036H4	BAYHTRE406*	6	1	20	20	23	25	-	-
3	WSC036H4	BAYHTRE412*	12	2	29	30	32	35	-	-
3	WSC036H4	BAYHTRY417*	17.4	2	37	40	40	40	-	-
4	WSC048H4	BAYHTRE406*	6	1	21	25	22	25	-	-
4	WSC048H4	BAYHTRE412*	12	2	30	30	32	35	-	-
4	WSC048H4	BAYHTRY417*	17.4	2	38	40	40	40	-	-
5	WSC060H4	BAYHTRX406*	6	1	24	25	25	30	-	-
5	WSC060H4	BAYHTRX412*	12	2	33	35	34	35	-	-
5	WSC060H4	BAYHTRY418*	17.4	2	41	45	42	45	-	-
5	WSC060H4	BAYHTRY423*	23	2	50	50	51	60	-	-
7.5	WSC092H4	BAYHTRU409*	9	1	32	40	35	40	-	-
7.5	WSC092H4	BAYHTRA409*	9	1	-	-	-	-	34	40
7.5	WSC092H4	BAYHTRU418*	18	1	45	50	48	50	-	-
7.5	WSC092H4	BAYHTRA418*	18	1	-	-	-	-	47	50
7.5	WSC092H4	BAYHTRU427*	27	2	59	60	62	70	-	-
7.5	WSC092H4	BAYHTRA427*	27	2	-	-	-	-	61	70
7.5	WSC092H4	BAYHTRU436*	36	2	72	80	75	80	-	-
7.5	WSC092H4	BAYHTRA436*	36	2	-	-	-	-	74	80
8.5	WSC102H4	BAYHTRU409*	9	1	34	40	35	40	-	-
8.5	WSC102H4	BAYHTRA409*	9	1	-	-	-	-	34	40
8.5	WSC102H4	BAYHTRU418*	18	1	47	50	49	50	-	-
8.5	WSC102H4	BAYHTRA418*	18	1	-	-	-	-	48	50
8.5	WSC102H4	BAYHTRU427*	27	2	61	70	62	70	-	-
8.5	WSC102H4	BAYHTRA427*	27	2	-	-	-	-	61	70
8.5	WSC102H4	BAYHTRU436*	36	2	74	80	76	80	-	-
8.5	WSC102H4	BAYHTRA436*	36	2	-	-	-	-	75	80
10	WSC120H4	BAYHTRA418*	18	1	51	60	-	-	-	-
10	WSC120H4	BAYHTRA427*	27	2	64	70	-	-	-	-
10	WSC120H4	BAYHTRA436*	36	2	78	80	-	-	-	-
10	WSC120H4	BAYHTRA454*	54	2	89	100	-	-	-	-

Table 111.Unit wiring with electric heat (single point connection) - standard efficiency (continued)

Tons	Unit Model Number	Heater Model Number	Heater kW Rating[a]	Control Stages	Standard Indoor Fan Motor		Oversized Indoor Fan Motor		Optional EBM Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
575 Volts Three Phase										
3	WSC036HW	BAYHTREW06*	6	1	19	20	19	20	-	-
3	WSC036HW	BAYHTREW12*	12	2	26	30	26	30	-	-
3	WSC036HW	BAYHTRYW17*	17.4	2	32	35	32	35	-	-
4	WSC048HW	BAYHTREW06*	6	1	19	20	19	20	-	-
4	WSC048HW	BAYHTREW12*	12	2	26	30	26	30	-	-
4	WSC048HW	BAYHTRYW17*	17.4	2	33	35	33	35	-	-
5	WSC060HW	BAYHTREW06*	6	1	20	20	20	20	-	-
5	WSC060HW	BAYHTREW12*	12	2	27	30	27	30	-	-
5	WSC060HW	BAYHTREW18*	17.4	2	33	35	33	35	-	-
5	WSC060HW	BAYHTREW23*	23	2	40	40	40	40	-	-
7.5	WSC092HW	BAYHTRUW18*	18	1	36	40	38	40	-	-
7.5	WSC092HW	BAYHTRAW18*	18	1	-	-	-	-	42	45
7.5	WSC092HW	BAYHTRUW27*	27	2	47	50	49	50	-	-
7.5	WSC092HW	BAYHTRAW27*	27	2	-	-	-	-	53	60
7.5	WSC092HW	BAYHTRUW36*	36	2	58	60	60	60	-	-
7.5	WSC092HW	BAYHTRAW36*	36	2	-	-	-	-	64	70
8.5	WSC102HW	BAYHTRUW18*	18	1	38	40	39	40	-	-
8.5	WSC102HW	BAYHTRAW18*	18	1	-	-	-	-	43	45
8.5	WSC102HW	BAYHTRUW27*	27	2	49	50	49	50	-	-
8.5	WSC102HW	BAYHTRAW27*	27	2	-	-	-	-	54	60
8.5	WSC102HW	BAYHTRUW36*	36	2	59	60	60	60	-	-
8.5	WSC102HW	BAYHTRAW36*	36	2	-	-	-	-	64	70
10	WSC120HW	BAYHTRAW18*	18	1	44	50	-	-	-	-
10	WSC120HW	BAYHTRAW27*	27	2	55	60	-	-	-	-
10	WSC120HW	BAYHTRAW36*	36	2	66	70	-	-	-	-
10	WSC120HW	BAYHTRAW54*	54	2	75	80	-	-	-	-

(a) The standard motor for 3-phase models (3 to 5 and 10 ton) is a multispeed, direct drive motor. The standard motor for 3-phase (7.5 to 8.5 tons) is a belt drive motor.

Table 112.Unit wiring with electric heat (single point connection) - high efficiency

Tons	Unit Model Number	Heater Model Number	Heater kW Rating[a]	Control Stages	Standard Indoor Fan Motor		Oversized Indoor Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
208/230 Volts Three Phase								
3	WHC036H3	BAYHTRE306*	4.5/6.0	1	39/41	45/45	36/38	40/45
3	WHC036H3	BAYHTRE312*	9.0/12.0	2	55/59	60/60	52/56	60/60
3	WHC036H3	BAYHTRY317*	13.1/17.4	2	69/76	70/80	66/73	70/80
4	WHC048H3	BAYHTRX306*	4.5/6.0	1	45/47	50/50	39/42	45/50
4	WHC048H3	BAYHTRX312*	9.0/12.0	2	60/65	60/70	55/60	60/60
4	WHC048H3	BAYHTRY318*	13.1/17.4	2	74/81	80/90	69/76	70/80
5	WHC060H3	BAYHTRX306*	4.5/6.0	1	48/50	60/60	43/45	50/50
5	WHC060H3	BAYHTRX312*	9.0/12.0	2	63/68	70/70	58/63	60/70
5	WHC060H3	BAYHTRY318*	13.1/17.4	2	77/84	80/90	72/79	80/80
5	WHC060H3	BAYHTRY323*	17.3/23.0	2	92/101	100/110	87/96	90/100
6	WHC074H3	BAYHTRA309*	6.8/9.0	1	65/69	70/70	-	-
6	WHC074H3	BAYHTRA318*	13.5/18.0	1	89/96	90/100	-	-
6	WHC074H3	BAYHTRA327*	20.3/27.0	2	112/123	125/125	-	-
6	WHC074H3	BAYHTRA336*	27.0/36.0	2	136/150	150/150	-	-
7.5	WHC092H3	BAYHTRA309*	6.8/9.0	1	67/70	70/70	-	-
7.5	WHC092H3	BAYHTRA318*	13.5/18.0	1	90/97	90/100	-	-
7.5	WHC092H3	BAYHTRA327*	20.3/27.0	2	113/124	125/125	-	-
7.5	WHC092H3	BAYHTRA336*	27.0/36.0	2	137/151	150/175	-	-
8.5	WHC102H3	BAYHTRA309*	6.8/9.0	1	69/73	80/80	-	-
8.5	WHC102H3	BAYHTRA318*	13.5/18.0	1	93/100	100/100	-	-
8.5	WHC102H3	BAYHTRA327*	20.3/27.0	2	116/127	125/150	-	-
8.5	WHC102H3	BAYHTRA336*	27.0/36.0	2	140/154	150/175	-	-
10	WHC120H3	BAYHTRB318*	13.5/18.0	1	96/103	100/110	-	-
10	WHC120H3	BAYHTRB327*	20.3/27.0	2	119/130	125/150	-	-
10	WHC120H3	BAYHTRB336*	27.0/36.0	2	142/157	150/175	-	-
10	WHC120H3	BAYHTRB354*	40.6/54.0	2	189/179	200/200	-	-
460 Volts Three Phase								
3	WHC036H4	BAYHRTE406*	6	1	22	25	19	20
3	WHC036H4	BAYHTRE412*	12	2	31	35	28	30
3	WHC036H4	BAYHTRY417*	17.4	2	39	40	36	40
4	WHC048H4	BAYHTRX406*	6	1	23	25	20	20
4	WHC048H4	BAYHTRX412*	12	2	32	35	29	30
4	WHC048H4	BAYHTRY418*	17.4	2	40	40	37	40
5	WHC060H4	BAYHTRX406*	6	1	24	25	21	25
5	WHC060H4	BAYHTRX412*	12	2	33	35	30	30
5	WHC060H4	BAYHTRY418*	17.4	2	41	45	38	40
5	WHC060H4	BAYHTRY423*	23	2	49	50	47	50

Table 112.Unit wiring with electric heat (single point connection) - high efficiency (continued)

Tons	Unit Model Number	Heater Model Number	Heater kW Rating[a]	Control Stages	Standard Indoor Fan Motor		Oversized Indoor Fan Motor	
					MCA	Max Fuse Size or Max Circuit Breaker	MCA	Max Fuse Size or Max Circuit Breaker
6	WHC074H4	BAYHTRA409*	9	1	33	35	-	-
6	WHC074H4	BAYHTRA418*	18	1	47	50	-	-
6	WHC074H4	BAYHTRA427*	27	2	60	60	-	-
6	WHC074H4	BAYHTRA436*	36	2	74	80	-	-
7.5	WHC092H4	BAYHTRA409*	9	1	34	35	-	-
7.5	WHC092H4	BAYHTRA418*	18	1	47	50	-	-
7.5	WHC092H4	BAYHTRA427*	27	2	61	70	-	-
7.5	WHC092H4	BAYHTRA436*	36	2	74	80	-	-
8.5	WHC102H4	BAYHTRA409*	9	1	35	35	-	-
8.5	WHC102H4	BAYHTRA418*	18	1	49	50	-	-
8.5	WHC102H4	BAYHTRA427*	27	2	62	70	-	-
8.5	WHC102H4	BAYHTRA436*	36	2	76	80	-	-
10	WHC120H4	BAYHTRB418*	18	1	51	60	-	-
10	WHC120H4	BAYHTRB427*	27	2	64	70	-	-
10	WHC120H4	BAYHTRB436*	36	2	78	80	-	-
10	WHC120H4	BAYHTRB454*	54	2	89	90	-	-
575 Volts Three Phase								
3	WHC036HW	BAYHTREW12*	12	2	24	25	-	-
3	WHC036HW	BAYHTRYW17*	17.4	2	30	30	-	-
4	WHC048HW	BAYHTRXW06*	6	1	18	20	-	-
4	WHC048HW	BAYHTRXW12*	12	2	25	25	-	-
4	WHC048HW	BAYHTRYW18*	17.4	2	31	35	-	-
5	WHC060HW	BAYHTRXW06*	6	1	19	20	-	-
5	WHC060HW	BAYHTRXW12*	12	2	26	30	-	-
5	WHC060HW	BAYHTRYW18*	17.4	2	32	35	-	-
5	WHC060HW	BAYHTRYW23*	23	2	39	40	-	-
6	WHC074HW	BAYHTRAW18*	18	1	42	45	-	-
6	WHC074HW	BAYHTRAW27*	27	2	52	60		
6	WHC074HW	BAYHTRAW36*	36	2	63	70	-	-
7.5	WHC092HW	BAYHTRAW18*	18	1	43	45	-	-
7.5	WHC092HW	BAYHTRAW27*	27	2	54	60		
7.5	WHC092HW	BAYHTRAW36*	36	2	64	70	-	-
8.5	WHC102HW	BAYHTRAW18*	18	1	44	45	-	-
8.5	WHC102HW	BAYHTRAW27*	27	2	54	60		
8.5	WHC102HW	BAYHTRAW36*	36	2	65	70	-	-
10	WHC120HW	BAYHTRBW18*	18	1	45	45	-	-
10	WHC120HW	BAYHTRBW36*	36	2	66	70	-	-
10	WHC120HW	BAYHTRBW54*	54	2	74	80	-	-

(a) The standard motor for all models is a multispeed, direct drive motor.

Table 113.Electrical characteristics - compressor motor and condenser motor - 60 cycle - standard efficiency

Tons	Unit Model Number	Compressor Motors							Condenser Fan Motors					
		No.	Volts	Phase	hp[a]	rpm	Amps[b]		No.	Volts	Phase	hp	Amps[b]	
							RLA	LRA					FLA	LRA
3	WSC036H3	1	208-230	3	3.2	3500	15	88	1	208-230	3	0.25	1.1	3.6
3	WSC036H4	1	460	3	3.2	3500	6.6	44	1	460	3	0.25	0.55	1.8
3	WSC036HW	1	575	3	3.2	3500	5.5	34	1	575	3	0.25	0.45	1.4
4	WSC048H3	1	208-230	3	3.8	3500	14.5	98	1	208-230	3	0.33	1.4	4.6
4	WSC048H4	1	460	3	3.8	3500	6.3	55	1	460	3	0.33	0.7	2.3
4	WSC048HW	1	575	3	3.8	3500	6	41	1	575	3	0.33	0.55	1.8
5	WSC060H3	1	208-230	3	4.7	3500	17.5	110	1	208-230	3	0.40	1.5	5.6
5	WSC060H4	1	460	3	4.7	3500	7.88	52	1	460	3	0.40	1.8	2.8
5	WSC060HW	1	575	3	4.7	3500	6.3	39	1	575	3	0.40	0.65	2.3
7.5	WSC092H3	1	208-230	3	8.6	3500	26.09	164	1	208-230	3	0.7	3.3	12.3
7.5	WSC092H4	1	460	3	8.6	3500	11.67	94	1	460	3	0.7	1.6	6.1
7.5	WSC092HW	1	575	3	8.6	3500	8.72	65	1	575	3	0.7	1.4	5.1
8.5	WSC102H3	1	208-230	3	9.2	3500	27.63	223	1	208-230	3	0.7	3.3	12.3
8.5	WSC102H4	1	460	3	9.2	3500	12.12	100	1	460	3	0.7	1.6	6.1
8.5	WSC102HW	1	575	3	9.2	3500	9.36	70	1	575	3	0.7	1.4	5.1
10	WSC120H3	1	208-230	3	10.5	3500	34	240	1	208-230	3	0.7	3.3	12.3
10	WSC120H4	1	460	3	10.5	3500	14.42	130	1	460	3	0.7	1.6	6.1
10	WSC120HW	1	575	3	10.5	3500	10.77	84	1	460	3	0.7	1.4	5.1

(a) hp for each compressor.
(b) Amp draw for each motor; multiply value by number of motors to determine total amps.

Table 114.Electrical characteristics - compressor motor - 60 cycle - high efficiency

Tons	Unit Model Number	No.	Voltage	Phase	hp[a]	Compressor Rated		
						LRA	RLA	MCC
3	W/DHC036H3	1	208-230	3	3.9	73	11.6	18.1
3	W/DHC036H4	1	460	3	3.8	38	5.7	8.9
3	W/DHC036HW	1	575	3	3.8	25.6	4	6.2
4	W/DHC048H3	1	208-230	3	4.3	83.1	14	21.9
4	W/DHC048H4	1	460	3	4.3	41	6.4	10
4	W/DHC048HW	1	575	3	4.3	33	4.6	7.1
5	W/DHC060H3	1	208-230	3	5.3	110	16.5	25.8
5	W/DHC060H4	1	460	3	5.3	52	7.2	11.3
5	W/DHC060HW	1	575	3	5.3	38.9	5.5	8.6
6	W/DHC074H3	2	208-230	3	2.3/4.5	88/88	14.2/13.2	22.1/20.6
6	W/DHC074H4	2	460	3	2.3/4.5	44/44	6.2/6	9.7/9.3
6	W/DHC074HW	2	575	3	2.3/4.5	30/30	5.1/4.2	7.9/6.5
7.5	W/DHC092H3	2	208-230	3	5.2/5.6	83.1/98	14/14.5	21.9/22.6
7.5	W/DHC092H4	2	460	3	5.2/5.6	41/55	6.4/6.3	10/9.9

Table 114.Electrical characteristics - compressor motor - 60 cycle - high efficiency (continued)

Tons	Unit Model Number	No.	Voltage	Phase	hp[a]	Compressor Rated		
						LRA	RLA	MCC
7.5	W/DHC092HW	2	575	3	5.2/5.6	33/41	4.6/6	7.1/9.4
8.5	W/DHC102H3	2	208-230	3	6/5.6	110/98	16.22/14.5	25.3/22.6
8.5	W/DHC102H4	2	460	3	6/5.6	52/55	7.63/6.3	11.9/9.9
8.5	W/DHC102HW	2	575	3	6/5.6	38.9/41	5.32/6	8.3/9.4
10	W/DHC120H3	2	208-230	3	7.5/6.5	136/110	17.56/16	27.4/24.9
10	W/DHC120H4	2	460	3	7.5/6.5	66.1/52	8.46/7.8	13.20/12.1
10	W/DHC120HW	2	575	3	7.5/6.5	55.3/38.9	6.35/5.7	9.9/8.9

(a) hp for each compressor.

Table 115.Electrical characteristics - condenser fan motor - 60 cycle - high efficiency

Tons	Unit Model Number	Motor Voltage	Motor Hz	Motor Phase	Condenser Rated		
					LRA	FLA	Bhp
3	W/DHC036H3	208-230	60	3	3.6	1.1	0.25
3	W/DHC036H4	460	60	3	1.8	0.55	0.25
3	W/DHC036HW	575	60	3	1.4	0.45	0.25
4	W/DHC048H3	208-230	60	3	5.6	1.5	0.4
4	W/DHC048H4	460	60	3	2.8	0.8	0.4
4	W/DHC048HW	575	60	3	2.3	0.65	0.4
5	W/DHC060H3	208-230	60	3	5.6	1.5	0.4
5	W/DHC060H4	460	60	3	2.8	0.8	0.4
5	W/DHC060HW	575	60	3	2.3	0.65	0.4
6	W/DHC074H3	208-230	60	3	12.3	3.3	0.7
6	W/DHC074H4	460	60	3	6.1	1.6	0.7
6	W/DHC074HW	575	60	3	5.1	1.4	0.7
7.5	W/DHC092H3	208-230	60	3	12.3	3.3	0.7
7.5	W/DHC092H4	460	60	3	6.1	1.6	0.7
7.5	W/DHC092HW	575	60	3	5.1	1.4	0.7
8.5	W/DHC102H3	208-230	60	3	12.3	3.3	0.7
8.5	W/DHC102H4	460	60	3	6.1	1.6	0.7
8.5	W/DHC102HW	575	60	3	5.1	1.4	0.7
10	W/DHC120H3	208-230	60	3	10.4	2.8	0.75
10	W/DHC120H4	460	60	3	5.2	1.4	0.75
10	W/DHC120HW	575	60	3	5.2	1.4	0.75

Note: Precedent™ unit nameplate FLA and catalog FLA may be different than actual condenser motor nameplate FLA for two reasons:
If multiple vendors for approved motor size are used, the highest FLA is used.
Actual condenser motor FLA may be determined through unit temperature and pressure testing.

Table 116.Electrical characteristics - standard evaporator fan motor - 60 cycle - direct or belt drive standard efficiency

Tons	Unit Model Number	Direct or Belt Drive	No.	Volts	Phase	hp	Amps	
							FLA	LRA
3	WSC036H3	Direct Drive	1	208-230	1	0.75	5.7	-
3	WSC036H4	Direct Drive	1	460	1	0.75	1.7	-
3	WSC036HW	Direct Drive	1	575	1	0.75	5.7	-
4	WSC048H3	Direct Drive	1	208-230	1	1.0	6.9	-
4	WSC048H4	Direct Drive	1	460	1	1.0	2.5	-
4	WSC048HW	Direct Drive	1	575	1	1.0	6.9	-
5	WSC060H3	Direct Drive	1	208-230	1	1.0	7.6	-
5	WSC060H4	Direct Drive	1	460	1	1.0	4.0	-
5	WSC060HW	Direct Drive	1	575	1	1.0	7.6	-
7.5	WSC092H3	Belt Drive	1	208-230	3	1	3.3	12.5
7.5	WSC092H4	Belt Drive	1	460	3	1	1.6	12.5
7.5	WSC092HW	Belt Drive	1	575	3	1	1.4	10
7.5	WSC092H3	Direct Drive	1	208-230	3	2.75	7.3	-
7.5	WSC092H4	Direct Drive	1	460	3	2.75	3.6	-
7.5	WSC092HW	Direct Drive	1	575	3	2.75	7.5	-
8.5	WSC102H3	Belt Drive	1	208-230	3	1	6.3	12.5
8.5	WSC102H4	Belt Drive	1	460	3	1	3.1	12.5
8.5	WSC102HW	Belt Drive	1	575	3	1	2.5	10
8.5	WSC102H3	Direct Drive	1	208-230	3	2.75	7.3	-
8.5	WSC102H4	Direct Drive	1	460	3	2.75	3.6	-
8.5	WSC102HW	Direct Drive	1	575	3	2.75	7.5	-
10	WSC120H3	Direct Drive	1	208-230	3	2.75	7.3	-
10	WSC120H4	Direct Drive	1	460	3	2.75	3.6	-
10	WSC120HW	Direct Drive	1	460	3	2.75	7.5	-

Note: WSC(036,048,060)HW utilize 230V evaporator motors.

Table 117.Electrical characteristics - standard evaporator fan motor - 60 cycle - high efficiency

Tons	Unit Model Number	Motor Voltage	Motor Hz	Phase	No.	Motor Rating		
						FLA	LRA	HP
3	W/DHC036H3	208-230	60	1	1	7.3	—	0.75
3	W/DHC036H4	460[a]	60	1	1	4.3	—	0.75
3	W/DHC036HW	575[b]	60	1	1	3.5	—	0.75
4	W/DHC048H3	208-230	60	1	1	9.4	—	1.00
4	W/DHC048H4	460[a]	60	1	1	4.3	—	1.00
4	W/DHC048HW	575[b]	60	1	1	3.5	—	1.00
5	W/DHC060H3	208-230	60	1	1	9.4	—	1.00
5	W/DHC060H4	460[a]	60	1	1	4.3	—	1.00
5	W/DHC060HW	575[b]	60	1	1	3.5	—	1.00
6	W/DHC074H3	208-230	60	1	1	7.3	-	2.75

Table 117.Electrical characteristics - standard evaporator fan motor - 60 cycle - high efficiency (continued)

Tons	Unit Model Number	Motor Voltage	Motor Hz	Phase	No.	Motor Rating		
						FLA	LRA	HP
6	W/DHC074H4	460	60	1	1	3.6	-	2.75
6	W/DHC074HW	575(c)	60	1	1	7.5	-	2.75
7.5	W/DHC092H3	208-230	60	1	1	7.3	-	2.75
7.5	W/DHC092H4	460	60	1	1	3.6	-	2.75
7.5	W/DHC092HW	575(c)	60	1	1	7.5	-	2.75
8.5	W/DHC102H3	208-230	60	1	1	7.3	-	2.75
8.5	W/DHC102H4	460	60	1	1	3.6	-	2.75
8.5	W/DHC102HW	575(c)	60	1	1	7.5	-	2.75
10	W/DHC120H3	208-230	60	1	1	7.3	-	2.75
10	W/DHC120H4	460	60	1	1	3.6	-	2.75
10	W/DHC120HW	575(c)	60	1	1	7.5	-	2.75

Note: Precedent™ unit nameplate FLA and catalog FLA may be different than actual evaporator motor nameplate FLA for two reasons:
If multiple vendors for approved motor size are used, the highest FLA is used.
Actual evaporator motor FLA may be determined through unit temperature and pressure testing.

(a) Precedent 460V rated units utilize a high efficiency 230V evaporator fan motor powered through 480/240V transformer. Fan voltage/FLA rated at transformer input.
(b) Precedent 575V rated units utilize a high efficiency 230V evaporator fan motor powered through 575/240V transformer. Fan voltage/FLA rated at transformer input.
(c) Precedent 575V rated units utilize a high efficiency 460V evaporator fan motor powered through 575/460V transformer. Fan voltage/FLA rated at transformer input.

Table 118.Electrical characteristics - oversized evaporator fan motor - 60 cycle - belt drive - standard efficiency

Tons	Unit Model Number	Direct or Belt Drive	No.	Volts	Phase	hp	Amps	
							FLA	LRA
3	WSC036H3	Direct Drive	1	208-230	1	1.5	8.2	-
3	WSC036H4	Direct Drive	1	460	1	1.5	4.2	-
3	WSC036HW	Direct Drive	1	575	1	1.5	3.5	-
4	WSC048H3	Direct Drive	1	208-230	1	1.5	8.2	-
4	WSC048H4	Direct Drive	1	460	1	1.5	4.2	-
4	WSC048HW	Direct Drive	1	575	1	1.5	3.5	-
5	WSC060H3	Direct Drive	1	208-230	1	1.5	8.2	-
5	WSC060H4	Direct Drive	1	460	1	1.5	4.2	-
5	WSC060HW	Direct Drive	1	575	1	1.5	3.5	-
7.5	WSC092H3	Belt Drive	1	208-230	3	3	9.4	52.4
7.5	WSC092H4	Belt Drive	1	460	3	3	4.6	26.3
7.5	WSC092HW	Belt Drive	1	575	3	3	3.4	29.4
8.5	WSC102H3	Belt Drive	1	208-230	3	3	9.4	52.4
8.5	WSC102H4	Belt Drive	1	460	3	3	4.6	26.3
8.5	WSC102HW	Belt Drive	1	575	3	3	3.4	29.4

Note: WSC(036,048,060)HW utilize 230V evaporator motors.

Table 119.Electrical characteristics - oversized evaporator fan motor - 60 cycle - high efficiency

Tons	Unit Model Number	Motor Voltage	Motor Hz	Phase	No.	Motor Rating		
						FLA	LRA	HP
3	W/DHC036H3	208-230	60	3	1	4.3	—	1.50
3	W/DHC036H4	460	60	3	1	1.9	—	1.50
4	W/DHC048H3	208-230	60	3	1	4.3	—	1.50
4	W/DHC048H4	460	60	3	1	1.9	—	1.50
5	W/DHC060H3	208-230	60	3	1	4.3	—	1.50
5	W/DHC060H4	460	60	3	1	1.9	—	1.50

Notes:
1. Precedent oversized evaporator available only on 230V and 460V.
2. Precedent™ unit nameplate FLA and catalog FLA may be different than actual evaporator motor nameplate FLA for two reasons:
   If multiple vendors for approved motor size are used, the highest FLA is used.
   Actual evaporator motor FLA may be determined through unit temperature and pressure testing.

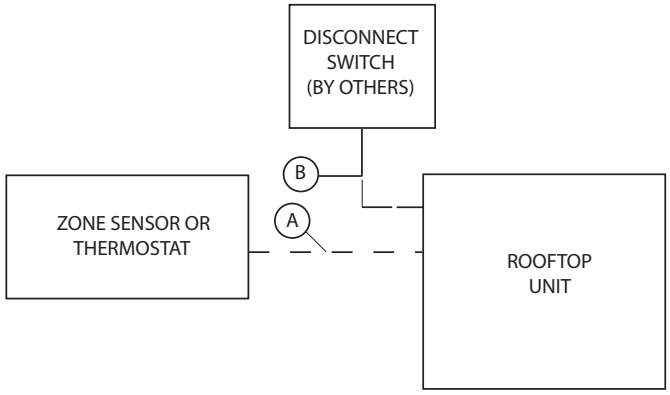
Table 120.Electrical characteristics - inducer motor

Unit Model Number	Stages	hp	rpm	volts	phase	LRA
DHC(036-120)H(3,4,W)*(L,X,M,Y,H,Z)	2	1/50	3200/3500	208-230	1	0.68
DHC074**(L,M,X,Y) DHC(092-102)**(L,X)	1	1/35	3000	208-230	1	0.6
DHC074**(H,Z) DHC(092-102)**(M,H,Y,Z) DHC120	2	1/15	3000/3350	208-230	1	0.4

Jobsite Connections

Table 121.Typical Number of Wires

Zone Sensors		
A	Manual Changeover.....	4
	Manual/Auto Changeover.....	5
	Manual/Auto Changeover with Status Indication LED's.....	10
	Programmable Night Setback with Status Indication LED's.....	7
Thermostats		
A	3 Wires, 24V, Cooling only	
	4 Wires, 24V, with Electric Heat	
B	3 Power Wires + 1 Ground Wire (3-phase)	
	2 Power Wires + 1 Ground Wire (1-phase)	



For specific wiring information, see the installation instructions.
All wiring except power wire is low voltage.
All customer supplied wiring to be copper and must conform to applicable electrical codes (such as NEC or CEC) and local electric codes. Wiring shown dotted is to be furnished and installed by the customer.

Dimensional Data

Figure 4. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency

Note: 2” electrical connection: single point power when heat installed (W*C)

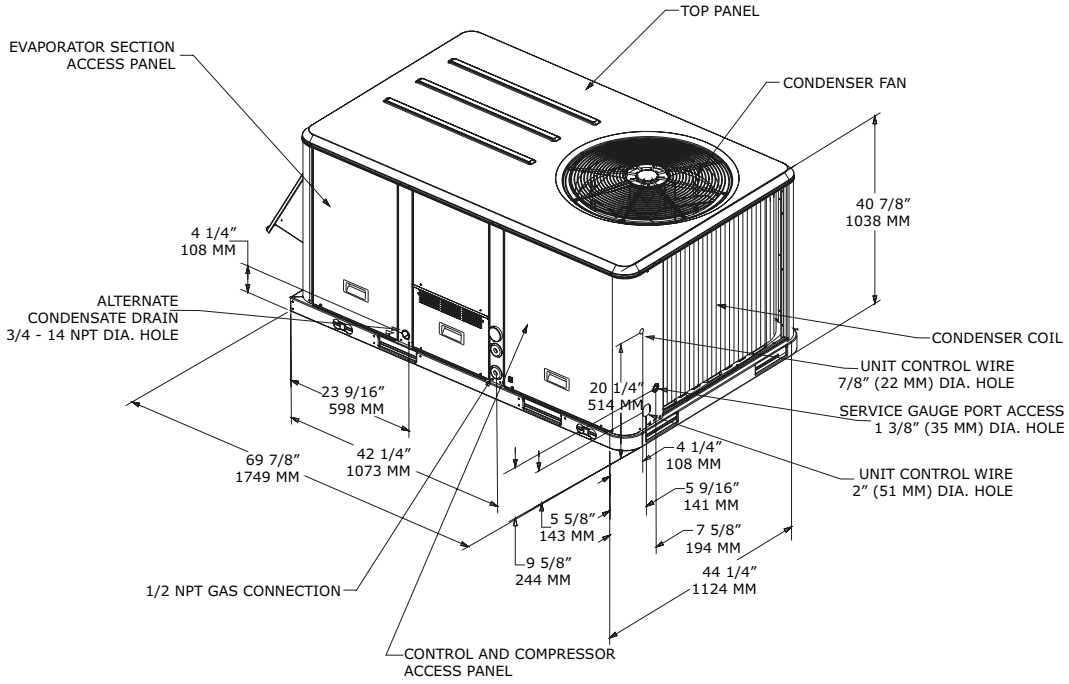


Figure 5. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - downflow airflow supply/return - through-the-base utilities

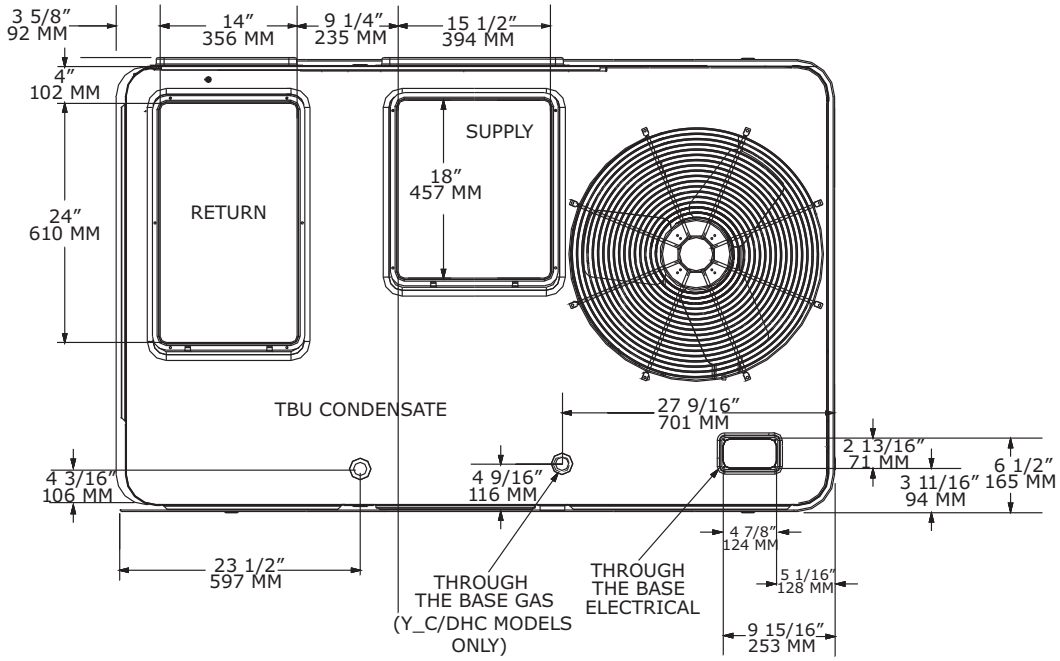


Figure 6. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - horizontal airflow supply/return

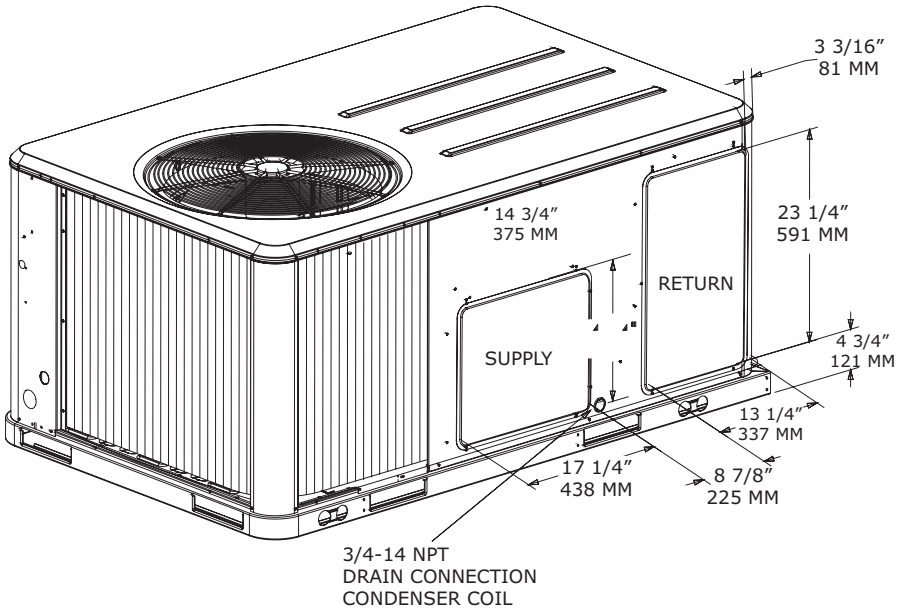


Figure 7. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - unit clearance and roof opening

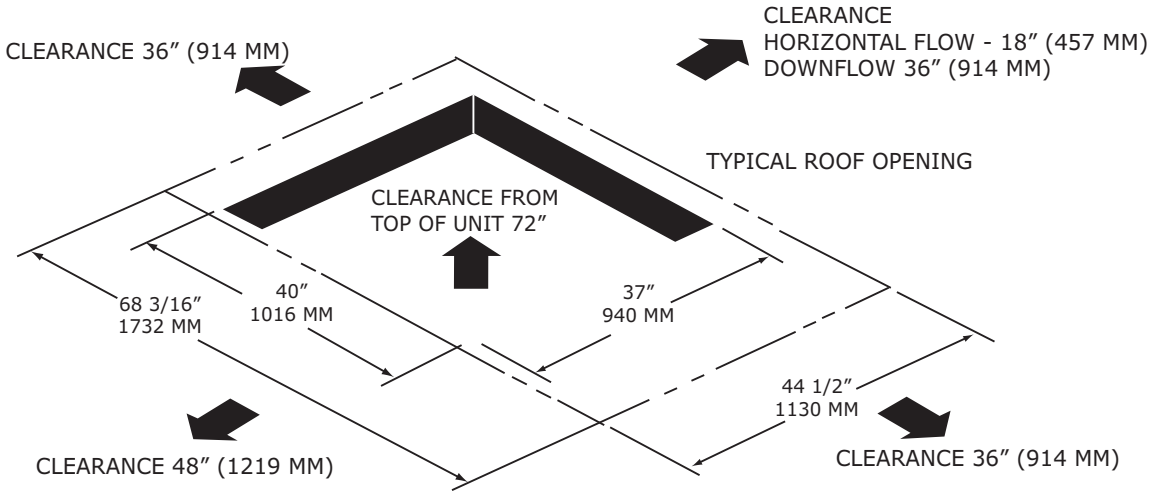


Figure 8. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - roof curb

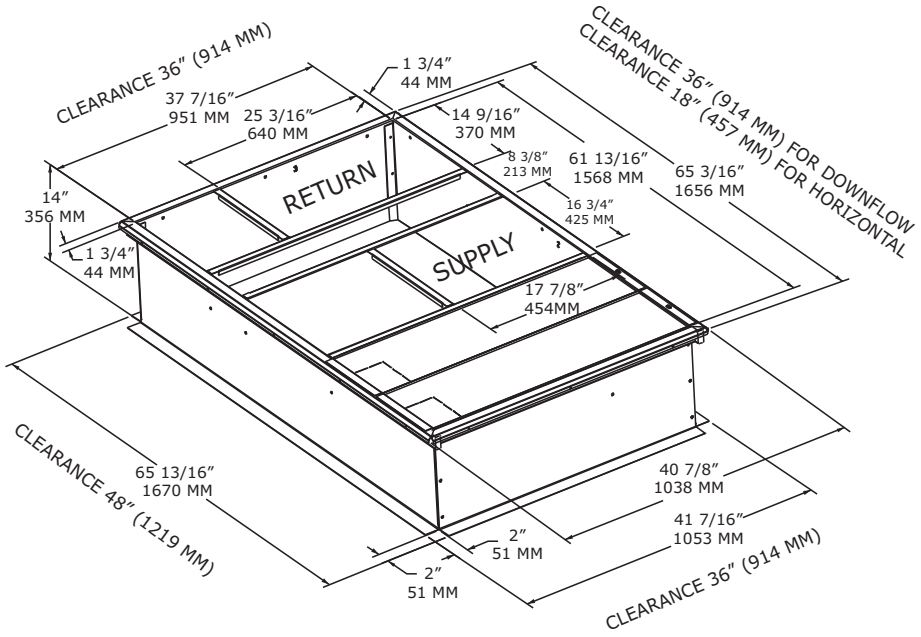


Figure 9. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - downflow duct connections - field fabricated

Note: Reference tabular information for duct clearance to combustible materials in the application consideration chapter.

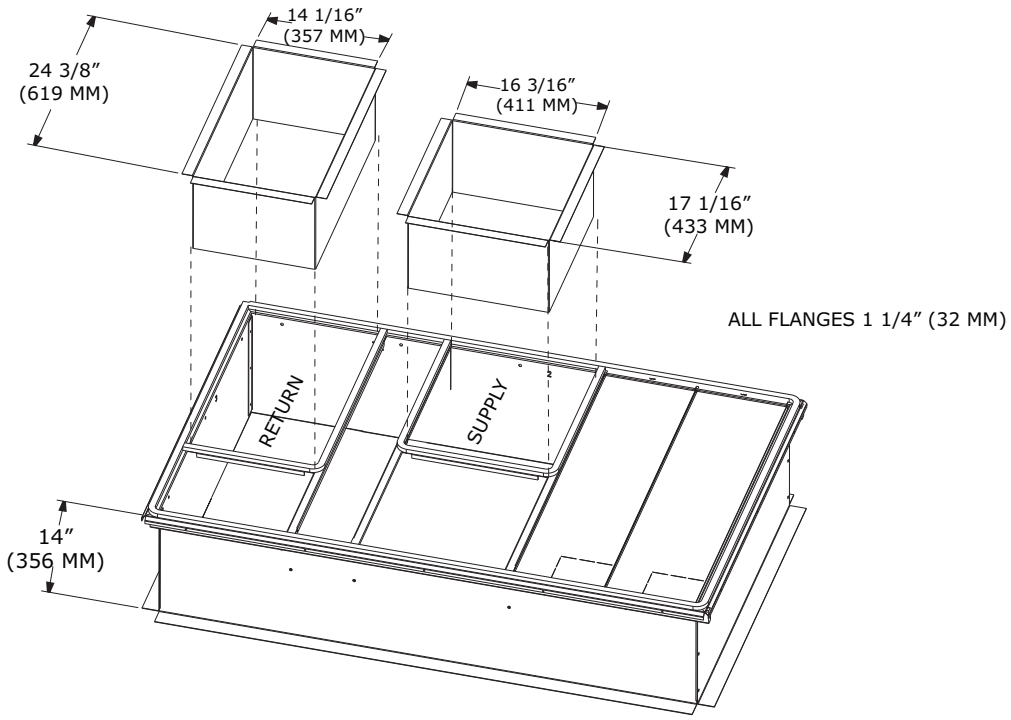


Figure 10. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - economizer, manual or motorized fresh air damper; power exhaust

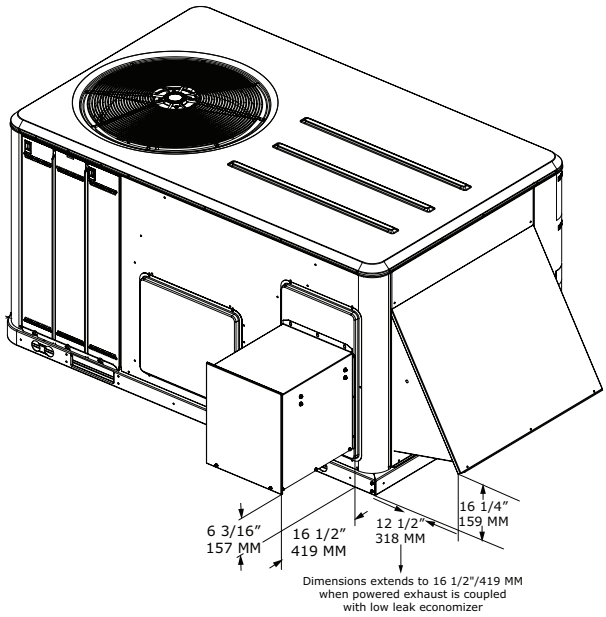


Figure 11. Heat pump 3 to 4 tons standard efficiency, 3 ton high efficiency - economizer and barometric relief damper hood

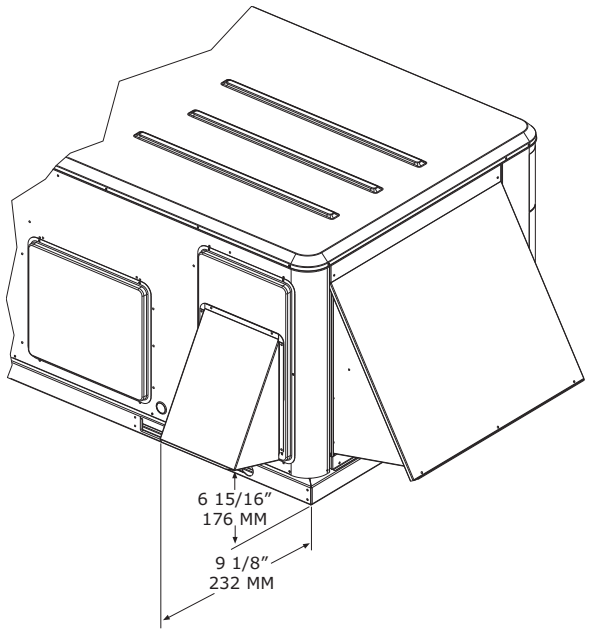


Figure 12. Heat pump - 3 to 4 tons standard efficiency, 3 ton high efficiency - swing diameter for hinged door(s) option

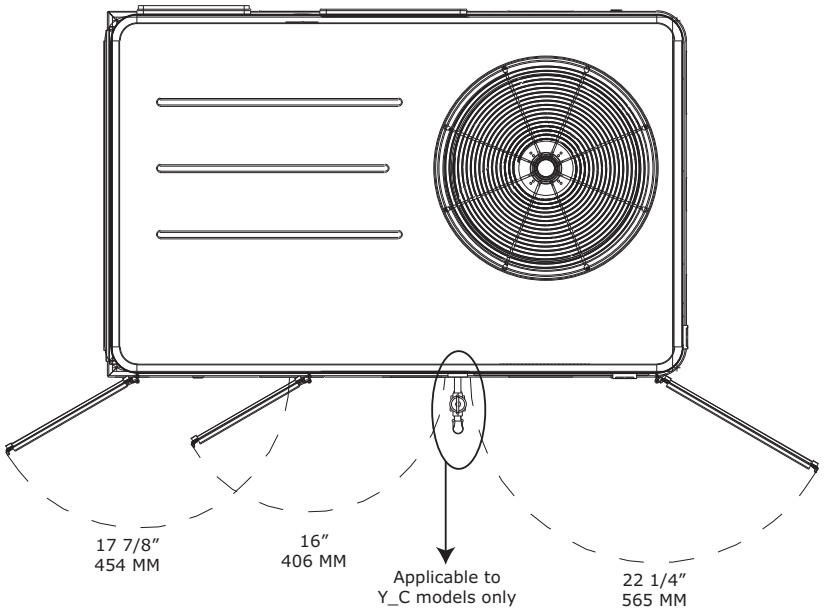


Figure 13. Heat pump - 5 tons standard efficiency, 4 to 5 tons high efficiency

Note: 2” electrical connection: single point power when heat installed (W*C)

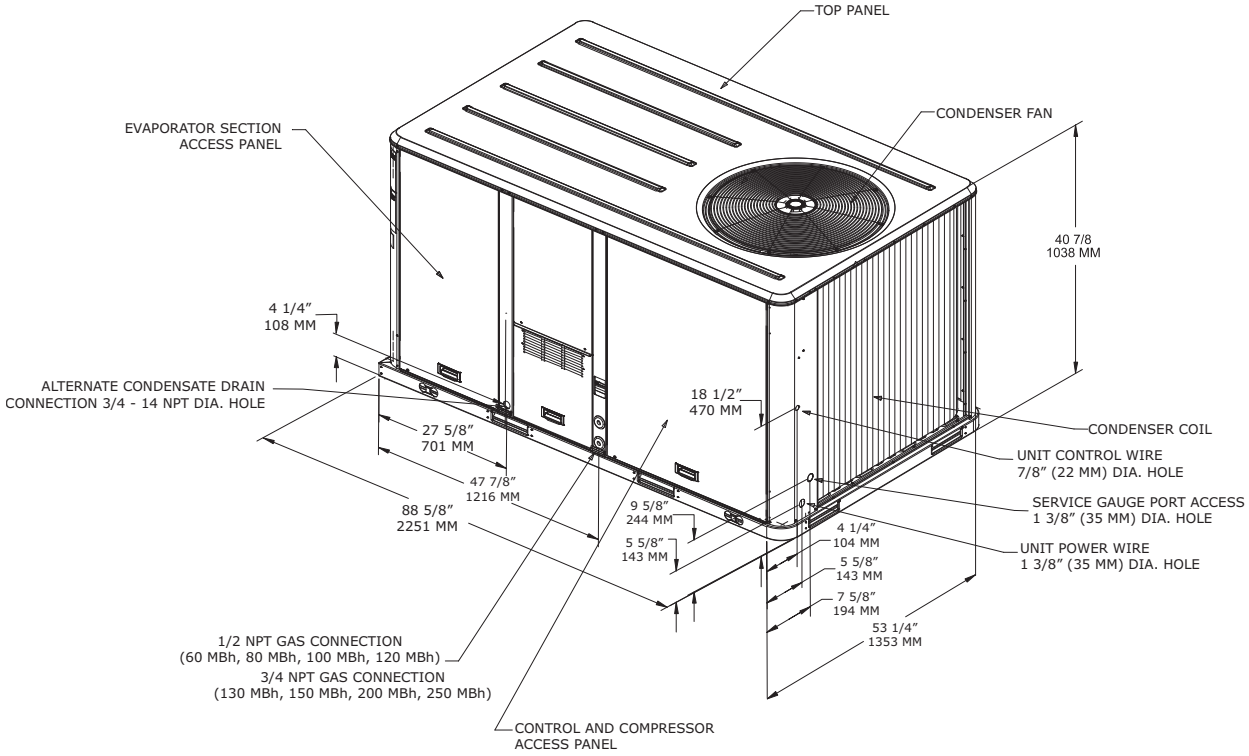


Figure 14. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - downflow airflow supply/return - through-the-base utilities

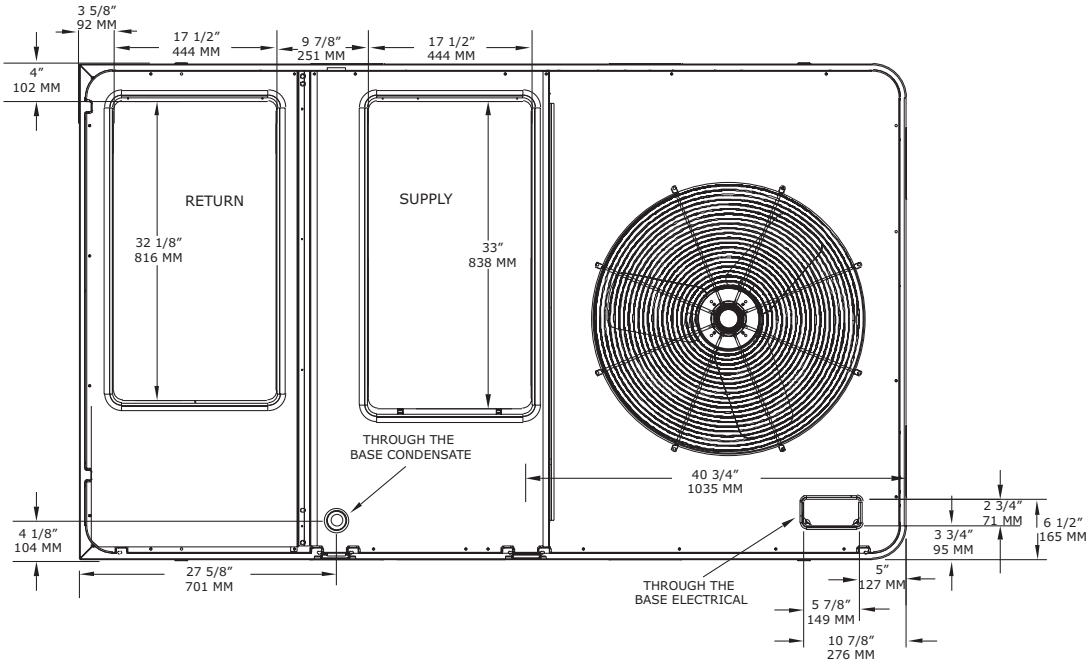


Figure 15. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - horizontal airflow supply and return

Note: All dimensions are in inches/millimeters.

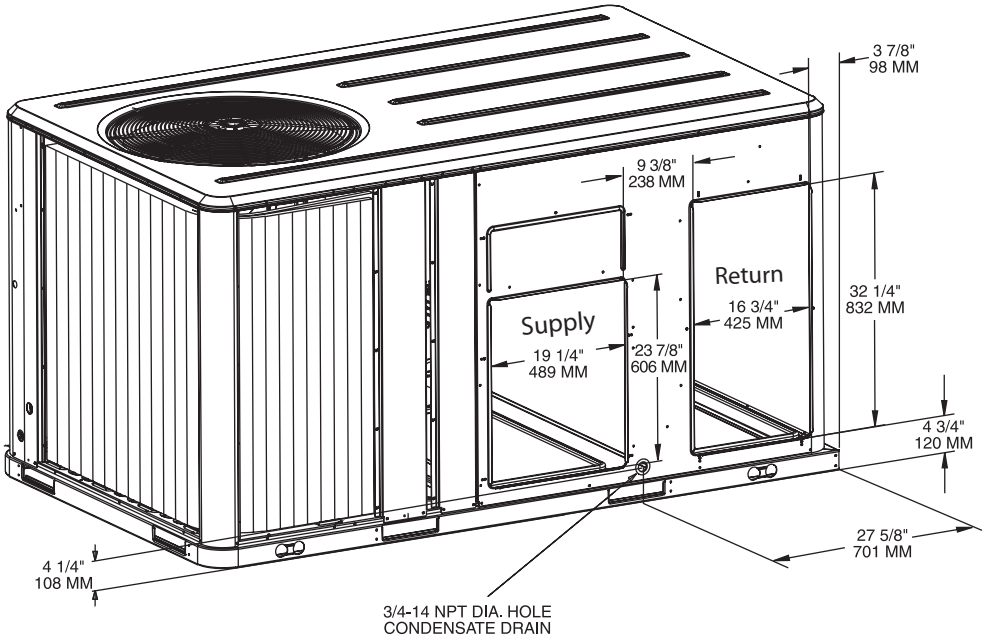


Figure 16. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - unit clearance and roof opening

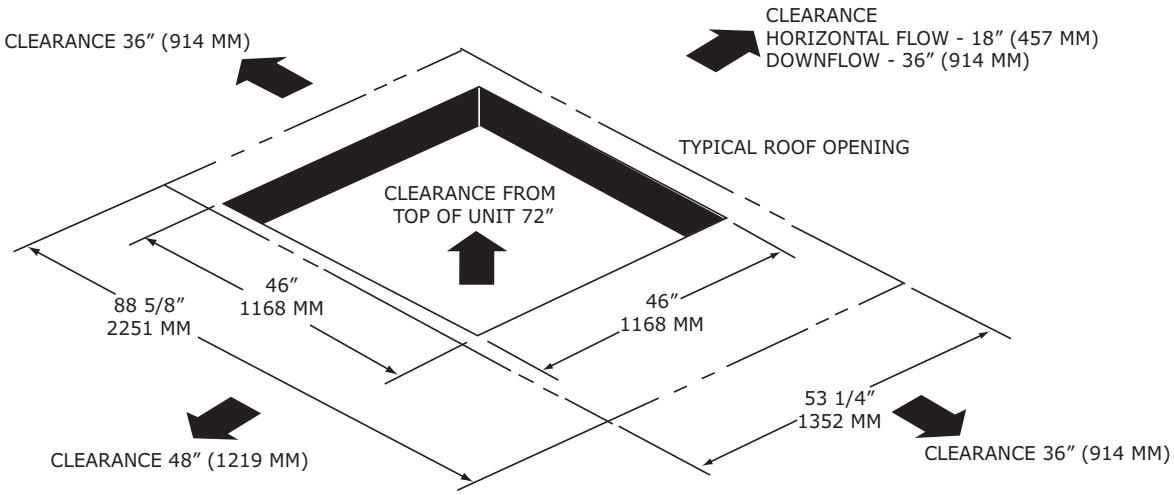


Figure 17. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - roof curb

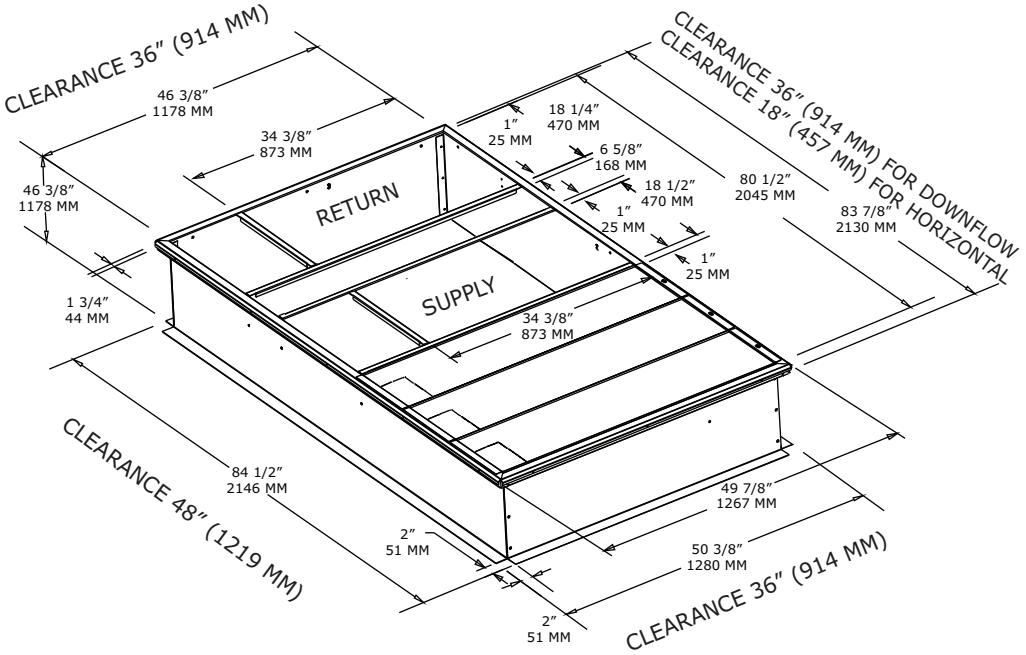


Figure 18. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - downflow duct connections field fabricated

Note: Reference tabular information for duct clearance to combustible materials in the application consideration chapter.

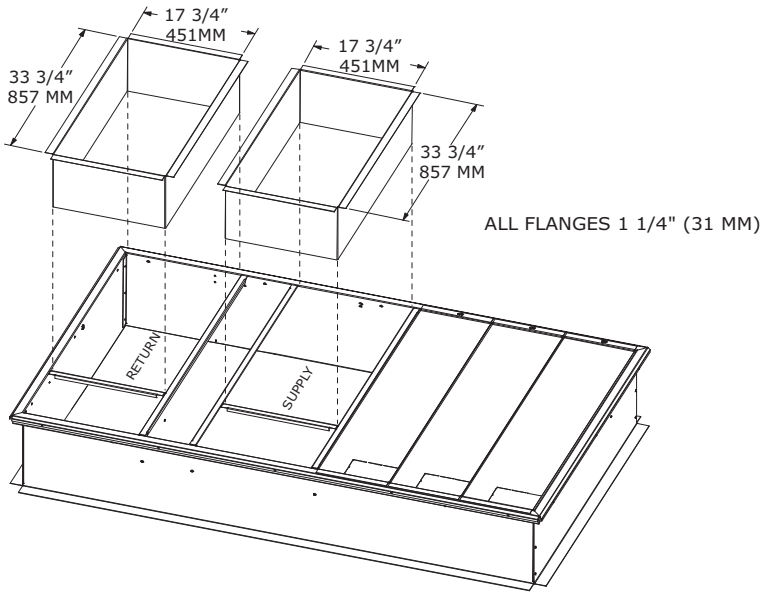


Figure 19. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - power exhaust

Note: Reference tabular information

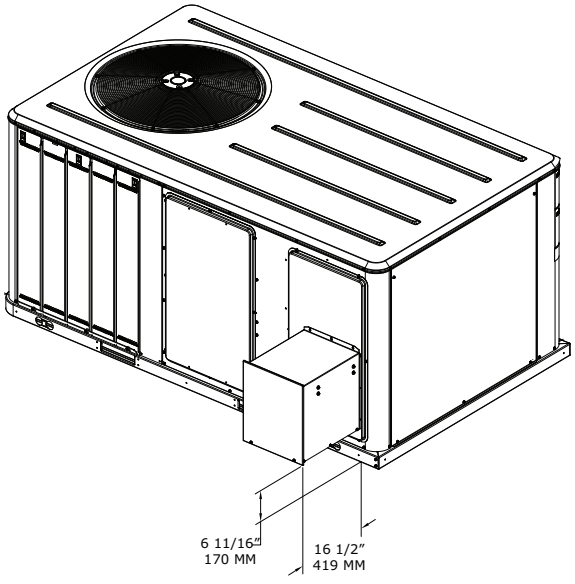


Figure 20. Heat pumps - 5 to 10 tons standard efficiency, 4 to 10 tons high efficiency - economizer, manual or motorized fresh air damper

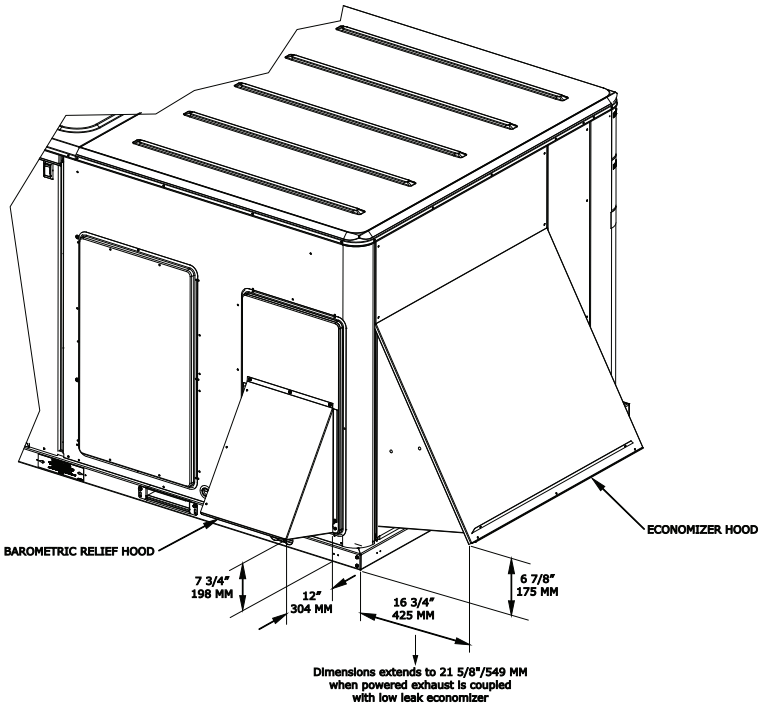


Figure 21. Heat pumps - 5 to 10 tons standard efficiency, 4 to 8.5 tons high efficiency - swing diameter for hinged door(s) option

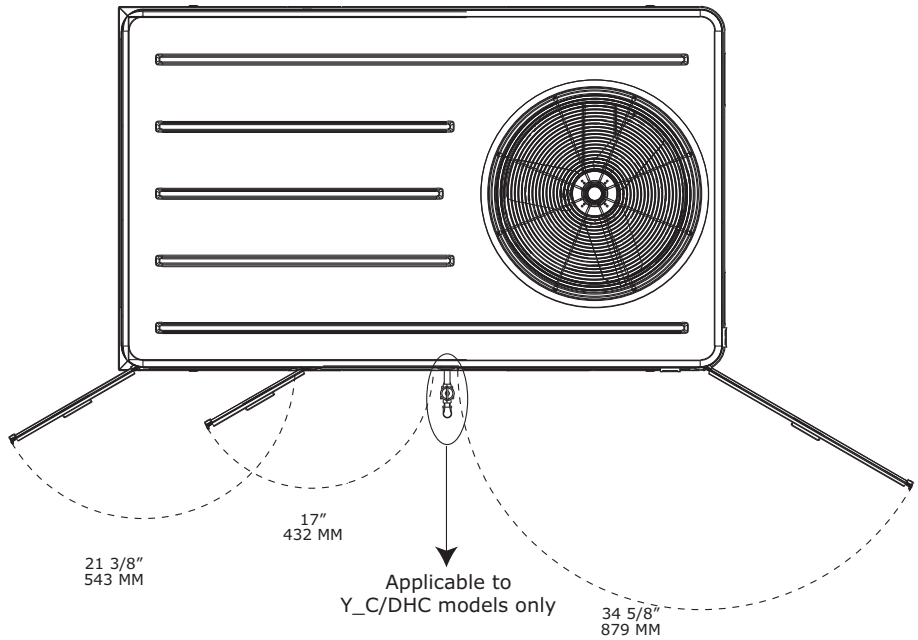


Figure 22. Heat pump - 7.5 to 10 tons standard efficiency and 7.5 to 8.5 tons high efficiency

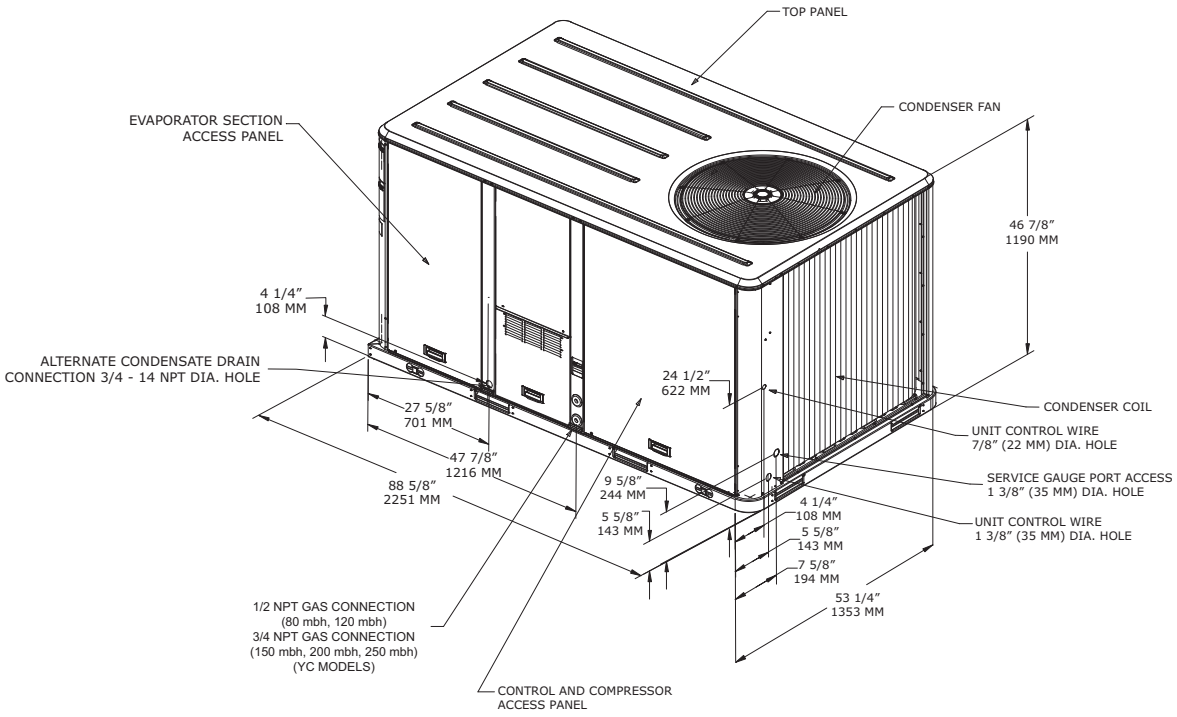


Figure 23. Heat pump - 10 tons high efficiency - downflow airflow supply/return through-the-base utilities

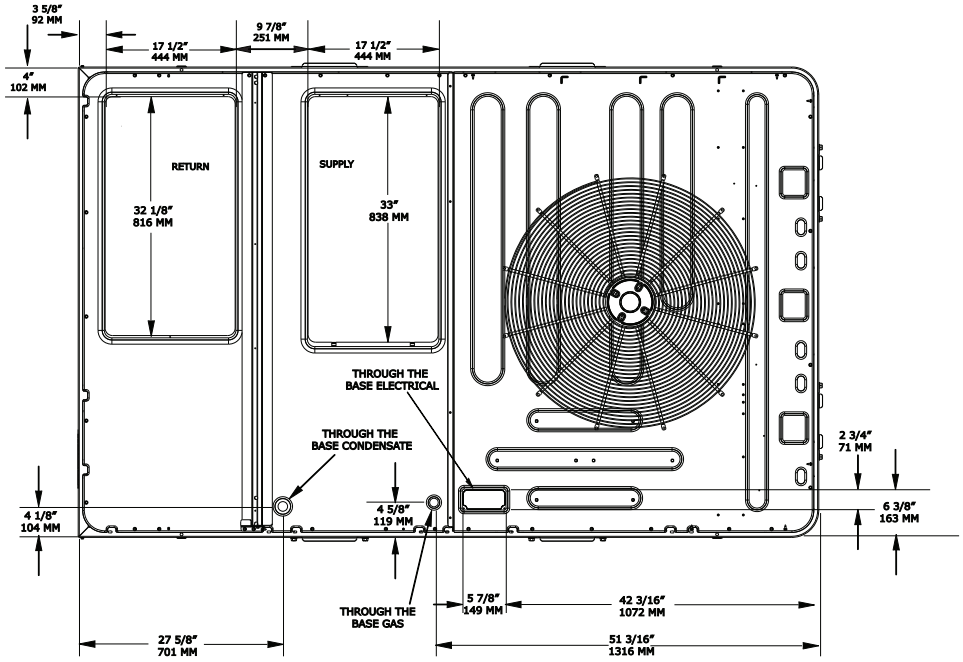


Figure 24. Heat pump - 10 tons high efficiency

Note: 2" Electrical Connection: Single Point Power When Heat Installed.

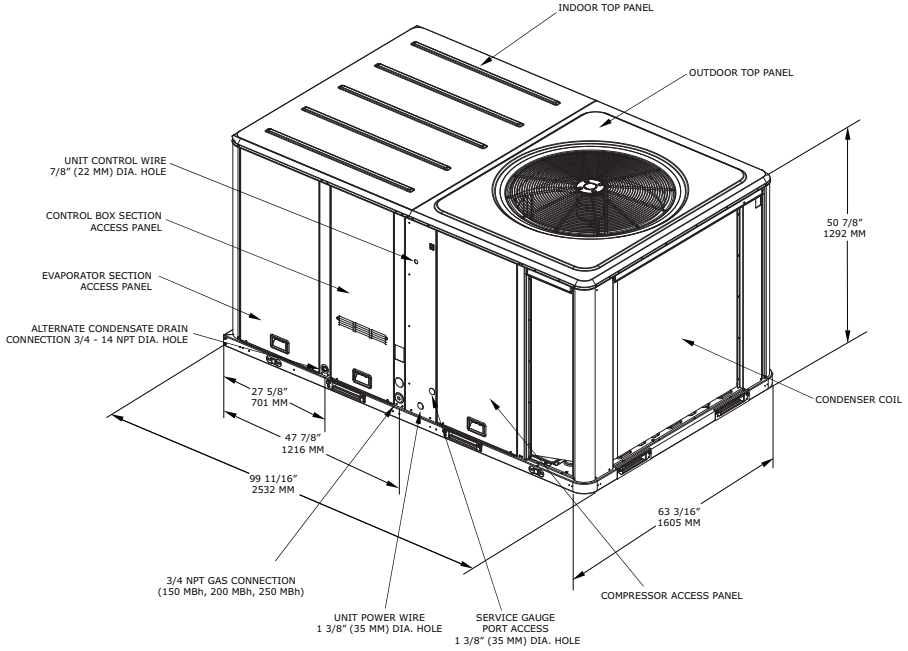


Figure 25. Heat pump - 10 tons high efficiency - unit clearance and roof opening

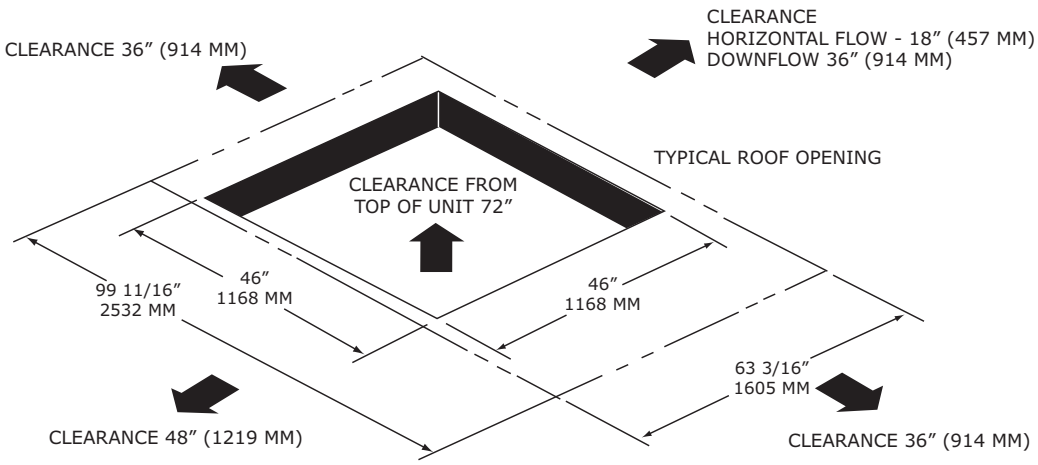


Figure 26. Heat pump - 10 tons high efficiency - roof curb

Note: 2" Electrical Connection: Single Point Power When Heat Installed.

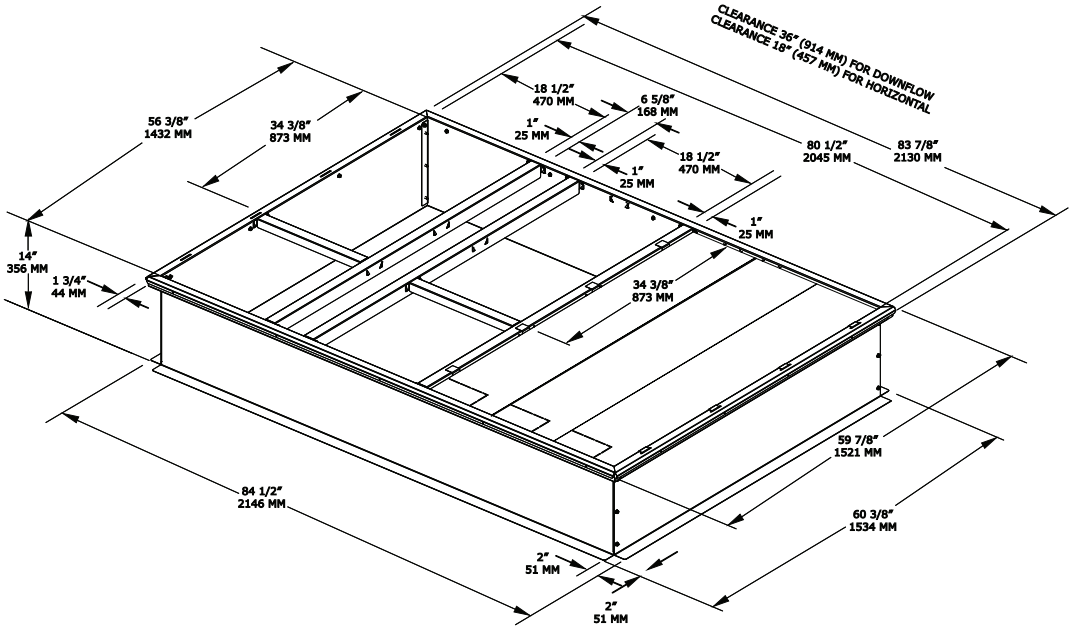


Figure 27. Heat pump - 10 tons high efficiency - horizontal airflow supply and return

Note: All dimensions are in inches/millimeters.

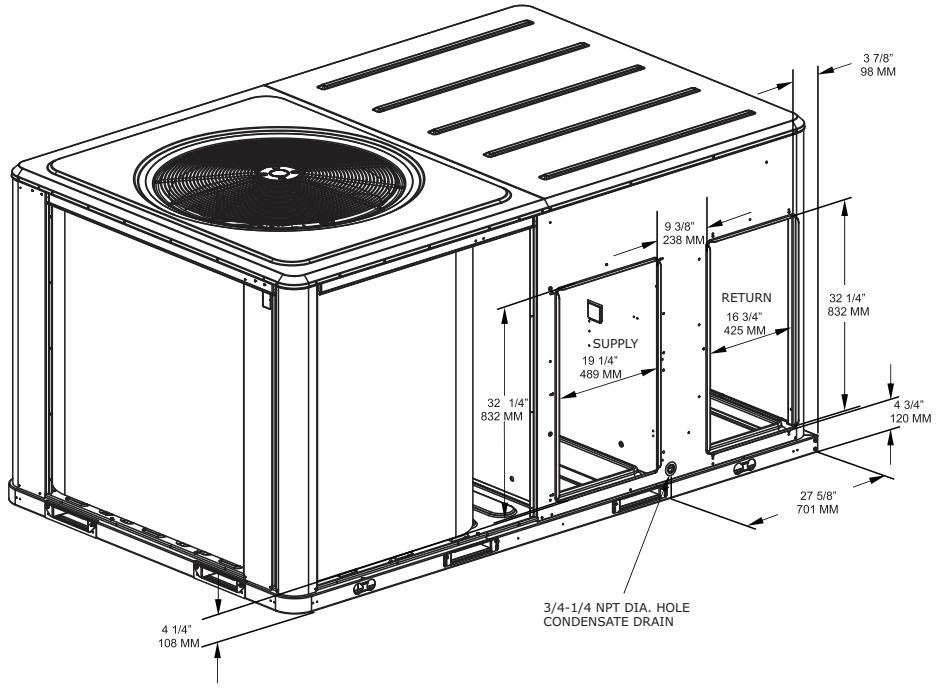


Figure 28. Heat pump - 10 tons high efficiency - downflow duct connections (field fabricated)

Note: Reference tabular information for duct clearance to combustible materials in the application consideration chapter.

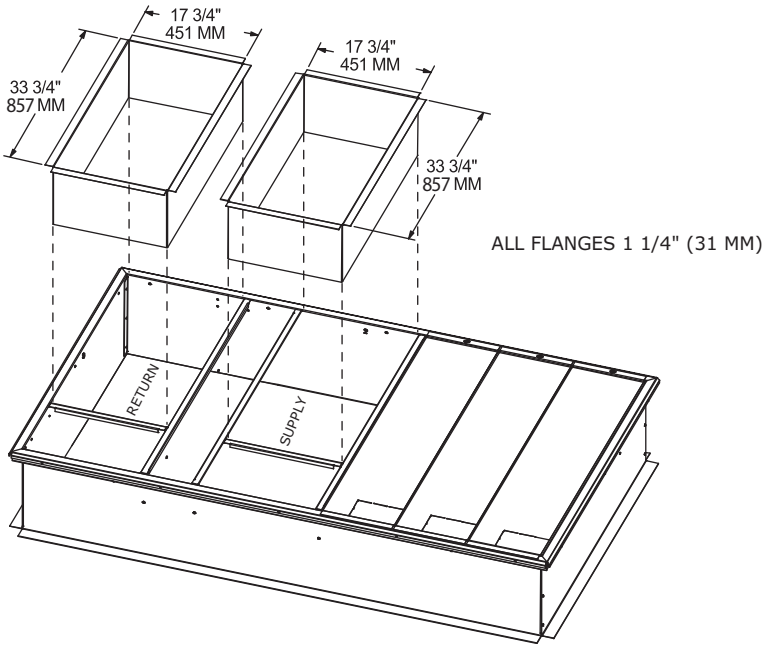


Figure 29. Heat pump - 10 tons high efficiency - power exhaust

Note: Reference tabular information

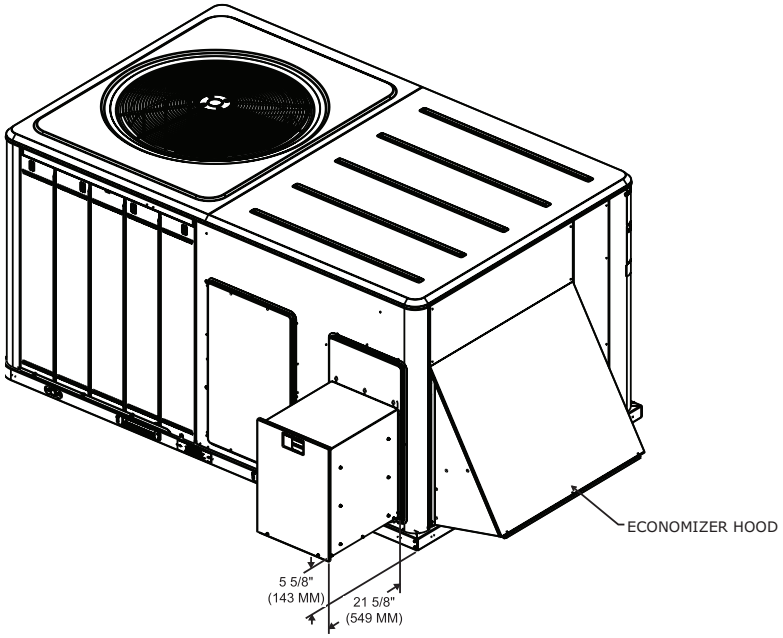
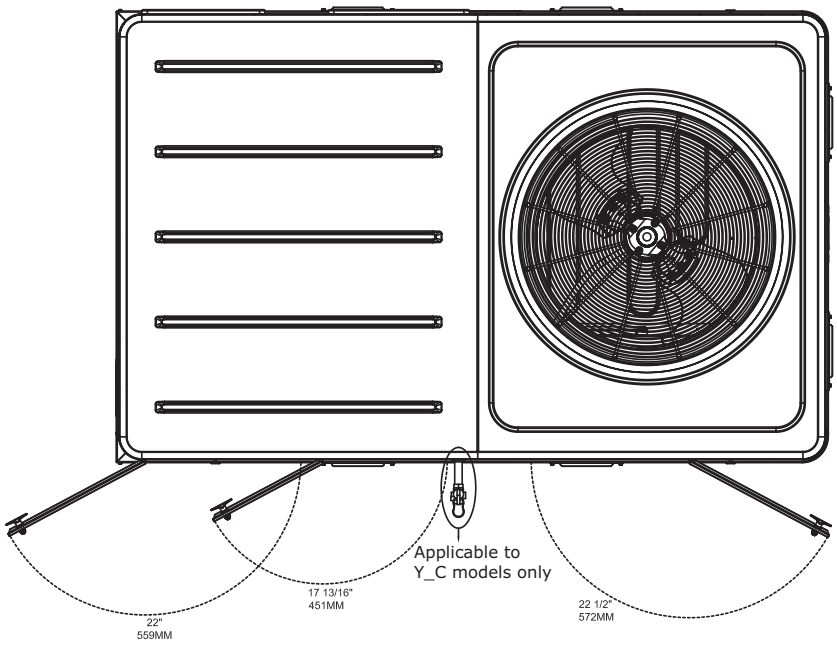


Figure 30. Heat pump - 10 tons high efficiency - swing diameter for hinged door(s) option



Weights

Table 122.Maximum unit and corner weights (lbs) and center of gravity dimensions (in.)

	Unit	Maximum Model Weights[a]		Corner Weights[b]				Center of Gravity (in.)	
Tons	Model No.	Shipping	Net	A	B	C	D	Length	Width
3	WSC036H	612	507	144	122	110	130	32	21
4	WSC048H	645	540	165	131	108	136	31	20
5	WSC060H	777	682	228	177	114	163	38	22
7.5	WSC092H	894	796	252	204	163	177	41	23
8.5	WSC102H	927	829	286	183	195	164	40	23
10	WSC120H	948	850	303	170	218	159	40	24
3	WHC036H	619	514	142	120	111	142	31	22
4	WHC048H	768	673	222	175	114	162	38	22
5	WHC060H	773	678	225	176	114	162	38	22
3	DHC036H	658	553	145	137	125	145	33	22
4	DHC048H	845	750	234	192	146	178	40	23
5	DHC060H	849	754	235	193	147	179	40	23
6	WHC074H	927	829	193	295	65	276	38	22
7.5	WHC092H	927	829	193	295	65	276	38	22
8.5	WHC102H	953	855	199	306	67	283	39	22
10	WHC120H	1433	1228	357	343	259	269	49	27
6	DHC074H	990	892	216	324	69	283	39	21
7.5	DHC092H	1004	906	218	330	70	288	39	21
8.5	DHC102H	1016	918	220	336	70	292	39	21
10	DHC120H	1499	1294	402	313	290	289	47	28

(a) Weights are approximate.
(b) Corner weights are given for information only.

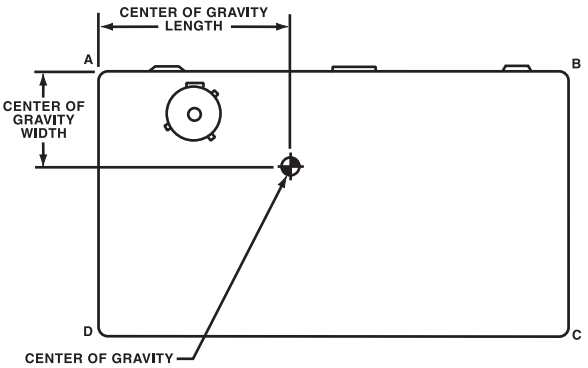


Table 123.Factory installed options (fiops)/accessory net weights (lbs)[a],[b]

Accessory	WSC036H-048H, D/WHC036H Net Weight 3 to 4 Tons	WSC060H, D/WHC048-060H Net Weight 4 to 5 Tons	WSC092H-120H W/DHC074-102H Net Weight 6 to 10 Tons	D/WHC120H Net Weight 10 Tons
460V/575V IDM Transformer[c]	29	29	—	—
Barometric Relief	7	10	10	10
Coil Guards	12	20	20	30
Economizer	26	36	36	36
Electric Heaters[d]	15	30	30/44[e]	50
Hinged Doors	10	12	12	12
Low Leak Economizer	70	91	91	91
Manual Outside Air Damper	16	26	26	26
Motorized Outside Air Damper	20	30	30	30
Oversized Motor	5	8	8	—
Powered Convenience Outlet	38	38	38	50
Powered Exhaust	40	80	80	80
Roof Curb	61	105	105	111
Smoke Detector, Supply	5	5	5	5
Smoke Detector, Return	7	7	7	7
Stainless Steel Heat Exchanger[f]	4	6	—	—
Through-the-Base Electrical	8	13	13	13
Through-the-Base Gas[f]	5	5	—	—
Traq Dampers	10	15	15	15
Unit Mounted Circuit Breaker	5	5	5	5
Unit Mounted Disconnect	5	5	5	5

(a) Weights for options not listed are <5 lbs.
(b) Net weight should be added to unit weight when ordering factory-installed accessories.
(c) Applicable to D/WHC 460/575V units.
(d) Applicable to heat pump units only (W*C).
(e) Larger weight applies to units with variable speed fan.
(f) Applicable to dual fuel units only (D*C).

Mechanical Specifications

Standard

General

Packaged rooftop units cooling, heating capacities, and efficiencies are AHRI Certified within scope of AHRI Standard 210-240 for 3 to 5 tons units or 340-360 (I-P) or 6 to 10 tons units and ANSIZ21.47 and 10 CFR Part 431 pertaining to Commercial Warm Air Furnaces (all gas heating units). The units shall be convertible airflow. The operating range shall be between 115°F and 0°F in cooling as standard from the factory for units with microprocessor controls. All units shall be factory assembled, internally wired, fully charged with R-410A, and 100 percent run tested to check cooling operation, fan and blower rotation, and control sequence before leaving the factory. Wiring internal to the unit shall be colored and numbered for simplified identification. Units shall be cULus listed and labeled, classified in accordance for Central Cooling Air Conditioners.

Casing

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel. Exterior surfaces shall be cleaned, phosphatized, and finished with a weather-resistant baked enamel finish. Unit's surface shall be tested 500 hours in a salt spray test in compliance with ASTM B117. Cabinet construction shall allow for all maintenance on one side of the unit. Service panels shall have lifting handles and be removed and reinstalled by removing two fasteners while providing a water and air tight seal. All exposed vertical panels and top covers in the indoor air section shall be insulated with a cleanable foil-faced, fire-retardant permanent, odorless glass fiber material. The base of the unit shall be insulated with 1/8 inch, foil-faced, closed-cell insulation. All insulation edges shall be either captured or sealed. The unit's base pan shall have no penetrations within the perimeter of the curb other than the raised 1 1/8 inch high downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up. The base of the unit shall have provisions for forklift and crane lifting, with forklift capabilities on three sides of the unit.

Compressors

All units shall have direct-drive, hermetic, scroll type compressors with centrifugal type oil pumps. Motor shall be suction gas-cooled and shall have a voltage utilization range of plus or minus 10 percent of unit nameplate voltage. Internal overloads shall be provided with the scroll compressors.

Crankcase Heaters

These band heaters provide improved compressor reliability by warming the oil to prevent migration during off-cycles or low ambient conditions.

Controls

Unit shall be completely factory-wired with necessary controls and contactor pressure lugs or terminal block for power wiring. Unit shall provide an external location for mounting a fused disconnect device.

Microprocessor controls shall be standard.

Microprocessor controls provide for all 24V control functions. The resident control algorithms shall make all heating, cooling, and/or ventilating decisions in response to electronic signals from sensors measuring indoor and outdoor temperatures. The control algorithm maintains accurate temperature control, minimizes drift from set point, and provides better building comfort. A centralized microprocessor shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection.

Units shall have single point power entry as standard.

Evaporator and Condenser Coils

Internally finned, 5/16-inch copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 600 psig. The assembled unit shall be leak tested to 465 psig. The condenser coil shall have a patent pending 1+1+1 hybrid coil designed with slight gaps for ease of cleaning. A plastic, dual-sloped, removable and reversible condensate drain pan with through-the-base condensate drain is standard.

Filters

Throwaway filters shall be standard on all units. Optional 2-inch MERV 8 and MERV 13 filters shall also be available.

High Pressure Control

All units include High Pressure Cutout as standard.

Indoor Fan

Standard efficiency 6 to 8.5 tons units come standard with belt drive motors with an adjustable idler-arm assembly for quick-adjustment to fan belts and motor sheaves. All high efficiency and 10 tons standard efficiency shall have variable speed direct drive motors. All motors shall be thermally protected. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

Outdoor Fans

The outdoor fan shall be direct-drive, statically balanced, draw-through in the vertical discharge position. The fan motor shall be permanently lubricated and shall have built-in thermal overload protection.

Phase Monitoring Protection

Precedent™ units with 3-phase power are equipped with phase monitoring protection as standard. These devices protect motors and compressors against problems caused by phase loss, phase imbalance and phase reversal indication.

Plenum Fan

Select 6 to 10 tons models are equipped with a direct drive plenum fan design. Plenum fan design shall include a backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor. All plenum fan designs will have a variable speed adjustment potentiometer located in the control box.

Refrigerant Circuits

Each refrigerant circuit offer thermal expansion valve as standard. Service pressure ports, and refrigerant line filter driers are factory-installed as standard. An area shall be provided for replacement suction line driers.

Unit Top

The top cover shall be one piece construction or where seams exist, it shall be double-hemmed and gasket-sealed. The ribbed top adds extra strength and prevents water from pooling on unit top.

Factory Installed Options

Black Epoxy Pre-Coated Coils

The black epoxy coils have a thermoset vinyl coating that is bonded to the aluminum fin stock prior to the fin-stamping process. The pre-coated coils are an economical option for protection in mildly corrosive environments.

CO_2 Sensor Wiring

Factory-installed CO_2 sensor wiring saves time and ensures proper unit connections for the field installed CO_2 sensor kits.

Condensate Overflow Switch

This option shall shut the unit down in the event that a clogged condensate drain line prevents proper condensate removal from the unit.

Fault Detection and Diagnostics (FDD)

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit. This option provides detection of the following faults: Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements.

Gas Heating Section

Note: *Applicable to Dual Fuel units.*

The heating section has a progressive tubular heat exchanger design using stainless steel burners and corrosion resistant steel throughout. An induced draft combustion blower is used to pull the combustion products through the firing tubes. The heater uses a direct spark ignition (DSI) system, on initial call for heat, the combustion blower purges the heat exchanger for 20 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system will be locked out until manually reset at the thermostat/zone sensor.

Important: *For installation in SCAQMD only (3 to 5 tons only): This furnace does not meet the SCAQMD Rule 1111 14 ng/J NOx emission limit, and thus is subject to a mitigation fee of up to $450. This furnace is not eligible for the Clean Air Furnace Rebate Program: www.CleanAirFurnaceRebate.com*

Hinged Access Doors

Sheet metal hinges are available on the filter/evaporator, supply fan/heat, and the compressor/control access doors. A compressor isolation panel is included to ease commissioning and servicing of units.

High Static Motor

Oversized motor for applications where higher external static pressure capability is required. 3 to 5 tons standard efficiency units shall offer direct drive constant torque motors. 3 to 5 tons high efficiency shall offer direct drive constant CFM motors. 6 to 8.5 tons standard efficiency units shall offer belt drive motors.

Human Interface

The Human Interface shall have a 5 inch color touchscreen display that conforms to FCC Part 15 Class B with an Ingress Protection Rating of IP24.The display text shall be readable by a person with 20/20 vision at a distance of 3 feet and 60° angle at lighting levels ranging from 100 lux - 25,000 lux. Also, the display shall operate at temperatures of -40° C to 70° C. Firmware and unit configurations shall be able to be restored via a USB storage device.

Multiple-Zone VAV Control

Multiple-zone VAV control shall vary the speed of the indoor fan to maintain the duct static pressure at a setpoint. In cooling mode, the compressors shall be cycled (or economizer modulated) to maintain the supply air temperature (SAT) at the desired setpoint. In heating mode, the indoor fan shall operate at maximum speed whenever the heater operating.VAV units cannot be controlled by a thermostat.

Powered or Unpowered Convenience Outlet

This is a GFCI, 120V/15amp, 2 plug, convenience outlet, either powered or unpowered. When the convenience outlet is powered, a service receptacle disconnect will be available. The convenience outlet is powered from the line side of the disconnect or circuit breaker, and therefore will not be affected by the position of the disconnect or circuit breaker. This option can only be ordered when the Through-the-Base Electrical with either the Disconnect Switch or Circuit Breaker option is ordered.

Single Zone VAV – One Zone Variable Air Volume Mode

Single-zone VAV shall vary the indoor fan speed as the zone cooling or heating load changes, while cooling or heating capacity is cycled to maintain the supply air temperature at setpoint.The indoor fan shall operate at maximum speed whenever the heater is operating.

Note: *SZVAV requires the use of a zone temperature sensor. If a unit is configured for SZVAV, but is connected to a conventional thermostat, the unit will revert to multiple-speed (two-speed) indoor fan control.*

Multi-Speed Indoor Fan System

Multi-speed indoor fan system is designed for use in applications for meeting the minimum requirement of CA Title 24. This system incorporates a multi-speed fan control to change the speed of the fan to 66% of full airflow based off compressor stages.

Stainless Steel Drain Pan

This option provides excellent corrosion and oxidation resistance. The drain pan shall be reversible and constructed of 304 stainless steel.

Stainless Steel Heat Exchanger

The optional stainless steel heat exchanger is constructed of 409 stainless steel. It is resistant to corrosion and oxidation and easy to clean. The high strength to weight ratio allows for high ventilation rates with gas units. It is an excellent option to compliment the dehumidification option as a high outside air ventilation unit. With this option, a 10-year stainless steel heat exchanger warranty is standard.

Supply, Return, and Plenum Air Smoke Detector

With this option, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. In order for the supply air smoke detector or return air smoke detector to properly sense smoke in the supply air stream or the return air stream, the air velocity entering the smoke detector unit must be between 500 - 4000 feet per minute. Equipment covered in this manual will develop an airflow velocity that falls within these limits over the entire airflow range specified in the evaporator fan performance table. Supply and/or Return Smoke Detectors may not be used with the Plenum Smoke Detector.

Thermal Expansion Valve

Thermal Expansion Valve is standard for all models.

Through-the-Base Electrical Access

An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through-the-base of the unit. Option will allow for field installation of liquid-tight conduit and an external field-installed disconnect switch.

Through-the-Base Electrical with Circuit Breaker

This option is a thermal magnetic, molded case, HACR Circuit Breaker with provisions for through-the-base electrical connections. The circuit breaker will be installed in a water tight enclosure in the unit with access through a swinging door. Wiring will be provided from the switch to the unit high voltage terminal block. The circuit breaker will provide overcurrent protection, be sized per NEC and cULus guidelines, and be agency recognized by cULus.

Through-the-Base Electrical with Disconnect Switch

This 3-pole, molded case, disconnect switch with provisions for through-the-base electrical connections are available. The disconnect switch will be installed in the unit in a water tight enclosure with access through a swinging door. Wiring will be provided from the switch to the unit high voltage terminal block. The switch will be cULus agency recognized.

Note: *The disconnect switch will be sized per NEC and cULus guidelines but will not be used in place of unit overcurrent protection.*

Through-the-Base Gas Piping

The unit includes a standard through-the-base gas provision. This option has all piping necessary including black steel pipe segments, manual gas shut-off valve, elbows, and union. The manual shutoff valve includes a 1/8” NPT pressure tap. This assembly will require minor field labor to install (dual fuel only).

Trane® Air-Fi® Wireless

Air-Fi® wireless communication shall be factory installed and tested. Air-Fi Wireless conforms to ANSI/ASHRAE Standard 135-2016 (BACnet®/ZigBee®[1]).

Two-Inch Filters

Two-inch MERV 8 and MERV 13 media filters shall be available on all models. When ordered, units come equipped with a filter removal tool.

Factory or Field Installed Options

Clogged Filter/Fan Failure Switch

A dedicated differential pressure switch is available to achieve active fan failure indication and/or clogged filter indication. These indications will be registered with a zone sensor with status indication lights. This option is available for microprocessor controlled units.

Differential Pressure Switches

These sensors allow individual fan failure and dirty filter indication for microprocessor controlled units. The fan failure switch will disable all unit functions and “flash” the Service LED on the zone sensor. The dirty filter switch will light the Service LED on the zone sensor and will allow continued unit operation.

Discharge Air Temperature Sensing

This option provides true discharge air temperature sensing in heating models. This option is available for microprocessor controlled units.

Economizer (Standard)

This accessory shall be available with or without barometric relief. The assembly includes fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control. The barometric relief shall provide a pressure operated damper that shall be gravity closing and shall prohibit entrance of outside air during the equipment “off” cycle. Optional solid state or differential enthalpy control shall be available for either factory or field installation. The economizer arrives in the shipping position and shall be moved to the operating position by the installing contractor.

[1] ZigBee is a registered trademark of the ZigBee Alliance.

Electric Heaters

Electric heat modules shall be available for installation within basic unit. Electric heater elements shall be constructed of heavy-duty nickel chromium elements internally delta connected for 240 volt, wye connected for 480 and 600 V. Staging shall be achieved through ReliaTel™. Each heater package shall have automatically reset high limit control operating through heating element contactors. All heaters shall be individually fused from the factory, where required, and shall meet all NEC and CEC requirements when properly installed. Power assemblies shall provide single-point connection. Electric heat modules shall be cULus listed.

Frostat™

This option is to be utilized as a safety device. The Frostat™ opens when temperatures on the evaporator coil fall below 10°F. The temperature will need to rise to 50°F before closing. This option should be utilized in low airflow or high outside air applications (cooling only).

Hail Guards

Hail protection quality coil guards are available for condenser coil protection.

LonTalk® Communication Interface

This option shall be provided to allow the unit to communicate as a Tracer® LCI-R device or directly with generic LonTalk® Network Building Automation System Controls.

Low Leak Economizer

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (4 cfm/ft^2@1" wg exterior air/return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. This option can be paired with or without Fault Detection and Diagnostics (FDD) to meet current mandatory CA Title 24 requirements.

Note: *Available on downflow units only.*

BACnet® Communication Interface

This option shall be provided to allow the unit to communicate directly with a generic open protocol BACnet® MS/TP Network Building Automation System Controls.

Reference or Comparative Enthalpy

Reference Enthalpy is used to measure and communicate outdoor humidity. The unit receives and uses this information to provide improved comfort cooling while using the economizer. Comparative Enthalpy measures and communicates humidity for both outdoor and return air conditions, and return air temperature. The unit receives and uses this information to maximize use of economizer cooling, and to provide maximum occupant comfort control. Reference or Comparative Enthalpy option shall be available when a factory or field installed Downflow Economizer is ordered. This option is available on all downflow models.

Trane® Communication Interface

This option shall be provided to interface ReliaTel™ controlled units with the Trane® Integrated Comfort™ systems.

Field Installed Options

CO_2 Sensing

The CO_2 sensor shall have the ability to monitor space occupancy levels within the building by measuring the parts per million of CO_2 (Carbon Dioxide) in the air. As the CO_2 levels increase, the outside air damper modulates to meet the CO_2 space ventilation requirements.

Two field installed kits are offered: CO_2 sensor and wiring or CO_2 sensor only. The CO_2 sensor only kit should be ordered with factory installed CO_2 Sensor wiring. Factory installed CO_2 sensor wiring saves set-up time and ensures proper unit connections for the CO_2 sensor.

Low Leak Economizer

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (4 cfm/ft^2@1" wg exterior air/return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief.

Note: *Available on downflow units only.*

Manual Outside Air Damper

This rain hood and screen shall provide up to 50 percent outside air.

Motorized Outside Air Damper

Manually set outdoor air dampers shall provide up to 50 percent outside air. Once set, outdoor air dampers shall open to set position when indoor fan starts. The damper shall close to the full closed position when indoor fan shuts down.

Outside Air Measuring/Monitoring Control (Traq Dampers)

- Requires Low Leak Economizer (Factory or Field Installed)
- Includes
  - UC400 Controller
  - Damper Actuator
  - Pressure Sensors

Powered Exhaust

The powered exhaust, available for 6 to 10 tons units, shall provide exhaust of return air, when using an economizer, to maintain better building pressurization.

Programmable Night Setback

Auto or manual changeover with seven-day programming. Keyboard selection of Heat, Cool, Fan, Auto, or On. All programmable sensors have System On, Heat, Cool, Service LED/indicators as standard. Night Setback Sensors have one (1) Occupied, one (1) Un-occupied, and one (1) Override program per day.

Remote Potentiometer

The minimum position setting of the economizer shall be adjusted with this accessory.

Roof Curb

The roof curb shall be designed to mate with the unit's downflow supply and return and provide support and a water tight installation when installed properly. The roof curb design shall allow field-fabricated rectangular supply/return ductwork to be connected directly to the curb. Curb shall be shipped knocked down for field assembly and shall include wood nailer strips.

Thermostat

Two stage heating and cooling operation or one stage heating and cooling shall be available in either manual or automatic changeover. Automatic programmable electronic with night set back shall also be available.

Ventilation Override Accessory

With the Ventilation Override Accessory installed, the unit can be set to transition up to 3 different pre-programmed sequences for Smoke Purge, Pressurization, and Exhaust. The transition occurs when a binary input on the RTOM is closed (shorted). This would typically be a hard wired relay output from a smoke detector or fire control panel. The ventilation override accessory shall be available as field installed.

Zone Sensor

This control shall be provided to interface with the Micro equipped units and shall be available in either manual, automatic programmable with night setback, with system malfunction lights, or remote sensor options.







The AHRI Certified mark indicates Trane U.S. Inc. participation in the AHRI Certification program. For verification of individual certified products, go to ahridirectory.org.

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.

PKGP-PRC013AA-EN 20 Dec 2022
Supersedes PKGP-PRC013Y-EN (Sep 2022)

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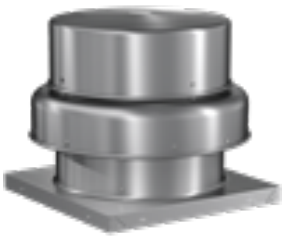
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GREENHECK Shop Online

SKU
G-099-4VG119XQD

Job Name:
Mark:
Submitted By:
Date: 01/27/2025

Centrifugal Downblast Exhaust Fan, Product # G-099-4VG119XQD, 400-1307 CFM

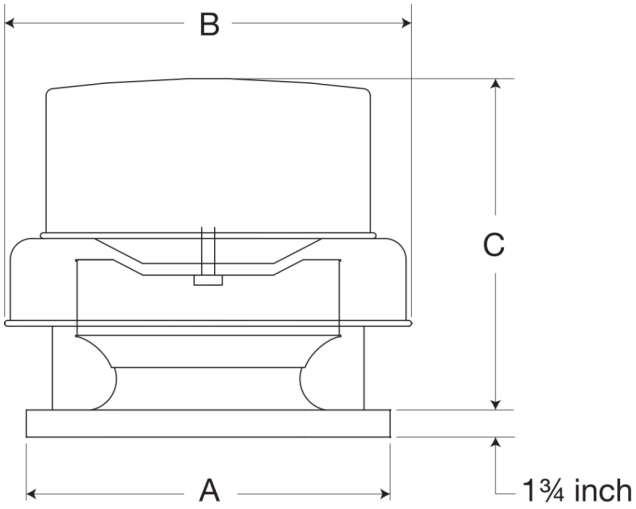


Model G, direct drive centrifugal roof exhaust fans provide the industry's best performance and durability for general clean air applications where air is discharged downward, toward the roof. Units feature the most advanced motor cooling of any fan in its class.

- 19 x 19 inch base with prepunched mounting holes for easy attachment to roof curb
- Energy-efficient, speed controllable, Vari-green® motor
- 15.5 x 15.5 inch recommended roof opening

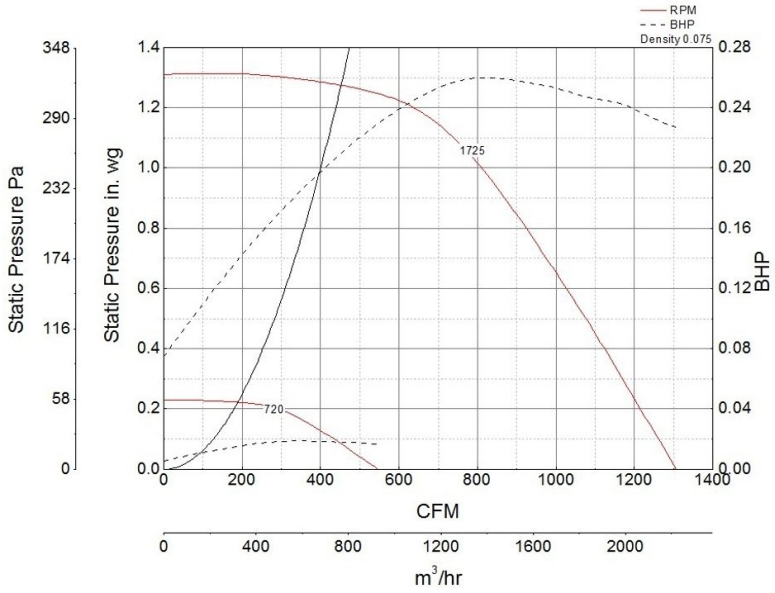
Certifications

AMCA Sound & Air
High Wind and Hurricane
Seismic
UL/cUL 705



A	B	C
19 in	24.375 in	23.75 in

Performance Characteristics



Construction Features

Housing Material	Spun Aluminum
Drive Type	Direct Drive
Impeller Type	Centrifugal Wheel
Impeller Material	Aluminum
Includes	Motor mounted potentiometer
Certifications	AMCA Sound & Air High Wind and Hurricane Seismic UL/cUL 705
Speed Controllable	Yes
Required Accessory	Roof curbs for new installations

Motor Information

Motor Insulation	B
Motor Phase	1
Service Factor	1.25
Voltage	115 208 230 277
HP	1/4
Hertz	60
Motor Enclosure	n/a
RPM	1800
Thermal Protection	AutoOverload
Nominal Efficiency	85

Air and Sound Performance

Motor HP	Max BHP	Max Fan RPM	Min Fan RPM	Ps (in. wg)	0	0.125	0.25	0.375	0.5	0.625	0.75	0.875	1	1.25
1/4	0.02	720	0	CFM	546	403	-	-	-	-	-	-	-	-
				Sones	3.6	3.5	-	-	-	-	-	-	-	-
1/4	0.03	860	0	CFM	625	536	400	-	-	-	-	-	-	-
				Sones	4.9	4.7	4.5	-	-	-	-	-	-	-
1/4	0.07	1140	0	CFM	864	777	687	590	457	-	-	-	-	-
				Sones	8.3	8.1	7.6	7.1	6.8	-	-	-	-	-
1/4	0.15	1435	0	CFM	1,087	1,018	949	877	801	721	615	404	-	-
				Sones	10.7	10.5	10.3	9.9	9.6	9.3	9	8.4	-	-
1/4	0.26	1725	720	CFM	1,307	1,250	1,192	1,135	1,076	1,013	949	883	806	515
				Sones	13.6	13.5	13.4	13.2	12.9	12.6	12.3	12	11.8	10.4

- Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.
- Performance certified is for installation type A: Free inlet, Free outlet.
- Power rating (BHP/kW) does not include transmission losses.
- Performance ratings include the effects of birdscreen.
- The sound ratings shown are loudness values in fan sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels.

California Residents

⚠ WARNING

This product can expose you to chemicals including cadmium used in the processing of corrosion resistant metal and fasteners, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information visit www.P65Warnings.ca.gov

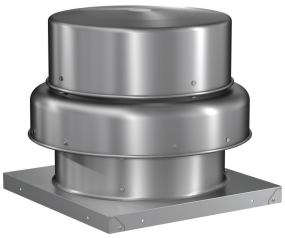
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SKU
G-060-DGE117XQD

Job Name:
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Submitted By:
Date: 01/27/2025

Centrifugal Downblast Exhaust Fan, Product # G-060-DGE117XQD, 73-203 CFM

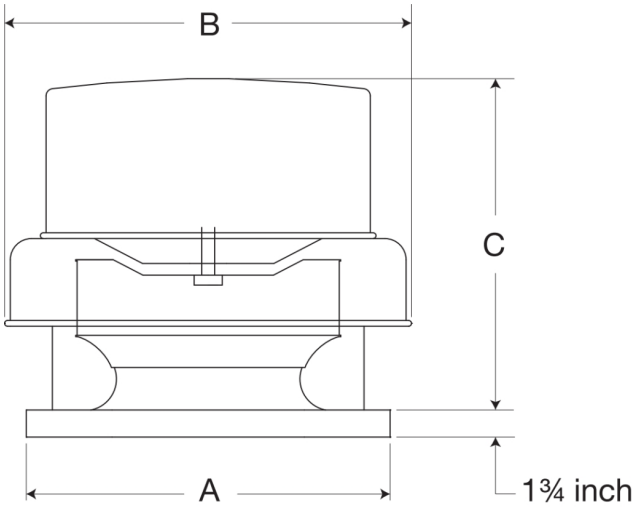


Model G, direct drive centrifugal roof exhaust fans provide the industry's best performance and durability for general clean air applications where air is discharged downward, toward the roof. Units feature the most advanced motor cooling of any fan in its class.

- 17 x 17 inch base with prepunched mounting holes for easy attachment to roof curb
- Speed controllable, with up to 30% turndown
- 13.5 x 13.5 inch recommended roof opening

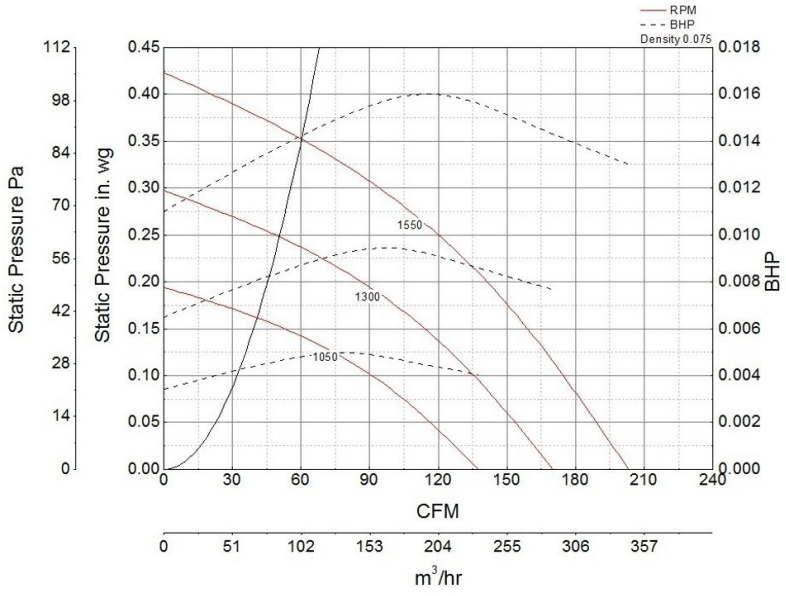
Certifications

AMCA Sound & Air
High Wind and Hurricane
Seismic
UL/cUL 705



A	B	C
17 in	19.375 in	12.125 in

Performance Characteristics



Construction Features

Housing Material	Spun Aluminum
Drive Type	Direct Drive
Impeller Type	Centrifugal Wheel
Impeller Material	Composite
Certifications	AMCA Sound & Air High Wind and Hurricane Seismic UL/cUL 705
Speed Controllable	Yes
Required Accessory	Roof curbs for new installations

Motor Information

Motor Insulation	B
Motor Phase	1
Service Factor	1
Voltage	115
HP	1/60
Hertz	60
Motor Enclosure	n/a
RPM	1550
Thermal Protection	AutoOverload
Nominal Efficiency	24

Air and Sound Performance

Motor HP	Max BHP	Max Fan RPM	Min Fan RPM	Ps (in. wg)	0	0.125	0.25
0.0166	0.02	1550	1050	CFM	203	166	120
				Sones	4.3	3.8	3.7



- Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.
- Performance certified is for installation type A: Free inlet, Free outlet.
- Power rating (BHP/kW) does not include transmission losses.
- Performance ratings include the effects of birdscreen.
- The sound ratings shown are loudness values in fan sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels.

California Residents

> ⚠ WARNING
>
> This product can expose you to chemicals including cadmium used in the processing of corrosion resistant metal and fasteners, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information visit www.P65Warnings.ca.gov

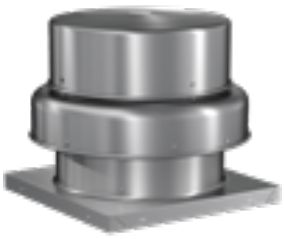
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SKU
G-080-DGE117XQD

Job Name:
Mark:
Submitted By:
Date: 01/27/2025

Centrifugal Downblast Exhaust Fan, Product # G-080-DGE117XQD, 134-495 CFM

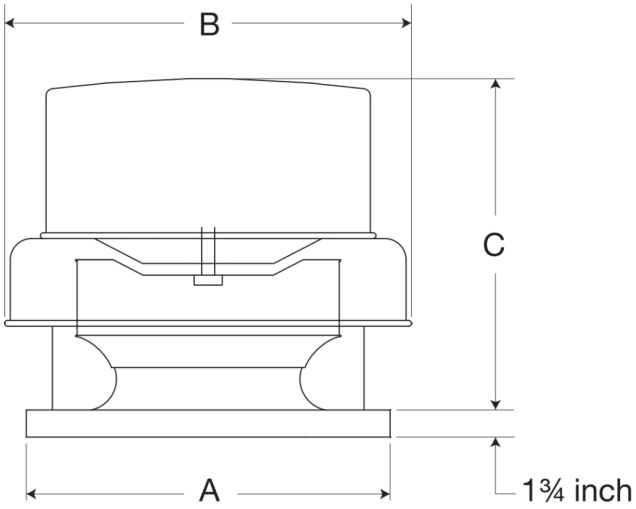


Model G, direct drive centrifugal roof exhaust fans provide the industry's best performance and durability for general clean air applications where air is discharged downward, toward the roof. Units feature the most advanced motor cooling of any fan in its class.

- Speed controllable, with up to 30% turndown
- 17 x 17 inch base with prepunched mounting holes for easy attachment to roof curb
- 13.5 x 13.5 inch recommended roof opening

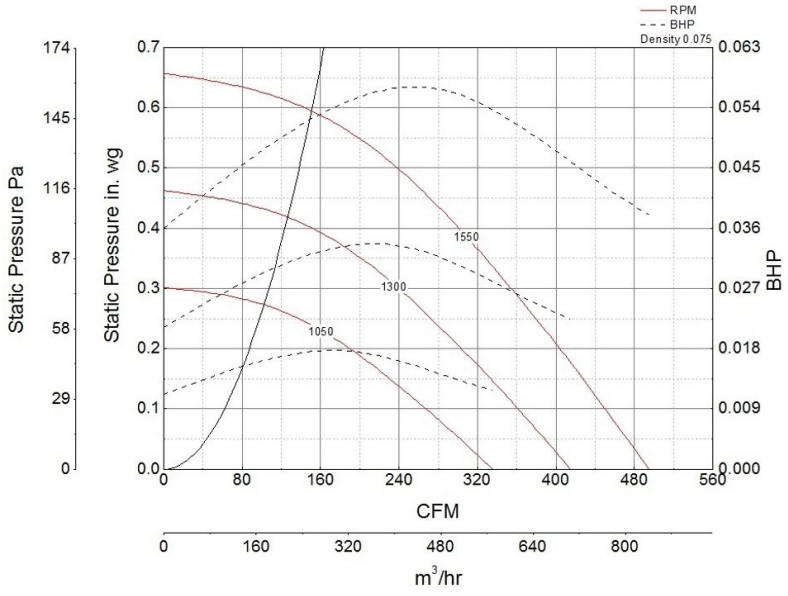
Certifications

AMCA Sound & Air
High Wind and Hurricane
Seismic
UL/cUL 705



A	B	C
17 in	21.75 in	14.625 in

Performance Characteristics



Construction Features

Housing Material	Spun Aluminum
Drive Type	Direct Drive
Impeller Type	Centrifugal Wheel
Impeller Material	Composite
Certifications	AMCA Sound & Air High Wind and Hurricane Seismic UL/cUL 705
Speed Controllable	Yes
Required Accessory	Roof curbs for new installations

Motor Information

Motor Insulation	B
Motor Phase	1
Service Factor	1
Voltage	115
HP	1/20
Hertz	60
Motor Enclosure	n/a
RPM	1550
Thermal Protection	AutoOverload
Nominal Efficiency	26
Watts	38.6

Air and Sound Performance

Motor HP	Max BHP	Max Fan RPM	Min Fan RPM	Ps (in. wg)	0	0.125	0.25	0.375	0.5
5/100	0.06	1550	1050	CFM	495	439	379	314	237
				Sones	7.3	7.3	7.2	7.3	7.6



- Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.
- Performance certified is for installation type A: Free inlet, Free outlet.
- Power rating (BHP/kW) does not include transmission losses.
- Performance ratings include the effects of birdscreen.
- The sound ratings shown are loudness values in fan sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels.

California Residents

> ⚠ WARNING
>
> This product can expose you to chemicals including cadmium used in the processing of corrosion resistant metal and fasteners, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information visit www.P65Warnings.ca.gov

HVAC and Exhaust Fan Noise Level Calculations

Scenario	Land Use	Direction	Building	Equipment Type	HVAC Equipment	Reference Noise Level (dBA Leq)	Reference Distance (ft)	Distance (ft)	Distance Attenuation (dBA)	Shielding[1] (dBA)	Noise Level (dBA Leq)		Daytime Combined Noise Level (dBA Leq)	Daytime Noise Standard (dBA Leq)	Exceed?	Noise Increase (dBA)
Existing	Residence	North	Building C	HVAC	Trane WHJ300	61.4	50	345	16.8	5.0	39.6					
				HVAC	Trane WHJ300	61.4	50	345	16.8	5.0	39.6		42.9	55.0	No	
				HVAC	Trane WHC120	53.4	50	345	16.8	5.0	31.6					
	Residence	East	Building C	HVAC	Trane WHJ300	61.4	50	95	5.6	5.0	50.8					
				HVAC	Trane WHJ300	61.4	50	95	5.6	5.0	50.8		54.1	55.0	No	
				HVAC	Trane WHC120	53.4	50	95	5.6	5.0	42.8					
	Residence	South	Building C	HVAC	Trane WHJ300	61.4	50	330	16.4	5.0	40.0					
				HVAC	Trane WHJ300	61.4	50	330	16.4	5.0	40.0		43.3	55.0	No	
				HVAC	Trane WHC120	53.4	50	330	16.4	5.0	32.0					
	Residence	West	Building C	HVAC	Trane WHJ300	61.4	50	305	15.7	5.0	40.7					
				HVAC	Trane WHJ300	61.4	50	305	15.7	5.0	40.7		44.0	55.0	No	
				HVAC	Trane WHC120	53.4	50	305	15.7	5.0	32.7					
Existing + Project	Residence	North	Building A	HVAC	Trane WHJ300	61.4	50	160	10.1	5.0	46.3					
				HVAC	Trane WHJ300	61.4	50	160	10.1	5.0	46.3					
				HVAC	Trane WHC120	53.4	50	265	14.5	5.0	33.9					
				HVAC	Trane WHC036	49.4	50	160	10.1	5.0	34.3					
				Exhaust Fan	Greenheck G-099-VG	41.2	50	265	14.5	5.0	21.7					
				Exhaust Fan	Greenheck G-099-VG	41.2	50	285	15.1	5.0	21.1					
				Exhaust Fan	Greenheck G-060-VG	22.8	50	255	14.2	5.0	3.6		50.7	55.0	No	7.8
				Exhaust Fan	Greenheck G-080-VG	32.8	50	160	10.1	5.0	17.7					
			Building B	HVAC	Trane WHC120	53.4	50	224	13.0	5.0	35.4					
				HVAC	Trane WHC120	53.4	50	224	13.0	5.0	35.4					
			Building C	HVAC	Trane WHJ300	61.4	50	345	16.8	5.0	39.6					
				HVAC	Trane WHJ300	61.4	50	345	16.8	5.0	39.6					
				HVAC	Trane WHC120	53.4	50	345	16.8	5.0	31.6					
Existing + Project	Residence	East	Building A	HVAC	Trane WHJ300	61.4	50	270	14.6	5.0	41.8					
				HVAC	Trane WHJ300	61.4	50	230	13.3	5.0	43.1					
				HVAC	Trane WHC120	53.4	50	235	13.4	5.0	35.0					
				HVAC	Trane WHC036	49.4	50	250	14.0	5.0	30.4					
				Exhaust Fan	Greenheck G-099-VG	41.2	50	210	12.5	5.0	23.7					
				Exhaust Fan	Greenheck G-099-VG	41.2	50	225	13.1	5.0	23.1					
				Exhaust Fan	Greenheck G-060-VG	22.8	50	215	12.7	5.0	5.1		55.1	55.0	Yes	1.0
				Exhaust Fan	Greenheck G-080-VG	32.8	50	290	15.3	5.0	12.5					
			Building B	HVAC	Trane WHC120	53.4	50	135	8.6	5.0	39.8					
				HVAC	Trane WHC120	53.4	50	110	6.8	5.0	41.6					
			Building C	HVAC	Trane WHJ300	61.4	50	95	5.6	5.0	50.8					
				HVAC	Trane WHJ300	61.4	50	95	5.6	5.0	50.8					
				HVAC	Trane WHC120	53.4	50	95	5.6	5.0	42.8					
Existing + Project	Residence	South	Building A	HVAC	Trane WHJ300	61.4	50	550	20.8	5.0	35.6					
				HVAC	Trane WHJ300	61.4	50	550	20.8	5.0	35.6					
				HVAC	Trane WHC120	53.4	50	445	19.0	5.0	29.4					
				HVAC	Trane WHC036	49.4	50	555	20.9	5.0	23.5					
				Exhaust Fan	Greenheck G-099-VG	41.2	50	455	19.2	5.0	17.0					
				Exhaust Fan	Greenheck G-099-VG	41.2	50	435	18.8	5.0	17.4					
				Exhaust Fan	Greenheck G-060-VG	22.8	50	465	19.4	5.0	-1.6		45.0	55.0	No	1.6
				Exhaust Fan	Greenheck G-080-VG	32.8	50	560	21.0	5.0	6.8					
			Building B	HVAC	Trane WHC120	53.4	50	500	20.0	5.0	28.4					
				HVAC	Trane WHC120	53.4	50	500	20.0	5.0	28.4					
			Building C	HVAC	Trane WHJ300	61.4	50	330	16.4	5.0	40.0					
				HVAC	Trane WHJ300	61.4	50	330	16.4	5.0	40.0					
				HVAC	Trane WHC120	53.4	50	330	16.4	5.0	32.0					

HVAC and Exhaust Fan Noise Level Calculations

Scenario	Land Use	Direction	Building	Equipment Type	HVAC Equipment	Reference Noise Level (dBA Leq)	Reference Distance (ft)	Distance (ft)	Distance Attenuation (dBA)	Shielding[1] (dBA)	Noise Level (dBA Leq)		Daytime Combined Noise Level (dBA Leq)	Daytime Noise Standard (dBA Leq)	Exceed?	Noise Increase (dBA)
Existing + Project	Residence	West	Building A	HVAC	Trane WHJ300	61.4	50	160	10.1	5.0	46.3		50.2	55.0	No	6.2
				HVAC	Trane WHJ300	61.4	50	200	12.0	5.0	44.4					
				HVAC	Trane WHC120	53.4	50	205	12.3	5.0	36.1					
				HVAC	Trane WHC036	49.4	50	190	11.6	5.0	32.8					
				Exhaust Fan	Greenheck G-099-VG	41.2	50	235	13.4	5.0	22.8					
				Exhaust Fan	Greenheck G-099-VG	41.2	50	220	12.9	5.0	23.3					
				Exhaust Fan	Greenheck G-060-VG	22.8	50	230	13.3	5.0	4.5					
				Exhaust Fan	Greenheck G-080-VG	32.8	50	155	9.8	5.0	18.0					
			Building B	HVAC	Trane WHC120	53.4	50	300	15.6	5.0	32.8					
				HVAC	Trane WHC120	53.4	50	325	16.3	5.0	32.1					
			Building C	HVAC	Trane WHJ300	61.4	50	305	15.7	5.0	40.7					
				HVAC	Trane WHJ300	61.4	50	305	15.7	5.0	40.7					
				HVAC	Trane WHC120	53.4	50	305	15.7	5.0	32.7					

[1] The roof line and parapet wall would provide a minimum noise reduction of 5 dBA.

CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: September 3, 2025

TO: Robert Vestal, Director of Public Works; City of Beaumont

FROM: Ken Wilhelm, Principal, LSA

SUBJECT: Calvary Chapel Expansion Project Trip Generation and Vehicle Miles Traveled Analysis Memorandum (LSA Project No. 20241535)

LSA Associates, Inc. (LSA) has prepared this Trip Generation and Vehicle Miles Traveled (VMT) Analysis memorandum (Memo) for the proposed Calvary Chapel Expansion Project (project) in the City of Beaumont (City). Currently the site includes a 3,300 square-foot (sf) sanctuary building, and five portable trailers with some parking facilities. The proposed expansion includes three new buildings including a new 11,000 sf sanctuary building, a 5,000 sf children's ministry center, a 7,700 sf youth recreation center/multipurpose building, as well as new baptismal area, two sports court facilities, and an outdoor barbecue area. The existing sanctuary building will remain and be repurposed for Lifegroup meetings, youth classes and activities. The project site is located at 1780 Orchard Heights Avenue at the southeast corner of the intersection of Orchard Heights Avenue/Brookside Avenue, with site access provided along Orchard Heights Avenue and Brookside Avenue. The project is consistent with the City's General Plan land use and zoning designation. Figure 1 (all figures provided in Attachment A) illustrates the regional and project location. Figure 2 illustrates the conceptual site plan for the project.

The objectives of this Memo are as follows:

- To estimate the trip generation for the proposed project and determine whether a detailed Level of Services (LOS) will be required for the project;
- To determine whether a detailed VMT analysis will be required for the proposed project; and
- To evaluate the project's impact on Active Transportation and Public Transit.

PROJECT SCOPING FORM

The City follows the *Traffic Impact Analysis Guidelines for the City of Beaumont,* dated August 2024 (TIA Guidelines) for traffic analysis purposes. As recommended in the TIA Guidelines, at the onset of any land development project TIA preparation process, the Project Scoping Form from the City's TIA Guidelines needs to be submitted to the City staff to determine the level of analysis required for each project. The Project Scoping From includes detailed project information and land uses, project trip generation, LOS analysis methodologies and VMT analysis methodologies. The City's Project Scoping Form with relevant information is provided in Attachment B. A detailed discussion about the

project trip generation and analysis/and or screening methodology, as included in the Project Scoping Form is included below:

PROJECT TRIP GENERATION

As previously mentioned, the City of Beaumont uses the *Traffic Impact Analysis Guidelines for the City of Beaumont,* dated August 2024 (TIA Guidelines), for traffic analysis purposes. According to the TIA Guidelines, a detailed LOS study may not be required if the project is estimated to generate less than 100 peak hour trips, or local community uses including local serving churches and local community facilities.

It should also be noted that the project proposes to replace the existing sanctuary with a new sanctuary facility and repurpose the existing sanctuary as a youth learning space to support the various functions on site, while also adding ancillary uses as part of the re-development. As such, since the project would be replacing an existing sanctuary, it is not estimated that the project would be resulting in any additional trips related to regular church services.

However, as previously mentioned, because of the expansion, several new ancillary facilities would be added, and the existing sanctuary will be repurposed to host Lifegroup classes. Therefore, this trip generation estimate has been developed to estimate additional trips resulting from these new ancillary facilities.

Typically, project trip generation estimates are developed using rates from the latest edition of Institute of Transportation Engineers (ITE) *Trip Generation Manual*. However, though the ITE *Trip Generation Manual,* 11th Edition includes trip generation rates for Churches, it does not include any trip generation rates for church related ancillary uses as proposed for the project. Therefore, trip generation for the proposed project was developed using the statement of operation included in the *Revised Letter of Intent*, dated September 2023. The Revised Letter of Intent is provided in Attachment C.

The statement of operation provides a brief description of the daily operations at the proposed project.

Based on the statement of operations, worship services are held at 6:30 p.m. on Wednesdays and at 8:00 a.m., 9:45 a.m., 11:30 a.m., and 1:30 p.m. on Sundays. No changes to the worship services are anticipated because of the project. The project would have two full-time and five part-time employees. Typical office hours for staffs would be from 10:00 a.m. to 4:00 p.m, for preparation of upcoming services. Additionally, the project would also host Lifegroup meetings throughout the week, with group sizes between 10-20 people for typical one-hour meetings.

Following is a brief description of the project trip generation estimates:

Parishioners (Regular Church Services) Trip Generation

As previously mentioned, the current site includes an existing sanctuary and proposes to expand this use complemented with ancillary uses. Despite the expansion of the sanctuary, it is not anticipated that the expansion would result in an increase in the number of parishioners who already use the existing facility. As such, the project would not result in any additional church service-related trips.

Employee Trip Generation

As previously stated, the proposed project is anticipated to have two full-time and five part-time employees with work hours of 10:00 a.m. to 4:00 p.m. Therefore, it could be estimated that the project will be generating 14 daily employee trips (inbound and outbound combined). Based on the TIA Guidelines, the a.m. peak hour occurs between 7:00-9:00 a.m., and the p.m. peak hour occurs between 4:00-6:00 p.m. As such, based on the operational hours, 7 inbound employee-related trips are estimated to occur outside the a.m. peak hour. However, the 7 outbound employee trips are estimated to occur during the p.m. peak hour.

Lifegroup Participants Trip Generation

Based on the project's statement of operations, the existing sanctuary building will be repurposed as a youth learning space to support on-site functions. The project is anticipated hosting Lifegroup sessions that last approximately one hour and are generally small groups with 10-20 participants.

While the Lifegroup sessions would be held throughout the week, it was estimated that approximately two meetings would occur each day. Additionally, as a conservative approach, it was estimated that each of these sessions would have 20 participants. As such, the project will host two sets of Lifegroup sessions per day or 40 participants would be accessing the project on a regular weekday. As such, because of these Lifegroup sessions, the project is estimated to have an additional 40 inbound and 40 outbound trips, or 80 additional daily trips.

Additionally, these sessions are estimated to occur during the church office hours. Given that the Lifegroup sessions are typically hour-long sessions and fall outside the peak hour windows, only 10% of these daily trips were estimated as peak hour trips. As such, it was estimated that approximately 8 Lifegroup participant trips (10 percent of the 80 daily trips) may occur during the a.m. peak hour and 8 Lifegroup participant trips (10 percent of the 80 daily trips) may occur during the p.m. peak hour.

These estimated trips were added to determine the additional trip generation for the proposed project. Table A (provided in Attachment D) summarizes the project trip generation as described above and shows that the proposed project is anticipated to generate 8 trips in the a.m. peak hour, 15 trips in the p.m. peak hour, and 94 daily trips.

Since the anticipated number of peak hour trips generated by the proposed project is lower than the 100 peak-hour trip threshold established by the TIA Guidelines, a LOS study may not be required for the project. Also, as previously mentioned, according to the TIA Guidelines, "*Local serving churches*" are classified as limited trip generation projects and do not affect levels of service significantly once distributed to the local roadway network. As such, a detailed LOS analysis may not be required for this project.

VMT SCREENING ANALYSIS

On December 28, 2018, the California Office of Administrative Law cleared the revised California Environmental Quality Act (CEQA) Guidelines for use. Among the changes to the guidelines was the removal of vehicle delay and level of service as the sole basis of determining CEQA impacts. With the implementation of the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on VMT. The TIA Guidelines include significant thresholds, requirements,

recommended methodologies, and procedures for VMT analysis for projects within the local jurisdiction.

Pursuant to the TIA Guidelines, certain project types may be presumed to have a less than significant impact, absent substantial evidence to the contrary. This includes projects generating less than 110 daily vehicle trips, subject to the discretion of the City.

Previously mentioned Table A summarizes the Trip Generation for the proposed project. As shown in Table A, the project is anticipated to generate 94 total daily trips, which is lower compared to the 110 daily trip threshold established by the TIA Guidelines. Therefore, based on the TIA Guidelines, the project may be potentially screened out from a detailed VMT analysis and is anticipated to have a less than significant VMT impact.

ACTIVE TRANSPORTATION AND PUBLIC TRANSIT ANALYSIS

According to the TIA Guidelines, a significant impact occurs when a project conflicts with adopted plans, policies, or programs regarding active transportation or public transit facilities, or otherwise decreases the performance or safety of such facilities.

Currently, there are no existing bikeways along Brookside Avenue. Based on the *Beaumont General Plan*, (City's General Plan) adopted 2020, the nearest bikeway is located 0.70 miles away, which is a Class Bike 2 Lane running east/west along Cougar Way. The project is not proposing any alteration/modification of the existing or proposed bike facilities. As such, the project will not decrease the performance or safety of any existing or proposed bicycle facilities.

According to the City's General Plan, Pedestrian facilities, (e.g. sidewalks, crosswalks, and trails) together with land uses, promote pedestrian activities, and can help increase walking as a means of transportation, recreation, and exercise while reducing growth in congestion and air pollution. Within the project vicinity, currently there are no paved sidewalks along Brookside Avenue. The project will add sidewalks along the project frontage on the south side of Brookside Avenue. As such, the project will help eliminate existing sidewalk gaps and will increase the performance or safety of the existing pedestrian facilities.

The nearest bus stop from the project site is approximately 0.50 miles, located at the southwest corner of Cherry Avenue and Brookside Avenue. Beaumont Transit Agency operates two routes at this location, a general fixed weekday Route 3, and a weekend service Route 3/4. Route 3 provides weekday service across Beaumont and Cherry Valley, with key stops including Vineland St, Cherry Valley Blvd, Cougar Way, Oak Valley Pkwy, Noble Creek Apartments, San Gorgonio Hospital, and several others, leading to Beaumont Walmart. Route 3/4 provides Saturday and limited holiday services into Downtown Beaumont and Cherry Valley, featuring stops at key locations such as Vineland St, Cherry Valley Blvd, Brookside Ave, and Beaumont Ave. At present, there are no proposed service changes in Beaumont transit's network. As such, the project will not decrease the performance or safety of any existing or proposed public transit facilities. As such, the project will help eliminate existing sidewalk gaps and will increase the performance or safety of the existing pedestrian facilities.

As summarized above, the project does not conflict with any existing or proposed bicycle, pedestrian, and public transit facilities. Therefore, it can be considered to conform to all adopted policies, plans, or programs concerning these facilities and will not have a significant impact.

CONCLUSION

As stated above, the project is anticipated to generate less than 100 trips in both peak hours. Therefore, a detailed LOS analysis would not be required for the project. Similarly, since the project is a low trip generator, a detailed VMT analysis will not be required for the project.

Should you have any questions, please do not hesitate to contact me at (949) 553-0666 or email me at Ken.Wilhelm@lsa.net.

Sincerely,

LSA Associates, Inc.



Ken Wilhelm
Principal

ATTACHMENTS

Attachment A: Figures

Figure 1: Regional and Project Location
Figure 2: Conceptual Site Plan

Attachment B: Scoping Form

City of Beaumont TIA Scoping Form

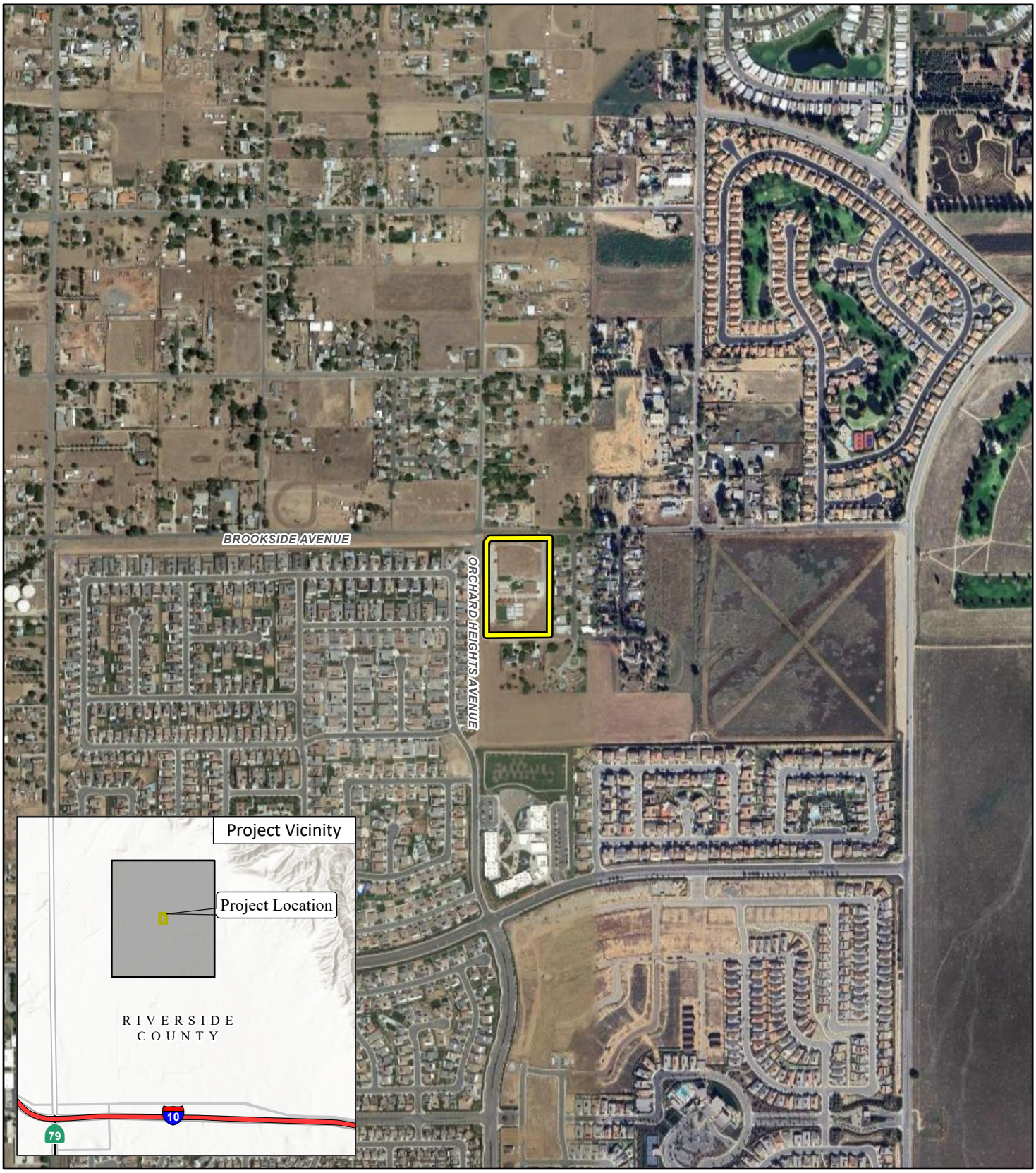
Attachment C: Project Letter of Intent

Attachment D: Trip Generation Table

Table A: Project Trip Generation

ATTACHMENT A

Figure 1: Regional and Project Location
Figure 2: Conceptual Site Plan



LSA

Project Location

FIGURE 1

N

0 400 800

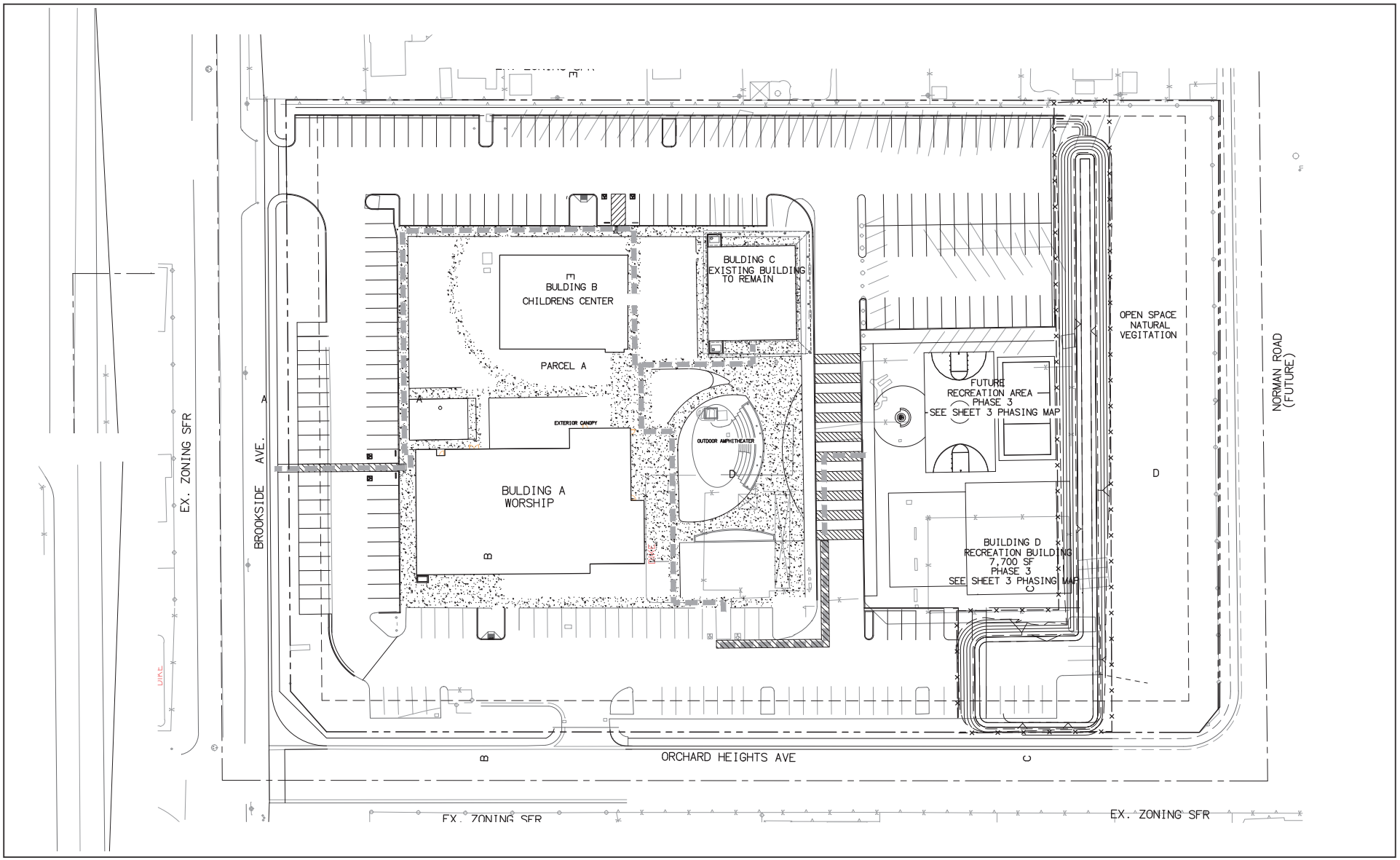
FEET

SOURCE: ESRI Streetmap, 2021, Google Maps Satellite, 2023

P:\20241535 - Calvary Chapel\Traffic\GIS\Calvary Chapel Beaumont\Calvary Chapel Beaumont.aprx (2/21/2024)

Calvary Chapel Expansion Project
Trip Generation and VMT Memorandum

Regional and Project Location



LSA

FIGURE 2

N

0 45 90

FEET

SOURCE: City of Beaumont

I:\2024\20242107\G\Site_Plan.ai (12/19/2024)

Calvary Chapel Expansion Project

Site Plan

ATTACHMENT B

City of Beaumont TIA Scoping Form

Project Scoping Form

This scoping form shall be submitted to the Lead Agency to assist in identifying infrastructure improvements that may be required to support traffic from the proposed project.

Project Identification:

Case Number:	
Related Cases:	
SP No.	
EIR No.	
GPA No.	
CZ No.	
Project Name:	Calvary Chapel Expansion Project
Project Address:	1780 Orchard Heights Avenue, Beaumont CA 92223
Project Opening Year:	Opening Year 2026
Project Description:	The proposed expansion features an 11,000 sf sanctuary, a 5,000 sf children's ministry center, a 7,700 sf multipurpose youth recreation center, a baptismal area, two sports courts, and an outdoor barbecue space.

	Consultant:	Developer:
Name:	LSA	West Coast Entitlement
Address:	3210 El Camino Real, Suite 100	543 W. County Line Road
	Irvine, California 92602	Calimesa, CA 92320
Telephone:	949-553-0666	909-335-1665
Fax/Email:		

Trip Generation Information:

Trip Generation Data Source: Revised Letter of Intent - Operational Statement (OS)

Current General Plan Land Use: Single Family Residential

Proposed General Plan Land Use: Single Family Residential

Current Zoning: Residential Single Family (RSF)

Proposed Zoning: Single Family Residential

	Existing Trip Generation			Proposed Trip Generation		
	In	Out	Total	In	Out	Total
AM Trips				8	0	8
PM Trips				0	15	15

Trip Internalization: ☐ Yes ☒ No (_____% Trip Discount)

Pass-By Allowance: ☐ Yes ☒ No (_____% Trip Discount)

Potential Screening Checks

Is your project screened from specific analyses (see Page 11 of the guidelines related to LOS assessment and Pages 24-26).

Is the project screened from LOS assessment? ☒ Yes ☐ No

LOS screening justification (see Page 11 of the guidelines): _____

The anticipated trips generated by the proposed project is lower than the 100 peak-hour trip threshold established by the TIA guidelines. Additionally, "Local Serving Churches" are classified as limited trip generation projects and do not affect levels of service significantly once distributed to the local roadway network.

Is the project screened from VMT assessment? ☒ Yes ☐ No

VMT screening justification (see Pages 24-26 of the guidelines): _____

The project is anticipated to generate 94 total daily trips which is less than 110 daily trip threshold established by by the TIA guidelines.

Level of Service Scoping

- Proposed Trip Distribution (Attach Graphic for Detailed Distribution):

North	South	East	West
%	%	%	%

- Attach list of Approved and Pending Projects that need to be considered (provided by the lead agency and adjacent agencies)
- Attach list of study intersections/roadway segments
- Attach site plan
- Note other specific items to be addressed:
    - Site access
    - On-site circulation
    - Parking
    - Consistency with Plans supporting Bikes/Peds/Transit
    - Other _____
- Date of Traffic Counts _____
- Attach proposed analysis scenarios (years plus proposed forecasting approach)
- Attach proposed phasing approach (if the project is phased)

VMT Scoping

For projects that are not screened, identify the following:

- Travel Demand Forecasting Model Used _____
- Attach WRCOG Screening VMT Assessment output or describe why it is not appropriate for use
- Attach proposed Model Land Use Inputs and Assumed Conversion Factors (attach)

ATTACHMENT C

Project Letter of Intent

September 20, 2023

Attn: Katie Jenson
City of Beaumont
550 E. 6th Street,
Beaumont, CA 92223

RE: Revised Letter of Intent for the resubmittal of CUP2023-0074 for the proposed expansion of the Calvary Chapel Beaumont church at 1780 Orchard Heights Avenue (APN: 408-070-012) and Tentative Parcel Map No. 38829 to subdivide the property concurrently with the CUP.

To Whom It May Concern,

West Coast Entitlement, on behalf of Calvary Chapel Beaumont, is proposing a Conditional Use Permit (CUP) to expand the existing institutional facility at 1780 Orchard Heights Avenue (APN: 408-070-012). Currently, the site features five (5) portable trailers, a 3,300 square-foot sanctuary building, and partial parking improvements. The proposed expansion includes a new 11,000 square-foot sanctuary building, a 5,000 square-foot children's ministry center, a 7,700 square-foot youth recreation center and multipurpose building, new baptismal area, two (2) sports court facilities, and an outdoor barbecue area. Access to the property will be provided through a driveway approach on Brookside Avenue and an approach on Orchard Heights Avenue with an adequate drive aisle and turn radius for both members of the church and emergency services. The new sanctuary building will include a seating area of 641 fixed seats, which requires a total of 213 (641 fixed seats/3) parking spaces, 213 are proposed. **Proposed concurrently with the CUP is Tentative Parcel Map (TPM) No. 38829 to subdivide the approximate 5.49-acre property to establish a 4.85-acre project site to support the proposed church expansion and a 0.64 acre Not-A-Part (NAP) Lot to allow for future residential construction. Any future construction on the NAP will be under a separate application determined by the Planning Department.** Two entitlements, Case No(s). 05-CUP-01 & 08-CUP-10, were previously approved for Calvary Chapel on September 27, 2005, and September 09, 2008, respectively; however, these applications have since expired, necessitating the new Project submittal.

In a typical week Calvary Chapel Beaumont will operate on a set hours of operation for worship services that will hold one (1) service on Wednesday nights at 6:30 pm and four (4) Sunday services at 8:00 am, 9:45 am, 11:30 am, and 1:30 pm. Calvary Chapel Beaumont also offers a flexible schedule for Lifegroups throughout the week; however, group sizes are generally small between 10-20 people at any one time and typically last for an hour. For day-to-day operations, Calvary Chapel Beaumont employs two (2) full-time and five (5) part-time staff and is open from 10:00 am to 4:00 pm to serve as office hours for staff to prepare for upcoming services.

The proposed Project is anticipated to be completed in three phases. Phase 1 includes the construction of the new sanctuary, new baptismal area, **Recordation of the Final Map,** and all parking areas, Phase 2 will include the construction of the Children's Center, and Phase 3 will include the construction of the Teen's Center and Recreation Area. Upon completion of Phase 1, the existing sanctuary building will be repurposed as a meeting room for Lifegroups and teen-related activities and will no longer be used as a sanctuary for Sunday services. Prior to the start of Phase 3, the design of the 7,700 square-foot youth recreation center

and multipurpose building will be submitted to the Planning Department for their review and approval and the existing portable trailers will be removed.

For the environmental portion of the Project review, the proposed Project is Categorically Exempt from CEQA pursuant to Section 15315 of the CEQA Guidelines (Class 15 – Minor Land Divisions) as the Project consists of a land division of four (4) or fewer parcels, will be located in an urbanized area, will be consistent the General Plan and zoning with no need for an exception or Variance, the parcel has not been involved in a subdivision within the previous two (2) years, and the property does not have an average slope greater than 20%. The Project is also Categorically Exempt pursuant to Section 15332 of the CEQA Guidelines (Class 32 – In-Fill Development) as the proposed church expansion occurs on a Project site of less than five (5) acres that is substantially surrounded by urban uses, will be consistent will all applicable General Plan and zoning policies, designations, and regulations, has no value for rare, threatened, or endangered species since the property has been disturbed through development activity since the original entitlement approvals in 2005 and 2008, will not generate significant effects relating to traffic, noise, air quality, or water quality, and the site will be adequately served by all required utilities. With the application of the Categorical Exemptions no further environmental review is necessary beyond adoption of the Categorical Exemptions by the reviewing authority at a public hearing.

If you have any questions or concerns, please contact me at (909) 335-1665 or Travis@westcoastentitlement.com.

Sincerely,

Travis Heaps
Member/Principal Planner
West Coast Entitlement

ATTACHMENT D

Table A: Project Trip Generation Table

LSA

Table A - Project Trip Generation

Land Uses	Units	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily
Church and Ancillary Facilities New Trip Generation[1]	23.7 TSF							
Parishioner Trip Generation[2]		0	0	0	0	0	0	0
Employee Trip Generation		0	0	0	0	7	7	14
Lifegroup Participants Trip Generation		8	0	8	0	8	8	80
Total Trip Generation		**8**	**0**	**8**	**0**	**15**	**15**	**94**

Notes:

TSF = thousand square-feet

[1] The trip generation was developed based on the the statement from the revised letter of intent.

[2] Based on the project letter of intent it is not estimated that there will not be any new trip generation for the Church Parishioners, as such since there is an existing church on site, no additional trip generation are estimated to occur because of the parishioners.

GeoTek, Inc.
1548 North Maple Street, Corona, California 92878
(951) 710-1160 Office (951) 710-1167 Fax www.geotekusa.com

May 3, 2023
Project No. 3538-CR

Matlock Design Build
1614 East Holt Boulevard, Suite 106
Ontario, California 91761

Attention: Mr. Susano Ureno

Subject: **Infiltration Evaluation**
Calvary Chapel
1780 Orchard Heights Avenue
Beaumont, Riverside County, California

Reference: See Page 5

Dear Mr. Ureno:

As requested and authorized, GeoTek, Inc. (GeoTek) has performed an Infiltration Evaluation in order to provide infiltration test results for the existing Calvary Chapel facility and proposed infiltration basins. The intent of this study is to evaluate the infiltration properties of the subsurface soils within the proposed project storm water disposal areas (basins). This report presents the results of the evaluation performed by GeoTek.

Site and Project Description

The approximately 5.5-acre almost rectangular-shaped project site is located at 1780 Orchard Heights Avenue, in the City of Beaumont, Riverside County, California (See Figure 1). Access to the site is available from Brookside Avenue (paved) located adjacent to the northern boundary of the site. The project is comprised of one (1) parcel of land (Riverside County Assessor's Parcel Number 408-070-012). The site is currently occupied by Calvary Chapel Church which consists of two (2) buildings, several modular trailers, concrete paved parking/drive areas, landscaping and vacant land.

Topographically, the site slopes gently downward to the southwest. Elevations across the site range from approximately 2,824 mean sea level (msl) to 2,830 msl.

Based upon review of *Calvary Chapel Site Plan and Conceptual Grade Plan* (undated), prepared by Joseph M. Long, GeoTek understands that it is proposed to demolish one (1) of the site buildings and remove the modular trailers and then construct a children's center and a worship

structure on the project site. Additional improvements are anticipated to include additional parking/drive areas, a recreation area, hardscaping, typical landscaping and associated improvements. Stormwater disposal is understood to be by means of stormwater basins in the southwestern and southeastern corners of the site.

Infiltration Testing

Two (2) percolation test borings, Borings I-1 and I-2 were excavated with a truck-mounted hollow stem auger drill rig to depths of approximately four (4) feet each, below the existing ground surface (bgs) within the area of the proposed basins. Additionally, one (1) deep exploratory boring (Boring B-1) was excavated near the vicinity of the two (2) basins to a depth of 15 feet for determination of depth of groundwater, if any, and for observation of any hardpan or impermeable layers below the basins. The approximate locations of the borings are indicated on the attached Exploration Location Map, Figure 2.

The borings were approximately 8-inches in diameter. Four-inch diameter slotted PVC pipes encapsulated in filter sock were inserted into the two (2) percolation test holes. The annular space between the test hole sidewalls and PVC pipe was filled with gravel.

The soils encountered in all borings consisted of alluvium, consisting of interbedded silty sand and clayey sand (SM and SC soil types based upon the Unified Soil Classification System). The logs of the borings are presented in Appendix A.

Groundwater was not encountered nor observed in any of the borings conducted for this evaluation. Based on a review of groundwater depths noted on the State Department of Water Resources Water Data Library website (Map (ca.gov)), it is estimated a historic high groundwater depth of greater than 50 feet below existing grade exists at the site.

Subsequent to pre-soaking the percolation test holes in general conformance with the referenced document (County of Riverside, 2011), percolation testing was performed in the lower approximate 24 inches in each of the percolation borings. The percolation testing was conducted in general conformance with the referenced document prepared by the County of Riverside. The percolation rates were converted to an infiltration rate via the Porchet Method.

The infiltration rate for each of the borings is presented in the follow table after the water level had stabilized.

Boring No.	Infiltration Rate (inches per hour)	Depth of Boring (feet)
Boring I-1	1.02	4
Boring I-2	0.91	4

Copies of the percolation data sheets and infiltration conversion sheets (Porchet Method) are included in Appendix B.

The reported infiltration rates are the measured rate without any factor of safety applied. Over the lifetime of the water quality facility, the infiltration rates may be affected by silt build up and biological activities, as well as local variations in near surface soil conditions. A suitable factor of safety should be applied to the field rates in design of the infiltration systems.

It should be noted that the infiltration rates provided above were performed in relatively undisturbed native soils. Infiltration rates will vary and are mostly dependent on the underlying consistency of the site soils and relative density. Infiltration rates will be impacted by weight of equipment travelling over the soils, placement of engineered fill and other various factors. GeoTek, Inc. assumes no responsibility or liability for the ultimate design or performance of the storm water facilities.

LIMITATIONS

The earth materials observed on the project site appear to be representative of the tested areas; however, soil materials vary in character between excavations and natural outcrops or conditions exposed during site construction. Site conditions may vary due to seasonal changes or other factors. GeoTek, Inc. assumes no responsibility or liability for work, testing or recommendations performed or provided by others.

GeoTek's conclusions and recommendations are professional opinions that are limited to the extent of the available data. Observations during construction are important to allow for any change in recommendations found to be warranted. These opinions have been derived in accordance with current standards of practice and no warranty is expressed or implied. Standards of practice are subject to change with time.

The opportunity to be of service on this project is sincerely appreciated. If you should have any questions, please do not hesitate to contact GeoTek.

Respectfully submitted,
GeoTek, Inc.

CERTIFIED ENGINEERING GEOLOGIST
EDWARD H. LaMONT
No. 1892
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
BRUCE A. HICK
GE 2284
GEOTECHNICAL
STATE OF CALIFORNIA

Edward H. LaMont
CEG 1892, Exp. 07/31/24
Principal Geologist

Bruce A. Hick
GE 2284, Exp. 12/31/24
Geotechnical Engineer

Anna M. Scott
Project Geologist

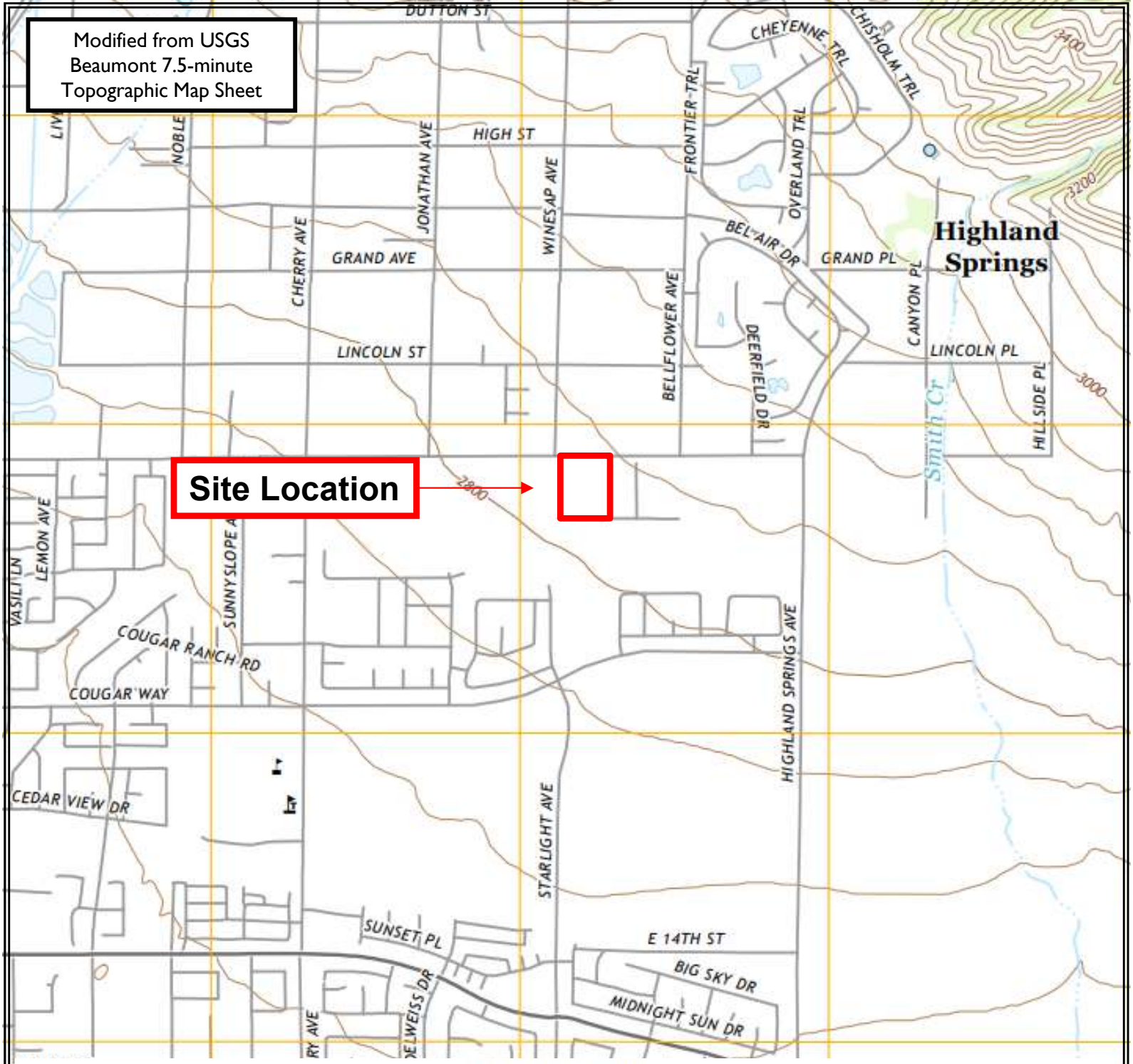
Enclosures: Figure 1 – Site Location Map
Figure 2 – Exploration Location Map
Appendix A – Logs of Exploratory Borings
Appendix B – Percolation Data Sheets and Conversion Sheets (Porchet Method)

Distribution: (1) Addressee via email (PDF file)

G:\Projects\3501 to 3550\3538CR Matlock Design Group 1780 Orchard Heights Avenue Beaumont\Infiltration Evaluation\3538CR Infiltration Evaluation 1780 Orchard Heights Avenue.doc

REFERENCE

County of Riverside, 2011, "Technical Guidance Document Appendix A – Infiltration Testing," dated September.



SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2

1000 500 0 METERS 1000 2000

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MILES

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FEET

Matlock Design Group
1780 Orchard Heights Avenue
Beaumont, Riverside County, California

GeoTek Project No. 3538-CR

NORTH

Figure 1

Site Location Map

GEOTEK



Matlock Design Group
1780 Orchard Heights Avenue
Beaumont, Riverside County, California

GeoTek Project No. 3538-CR

NORTH

Figure 2

Exploration Location Map

GEOTEK

APPENDIX A

LOGS OF EXPLORATORY BORINGS

Calvary Chapel
1780 Orchard Heights Avenue
Beaumont, Riverside County, California
Project No. 3538-CR

GEOTEK

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Matlock Design Group	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	1780 Orchard Heights Avenue	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Nik
PROJECT NO.:	3538-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	5/2/2023

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: I-1** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Fan Deposits:** Silty f-c SAND, light brown, slightly moist, trace organics			
					Silty f-c SAND, brown to dark brown, moist, few gravel			
5					**BORING TERMINATED AT 4.0 FEET** No groundwater encountered Boring backfilled with soil cuttings			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring; ---SPT; ---Small Bulk; ---Large Bulk; ---No Recovery; ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Matlock Design Group	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	1780 Orchard Heights Avenue	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Nik
PROJECT NO.:	3538-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	5/2/2023

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: I-2** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Fan Deposits:** Silty f-c SAND, light brown, slightly moist, trace organics			
					Silty f-c SAND, brown to dark brown, moist, few gravel			
					BORING TERMINATED AT 3.0 FEET			
5					No groundwater encountered Boring backfilled with soil cuttings			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Matlock Design Group	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	1780 Orchard Heights Avenue	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Nik
PROJECT NO.:	3538-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	5/2/2023

BORING NO.: B-1

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Fan Deposits:** Silty f-c SAND, light brown, slightly moist, trace organics			
					Silty f-c SAND, brown to dark brown, moist, few gravel			
5								
				SM/SC	Silty/clayey f-c SAND, brown, moist, trace gravel			
10								
				SM	Silty f-c SAND, brown, moist, few gravel			
15					**BORING TERMINATED AT 15.0 FEET**			
					No groundwater encountered			
					Boring backfilled with soil cuttings			
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

APPENDIX B

PERCOLATION DATA AND CONVERSION SHEETS

Calvary Chapel
1780 Orchard Heights Avenue
Beaumont, Riverside County, California
Project No. 3538-CR

GEOTEK

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-GR

Test Hole No.: I-1 **Tested By:** _____ **Date:** 5/3/23

Depth of Hole As Drilled: 4' **Before Test:** 4' **After Test:** 4'

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
1	9:30 9:55	25	48	24	30.0"	6"		<6" IN 25 MIN 5/2/23
2	9:55 10:20	25	48	24	29.7"	5.7"		
3	7:30 8:00	30	48	24	30.5	6.5		STARTED TEST ON 5/3/23
4	8:00 8:30	30	48	24	30.2	6.2		
5	8:31 9:01	30	48	24	30.2	6.2		
6	9:01 9:31	30	48	24	30.2	6.2		
7	9:31 10:01	30	48	24	30.1	6.1		
8	10:02 10:32	30	48	24	30.1	6.1		
9	10:32 11:02	30	48	24	30.0	6.0		
10	11:02 11:32	30	48	24	30.0	6.0		

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-CR

Test Hole No.: I-1 **Tested By:** _____ **Date:** 5/3/23

Depth of Hole As Drilled: 4' **Before Test:** 4' **After Test:** 4'

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
11	11:32 / 12:02	30	48	24	30.0	6.0		
12	12:02 / 12:32	30	48	24	29.9	5.9		
13	12:33 / 1:03	30	48	24	29.9	5.9		
14	1.03 / 1:33	30	48	24	29.9	5.9		
	/							
	/							
	/							
	/							
	/							
	/							

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-CK

Test Hole No.: I-2 **Tested By:** DRW **Date:**

Depth of Hole As Drilled: 3' **Before Test:** 3' **After Test:** 3'

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
1	9:32 / 9:57	25	36	24	29.5	5.5		<6" IN 25 MIN
2	9:57 / 10:22	25	36	24	29.1	5.1		
3	7:35 / 8:05	30	36	24	30.1	6.1		STARTED TEST ON 5/3/23
4	8:05 / 8:35	30	36	24	29.9	5.9		
5	8:35 / 9:05	30	36	24	29.7	5.7		
6	9:06 / 9:36	30	36	24	29.5	5.5		
7	9:36 / 10:06	30	36	24	29.4	5.4		
8	10:06 / 10:36	30	36	24	29.4	5.4		
9	10:37 / 11:07	30	36	24	29.3	5.3		
10	11:07 / 11:37	30	36	24	29.3	5.3		

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-CR

Test Hole No.: _____ **Tested By:** _____ **Date:** _____

Depth of Hole As Drilled: _____ **Before Test:** _____ **After Test:** _____

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
11	11:37 / 12:07	30	36	24	29.3	5.3		
12	12:07 / 12:37	30	36	24	29.2	5.2		
13	12:38 / 1:08	30	36	24	29.2	5.2		
14	1:08 / 1:38	30	36	24	29.2	5.2		
	/							
	/							
	/							
	/							
	/							
	/							

Client:	**Matlock Design Group**
Project:	**1780 Orchard Heights Avenue**
Project No:	**3538-CR**
Date:	**5/3/2023**

Boring No. **I-1**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	30
Final Depth to Water, D_F =	29.9
Test Hole Radius, r =	4
Initial Depth to Water, D_O =	24
Total Test Hole Depth, D_T =	48

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	24
$H_F = D_T - D_F$ =	18.1
$\Delta H = \Delta D = H_O - H_F$ =	5.9
$H_{avg} = (H_O+H_F)/2$ =	21.05

I_t = 1.02 **Inches per Hour**

GEOTEK

Client:	**Matlock Design Group**
Project:	**1780 Orchard Heights Avenue**
Project No:	**3538-CR**
Date:	**5/3/2023**

Boring No. **I-2**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	30
Final Depth to Water, D_F =	17.3
Test Hole Radius, r =	4
Initial Depth to Water, D_O =	12
Total Test Hole Depth, D_T =	36

Equation - $I_t = \dfrac{\Delta H\ (60r)}{\Delta t\ (r+2H_{avg})}$

$H_O = D_T - D_O$ =	24
$H_F = D_T - D_F$ =	18.7
$\Delta H = \Delta D = H_O - H_F$ =	5.3
$H_{avg} = (H_O+H_F)/2$ =	21.35

I_t = 0.91 **Inches per Hour**

GEOTEK

Beaumont-Cherry Valley Water District
560 Magnolia Avenue, Beaumont, CA 92223
www.bcvwd.gov

Board of Directors

Andy Ramirez
Division 1

Lona Williams
Division 2

Daniel Slawson
Division 3

John Covington
Division 4

David Hoffman
Division 5

December 10, 2024

Julie Montgomery
West Coast Entitlement
543 W County Line Rd
Calimesa, CA 92320

Subject: **Fire Flow Analysis and Fire Hydrant Location**
Riverside County Assessor's Parcel No. 408-070-012
1780 Orchard Heights Avenue, Beaumont, CA 92223

The Applicant (Julie Montgomery) has requested that the Beaumont-Cherry Valley Water District verify the closest approved fire hydrant location(s) and confirm static pressures and fire flow capabilities in the existing water system in accordance with Riverside County Fire Department requirements for the construction of a new, 11,000 sf worship building, a new 5,000 sf children's center, and a 7,700 sf recreation building to be located on APN 408-070-012.

This property is located within the City of Beaumont, California. See "Figure 1-Riverside County Assessor's Parcel No. 408-070-012 Property Location and Fire Hydrant Location Map" (attached) for the District's understanding of the property location, the location of the new structures, and associated fire hydrant location.

The District has a Fire Hydrant located near the subject property. The nearest District Fire Hydrant (Identified as Fire Hydrant No. 1) is located approximately **713 feet** north of the proposed structures, measured to the furthest portion of the furthest proposed structure along exterior ground floor walls, per the District's understanding of the proposed structure locations (see Figure No. 1).

Said Fire Hydrant No. 1 is supported by a 12" water main and has one 2-½" outlet and one 4" outlet.

The District understands that the fire department is requiring the water system to deliver a fire flow of **1,500 gallons per minute with a 20 psi residual for a 2 hour duration** to a fire hydrant within the vicinity of the subject property. Should the fire department requirements differ from the analysis provided, an additional analysis may be required.

Fire Hydrant No. 1 is **capable** of providing said flows and residual 20 psi as requested. See below for further information.

We have reviewed our water system in the area and have identified the Subject Property is located within the District's **3040 pressure zone**. The District has modeled fire flows of various demand scenarios during current and future Maximum Day Demand Conditions to Fire Hydrant No. 1 as described above using the District's water system modeling program. The model analysis shows the District's existing water system is capable of delivering fire flow and Max Day Demand residual pressures at Fire Hydrant No. 1 under said operating conditions for **2 hours**. The modeling results are as follows:

Fire Hydrant Fire Flow

Fire Hydrant No.	Fire Flow Modeled (Gallons Per Minute)	Minimum Residual Pressure at Fire Hydrant
Fire Hydrant No. 1	1,500 gpm	88 psi

The District also modeled peak hour demands in the vicinity of the Subject Property in order to identify minimum system operating pressures available for sprinkler design using the District's water system modeling program. Modeling results are based upon current and future area development and show the District's water system will be capable of maintaining system pressures at the identified property under peak hour operating conditions at ultimate development conditions (worst case scenario) as follows:

Location of Water Service	Condition	System Pressure[(1)]
APN 408-070-012	3040 Zone Peak Hour System Operating Condition	96 psi

(1) Does not include service run, meter, or onsite backflow or onsite pipeline hydraulic losses

The estimated static water pressure at the Fire Hydrant No. 1 based upon the District's 3040 pressure zone reservoir elevations will be as follows:

Minimum Static Pressure: 94 PSI
Maximum Static Pressure: 108 PSI

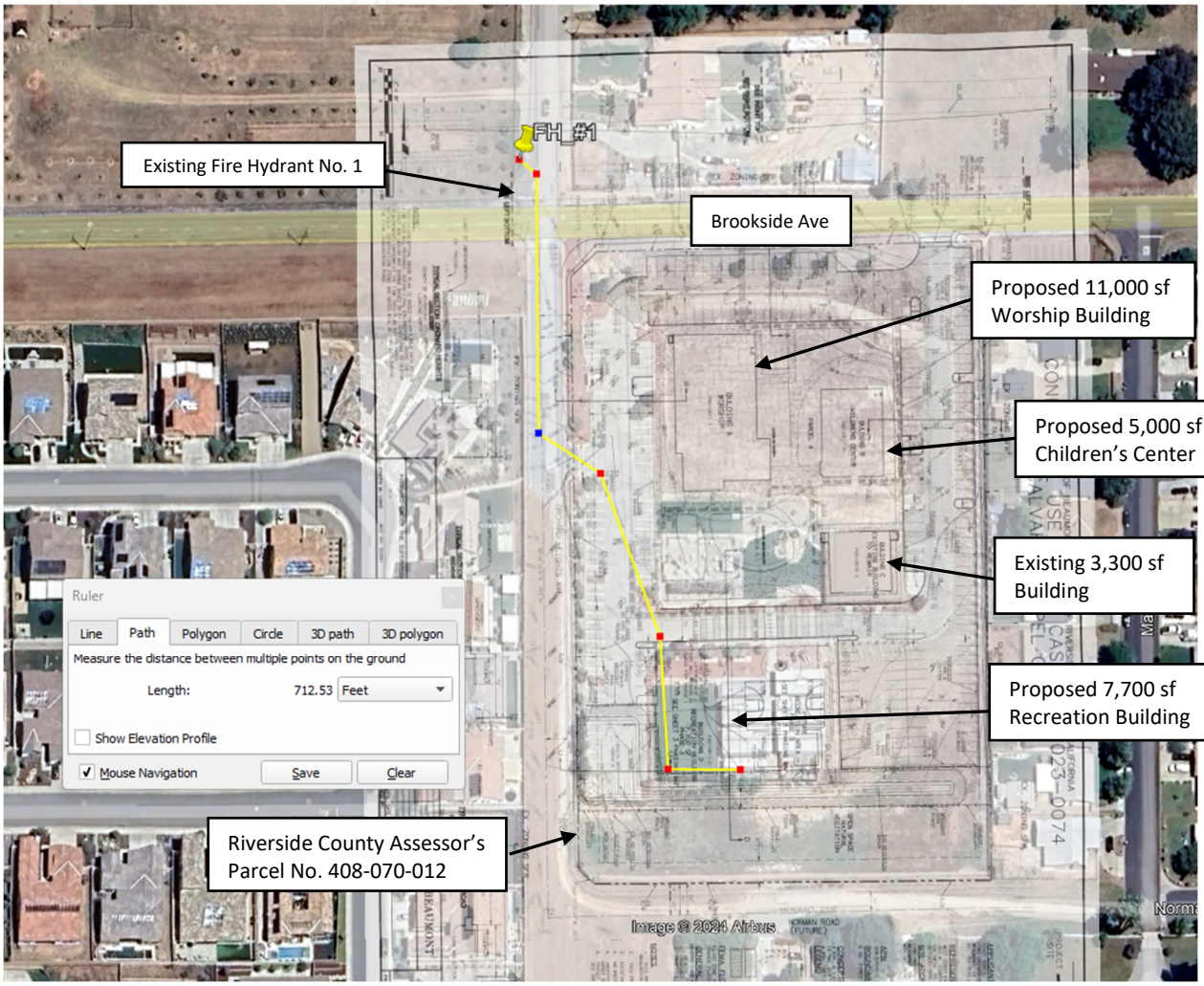
Please call at (951) 845-9581, extension 218 if you have any questions or email me at mark.swanson@bcvwd.gov.

Sincerely,

Mark Swanson, PE
Director of Engineering
Beaumont-Cherry Valley Water District
Tel: (951) 845-9581 x 218 | Fax: (951) 845-0159

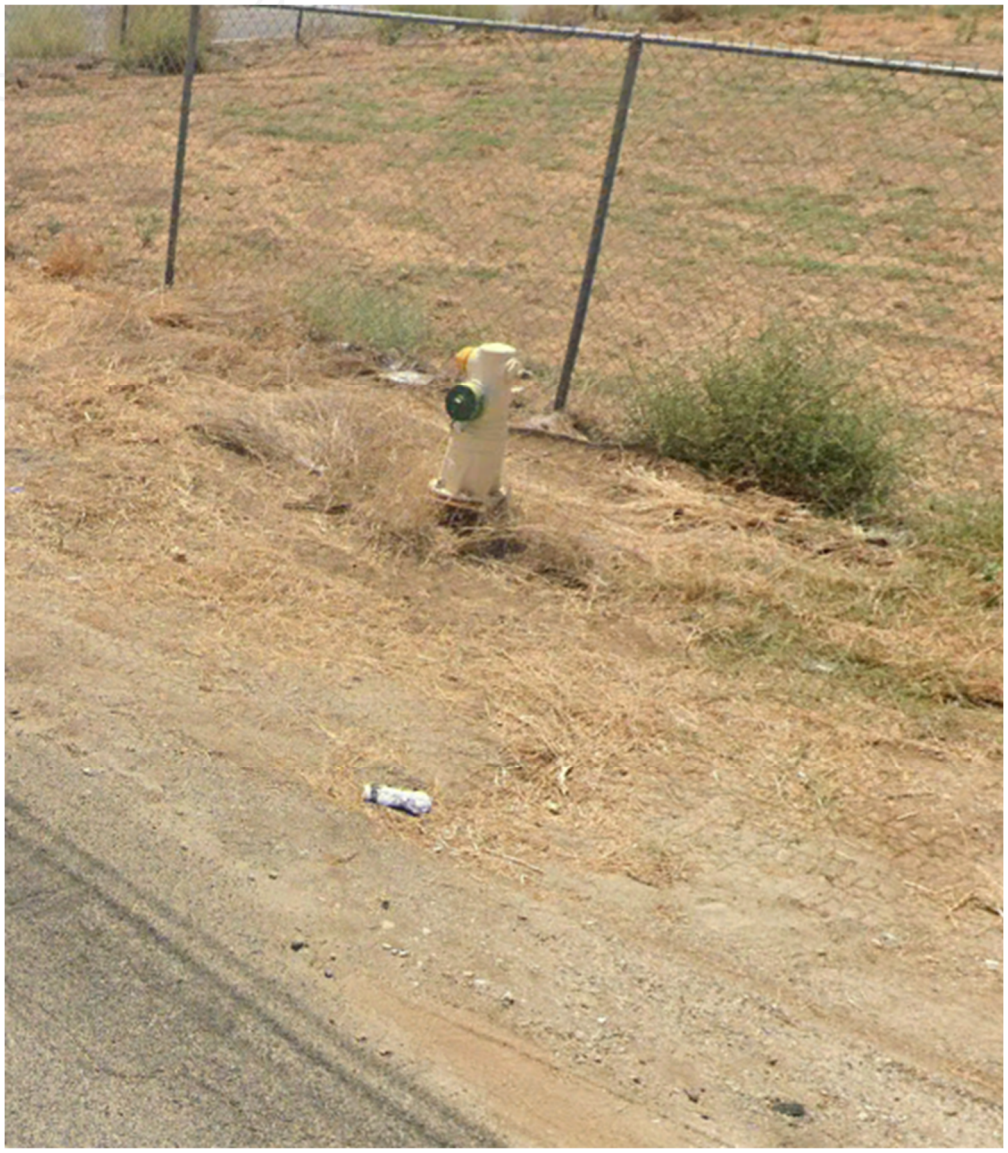
MBS/ejw
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Figure 1
Property Location and Fire Hydrant Location Map
(Riverside County APN 408-070-012)



Not to Scale

Figure 2 – Fire Hydrant No. 1
(Along the west side of Winesap Avenue)



Beaumont-Cherry Valley Water District
560 Magnolia Avenue, Beaumont, CA 92223
www.bcvwd.org

July 25, 2024

Board of Directors

Andy Ramirez
Division 1

Lona Williams
Division 2

Daniel Slawson
Division 3

John Covington
Division 4

David Hoffman
Division 5

Travis Heaps
Calvary Chapel
543 W County Line Rd
Calimesa, CA 92320

Subject here: **Will Serve Letter**
Calvary Chapel (APN 408-070-012)
Beaumont, CA

To whom it may concern:

At the regular meeting of the Beaumont-Cherry Valley Water District Board of Directors held on July 10, 2024, your request for water service ("Will Serve Letter") for the above referenced property Riverside County No. (APN) 408-070-012 was approved for water service for the proposed parcel expansion as set forth in the July 10, 2024 Staff Report and associated project information provided as part of that "Will Serve Letter" request package.

The Beaumont Cherry Valley Water District will provide water service to the subject property for the Phase I and Phase II development conditions and associated water demand conditions set forth in the District's July 10, 2024 Staff Report related to this item, but not limited to, the Rules and Regulations Governing Water Service as amended by the Board of Directors from time to time.

We look forward to working with you in the coming months and please feel free to contact the office should you have any questions.

This letter will expire **July 10,2025** from the date of issue.

Sincerely,

Daniel K. Jaggers
BCVWD
General Manager

DKJ/lmt

Attachments: 1.
1. Request for Will-Serve Letter for Riverside County Assessor's Parcel No. (APN) 408-070-012 located at the Southeast corner of Brookside Avenue and Orchard Heights Avenue in the City of Beaumont

STAFF REPORT

TO: Board of Directors

FROM: Dan Jaggers, General Manager

SUBJECT: **Request for Increase of Water Service *Will-Serve Letter* for an Expansion to the Existing Calvary Chapel Church Located on Riverside County Assessor's Parcel Number (APN) 408-070-012 on the Southeast Corner of Brookside Avenue and Orchard Heights Avenue**

Staff Recommendation

Consider the request for water service *Will-Serve Letter* for the proposed expansion to the Calvary Chapel church located on Riverside County Assessor's Parcel Number (APN) 408-070-012 subject to payment of all deposits and fees to the District and securing all approvals from the City of Beaumont, and:

A. Approve the Application and furnish an increase to service *Will-Serve Letter* per conditions as enumerated, or

B. Deny the Application for water service

Executive Summary

The Applicant, Travis Heaps (on behalf of Calvary Chapel), has requested domestic and irrigation water service from the District for the proposed expansion to the existing property located at 1780 Orchard Heights Avenue (see Attachment 1 – APN 408-070-012 Location Map). The Project is currently receiving water service from the District and is requesting an increase to service *Will-Serve Letter* for the increase in water consumption based on the proposed improvements. A summary of the existing Church Project has been provided in Table 1, below.

Table 1 – Project Summary

Applicant	Travis Heaps (on behalf of Calvary Church)
Owner / Developer	Calvary Chapel – Beaumont
Development Type	Commercial
Development Name	Calvary Chapel
Annexation Required (Yes/No)	No
Existing Total Consumption	2.5 EDUs
Estimated Potable Consumption	1.0 EDU
Estimated Non-Potable Consumption	3.8 EDUs
Total Increased Water Consumption	2.3 EDUs

Background

The Applicant, Travis Heaps (on behalf of Calvary Chapel), has requested an increase of water service from the District for the increase in water demand (allocation) to the existing church located at 1780 Orchard Heights Avenue which proposes construction of a new worship building, future children's center and recreation building (see Attachment 2 – APN 408-070-012 Site Plan). The recreation building (Phase 3) is not included as a part of the Project at this time (see

Attachment 3 – Phasing Plan) and is not included in the estimated water demands in Table 1. Said future building will be required to an additional service request in the future.

The Project is currently served by a combination meter which provides the existing domestic, irrigation and fire flow demands located at the northwest corner of the parcel by a 12-inch 3040 Pressure Zone (PZ) steel pipeline. The Applicant will be required to install a separate irrigation meter with backflow assembly to service the irrigation demands of the Project, which is the current District standard. The existing combination meter may continue to be utilized for domestic and fire demands so long as the size of the system is able to meet the fire flow demands.

Discussion

The Applicant has worked with District staff to estimate the Project water consumption for this Project as well as existing facilities which has been summarized in Table 2, below.

Table 2 – Proposed and Existing Water Consumption

Demand	Estimate Consumption (GPD)	Estimate Consumption (EDUs)
Potable Water Demand	487	1.0
Irrigation Water Demand	1,851	3.8
Total Water Demand	**2,338**	**4.8**

District staff analyzed the historical existing water consumption for the existing site and has summarized the results in Table 3, below.

Table 3 – Existing Water Consumption

Demand	Est. Consumption (GPD)	Est. Consumption (EDUs)
Potable Water Consumption[1]	487	1.0
Irrigation Water Consumption[1]	731	1.5
Total Water Consumption	**1,218**	**2.5**

1. The domestic and irrigation demands of the existing Project are served from the same meter. The separation of domestic vs irrigation existing consumption has been estimated by District staff.

District staff has compared the proposed total water consumption to the existing water consumption. The Applicant will be credited 2.5 EDUs based upon their existing water consumption. District staff has provided a summary of the net difference in water consumption below, in Table 4.

Table 4 – Water Consumption Summary

Description	Domestic (GPD)	Domestic (EDUs)	Irrigation (GPD)	Irrigation (EDUs)
Proposed Consumption[1]	487	1.0	1,851	3.8
Existing Consumption[2]	487	1.0	731	1.5
Total Net Increase	**0**	**0.0**	**1,120**	**2.3**

1. Values derived from Table 2
2. Values derived from Table 3

As mentioned previously, the Applicant will be required to install a new irrigation meter with a backflow assembly, per District standards. The final domestic and irrigation meter sizes will be determined by the Applicant. Upon approval of service, the Applicant shall pay all applicable District deposits and fees, including, but not limited to, water capacity charges, meter charges, and GIS deposits (as applicable).

Fire Flow requirements will be determined by the City of Beaumont (or County of Riverside) Fire Department and will dictate actual required fire suppression needs of the Project.

Conditions of Development

Prior to final Project development, the following conditions must be met:

1. The Applicant shall conform to all District requirements (including the Regulations Governing Water Service) and/or all City of Beaumont requirements.
2. The Applicant will be required to prepare a water service connection plan / exhibit for irrigation service. Should the proposed project demands exceed the existing potable service capabilities, the Applicant shall be responsible for the design and costs associated with a new fire and potable service connection.
3. The District reserves the right to review annual consumption data (water consumption audit) and adjust the Applicant's capacity charges (facilities fees) at the end of this phase of construction as well as at final buildout of the Project and when project facilities are placed into service, for any amount greater than 4.8 EDUs (1.0 EDU [487 gpd] for the domestic demand and 3.8 EDUs [1,851 gpd] for the irrigation demand) as identified in Table 2.
4. In the event the Applicant constructs facilities which require additional water (i.e., expansion or change of use [Phase 3]), the Applicant will be required to request an additional service increase from the District for the service to facilitate the increased consumption requirements and pay all additional capacity charges (facilities fees) related to these upgrades.
5. To minimize irrigation consumption, the District requires the Applicant conform to all City of Beaumont Amended Chapter 17.06 "Landscape Standards" Ordinance pertaining to water efficient landscape requirements, and the following:
    a. Landscaped areas, which have functional turf, shall have "smart irrigation controllers" which use Evapotranspiration (ET) data to automatically control the watering. Systems shall have an automatic rain sensor to prevent watering during and shortly after rainfall, automatically determine watering schedule based on weather conditions, and not require seasonal monitoring changes.
    b. Landscaping in non-turf areas should be drought-tolerant, consisting of planting materials which are native to the region. Irrigation systems for these areas should be drip or bubbler type.
    c. The District will provide irrigation service so long as landscape areas are not converted to areas of use with water demands greater than the landscape plan which will be added as part of the service agreement. In the event modifications

are made to the landscape the applicant shall require approval for any proposed modifications .

Fiscal Impact

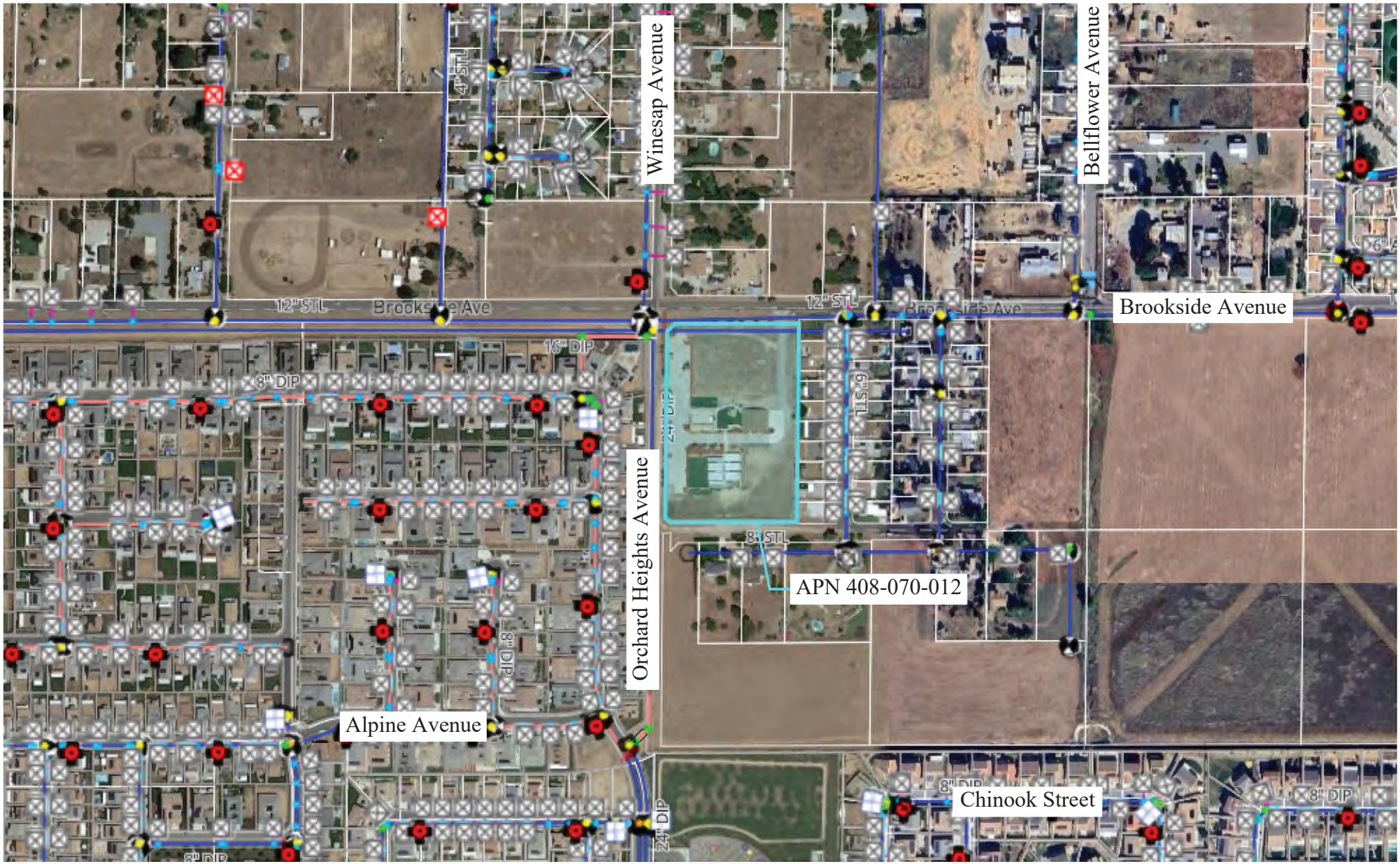
No negative fiscal impact to the District. All fees and deposits will be paid by the Applicant prior to providing service.

Attachments

1. APN 408-070-012 Location Map
2. APN 408-070-012 Site Plan
3. APN 408-070-012 Phasing Plan
4. APN 408-070-012 Will Serve Letter Application

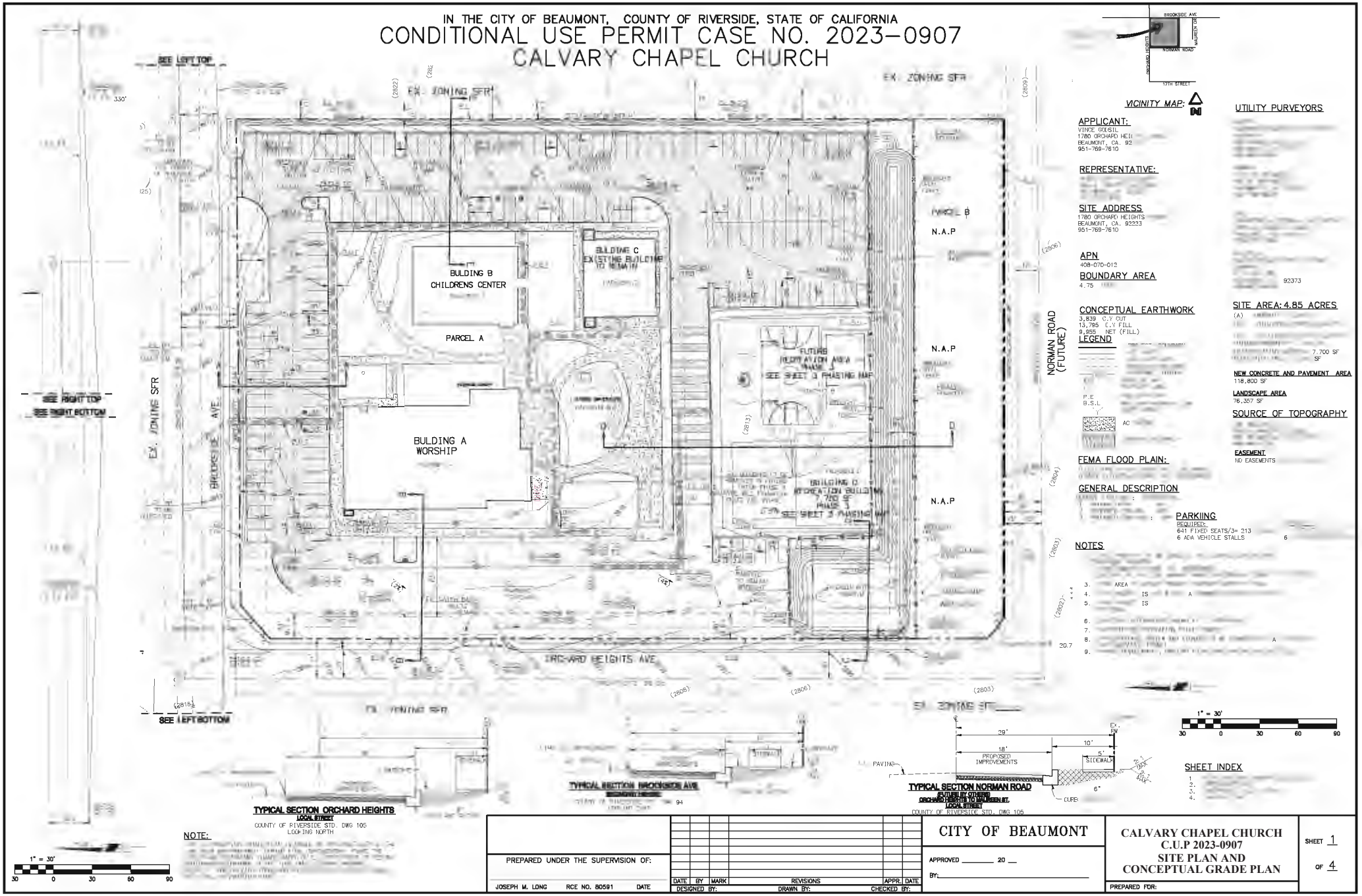
Staff Report prepared by Evan Ward, Civil Engineering Assistant

Attachment 1 - APN 408-070-012 Location Map



N.T.S.

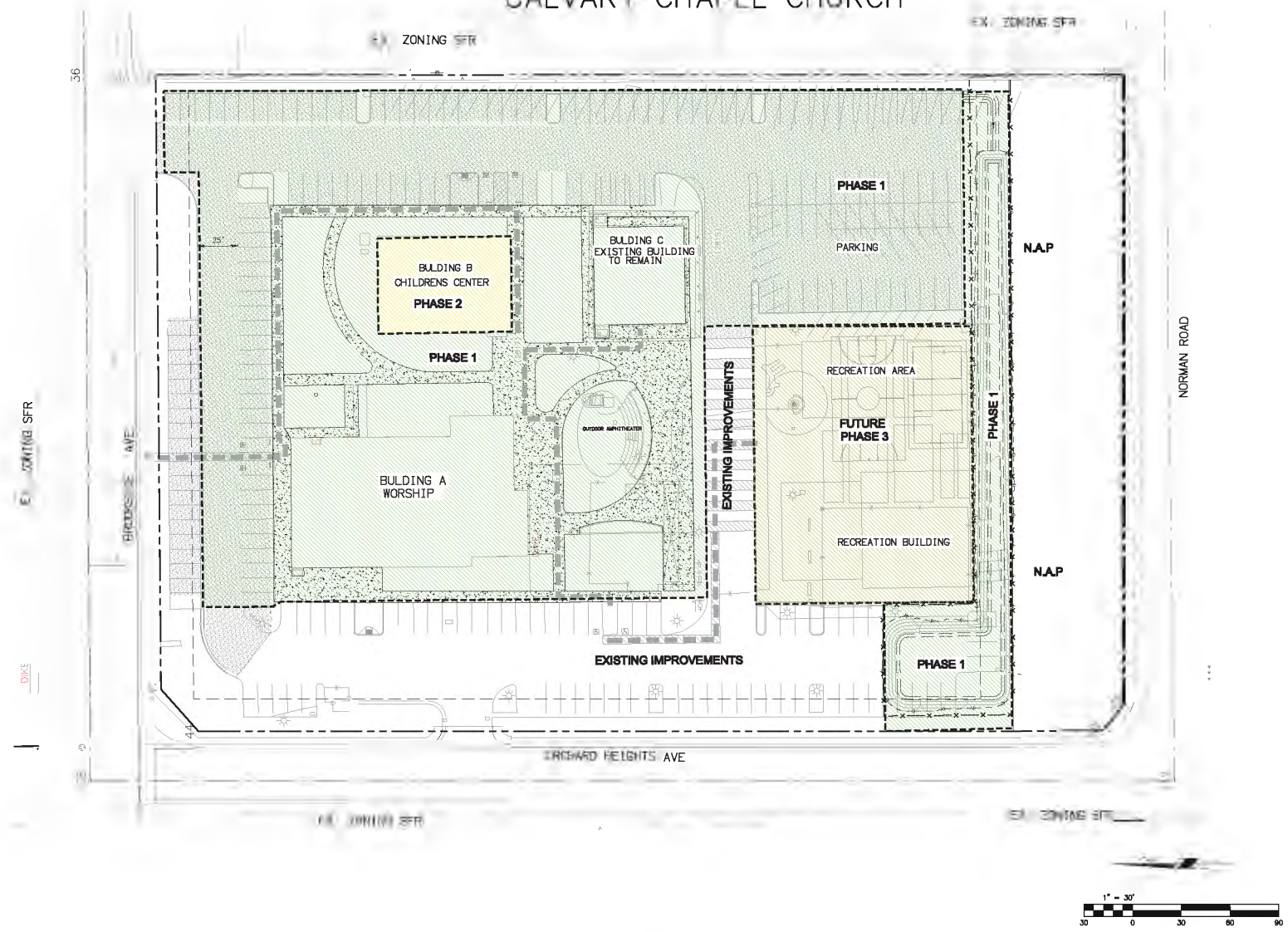
Attachment 2 - APN 408-070-012 Site Plan



Attachment 3 - APN 408-070-012 Phasing Plan

IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

CONDITIONAL USE PERMIT CASE NO. 2023-0907
CALVARY CHAPEL CHURCH



PREPARED UNDER THE SUPERVISION OF: JOSEPH M. LONG RCE NO. 80591 DATE	DATE BY MARK REVISIONS APPR. DATE DESIGNED BY: DRAWN BY: CHECKED BY:	CITY OF BEAUMONT APPROVED _____ 20 __ BY:_____	CALVARY CHAPEL CHURCH C.U.P 2023-0907 PHASING PLAN PREPARED FOR:	SHEET 3 OF 4

Attachment 4 - APN 408-070-012 Will Serve Letter Application

BEAUMONT CHERRY VALLEY WATER DISTRICT
560 Magnolia Avenue • PO Box 2037
Beaumont, CA 92223-2258
Phone (951) 845-9581
www.bcvwd.org

☑ **Will Serve Request** ☐ **Water Supply Assessment (SB210)**

Applicant Name: West Coast Entitlement	Contact Phone # [redacted]
Mailing Address: [redacted]	Fax #: [redacted]
City: [redacted]	E-mail: [redacted]
State & Zip: [redacted]	
Service Address: 1780 Orchard Heights Avenue, Beaumont Ca 92223	
Assessor's Parcel Number (APN), Tract Map No. Parcel Map No.: 408-070-012	
Project Type: ☐ Single-Family ☐ Multi-Family ☐ Commercial/Industrial ☐ Minor Subdivision (5 lots or less) ☐ Major subdivision (6+ lots) ☑ Other	
Site Map Attached: ☑ Yes ☐ No	

The letter should be delivered to:

Recipient: [redacted]

PLEASE CHOOSE ONE:

☑ **Mail (above address)** ☑ **E-mail**
☐ **Fax** ☐ **Will pick up**

The District reserves the right to impose terms and conditions in Will Serve Letters and/or Water Supply Assessment Reports that take into account water availability issues, conservation issues and the District's existing facilities, all of which impact the District's ability to provide service to the subject property and maintain the District's ability to meet existing water demands.

Applicant's Signature

04/16/2024
Date

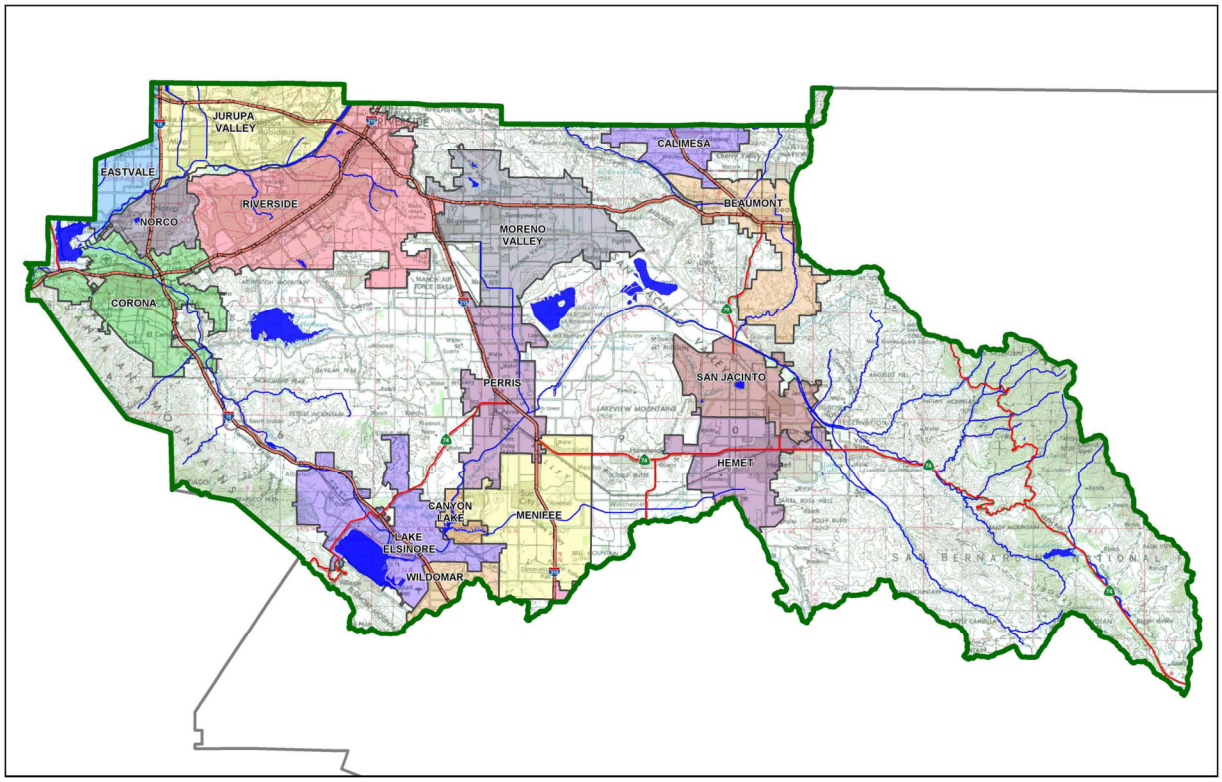
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: Calvary Chapel Beaumont

Development No: N/A

Design Review/Case No: PW2023-1050



☒ **Preliminary**
☐ **Final**

Original Date Prepared: June 2023

Revision Date(s):

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**
Template revised June 30, 2016

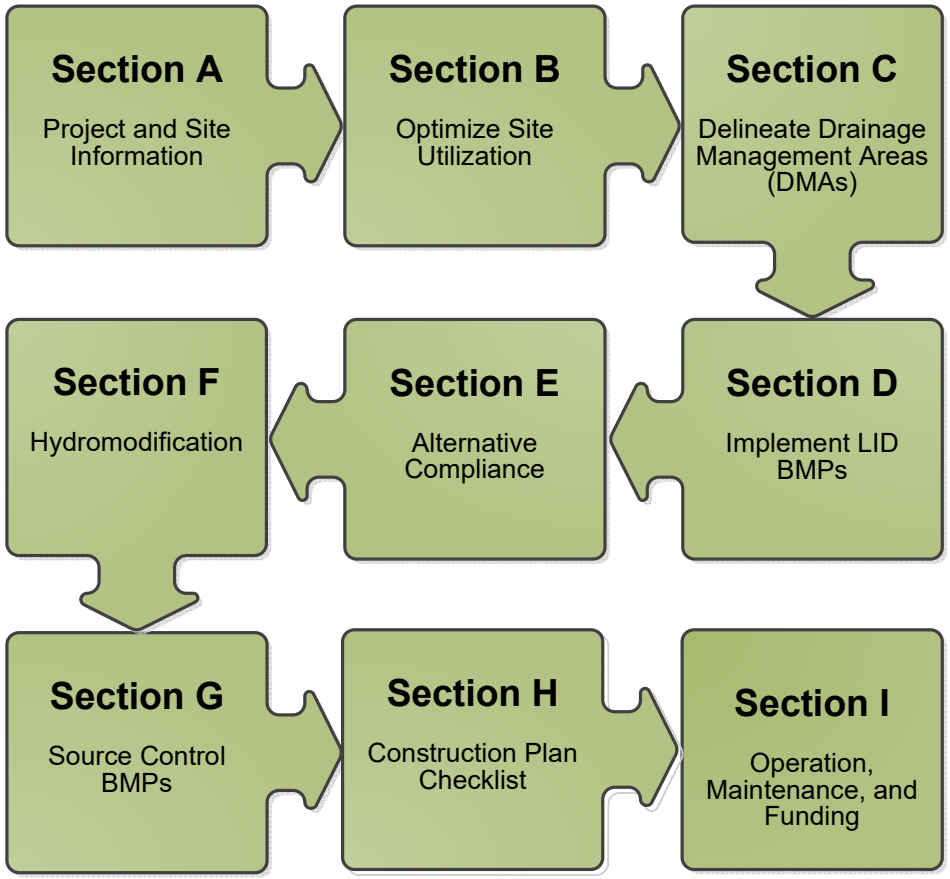
Contact Information:

Prepared for: Premium Land Development
108 Orange Street #5
Redlands, CA 92373

Prepared by: ERSC, Inc.
1861 W. Redlands Blvd.
Redlands, CA 92373.
Trent Brudin, PE, QSD
Engineer IV
909-890-1255

A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Premium Land Development by Engineering Resources of Southern California Inc. for the Calvary Chapel Beaumont project.

This WQMP is intended to comply with the requirements of City of Beaumont for Riverside County's Water Ordinance No. 754 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under Riverside County Water Quality Ordinance No. 754.

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature

10-2-23
Date

Vincent Godsil
Owner's Printed Name

Executive Pastor
Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature

10/01/2023
Date

Trent Brudin, PE
Preparer's Printed Name

Engineer IV
Preparer's Title/Position

Preparer's Licensure:



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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Chapel
Planning Area:	N/A
Community Name:	Calvary
Development Name:	N/A
PROJECT LOCATION	
Latitude & Longitude (DMS): 33°57'37.84"N & 116° 57'17.23"W	
Project Watershed and Sub-Watershed: Santa Ana River	
Gross Acres: 5 Acres APN(s): 408-070-012 Map Book and Page No.: 10/2	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Church, recreation, parking
Proposed or Potential SIC Code(s)	7521, 8661
Area of Impervious Project Footprint (SF)	145,800
Total Area of proposed Impervious Surfaces within the Project Footprint (SF)/or Replacement	145,800
Does the project consist of offsite road improvements?	☒ Y ☐ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the Project limits Footprint (SF)	65,045
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	N/A
Are there any natural hydrologic features on the project site?	☐ Y ☒ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	A
What is the Water Quality Design Storm Depth for the project?	0.85

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling
- BMP Locations (Lat/Long)

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Portrero Creek	Turbidity, Dissolved Oxygen	AGR, GWR, REC 1*, REC 2*, WARM, WILD, RARE	0.53 miles
San Jacinto River	None	AGR, GWR, REC 1*, REC 2*, WARM, WILD, RARE	9.2 miles
Canyon Lake	Nutrients	MUN, AGR, GWR, REC 1*, REC 2*, COMM, WARM, WILD	N/A
San Jacinto River	None	AGR, GWR, REC 1*, REC 2*, COMM, WARM, WILD, RARE	26.9 miles
Lake Elsinore	PCBs, Organic Enrichment/Low Dissolved Oxygen, Nutrients, Toxicity, DDT	REC 1*, REC 2*, COMM, WARM, WILD, RARE	28.7 miles

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)*	☐ Y	☒ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Consideration of "highest and best use" of the discharge should also be considered. For example, Lake Elsinore is evaporating faster than runoff from natural precipitation can recharge it. Requiring infiltration of 85% of runoff events for projects tributary to Lake Elsinore would only exacerbate current water quality problems associated with Pollutant concentration due to lake water evaporation. In cases where rainfall events have low potential to recharge Lake Elsinore (i.e. no hydraulic connection between groundwater to Lake Elsinore, or other factors), requiring infiltration of Urban Runoff from projects is counterproductive to the overall watershed goals. Project proponents, in these cases, would be allowed to discharge Urban Runoff, provided they used equally effective filtration-based BMPs.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

The current drainage pattern for the site directs flow to the southwest corner of the property. This pattern is preserved in our design. The bioretention basin is located in the southern portion of the site and will discharge at the southwest corner. Underdrains will drain to a small pump station and discharge to Orchard Heights Avenue. The basin will also be equipped with an overflow weir. The weir will discharge to Orchard Heights Avenue via an underwalk drain. The weir will not be used for discharging the WQMP design storm, it is designed to satisfy requirements for the 100yr, 24-hour storm. The WQMP storm will be fully treated within the basin. Unit hydrograph and basin routing calculations provided in Section F.2 for HCOC Mitigation show the basin acting to preserve the existing drainage intensity.

Did you identify and protect existing vegetation? If so, how? If not, why?

The existing vegetation includes ornamental landscaping installed as part of the existing site improvements. There is a large portion of the site that is unimproved with general surface weeds. Existing

landscaping will be preserved or replanted where feasible. Unimproved areas will be planted with ornamental landscaping where applicable. Areas of the site that go untouched will retain existing coverage.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

The site is mapped as HSG A but does not have adequate infiltration capacity as indicated by the in-situ infiltration test results. Infiltration will be promoted to the maximum extent possible via the bioretention basin.

Did you identify and minimize impervious area? If so, how? If not, why?

Impervious areas were identified in the proposed design. All impervious areas serve a purpose. The proposed condition will utilize the minimum pervious area needed to satisfy the site design.

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

The site is designed such that runoff is directed to pervious areas where feasible. In addition, the entire site will flow to the bioretention basin to be treated, infiltrated (to the maximum extent possible), and discharged off site in the same general pattern as the existing condition.

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1][2]	Area (Sq. Ft.)	DMA Type
A	Roofs	27,000	D
A	Concrete/Asphalt	118,800	D
A	Ornamental Landscaping	76,357	D

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*
[2]*If multi-surface provide back-up*

Table C.2 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
A	BMP A

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

If yes has been checked, Infiltration BMPs shall not be used for the site; proceed to section D.3

If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		x
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		x
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		x
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	x	
If Yes, list affected DMAs: DMA 1		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		x
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		x
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If none of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: 1.66 Acre

Type of Landscaping (Conservation Design or Active Turf): Conservation Design

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 3.1 Acre

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: 2.12

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: 6.57 Acre

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
6.57 Acre	1.66 Acre

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: 55

Project Type: Church

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 3.35 Acre

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-2 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: 229

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: 767

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)
767	55

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

N/A

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: N/A

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: N/A

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-4 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-4: N/A

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use: N/A

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the projected average daily use (Step 1) to the minimum required non-potable use (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
N/A	*N/A*

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment per Section 3.4.2 of the WQMP Guidance Document.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
A	☐	☐	☒	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

[Not Applicable]

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First**,** calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second**,** design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]			
DMA A Impervious	*27,000*	*Roofs*	*1.0*	*0.89*	*24,084*			
DMA A Impervious	*118,800*	*Concrete/ Asphalt*	*1.0*	*0.89*	*105,969.6*			
DMA A Pervious	*76,357*	*Ornamental Landscaping*	*0.1*	*0.11*	*8,434.2*			
	A_T = Σ[A]	***222,157 SF***			Σ= [D] 138,487.8	*Design Storm Depth (in)* [E] 0.85	*Design Capture Volume,* V_{BMP} *(cubic feet)* $[F] = \frac{[D]x[E]}{12}$ 9,809.6	*Proposed Volume on Plans (cubic feet)* [G] 15,670

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration			
Volume (Cubic Feet)			

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Susceptibility Maps.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

All downstream conveyance channels to Lake Elsinore

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

HCOC exemptions cannot be claimed for this project. Exemption #2 was close, but just out of reach. Runoff volume and runoff rate will be controlled to minimize hydromodification impacts. See below.

-Existing runoff volume (2 yr, 24 hr) = 19,327.4 cf
-Proposed runoff volume (2 yr, 24 hr) = 26,786.5 cf
-Existing peak flow rate (2 yr, 24 hr) = 0.730 cfs
-Proposed peak flow rate (2 yr, 24 hr) = 0.643 cfs (routed and mitigated through bioretention basin)

Runoff Volume: The runoff volume for the proposed condition increases more than 10% from the existing. Per F.2 HCOC Mitigation "c" (above), since the volume cannot infiltrate (due to low in-situ infiltration capacity), and capture/reuse is not feasible, the discharge from the site will need to be mitigated. See "Runoff Rate" discussion below. Post-development and pre-development hydrographs are provided in Appendix 7.

Runoff Rate: Due to routing the stormwater through the bioretention basin, the runoff rate for the proposed condition *decreases* for the 2yr-24hr storm event when compared to the existing. Per F.2 HCOC Mitigation "c" (above), since the runoff rate increase is no greater than 110%, this HCOC is not significant. Post-development and pre-development hydrographs are provided in Appendix 7, along with basin routing calcs.

The methodology of the calculation setup is discussed below.

Unit hydrographs and basin routing calcs were performed using Civil Design Engineering Software. The unit hydrograph cut sheets, which show additional detail, are included in Appendix 7. Manning's "n" of 0.015 was selected for both the existing and proposed conditions. Per the Riverside County Hydrology Manual (April 1978), the description of the conditions that represent an "n" of 0.015 are emulated in both project's site conditions.

The runoff mitigation functionality of the basin is modeled in the basin routing calcs provided in Appendix 7. Some of the inputs at the basin routing calculations are not clearly displayed on the calculation cut sheets and are discussed in more detail below, along with other calculation considerations.

Prior to design, an infiltration evaluation was performed at the project site (see Appendix B). Two borings were analyzed and yielded infiltration rates of 1.02 in/hr and 0.91 in/hr, respectively. Since the WQMP Guidance Document for the Santa Ana Region requires a minimum infiltration rate of 1.6 in/hr for infiltration BMPs, bioretention was pursued as an alternative.

Per the LID BMP Handbook, bioretention facilities are built with an engineered media to promote timely infiltration and treatment of site runoff. Beneath the engineered media, a gravel section and underdrains direct the treated water to the discharge location. In this case, the discharge location will be a small pump station to get the treated water up to the Orchard Heights Avenue gutter. Research performed during design provides that the specifications for the make-up and gradation of the engineered media also specify and long-term infiltration rate of 5 in/hr. The long-term infiltration rate accounts for some losses in infiltration effectiveness overtime. This infiltration rate was applied across the bottom area of the basin (5,590 SF). 5,590 SF and 5in/hr translates to 0.65cfs. This flow rate contributes to the "Outflow" rate shown on page 2 of the basin routing calculations. Please note, 5,590 SF is only the area of the bottom of the basin. This area does not take into account the additional area provided by the 4:1 side slopes at the 1-foot ponding depth (see basin cross section sketch in Appendix 1). The smaller bottom area was used as a factor of safety in case infiltration capacity deteriorates further than what was accounted for in the long-term infiltration rate.

Since bioretention BMPs are also intended to maximize the site natural infiltration rate, the in-situ infiltration rate was also considered during the design and applied to the "Outflow" rate shown on page 2 of the basin routing calculations. As discussed above, the infiltration evaluation performed by GeoTek, Inc. found natural infiltration rates of 1.02 in /hr and 0.91 in/hr, respectively (see Appendix 3). Therefore, to account for natural infiltration, while still considering a safety factor, an infiltration rate of 0.5in/hr was applied to the "Outflow" rate shown on page 2 of the basin routing calculations. Note, as discussed above, this infiltration rate was also only applied to the bottom area of the basin (5,590 SF), which translates to 0.06cfs.

The bioretention basin is also equipped with a 1-foor-long rectangular weir. The weir is placed 1-foot above the bottom of the basin which allows for maintaining the health of the bioretention components, minimizes ponding for safety, and decreases drawdown times. The weir discharge rate is calculated using the weir equation: $Q = 3LH^{3/2}$, where L is 1-foot and H is the height of the water surface about the weir (varies). As seen in the table on page 2 of the basin routing calcs, the "Outflow" rate only increases above the 5-foot depth. This is because the bottom of the weir is set at this elevation. For the 2-year, 24-hour storm, the water surface does not get deep enough to breach the weir and only relies on infiltration. The "Outflow" column on page 2 of the basin routing calculations has a consistent 0.71 CFS in the first few cells, which is representative of only relying on infiltration at the bioretention basin (0.06 cfs + 0.65 cfs = 0.71 cfs).

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On-site storm drain inlets	Inlets will be marked with "Only Rain Down the Storm Drain" or similar.	-Maintain and periodically repaint or replace inlet markings. -Provide stormwater pollution prevention information to new site owners, lessees, or operators. -See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA

		Stormwater Quality Handbooks at www.cabmphandbooks.com -Include the following in lease agreements: “Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains.”
Need for future indoor & structural pest control	Standard building design features will deter pest entry (windows, doors, solid roof and walls)	Provide Integrated Pest Management (IMP) information to owners, lessees, and operators. IMP is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism.
Landscape/Outdoor pesticide use	Landscaping is designed to minimize irrigation and runoff, promote surface infiltration, and minimize the use of fertilizers and pesticides. Pest-resistant plants can be considered to promote limited use of pesticides, especially adjacent to hardscape. To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	Maintain landscaping using minimum or no pesticides. Provide IPM information to new owners, lessees and operators. IMP is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism.
Refuse areas	Covered refuse containers and municipal trash service are present to dispose of refuse. “Do not dump hazardous materials here” signage will be posted.	An adequate number of trash receptacles will be present. Receptacles will be inspected and repaired regularly. Receptacles will be kept covered. Inspect and clean litter and spills daily. Keep spill containment

		materials on site. See CASQA Fact Sheet SC-3 in Appendix 10.
Fire sprinkler test water	Building design will provide a means to drain fire sprinkler test water to the sanitary sewer.	See the note in Fact Sheet SC-41, "Building and Grounds maintenance," in Appendix 10.
Roofing, gutters, and trim	Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff	N/A
Condensate Drain Lines	Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.	N/A
Plazas, sidewalk, and parking lots	N/A	See SC-71 in Appendix 10. Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect wash water containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)	BMP Location (Lat/Long)
A	Bioretention Basin	Precise Grading Plan	33°57’36.17”N / 16°57’19.04”W

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: See Appendix 9 and 10

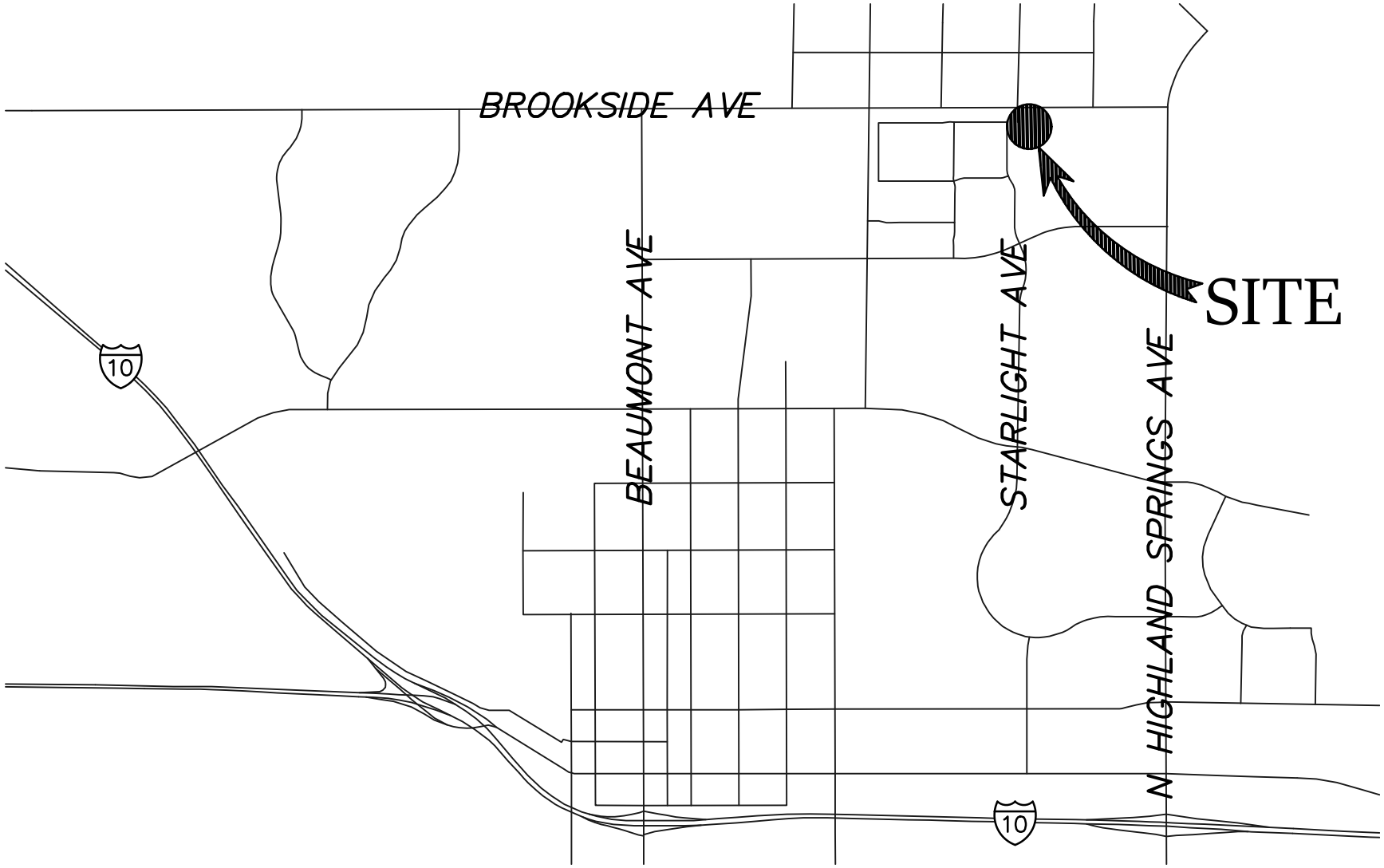
Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☐ Y ☒ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

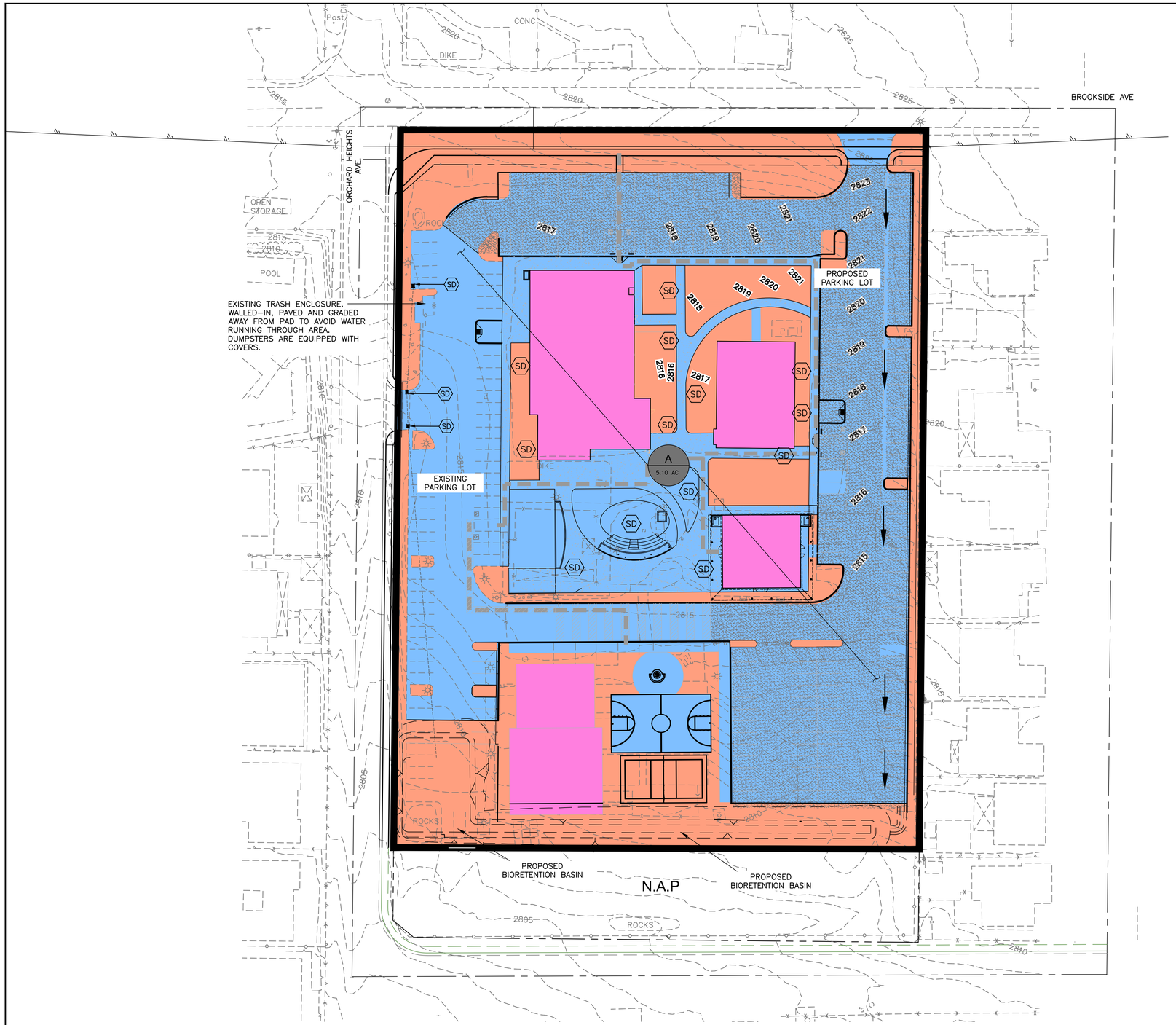


ERSC INC.COM
Engineering Resources of Southern California
1861 W. Redlands Blvd.
Redlands, Ca. 92373
909.890.1255

WQMP VICINITY MAP

CALVARY CHAPEL
SITE IMPROVEMENT

T:\Projects\23005001 - Calvary Chapel Beaumont\DESIGN\REPORTS & STUDIES\WQMP\CAD\5001-WQMP VICINITY MAP.dwg Jun06,2023



LEGEND

- SD — STORM DRAIN INLET
- DMA BOUNDARY
- WATERCOURSE
- 1000 — ELEVATION
- X / X.XX AC — DRAINAGE AREA
- ROOFS
- CONCRETE/ASPHALT
- ORNAMENTAL LANDSCAPING

SURFACE TYPE	AREA (SF)
ROOFS (IMP)	27,000
CONCRETE OR ASPHALT (IMP)	118,800
ORNAMENTAL LANDSCAPING (PER)	76,357
TOTAL	222,157

REQUIRED DCV (CF)	REQUIRED BIORETENTION AREA (SF)
9,810	5,723

PROVIDED DCV (CF)	PROVIDED BIORETENTION AREA (SF)
15,670	9,058

(AREA @ BOTTOM OF BASIN = 5,590 SF)
(AREA @ 1FT DEPTH = 9,058 SF)

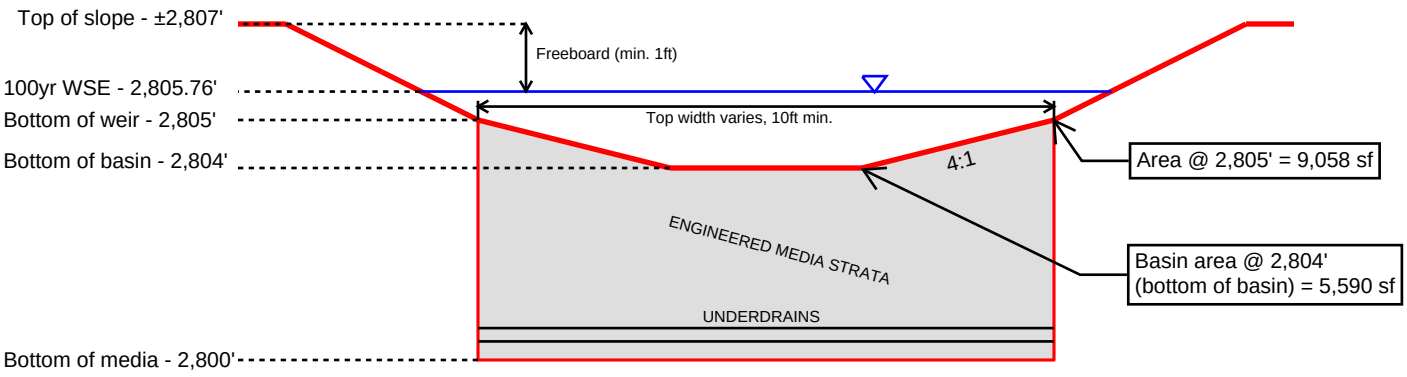
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0 40 80 120
FEET

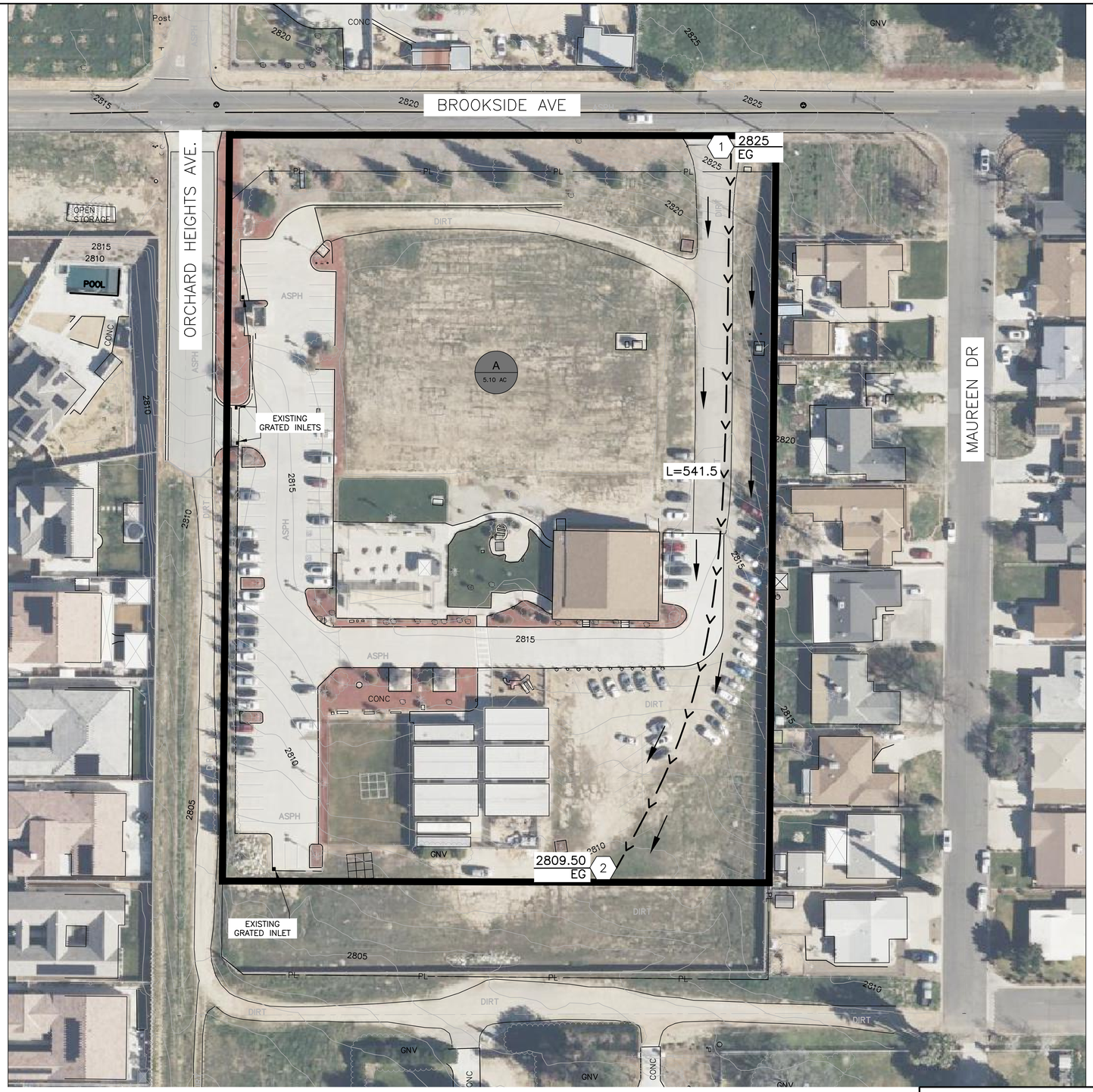
ERSC INC.COM
Engineering Resources of Southern California
1861 W. Redlands Blvd, Bldg 7B
Redlands, Ca. 92373
P: (909) 890-1255
F: (909) 890-0995

CITY OF BEAUMONT

WQMP MAP
CALVARY CHAPEL BEAUMONT

BIORETENTION BASIN CROSS-SECTION





LEGEND

- 1 — NODE NUMBER
- WATERSHED BOUNDARY
- WATERCOURSE
- FLOW LINE
- 1000 — ELEVATION
- L=100 — LENGTH IN FEET
- X / X.XX AC — DRAINAGE AREA

RATIONAL METHOD		
AREA	Q (10 YR STORM)	Q (100 YR STORM)
A	6.03 CFS	11.88 CFS

UNIT HYDROGRAPH		
AREA	Q (100 YR, 24 HR)	FLOOD VOLUME (100 YR, 24 HR)
A	3.14 CFS	51,127 CF

1" = 40'
0 40 80 120
FEET

CITY OF BEAUMONT

EXISTING HYDROLOGY MAP
CALVARY CHAPEL BEAUMONT

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F: (909) 890-0995



LEGEND

- 1 — NODE NUMBER
- WATERSHED BOUNDARY
- WATERCOURSE
- FLOW LINE
- 1000 — ELEVATION
- L=100 — LENGTH IN FEET
- X / X.XX AC — DRAINAGE AREA
- SD — STORM DRAIN INLET

RATIONAL METHOD		
AREA	Q (10 YR STORM)	Q (100 YR STORM)
A	9.45 CFS	15.50 CFS

UNIT HYDROGRAPH		
AREA	Q (100 YR, 24 HR)	FLOOD VOLUME (100 YR, 24 HR)
A	3.97 CFS	82,180 CF

BASIN ROUTING			
AREA	MAX DISCHARGE (100 YR, 24 HR)	MAX STORAGE VOLUME (100 YR, 24 HR)	MAX PONDING (100 YR, 24 HR)
A	2.99 CFS	21,562 CF	1.76 FT

1" = 40'

0 40 80 120

FEET

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Engineering Resources of Southern California
1861 W. Redlands Blvd, Bldg 7B
Redlands, Ca. 92373
P: (909) 890-1255
F: (909) 890-0995

CITY OF BEAUMONT

PROPOSED HYDROLOGY MAP
CALVARY CHAPEL BEAUMONT

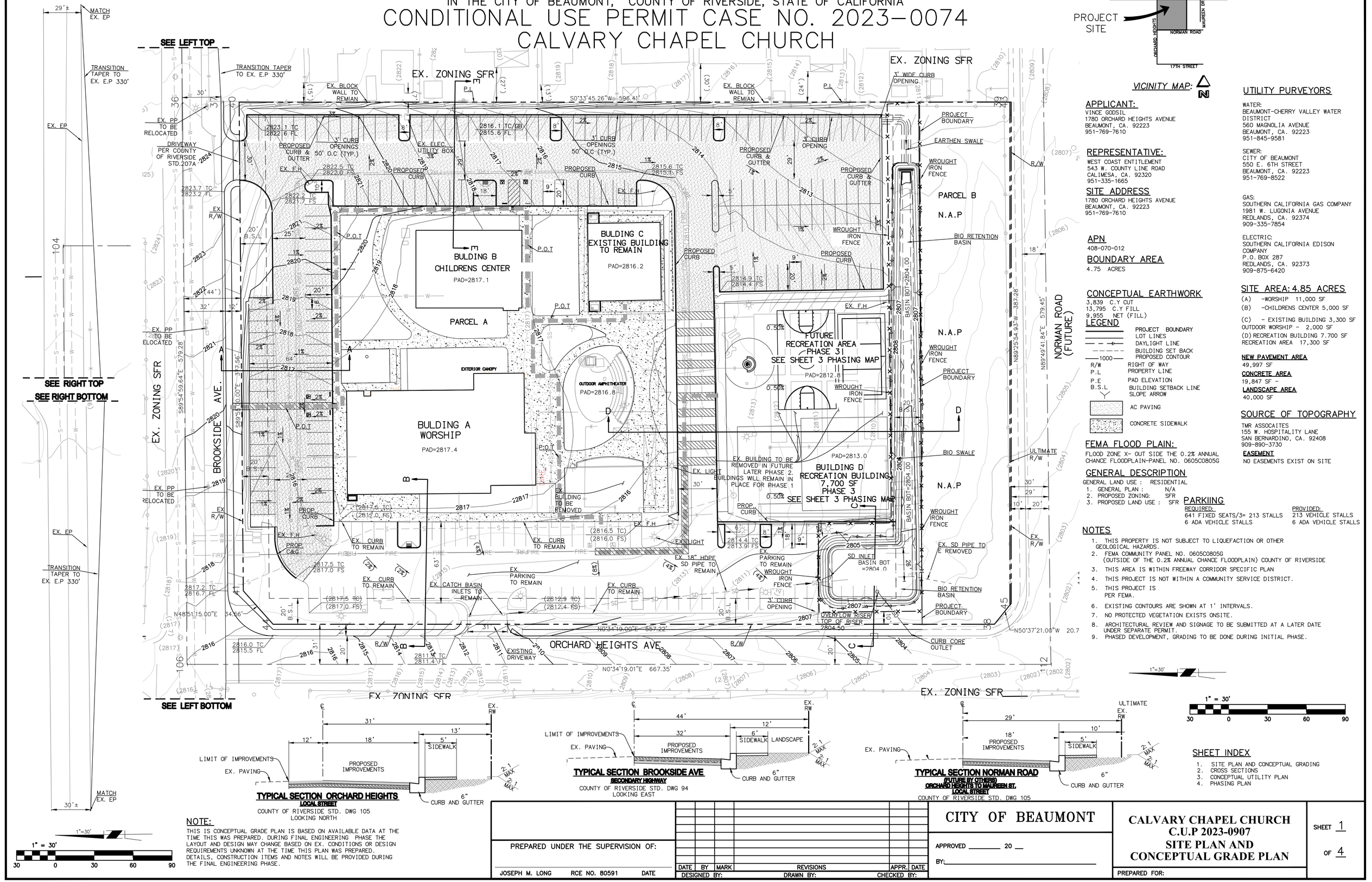
Appendix 2: Construction Plans

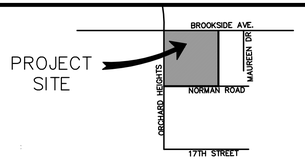
Grading and Drainage Plans

IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

CONDITIONAL USE PERMIT CASE NO. 2023-0074

CALVARY CHAPEL CHURCH





VICINITY MAP:

APPLICANT:
VINCE GODSIL
1780 ORCHARD HEIGHTS AVENUE
BEAUMONT, CA. 92223
951-769-7610

REPRESENTATIVE:
WEST COAST ENTITLEMENT
543 W. COUNTY LINE ROAD
CALIMESA, CA. 92320
951-335-1665

SITE ADDRESS
1780 ORCHARD HEIGHTS AVENUE
BEAUMONT, CA. 92223
951-769-7610

APN
408-070-012

BOUNDARY AREA
4.75 ACRES

CONCEPTUAL EARTHWORK
3,839 C.Y CUT
13,795 C.Y FILL
9,955 NET (FILL)

LEGEND
- PROJECT BOUNDARY
- LOT LINES
- DAYLIGHT LINE
- BUILDING SET BACK
- 1000 PROPOSED CONTOUR
- R/W RIGHT OF WAY
- P.L PROPERTY LINE
- P.E PAD ELEVATION
- B.S.L BUILDING SETBACK LINE / SLOPE ARROW
- AC PAVING
- CONCRETE SIDEWALK

FEMA FLOOD PLAIN:
FLOOD ZONE X- OUT SIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN-PANEL NO. 0605C0805G

GENERAL DESCRIPTION
GENERAL LAND USE : RESIDENTIAL
1. GENERAL PLAN : N/A
2. PROPOSED ZONING: SFR
3. PROPOSED LAND USE : SFR

PARKIING
REQUIRED:	PROVIDED:
641 FIXED SEATS/3= 213 STALLS	213 VEHICLE STALLS
6 ADA VEHICLE STALLS	6 ADA VEHICLE STALLS

NOTES
1. THIS PROPERTY IS NOT SUBJECT TO LIQUEFACTION OR OTHER GEOLOGICAL HAZARDS.
2. FEMA COMMUNITY PANEL NO. 0605C0805G (OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) COUNTY OF RIVERSIDE
3. THIS AREA IS WITHIN FREEWAY CORRIDOR SPECIFIC PLAN
4. THIS PROJECT IS NOT WITHIN A COMMUNITY SERVICE DISTRICT.
5. THIS PROJECT IS PER FEMA.
6. EXISTING CONTOURS ARE SHOWN AT 1' INTERVALS.
7. NO PROTECTED VEGETATION EXISTS ONSITE.
8. ARCHITECTURAL REVIEW AND SIGNAGE TO BE SUBMITTED AT A LATER DATE UNDER SEPARATE PERMIT.
9. PHASED DEVELOPMENT, GRADING TO BE DONE DURING INITIAL PHASE.

UTILITY PURVEYORS
WATER:
BEAUMONT-CHERRY VALLEY WATER DISTRICT
560 MAGNOLIA AVENUE
BEAUMONT, CA. 92223
951-845-9581

SEWER:
CITY OF BEAUMONT
550 E. 6TH STREET
BEAUMONT, CA. 92223
951-769-8522

GAS:
SOUTHERN CALIFORNIA GAS COMPANY
1981 W. LUGONIA AVENUE
REDLANDS, CA. 92374
909-335-7854

ELECTRIC:
SOUTHERN CALIFORNIA EDISON COMPANY
P.O. BOX 287
REDLANDS, CA. 92373
909-875-6420

SITE AREA: 4.85 ACRES
(A) -WORSHIP 11,000 SF
(B) -CHILDRENS CENTER 5,000 SF
(C) - EXISTING BUILDING 3,300 SF
OUTDOOR WORSHIP - 2,000 SF
(D) RECREATION BUILDING 7.700 SF
RECREATION AREA 17,300 SF

NEW PAVEMENT AREA
49,997 SF
CONCRETE AREA
19,847 SF -
LANDSCAPE AREA
40,000 SF

SOURCE OF TOPOGRAPHY
TMR ASSOCAITES
155 W. HOSPITALITY LANE
SAN BERNARDINO, CA. 92408
909-890-3730

EASEMENT
NO EASEMENTS EXIST ON SITE

SHEET INDEX

1. SITE PLAN AND CONCEPTUAL GRADING
2. CROSS SECTIONS
3. CONCEPTUAL UTILITY PLAN
4. PHASING PLAN

NOTE:
THIS IS CONCEPTUAL GRADE PLAN IS BASED ON AVAILABLE DATA AT THE TIME THIS WAS PREPARED. DURING FINAL ENGINEERING PHASE THE LAYOUT AND DESIGN MAY CHANGE BASED ON EX. CONDITIONS OR DESIGN REQUIREMENTS UNKNOWN AT THE TIME THIS PLAN WAS PREPARED. DETAILS, CONSTRUCTION ITEMS AND NOTES WILL BE PROVIDED DURING THE FINAL ENGINEERING PHASE.

PREPARED UNDER THE SUPERVISION OF:

JOSEPH M. LONG RCE NO. 80591 DATE

DATE	BY	MARK	REVISIONS	APPR.	DATE

DESIGNED BY: DRAWN BY: CHECKED BY:

CITY OF BEAUMONT

APPROVED _____ 20 __

BY:_____

CALVARY CHAPEL CHURCH
C.U.P 2023-0907
SITE PLAN AND CONCEPTUAL GRADE PLAN

PREPARED FOR:

SHEET 1 OF 4

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

GeoTek, Inc.
1548 North Maple Street, Corona, California 92878
(951) 710-1160 Office (951) 710-1167 Fax www.geotekusa.com

May 3, 2023
Project No. 3538-CR

Matlock Design Build
1614 East Holt Boulevard, Suite 106
Ontario, California 91761

Attention: Mr. Susano Ureno

Subject: **Infiltration Evaluation**
Calvary Chapel
1780 Orchard Heights Avenue
Beaumont, Riverside County, California

Reference: See Page 5

Dear Mr. Ureno:

As requested and authorized, GeoTek, Inc. (GeoTek) has performed an Infiltration Evaluation in order to provide infiltration test results for the existing Calvary Chapel facility and proposed infiltration basins. The intent of this study is to evaluate the infiltration properties of the subsurface soils within the proposed project storm water disposal areas (basins). This report presents the results of the evaluation performed by GeoTek.

Site and Project Description

The approximately 5.5-acre almost rectangular-shaped project site is located at 1780 Orchard Heights Avenue, in the City of Beaumont, Riverside County, California (See Figure 1). Access to the site is available from Brookside Avenue (paved) located adjacent to the northern boundary of the site. The project is comprised of one (1) parcel of land (Riverside County Assessor's Parcel Number 408-070-012). The site is currently occupied by Calvary Chapel Church which consists of two (2) buildings, several modular trailers, concrete paved parking/drive areas, landscaping and vacant land.

Topographically, the site slopes gently downward to the southwest. Elevations across the site range from approximately 2,824 mean sea level (msl) to 2,830 msl.

Based upon review of *Calvary Chapel Site Plan and Conceptual Grade Plan* (undated), prepared by Joseph M. Long, GeoTek understands that it is proposed to demolish one (1) of the site buildings and remove the modular trailers and then construct a children's center and a worship

structure on the project site. Additional improvements are anticipated to include additional parking/drive areas, a recreation area, hardscaping, typical landscaping and associated improvements. Stormwater disposal is understood to be by means of stormwater basins in the southwestern and southeastern corners of the site.

Infiltration Testing

Two (2) percolation test borings, Borings I-1 and I-2 were excavated with a truck-mounted hollow stem auger drill rig to depths of approximately four (4) feet each, below the existing ground surface (bgs) within the area of the proposed basins. Additionally, one (1) deep exploratory boring (Boring B-1) was excavated near the vicinity of the two (2) basins to a depth of 15 feet for determination of depth of groundwater, if any, and for observation of any hardpan or impermeable layers below the basins. The approximate locations of the borings are indicated on the attached Exploration Location Map, Figure 2.

The borings were approximately 8-inches in diameter. Four-inch diameter slotted PVC pipes encapsulated in filter sock were inserted into the two (2) percolation test holes. The annular space between the test hole sidewalls and PVC pipe was filled with gravel.

The soils encountered in all borings consisted of alluvium, consisting of interbedded silty sand and clayey sand (SM and SC soil types based upon the Unified Soil Classification System). The logs of the borings are presented in Appendix A.

Groundwater was not encountered nor observed in any of the borings conducted for this evaluation. Based on a review of groundwater depths noted on the State Department of Water Resources Water Data Library website (Map (ca.gov)), it is estimated a historic high groundwater depth of greater than 50 feet below existing grade exists at the site.

Subsequent to pre-soaking the percolation test holes in general conformance with the referenced document (County of Riverside, 2011), percolation testing was performed in the lower approximate 24 inches in each of the percolation borings. The percolation testing was conducted in general conformance with the referenced document prepared by the County of Riverside. The percolation rates were converted to an infiltration rate via the Porchet Method.

The infiltration rate for each of the borings is presented in the follow table after the water level had stabilized.

Boring No.	Infiltration Rate (inches per hour)	Depth of Boring (feet)
Boring I-1	1.02	4
Boring I-2	0.91	4

Copies of the percolation data sheets and infiltration conversion sheets (Porchet Method) are included in Appendix B.

The reported infiltration rates are the measured rate without any factor of safety applied. Over the lifetime of the water quality facility, the infiltration rates may be affected by silt build up and biological activities, as well as local variations in near surface soil conditions. A suitable factor of safety should be applied to the field rates in design of the infiltration systems.

It should be noted that the infiltration rates provided above were performed in relatively undisturbed native soils. Infiltration rates will vary and are mostly dependent on the underlying consistency of the site soils and relative density. Infiltration rates will be impacted by weight of equipment travelling over the soils, placement of engineered fill and other various factors. GeoTek, Inc. assumes no responsibility or liability for the ultimate design or performance of the storm water facilities.

LIMITATIONS

The earth materials observed on the project site appear to be representative of the tested areas; however, soil materials vary in character between excavations and natural outcrops or conditions exposed during site construction. Site conditions may vary due to seasonal changes or other factors. GeoTek, Inc. assumes no responsibility or liability for work, testing or recommendations performed or provided by others.

GeoTek's conclusions and recommendations are professional opinions that are limited to the extent of the available data. Observations during construction are important to allow for any change in recommendations found to be warranted. These opinions have been derived in accordance with current standards of practice and no warranty is expressed or implied. Standards of practice are subject to change with time.

The opportunity to be of service on this project is sincerely appreciated. If you should have any questions, please do not hesitate to contact GeoTek.

Respectfully submitted,
GeoTek, Inc.





Edward H. LaMont
CEG 1892, Exp. 07/31/24
Principal Geologist

Bruce A. Hick
GE 2284, Exp. 12/31/24
Geotechnical Engineer

Anna M. Scott
Project Geologist

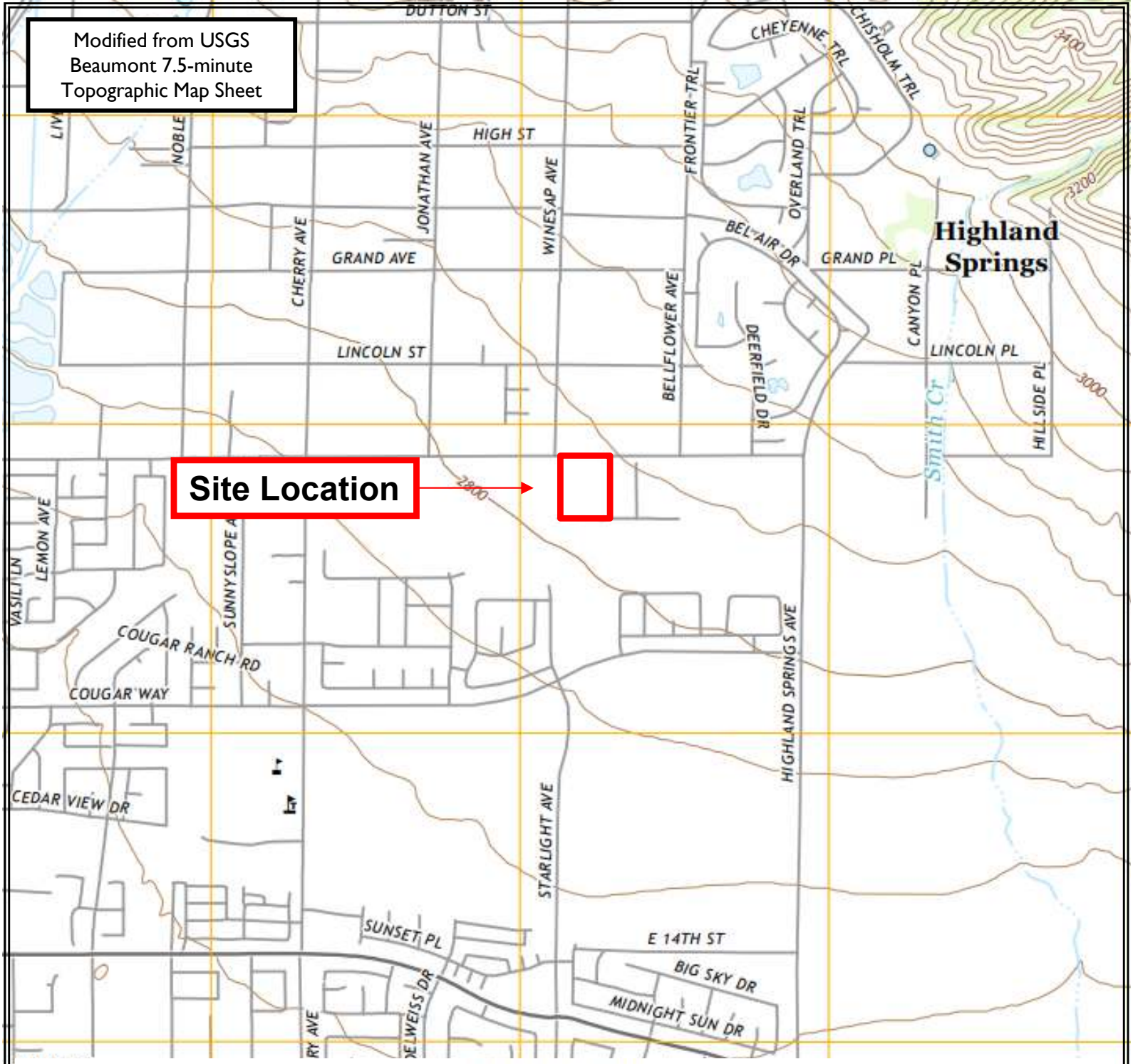
Enclosures: Figure 1 – Site Location Map
Figure 2 – Exploration Location Map
Appendix A – Logs of Exploratory Borings
Appendix B – Percolation Data Sheets and Conversion Sheets (Porchet Method)

Distribution: (1) Addressee via email (PDF file)

G:\Projects\3501 to 3550\3538CR Matlock Design Group 1780 Orchard Heights Avenue Beaumont\Infiltration Evaluation\3538CR Infiltration Evaluation 1780 Orchard Heights Avenue.doc

REFERENCE

County of Riverside, 2011, "Technical Guidance Document Appendix A – Infiltration Testing," dated September.



SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2

1000 500 0 METERS 1000 2000

1 0.5 0 1

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

FEET

Matlock Design Group
1780 Orchard Heights Avenue
Beaumont, Riverside County, California

GeoTek Project No. 3538-CR

NORTH

Figure 1

Site Location Map

GEOTEK



Matlock Design Group
1780 Orchard Heights Avenue
Beaumont, Riverside County, California

GeoTek Project No. 3538-CR

NORTH

Figure 2

Exploration Location Map

GEOTEK

APPENDIX A

LOGS OF EXPLORATORY BORINGS

Calvary Chapel
1780 Orchard Heights Avenue
Beaumont, Riverside County, California
Project No. 3538-CR

GEOTEK

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Matlock Design Group	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	1780 Orchard Heights Avenue	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Nik
PROJECT NO.:	3538-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	5/2/2023

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: I-1** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Fan Deposits:** Silty f-c SAND, light brown, slightly moist, trace organics			
					Silty f-c SAND, brown to dark brown, moist, few gravel			
5					**BORING TERMINATED AT 4.0 FEET** No groundwater encountered Boring backfilled with soil cuttings			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring; ---SPT; ---Small Bulk; ---Large Bulk; ---No Recovery; ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Matlock Design Group	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	1780 Orchard Heights Avenue	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Nik
PROJECT NO.:	3538-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	5/2/2023

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: I-2 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Fan Deposits:** Silty f-c SAND, light brown, slightly moist, trace organics			
					Silty f-c SAND, brown to dark brown, moist, few gravel			
5					**BORING TERMINATED AT 3.0 FEET** No groundwater encountered Boring backfilled with soil cuttings			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Matlock Design Group	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	1780 Orchard Heights Avenue	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Nik
PROJECT NO.:	3538-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	5/2/2023

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: B-1** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Fan Deposits:** Silty f-c SAND, light brown, slightly moist, trace organics			
					Silty f-c SAND, brown to dark brown, moist, few gravel			
5								
				SM/SC	Silty/clayey f-c SAND, brown, moist, trace gravel			
10								
				SM	Silty f-c SAND, brown, moist, few gravel			
15					**BORING TERMINATED AT 15.0 FEET**			
					No groundwater encountered Boring backfilled with soil cuttings			
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

APPENDIX B

PERCOLATION DATA AND CONVERSION SHEETS

Calvary Chapel
1780 Orchard Heights Avenue
Beaumont, Riverside County, California
Project No. 3538-CR

GEOTEK

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-GR

Test Hole No.: I-1 **Tested By:** _____ **Date:** 5/3/23

Depth of Hole As Drilled: 4' **Before Test:** 4' **After Test:** 4'

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
1	9:30 9:55	25	48	24	30.0"	6"		<6" IN 25 MIN 5/2/23
2	9:55 10:20	25	48	24	29.7"	5.7"		
3	7:30 8:00	30	48	24	30.5	6.5		STARTED TEST ON 5/3/23
4	8:00 8:30	30	48	24	30.2	6.2		
5	8:31 9:01	30	48	24	30.2	6.2		
6	9:01 9:31	30	48	24	30.2	6.2		
7	9:31 10:01	30	48	24	30.1	6.1		
8	10:02 10:32	30	48	24	30.1	6.1		
9	10:32 11:02	30	48	24	30.0	6.0		
10	11:02 11:32	30	48	24	30.0	6.0		

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-CR

Test Hole No.: I-1 **Tested By:** _____ **Date:** 5/3/23

Depth of Hole As Drilled: 4' **Before Test:** 4' **After Test:** 4'

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
11	11:32 / 12:02	30	48	24	30.0	6.0		
12	12:02 / 12:32	30	48	24	29.9	5.9		
13	12:33 / 1:03	30	48	24	29.9	5.9		
14	1.03 / 1:33	30	48	24	29.9	5.9		
	/							
	/							
	/							
	/							
	/							
	/							

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-CK

Test Hole No.: I-2 **Tested By:** DRW **Date:**

Depth of Hole As Drilled: 3' **Before Test:** 3' **After Test:** 3'

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
1	9:32 / 9:57	25	36	24	29.5	5.5		<6" IN 25 MIN
2	9:57 / 10:22	25	36	24	29.1	5.1		
3	7:35 / 8:05	30	36	24	30.1	6.1		STARTED TEST ON 5/3/23
4	8:05 / 8:35	30	36	24	29.9	5.9		
5	8:35 / 9:05	30	36	24	29.7	5.7		
6	9:06 / 9:36	30	36	24	29.5	5.5		
7	9:36 / 10:06	30	36	24	29.4	5.4		
8	10:06 / 10:36	30	36	24	29.4	5.4		
9	10:37 / 11:07	30	36	24	29.3	5.3		
10	11:07 / 11:37	30	36	24	29.3	5.3		

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-CR

Test Hole No.: _____ **Tested By:** _____ **Date:** _____

Depth of Hole As Drilled: _____ **Before Test:** _____ **After Test:** _____

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
11	11:37 / 12:07	30	36	24	29.3	5.3		
12	12:07 / 12:37	30	36	24	29.2	5.2		
13	12:38 / 1:08	30	36	24	29.2	5.2		
14	1:08 / 1:38	30	36	24	29.2	5.2		
	/							
	/							
	/							
	/							
	/							
	/							

Client:	**Matlock Design Group**
Project:	**1780 Orchard Heights Avenue**
Project No:	**3538-CR**
Date:	**5/3/2023**

Boring No. **I-1**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	30
Final Depth to Water, D_F =	29.9
Test Hole Radius, r =	4
Initial Depth to Water, D_O =	24
Total Test Hole Depth, D_T =	48

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	24
$H_F = D_T - D_F$ =	18.1
$\Delta H = \Delta D = H_O - H_F$ =	5.9
$H_{avg} = (H_O+H_F)/2$ =	21.05

I_t = 1.02 **Inches per Hour**

GEOTEK

Client:	**Matlock Design Group**
Project:	**1780 Orchard Heights Avenue**
Project No:	**3538-CR**
Date:	**5/3/2023**

Boring No. **I-2**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	30
Final Depth to Water, D_F =	17.3
Test Hole Radius, r =	4
Initial Depth to Water, D_O =	12
Total Test Hole Depth, D_T =	36

Equation - $I_t = \dfrac{\Delta H\ (60r)}{\Delta t\ (r+2H_{avg})}$

$H_O = D_T - D_O$ =	24
$H_F = D_T - D_F$ =	18.7
$\Delta H = \Delta D = H_O - H_F$ =	5.3
$H_{avg} = (H_O+H_F)/2$ =	21.35

I_t = 0.91 **Inches per Hour**

GEOTEK

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

NOT USED

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

NOT USED

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name ERSC | Date 10/4/2023

Designed by | Case No

Company Project Number/Name Calvary Chapel Beaumont

BMP Identification

BMP NAME / ID DMA A

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A Imperv.	*27000*	*Roofs*	*1*	*0.89*	*24084*			
DMA Imperv.	*118800*	*Concrete or Asphalt*	*1*	*0.89*	*105969.6*			
DMA A Pervious	*76357*	*Ornamental Landscaping*	*0.1*	*0.11*	*8434.2*			
	222157	***Total***			**138487.8**	**0.85**	***9809.6***	***15670***

Notes:

Bioretention Facility - Design Procedure	BMP ID: A	Legend:	Required Entries / Calculated Cells

Company Name:	Calvary Chapel	Date:	10/4/2023
Designed by:	ERSC INC.	County/City Case No.:	

Design Volume

Enter the area tributary to this feature	A_T=	5.1	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	9,900	ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	3.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	10.0	ft
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$	d_E =	1.73	ft
Minimum Surface Area, A_m $A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$	A_M =	5,723	ft^2
Proposed Surface Area	A=	9,058	ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	4	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		0.5	%
6" Check Dam Spacing		0	feet
Describe Vegetation:			

Notes:

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/13/23 File: exuh242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6158

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

CCB Existing 2yr, 24hr

Drainage Area = 5.10(Ac.) = 0.008 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 5.10(Ac.) = 0.008 Sq. Mi.
Length along longest watercourse = 541.50(Ft.)
Length along longest watercourse measured to centroid = 270.75(Ft.)
Length along longest watercourse = 0.103 Mi.
Length along longest watercourse measured to centroid = 0.051 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 151.1357 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.025 Hr.
Lag time = 1.51 Min.
25% of lag time = 0.38 Min.
40% of lag time = 0.60 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
5.10	3.00	15.30

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
5.10	7.00	35.70

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 3.000(In)
Area Averaged 100-Year Rainfall = 7.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 3.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
5.100	32.00	0.310

Total Area Entered = 5.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
32.0	32.0	0.742	0.310	0.535	1.000	0.535
					Sum (F) =	0.535

Area averaged mean soil loss (F) (In/Hr) = 0.535
Minimum soil loss rate ((In/Hr)) = 0.267
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.652

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	330.914	59.646	3.066
2	0.167	661.829	35.491	1.824
3	0.250	992.743	4.863	0.250
			Sum = 100.000	Sum= 5.140

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.024	0.948	0.016	0.01
2	0.17	0.07	0.024	0.945	0.016	0.01
3	0.25	0.07	0.024	0.941	0.016	0.01
4	0.33	0.10	0.036	0.937	0.023	0.01
5	0.42	0.10	0.036	0.934	0.023	0.01
6	0.50	0.10	0.036	0.930	0.023	0.01
7	0.58	0.10	0.036	0.926	0.023	0.01
8	0.67	0.10	0.036	0.923	0.023	0.01
9	0.75	0.10	0.036	0.919	0.023	0.01
10	0.83	0.13	0.048	0.916	0.031	0.02
11	0.92	0.13	0.048	0.912	0.031	0.02
12	1.00	0.13	0.048	0.908	0.031	0.02
13	1.08	0.10	0.036	0.905	0.023	0.01
14	1.17	0.10	0.036	0.901	0.023	0.01
15	1.25	0.10	0.036	0.898	0.023	0.01
16	1.33	0.10	0.036	0.894	0.023	0.01
17	1.42	0.10	0.036	0.891	0.023	0.01
18	1.50	0.10	0.036	0.887	0.023	0.01
19	1.58	0.10	0.036	0.883	0.023	0.01
20	1.67	0.10	0.036	0.880	0.023	0.01
21	1.75	0.10	0.036	0.876	0.023	0.01
22	1.83	0.13	0.048	0.873	0.031	0.02
23	1.92	0.13	0.048	0.869	0.031	0.02
24	2.00	0.13	0.048	0.866	0.031	0.02
25	2.08	0.13	0.048	0.862	0.031	0.02
26	2.17	0.13	0.048	0.859	0.031	0.02
27	2.25	0.13	0.048	0.855	0.031	0.02
28	2.33	0.13	0.048	0.852	0.031	0.02
29	2.42	0.13	0.048	0.848	0.031	0.02
30	2.50	0.13	0.048	0.845	0.031	0.02
31	2.58	0.17	0.060	0.841	0.039	0.02
32	2.67	0.17	0.060	0.838	0.039	0.02
33	2.75	0.17	0.060	0.835	0.039	0.02
34	2.83	0.17	0.060	0.831	0.039	0.02
35	2.92	0.17	0.060	0.828	0.039	0.02
36	3.00	0.17	0.060	0.824	0.039	0.02
37	3.08	0.17	0.060	0.821	0.039	0.02
38	3.17	0.17	0.060	0.817	0.039	0.02
39	3.25	0.17	0.060	0.814	0.039	0.02
40	3.33	0.17	0.060	0.811	0.039	0.02
41	3.42	0.17	0.060	0.807	0.039	0.02
42	3.50	0.17	0.060	0.804	0.039	0.02
43	3.58	0.17	0.060	0.801	0.039	0.02

44	3.67	0.17	0.060	0.797	0.039	0.02
45	3.75	0.17	0.060	0.794	0.039	0.02
46	3.83	0.20	0.072	0.790	0.047	0.03
47	3.92	0.20	0.072	0.787	0.047	0.03
48	4.00	0.20	0.072	0.784	0.047	0.03
49	4.08	0.20	0.072	0.780	0.047	0.03
50	4.17	0.20	0.072	0.777	0.047	0.03
51	4.25	0.20	0.072	0.774	0.047	0.03
52	4.33	0.23	0.084	0.771	0.055	0.03
53	4.42	0.23	0.084	0.767	0.055	0.03
54	4.50	0.23	0.084	0.764	0.055	0.03
55	4.58	0.23	0.084	0.761	0.055	0.03
56	4.67	0.23	0.084	0.757	0.055	0.03
57	4.75	0.23	0.084	0.754	0.055	0.03
58	4.83	0.27	0.096	0.751	0.063	0.03
59	4.92	0.27	0.096	0.748	0.063	0.03
60	5.00	0.27	0.096	0.744	0.063	0.03
61	5.08	0.20	0.072	0.741	0.047	0.03
62	5.17	0.20	0.072	0.738	0.047	0.03
63	5.25	0.20	0.072	0.735	0.047	0.03
64	5.33	0.23	0.084	0.732	0.055	0.03
65	5.42	0.23	0.084	0.728	0.055	0.03
66	5.50	0.23	0.084	0.725	0.055	0.03
67	5.58	0.27	0.096	0.722	0.063	0.03
68	5.67	0.27	0.096	0.719	0.063	0.03
69	5.75	0.27	0.096	0.716	0.063	0.03
70	5.83	0.27	0.096	0.712	0.063	0.03
71	5.92	0.27	0.096	0.709	0.063	0.03
72	6.00	0.27	0.096	0.706	0.063	0.03
73	6.08	0.30	0.108	0.703	0.070	0.04
74	6.17	0.30	0.108	0.700	0.070	0.04
75	6.25	0.30	0.108	0.697	0.070	0.04
76	6.33	0.30	0.108	0.694	0.070	0.04
77	6.42	0.30	0.108	0.691	0.070	0.04
78	6.50	0.30	0.108	0.687	0.070	0.04
79	6.58	0.33	0.120	0.684	0.078	0.04
80	6.67	0.33	0.120	0.681	0.078	0.04
81	6.75	0.33	0.120	0.678	0.078	0.04
82	6.83	0.33	0.120	0.675	0.078	0.04
83	6.92	0.33	0.120	0.672	0.078	0.04
84	7.00	0.33	0.120	0.669	0.078	0.04
85	7.08	0.33	0.120	0.666	0.078	0.04
86	7.17	0.33	0.120	0.663	0.078	0.04
87	7.25	0.33	0.120	0.660	0.078	0.04
88	7.33	0.37	0.132	0.657	0.086	0.05
89	7.42	0.37	0.132	0.654	0.086	0.05
90	7.50	0.37	0.132	0.651	0.086	0.05
91	7.58	0.40	0.144	0.648	0.094	0.05

92	7.67	0.40	0.144	0.645	0.094	0.05
93	7.75	0.40	0.144	0.642	0.094	0.05
94	7.83	0.43	0.156	0.639	0.102	0.05
95	7.92	0.43	0.156	0.636	0.102	0.05
96	8.00	0.43	0.156	0.633	0.102	0.05
97	8.08	0.50	0.180	0.630	0.117	0.06
98	8.17	0.50	0.180	0.627	0.117	0.06
99	8.25	0.50	0.180	0.624	0.117	0.06
100	8.33	0.50	0.180	0.621	0.117	0.06
101	8.42	0.50	0.180	0.619	0.117	0.06
102	8.50	0.50	0.180	0.616	0.117	0.06
103	8.58	0.53	0.192	0.613	0.125	0.07
104	8.67	0.53	0.192	0.610	0.125	0.07
105	8.75	0.53	0.192	0.607	0.125	0.07
106	8.83	0.57	0.204	0.604	0.133	0.07
107	8.92	0.57	0.204	0.601	0.133	0.07
108	9.00	0.57	0.204	0.598	0.133	0.07
109	9.08	0.63	0.228	0.596	0.149	0.08
110	9.17	0.63	0.228	0.593	0.149	0.08
111	9.25	0.63	0.228	0.590	0.149	0.08
112	9.33	0.67	0.240	0.587	0.156	0.08
113	9.42	0.67	0.240	0.584	0.156	0.08
114	9.50	0.67	0.240	0.582	0.156	0.08
115	9.58	0.70	0.252	0.579	0.164	0.09
116	9.67	0.70	0.252	0.576	0.164	0.09
117	9.75	0.70	0.252	0.573	0.164	0.09
118	9.83	0.73	0.264	0.570	0.172	0.09
119	9.92	0.73	0.264	0.568	0.172	0.09
120	10.00	0.73	0.264	0.565	0.172	0.09
121	10.08	0.50	0.180	0.562	0.117	0.06
122	10.17	0.50	0.180	0.559	0.117	0.06
123	10.25	0.50	0.180	0.557	0.117	0.06
124	10.33	0.50	0.180	0.554	0.117	0.06
125	10.42	0.50	0.180	0.551	0.117	0.06
126	10.50	0.50	0.180	0.549	0.117	0.06
127	10.58	0.67	0.240	0.546	0.156	0.08
128	10.67	0.67	0.240	0.543	0.156	0.08
129	10.75	0.67	0.240	0.541	0.156	0.08
130	10.83	0.67	0.240	0.538	0.156	0.08
131	10.92	0.67	0.240	0.535	0.156	0.08
132	11.00	0.67	0.240	0.533	0.156	0.08
133	11.08	0.63	0.228	0.530	0.149	0.08
134	11.17	0.63	0.228	0.528	0.149	0.08
135	11.25	0.63	0.228	0.525	0.149	0.08
136	11.33	0.63	0.228	0.522	0.149	0.08
137	11.42	0.63	0.228	0.520	0.149	0.08
138	11.50	0.63	0.228	0.517	0.149	0.08
139	11.58	0.57	0.204	0.515	0.133	0.07

140	11.67	0.57	0.204	0.512	0.133	0.07
141	11.75	0.57	0.204	0.509	0.133	0.07
142	11.83	0.60	0.216	0.507	0.141	0.08
143	11.92	0.60	0.216	0.504	0.141	0.08
144	12.00	0.60	0.216	0.502	0.141	0.08
145	12.08	0.83	0.300	0.499	0.196	0.10
146	12.17	0.83	0.300	0.497	0.196	0.10
147	12.25	0.83	0.300	0.494	0.196	0.10
148	12.33	0.87	0.312	0.492	0.203	0.11
149	12.42	0.87	0.312	0.489	0.203	0.11
150	12.50	0.87	0.312	0.487	0.203	0.11
151	12.58	0.93	0.336	0.485	0.219	0.12
152	12.67	0.93	0.336	0.482	0.219	0.12
153	12.75	0.93	0.336	0.480	0.219	0.12
154	12.83	0.97	0.348	0.477	0.227	0.12
155	12.92	0.97	0.348	0.475	0.227	0.12
156	13.00	0.97	0.348	0.472	0.227	0.12
157	13.08	1.13	0.408	0.470	0.266	0.14
158	13.17	1.13	0.408	0.468	0.266	0.14
159	13.25	1.13	0.408	0.465	0.266	0.14
160	13.33	1.13	0.408	0.463	0.266	0.14
161	13.42	1.13	0.408	0.461	0.266	0.14
162	13.50	1.13	0.408	0.458	0.266	0.14
163	13.58	0.77	0.276	0.456	0.180	0.10
164	13.67	0.77	0.276	0.454	0.180	0.10
165	13.75	0.77	0.276	0.451	0.180	0.10
166	13.83	0.77	0.276	0.449	0.180	0.10
167	13.92	0.77	0.276	0.447	0.180	0.10
168	14.00	0.77	0.276	0.444	0.180	0.10
169	14.08	0.90	0.324	0.442	0.211	0.11
170	14.17	0.90	0.324	0.440	0.211	0.11
171	14.25	0.90	0.324	0.438	0.211	0.11
172	14.33	0.87	0.312	0.435	0.203	0.11
173	14.42	0.87	0.312	0.433	0.203	0.11
174	14.50	0.87	0.312	0.431	0.203	0.11
175	14.58	0.87	0.312	0.429	0.203	0.11
176	14.67	0.87	0.312	0.427	0.203	0.11
177	14.75	0.87	0.312	0.424	0.203	0.11
178	14.83	0.83	0.300	0.422	0.196	0.10
179	14.92	0.83	0.300	0.420	0.196	0.10
180	15.00	0.83	0.300	0.418	0.196	0.10
181	15.08	0.80	0.288	0.416	0.188	0.10
182	15.17	0.80	0.288	0.414	0.188	0.10
183	15.25	0.80	0.288	0.411	0.188	0.10
184	15.33	0.77	0.276	0.409	0.180	0.10
185	15.42	0.77	0.276	0.407	0.180	0.10
186	15.50	0.77	0.276	0.405	0.180	0.10
187	15.58	0.63	0.228	0.403	0.149	0.08

188	15.67	0.63	0.228	0.401	0.149	0.08
189	15.75	0.63	0.228	0.399	0.149	0.08
190	15.83	0.63	0.228	0.397	0.149	0.08
191	15.92	0.63	0.228	0.395	0.149	0.08
192	16.00	0.63	0.228	0.393	0.149	0.08
193	16.08	0.13	0.048	0.391	0.031	0.02
194	16.17	0.13	0.048	0.389	0.031	0.02
195	16.25	0.13	0.048	0.387	0.031	0.02
196	16.33	0.13	0.048	0.385	0.031	0.02
197	16.42	0.13	0.048	0.383	0.031	0.02
198	16.50	0.13	0.048	0.381	0.031	0.02
199	16.58	0.10	0.036	0.379	0.023	0.01
200	16.67	0.10	0.036	0.377	0.023	0.01
201	16.75	0.10	0.036	0.375	0.023	0.01
202	16.83	0.10	0.036	0.373	0.023	0.01
203	16.92	0.10	0.036	0.371	0.023	0.01
204	17.00	0.10	0.036	0.370	0.023	0.01
205	17.08	0.17	0.060	0.368	0.039	0.02
206	17.17	0.17	0.060	0.366	0.039	0.02
207	17.25	0.17	0.060	0.364	0.039	0.02
208	17.33	0.17	0.060	0.362	0.039	0.02
209	17.42	0.17	0.060	0.360	0.039	0.02
210	17.50	0.17	0.060	0.359	0.039	0.02
211	17.58	0.17	0.060	0.357	0.039	0.02
212	17.67	0.17	0.060	0.355	0.039	0.02
213	17.75	0.17	0.060	0.353	0.039	0.02
214	17.83	0.13	0.048	0.351	0.031	0.02
215	17.92	0.13	0.048	0.350	0.031	0.02
216	18.00	0.13	0.048	0.348	0.031	0.02
217	18.08	0.13	0.048	0.346	0.031	0.02
218	18.17	0.13	0.048	0.345	0.031	0.02
219	18.25	0.13	0.048	0.343	0.031	0.02
220	18.33	0.13	0.048	0.341	0.031	0.02
221	18.42	0.13	0.048	0.340	0.031	0.02
222	18.50	0.13	0.048	0.338	0.031	0.02
223	18.58	0.10	0.036	0.336	0.023	0.01
224	18.67	0.10	0.036	0.335	0.023	0.01
225	18.75	0.10	0.036	0.333	0.023	0.01
226	18.83	0.07	0.024	0.331	0.016	0.01
227	18.92	0.07	0.024	0.330	0.016	0.01
228	19.00	0.07	0.024	0.328	0.016	0.01
229	19.08	0.10	0.036	0.327	0.023	0.01
230	19.17	0.10	0.036	0.325	0.023	0.01
231	19.25	0.10	0.036	0.324	0.023	0.01
232	19.33	0.13	0.048	0.322	0.031	0.02
233	19.42	0.13	0.048	0.321	0.031	0.02
234	19.50	0.13	0.048	0.319	0.031	0.02
235	19.58	0.10	0.036	0.318	0.023	0.01

236	19.67	0.10	0.036	0.316	0.023	0.01
237	19.75	0.10	0.036	0.315	0.023	0.01
238	19.83	0.07	0.024	0.313	0.016	0.01
239	19.92	0.07	0.024	0.312	0.016	0.01
240	20.00	0.07	0.024	0.311	0.016	0.01
241	20.08	0.10	0.036	0.309	0.023	0.01
242	20.17	0.10	0.036	0.308	0.023	0.01
243	20.25	0.10	0.036	0.307	0.023	0.01
244	20.33	0.10	0.036	0.305	0.023	0.01
245	20.42	0.10	0.036	0.304	0.023	0.01
246	20.50	0.10	0.036	0.303	0.023	0.01
247	20.58	0.10	0.036	0.301	0.023	0.01
248	20.67	0.10	0.036	0.300	0.023	0.01
249	20.75	0.10	0.036	0.299	0.023	0.01
250	20.83	0.07	0.024	0.298	0.016	0.01
251	20.92	0.07	0.024	0.296	0.016	0.01
252	21.00	0.07	0.024	0.295	0.016	0.01
253	21.08	0.10	0.036	0.294	0.023	0.01
254	21.17	0.10	0.036	0.293	0.023	0.01
255	21.25	0.10	0.036	0.292	0.023	0.01
256	21.33	0.07	0.024	0.291	0.016	0.01
257	21.42	0.07	0.024	0.290	0.016	0.01
258	21.50	0.07	0.024	0.289	0.016	0.01
259	21.58	0.10	0.036	0.287	0.023	0.01
260	21.67	0.10	0.036	0.286	0.023	0.01
261	21.75	0.10	0.036	0.285	0.023	0.01
262	21.83	0.07	0.024	0.284	0.016	0.01
263	21.92	0.07	0.024	0.283	0.016	0.01
264	22.00	0.07	0.024	0.282	0.016	0.01
265	22.08	0.10	0.036	0.282	0.023	0.01
266	22.17	0.10	0.036	0.281	0.023	0.01
267	22.25	0.10	0.036	0.280	0.023	0.01
268	22.33	0.07	0.024	0.279	0.016	0.01
269	22.42	0.07	0.024	0.278	0.016	0.01
270	22.50	0.07	0.024	0.277	0.016	0.01
271	22.58	0.07	0.024	0.276	0.016	0.01
272	22.67	0.07	0.024	0.276	0.016	0.01
273	22.75	0.07	0.024	0.275	0.016	0.01
274	22.83	0.07	0.024	0.274	0.016	0.01
275	22.92	0.07	0.024	0.273	0.016	0.01
276	23.00	0.07	0.024	0.273	0.016	0.01
277	23.08	0.07	0.024	0.272	0.016	0.01
278	23.17	0.07	0.024	0.272	0.016	0.01
279	23.25	0.07	0.024	0.271	0.016	0.01
280	23.33	0.07	0.024	0.270	0.016	0.01
281	23.42	0.07	0.024	0.270	0.016	0.01
282	23.50	0.07	0.024	0.269	0.016	0.01
283	23.58	0.07	0.024	0.269	0.016	0.01

```
284  23.67     0.07      0.024         0.269     0.016         0.01
285  23.75     0.07      0.024         0.268     0.016         0.01
286  23.83     0.07      0.024         0.268     0.016         0.01
287  23.92     0.07      0.024         0.268     0.016         0.01
288  24.00     0.07      0.024         0.268     0.016         0.01
    Sum =     100.0                                  Sum =    12.5
      Flood volume = Effective rainfall      1.04(In)
       times area       5.1(Ac.)/[(In)/(Ft.)] =       0.4(Ac.Ft)
      Total soil loss =      1.96(In)
      Total soil loss =     0.831(Ac.Ft)
      Total rainfall =      3.00(In)
      Flood volume =       19327.4 Cubic Feet
      Total soil loss =       36211.1 Cubic Feet
      ---------------------------------------------------------------
       Peak flow rate of this hydrograph =     0.730(CFS)
      ---------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ------------------------------------------------------------------------
   0+ 5       0.0002      0.03  Q         |         |         |         |
   0+10       0.0005      0.04  Q         |         |         |         |
   0+15       0.0008      0.04  Q         |         |         |         |
   0+20       0.0011      0.06  Q         |         |         |         |
   0+25       0.0016      0.06  Q         |         |         |         |
   0+30       0.0020      0.06  Q         |         |         |         |
   0+35       0.0025      0.06  Q         |         |         |         |
   0+40       0.0029      0.06  Q         |         |         |         |
   0+45       0.0033      0.06  Q         |         |         |         |
   0+50       0.0039      0.08  Q         |         |         |         |
   0+55       0.0045      0.08  Q         |         |         |         |
   1+ 0       0.0051      0.09  Q         |         |         |         |
   1+ 5       0.0056      0.07  Q         |         |         |         |
   1+10       0.0060      0.07  Q         |         |         |         |
   1+15       0.0065      0.06  Q         |         |         |         |
   1+20       0.0069      0.06  Q         |         |         |         |
   1+25       0.0073      0.06  Q         |         |         |         |
   1+30       0.0078      0.06  Q         |         |         |         |
   1+35       0.0082      0.06  Q         |         |         |         |
   1+40       0.0087      0.06  Q         |         |         |         |
   1+45       0.0091      0.06  Q         |         |         |         |
   1+50       0.0096      0.08  Q         |         |         |         |
   1+55       0.0102      0.08  Q         |         |         |         |
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2+ 0	0.0108	0.09	Q	|	|	|	|
2+ 5	0.0114	0.09	QV	|	|	|	|
2+10	0.0120	0.09	QV	|	|	|	|
2+15	0.0126	0.09	QV	|	|	|	|
2+20	0.0132	0.09	QV	|	|	|	|
2+25	0.0138	0.09	QV	|	|	|	|
2+30	0.0144	0.09	QV	|	|	|	|
2+35	0.0151	0.10	QV	|	|	|	|
2+40	0.0158	0.11	QV	|	|	|	|
2+45	0.0165	0.11	QV	|	|	|	|
2+50	0.0173	0.11	QV	|	|	|	|
2+55	0.0180	0.11	QV	|	|	|	|
3+ 0	0.0187	0.11	QV	|	|	|	|
3+ 5	0.0195	0.11	QV	|	|	|	|
3+10	0.0202	0.11	QV	|	|	|	|
3+15	0.0210	0.11	QV	|	|	|	|
3+20	0.0217	0.11	QV	|	|	|	|
3+25	0.0224	0.11	Q V	|	|	|	|
3+30	0.0232	0.11	Q V	|	|	|	|
3+35	0.0239	0.11	Q V	|	|	|	|
3+40	0.0247	0.11	Q V	|	|	|	|
3+45	0.0254	0.11	Q V	|	|	|	|
3+50	0.0262	0.12	Q V	|	|	|	|
3+55	0.0271	0.13	Q V	|	|	|	|
4+ 0	0.0280	0.13	Q V	|	|	|	|
4+ 5	0.0289	0.13	Q V	|	|	|	|
4+10	0.0298	0.13	Q V	|	|	|	|
4+15	0.0307	0.13	Q V	|	|	|	|
4+20	0.0316	0.14	Q V	|	|	|	|
4+25	0.0327	0.15	Q V	|	|	|	|
4+30	0.0337	0.15	Q V	|	|	|	|
4+35	0.0347	0.15	Q V	|	|	|	|
4+40	0.0358	0.15	Q V	|	|	|	|
4+45	0.0368	0.15	Q V	|	|	|	|
4+50	0.0379	0.16	Q V	|	|	|	|
4+55	0.0391	0.17	Q V	|	|	|	|
5+ 0	0.0403	0.17	Q V	|	|	|	|
5+ 5	0.0413	0.15	Q V	|	|	|	|
5+10	0.0422	0.13	Q V	|	|	|	|
5+15	0.0431	0.13	Q V	|	|	|	|
5+20	0.0441	0.14	Q V	|	|	|	|
5+25	0.0451	0.15	Q V	|	|	|	|
5+30	0.0461	0.15	Q V	|	|	|	|
5+35	0.0472	0.16	Q V	|	|	|	|
5+40	0.0484	0.17	Q V	|	|	|	|
5+45	0.0496	0.17	Q V	|	|	|	|
5+50	0.0508	0.17	Q V	|	|	|	|
5+55	0.0520	0.17	Q V	|	|	|	|

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6+ 0       0.0532      0.17  Q   V     |          |          |          |
6+ 5       0.0544      0.18  Q   V     |          |          |          |
6+10       0.0557      0.19  Q    V    |          |          |          |
6+15       0.0571      0.19  Q    V    |          |          |          |
6+20       0.0584      0.19  Q    V    |          |          |          |
6+25       0.0597      0.19  Q    V    |          |          |          |
6+30       0.0611      0.19  Q    V    |          |          |          |
6+35       0.0625      0.21  Q    V    |          |          |          |
6+40       0.0640      0.21  Q    V    |          |          |          |
6+45       0.0654      0.21  Q    V    |          |          |          |
6+50       0.0669      0.21  Q     V   |          |          |          |
6+55       0.0684      0.21  Q     V   |          |          |          |
7+ 0       0.0699      0.21  Q     V   |          |          |          |
7+ 5       0.0714      0.21  Q     V   |          |          |          |
7+10       0.0728      0.21  Q     V   |          |          |          |
7+15       0.0743      0.21  Q     V   |          |          |          |
7+20       0.0759      0.23  Q     V   |          |          |          |
7+25       0.0775      0.24  Q     V   |          |          |          |
7+30       0.0791      0.24  Q      V  |          |          |          |
7+35       0.0808      0.25  Q      V  |          |          |          |
7+40       0.0826      0.26  |Q     V  |          |          |          |
7+45       0.0844      0.26  |Q     V  |          |          |          |
7+50       0.0863      0.27  |Q     V  |          |          |          |
7+55       0.0882      0.28  |Q     V  |          |          |          |
8+ 0       0.0901      0.28  |Q      V |          |          |          |
8+ 5       0.0922      0.30  |Q      V |          |          |          |
8+10       0.0944      0.32  |Q      V |          |          |          |
8+15       0.0966      0.32  |Q      V |          |          |          |
8+20       0.0988      0.32  |Q      V |          |          |          |
8+25       0.1010      0.32  |Q       V|          |          |          |
8+30       0.1033      0.32  |Q       V|          |          |          |
8+35       0.1056      0.33  |Q       V|          |          |          |
8+40       0.1079      0.34  |Q       V|          |          |          |
8+45       0.1103      0.34  |Q       V|          |          |          |
8+50       0.1128      0.36  |Q        V          |          |          |
8+55       0.1153      0.36  |Q        V          |          |          |
9+ 0       0.1178      0.37  |Q        V          |          |          |
9+ 5       0.1205      0.39  |Q        V          |          |          |
9+10       0.1233      0.41  |Q        |V         |          |          |
9+15       0.1261      0.41  |Q        |V         |          |          |
9+20       0.1290      0.42  |Q        |V         |          |          |
9+25       0.1319      0.43  |Q        |V         |          |          |
9+30       0.1349      0.43  |Q        | V        |          |          |
9+35       0.1379      0.44  |Q        | V        |          |          |
9+40       0.1410      0.45  |Q        | V        |          |          |
9+45       0.1441      0.45  |Q        | V        |          |          |
9+50       0.1473      0.46  |Q        |  V       |          |          |
9+55       0.1506      0.47  |Q        |  V       |          |          |
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10+ 0       0.1538      0.47  |Q         |  V       |          |          |
10+ 5       0.1565      0.38  |Q         |   V      |          |          |
10+10       0.1587      0.33  |Q         |   V      |          |          |
10+15       0.1609      0.32  |Q         |   V      |          |          |
10+20       0.1632      0.32  |Q         |   V      |          |          |
10+25       0.1654      0.32  |Q         |   V      |          |          |
10+30       0.1676      0.32  |Q         |    V     |          |          |
10+35       0.1703      0.39  |Q         |    V     |          |          |
10+40       0.1732      0.42  |Q         |    V     |          |          |
10+45       0.1761      0.43  |Q         |    V     |          |          |
10+50       0.1791      0.43  |Q         |     V    |          |          |
10+55       0.1821      0.43  |Q         |     V    |          |          |
11+ 0       0.1850      0.43  |Q         |     V    |          |          |
11+ 5       0.1879      0.42  |Q         |     V    |          |          |
11+10       0.1907      0.41  |Q         |      V   |          |          |
11+15       0.1935      0.41  |Q         |      V   |          |          |
11+20       0.1963      0.41  |Q         |      V   |          |          |
11+25       0.1991      0.41  |Q         |      V   |          |          |
11+30       0.2019      0.41  |Q         |       V  |          |          |
11+35       0.2046      0.38  |Q         |       V  |          |          |
11+40       0.2071      0.37  |Q         |       V  |          |          |
11+45       0.2096      0.37  |Q         |       V  |          |          |
11+50       0.2122      0.38  |Q         |        V |          |          |
11+55       0.2149      0.39  |Q         |        V |          |          |
12+ 0       0.2175      0.39  |Q         |        V |          |          |
12+ 5       0.2208      0.48  |Q         |        V |          |          |
12+10       0.2245      0.53  | Q        |         V          |          |
12+15       0.2282      0.54  | Q        |         V          |          |
12+20       0.2319      0.55  | Q        |         V          |          |
12+25       0.2358      0.56  | Q        |         |V         |          |
12+30       0.2396      0.56  | Q        |         |V         |          |
12+35       0.2437      0.58  | Q        |         |V         |          |
12+40       0.2478      0.60  | Q        |         | V        |          |
12+45       0.2519      0.60  | Q        |         | V        |          |
12+50       0.2562      0.61  | Q        |         |  V       |          |
12+55       0.2604      0.62  | Q        |         |  V       |          |
13+ 0       0.2647      0.62  | Q        |         |  V       |          |
13+ 5       0.2695      0.69  | Q        |         |   V      |          |
13+10       0.2744      0.72  | Q        |         |   V      |          |
13+15       0.2795      0.73  | Q        |         |    V     |          |
13+20       0.2845      0.73  | Q        |         |    V     |          |
13+25       0.2895      0.73  | Q        |         |     V    |          |
13+30       0.2946      0.73  | Q        |         |     V    |          |
13+35       0.2986      0.59  | Q        |         |     V    |          |
13+40       0.3021      0.51  | Q        |         |      V   |          |
13+45       0.3055      0.49  |Q         |         |      V   |          |
13+50       0.3089      0.49  |Q         |         |      V   |          |
13+55       0.3123      0.49  |Q         |         |       V  |          |
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14+ 0       0.3157      0.49  |Q         |          |        V |          |
14+ 5       0.3195      0.55  | Q        |          |        V |          |
14+10       0.3234      0.58  | Q        |          |         V|          |
14+15       0.3274      0.58  | Q        |          |         V|          |
14+20       0.3313      0.57  | Q        |          |         V|          |
14+25       0.3352      0.56  | Q        |          |          V          |
14+30       0.3390      0.56  | Q        |          |          V          |
14+35       0.3429      0.56  | Q        |          |          V          |
14+40       0.3467      0.56  | Q        |          |          |V         |
14+45       0.3506      0.56  | Q        |          |          |V         |
14+50       0.3543      0.55  | Q        |          |          |V         |
14+55       0.3580      0.54  | Q        |          |          | V        |
15+ 0       0.3617      0.54  | Q        |          |          | V        |
15+ 5       0.3653      0.52  | Q        |          |          | V        |
15+10       0.3689      0.52  | Q        |          |          |  V       |
15+15       0.3724      0.52  | Q        |          |          |  V       |
15+20       0.3759      0.50  | Q        |          |          |  V       |
15+25       0.3793      0.49  |Q         |          |          |   V      |
15+30       0.3827      0.49  |Q         |          |          |   V      |
15+35       0.3858      0.44  |Q         |          |          |   V      |
15+40       0.3886      0.41  |Q         |          |          |    V     |
15+45       0.3914      0.41  |Q         |          |          |    V     |
15+50       0.3942      0.41  |Q         |          |          |    V     |
15+55       0.3970      0.41  |Q         |          |          |    V     |
16+ 0       0.3998      0.41  |Q         |          |          |     V    |
16+ 5       0.4013      0.22  Q          |          |          |     V    |
16+10       0.4020      0.10  Q          |          |          |     V    |
16+15       0.4026      0.09  Q          |          |          |     V    |
16+20       0.4032      0.09  Q          |          |          |     V    |
16+25       0.4038      0.09  Q          |          |          |     V    |
16+30       0.4044      0.09  Q          |          |          |     V    |
16+35       0.4049      0.07  Q          |          |          |     V    |
16+40       0.4053      0.07  Q          |          |          |     V    |
16+45       0.4058      0.06  Q          |          |          |     V    |
16+50       0.4062      0.06  Q          |          |          |     V    |
16+55       0.4067      0.06  Q          |          |          |     V    |
17+ 0       0.4071      0.06  Q          |          |          |     V    |
17+ 5       0.4077      0.09  Q          |          |          |     V    |
17+10       0.4085      0.11  Q          |          |          |     V    |
17+15       0.4092      0.11  Q          |          |          |     V    |
17+20       0.4099      0.11  Q          |          |          |     V    |
17+25       0.4107      0.11  Q          |          |          |      V   |
17+30       0.4114      0.11  Q          |          |          |      V   |
17+35       0.4122      0.11  Q          |          |          |      V   |
17+40       0.4129      0.11  Q          |          |          |      V   |
17+45       0.4136      0.11  Q          |          |          |      V   |
17+50       0.4143      0.09  Q          |          |          |      V   |
17+55       0.4149      0.09  Q          |          |          |      V   |
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18+ 0	0.4155	0.09	Q	|	|	|	V |
18+ 5	0.4161	0.09	Q	|	|	|	V |
18+10	0.4167	0.09	Q	|	|	|	V |
18+15	0.4173	0.09	Q	|	|	|	V |
18+20	0.4178	0.09	Q	|	|	|	V |
18+25	0.4184	0.09	Q	|	|	|	V |
18+30	0.4190	0.09	Q	|	|	|	V |
18+35	0.4195	0.07	Q	|	|	|	V |
18+40	0.4200	0.07	Q	|	|	|	V |
18+45	0.4204	0.06	Q	|	|	|	V |
18+50	0.4208	0.05	Q	|	|	|	V |
18+55	0.4211	0.04	Q	|	|	|	V |
19+ 0	0.4214	0.04	Q	|	|	|	V |
19+ 5	0.4218	0.06	Q	|	|	|	V |
19+10	0.4222	0.06	Q	|	|	|	V |
19+15	0.4226	0.06	Q	|	|	|	V |
19+20	0.4232	0.08	Q	|	|	|	V |
19+25	0.4238	0.08	Q	|	|	|	V |
19+30	0.4243	0.09	Q	|	|	|	V |
19+35	0.4249	0.07	Q	|	|	|	V |
19+40	0.4253	0.07	Q	|	|	|	V |
19+45	0.4257	0.06	Q	|	|	|	V |
19+50	0.4261	0.05	Q	|	|	|	V |
19+55	0.4264	0.04	Q	|	|	|	V |
20+ 0	0.4267	0.04	Q	|	|	|	V |
20+ 5	0.4271	0.06	Q	|	|	|	V |
20+10	0.4275	0.06	Q	|	|	|	V |
20+15	0.4280	0.06	Q	|	|	|	V |
20+20	0.4284	0.06	Q	|	|	|	V |
20+25	0.4289	0.06	Q	|	|	|	V |
20+30	0.4293	0.06	Q	|	|	|	V |
20+35	0.4297	0.06	Q	|	|	|	V |
20+40	0.4302	0.06	Q	|	|	|	V |
20+45	0.4306	0.06	Q	|	|	|	V |
20+50	0.4310	0.05	Q	|	|	|	V |
20+55	0.4313	0.04	Q	|	|	|	V |
21+ 0	0.4316	0.04	Q	|	|	|	V |
21+ 5	0.4320	0.06	Q	|	|	|	V |
21+10	0.4324	0.06	Q	|	|	|	V |
21+15	0.4328	0.06	Q	|	|	|	V|
21+20	0.4332	0.05	Q	|	|	|	V|
21+25	0.4335	0.04	Q	|	|	|	V|
21+30	0.4338	0.04	Q	|	|	|	V|
21+35	0.4342	0.06	Q	|	|	|	V|
21+40	0.4346	0.06	Q	|	|	|	V|
21+45	0.4351	0.06	Q	|	|	|	V|
21+50	0.4354	0.05	Q	|	|	|	V|
21+55	0.4357	0.04	Q	|	|	|	V|

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   22+ 0       0.4360      0.04  Q          |          |          |         V|
   22+ 5       0.4364      0.06  Q          |          |          |         V|
   22+10       0.4368      0.06  Q          |          |          |         V|
   22+15       0.4373      0.06  Q          |          |          |         V|
   22+20       0.4376      0.05  Q          |          |          |         V|
   22+25       0.4379      0.04  Q          |          |          |         V|
   22+30       0.4382      0.04  Q          |          |          |         V|
   22+35       0.4385      0.04  Q          |          |          |         V|
   22+40       0.4388      0.04  Q          |          |          |         V|
   22+45       0.4391      0.04  Q          |          |          |         V|
   22+50       0.4394      0.04  Q          |          |          |         V|
   22+55       0.4397      0.04  Q          |          |          |         V|
   23+ 0       0.4400      0.04  Q          |          |          |         V|
   23+ 5       0.4403      0.04  Q          |          |          |         V|
   23+10       0.4406      0.04  Q          |          |          |         V|
   23+15       0.4409      0.04  Q          |          |          |         V|
   23+20       0.4412      0.04  Q          |          |          |         V|
   23+25       0.4415      0.04  Q          |          |          |         V|
   23+30       0.4418      0.04  Q          |          |          |         V|
   23+35       0.4421      0.04  Q          |          |          |         V|
   23+40       0.4424      0.04  Q          |          |          |         V|
   23+45       0.4427      0.04  Q          |          |          |         V|
   23+50       0.4430      0.04  Q          |          |          |         V|
   23+55       0.4433      0.04  Q          |          |          |         V|
   24+ 0       0.4436      0.04  Q          |          |          |         V|
   24+ 5       0.4437      0.02  Q          |          |          |         V|
   24+10       0.4437      0.00  Q          |          |          |          V
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 10/09/23 File: propuh242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6158

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

CCB PROPOSED, 24HR, 2YR

Drainage Area = 5.10(Ac.) = 0.008 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 5.10(Ac.) = 0.008 Sq. Mi.
Length along longest watercourse = 572.50(Ft.)
Length along longest watercourse measured to centroid = 310.20(Ft.)
Length along longest watercourse = 0.108 Mi.
Length along longest watercourse measured to centroid = 0.059 Mi.
Difference in elevation = 21.00(Ft.)
Slope along watercourse = 193.6769 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.019 Hr.
Lag time = 1.16 Min.
25% of lag time = 0.29 Min.
40% of lag time = 0.47 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
5.10	3.00	15.30

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
5.10	7.00	35.70

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 3.000(In)
Area Averaged 100-Year Rainfall = 7.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 3.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
5.100	32.00	0.690

Total Area Entered = 5.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
32.0	32.0	0.742	0.690	0.281	1.000	0.281
					Sum (F) =	0.281

Area averaged mean soil loss (F) (In/Hr) = 0.281
Minimum soil loss rate ((In/Hr)) = 0.141
(for 24 hour storm duration)
Note: User entry of the fm value
Soil low loss rate (decimal) = 0.350

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	430.016	67.046	3.446
2	0.167	860.031	32.954	1.694
			Sum = 100.000 Sum=	5.140

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.024	0.498	0.008	0.02
2	0.17	0.07	0.024	0.496	0.008	0.02
3	0.25	0.07	0.024	0.494	0.008	0.02
4	0.33	0.10	0.036	0.492	0.013	0.02
5	0.42	0.10	0.036	0.490	0.013	0.02
6	0.50	0.10	0.036	0.488	0.013	0.02
7	0.58	0.10	0.036	0.486	0.013	0.02
8	0.67	0.10	0.036	0.485	0.013	0.02
9	0.75	0.10	0.036	0.483	0.013	0.02
10	0.83	0.13	0.048	0.481	0.017	0.03
11	0.92	0.13	0.048	0.479	0.017	0.03
12	1.00	0.13	0.048	0.477	0.017	0.03
13	1.08	0.10	0.036	0.475	0.013	0.02
14	1.17	0.10	0.036	0.473	0.013	0.02
15	1.25	0.10	0.036	0.471	0.013	0.02
16	1.33	0.10	0.036	0.469	0.013	0.02
17	1.42	0.10	0.036	0.468	0.013	0.02
18	1.50	0.10	0.036	0.466	0.013	0.02
19	1.58	0.10	0.036	0.464	0.013	0.02
20	1.67	0.10	0.036	0.462	0.013	0.02
21	1.75	0.10	0.036	0.460	0.013	0.02
22	1.83	0.13	0.048	0.458	0.017	0.03
23	1.92	0.13	0.048	0.456	0.017	0.03
24	2.00	0.13	0.048	0.455	0.017	0.03
25	2.08	0.13	0.048	0.453	0.017	0.03
26	2.17	0.13	0.048	0.451	0.017	0.03
27	2.25	0.13	0.048	0.449	0.017	0.03
28	2.33	0.13	0.048	0.447	0.017	0.03
29	2.42	0.13	0.048	0.446	0.017	0.03
30	2.50	0.13	0.048	0.444	0.017	0.03
31	2.58	0.17	0.060	0.442	0.021	0.04
32	2.67	0.17	0.060	0.440	0.021	0.04
33	2.75	0.17	0.060	0.438	0.021	0.04
34	2.83	0.17	0.060	0.436	0.021	0.04
35	2.92	0.17	0.060	0.435	0.021	0.04
36	3.00	0.17	0.060	0.433	0.021	0.04
37	3.08	0.17	0.060	0.431	0.021	0.04
38	3.17	0.17	0.060	0.429	0.021	0.04
39	3.25	0.17	0.060	0.428	0.021	0.04
40	3.33	0.17	0.060	0.426	0.021	0.04
41	3.42	0.17	0.060	0.424	0.021	0.04
42	3.50	0.17	0.060	0.422	0.021	0.04
43	3.58	0.17	0.060	0.420	0.021	0.04

44	3.67	0.17	0.060	0.419	0.021	0.04
45	3.75	0.17	0.060	0.417	0.021	0.04
46	3.83	0.20	0.072	0.415	0.025	0.05
47	3.92	0.20	0.072	0.413	0.025	0.05
48	4.00	0.20	0.072	0.412	0.025	0.05
49	4.08	0.20	0.072	0.410	0.025	0.05
50	4.17	0.20	0.072	0.408	0.025	0.05
51	4.25	0.20	0.072	0.406	0.025	0.05
52	4.33	0.23	0.084	0.405	0.029	0.05
53	4.42	0.23	0.084	0.403	0.029	0.05
54	4.50	0.23	0.084	0.401	0.029	0.05
55	4.58	0.23	0.084	0.400	0.029	0.05
56	4.67	0.23	0.084	0.398	0.029	0.05
57	4.75	0.23	0.084	0.396	0.029	0.05
58	4.83	0.27	0.096	0.394	0.034	0.06
59	4.92	0.27	0.096	0.393	0.034	0.06
60	5.00	0.27	0.096	0.391	0.034	0.06
61	5.08	0.20	0.072	0.389	0.025	0.05
62	5.17	0.20	0.072	0.388	0.025	0.05
63	5.25	0.20	0.072	0.386	0.025	0.05
64	5.33	0.23	0.084	0.384	0.029	0.05
65	5.42	0.23	0.084	0.383	0.029	0.05
66	5.50	0.23	0.084	0.381	0.029	0.05
67	5.58	0.27	0.096	0.379	0.034	0.06
68	5.67	0.27	0.096	0.378	0.034	0.06
69	5.75	0.27	0.096	0.376	0.034	0.06
70	5.83	0.27	0.096	0.374	0.034	0.06
71	5.92	0.27	0.096	0.373	0.034	0.06
72	6.00	0.27	0.096	0.371	0.034	0.06
73	6.08	0.30	0.108	0.369	0.038	0.07
74	6.17	0.30	0.108	0.368	0.038	0.07
75	6.25	0.30	0.108	0.366	0.038	0.07
76	6.33	0.30	0.108	0.364	0.038	0.07
77	6.42	0.30	0.108	0.363	0.038	0.07
78	6.50	0.30	0.108	0.361	0.038	0.07
79	6.58	0.33	0.120	0.360	0.042	0.08
80	6.67	0.33	0.120	0.358	0.042	0.08
81	6.75	0.33	0.120	0.356	0.042	0.08
82	6.83	0.33	0.120	0.355	0.042	0.08
83	6.92	0.33	0.120	0.353	0.042	0.08
84	7.00	0.33	0.120	0.352	0.042	0.08
85	7.08	0.33	0.120	0.350	0.042	0.08
86	7.17	0.33	0.120	0.348	0.042	0.08
87	7.25	0.33	0.120	0.347	0.042	0.08
88	7.33	0.37	0.132	0.345	0.046	0.09
89	7.42	0.37	0.132	0.344	0.046	0.09
90	7.50	0.37	0.132	0.342	0.046	0.09
91	7.58	0.40	0.144	0.340	0.050	0.09

92	7.67	0.40	0.144	0.339	0.050	0.09
93	7.75	0.40	0.144	0.337	0.050	0.09
94	7.83	0.43	0.156	0.336	0.055	0.10
95	7.92	0.43	0.156	0.334	0.055	0.10
96	8.00	0.43	0.156	0.333	0.055	0.10
97	8.08	0.50	0.180	0.331	0.063	0.12
98	8.17	0.50	0.180	0.330	0.063	0.12
99	8.25	0.50	0.180	0.328	0.063	0.12
100	8.33	0.50	0.180	0.327	0.063	0.12
101	8.42	0.50	0.180	0.325	0.063	0.12
102	8.50	0.50	0.180	0.323	0.063	0.12
103	8.58	0.53	0.192	0.322	0.067	0.12
104	8.67	0.53	0.192	0.320	0.067	0.12
105	8.75	0.53	0.192	0.319	0.067	0.12
106	8.83	0.57	0.204	0.317	0.071	0.13
107	8.92	0.57	0.204	0.316	0.071	0.13
108	9.00	0.57	0.204	0.314	0.071	0.13
109	9.08	0.63	0.228	0.313	0.080	0.15
110	9.17	0.63	0.228	0.311	0.080	0.15
111	9.25	0.63	0.228	0.310	0.080	0.15
112	9.33	0.67	0.240	0.309	0.084	0.16
113	9.42	0.67	0.240	0.307	0.084	0.16
114	9.50	0.67	0.240	0.306	0.084	0.16
115	9.58	0.70	0.252	0.304	0.088	0.16
116	9.67	0.70	0.252	0.303	0.088	0.16
117	9.75	0.70	0.252	0.301	0.088	0.16
118	9.83	0.73	0.264	0.300	0.092	0.17
119	9.92	0.73	0.264	0.298	0.092	0.17
120	10.00	0.73	0.264	0.297	0.092	0.17
121	10.08	0.50	0.180	0.295	0.063	0.12
122	10.17	0.50	0.180	0.294	0.063	0.12
123	10.25	0.50	0.180	0.293	0.063	0.12
124	10.33	0.50	0.180	0.291	0.063	0.12
125	10.42	0.50	0.180	0.290	0.063	0.12
126	10.50	0.50	0.180	0.288	0.063	0.12
127	10.58	0.67	0.240	0.287	0.084	0.16
128	10.67	0.67	0.240	0.286	0.084	0.16
129	10.75	0.67	0.240	0.284	0.084	0.16
130	10.83	0.67	0.240	0.283	0.084	0.16
131	10.92	0.67	0.240	0.281	0.084	0.16
132	11.00	0.67	0.240	0.280	0.084	0.16
133	11.08	0.63	0.228	0.279	0.080	0.15
134	11.17	0.63	0.228	0.277	0.080	0.15
135	11.25	0.63	0.228	0.276	0.080	0.15
136	11.33	0.63	0.228	0.275	0.080	0.15
137	11.42	0.63	0.228	0.273	0.080	0.15
138	11.50	0.63	0.228	0.272	0.080	0.15
139	11.58	0.57	0.204	0.271	0.071	0.13

140	11.67	0.57	0.204	0.269	0.071	0.13
141	11.75	0.57	0.204	0.268	0.071	0.13
142	11.83	0.60	0.216	0.267	0.076	0.14
143	11.92	0.60	0.216	0.265	0.076	0.14
144	12.00	0.60	0.216	0.264	0.076	0.14
145	12.08	0.83	0.300	0.263	---	0.04
146	12.17	0.83	0.300	0.261	---	0.04
147	12.25	0.83	0.300	0.260	---	0.04
148	12.33	0.87	0.312	0.259	---	0.05
149	12.42	0.87	0.312	0.257	---	0.05
150	12.50	0.87	0.312	0.256	---	0.06
151	12.58	0.93	0.336	0.255	---	0.08
152	12.67	0.93	0.336	0.253	---	0.08
153	12.75	0.93	0.336	0.252	---	0.08
154	12.83	0.97	0.348	0.251	---	0.10
155	12.92	0.97	0.348	0.250	---	0.10
156	13.00	0.97	0.348	0.248	---	0.10
157	13.08	1.13	0.408	0.247	---	0.16
158	13.17	1.13	0.408	0.246	---	0.16
159	13.25	1.13	0.408	0.245	---	0.16
160	13.33	1.13	0.408	0.243	---	0.16
161	13.42	1.13	0.408	0.242	---	0.17
162	13.50	1.13	0.408	0.241	---	0.17
163	13.58	0.77	0.276	0.240	---	0.04
164	13.67	0.77	0.276	0.239	---	0.04
165	13.75	0.77	0.276	0.237	---	0.04
166	13.83	0.77	0.276	0.236	---	0.04
167	13.92	0.77	0.276	0.235	---	0.04
168	14.00	0.77	0.276	0.234	---	0.04
169	14.08	0.90	0.324	0.233	---	0.09
170	14.17	0.90	0.324	0.231	---	0.09
171	14.25	0.90	0.324	0.230	---	0.09
172	14.33	0.87	0.312	0.229	---	0.08
173	14.42	0.87	0.312	0.228	---	0.08
174	14.50	0.87	0.312	0.227	---	0.09
175	14.58	0.87	0.312	0.226	---	0.09
176	14.67	0.87	0.312	0.224	---	0.09
177	14.75	0.87	0.312	0.223	---	0.09
178	14.83	0.83	0.300	0.222	---	0.08
179	14.92	0.83	0.300	0.221	---	0.08
180	15.00	0.83	0.300	0.220	---	0.08
181	15.08	0.80	0.288	0.219	---	0.07
182	15.17	0.80	0.288	0.218	---	0.07
183	15.25	0.80	0.288	0.216	---	0.07
184	15.33	0.77	0.276	0.215	---	0.06
185	15.42	0.77	0.276	0.214	---	0.06
186	15.50	0.77	0.276	0.213	---	0.06
187	15.58	0.63	0.228	0.212	---	0.02

188	15.67	0.63	0.228	0.211	---	0.02
189	15.75	0.63	0.228	0.210	---	0.02
190	15.83	0.63	0.228	0.209	---	0.02
191	15.92	0.63	0.228	0.208	---	0.02
192	16.00	0.63	0.228	0.207	---	0.02
193	16.08	0.13	0.048	0.206	0.017	0.03
194	16.17	0.13	0.048	0.205	0.017	0.03
195	16.25	0.13	0.048	0.204	0.017	0.03
196	16.33	0.13	0.048	0.203	0.017	0.03
197	16.42	0.13	0.048	0.202	0.017	0.03
198	16.50	0.13	0.048	0.200	0.017	0.03
199	16.58	0.10	0.036	0.199	0.013	0.02
200	16.67	0.10	0.036	0.198	0.013	0.02
201	16.75	0.10	0.036	0.197	0.013	0.02
202	16.83	0.10	0.036	0.196	0.013	0.02
203	16.92	0.10	0.036	0.195	0.013	0.02
204	17.00	0.10	0.036	0.194	0.013	0.02
205	17.08	0.17	0.060	0.194	0.021	0.04
206	17.17	0.17	0.060	0.193	0.021	0.04
207	17.25	0.17	0.060	0.192	0.021	0.04
208	17.33	0.17	0.060	0.191	0.021	0.04
209	17.42	0.17	0.060	0.190	0.021	0.04
210	17.50	0.17	0.060	0.189	0.021	0.04
211	17.58	0.17	0.060	0.188	0.021	0.04
212	17.67	0.17	0.060	0.187	0.021	0.04
213	17.75	0.17	0.060	0.186	0.021	0.04
214	17.83	0.13	0.048	0.185	0.017	0.03
215	17.92	0.13	0.048	0.184	0.017	0.03
216	18.00	0.13	0.048	0.183	0.017	0.03
217	18.08	0.13	0.048	0.182	0.017	0.03
218	18.17	0.13	0.048	0.181	0.017	0.03
219	18.25	0.13	0.048	0.181	0.017	0.03
220	18.33	0.13	0.048	0.180	0.017	0.03
221	18.42	0.13	0.048	0.179	0.017	0.03
222	18.50	0.13	0.048	0.178	0.017	0.03
223	18.58	0.10	0.036	0.177	0.013	0.02
224	18.67	0.10	0.036	0.176	0.013	0.02
225	18.75	0.10	0.036	0.175	0.013	0.02
226	18.83	0.07	0.024	0.175	0.008	0.02
227	18.92	0.07	0.024	0.174	0.008	0.02
228	19.00	0.07	0.024	0.173	0.008	0.02
229	19.08	0.10	0.036	0.172	0.013	0.02
230	19.17	0.10	0.036	0.171	0.013	0.02
231	19.25	0.10	0.036	0.170	0.013	0.02
232	19.33	0.13	0.048	0.170	0.017	0.03
233	19.42	0.13	0.048	0.169	0.017	0.03
234	19.50	0.13	0.048	0.168	0.017	0.03
235	19.58	0.10	0.036	0.167	0.013	0.02

236	19.67	0.10	0.036	0.167	0.013	0.02
237	19.75	0.10	0.036	0.166	0.013	0.02
238	19.83	0.07	0.024	0.165	0.008	0.02
239	19.92	0.07	0.024	0.164	0.008	0.02
240	20.00	0.07	0.024	0.164	0.008	0.02
241	20.08	0.10	0.036	0.163	0.013	0.02
242	20.17	0.10	0.036	0.162	0.013	0.02
243	20.25	0.10	0.036	0.161	0.013	0.02
244	20.33	0.10	0.036	0.161	0.013	0.02
245	20.42	0.10	0.036	0.160	0.013	0.02
246	20.50	0.10	0.036	0.159	0.013	0.02
247	20.58	0.10	0.036	0.159	0.013	0.02
248	20.67	0.10	0.036	0.158	0.013	0.02
249	20.75	0.10	0.036	0.157	0.013	0.02
250	20.83	0.07	0.024	0.157	0.008	0.02
251	20.92	0.07	0.024	0.156	0.008	0.02
252	21.00	0.07	0.024	0.156	0.008	0.02
253	21.08	0.10	0.036	0.155	0.013	0.02
254	21.17	0.10	0.036	0.154	0.013	0.02
255	21.25	0.10	0.036	0.154	0.013	0.02
256	21.33	0.07	0.024	0.153	0.008	0.02
257	21.42	0.07	0.024	0.153	0.008	0.02
258	21.50	0.07	0.024	0.152	0.008	0.02
259	21.58	0.10	0.036	0.151	0.013	0.02
260	21.67	0.10	0.036	0.151	0.013	0.02
261	21.75	0.10	0.036	0.150	0.013	0.02
262	21.83	0.07	0.024	0.150	0.008	0.02
263	21.92	0.07	0.024	0.149	0.008	0.02
264	22.00	0.07	0.024	0.149	0.008	0.02
265	22.08	0.10	0.036	0.148	0.013	0.02
266	22.17	0.10	0.036	0.148	0.013	0.02
267	22.25	0.10	0.036	0.147	0.013	0.02
268	22.33	0.07	0.024	0.147	0.008	0.02
269	22.42	0.07	0.024	0.147	0.008	0.02
270	22.50	0.07	0.024	0.146	0.008	0.02
271	22.58	0.07	0.024	0.146	0.008	0.02
272	22.67	0.07	0.024	0.145	0.008	0.02
273	22.75	0.07	0.024	0.145	0.008	0.02
274	22.83	0.07	0.024	0.144	0.008	0.02
275	22.92	0.07	0.024	0.144	0.008	0.02
276	23.00	0.07	0.024	0.144	0.008	0.02
277	23.08	0.07	0.024	0.143	0.008	0.02
278	23.17	0.07	0.024	0.143	0.008	0.02
279	23.25	0.07	0.024	0.143	0.008	0.02
280	23.33	0.07	0.024	0.143	0.008	0.02
281	23.42	0.07	0.024	0.142	0.008	0.02
282	23.50	0.07	0.024	0.142	0.008	0.02
283	23.58	0.07	0.024	0.142	0.008	0.02

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284  23.67     0.07      0.024          0.142     0.008          0.02
285  23.75     0.07      0.024          0.141     0.008          0.02
286  23.83     0.07      0.024          0.141     0.008          0.02
287  23.92     0.07      0.024          0.141     0.008          0.02
288  24.00     0.07      0.024          0.141     0.008          0.02
    Sum =     100.0                                    Sum =    17.4
       Flood volume = Effective rainfall      1.45(In)
        times area       5.1(Ac.)/[(In)/(Ft.)] =       0.6(Ac.Ft)
       Total soil loss =      1.55(In)
       Total soil loss =     0.660(Ac.Ft)
       Total rainfall =      3.00(In)
       Flood volume =       26786.5 Cubic Feet
       Total soil loss =       28751.9 Cubic Feet
       ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      0.882(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

       ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ----------------------------------------------------------------------------
   0+ 5       0.0004      0.05  Q          |         |         |         |
   0+10       0.0009      0.08  Q          |         |         |         |
   0+15       0.0015      0.08  Q          |         |         |         |
   0+20       0.0022      0.11  Q          |         |         |         |
   0+25       0.0030      0.12  Q          |         |         |         |
   0+30       0.0039      0.12  Q          |         |         |         |
   0+35       0.0047      0.12  Q          |         |         |         |
   0+40       0.0055      0.12  Q          |         |         |         |
   0+45       0.0064      0.12  Q          |         |         |         |
   0+50       0.0074      0.15  Q          |         |         |         |
   0+55       0.0085      0.16  Q          |         |         |         |
   1+ 0       0.0096      0.16  Q          |         |         |         |
   1+ 5       0.0105      0.13  Q          |         |         |         |
   1+10       0.0113      0.12  Q          |         |         |         |
   1+15       0.0122      0.12  Q          |         |         |         |
   1+20       0.0130      0.12  Q          |         |         |         |
   1+25       0.0138      0.12  Q          |         |         |         |
   1+30       0.0146      0.12  Q          |         |         |         |
   1+35       0.0155      0.12  QV         |         |         |         |
   1+40       0.0163      0.12  QV         |         |         |         |
   1+45       0.0171      0.12  QV         |         |         |         |
   1+50       0.0181      0.15  QV         |         |         |         |
   1+55       0.0192      0.16  QV         |         |         |         |
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2+ 0       0.0204      0.16  QV         |          |          |          |
2+ 5       0.0215      0.16  QV         |          |          |          |
2+10       0.0226      0.16  QV         |          |          |          |
2+15       0.0237      0.16  QV         |          |          |          |
2+20       0.0248      0.16  QV         |          |          |          |
2+25       0.0259      0.16  QV         |          |          |          |
2+30       0.0270      0.16  QV         |          |          |          |
2+35       0.0283      0.19  QV         |          |          |          |
2+40       0.0297      0.20  QV         |          |          |          |
2+45       0.0310      0.20  Q V        |          |          |          |
2+50       0.0324      0.20  Q V        |          |          |          |
2+55       0.0338      0.20  Q V        |          |          |          |
3+ 0       0.0352      0.20  Q V        |          |          |          |
3+ 5       0.0366      0.20  Q V        |          |          |          |
3+10       0.0379      0.20  Q V        |          |          |          |
3+15       0.0393      0.20  Q V        |          |          |          |
3+20       0.0407      0.20  Q V        |          |          |          |
3+25       0.0421      0.20  Q V        |          |          |          |
3+30       0.0435      0.20  Q V        |          |          |          |
3+35       0.0448      0.20  Q V        |          |          |          |
3+40       0.0462      0.20  Q  V       |          |          |          |
3+45       0.0476      0.20  Q  V       |          |          |          |
3+50       0.0492      0.23  Q  V       |          |          |          |
3+55       0.0508      0.24  Q  V       |          |          |          |
4+ 0       0.0525      0.24  Q  V       |          |          |          |
4+ 5       0.0542      0.24  Q  V       |          |          |          |
4+10       0.0558      0.24  Q  V       |          |          |          |
4+15       0.0575      0.24  Q  V       |          |          |          |
4+20       0.0593      0.27  |Q V       |          |          |          |
4+25       0.0612      0.28  |Q V       |          |          |          |
4+30       0.0632      0.28  |Q  V      |          |          |          |
4+35       0.0651      0.28  |Q  V      |          |          |          |
4+40       0.0670      0.28  |Q  V      |          |          |          |
4+45       0.0690      0.28  |Q  V      |          |          |          |
4+50       0.0711      0.31  |Q  V      |          |          |          |
4+55       0.0733      0.32  |Q  V      |          |          |          |
5+ 0       0.0755      0.32  |Q  V      |          |          |          |
5+ 5       0.0774      0.27  |Q   V     |          |          |          |
5+10       0.0790      0.24  Q    V     |          |          |          |
5+15       0.0807      0.24  Q    V     |          |          |          |
5+20       0.0825      0.27  |Q   V     |          |          |          |
5+25       0.0844      0.28  |Q   V     |          |          |          |
5+30       0.0864      0.28  |Q   V     |          |          |          |
5+35       0.0885      0.31  |Q   V     |          |          |          |
5+40       0.0907      0.32  |Q   V     |          |          |          |
5+45       0.0929      0.32  |Q    V    |          |          |          |
5+50       0.0951      0.32  |Q    V    |          |          |          |
5+55       0.0973      0.32  |Q    V    |          |          |          |
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6+ 0       0.0995      0.32  |Q    V   |          |          |          |
6+ 5       0.1019      0.35  |Q    V   |          |          |          |
6+10       0.1044      0.36  |Q    V   |          |          |          |
6+15       0.1069      0.36  |Q    V   |          |          |          |
6+20       0.1094      0.36  |Q     V  |          |          |          |
6+25       0.1119      0.36  |Q     V  |          |          |          |
6+30       0.1144      0.36  |Q     V  |          |          |          |
6+35       0.1170      0.39  |Q     V  |          |          |          |
6+40       0.1198      0.40  |Q     V  |          |          |          |
6+45       0.1226      0.40  |Q     V  |          |          |          |
6+50       0.1253      0.40  |Q      V |          |          |          |
6+55       0.1281      0.40  |Q      V |          |          |          |
7+ 0       0.1309      0.40  |Q      V |          |          |          |
7+ 5       0.1336      0.40  |Q      V |          |          |          |
7+10       0.1364      0.40  |Q      V |          |          |          |
7+15       0.1391      0.40  |Q       V|          |          |          |
7+20       0.1421      0.43  |Q       V|          |          |          |
7+25       0.1451      0.44  |Q       V|          |          |          |
7+30       0.1482      0.44  |Q       V|          |          |          |
7+35       0.1514      0.47  |Q       V|          |          |          |
7+40       0.1547      0.48  |Q        V          |          |          |
7+45       0.1580      0.48  |Q        V          |          |          |
7+50       0.1615      0.51  | Q       V          |          |          |
7+55       0.1651      0.52  | Q       V          |          |          |
8+ 0       0.1687      0.52  | Q       V          |          |          |
8+ 5       0.1727      0.58  | Q       |V         |          |          |
8+10       0.1768      0.60  | Q       |V         |          |          |
8+15       0.1810      0.60  | Q       |V         |          |          |
8+20       0.1851      0.60  | Q       | V        |          |          |
8+25       0.1892      0.60  | Q       | V        |          |          |
8+30       0.1934      0.60  | Q       | V        |          |          |
8+35       0.1977      0.63  | Q       | V        |          |          |
8+40       0.2021      0.64  | Q       |  V       |          |          |
8+45       0.2066      0.64  | Q       |  V       |          |          |
8+50       0.2112      0.67  | Q       |  V       |          |          |
8+55       0.2159      0.68  | Q       |   V      |          |          |
9+ 0       0.2206      0.68  | Q       |   V      |          |          |
9+ 5       0.2256      0.74  | Q       |   V      |          |          |
9+10       0.2309      0.76  |  Q      |    V     |          |          |
9+15       0.2361      0.76  |  Q      |    V     |          |          |
9+20       0.2416      0.79  |  Q      |    V     |          |          |
9+25       0.2471      0.80  |  Q      |     V    |          |          |
9+30       0.2526      0.80  |  Q      |     V    |          |          |
9+35       0.2583      0.83  |  Q      |     V    |          |          |
9+40       0.2641      0.84  |  Q      |      V   |          |          |
9+45       0.2699      0.84  |  Q      |      V   |          |          |
9+50       0.2759      0.87  |  Q      |      V   |          |          |
9+55       0.2820      0.88  |  Q      |       V  |          |          |
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10+ 0       0.2881      0.88  |  Q       |        V |          |          |
10+ 5       0.2928      0.69  | Q        |         V|          |          |
10+10       0.2970      0.60  | Q        |         V|          |          |
10+15       0.3011      0.60  | Q        |         V|          |          |
10+20       0.3053      0.60  | Q        |         V|          |          |
10+25       0.3094      0.60  | Q        |          V          |          |
10+30       0.3136      0.60  | Q        |          V          |          |
10+35       0.3186      0.74  | Q        |          V          |          |
10+40       0.3242      0.80  |  Q       |          |V         |          |
10+45       0.3297      0.80  |  Q       |          |V         |          |
10+50       0.3352      0.80  |  Q       |          |V         |          |
10+55       0.3407      0.80  |  Q       |          | V        |          |
11+ 0       0.3463      0.80  |  Q       |          | V        |          |
11+ 5       0.3516      0.78  |  Q       |          | V        |          |
11+10       0.3568      0.76  |  Q       |          |  V       |          |
11+15       0.3621      0.76  |  Q       |          |  V       |          |
11+20       0.3673      0.76  |  Q       |          |  V       |          |
11+25       0.3726      0.76  |  Q       |          |   V      |          |
11+30       0.3778      0.76  |  Q       |          |   V      |          |
11+35       0.3827      0.71  | Q        |          |   V      |          |
11+40       0.3874      0.68  | Q        |          |    V     |          |
11+45       0.3921      0.68  | Q        |          |    V     |          |
11+50       0.3970      0.71  | Q        |          |    V     |          |
11+55       0.4020      0.72  | Q        |          |     V    |          |
12+ 0       0.4069      0.72  | Q        |          |     V    |          |
12+ 5       0.4095      0.37  |Q         |          |     V    |          |
12+10       0.4108      0.20  Q          |          |     V    |          |
12+15       0.4122      0.20  Q          |          |     V    |          |
12+20       0.4140      0.25  |Q         |          |     V    |          |
12+25       0.4159      0.28  |Q         |          |      V   |          |
12+30       0.4178      0.29  |Q         |          |      V   |          |
12+35       0.4204      0.37  |Q         |          |      V   |          |
12+40       0.4233      0.42  |Q         |          |      V   |          |
12+45       0.4263      0.43  |Q         |          |      V   |          |
12+50       0.4296      0.48  |Q         |          |      V   |          |
12+55       0.4330      0.50  | Q        |          |       V  |          |
13+ 0       0.4365      0.51  | Q        |          |       V  |          |
13+ 5       0.4415      0.72  | Q        |          |       V  |          |
13+10       0.4472      0.83  |  Q       |          |        V |          |
13+15       0.4530      0.84  |  Q       |          |        V |          |
13+20       0.4588      0.84  |  Q       |          |        V |          |
13+25       0.4647      0.85  |  Q       |          |         V          |
13+30       0.4706      0.86  |  Q       |          |         V          |
13+35       0.4734      0.41  |Q         |          |         V          |
13+40       0.4747      0.19  Q          |          |         V          |
13+45       0.4761      0.20  Q          |          |         V          |
13+50       0.4775      0.20  Q          |          |         |V         |
13+55       0.4789      0.21  Q          |          |         |V         |
```

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14+ 0       0.4804      0.22  Q          |          |          |V         |
14+ 5       0.4831      0.39  |Q         |          |          |V         |
14+10       0.4863      0.47  |Q         |          |          |V         |
14+15       0.4896      0.48  |Q         |          |          |V         |
14+20       0.4927      0.45  |Q         |          |          | V        |
14+25       0.4957      0.43  |Q         |          |          | V        |
14+30       0.4987      0.44  |Q         |          |          | V        |
14+35       0.5017      0.44  |Q         |          |          | V        |
14+40       0.5048      0.45  |Q         |          |          | V        |
14+45       0.5079      0.45  |Q         |          |          |  V       |
14+50       0.5108      0.42  |Q         |          |          |  V       |
14+55       0.5136      0.40  |Q         |          |          |  V       |
15+ 0       0.5164      0.41  |Q         |          |          |  V       |
15+ 5       0.5190      0.37  |Q         |          |          |  V       |
15+10       0.5215      0.36  |Q         |          |          |  V       |
15+15       0.5240      0.37  |Q         |          |          |   V      |
15+20       0.5263      0.33  |Q         |          |          |   V      |
15+25       0.5285      0.32  |Q         |          |          |   V      |
15+30       0.5307      0.32  |Q         |          |          |   V      |
15+35       0.5318      0.16  Q          |          |          |   V      |
15+40       0.5324      0.09  Q          |          |          |   V      |
15+45       0.5330      0.09  Q          |          |          |   V      |
15+50       0.5337      0.10  Q          |          |          |   V      |
15+55       0.5344      0.10  Q          |          |          |   V      |
16+ 0       0.5351      0.11  Q          |          |          |   V      |
16+ 5       0.5361      0.14  Q          |          |          |   V      |
16+10       0.5372      0.16  Q          |          |          |   V      |
16+15       0.5383      0.16  Q          |          |          |    V     |
16+20       0.5394      0.16  Q          |          |          |    V     |
16+25       0.5405      0.16  Q          |          |          |    V     |
16+30       0.5416      0.16  Q          |          |          |    V     |
16+35       0.5426      0.13  Q          |          |          |    V     |
16+40       0.5434      0.12  Q          |          |          |    V     |
16+45       0.5442      0.12  Q          |          |          |    V     |
16+50       0.5450      0.12  Q          |          |          |    V     |
16+55       0.5459      0.12  Q          |          |          |    V     |
17+ 0       0.5467      0.12  Q          |          |          |    V     |
17+ 5       0.5479      0.17  Q          |          |          |    V     |
17+10       0.5493      0.20  Q          |          |          |    V     |
17+15       0.5507      0.20  Q          |          |          |    V     |
17+20       0.5520      0.20  Q          |          |          |    V     |
17+25       0.5534      0.20  Q          |          |          |    V     |
17+30       0.5548      0.20  Q          |          |          |     V    |
17+35       0.5562      0.20  Q          |          |          |     V    |
17+40       0.5576      0.20  Q          |          |          |     V    |
17+45       0.5590      0.20  Q          |          |          |     V    |
17+50       0.5601      0.17  Q          |          |          |     V    |
17+55       0.5613      0.16  Q          |          |          |     V    |
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18+ 0       0.5624      0.16  Q          |          |          |      V   |
18+ 5       0.5635      0.16  Q          |          |          |      V   |
18+10       0.5646      0.16  Q          |          |          |      V   |
18+15       0.5657      0.16  Q          |          |          |      V   |
18+20       0.5668      0.16  Q          |          |          |      V   |
18+25       0.5679      0.16  Q          |          |          |      V   |
18+30       0.5690      0.16  Q          |          |          |       V  |
18+35       0.5699      0.13  Q          |          |          |       V  |
18+40       0.5707      0.12  Q          |          |          |       V  |
18+45       0.5716      0.12  Q          |          |          |       V  |
18+50       0.5722      0.09  Q          |          |          |       V  |
18+55       0.5728      0.08  Q          |          |          |       V  |
19+ 0       0.5733      0.08  Q          |          |          |       V  |
19+ 5       0.5741      0.11  Q          |          |          |       V  |
19+10       0.5749      0.12  Q          |          |          |       V  |
19+15       0.5757      0.12  Q          |          |          |       V  |
19+20       0.5767      0.15  Q          |          |          |       V  |
19+25       0.5778      0.16  Q          |          |          |       V  |
19+30       0.5789      0.16  Q          |          |          |       V  |
19+35       0.5799      0.13  Q          |          |          |       V  |
19+40       0.5807      0.12  Q          |          |          |       V  |
19+45       0.5815      0.12  Q          |          |          |       V  |
19+50       0.5822      0.09  Q          |          |          |       V  |
19+55       0.5827      0.08  Q          |          |          |       V  |
20+ 0       0.5833      0.08  Q          |          |          |       V  |
20+ 5       0.5840      0.11  Q          |          |          |       V  |
20+10       0.5848      0.12  Q          |          |          |        V |
20+15       0.5857      0.12  Q          |          |          |        V |
20+20       0.5865      0.12  Q          |          |          |        V |
20+25       0.5873      0.12  Q          |          |          |        V |
20+30       0.5881      0.12  Q          |          |          |        V |
20+35       0.5890      0.12  Q          |          |          |        V |
20+40       0.5898      0.12  Q          |          |          |        V |
20+45       0.5906      0.12  Q          |          |          |        V |
20+50       0.5913      0.09  Q          |          |          |        V |
20+55       0.5918      0.08  Q          |          |          |        V |
21+ 0       0.5924      0.08  Q          |          |          |        V |
21+ 5       0.5931      0.11  Q          |          |          |        V |
21+10       0.5939      0.12  Q          |          |          |        V |
21+15       0.5948      0.12  Q          |          |          |        V |
21+20       0.5954      0.09  Q          |          |          |        V |
21+25       0.5960      0.08  Q          |          |          |        V |
21+30       0.5965      0.08  Q          |          |          |        V |
21+35       0.5973      0.11  Q          |          |          |        V |
21+40       0.5981      0.12  Q          |          |          |        V |
21+45       0.5989      0.12  Q          |          |          |        V |
21+50       0.5996      0.09  Q          |          |          |        V |
21+55       0.6001      0.08  Q          |          |          |         V|
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22+ 0	0.6007	0.08	Q	|	|	|	V|
22+ 5	0.6014	0.11	Q	|	|	|	V|
22+10	0.6022	0.12	Q	|	|	|	V|
22+15	0.6031	0.12	Q	|	|	|	V|
22+20	0.6037	0.09	Q	|	|	|	V|
22+25	0.6043	0.08	Q	|	|	|	V|
22+30	0.6048	0.08	Q	|	|	|	V|
22+35	0.6054	0.08	Q	|	|	|	V|
22+40	0.6059	0.08	Q	|	|	|	V|
22+45	0.6065	0.08	Q	|	|	|	V|
22+50	0.6070	0.08	Q	|	|	|	V|
22+55	0.6076	0.08	Q	|	|	|	V|
23+ 0	0.6081	0.08	Q	|	|	|	V|
23+ 5	0.6087	0.08	Q	|	|	|	V|
23+10	0.6092	0.08	Q	|	|	|	V|
23+15	0.6098	0.08	Q	|	|	|	V|
23+20	0.6103	0.08	Q	|	|	|	V|
23+25	0.6109	0.08	Q	|	|	|	V|
23+30	0.6114	0.08	Q	|	|	|	V|
23+35	0.6120	0.08	Q	|	|	|	V|
23+40	0.6125	0.08	Q	|	|	|	V|
23+45	0.6131	0.08	Q	|	|	|	V|
23+50	0.6136	0.08	Q	|	|	|	V|
23+55	0.6142	0.08	Q	|	|	|	V|
24+ 0	0.6148	0.08	Q	|	|	|	V|
24+ 5	0.6149	0.03	Q	|	|	|	V|

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 10/09/23

BASIN Proposed 24hr, 2yr
BASIN ROUTING

Program License Serial Number 6158

********** HYDROGRAPH INFORMATION **********

From study/file name: propuh242.rte
**********HYDROGRAPH DATA**********
Number of intervals = 289
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 0.882 (CFS)
Total volume = 0.615 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 1.000 to Point/Station 2.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 289
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
4.000	0.154	0.712	0.152	0.156
5.000	0.322	0.712	0.320	0.324
6.000	0.549	3.712	0.536	0.562
6.500	0.667	6.223	0.646	0.688
6.700	0.721	7.361	0.696	0.746

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	0.2	0.44	0.66	0.88	Depth (Ft.)
0.083	0.05	0.00	0.000	OI	|	|	|	|	0.00
0.167	0.08	0.00	0.001	O I	|	|	|	|	0.02
0.250	0.08	0.01	0.001	O I	|	|	|	|	0.03
0.333	0.11	0.01	0.002	O I	|	|	|	|	0.05
0.417	0.12	0.01	0.002	O I	|	|	|	|	0.06
0.500	0.12	0.01	0.003	O I	|	|	|	|	0.08
0.583	0.12	0.02	0.004	O I	|	|	|	|	0.10
0.667	0.12	0.02	0.005	O I	|	|	|	|	0.12
0.750	0.12	0.02	0.005	O I	|	|	|	|	0.14
0.833	0.15	0.03	0.006	|O I	|	|	|	|	0.16
0.917	0.16	0.03	0.007	|O I	|	|	|	|	0.18
1.000	0.16	0.04	0.008	|O I	|	|	|	|	0.20
1.083	0.13	0.04	0.009	|O I	|	|	|	|	0.22
1.167	0.12	0.04	0.009	|O I	|	|	|	|	0.24
1.250	0.12	0.04	0.010	|O I	|	|	|	|	0.25
1.333	0.12	0.05	0.010	|O I	|	|	|	|	0.26
1.417	0.12	0.05	0.011	|O I	|	|	|	|	0.28
1.500	0.12	0.05	0.011	|O I	|	|	|	|	0.29
1.583	0.12	0.05	0.012	|O I	|	|	|	|	0.30
1.667	0.12	0.06	0.012	| O I	|	|	|	|	0.31
1.750	0.12	0.06	0.012	| O I	|	|	|	|	0.32
1.833	0.15	0.06	0.013	| O I	|	|	|	|	0.34
1.917	0.16	0.06	0.014	| O I	|	|	|	|	0.35
2.000	0.16	0.07	0.014	| O I	|	|	|	|	0.37
2.083	0.16	0.07	0.015	| O I	|	|	|	|	0.39

2.167	0.16	0.07	0.016	O I				0.40
2.250	0.16	0.07	0.016	O I				0.42
2.333	0.16	0.08	0.017	O I				0.43
2.417	0.16	0.08	0.017	O I				0.45
2.500	0.16	0.08	0.018	O I				0.46
2.583	0.19	0.09	0.018	O I				0.48
2.667	0.20	0.09	0.019	O I				0.50
2.750	0.20	0.09	0.020	O I				0.52
2.833	0.20	0.10	0.021	O I				0.54
2.917	0.20	0.10	0.021	O I				0.56
3.000	0.20	0.10	0.022	O I				0.57
3.083	0.20	0.11	0.023	O I				0.59
3.167	0.20	0.11	0.023	O I				0.61
3.250	0.20	0.11	0.024	O I				0.62
3.333	0.20	0.11	0.025	O I				0.64
3.417	0.20	0.12	0.025	O I				0.66
3.500	0.20	0.12	0.026	O I				0.67
3.583	0.20	0.12	0.026	O I				0.68
3.667	0.20	0.12	0.027	O I				0.70
3.750	0.20	0.13	0.027	O I				0.71
3.833	0.23	0.13	0.028	O I				0.73
3.917	0.24	0.13	0.029	O I				0.75
4.000	0.24	0.14	0.029	O I				0.76
4.083	0.24	0.14	0.030	O I				0.78
4.167	0.24	0.14	0.031	O I				0.80
4.250	0.24	0.15	0.031	O I				0.82
4.333	0.27	0.15	0.032	O I				0.84
4.417	0.28	0.15	0.033	O I				0.86
4.500	0.28	0.16	0.034	O I				0.88
4.583	0.28	0.16	0.035	O I				0.90
4.667	0.28	0.16	0.036	O I				0.92
4.750	0.28	0.17	0.036	O I				0.95
4.833	0.31	0.17	0.037	O I				0.97
4.917	0.32	0.18	0.038	O I				0.99
5.000	0.32	0.18	0.039	O I				1.02
5.083	0.27	0.18	0.040	O I				1.04
5.167	0.24	0.19	0.040	O I				1.05
5.250	0.24	0.19	0.041	O I				1.06
5.333	0.27	0.19	0.041	O I				1.07
5.417	0.28	0.19	0.042	O I				1.09
5.500	0.28	0.20	0.042	O I				1.10
5.583	0.31	0.20	0.043	O I				1.12
5.667	0.32	0.20	0.044	O I				1.14
5.750	0.32	0.21	0.045	O I				1.16
5.833	0.32	0.21	0.045	O I				1.18
5.917	0.32	0.21	0.046	O I				1.20
6.000	0.32	0.22	0.047	O I				1.22
6.083	0.35	0.22	0.048	O I				1.24

6.167	0.36	0.22	0.049	|	O I	|	|	1.26
6.250	0.36	0.23	0.050	|	O I	|	|	1.29
6.333	0.36	0.23	0.050	|	O I	|	|	1.31
6.417	0.36	0.24	0.051	|	O I	|	|	1.33
6.500	0.36	0.24	0.052	|	O I	|	|	1.35
6.583	0.39	0.25	0.053	|	O I	|	|	1.38
6.667	0.40	0.25	0.054	|	|O I	|	|	1.40
6.750	0.40	0.25	0.055	|	|O I	|	|	1.43
6.833	0.40	0.26	0.056	|	|O I	|	|	1.46
6.917	0.40	0.26	0.057	|	|O I	|	|	1.48
7.000	0.40	0.27	0.058	|	|O I	|	|	1.51
7.083	0.40	0.27	0.059	|	|O I	|	|	1.53
7.167	0.40	0.28	0.060	|	| O I	|	|	1.55
7.250	0.40	0.28	0.061	|	| O I	|	|	1.57
7.333	0.43	0.28	0.061	|	| O I|	|	|	1.60
7.417	0.44	0.29	0.063	|	| O I	|	|	1.62
7.500	0.44	0.29	0.064	|	| O I	|	|	1.65
7.583	0.47	0.30	0.065	|	| O I	|	|	1.68
7.667	0.48	0.30	0.066	|	| O |I	|	|	1.71
7.750	0.48	0.31	0.067	|	| O |I	|	|	1.74
7.833	0.51	0.32	0.068	|	| O | I	|	|	1.77
7.917	0.52	0.32	0.070	|	| O | I	|	|	1.81
8.000	0.52	0.33	0.071	|	| O | I	|	|	1.84
8.083	0.58	0.34	0.072	|	| O | I	|	|	1.88
8.167	0.60	0.34	0.074	|	| O | I	|	|	1.93
8.250	0.60	0.35	0.076	|	| O | I	|	|	1.97
8.333	0.60	0.36	0.078	|	| O | I	|	|	2.02
8.417	0.60	0.37	0.079	|	| O | I	|	|	2.06
8.500	0.60	0.37	0.081	|	| O | I	|	|	2.10
8.583	0.63	0.38	0.083	|	| O | I	|	|	2.14
8.667	0.64	0.39	0.084	|	| O | I|	|	|	2.19
8.750	0.64	0.40	0.086	|	| O | I|	|	|	2.23
8.833	0.67	0.41	0.088	|	| O | I	|	|	2.28
8.917	0.68	0.41	0.090	|	| O| I	|	|	2.33
9.000	0.68	0.42	0.091	|	| O| I	|	|	2.37
9.083	0.74	0.43	0.093	|	| O| | I	|	|	2.42
9.167	0.76	0.44	0.095	|	| O | I	|	|	2.48
9.250	0.76	0.45	0.098	|	| O | I	|	|	2.54
9.333	0.79	0.46	0.100	|	| O | I	|	|	2.59
9.417	0.80	0.47	0.102	|	| |O | I	|	|	2.65
9.500	0.80	0.48	0.104	|	| |O | I	|	|	2.71
9.583	0.83	0.49	0.107	|	| |O | I	|	|	2.77
9.667	0.84	0.50	0.109	|	| | O | I	|	|	2.83
9.750	0.84	0.51	0.111	|	| | O | I	|	|	2.89
9.833	0.87	0.52	0.114	|	| | O | I	|	|	2.95
9.917	0.88	0.54	0.116	|	| | O | I	|	|	3.01
10.000	0.88	0.55	0.118	|	| | O | I	|	|	3.07
10.083	0.69	0.55	0.120	|	| | O |I	|	|	3.11

10.167	0.60	0.56	0.121	|	|	| OI	|	|	3.13
10.250	0.60	0.56	0.121	|	|	| OI	|	|	3.14
10.333	0.60	0.56	0.121	|	|	| OI	|	|	3.15
10.417	0.60	0.56	0.121	|	|	| OI	|	|	3.15
10.500	0.60	0.56	0.122	|	|	| OI	|	|	3.16
10.583	0.74	0.57	0.122	|	|	| O	| I	|	3.18
10.667	0.80	0.57	0.124	|	|	| O	| I	|	3.21
10.750	0.80	0.58	0.125	|	|	| O	| I	|	3.26
10.833	0.80	0.59	0.127	|	|	| O	| I	|	3.29
10.917	0.80	0.59	0.128	|	|	| O	| I	|	3.33
11.000	0.80	0.60	0.130	|	|	| O	| I	|	3.37
11.083	0.78	0.61	0.131	|	|	| O	| I	|	3.40
11.167	0.76	0.61	0.132	|	|	| O	| I	|	3.43
11.250	0.76	0.62	0.133	|	|	| O	| I	|	3.46
11.333	0.76	0.62	0.134	|	|	| O	| I	|	3.48
11.417	0.76	0.62	0.135	|	|	| O	| I	|	3.51
11.500	0.76	0.63	0.136	|	|	| O	| I	|	3.53
11.583	0.71	0.63	0.137	|	|	| O	|I	|	3.55
11.667	0.68	0.63	0.137	|	|	| O	I |	|	3.56
11.750	0.68	0.64	0.137	|	|	| OI	|	|	3.57
11.833	0.71	0.64	0.138	|	|	| O	|I	|	3.58
11.917	0.72	0.64	0.138	|	|	| O	| I	|	3.60
12.000	0.72	0.64	0.139	|	|	| O	| I	|	3.61
12.083	0.37	0.64	0.138	|	| I	| O	|	|	3.59
12.167	0.20	0.63	0.136	| I	|	| O	|	|	3.53
12.250	0.20	0.61	0.133	| I	|	| O	|	|	3.45
12.333	0.25	0.60	0.130	| |I	|	| O	|	|	3.39
12.417	0.28	0.59	0.128	| | I	|	| O	|	|	3.33
12.500	0.29	0.58	0.126	| | I	|	| O	|	|	3.27
12.583	0.37	0.57	0.124	|	| I	| O	|	|	3.23
12.667	0.42	0.57	0.123	|	| I	| O	|	|	3.20
12.750	0.43	0.56	0.122	|	| I	| O	|	|	3.17
12.833	0.48	0.56	0.121	|	| |I	O	|	|	3.15
12.917	0.50	0.56	0.121	|	| | I	O	|	|	3.14
13.000	0.51	0.56	0.121	|	| | I	O	|	|	3.13
13.083	0.72	0.56	0.121	|	|	| O	| I	|	3.14
13.167	0.83	0.57	0.122	|	|	| O	|	| I	3.18
13.250	0.84	0.57	0.124	|	|	| O	|	| I	3.23
13.333	0.84	0.58	0.126	|	|	| O	|	| I	3.27
13.417	0.85	0.59	0.128	|	|	| O	|	| I	3.32
13.500	0.86	0.60	0.130	|	|	| O	|	| I	3.37
13.583	0.41	0.60	0.130	|	| I	| O	|	|	3.37
13.667	0.19	0.59	0.128	| I	|	| O	|	|	3.32
13.750	0.20	0.58	0.125	| I	|	| O	|	|	3.25
13.833	0.20	0.57	0.123	| I	|	| O	|	|	3.18
13.917	0.21	0.56	0.120	| I	|	| O	|	|	3.12
14.000	0.22	0.54	0.118	| I	|	| O	|	|	3.06
14.083	0.39	0.54	0.116	|	| I	| O	|	|	3.02

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14.167    0.47    0.53      0.115  |        |        |I O    |        |      3.00
14.250    0.48    0.53      0.115  |        |        |I O    |        |      2.99
14.333    0.45    0.53      0.115  |        |       I  O    |        |      2.97
14.417    0.43    0.53      0.114  |        |      I|  O    |        |      2.96
14.500    0.44    0.52      0.113  |        |      I| O     |        |      2.94
14.583    0.44    0.52      0.113  |        |       I O     |        |      2.93
14.667    0.45    0.52      0.112  |        |       I O     |        |      2.91
14.750    0.45    0.52      0.112  |        |       I O     |        |      2.90
14.833    0.42    0.51      0.111  |        |      I| O     |        |      2.89
14.917    0.40    0.51      0.111  |        |     I | O     |        |      2.87
15.000    0.41    0.51      0.110  |        |     I | O     |        |      2.85
15.083    0.37    0.50      0.109  |        |    I  | O     |        |      2.83
15.167    0.36    0.50      0.108  |        |    I  | O     |        |      2.81
15.250    0.37    0.50      0.107  |        |    I  |O      |        |      2.78
15.333    0.33    0.49      0.106  |        |  I    |O      |        |      2.76
15.417    0.32    0.49      0.105  |        |  I    |O      |        |      2.73
15.500    0.32    0.48      0.104  |        |  I    |O      |        |      2.70
15.583    0.16    0.47      0.102  |    I   |       |O      |        |      2.66
15.667    0.09    0.46      0.100  |  I     |       O       |        |      2.60
15.750    0.09    0.45      0.097  |  I     |       O       |        |      2.53
15.833    0.10    0.44      0.095  |  I     |      O|       |        |      2.47
15.917    0.10    0.43      0.093  |  I     |      O|       |        |      2.41
16.000    0.11    0.42      0.090  |  I     |      O|       |        |      2.35
16.083    0.14    0.41      0.088  |    I   |     O |       |        |      2.30
16.167    0.16    0.40      0.087  |    I   |     O |       |        |      2.25
16.250    0.16    0.39      0.085  |    I   |     O |       |        |      2.21
16.333    0.16    0.39      0.084  |    I   |     O |       |        |      2.17
16.417    0.16    0.38      0.082  |    I   |    O  |       |        |      2.13
16.500    0.16    0.37      0.081  |    I   |    O  |       |        |      2.09
16.583    0.13    0.37      0.079  |   I    |    O  |       |        |      2.05
16.667    0.12    0.36      0.077  |   I    |   O   |       |        |      2.01
16.750    0.12    0.35      0.076  |   I    |   O   |       |        |      1.97
16.833    0.12    0.34      0.074  |   I    |   O   |       |        |      1.93
16.917    0.12    0.34      0.073  |   I    |   O   |       |        |      1.89
17.000    0.12    0.33      0.071  |   I    |  O    |       |        |      1.85
17.083    0.17    0.32      0.070  |     I  |  O    |       |        |      1.82
17.167    0.20    0.32      0.069  |      I|  O    |       |        |      1.79
17.250    0.20    0.32      0.068  |      I|  O    |       |        |      1.77
17.333    0.20    0.31      0.067  |      I|  O    |       |        |      1.75
17.417    0.20    0.31      0.067  |      I|  O    |       |        |      1.73
17.500    0.20    0.31      0.066  |      I|  O    |       |        |      1.71
17.583    0.20    0.30      0.065  |      I| O     |       |        |      1.70
17.667    0.20    0.30      0.065  |      I| O     |       |        |      1.68
17.750    0.20    0.30      0.064  |      I| O     |       |        |      1.66
17.833    0.17    0.29      0.063  |     I  | O     |       |        |      1.64
17.917    0.16    0.29      0.062  |    I   | O     |       |        |      1.62
18.000    0.16    0.28      0.061  |    I   | O     |       |        |      1.60
18.083    0.16    0.28      0.061  |    I   | O     |       |        |      1.58
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18.167	0.16	0.28	0.060	I	O			1.55
18.250	0.16	0.27	0.059	I	O			1.53
18.333	0.16	0.27	0.058	I	O			1.51
18.417	0.16	0.27	0.058	I	O			1.49
18.500	0.16	0.26	0.057	I	O			1.48
18.583	0.13	0.26	0.056	I	O			1.46
18.667	0.12	0.25	0.055	I	O			1.43
18.750	0.12	0.25	0.054	I	O			1.41
18.833	0.09	0.25	0.053	I	O			1.38
18.917	0.08	0.24	0.052	I	O			1.36
19.000	0.08	0.24	0.051	I	O			1.33
19.083	0.11	0.23	0.050	I	O			1.30
19.167	0.12	0.23	0.049	I	O			1.28
19.250	0.12	0.22	0.049	I	O			1.26
19.333	0.15	0.22	0.048	I	O			1.25
19.417	0.16	0.22	0.048	I	O			1.23
19.500	0.16	0.22	0.047	I	O			1.22
19.583	0.13	0.22	0.047	I	O			1.21
19.667	0.12	0.21	0.046	I	O			1.20
19.750	0.12	0.21	0.045	I	O			1.18
19.833	0.09	0.21	0.045	I	O			1.16
19.917	0.08	0.20	0.044	I	O			1.14
20.000	0.08	0.20	0.043	I	O			1.12
20.083	0.11	0.20	0.042	I	O			1.10
20.167	0.12	0.19	0.042	I	O			1.09
20.250	0.12	0.19	0.041	I	O			1.07
20.333	0.12	0.19	0.041	I	O			1.06
20.417	0.12	0.19	0.040	I	O			1.05
20.500	0.12	0.18	0.040	I	O			1.04
20.583	0.12	0.18	0.039	I	O			1.03
20.667	0.12	0.18	0.039	I	O			1.01
20.750	0.12	0.18	0.039	I	O			1.00
20.833	0.09	0.18	0.038	I	O			0.99
20.917	0.08	0.17	0.038	I	O			0.98
21.000	0.08	0.17	0.037	I	O			0.96
21.083	0.11	0.17	0.036	I	O			0.95
21.167	0.12	0.17	0.036	I	O			0.94
21.250	0.12	0.17	0.036	I	O			0.93
21.333	0.09	0.16	0.035	I	O			0.92
21.417	0.08	0.16	0.035	I	O			0.90
21.500	0.08	0.16	0.034	I	O			0.89
21.583	0.11	0.16	0.034	I	O			0.88
21.667	0.12	0.15	0.034	I	O			0.87
21.750	0.12	0.15	0.033	I	O			0.86
21.833	0.09	0.15	0.033	I	O			0.86
21.917	0.08	0.15	0.033	I	O			0.84
22.000	0.08	0.15	0.032	I	O			0.83
22.083	0.11	0.15	0.032	I	O			0.82

22.167	0.12	0.15	0.031	| IO |	|	|	|	0.82
22.250	0.12	0.14	0.031	| IO |	|	|	|	0.81
22.333	0.09	0.14	0.031	| I O |	|	|	|	0.81
22.417	0.08	0.14	0.031	| I O |	|	|	|	0.80
22.500	0.08	0.14	0.030	| I O |	|	|	|	0.79
22.583	0.08	0.14	0.030	| I O |	|	|	|	0.77
22.667	0.08	0.14	0.029	| I O |	|	|	|	0.76
22.750	0.08	0.13	0.029	| I O |	|	|	|	0.75
22.833	0.08	0.13	0.029	| I O |	|	|	|	0.75
22.917	0.08	0.13	0.028	| I O |	|	|	|	0.74
23.000	0.08	0.13	0.028	| I O |	|	|	|	0.73
23.083	0.08	0.13	0.028	| I O |	|	|	|	0.72
23.167	0.08	0.13	0.027	| I O |	|	|	|	0.71
23.250	0.08	0.12	0.027	| I O |	|	|	|	0.70
23.333	0.08	0.12	0.027	| I O |	|	|	|	0.69
23.417	0.08	0.12	0.026	| I O |	|	|	|	0.69
23.500	0.08	0.12	0.026	| I O |	|	|	|	0.68
23.583	0.08	0.12	0.026	| I O |	|	|	|	0.67
23.667	0.08	0.12	0.026	| I O |	|	|	|	0.66
23.750	0.08	0.12	0.025	| I O |	|	|	|	0.66
23.833	0.08	0.12	0.025	| I O |	|	|	|	0.65
23.917	0.08	0.11	0.025	| I O |	|	|	|	0.65
24.000	0.08	0.11	0.025	| I O |	|	|	|	0.64
24.083	0.03	0.11	0.024	I O |	|	|	|	0.63
24.167	0.00	0.11	0.024	I O |	|	|	|	0.61
24.250	0.00	0.11	0.023	I O |	|	|	|	0.59
24.333	0.00	0.10	0.022	I O |	|	|	|	0.57
24.417	0.00	0.10	0.021	I O |	|	|	|	0.56
24.500	0.00	0.10	0.021	I O |	|	|	|	0.54
24.583	0.00	0.09	0.020	I O |	|	|	|	0.52
24.667	0.00	0.09	0.019	I O |	|	|	|	0.50
24.750	0.00	0.09	0.019	I O |	|	|	|	0.49
24.833	0.00	0.08	0.018	I O |	|	|	|	0.47
24.917	0.00	0.08	0.018	I O |	|	|	|	0.46
25.000	0.00	0.08	0.017	I O |	|	|	|	0.44
25.083	0.00	0.08	0.017	I O |	|	|	|	0.43
25.167	0.00	0.07	0.016	I O |	|	|	|	0.42
25.250	0.00	0.07	0.016	I O |	|	|	|	0.40
25.333	0.00	0.07	0.015	I O |	|	|	|	0.39
25.417	0.00	0.07	0.015	I O |	|	|	|	0.38
25.500	0.00	0.07	0.014	I O |	|	|	|	0.37
25.583	0.00	0.06	0.014	I O |	|	|	|	0.36
25.667	0.00	0.06	0.013	I O |	|	|	|	0.34
25.750	0.00	0.06	0.013	I O |	|	|	|	0.33
25.833	0.00	0.06	0.012	I O |	|	|	|	0.32
25.917	0.00	0.06	0.012	I O |	|	|	|	0.31
26.000	0.00	0.05	0.012	IO |	|	|	|	0.30
26.083	0.00	0.05	0.011	IO |	|	|	|	0.29

26.167	0.00	0.05	0.011	IO	|	|	|	0.28
26.250	0.00	0.05	0.011	IO	|	|	|	0.28
26.333	0.00	0.05	0.010	IO	|	|	|	0.27
26.417	0.00	0.05	0.010	IO	|	|	|	0.26
26.500	0.00	0.04	0.010	IO	|	|	|	0.25
26.583	0.00	0.04	0.009	IO	|	|	|	0.24
26.667	0.00	0.04	0.009	IO	|	|	|	0.24
26.750	0.00	0.04	0.009	IO	|	|	|	0.23
26.833	0.00	0.04	0.008	IO	|	|	|	0.22
26.917	0.00	0.04	0.008	IO	|	|	|	0.21
27.000	0.00	0.04	0.008	IO	|	|	|	0.21
27.083	0.00	0.04	0.008	IO	|	|	|	0.20
27.167	0.00	0.03	0.007	IO	|	|	|	0.19
27.250	0.00	0.03	0.007	IO	|	|	|	0.19
27.333	0.00	0.03	0.007	IO	|	|	|	0.18
27.417	0.00	0.03	0.007	IO	|	|	|	0.18
27.500	0.00	0.03	0.007	IO	|	|	|	0.17
27.583	0.00	0.03	0.006	IO	|	|	|	0.17
27.667	0.00	0.03	0.006	IO	|	|	|	0.16
27.750	0.00	0.03	0.006	IO	|	|	|	0.16
27.833	0.00	0.03	0.006	O	|	|	|	0.15
27.917	0.00	0.03	0.006	O	|	|	|	0.15
28.000	0.00	0.03	0.005	O	|	|	|	0.14
28.083	0.00	0.02	0.005	O	|	|	|	0.14
28.167	0.00	0.02	0.005	O	|	|	|	0.13
28.250	0.00	0.02	0.005	O	|	|	|	0.13
28.333	0.00	0.02	0.005	O	|	|	|	0.12
28.417	0.00	0.02	0.005	O	|	|	|	0.12
28.500	0.00	0.02	0.004	O	|	|	|	0.12
28.583	0.00	0.02	0.004	O	|	|	|	0.11
28.667	0.00	0.02	0.004	O	|	|	|	0.11
28.750	0.00	0.02	0.004	O	|	|	|	0.11
28.833	0.00	0.02	0.004	O	|	|	|	0.10
28.917	0.00	0.02	0.004	O	|	|	|	0.10
29.000	0.00	0.02	0.004	O	|	|	|	0.10
29.083	0.00	0.02	0.004	O	|	|	|	0.09
29.167	0.00	0.02	0.003	O	|	|	|	0.09
29.250	0.00	0.02	0.003	O	|	|	|	0.09
29.333	0.00	0.02	0.003	O	|	|	|	0.08
29.417	0.00	0.01	0.003	O	|	|	|	0.08
29.500	0.00	0.01	0.003	O	|	|	|	0.08
29.583	0.00	0.01	0.003	O	|	|	|	0.08
29.667	0.00	0.01	0.003	O	|	|	|	0.07
29.750	0.00	0.01	0.003	O	|	|	|	0.07
29.833	0.00	0.01	0.003	O	|	|	|	0.07
29.917	0.00	0.01	0.003	O	|	|	|	0.07
30.000	0.00	0.01	0.003	O	|	|	|	0.07
30.083	0.00	0.01	0.002	O	|	|	|	0.06

30.167	0.00	0.01	0.002	O	|	|	|	0.06
30.250	0.00	0.01	0.002	O	|	|	|	0.06
30.333	0.00	0.01	0.002	O	|	|	|	0.06
30.417	0.00	0.01	0.002	O	|	|	|	0.06
30.500	0.00	0.01	0.002	O	|	|	|	0.05
30.583	0.00	0.01	0.002	O	|	|	|	0.05
30.667	0.00	0.01	0.002	O	|	|	|	0.05
30.750	0.00	0.01	0.002	O	|	|	|	0.05
30.833	0.00	0.01	0.002	O	|	|	|	0.05
30.917	0.00	0.01	0.002	O	|	|	|	0.05
31.000	0.00	0.01	0.002	O	|	|	|	0.04
31.083	0.00	0.01	0.002	O	|	|	|	0.04
31.167	0.00	0.01	0.002	O	|	|	|	0.04
31.250	0.00	0.01	0.002	O	|	|	|	0.04
31.333	0.00	0.01	0.002	O	|	|	|	0.04
31.417	0.00	0.01	0.001	O	|	|	|	0.04
31.500	0.00	0.01	0.001	O	|	|	|	0.04
31.583	0.00	0.01	0.001	O	|	|	|	0.04
31.667	0.00	0.01	0.001	O	|	|	|	0.03
31.750	0.00	0.01	0.001	O	|	|	|	0.03
31.833	0.00	0.01	0.001	O	|	|	|	0.03
31.917	0.00	0.01	0.001	O	|	|	|	0.03
32.000	0.00	0.01	0.001	O	|	|	|	0.03
32.083	0.00	0.01	0.001	O	|	|	|	0.03
32.167	0.00	0.01	0.001	O	|	|	|	0.03
32.250	0.00	0.00	0.001	O	|	|	|	0.03
32.333	0.00	0.00	0.001	O	|	|	|	0.03
32.417	0.00	0.00	0.001	O	|	|	|	0.03
32.500	0.00	0.00	0.001	O	|	|	|	0.03
32.583	0.00	0.00	0.001	O	|	|	|	0.02
32.667	0.00	0.00	0.001	O	|	|	|	0.02
32.750	0.00	0.00	0.001	O	|	|	|	0.02
32.833	0.00	0.00	0.001	O	|	|	|	0.02
32.917	0.00	0.00	0.001	O	|	|	|	0.02
33.000	0.00	0.00	0.001	O	|	|	|	0.02
33.083	0.00	0.00	0.001	O	|	|	|	0.02
33.167	0.00	0.00	0.001	O	|	|	|	0.02
33.250	0.00	0.00	0.001	O	|	|	|	0.02
33.333	0.00	0.00	0.001	O	|	|	|	0.02
33.417	0.00	0.00	0.001	O	|	|	|	0.02
33.500	0.00	0.00	0.001	O	|	|	|	0.02
33.583	0.00	0.00	0.001	O	|	|	|	0.02
33.667	0.00	0.00	0.001	O	|	|	|	0.02
33.750	0.00	0.00	0.001	O	|	|	|	0.02
33.833	0.00	0.00	0.001	O	|	|	|	0.02
33.917	0.00	0.00	0.001	O	|	|	|	0.01
34.000	0.00	0.00	0.001	O	|	|	|	0.01
34.083	0.00	0.00	0.001	O	|	|	|	0.01

34.167	0.00	0.00	0.001	O	|	|	|	0.01
34.250	0.00	0.00	0.000	O	|	|	|	0.01
34.333	0.00	0.00	0.000	O	|	|	|	0.01
34.417	0.00	0.00	0.000	O	|	|	|	0.01
34.500	0.00	0.00	0.000	O	|	|	|	0.01
34.583	0.00	0.00	0.000	O	|	|	|	0.01
34.667	0.00	0.00	0.000	O	|	|	|	0.01
34.750	0.00	0.00	0.000	O	|	|	|	0.01
34.833	0.00	0.00	0.000	O	|	|	|	0.01
34.917	0.00	0.00	0.000	O	|	|	|	0.01
35.000	0.00	0.00	0.000	O	|	|	|	0.01
35.083	0.00	0.00	0.000	O	|	|	|	0.01
35.167	0.00	0.00	0.000	O	|	|	|	0.01
35.250	0.00	0.00	0.000	O	|	|	|	0.01
35.333	0.00	0.00	0.000	O	|	|	|	0.01
35.417	0.00	0.00	0.000	O	|	|	|	0.01
35.500	0.00	0.00	0.000	O	|	|	|	0.01
35.583	0.00	0.00	0.000	O	|	|	|	0.01
35.667	0.00	0.00	0.000	O	|	|	|	0.01
35.750	0.00	0.00	0.000	O	|	|	|	0.01
35.833	0.00	0.00	0.000	O	|	|	|	0.01
35.917	0.00	0.00	0.000	O	|	|	|	0.01
36.000	0.00	0.00	0.000	O	|	|	|	0.01
36.083	0.00	0.00	0.000	O	|	|	|	0.01
36.167	0.00	0.00	0.000	O	|	|	|	0.01
36.250	0.00	0.00	0.000	O	|	|	|	0.01
36.333	0.00	0.00	0.000	O	|	|	|	0.01
36.417	0.00	0.00	0.000	O	|	|	|	0.01
36.500	0.00	0.00	0.000	O	|	|	|	0.01

**********HYDROGRAPH DATA**********

Number of intervals = 438
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 0.643 (CFS)
Total volume = 0.615 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ A. **On-site storm drain inlets**	☑ **Locations of inlets.**	☑ **Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	☑ **Maintain and periodically repaint or replace inlet markings.** ☑ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ☑ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ☑ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
☐ N/A B. **Interior floor drains and elevator shaft sump pumps**		☐ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**
☐ N/A C. **Interior parking garages**		☐ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ D1. **Need for future indoor & structural pest control**		☑ **Note building design features that discourage entry of pests.**	☑ **Provide Integrated Pest Management information to owners, lessees, and operators.**
☑ D2. **Landscape/ Outdoor Pesticide Use**	☐ N/A **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ☐ N/A **Show self-retaining landscape areas, if any.** ☑ **Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)**	**State that final landscape plans will accomplish all of the following.** ☐ N/A **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ☑ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ☐ N/A **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ☑ **Consider using pest-resistant plants, especially adjacent to hardscape.** **To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	☑ **Maintain landscaping using minimum or no pesticides.** ☑ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening"** at http://rcflood.org/stormwater/**Error! Hyperlink reference not valid.** ☑ **Provide IPM information to new owners, lessees and operators.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ N/A E. **Pools, spas, ponds, decorative fountains, and other water features.**	☐ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)**	**If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	☐ **See applicable operational BMPs in** "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☐ N/A F. **Food service**	☐ **For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.** ☐ **On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.**	☐ **Describe the location and features of the designated cleaning area.** ☐ **Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.**	☐ **See the brochure, "**The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ **Provide this brochure to new site owners, lessees, and operators.**
☑ G. **Refuse areas**	☑ **Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.** ☑ **If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.** ☐ N/A **Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.**	☑ **State how site refuse will be handled and provide supporting detail to what is shown on plans.** ☑ **State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.**	☑ **State how the following will be implemented:** **Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at** www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ H. **Industrial processes.** N/A	❑ **Show process area.**	❑ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	❑ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ N/A I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	❑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ❑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ❑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	**Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** www.cchealth.org/groups/hazmat/	❑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ N/A J. **Vehicle and Equipment Cleaning**	❑ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	❑ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ❑ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ❑**Car dealerships and similar may rinse cars with water only.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ N/A K. **Vehicle/Equipment Repair and Maintenance**	❑ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ❑ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ❑ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	❑ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ❑ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ❑ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:** ❑ **No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ❑ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ❑ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.** Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ N/A L. **Fuel Dispensing Areas**	❑ **Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ❑ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**		❑ **The property owner shall dry sweep the fueling area routinely.** ❑ **See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

[6] **The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ M. **Loading Docks** N/A	❑ **Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.** ❑ **Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.** ❑ **Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.**		❑ **Move loaded and unloaded items indoors as soon as possible.** ❑ **See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ N. **Fire Sprinkler Test Water**		☑ **Provide a means to drain fire sprinkler test water to the sanitary sewer.**	☑ **See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
O. **Miscellaneous Drain or Wash Water or Other Sources** ☐ **Boiler drain lines** ☑ **Condensate drain lines** ☐ **Rooftop equipment** ☐ **Drainage sumps** ☑ **Roofing, gutters, and trim.** ☐ **Other sources**		☐ **Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.** ☑ **Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.** ☐ **Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.** ☑ **Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.** ☐ **Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.** **Include controls for other sources as specified by local reviewer.**	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ P. **Plazas, sidewalks, and parking lots.**			☑ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.**

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

BMP GENERAL MAINTENANCE TABLE

BMP	Responsibility	Frequency	Funding Source
Education for Property Owners, Operators, Tenants, Occupants or Employees	Calvary Chapel	Information to be provided to each employee as needed	Calvary Chapel
Site upkeep (Sweep pavement, shovel, clean, etc)	Calvary Chapel	Daily As needed	Calvary Chapel

MAINTENANCE ACTIVITIES FOR BIORETENTION BASIN

Activity	Responsibilities	Schedule	Funding sources
• Re-mulch void areas • Treat diseased plants	Calvary Chapel	Weekly As needed	Calvary Chapel
• Water landscaping	Calvary Chapel	As needed	Calvary Chapel
• Inspect soil and repair eroded areas • Remove littler and debris	Calvary Chapel	Weekly As needed	Calvary Chapel
• Remove and replace dead and diseased vegetation	Calvary Chapel	As needed	Calvary Chapel
• Add Mulch • Replace tree stakes and wires	Calvary Chapel	Weekly As needed	Calvary Chapel
• Inspect and clean bioretention discharge area and underdrain • Inspect bioretention underdrains via provided cleanouts	Calvary Chapel	As needed and weekly during rainy season between Apr. and Oct. of each year.	Calvary Chapel
• Inspect manhole, pump and outlet. Ensure proper function.	Calvary Chapel	Following rain events	Calvary Chapel

Long Term Maintenance Plan Table

Post Construction BMP Long Term Maintenance Schedule						
Type of BMP	Location (See site plan)	Inspection Frequency	Maintenance Frequency	Pollutant Disposal Method	O&M Contact	
Bioretention Basin (BMP A)*	Southwestern corner of site	Monthly or as needed	Monthly or as Needed	Landfill	Calvary Chapel Beaumont 951-769-7610	

*See site plan in appendix 1 for bioretention basin details, water quality system details, and site characteristics.

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

Parking/Storage Area Maintenance SC-43



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓
Oxygen Demanding	✓

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The following protocols are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook).
- Keep accurate maintenance logs to evaluate BMP implementation.

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.

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- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel and dispose of litter in the trash.

Surface cleaning

- Use dry cleaning methods (e.g. sweeping or vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- If water is used follow the procedures below:
  - Block the storm drain or contain runoff.
  - Wash water should be collected and pumped to the sanitary sewer or discharged to a pervious surface, do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- When cleaning heavy oily deposits:
  - Use absorbent materials on oily spots prior to sweeping or washing.
  - Dispose of used absorbents appropriately.

Surface Repair

- Pre-heat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination form contacting stormwater runoff.
- Cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc., where applicable. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of the parking facilities and stormwater conveyance systems associated with them on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, nad implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

Requirements

Costs

Cleaning/sweeping costs can be quite large, construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities on a regular basis to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

SC-43 Parking/Storage Area Maintenance

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination form contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Use only as much water as necessary for dust control, to avoid runoff.

References and Resources

http://www.stormwatercenter.net/

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA) http://www.basma.org

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Plaza and Sidewalk Cleaning SC-71



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Pollutants on sidewalks and other pedestrian traffic areas and plazas are typically due to littering and vehicle use. This fact sheet describes good housekeeping practices that can be incorporated into the municipality's existing cleaning and maintenance program.

Approach

Pollution Prevention

- Use dry cleaning methods whenever practical for surface cleaning activities.
- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal).

Suggested Protocols

Surface Cleaning

- Regularly broom (dry) sweep sidewalk, plaza and parking lot areas to minimize cleaning with water.
- Dry cleanup first (sweep, collect, and dispose of debris and trash) when cleaning sidewalks or plazas, then wash with or without soap.
- Block the storm drain or contain runoff when cleaning with water. Discharge wash water to landscaping or collect water and pump to a tank or discharge to sanitary sewer if allowed. (Permission may be required from local sanitation district.)

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- Block the storm drain or contain runoff when washing parking areas, driveways or drive-throughs. Use absorbents to pick up oil; then dry sweep. Clean with or without soap. Collect water and pump to a tank or discharge to sanitary sewer if allowed. Street Repair and Maintenance.

Graffiti Removal

- Avoid graffiti abatement activities during rain events.
- Implement the procedures under Painting and Paint Removal in SC-70 Roads, Streets, and Highway Operation and Maintenance fact sheet when graffiti is removed by painting over.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a dirt or landscaped area after treating with an appropriate filtering device.
- Plug nearby storm drain inlets and vacuum/pump wash water to the sanitary sewer if authorized to do so if a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound). Ensure that a non-hazardous cleaning compound is used or dispose as hazardous waste, as appropriate.

Surface Removal and Repair

- Schedule surface removal activities for dry weather if possible.
- Avoid creating excess dust when breaking asphalt or concrete.
- Take measures to protect nearby storm drain inlets prior to breaking up asphalt or concrete (e.g. place hay bales or sand bags around inlets). Clean afterwards by sweeping up as much material as possible.
- Designate an area for clean up and proper disposal of excess materials.
- Remove and recycle as much of the broken pavement as possible to avoid contact with rainfall and stormwater runoff.
- When making saw cuts in pavement, use as little water as possible. Cover each storm drain inlet completely with filter fabric during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site.
- Always dry sweep first to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains. Once dry sweeping is complete, the area may be hosed down if needed. Wash water should be directed to landscaping or collected and pumped to the sanitary sewer if allowed.

Concrete Installation and Repair

- Schedule asphalt and concrete activities for dry weather.

- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place san bags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- Protect applications of fresh concrete from rainfall and runoff until the material has dried.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Cover litter receptacles and clean out frequently to prevent leaking/spillage or overflow.
- Clean parking lots on a regular basis with a street sweeper.

Training

- Provide regular training to field employees and/or contractors regarding surface cleaning and proper operation of equipment.
- Train employee and contractors in proper techniques for spill containment and cleanup.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Limitations related to sweeping activities at large parking facilities may include current sweeper technology to remove oil and grease.
- Surface cleaning activities that require discharges to the local sewering agency will require coordination with the agency.
- Arrangements for disposal of the swept material collected must be made, as well as accurate tracking of the areas swept and the frequency of sweeping.

Requirements

Costs

- The largest expenditures for sweeping and cleaning of sidewalks, plazas, and parking lots are in staffing and equipment. Sweeping of these areas should be incorporated into street sweeping programs to reduce costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Community education, such as informing residents about their options for recycling and waste disposal, as well as the consequences of littering, can instill a sense of citizen responsibility and potentially reduce the amount of maintenance required by the municipality.

Additional BMPs that should be considered for parking lot areas include:

- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Structural BMPs such as storm drain inlet filters can be very effective in reducing the amount of pollutants discharged from parking facilities during periods of rain.

References and Resources

Bay Area Stormwater Management Agencies Association (BASMAA). 1996. Pollution From Surface Cleaning Folder http://www.basmaa.org

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Santa Clara Valley Urban Runoff Pollution Prevention Program. Maintenance Best Management Practices for the Construction Industry. Brochures: Landscaping, Gardening, and Pool; Roadwork and Paving; and Fresh Concrete and Mortar Application. June 2001.

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Plan. 2001. Municipal Activities Model Program Guidance. November.

Bioretention TC-32



Design Considerations

- Soil for Infiltration
- Tributary Area
- Slope
- Aesthetics
- Environmental Side-effects

Description

The bioretention best management practice (BMP) functions as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. These facilities normally consist of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. The runoff's velocity is reduced by passing over or through buffer strip and subsequently distributed evenly along a ponding area. Exfiltration of the stored water in the bioretention area planting soil into the underlying soils occurs over a period of days.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	▲
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■

Legend ***(Removal Effectiveness)***

- ● Low
- ▲ Medium
- ■ High

California Experience

None documented. Bioretention has been used as a stormwater BMP since 1992. In addition to Prince George's County, MD and Alexandria, VA, bioretention has been used successfully at urban and suburban areas in Montgomery County, MD; Baltimore County, MD; Chesterfield County, VA; Prince William County, VA; Smith Mountain Lake State Park, VA; and Cary, NC.

Advantages

- Bioretention provides stormwater treatment that enhances the quality of downstream water bodies by temporarily storing runoff in the BMP and releasing it over a period of four days to the receiving water (EPA, 1999).
- The vegetation provides shade and wind breaks, absorbs noise, and improves an area's landscape.

Limitations

- The bioretention BMP is not recommended for areas with slopes greater than 20% or where mature tree removal would

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be required since clogging may result, particularly if the BMP receives runoff with high sediment loads (EPA, 1999).

- Bioretention is not a suitable BMP at locations where the water table is within 6 feet of the ground surface and where the surrounding soil stratum is unstable.
- By design, bioretention BMPs have the potential to create very attractive habitats for mosquitoes and other vectors because of highly organic, often heavily vegetated areas mixed with shallow water.
- In cold climates the soil may freeze, preventing runoff from infiltrating into the planting soil.

Design and Sizing Guidelines

- The bioretention area should be sized to capture the design storm runoff.
- In areas where the native soil permeability is less than 0.5 in/hr an underdrain should be provided.
- Recommended minimum dimensions are 15 feet by 40 feet, although the preferred width is 25 feet. Excavated depth should be 4 feet.
- Area should drain completely within 72 hours.
- Approximately 1 tree or shrub per 50 ft^2 of bioretention area should be included.
- Cover area with about 3 inches of mulch.

Construction/Inspection Considerations

Bioretention area should not be established until contributing watershed is stabilized.

Performance

Bioretention removes stormwater pollutants through physical and biological processes, including adsorption, filtration, plant uptake, microbial activity, decomposition, sedimentation and volatilization (EPA, 1999). Adsorption is the process whereby particulate pollutants attach to soil (e.g., clay) or vegetation surfaces. Adequate contact time between the surface and pollutant must be provided for in the design of the system for this removal process to occur. Thus, the infiltration rate of the soils must not exceed those specified in the design criteria or pollutant removal may decrease. Pollutants removed by adsorption include metals, phosphorus, and hydrocarbons. Filtration occurs as runoff passes through the bioretention area media, such as the sand bed, ground cover, and planting soil.

Common particulates removed from stormwater include particulate organic matter, phosphorus, and suspended solids. Biological processes that occur in wetlands result in pollutant uptake by plants and microorganisms in the soil. Plant growth is sustained by the uptake of nutrients from the soils, with woody plants locking up these nutrients through the seasons. Microbial activity within the soil also contributes to the removal of nitrogen and organic matter. Nitrogen is removed by nitrifying and denitrifying bacteria, while aerobic bacteria are responsible for the decomposition of the organic matter. Microbial processes require oxygen and can result in depleted oxygen levels if the bioretention area is not adequately

aerated. Sedimentation occurs in the swale or ponding area as the velocity slows and solids fall out of suspension.

The removal effectiveness of bioretention has been studied during field and laboratory studies conducted by the University of Maryland (Davis et al, 1998). During these experiments, synthetic stormwater runoff was pumped through several laboratory and field bioretention areas to simulate typical storm events in Prince George's County, MD. Removal rates for heavy metals and nutrients are shown in Table 1.

Table 1 Laboratory and Estimated Bioretention Davis et al. (1998); PGDER (1993)

Pollutant	Removal Rate
Total Phosphorus	70-83%
Metals (Cu, Zn, Pb)	93-98%
TKN	68-80%
Total Suspended Solids	90%
Organics	90%
Bacteria	90%

Results for both the laboratory and field experiments were similar for each of the pollutants analyzed. Doubling or halving the influent pollutant levels had little effect on the effluent pollutants concentrations (Davis et al, 1998).

The microbial activity and plant uptake occurring in the bioretention area will likely result in higher removal rates than those determined for infiltration BMPs.

Siting Criteria

Bioretention BMPs are generally used to treat stormwater from impervious surfaces at commercial, residential, and industrial areas (EPA, 1999). Implementation of bioretention for stormwater management is ideal for median strips, parking lot islands, and swales. Moreover, the runoff in these areas can be designed to either divert directly into the bioretention area or convey into the bioretention area by a curb and gutter collection system.

The best location for bioretention areas is upland from inlets that receive sheet flow from graded areas and at areas that will be excavated (EPA, 1999). In order to maximize treatment effectiveness, the site must be graded in such a way that minimizes erosive conditions as sheet flow is conveyed to the treatment area. Locations where a bioretention area can be readily incorporated into the site plan without further environmental damage are preferred. Furthermore, to effectively minimize sediment loading in the treatment area, bioretention only should be used in stabilized drainage areas.

Additional Design Guidelines

The layout of the bioretention area is determined after site constraints such as location of utilities, underlying soils, existing vegetation, and drainage are considered (EPA, 1999). Sites with loamy sand soils are especially appropriate for bioretention because the excavated soil can be backfilled and used as the planting soil, thus eliminating the cost of importing planting soil.

The use of bioretention may not be feasible given an unstable surrounding soil stratum, soils with clay content greater than 25 percent, a site with slopes greater than 20 percent, and/or a site with mature trees that would be removed during construction of the BMP.

Bioretention can be designed to be off-line or on-line of the existing drainage system (EPA, 1999). The drainage area for a bioretention area should be between 0.1 and 0.4 hectares (0.25 and 1.0 acres). Larger drainage areas may require multiple bioretention areas. Furthermore, the maximum drainage area for a bioretention area is determined by the expected rainfall intensity and runoff rate. Stabilized areas may erode when velocities are greater than 5 feet per second (1.5 meter per second). The designer should determine the potential for erosive conditions at the site.

The size of the bioretention area, which is a function of the drainage area and the runoff generated from the area is sized to capture the water quality volume.

The recommended minimum dimensions of the bioretention area are 15 feet (4.6 meters) wide by 40 feet (12.2 meters) long, where the minimum width allows enough space for a dense, randomly-distributed area of trees and shrubs to become established. Thus replicating a natural forest and creating a microclimate, thereby enabling the bioretention area to tolerate the effects of heat stress, acid rain, runoff pollutants, and insect and disease infestations which landscaped areas in urban settings typically are unable to tolerate. The preferred width is 25 feet (7.6 meters), with a length of twice the width. Essentially, any facilities wider than 20 feet (6.1 meters) should be twice as long as they are wide, which promotes the distribution of flow and decreases the chances of concentrated flow.

In order to provide adequate storage and prevent water from standing for excessive periods of time the ponding depth of the bioretention area should not exceed 6 inches (15 centimeters). Water should not be left to stand for more than 72 hours. A restriction on the type of plants that can be used may be necessary due to some plants' water intolerance. Furthermore, if water is left standing for longer than 72 hours mosquitoes and other insects may start to breed.

The appropriate planting soil should be backfilled into the excavated bioretention area. Planting soils should be sandy loam, loamy sand, or loam texture with a clay content ranging from 10 to 25 percent.

Generally the soil should have infiltration rates greater than 0.5 inches (1.25 centimeters) per hour, which is typical of sandy loams, loamy sands, or loams. The pH of the soil should range between 5.5 and 6.5, where pollutants such as organic nitrogen and phosphorus can be adsorbed by the soil and microbial activity can flourish. Additional requirements for the planting soil include a 1.5 to 3 percent organic content and a maximum 500 ppm concentration of soluble salts.

Soil tests should be performed for every 500 cubic yards (382 cubic meters) of planting soil, with the exception of pH and organic content tests, which are required only once per bioretention area (EPA, 1999). Planting soil should be 4 inches (10.1 centimeters) deeper than the bottom of the largest root ball and 4 feet (1.2 meters) altogether. This depth will provide adequate soil for the plants' root systems to become established, prevent plant damage due to severe wind, and provide adequate moisture capacity. Most sites will require excavation in order to obtain the recommended depth.

Planting soil depths of greater than 4 feet (1.2 meters) may require additional construction practices such as shoring measures (EPA, 1999). Planting soil should be placed in 18 inches or greater lifts and lightly compacted until the desired depth is reached. Since high canopy trees may be destroyed during maintenance the bioretention area should be vegetated to resemble a terrestrial forest community ecosystem that is dominated by understory trees. Three species each of both trees and shrubs are recommended to be planted at a rate of 2500 trees and shrubs per hectare (1000 per acre). For instance, a 15 foot (4.6 meter) by 40 foot (12.2 meter) bioretention area (600 square feet or 55.75 square meters) would require 14 trees and shrubs. The shrub-to-tree ratio should be 2:1 to 3:1.

Trees and shrubs should be planted when conditions are favorable. Vegetation should be watered at the end of each day for fourteen days following its planting. Plant species tolerant of pollutant loads and varying wet and dry conditions should be used in the bioretention area.

The designer should assess aesthetics, site layout, and maintenance requirements when selecting plant species. Adjacent non-native invasive species should be identified and the designer should take measures, such as providing a soil breach to eliminate the threat of these species invading the bioretention area. Regional landscaping manuals should be consulted to ensure that the planting of the bioretention area meets the landscaping requirements established by the local authorities. The designers should evaluate the best placement of vegetation within the bioretention area. Plants should be placed at irregular intervals to replicate a natural forest. Trees should be placed on the perimeter of the area to provide shade and shelter from the wind. Trees and shrubs can be sheltered from damaging flows if they are placed away from the path of the incoming runoff. In cold climates, species that are more tolerant to cold winds, such as evergreens, should be placed in windier areas of the site.

Following placement of the trees and shrubs, the ground cover and/or mulch should be established. Ground cover such as grasses or legumes can be planted at the beginning of the growing season. Mulch should be placed immediately after trees and shrubs are planted. Two to 3 inches (5 to 7.6 cm) of commercially-available fine shredded hardwood mulch or shredded hardwood chips should be applied to the bioretention area to protect from erosion.

Maintenance

The primary maintenance requirement for bioretention areas is that of inspection and repair or replacement of the treatment area's components. Generally, this involves nothing more than the routine periodic maintenance that is required of any landscaped area. Plants that are appropriate for the site, climatic, and watering conditions should be selected for use in the bioretention cell. Appropriately selected plants will aide in reducing fertilizer, pesticide, water, and overall maintenance requirements. Bioretention system components should blend over time through plant and root growth, organic decomposition, and the development of a natural

soil horizon. These biologic and physical processes over time will lengthen the facility's life span and reduce the need for extensive maintenance.

Routine maintenance should include a biannual health evaluation of the trees and shrubs and subsequent removal of any dead or diseased vegetation (EPA, 1999). Diseased vegetation should be treated as needed using preventative and low-toxic measures to the extent possible. BMPs have the potential to create very attractive habitats for mosquitoes and other vectors because of highly organic, often heavily vegetated areas mixed with shallow water. Routine inspections for areas of standing water within the BMP and corrective measures to restore proper infiltration rates are necessary to prevent creating mosquito and other vector habitat. In addition, bioretention BMPs are susceptible to invasion by aggressive plant species such as cattails, which increase the chances of water standing and subsequent vector production if not routinely maintained.

In order to maintain the treatment area's appearance it may be necessary to prune and weed. Furthermore, mulch replacement is suggested when erosion is evident or when the site begins to look unattractive. Specifically, the entire area may require mulch replacement every two to three years, although spot mulching may be sufficient when there are random void areas. Mulch replacement should be done prior to the start of the wet season.

New Jersey's Department of Environmental Protection states in their bioretention systems standards that accumulated sediment and debris removal (especially at the inflow point) will normally be the primary maintenance function. Other potential tasks include replacement of dead vegetation, soil pH regulation, erosion repair at inflow points, mulch replenishment, unclogging the underdrain, and repairing overflow structures. There is also the possibility that the cation exchange capacity of the soils in the cell will be significantly reduced over time. Depending on pollutant loads, soils may need to be replaced within 5-10 years of construction (LID, 2000).

Cost

Construction Cost

Construction cost estimates for a bioretention area are slightly greater than those for the required landscaping for a new development (EPA, 1999). A general rule of thumb (Coffman, 1999) is that residential bioretention areas average about $3 to $4 per square foot, depending on soil conditions and the density and types of plants used. Commercial, industrial and institutional site costs can range between $10 to $40 per square foot, based on the need for control structures, curbing, storm drains and underdrains.

Retrofitting a site typically costs more, averaging $6,500 per bioretention area. The higher costs are attributed to the demolition of existing concrete, asphalt, and existing structures and the replacement of fill material with planting soil. The costs of retrofitting a commercial site in Maryland, Kettering Development, with 15 bioretention areas were estimated at $111,600.

In any bioretention area design, the cost of plants varies substantially and can account for a significant portion of the expenditures. While these cost estimates are slightly greater than those of typical landscaping treatment (due to the increased number of plantings, additional soil excavation, backfill material, use of underdrains etc.), those landscaping expenses that would be required regardless of the bioretention installation should be subtracted when determining the net cost.

Perhaps of most importance, however, the cost savings compared to the use of traditional structural stormwater conveyance systems makes bioretention areas quite attractive financially. For example, the use of bioretention can decrease the cost required for constructing stormwater conveyance systems at a site. A medical office building in Maryland was able to reduce the amount of storm drain pipe that was needed from 800 to 230 feet - a cost savings of $24,000 (PGDER, 1993). And a new residential development spent a total of approximately $100,000 using bioretention cells on each lot instead of nearly $400,000 for the traditional stormwater ponds that were originally planned (Rappahanock,). Also, in residential areas, stormwater management controls become a part of each property owner's landscape, reducing the public burden to maintain large centralized facilities.

Maintenance Cost

The operation and maintenance costs for a bioretention facility will be comparable to those of typical landscaping required for a site. Costs beyond the normal landscaping fees will include the cost for testing the soils and may include costs for a sand bed and planting soil.

References and Sources of Additional Information

Coffman, L.S., R. Goo and R. Frederick, 1999: Low impact development: an innovative alternative approach to stormwater management. Proceedings of the 26th Annual Water Resources Planning and Management Conference ASCE, June 6-9, Tempe, Arizona.

Davis, A.P., Shokouhian, M., Sharma, H. and Minami, C., "Laboratory Study of Biological Retention (Bioretention) for Urban Stormwater Management," *Water Environ. Res.*, 73(1), 5-14 (2001).

Davis, A.P., Shokouhian, M., Sharma, H., Minami, C., and Winogradoff, D. "Water Quality Improvement through Bioretention: Lead, Copper, and Zinc," *Water Environ. Res.*, accepted for publication, August 2002.

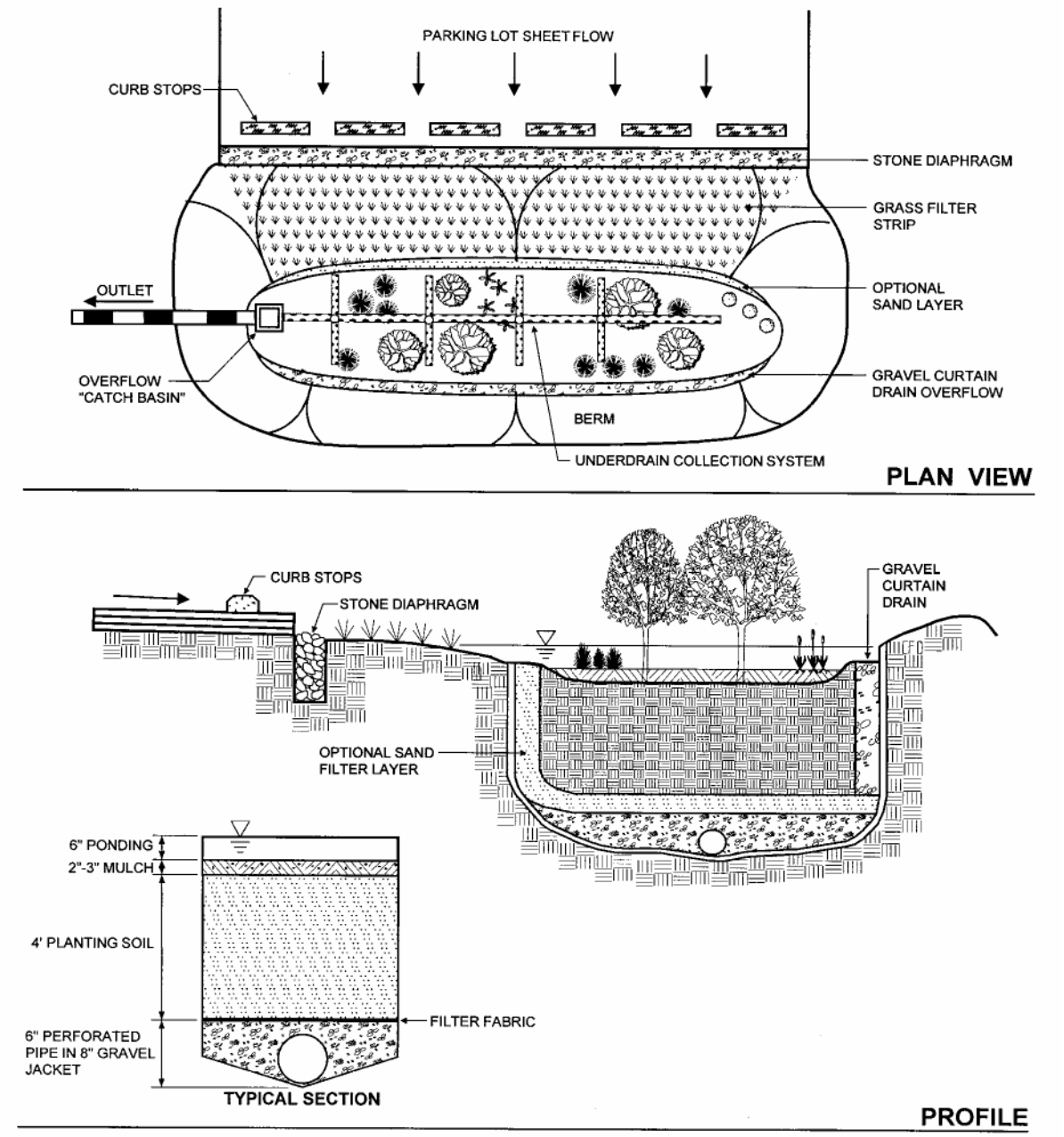
Kim, H., Seagren, E.A., and Davis, A.P., "Engineered Bioretention for Removal of Nitrate from Stormwater Runoff," *WEFTEC 2000 Conference Proceedings on CDROM Research Symposium, Nitrogen Removal*, Session 19, Anaheim CA, October 2000.

Hsieh, C.-h. and Davis, A.P. "Engineering Bioretention for Treatment of Urban Stormwater Runoff," *Watersheds 2002, Proceedings on CDROM Research Symposium*, Session 15, Ft. Lauderdale, FL, Feb. 2002.

Prince George's County Department of Environmental Resources (PGDER), 1993. Design Manual for Use of *Bioretention in Stormwater Management*. Division of Environmental Management, Watershed Protection Branch. Landover, MD.

U.S. EPA Office of Water, 1999. Stormwater Technology Fact Sheet: Bioretention. EPA 832-F-99-012.

Weinstein, N. Davis, A.P. and Veeramachaneni, R. "Low Impact Development (LID) Stormwater Management Approach for the Control of Diffuse Pollution from Urban Roadways," *5th International Conference Diffuse/Nonpoint Pollution and Watershed Management Proceedings*, C.S. Melching and Emre Alp, Eds. 2001 International Water Association



Schematic of a Bioretention Facility (MDE, 2000)

HYDROLOGY STUDY

for

Calvary Chapel Beaumont

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November 2023
Job No. 23005001

Trenton Brudin, PE

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INTRODUCTION

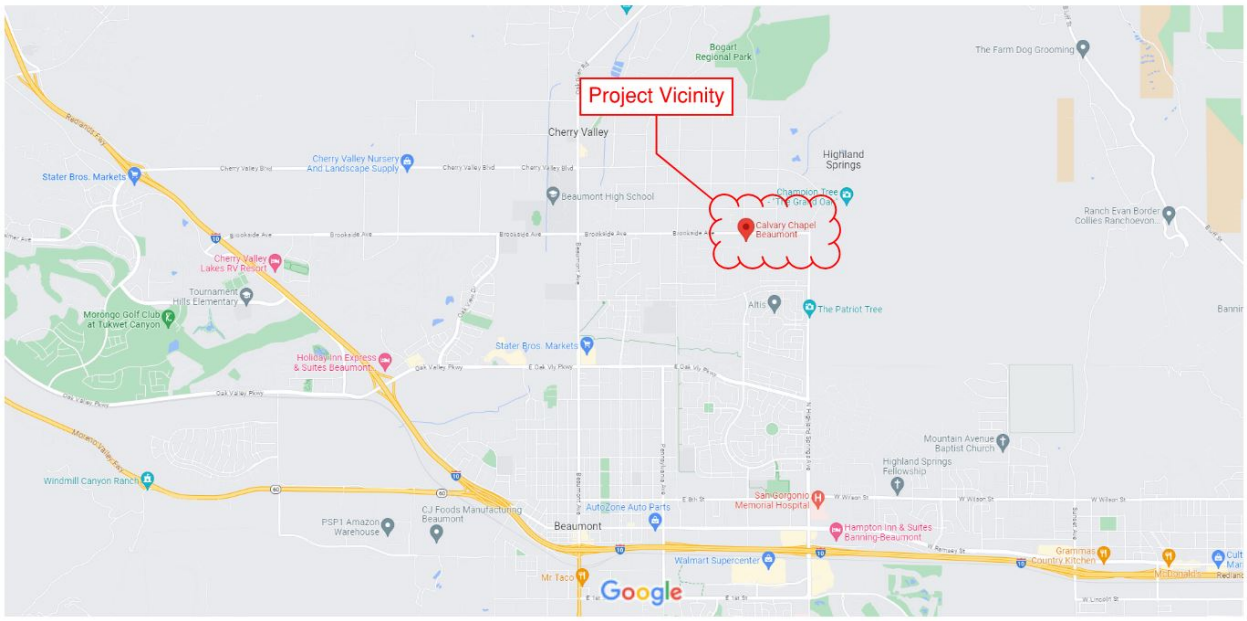
PURPOSE

The purpose of this report is to determine the stormwater runoff and volumes generated by the proposed project site and any contributing offsite run-on. The runoff rates and volumes will be used to determine sizes of the facilities required to control discharge of the runoff to less than or equal to the existing condition.

SITE DESCRIPTION

The project is located at 1780 Orchard Heights Avenue, Beaumont, CA, 92223 (Parcel no. 408-070-012). The site has existing improvements consisting of church buildings, paved parking, and unpaved parking. According to Flood Insurance Rate Map number 06065C0805G, located in Appendix C, the project site has a Zone X designation, and is not located in a floodplain.

Vicinity Map



METHODS

The Hydrology and Hydraulic Calculations were performed using the Unit Hydrograph Method and Rational Method outlined in the Hydrology Manual, published by the County of Riverside, revised August 1986 and the CivilCADD/Civil Design Engineering Software, Version 7.1. The Santa Ana Region Water Quality Management Plan Guidance Document was used to determine appropriate water quality features and basin sizing.

EXISTING CONDITION

The existing project contains multiple buildings along with paved and unpaved parking lots. The project site is one drainage area with stormwater generally flowing from North to South. The Western portion of the project site has existing drainage improvements with grated inlets directing flow to the south edge of the property where it ultimately drains to Orchard Heights Avenue. The east portion of the site surface-flows and ultimately drains to the same location.

The area between Brookside Avenue and the project property-line drains through the site, so the area has been included in the drainage area for analysis. In total the drainage area of the project is about 5.10 Acres. As it exists the project area has 31% impervious area (or 69% pervious area). NRCS data shows that the soil type of the project site is soil type A. See Existing Hydrology Map in Appendix D.

PROPOSED CONDITION

Proposed site improvements include a worship center, children's center, an amphitheater, and additional paved parking. The existing parking on the west side of the site will remain, and some additional spots will be added to the north portion of the site. The eastern side of the project site will have most of its natural-ground parking replaced with paved parking. See Proposed Hydrology Map in Appendix D.

The proposed improvements add impervious surfaces to the project site. The impervious area will be increased from 31% (existing) to 69% (proposed) of the total site area. This condition decreases the site's natural infiltration rate and will cause an increase in storm water runoff. In addition, per current NPDES requirements, storm water runoff will need to be treated via bioretention. The proposed bioretention basin will act as a water quality feature and will also perform as a runoff retarding basin to mitigate the increase in site runoff due to the increase in impervious area. The entire site will drain from north to south (mimicking existing drainage patterns) to the proposed basin located along the southern edge of the site.

The bioretention facility was designed and sized using the County of Riverside, Santa Ana Region WQMP guidelines. The bioretention basin is designed with 3 feet of soil media, 1ft gravel layer for the underdrains, and 1 foot of ponding depth. Worksheets from Appendix F of the LID BMP Design Handbook were used to determine the design capture volume (DCV) and the required size of the basin. The required DCV is 9,810 CF, the proposed basin provides 15,670 CF. The required basin area is 5,723 square feet, the proposed basin provides 9,058 square feet. Basin sizing worksheets are provided in Appendix F. A sketch of the basin cross section is included in the Conclusion section. Since the bottom of the engineered media is too low to daylight to Orchard Heights Avenue, a small pump station will be constructed to discharge flows from the underdrains to the street.

In addition, and as discussed above, the basin was sized to ensure peak runoff flows from the proposed site are not greater than those from the existing site. Basin routing calcs were performed to ensure that the proposed basin provides enough volume to allow the runoff rate to be slowed to (at least) the runoff rate for the existing condition. To perform in this capacity, the proposed basin requires a volume of 21,562 CF (0.495 AF). The provided volume is 23,926 CF (0.549 AF). This volume is provided by ponding in the basin, and storage in the pore space of the

3-foot soil media and 1-foot underdrain gravel section below (30% pore space). Basin routing calculations show that the proposed basin is successful in capturing the 100-year, 24-hour storm and releasing water at a lower rate than existing conditions (See Appendix E). The 10-year, 24-hour storm was also analyzed, and no runoff passes the weir in this condition. Therefore, both storm events are successfully mitigated via the proposed basin components (discussed below). The 100-year water surface elevation is provided in the basin cross section sketch in the Conclusion section.

The basin is designed such that a 1-foot-long rectangular weir is placed 1-foot above the bottom of the basin. This controls the ponding to a maximum depth of 1-foot, which allows for the bioretention basin's optimum performance, and provides enough capacity to slow the proposed condition's site discharge to less than existing conditions. In the basin routing calcs, the basin relies on three components for draw down: natural infiltration capacity, infiltration though the bioretention soil media and underdrains (and discharge via the pump station), and the overflow weir. These features are discussed more in the Methodology section, below.

The overflow weir will discharge to Orchard Heights Avenue via an under-walk drain, mimicking the drainage pattern of the existing condition. Results of the preliminary calculations for the 10-year and 100-year Rational Method, the 100-year, 24 hour Unit Hydrograph, and Basin Routing are summarized in the following tables. Full calculations can be found in Appendix E.

Table 1: Rational Method Results

Area	Existing Q (10 Year)	Existing Q (100 Year)	Area	Proposed Q (10 Year)	Proposed Q (100 Year)
A	6.03 CFS	11.88 CFS	A	9.45 CFS	15.50 CFS

Table 2: Unit Hydrograph Results: 100 Year, 24 Hour Storm

Area	Peak Flow Existing	Flood Volume Existing	Area	Peak Flow Proposed	Flood Volume Proposed
A	3.14 CFS	51,127 CF	A	3.97 CFS	82,180 CF

Table 3: Basin Routing

Area	Peak Flow Existing	Area	Peak Flow Proposed
A	3.14 CFS	A	2.82 CFS

METHODOLOGY

Unit hydrographs and basin routing calcs were performed using Civil Design Engineering Software. Setup of the site included creating hydrology maps reflecting the existing and proposed site conditions. Some parameters are included in the table below. The unit hydrograph cut sheets, which show additional detail, are included in Appendix E. Manning's "n" of 0.015 was selected for both the existing and proposed conditions. Per the Riverside County Hydrology Manual (April 1978), the description of the conditions that represent an "n" of 0.015 are emulated in both project's site conditions.

The proposed bioretention basin is designed to perform two functions: stormwater treatment and stormwater discharge control. The treatment function of the basin is analyzed in detail in the project Water Quality Management Plan (WQMP), but some of those details are discussed herein due to the close relationship and drainage characteristics. The runoff mitigation is modeled in the basin routing calcs provided in Appendix E. Some of the inputs at the basin routing calculations are not clearly displayed on the calculation cut sheets and are discussed in more detail below, along with other calculation considerations.

Prior to design, an infiltration evaluation was performed at the project site (see Appendix B). Two borings were analyzed and yielded infiltration rates of 1.02 in/hr and 0.91 in/hr, respectively. Since the WQMP Guidance Document for the Santa Ana Region requires a minimum infiltration rate of 1.6 in/hr for infiltration BMPs, bioretention was pursued as an alternative.

Per the LID BMP Handbook, bioretention facilities are built with an engineered media to promote timely infiltration and treatment of site runoff. Beneath the engineered media, a gravel section and underdrains direct the treated water to the discharge location. Research performed during design provides that the specifications for the make-up and gradation of the engineered media also specify and long-term infiltration rate of 5 in/hr. The long-term infiltration rate accounts for some losses in infiltration effectiveness over time. This infiltration rate was applied across the bottom area of the basin (5,590 SF). 5,590 SF and 5in/hr translates to 0.65cfs. Note, 5,590 SF is the area of the bottom of the basin. This area does not take into account the additional area provided by the 4:1 side slopes at the 1-foot ponding depth (see basin cross section sketch below). The smaller bottom area was used as a factor of safety in case infiltration capacity deteriorates further than what was accounted for in the long-term infiltration rate. The same method was taken to calculate the storage in the pore space of the soil media. This storage volume was calculated using 30% pore space (per the WQMP Guidance manual) and a 5,590 SF bottom area.

The runoff will infiltrate through the media, though the underdrains, and to the pump station. An effluent pump with automatic float switches will be selected to mimic the infiltration rate of the media (±0.65 cfs). A 6" diameter PVC pipe at 0.5% has the capacity to transmit 0.55 cfs, which is less than the discussed flow rate. However, there are multiple underdrains, and one pipe does not transmit the full 0.65 cfs. The 6" diameter PVC pipes will be adequate in this application. The 0.65 cfs flow rate was applied to the routing calculations and contributes to the "Outflow" column on page 2 of the basin routing calcs (see Appendix E). This will represent a constant

flow rate being discharged by the pump. The pump will be triggered when the runoff volume is enough to be 1ft deep in the soil media.

Since bioretention BMPs are also intended to maximize the site natural infiltration rate, the in-situ infiltration rate was also considered during the design and applied to the discharge rate shown on page 2 of the basin routing calculations (see Appendix E). As discussed above, the infiltration evaluation performed by GeoTek, Inc. found natural infiltration rates of 1.02 in /hr and 0.91 in/hr, respectively (see Appendix B). Therefore, to account for natural infiltration, while still considering a safety factor, an infiltration rate of 0.5in/hr was applied to the discharge rate in the basin routing calculations. Note, as discussed above, this infiltration rate was also applied to the bottom area of the basin (5,590 SF), which translates to 0.06cfs.

The final contributing factor to the basin discharge is the 1-foot-long rectangular concrete weir. The weir is placed 1-foot above the bottom of the basin which allows for maintaining the health of the bioretention components, minimizes ponding for safety, and decreases drawdown times. The weir discharge rate was calculated using the weir equation: $Q = 3LH^{3/2}$, where L is 1-foot and H is the height of the water surface about the weir (varies).

Considering the information discussed above, all of these discharges were summed and input into the basin routing calculations as shown in the table below (see greyed cells). The "Total Discharge" column has a consistent 0.71 CFS in the first few cells because the water level hasn't reached the weir yet (Bottom of weir = Elev 2,805'). This information was input into the calculations and is reiterated on page 2 of the basin routing cut sheets. In the basin routing results, the basin never gets to the 6-feet deep (includes 4 feet of soil media, see cross-section sketch below) because the basin successfully discharges the runoff before getting any deeper as the storm event dissipates. The peak flow and depth of the basin is shown on sheet 5 at hour 13.583 of the 100-year basin routing cut sheets. The 10-year storm is successfully infiltrated through the bioretention media and does not flow over the weir.

	Elevation (ft)	**Depth (ft)**	**Storage (ac-ft)**	In-Situ Infiltration (cfs)	Bioretention Infiltration (cfs)	Weir (cfs)	**Total Discharge (cfs)**
Bottom of Engineered Media	2800	**0**	**0**	0	0	0	**0**
Engineered Media	2801	1	0.038	0.06	0.65	0	0.71
Engineered Media	2802	2	0.077	0.06	0.65	0	0.71
Engineered Media	2803	3	0.115	0.06	0.65	0	0.71
Bottom of Basin	2804	**4**	**0.154**	0.06	0.65	0	**0.71**
Ponding. Bottom of weir	2805	**5**	**0.322**	0.06	0.65	0	**0.71**
These depths are not reached, they are only modeling parameters. The maximum depth is 5.76 ft per the 100 yr basin routing calcs, sheet 5.	2806	**6**	**0.549**	0.06	0.65	3.00	**3.71**
	2806.5	**6.5**	**0.667**	0.06	0.65	5.51	**6.22**
	2806.7	**6.7**	**0.721**	0.06	0.65	6.65	**7.36**

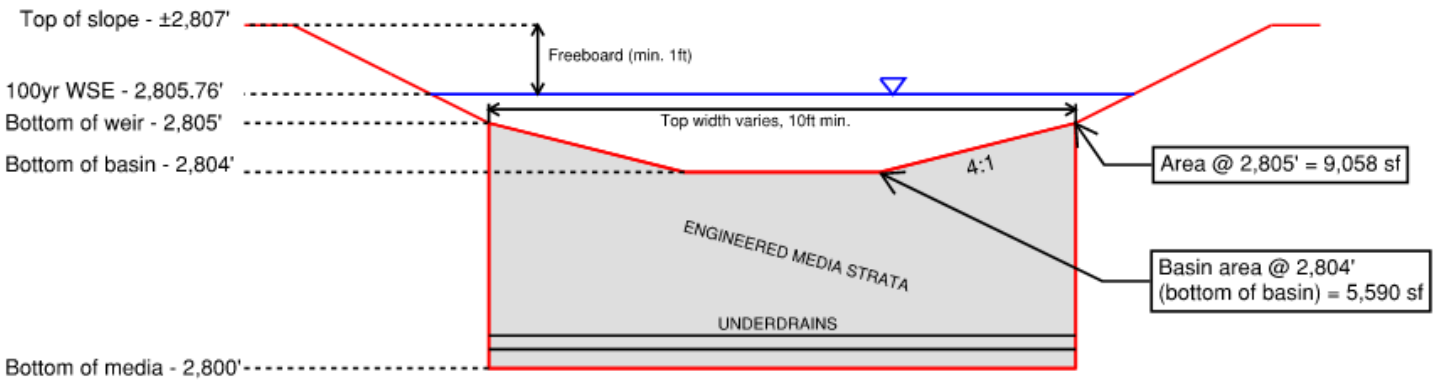
Draw down time of the basin was analyzed using the infiltration parameters discussed above (5 in/hr). Per the WQMP Guidance document and other resources, water quality BMPs are typically

expected to discharge the stored volume within 72-hours. With this infiltration rate, at 1-foot of ponding, the basin is expected to draw down in 2.4 hours.

CONCLUSION

The proposed site's drainage mitigation components are successful in controlling site runoff to mimic existing conditions and provide necessary water quality management. The basin is designed to provide the required Design Capture Volume (DCV), as determined in the project WQMP and the LID BMP Handbook worksheet, and control the 100yr, 24hr peak flow rate to release at the same rate, or slower, than the existing peak flow rate. The captured storm water will be released at the southwest corner of the site along Orchard Heights Avenue (to mimic the existing drainage pattern) via a 1-foot weir and the bioretention underdrain and pump system. Stormwater pump operations and discharges are only allowed during rainfall events and immediately after rainfall events. No dry weather discharges are allowed from stormwater pump facilities. Given that the basin is a stormwater control feature, non-stormwater discharges are not expected. A sketch of the bioretention basin cross section is provided below. Pertinent runoff rates are also summarized in the bullets below.

- Existing Condition Site Runoff (100yr, 24hr): 3.14 CFS
- Proposed Condition Site Runoff (100yr, 24hr, unmitigated): 3.97 CFS
- Proposed Condition Site Runoff (100yr, 24hr, mitigated): 2.82 CFS



APPENDIX A: PRECIPITATION MAPS

Project Vicinity

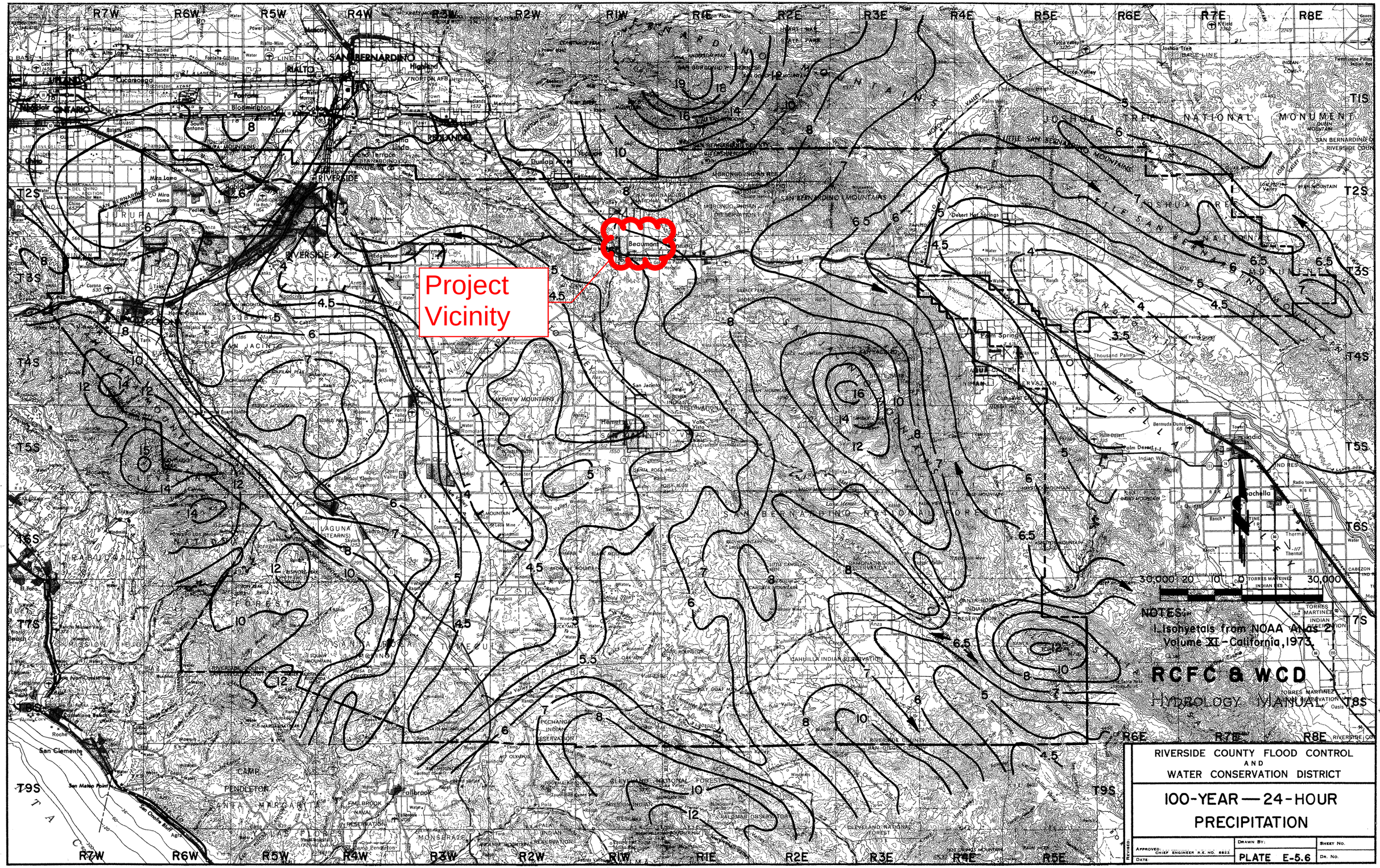
NOTES:
1. Isohyetals from NOAA Atlas 2, Volume XI - California, 1973.

RCFC & WCD
HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

2-YEAR — 24-HOUR PRECIPITATION

APPROVED CHIEF ENGINEER R.E. NO. 8822	DRAWN BY: R.A.S.	SHEET NO.
DATE	PLATE E-5.5	DR. NO.
REVISED		



RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

100-YEAR — 24-HOUR PRECIPITATION

APPROVED CHIEF ENGINEER R.E. NO. 8822	DRAWN BY:	SHEET NO.
DATE	PLATE E-5.6	DR. NO.
REVISED		

RAINFALL INTENSITY–INCHES PER HOUR

ANZA			BANNING			BEAUMONT			CALIMESA			CANYON LAKE		
DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR
5	4.23	6.85	5	3.32	4.93	5	3.32	4.93	5	3.57	5.30	5	3.07	4.61
6	3.80	6.16	6	3.02	4.47	6	3.02	4.47	6	3.23	4.79	6	2.81	4.23
7	3.48	5.63	7	2.78	4.12	7	2.78	4.12	7	2.97	4.40	7	2.61	3.93
8	3.22	5.21	8	2.59	3.84	8	2.59	3.84	8	2.76	4.09	8	2.45	3.68
9	3.01	4.87	9	2.43	3.61	9	2.43	3.61	9	2.58	3.83	9	2.31	3.48
10	2.83	4.58	10	2.30	3.41	10	2.30	3.41	10	2.44	3.62	10	2.20	3.31
11	2.67	4.33	11	2.19	3.24	11	2.19	3.24	11	2.31	3.43	11	2.10	3.16
12	2.54	4.12	12	2.09	3.10	12	2.09	3.10	12	2.21	3.27	12	2.01	3.03
13	2.43	3.93	13	2.00	2.97	13	2.00	2.97	13	2.11	3.13	13	1.94	2.92
14	2.33	3.77	14	1.92	2.85	14	1.92	2.85	14	2.03	3.01	14	1.87	2.82
15	2.23	3.62	15	1.86	2.75	15	1.86	2.75	15	1.95	2.89	15	1.81	2.72
16	2.15	3.49	16	1.79	2.66	16	1.79	2.66	16	1.88	2.79	16	1.75	2.64
17	2.08	3.37	17	1.74	2.58	17	1.74	2.58	17	1.82	2.70	17	1.70	2.56
18	2.01	3.26	18	1.68	2.50	18	1.68	2.50	18	1.76	2.62	18	1.66	2.50
19	1.95	3.16	19	1.64	2.43	19	1.64	2.43	19	1.71	2.54	19	1.62	2.43
20	1.89	3.06	20	1.59	2.36	20	1.59	2.36	20	1.67	2.47	20	1.58	2.37
22	1.79	2.90	22	1.51	2.25	22	1.51	2.25	22	1.58	2.34	22	1.51	2.27
24	1.70	2.76	24	1.45	2.15	24	1.45	2.15	24	1.51	2.23	24	1.44	2.17
26	1.62	2.63	26	1.39	2.06	26	1.39	2.06	26	1.44	2.14	26	1.39	2.09
28	1.56	2.52	28	1.33	1.98	28	1.33	1.98	28	1.38	2.05	28	1.34	2.02
30	1.49	2.42	30	1.29	1.91	30	1.29	1.91	30	1.33	1.98	30	1.30	1.95
32	1.44	2.33	32	1.24	1.84	32	1.24	1.84	32	1.29	1.91	32	1.26	1.89
34	1.39	2.25	34	1.20	1.78	34	1.20	1.78	34	1.24	1.85	34	1.22	1.84
36	1.34	2.18	36	1.17	1.73	36	1.17	1.73	36	1.21	1.79	36	1.19	1.79
38	1.30	2.11	38	1.13	1.68	38	1.13	1.68	38	1.17	1.74	38	1.16	1.74
40	1.27	2.05	40	1.10	1.64	40	1.10	1.64	40	1.14	1.69	40	1.13	1.70
45	1.18	1.91	45	1.04	1.54	45	1.04	1.54	45	1.07	1.58	45	1.07	1.61
50	1.11	1.80	50	.98	1.45	50	.98	1.45	50	1.01	1.49	50	1.02	1.53
55	1.05	1.70	55	.93	1.38	55	.93	1.38	55	.95	1.42	55	.97	1.46
60	1.00	1.62	60	.89	1.32	60	.89	1.32	60	.91	1.35	60	.93	1.40
65	.95	1.55	65	.85	1.27	65	.85	1.27	65	.87	1.29	65	.89	1.35
70	.91	1.48	70	.82	1.22	70	.82	1.22	70	.84	1.24	70	.86	1.30
75	.88	1.42	75	.79	1.17	75	.79	1.17	75	.80	1.19	75	.84	1.26
80	.85	1.37	80	.76	1.13	80	.76	1.13	80	.78	1.15	80	.81	1.22
85	.82	1.32	85	.74	1.10	85	.74	1.10	85	.75	1.11	85	.79	1.18
SLOPE = .580			SLOPE = .530			SLOPE = .530			SLOPE = .550			SLOPE = .480		

RCFC & WCD

HYDROLOGY MANUAL

STANDARD INTENSITY–DURATION CURVES DATA

PLATE D-4.1 (1 of 6)

RAINFALL INTENSITY—INCHES PER HOUR

CATHEDRAL CITY			CHERRY VALLEY			CORONA			DESERT HOT SPRINGS			ELSINORE - WILDOMAR		
DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY	
	10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR
5	4.14	6.76	5	3.65	5.49	5	3.10	4.78	5	4.39	6.76	5	3.23	4.94
6	3.73	6.08	6	3.30	4.97	6	2.84	4.38	6	3.95	6.08	6	2.96	4.53
7	3.41	5.56	7	3.03	4.56	7	2.64	4.07	7	3.62	5.56	7	2.75	4.21
8	3.15	5.15	8	2.82	4.24	8	2.47	3.81	8	3.35	5.15	8	2.58	3.95
9	2.95	4.81	9	2.64	3.97	9	2.34	3.60	9	3.13	4.81	9	2.44	3.73
10	2.77	4.52	10	2.49	3.75	10	2.22	3.43	10	2.94	4.52	10	2.32	3.54
11	2.62	4.28	11	2.36	3.56	11	2.12	3.27	11	2.78	4.28	11	2.21	3.39
12	2.49	4.07	12	2.25	3.39	12	2.04	3.14	12	2.65	4.07	12	2.12	3.25
13	2.38	3.88	13	2.16	3.25	13	1.96	3.02	13	2.53	3.88	13	2.04	3.13
14	2.28	3.72	14	2.07	3.12	14	1.89	2.92	14	2.42	3.72	14	1.97	3.02
15	2.19	3.58	15	1.99	3.00	15	1.83	2.82	15	2.32	3.58	15	1.91	2.92
16	2.11	3.44	16	1.92	2.90	16	1.77	2.73	16	2.24	3.44	16	1.85	2.83
17	2.04	3.32	17	1.86	2.80	17	1.72	2.66	17	2.16	3.32	17	1.80	2.75
18	1.97	3.22	18	1.80	2.71	18	1.68	2.58	18	2.09	3.22	18	1.75	2.67
19	1.91	3.12	19	1.75	2.64	19	1.63	2.52	19	2.03	3.12	19	1.70	2.60
20	1.85	3.03	20	1.70	2.56	20	1.59	2.46	20	1.97	3.03	20	1.66	2.54
22	1.75	2.86	22	1.61	2.43	22	1.52	2.35	22	1.86	2.86	22	1.59	2.43
24	1.67	2.72	24	1.54	2.32	24	1.46	2.25	24	1.77	2.72	24	1.52	2.33
26	1.59	2.60	26	1.47	2.22	26	1.40	2.17	26	1.69	2.60	26	1.46	2.24
28	1.52	2.49	28	1.41	2.13	28	1.36	2.09	28	1.62	2.49	28	1.41	2.16
30	1.46	2.39	30	1.36	2.05	30	1.31	2.02	30	1.55	2.39	30	1.37	2.09
32	1.41	2.30	32	1.31	1.98	32	1.27	1.96	32	1.50	2.30	32	1.33	2.03
34	1.36	2.22	34	1.27	1.91	34	1.23	1.90	34	1.45	2.22	34	1.29	1.97
36	1.32	2.15	36	1.23	1.85	36	1.20	1.85	36	1.40	2.15	36	1.25	1.92
38	1.28	2.09	38	1.20	1.80	38	1.17	1.81	38	1.36	2.09	38	1.22	1.87
40	1.24	2.02	40	1.16	1.75	40	1.14	1.76	40	1.32	2.02	40	1.19	1.82
45	1.16	1.89	45	1.09	1.64	45	1.08	1.66	45	1.23	1.89	45	1.13	1.72
50	1.09	1.78	50	1.03	1.55	50	1.03	1.58	50	1.16	1.78	50	1.07	1.64
55	1.03	1.68	55	.98	1.47	55	.98	1.51	55	1.09	1.68	55	1.02	1.56
60	.98	1.60	60	.93	1.40	60	.94	1.45	60	1.04	1.60	60	.98	1.50
65	.94	1.53	65	.89	1.34	65	.90	1.40	65	.99	1.53	65	.94	1.44
70	.90	1.46	70	.85	1.29	70	.87	1.35	70	.95	1.46	70	.91	1.39
75	.86	1.41	75	.82	1.24	75	.84	1.30	75	.91	1.41	75	.88	1.35
80	.83	1.35	80	.79	1.20	80	.82	1.26	80	.88	1.35	80	.85	1.31
85	.80	1.31	85	.77	1.16	85	.80	1.23	85	.85	1.31	85	.83	1.27
SLOPE = .580			SLOPE = .550			SLOPE = .480			SLOPE = .580			SLOPE = .480		

STANDARD INTENSITY—DURATION CURVES DATA

RAINFALL INTENSITY–INCHES PER HOUR

HEMET			HIGHGROVE			HOMELAND – WINCHESTER			IDYLLWILD			LAKEVIEW		
DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR
5	2.84	4.40	5	3.02	4.37	5	2.91	4.37	5	4.91	7.28	5	2.77	4.16
6	2.58	4.00	6	2.75	3.97	6	2.65	3.97	6	4.47	6.62	6	2.53	3.79
7	2.37	3.68	7	2.54	3.67	7	2.44	3.67	7	4.13	6.11	7	2.34	3.51
8	2.21	3.43	8	2.37	3.42	8	2.28	3.42	8	3.85	5.70	8	2.19	3.29
9	2.08	3.23	9	2.23	3.22	9	2.15	3.22	9	3.62	5.36	9	2.07	3.10
10	1.96	3.05	10	2.11	3.05	10	2.03	3.05	10	3.43	5.08	10	1.96	2.94
11	1.87	2.90	11	2.01	2.90	11	1.93	2.90	11	3.26	4.83	11	1.87	2.80
12	1.78	2.77	12	1.92	2.77	12	1.85	2.77	12	3.12	4.62	12	1.79	2.68
13	1.71	2.65	13	1.84	2.66	13	1.77	2.66	13	2.99	4.43	13	1.72	2.58
14	1.64	2.55	14	1.77	2.56	14	1.71	2.56	14	2.88	4.26	14	1.66	2.48
15	1.58	2.46	15	1.71	2.47	15	1.64	2.47	15	2.78	4.11	15	1.60	2.40
16	1.53	2.38	16	1.65	2.39	16	1.59	2.39	16	2.68	3.98	16	1.55	2.32
17	1.48	2.30	17	1.60	2.31	17	1.54	2.31	17	2.60	3.85	17	1.50	2.25
18	1.44	2.23	18	1.55	2.24	18	1.50	2.24	18	2.52	3.74	18	1.46	2.19
19	1.40	2.17	19	1.51	2.18	19	1.45	2.18	19	2.45	3.64	19	1.42	2.13
20	1.36	2.11	20	1.47	2.12	20	1.42	2.12	20	2.39	3.54	20	1.39	2.08
22	1.29	2.01	22	1.40	2.02	22	1.35	2.02	22	2.27	3.37	22	1.32	1.98
24	1.24	1.92	24	1.34	1.93	24	1.29	1.93	24	2.17	3.22	24	1.26	1.90
26	1.18	1.84	26	1.28	1.85	26	1.24	1.85	26	2.09	3.09	26	1.22	1.82
28	1.14	1.77	28	1.23	1.78	28	1.19	1.78	28	2.01	2.97	28	1.17	1.76
30	1.10	1.70	30	1.19	1.72	30	1.15	1.72	30	1.94	2.87	30	1.13	1.70
32	1.06	1.65	32	1.15	1.66	32	1.11	1.66	32	1.87	2.77	32	1.10	1.64
34	1.03	1.59	34	1.12	1.61	34	1.07	1.61	34	1.81	2.69	34	1.06	1.59
36	1.00	1.55	36	1.08	1.57	36	1.04	1.57	36	1.76	2.61	36	1.03	1.55
38	.97	1.50	38	1.05	1.52	38	1.01	1.52	38	1.71	2.54	38	1.01	1.51
40	.94	1.46	40	1.02	1.48	40	.99	1.48	40	1.67	2.47	40	.98	1.47
45	.89	1.37	45	.96	1.39	45	.93	1.39	45	1.57	2.32	45	.92	1.39
50	.84	1.30	50	.91	1.32	50	.88	1.32	50	1.48	2.20	50	.88	1.31
55	.80	1.24	55	.87	1.26	55	.84	1.26	55	1.41	2.09	55	.84	1.25
60	.76	1.18	60	.83	1.20	60	.80	1.20	60	1.35	2.00	60	.80	1.20
65	.73	1.13	65	.80	1.15	65	.77	1.15	65	1.29	1.92	65	.77	1.15
70	.70	1.09	70	.77	1.11	70	.74	1.11	70	1.25	1.85	70	.74	1.11
75	.68	1.05	75	.74	1.07	75	.71	1.07	75	1.20	1.78	75	.72	1.07
80	.65	1.01	80	.71	1.03	80	.69	1.03	80	1.16	1.72	80	.69	1.04
85	.63	.98	85	.69	1.00	85	.67	1.00	85	1.13	1.67	85	.67	1.01
SLOPE = .530			SLOPE = .520			SLOPE = .520			SLOPE = .520			SLOPE = .500		

STANDARD
INTENSITY–DURATION
CURVES DATA

RAINFALL INTENSITY—INCHES PER HOUR

MIRA LOMA			MURRIETA - TEMECULA & RANCHO CALIFORNIA			NORCO			PALM SPRINGS			PERRIS VALLEY		
DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY	
	10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR
5	2.84	4.48	5	3.45	5.10	5	2.77	4.16	5	4.23	6.76	5	2.64	3.78
6	2.58	4.07	6	3.12	4.61	6	2.53	3.79	6	3.80	6.08	6	2.41	3.46
7	2.37	3.75	7	2.87	4.24	7	2.34	3.51	7	3.48	5.56	7	2.24	3.21
8	2.21	3.49	8	2.67	3.94	8	2.19	3.29	8	3.22	5.15	8	2.09	3.01
9	2.08	3.28	9	2.50	3.69	9	2.07	3.10	9	3.01	4.81	9	1.98	2.84
10	1.96	3.10	10	2.36	3.48	10	1.96	2.94	10	2.83	4.52	10	1.88	2.69
11	1.87	2.95	11	2.24	3.30	11	1.87	2.80	11	2.67	4.28	11	1.79	2.57
12	1.78	2.82	12	2.13	3.15	12	1.79	2.68	12	2.54	4.07	12	1.72	2.46
13	1.71	2.70	13	2.04	3.01	13	1.72	2.58	13	2.43	3.88	13	1.65	2.37
14	1.64	2.60	14	1.96	2.89	14	1.66	2.48	14	2.33	3.72	14	1.59	2.29
15	1.58	2.50	15	1.89	2.79	15	1.60	2.40	15	2.23	3.58	15	1.54	2.21
16	1.53	2.42	16	1.82	2.69	16	1.55	2.32	16	2.15	3.44	16	1.49	2.14
17	1.48	2.34	17	1.76	2.60	17	1.50	2.25	17	2.08	3.32	17	1.45	2.08
18	1.44	2.27	18	1.71	2.52	18	1.46	2.19	18	2.01	3.22	18	1.41	2.02
19	1.40	2.21	19	1.66	2.45	19	1.42	2.13	19	1.95	3.12	19	1.37	1.97
20	1.36	2.15	20	1.61	2.38	20	1.39	2.08	20	1.89	3.03	20	1.34	1.92
22	1.29	2.04	22	1.53	2.26	22	1.32	1.98	22	1.79	2.86	22	1.28	1.83
24	1.24	1.95	24	1.46	2.15	24	1.26	1.90	24	1.70	2.72	24	1.22	1.75
26	1.18	1.87	26	1.39	2.06	26	1.22	1.82	26	1.62	2.60	26	1.18	1.69
28	1.14	1.80	28	1.34	1.98	28	1.17	1.76	28	1.56	2.49	28	1.13	1.63
30	1.10	1.73	30	1.29	1.90	30	1.13	1.70	30	1.49	2.39	30	1.10	1.57
32	1.06	1.67	32	1.24	1.84	32	1.10	1.64	32	1.44	2.30	32	1.06	1.52
34	1.03	1.62	34	1.20	1.78	34	1.06	1.59	34	1.39	2.22	34	1.03	1.48
36	1.00	1.57	36	1.17	1.72	36	1.03	1.55	36	1.34	2.15	36	1.00	1.44
38	.97	1.53	38	1.13	1.67	38	1.01	1.51	38	1.30	2.09	38	.98	1.40
40	.94	1.49	40	1.10	1.62	40	.98	1.47	40	1.27	2.02	40	.95	1.37
45	.89	1.40	45	1.03	1.52	45	.92	1.39	45	1.18	1.89	45	.90	1.29
50	.84	1.32	50	.97	1.44	50	.88	1.31	50	1.11	1.78	50	.85	1.22
55	.80	1.26	55	.92	1.36	55	.84	1.25	55	1.05	1.68	55	.81	1.17
60	.76	1.20	60	.88	1.30	60	.80	1.20	60	1.00	1.60	60	.78	1.12
65	.73	1.15	65	.84	1.24	65	.77	1.15	65	.95	1.53	65	.75	1.08
70	.70	1.11	70	.81	1.19	70	.74	1.11	70	.91	1.46	70	.72	1.04
75	.68	1.07	75	.78	1.15	75	.72	1.07	75	.88	1.41	75	.70	1.00
80	.65	1.03	80	.75	1.11	80	.69	1.04	80	.85	1.35	80	.68	.97
85	.63	1.00	85	.73	1.07	85	.67	1.01	85	.82	1.31	85	.66	.94
SLOPE = .530			SLOPE = .550			SLOPE = .500			SLOPE = .580			SLOPE = .490		

STANDARD
INTENSITY-DURATION
CURVES DATA

RAINFALL INTENSITY—INCHES PER HOUR

RIVERSIDE			RIVERSIDE (FOOTHILL AREAS)			RUBIDOUX			SAN JACINTO			SUN CITY		
DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY	
	10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR
5	2.75	3.92	5	3.14	4.71	5	3.18	4.71	5	2.81	4.16	5	3.25	4.85
6	2.48	3.55	6	2.84	4.26	6	2.87	4.26	6	2.56	3.79	6	2.95	4.40
7	2.28	3.26	7	2.61	3.91	7	2.64	3.91	7	2.37	3.51	7	2.72	4.06
8	2.12	3.03	8	2.42	3.63	8	2.45	3.63	8	2.22	3.29	8	2.53	3.78
9	1.99	2.84	9	2.27	3.41	9	2.30	3.41	9	2.09	3.10	9	2.38	3.55
10	1.88	2.68	10	2.14	3.21	10	2.17	3.21	10	1.98	2.94	10	2.25	3.36
11	1.78	2.54	11	2.03	3.05	11	2.06	3.05	11	1.89	2.80	11	2.14	3.19
12	1.70	2.42	12	1.94	2.91	12	1.96	2.91	12	1.81	2.68	12	2.04	3.05
13	1.62	2.32	13	1.86	2.78	13	1.88	2.78	13	1.74	2.58	13	1.96	2.92
14	1.56	2.23	14	1.78	2.67	14	1.80	2.67	14	1.68	2.48	14	1.88	2.81
15	1.50	2.14	15	1.71	2.57	15	1.74	2.57	15	1.62	2.40	15	1.81	2.71
16	1.45	2.07	16	1.66	2.48	16	1.68	2.48	16	1.57	2.32	16	1.75	2.62
17	1.40	2.00	17	1.60	2.40	17	1.62	2.40	17	1.52	2.25	17	1.70	2.54
18	1.36	1.94	18	1.55	2.33	18	1.57	2.33	18	1.48	2.19	18	1.65	2.46
19	1.32	1.88	19	1.51	2.26	19	1.52	2.26	19	1.44	2.13	19	1.60	2.39
20	1.28	1.83	20	1.46	2.20	20	1.48	2.20	20	1.40	2.08	20	1.56	2.33
22	1.22	1.74	22	1.39	2.08	22	1.41	2.08	22	1.34	1.98	22	1.48	2.21
24	1.16	1.66	24	1.32	1.99	24	1.34	1.99	24	1.28	1.90	24	1.41	2.11
26	1.11	1.58	26	1.27	1.90	26	1.28	1.90	26	1.23	1.82	26	1.36	2.03
28	1.06	1.52	28	1.22	1.82	28	1.23	1.82	28	1.19	1.76	28	1.30	1.95
30	1.02	1.46	30	1.17	1.76	30	1.19	1.76	30	1.15	1.70	30	1.26	1.88
32	.99	1.41	32	1.13	1.70	32	1.14	1.70	32	1.11	1.64	32	1.21	1.81
34	.96	1.37	34	1.09	1.64	34	1.11	1.64	34	1.08	1.59	34	1.18	1.76
36	.93	1.32	36	1.06	1.59	36	1.07	1.59	36	1.05	1.55	36	1.14	1.70
38	.90	1.29	38	1.03	1.54	38	1.04	1.54	38	1.02	1.51	38	1.11	1.66
40	.87	1.25	40	1.00	1.50	40	1.01	1.50	40	.99	1.47	40	1.08	1.61
45	.82	1.17	45	.94	1.41	45	.95	1.41	45	.94	1.39	45	1.01	1.51
50	.77	1.11	50	.88	1.33	50	.90	1.33	50	.89	1.31	50	.96	1.43
55	.73	1.05	55	.84	1.26	55	.85	1.26	55	.85	1.25	55	.91	1.36
60	.70	1.00	60	.80	1.20	60	.81	1.20	60	.81	1.20	60	.87	1.30
65	.67	.96	65	.77	1.15	65	.78	1.15	65	.78	1.15	65	.83	1.25
70	.64	.92	70	.73	1.10	70	.74	1.10	70	.75	1.11	70	.80	1.20
75	.62	.88	75	.71	1.06	75	.72	1.06	75	.72	1.07	75	.77	1.15
80	.60	.85	80	.68	1.02	80	.69	1.02	80	.70	1.04	80	.75	1.12
85	.58	.83	85	.66	.99	85	.67	.99	85	.68	1.01	85	.72	1.08
SLOPE = .550			SLOPE = .550			SLOPE = .550			SLOPE = .500			SLOPE = .530		

RCFC & WCD

HYDROLOGY MANUAL

STANDARD INTENSITY-DURATION CURVES DATA

PLATE D-4.1(5 of 6)

RAINFALL INTENSITY—INCHES PER HOUR

SUNNYMEAD - MORENO			WOODCREST		
DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY	
	10 YEAR	100 YEAR		10 YEAR	100 YEAR
5	2.84	4.16	5	3.37	5.30
6	2.59	3.79	6	3.05	4.79
7	2.40	3.51	7	2.80	4.40
8	2.25	3.29	8	2.60	4.09
9	2.12	3.10	9	2.44	3.83
10	2.01	2.94	10	2.30	3.62
11	1.92	2.80	11	2.19	3.43
12	1.83	2.68	12	2.08	3.27
13	1.76	2.58	13	1.99	3.13
14	1.70	2.48	14	1.91	3.01
15	1.64	2.40	15	1.84	2.89
16	1.59	2.32	16	1.78	2.79
17	1.54	2.25	17	1.72	2.70
18	1.50	2.19	18	1.67	2.62
19	1.46	2.13	19	1.62	2.54
20	1.42	2.08	20	1.57	2.47
22	1.35	1.98	22	1.49	2.34
24	1.30	1.90	24	1.42	2.23
26	1.25	1.82	26	1.36	2.14
28	1.20	1.76	28	1.31	2.05
30	1.16	1.70	30	1.26	1.98
32	1.12	1.64	32	1.22	1.91
34	1.09	1.59	34	1.18	1.85
36	1.06	1.55	36	1.14	1.79
38	1.03	1.51	38	1.11	1.74
40	1.00	1.47	40	1.07	1.69
45	.95	1.39	45	1.01	1.58
50	.90	1.31	50	.95	1.49
55	.86	1.25	55	.90	1.42
60	.82	1.20	60	.86	1.35
65	.79	1.15	65	.82	1.29
70	.76	1.11	70	.79	1.24
75	.73	1.07	75	.76	1.19
80	.71	1.04	80	.73	1.15
85	.69	1.01	85	.71	1.11
SLOPE = .500			SLOPE = .550		

RCFC & WCD

HYDROLOGY MANUAL

STANDARD INTENSITY-DURATION CURVES DATA

PLATE D-4.1 (6 of 6)

APPENDIX B: HYDROLOGICAL SOIL GROUP DATA AND INFILTRATION EVALUATION

GeoTek, Inc.
1548 North Maple Street, Corona, California 92878
(951) 710-1160 Office (951) 710-1167 Fax www.geotekusa.com

May 3, 2023
Project No. 3538-CR

Matlock Design Build
1614 East Holt Boulevard, Suite 106
Ontario, California 91761

Attention: Mr. Susano Ureno

Subject: **Infiltration Evaluation**
Calvary Chapel
1780 Orchard Heights Avenue
Beaumont, Riverside County, California

Reference: See Page 5

Dear Mr. Ureno:

As requested and authorized, GeoTek, Inc. (GeoTek) has performed an Infiltration Evaluation in order to provide infiltration test results for the existing Calvary Chapel facility and proposed infiltration basins. The intent of this study is to evaluate the infiltration properties of the subsurface soils within the proposed project storm water disposal areas (basins). This report presents the results of the evaluation performed by GeoTek.

Site and Project Description

The approximately 5.5-acre almost rectangular-shaped project site is located at 1780 Orchard Heights Avenue, in the City of Beaumont, Riverside County, California (See Figure 1). Access to the site is available from Brookside Avenue (paved) located adjacent to the northern boundary of the site. The project is comprised of one (1) parcel of land (Riverside County Assessor's Parcel Number 408-070-012). The site is currently occupied by Calvary Chapel Church which consists of two (2) buildings, several modular trailers, concrete paved parking/drive areas, landscaping and vacant land.

Topographically, the site slopes gently downward to the southwest. Elevations across the site range from approximately 2,824 mean sea level (msl) to 2,830 msl.

Based upon review of *Calvary Chapel Site Plan and Conceptual Grade Plan* (undated), prepared by Joseph M. Long, GeoTek understands that it is proposed to demolish one (1) of the site buildings and remove the modular trailers and then construct a children's center and a worship

structure on the project site. Additional improvements are anticipated to include additional parking/drive areas, a recreation area, hardscaping, typical landscaping and associated improvements. Stormwater disposal is understood to be by means of stormwater basins in the southwestern and southeastern corners of the site.

Infiltration Testing

Two (2) percolation test borings, Borings I-1 and I-2 were excavated with a truck-mounted hollow stem auger drill rig to depths of approximately four (4) feet each, below the existing ground surface (bgs) within the area of the proposed basins. Additionally, one (1) deep exploratory boring (Boring B-1) was excavated near the vicinity of the two (2) basins to a depth of 15 feet for determination of depth of groundwater, if any, and for observation of any hardpan or impermeable layers below the basins. The approximate locations of the borings are indicated on the attached Exploration Location Map, Figure 2.

The borings were approximately 8-inches in diameter. Four-inch diameter slotted PVC pipes encapsulated in filter sock were inserted into the two (2) percolation test holes. The annular space between the test hole sidewalls and PVC pipe was filled with gravel.

The soils encountered in all borings consisted of alluvium, consisting of interbedded silty sand and clayey sand (SM and SC soil types based upon the Unified Soil Classification System). The logs of the borings are presented in Appendix A.

Groundwater was not encountered nor observed in any of the borings conducted for this evaluation. Based on a review of groundwater depths noted on the State Department of Water Resources Water Data Library website (Map (ca.gov)), it is estimated a historic high groundwater depth of greater than 50 feet below existing grade exists at the site.

Subsequent to pre-soaking the percolation test holes in general conformance with the referenced document (County of Riverside, 2011), percolation testing was performed in the lower approximate 24 inches in each of the percolation borings. The percolation testing was conducted in general conformance with the referenced document prepared by the County of Riverside. The percolation rates were converted to an infiltration rate via the Porchet Method.

The infiltration rate for each of the borings is presented in the follow table after the water level had stabilized.

Boring No.	Infiltration Rate (inches per hour)	Depth of Boring (feet)
Boring I-1	1.02	4
Boring I-2	0.91	4

Copies of the percolation data sheets and infiltration conversion sheets (Porchet Method) are included in Appendix B.

The reported infiltration rates are the measured rate without any factor of safety applied. Over the lifetime of the water quality facility, the infiltration rates may be affected by silt build up and biological activities, as well as local variations in near surface soil conditions. A suitable factor of safety should be applied to the field rates in design of the infiltration systems.

It should be noted that the infiltration rates provided above were performed in relatively undisturbed native soils. Infiltration rates will vary and are mostly dependent on the underlying consistency of the site soils and relative density. Infiltration rates will be impacted by weight of equipment travelling over the soils, placement of engineered fill and other various factors. GeoTek, Inc. assumes no responsibility or liability for the ultimate design or performance of the storm water facilities.

LIMITATIONS

The earth materials observed on the project site appear to be representative of the tested areas; however, soil materials vary in character between excavations and natural outcrops or conditions exposed during site construction. Site conditions may vary due to seasonal changes or other factors. GeoTek, Inc. assumes no responsibility or liability for work, testing or recommendations performed or provided by others.

GeoTek's conclusions and recommendations are professional opinions that are limited to the extent of the available data. Observations during construction are important to allow for any change in recommendations found to be warranted. These opinions have been derived in accordance with current standards of practice and no warranty is expressed or implied. Standards of practice are subject to change with time.

The opportunity to be of service on this project is sincerely appreciated. If you should have any questions, please do not hesitate to contact GeoTek.

Respectfully submitted,
GeoTek, Inc.

CERTIFIED ENGINEERING GEOLOGIST
EDWARD H. LaMONT
No. 1892
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
BRUCE A. HICK
GE 2284
GEOTECHNICAL
STATE OF CALIFORNIA

Edward H. LaMont
CEG 1892, Exp. 07/31/24
Principal Geologist

Bruce A. Hick
GE 2284, Exp. 12/31/24
Geotechnical Engineer

Anna M. Scott
Project Geologist

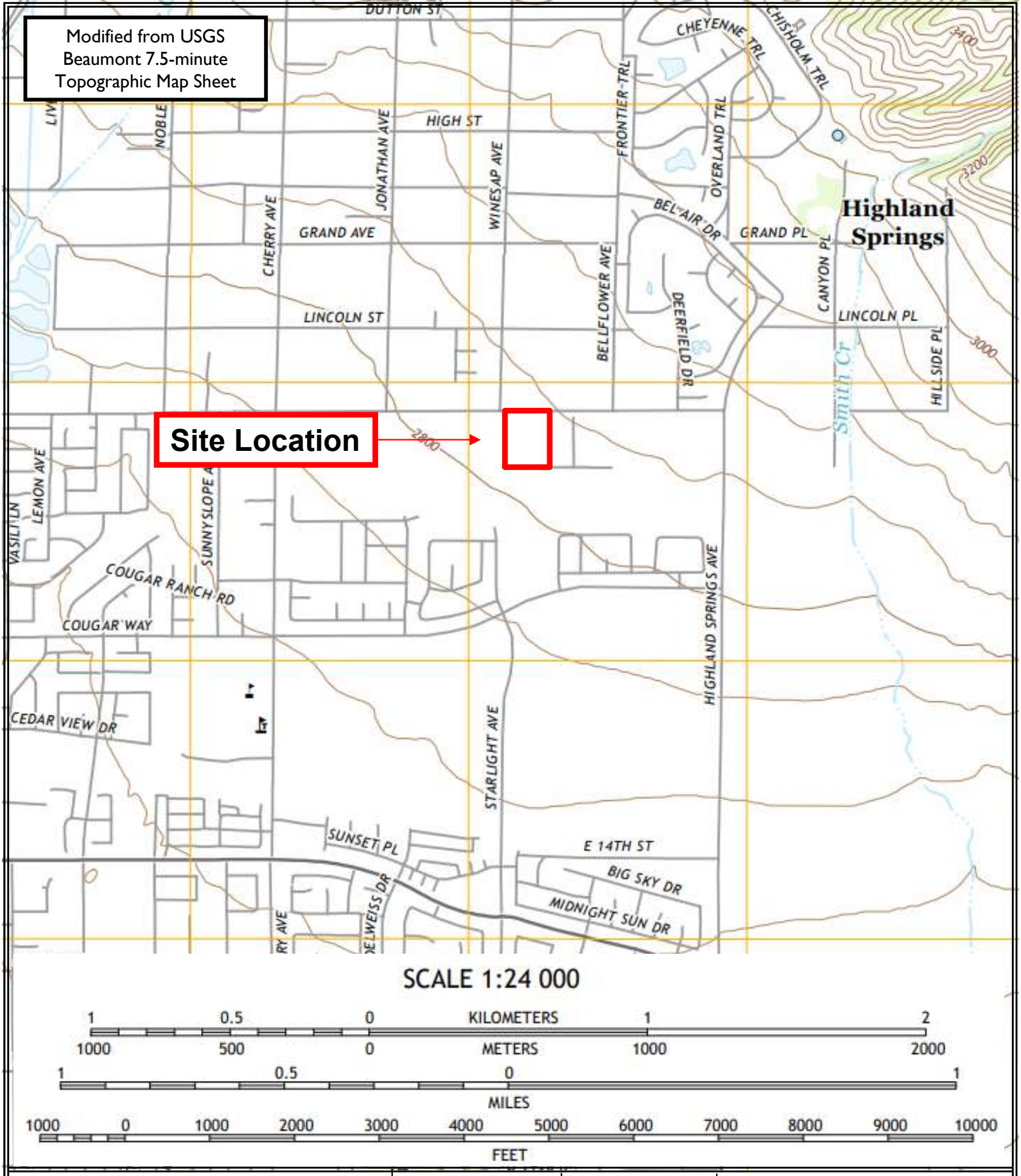
Enclosures: Figure 1 – Site Location Map
Figure 2 – Exploration Location Map
Appendix A – Logs of Exploratory Borings
Appendix B – Percolation Data Sheets and Conversion Sheets (Porchet Method)

Distribution: (1) Addressee via email (PDF file)

G:\Projects\3501 to 3550\3538CR Matlock Design Group 1780 Orchard Heights Avenue Beaumont\Infiltration Evaluation\3538CR Infiltration Evaluation 1780 Orchard Heights Avenue.doc

REFERENCE

County of Riverside, 2011, "Technical Guidance Document Appendix A – Infiltration Testing," dated September.



Matlock Design Group
1780 Orchard Heights Avenue
Beaumont, Riverside County, California

GeoTek Project No. 3538-CR

Figure 1

Site Location Map

GEOTEK



Matlock Design Group
1780 Orchard Heights Avenue
Beaumont, Riverside County, California

GeoTek Project No. 3538-CR

NORTH

Figure 2

Exploration Location Map

GEOTEK

APPENDIX A

LOGS OF EXPLORATORY BORINGS

Calvary Chapel
1780 Orchard Heights Avenue
Beaumont, Riverside County, California
Project No. 3538-CR

GEOTEK

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Matlock Design Group	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	1780 Orchard Heights Avenue	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Nik
PROJECT NO.:	3538-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	5/2/2023

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: I-1** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Fan Deposits:** Silty f-c SAND, light brown, slightly moist, trace organics			
					Silty f-c SAND, brown to dark brown, moist, few gravel			
5					**BORING TERMINATED AT 4.0 FEET** No groundwater encountered Boring backfilled with soil cuttings			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring; ---SPT; ---Small Bulk; ---Large Bulk; ---No Recovery; ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Matlock Design Group	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	1780 Orchard Heights Avenue	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Nik
PROJECT NO.:	3538-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	5/2/2023

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: I-2** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Fan Deposits:** Silty f-c SAND, light brown, slightly moist, trace organics			
					Silty f-c SAND, brown to dark brown, moist, few gravel			
5					**BORING TERMINATED AT 3.0 FEET** No groundwater encountered Boring backfilled with soil cuttings			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring; ---SPT; ---Small Bulk; ---Large Bulk; ---No Recovery; ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Matlock Design Group	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	1780 Orchard Heights Avenue	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Nik
PROJECT NO.:	3538-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	5/2/2023

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-1 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Fan Deposits:			
				SM	Silty f-c SAND, light brown, slightly moist, trace organics			
					Silty f-c SAND, brown to dark brown, moist, few gravel			
5								
				SM/SC	Silty/clayey f-c SAND, brown, moist, trace gravel			
10								
				SM	Silty f-c SAND, brown, moist, few gravel			
15					**BORING TERMINATED AT 15.0 FEET**			
					No groundwater encountered Boring backfilled with soil cuttings			
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

APPENDIX B

PERCOLATION DATA AND CONVERSION SHEETS

Calvary Chapel
1780 Orchard Heights Avenue
Beaumont, Riverside County, California
Project No. 3538-CR

GEOTEK

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-GR

Test Hole No.: I-1 **Tested By:** _____ **Date:** 5/3/23

Depth of Hole As Drilled: 4' **Before Test:** 4' **After Test:** 4'

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
1	9:30 9:55	25	48	24	30.0"	6"		<6" IN 25 MIN 5/2/23
2	9:55 10:20	25	48	24	29.7"	5.7"		
3	7:30 8:00	30	48	24	30.5	6.5		STARTED TEST ON 5/3/23
4	8:00 8:30	30	48	24	30.2	6.2		
5	8:31 9:01	30	48	24	30.2	6.2		
6	9:01 9:31	30	48	24	30.2	6.2		
7	9:31 10:01	30	48	24	30.1	6.1		
8	10:02 10:32	30	48	24	30.1	6.1		
9	10:32 11:02	30	48	24	30.0	6.0		
10	11:02 11:32	30	48	24	30.0	6.0		

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-CR

Test Hole No.: I-1 **Tested By:** _____ **Date:** 5/3/23

Depth of Hole As Drilled: 4' **Before Test:** 4' **After Test:** 4'

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
11	11:32 / 12:02	30	48	24	30.0	6.0		
12	12:02 / 12:32	30	48	24	29.9	5.9		
13	12:33 / 1:03	30	48	24	29.9	5.9		
14	1.03 / 1:33	30	48	24	29.9	5.9		
	/							
	/							
	/							
	/							
	/							
	/							

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-CK

Test Hole No.: I-2 **Tested By:** DRW **Date:**

Depth of Hole As Drilled: 3' **Before Test:** 3' **After Test:** 3'

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
1	9:32 / 9:57	25	36	24	29.5	5.5		<6" IN 25 MIN
2	9:57 / 10:22	25	36	24	29.1	5.1		
3	7:35 / 8:05	30	36	24	30.1	6.1		STARTED TEST ON 5/3/23
4	8:05 / 8:35	30	36	24	29.9	5.9		
5	8:35 / 9:05	30	36	24	29.7	5.7		
6	9:06 / 9:36	30	36	24	29.5	5.5		
7	9:36 / 10:06	30	36	24	29.4	5.4		
8	10:06 / 10:36	30	36	24	29.4	5.4		
9	10:37 / 11:07	30	36	24	29.3	5.3		
10	11:07 / 11:37	30	36	24	29.3	5.3		

PERCOLATION DATA SHEET

Project: MATLOCK DESIGN GROUP **Job No.:** 3538-CR

Test Hole No.: _____ **Tested By:** _____ **Date:** _____

Depth of Hole As Drilled: _____ **Before Test:** _____ **After Test:** _____

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
11	11:37 / 12:07	30	36	24	29.3	5.3		
12	12:07 / 12:37	30	36	24	29.2	5.2		
13	12:38 / 1:08	30	36	24	29.2	5.2		
14	1:08 / 1:38	30	36	24	29.2	5.2		
	/							
	/							
	/							
	/							
	/							
	/							

Client:	**Matlock Design Group**
Project:	**1780 Orchard Heights Avenue**
Project No:	**3538-CR**
Date:	**5/3/2023**

Boring No. **I-1**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	30
Final Depth to Water, D_F =	29.9
Test Hole Radius, r =	4
Initial Depth to Water, D_O =	24
Total Test Hole Depth, D_T =	48

Equation - $I_t = \dfrac{\Delta H\ (60r)}{\Delta t\ (r+2H_{avg})}$

$H_O = D_T - D_O$ =	24
$H_F = D_T - D_F$ =	18.1
$\Delta H = \Delta D = H_O - H_F$ =	5.9
$H_{avg} = (H_O+H_F)/2$ =	21.05

I_t = 1.02 **Inches per Hour**

GEOTEK

Client:	**Matlock Design Group**
Project:	**1780 Orchard Heights Avenue**
Project No:	**3538-CR**
Date:	**5/3/2023**

Boring No. **I-2**

Infiltration Rate (Porchet Method)

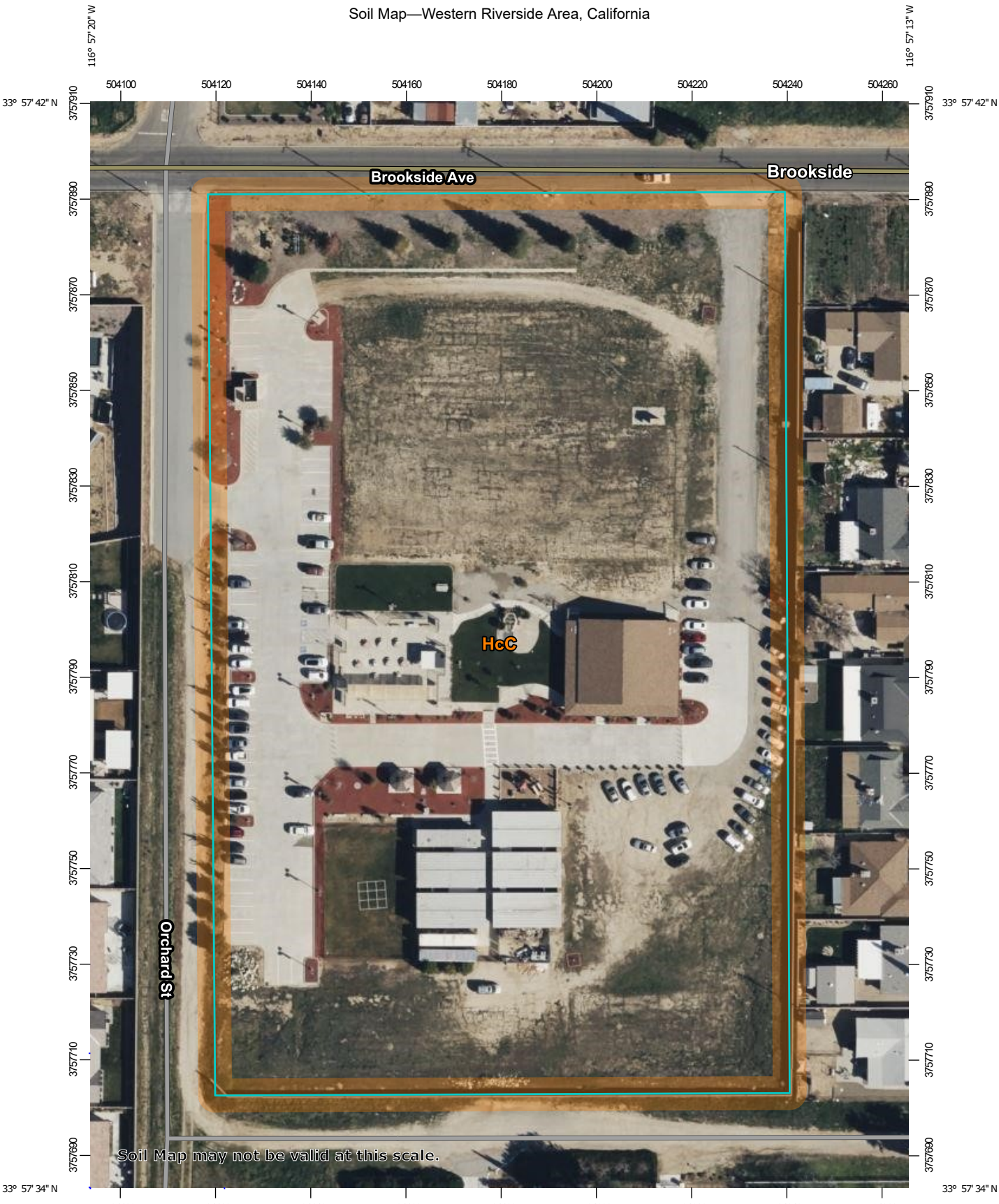
Time Interval, Δt =	30
Final Depth to Water, D_F =	17.3
Test Hole Radius, r =	4
Initial Depth to Water, D_O =	12
Total Test Hole Depth, D_T =	36

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	24
$H_F = D_T - D_F$ =	18.7
$\Delta H = \Delta D = H_O - H_F$ =	5.3
$H_{avg} = (H_O+H_F)/2$ =	21.35

I_t = 0.91 **Inches per Hour**

GEOTEK



Map Scale: 1:1,110 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 15, Sep 6, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HcC	Hanford coarse sandy loam, 2 to 8 percent slopes	5.7	100.0%
Totals for Area of Interest		**5.7**	**100.0%**

Western Riverside Area, California

HcC—Hanford coarse sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2y8tk
Elevation: 680 to 2,930 feet
Mean annual precipitation: 9 to 17 inches
Mean annual air temperature: 63 to 65 degrees F
Frost-free period: 290 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanford

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 8 inches: coarse sandy loam
C1 - 8 to 40 inches: fine sandy loam
C2 - 40 to 60 inches: stratified loamy sand to coarse sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: R019XD012CA - SANDY

Hydric soil rating: No

Minor Components

Greenfield
Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ramona
Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed
Percent of map unit: 2 percent
Hydric soil rating: No

Tujunga
Percent of map unit: 2 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed
Percent of map unit: 1 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 15, Sep 6, 2022

APPENDIX C: FEMA MAP

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later.

This map may reflect more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 2760000mN — 1000-meter Universal Transverse Mercator grid values, zone 11N
- 600000 FT — 5000-foot grid ticks: California State Plane coordinate system, zone VI (FIPSZONE 0406), Lambert Conformal Conic projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- ●M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0805G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 805 OF 3805
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEAUMONT, CITY OF	060247	0805	G
RIVERSIDE COUNTY	060245	0805	G

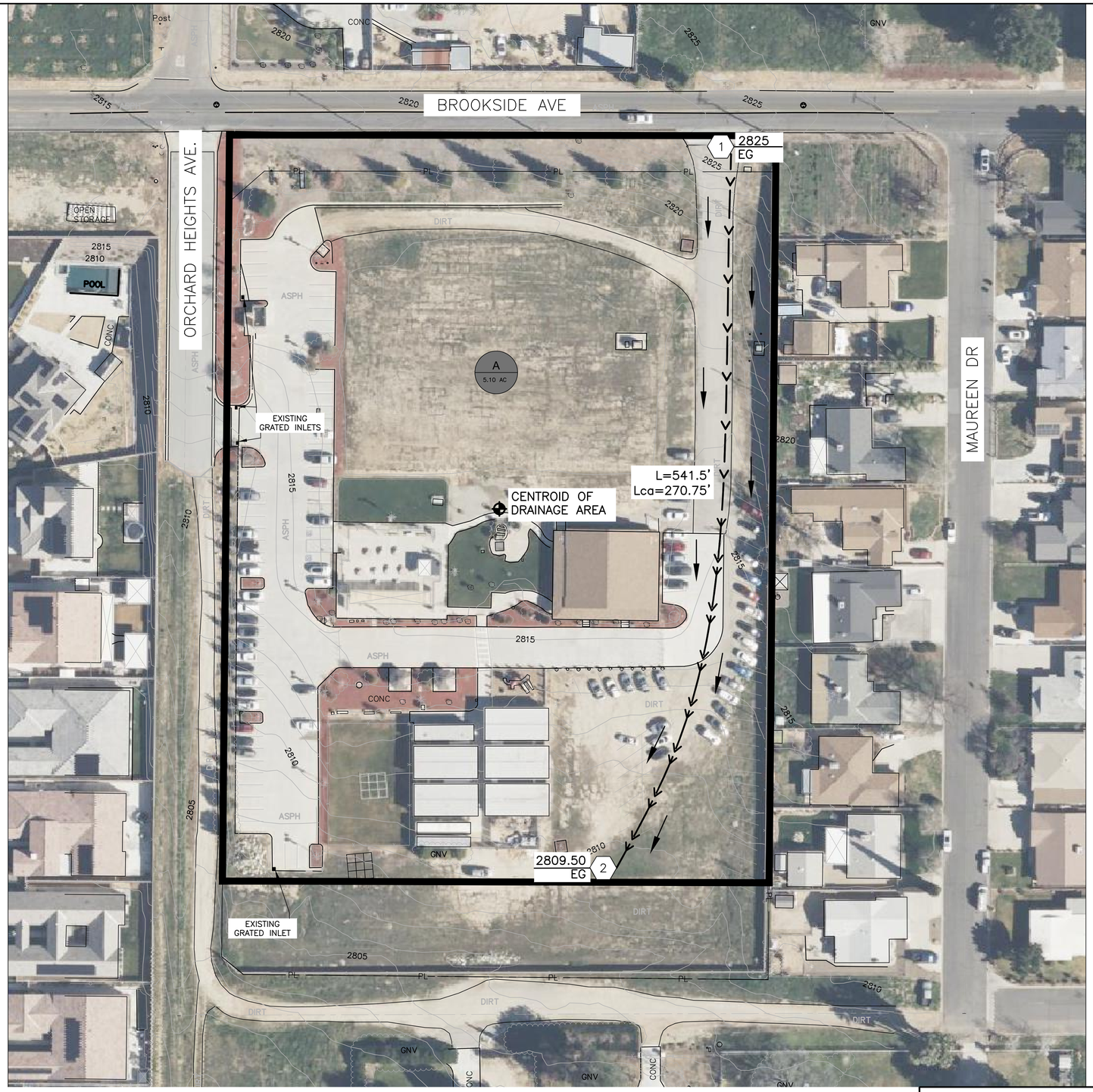
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C0805G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

APPENDIX D: HYDROLOGY MAPS



LEGEND

- 1 — NODE NUMBER
- WATERSHED BOUNDARY
- WATERCOURSE
- FLOW LINE
- 1000 — ELEVATION
- L=100 — LENGTH IN FEET
- X / X.XX AC — DRAINAGE AREA

RATIONAL METHOD		
AREA	Q (10 YR STORM)	Q (100 YR STORM)
A	6.03 CFS	11.88 CFS

UNIT HYDROGRAPH		
AREA	Q (100 YR, 24 HR)	FLOOD VOLUME (100 YR, 24 HR)
A	3.14 CFS	51,127 CF

1" = 40'

0 40 80 120

FEET

CITY OF BEAUMONT

EXISTING HYDROLOGY MAP
CALVARY CHAPEL BEAUMONT

ERSG INC.COM
Engineering Resources of Southern California
1861 W. Redlands Blvd, Bldg 7B
Redlands, Ca. 92373
P: (909) 890-1255
F: (909) 890-0995



LEGEND

- 1 — NODE NUMBER
- WATERSHED BOUNDARY
- WATERCOURSE
- FLOW LINE
- 1000 — ELEVATION
- L=100 — LENGTH IN FEET
- X / X.XX AC — DRAINAGE AREA
- SD — STORM DRAIN INLET
- 6" PERFORATED PVC UNDERDRAIN

RATIONAL METHOD		
AREA	Q (10 YR STORM)	Q (100 YR STORM)
A	9.45 CFS	15.50 CFS

UNIT HYDROGRAPH		
AREA	Q (100 YR, 24 HR)	FLOOD VOLUME (100 YR, 24 HR)
A	3.97 CFS	82,180 CF

BASIN ROUTING			
AREA	MAX DISCHARGE (100 YR, 24 HR)	MAX STORAGE VOLUME (100 YR, 24 HR)	MAX PONDING (100 YR, 24 HR)
A	2.99 CFS	21,562 CF	1.76 FT

1" = 40'

0 40 80 120

FEET

ERSC INC.COM
Engineering Resources of Southern California
1861 W. Redlands Blvd, Bldg 7B
Redlands, Ca. 92373
P: (909) 890-1255
F: (909) 890-0995

CITY OF BEAUMONT

PROPOSED HYDROLOGY MAP
CALVARY CHAPEL BEAUMONT

APPENDIX E: HYDROLOGY CALCULATIONS

Existing Rational Method Calculations
(10 Year and 100 Year)

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 08/30/23 File:Existing10yr.out

---

Existing Conditions
10 Year Storm
Area A

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6158

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Beaumont] area used.
10 year storm 10 minute intensity = 2.300(In/Hr)
10 year storm 60 minute intensity = 0.890(In/Hr)
100 year storm 10 minute intensity = 3.410(In/Hr)
100 year storm 60 minute intensity = 1.320(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.890(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 541.500(Ft.)
Top (of initial area) elevation = 2825.000(Ft.)
Bottom (of initial area) elevation = 2809.500(Ft.)
Difference in elevation = 15.500(Ft.)
Slope = 0.02862 s(percent)= 2.86
TC = k(0.447)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.282 min.
Rainfall intensity = 2.158(In/Hr) for a 10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.547
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000

```
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.690; Impervious fraction =  0.310
Initial subarea runoff =      6.025(CFS)
Total initial stream area =        5.100(Ac.)
Pervious area fraction = 0.690
End of computations, total study area =            5.10 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.690
Area averaged RI index number =  32.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 08/30/23 File:Existing100yr.out

---

Existing Conditions
100 Year Storm
Area A

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6158

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [Beaumont] area used.
10 year storm 10 minute intensity = 2.300(In/Hr)
10 year storm 60 minute intensity = 0.890(In/Hr)
100 year storm 10 minute intensity = 3.410(In/Hr)
100 year storm 60 minute intensity = 1.320(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.320(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 541.500(Ft.)
Top (of initial area) elevation = 2825.000(Ft.)
Bottom (of initial area) elevation = 2809.500(Ft.)
Difference in elevation = 15.500(Ft.)
Slope = 0.02862 s(percent)= 2.86
TC = k(0.447)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.282 min.
Rainfall intensity = 3.201(In/Hr) for a 100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.728
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000

```
RI index for soil(AMC 3)  =  52.00
Pervious area fraction =  0.690; Impervious fraction =  0.310
Initial subarea runoff =     11.875(CFS)
Total initial stream area =        5.100(Ac.)
Pervious area fraction = 0.690
End of computations, total study area =            5.10 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.690
Area averaged RI index number =  32.0
```

Proposed Rational Method Calculations (10 Year and 100 Year)

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 10/04/23
File:proposed10yr.out

Proposed Conditions
10 Year Storm
Area A

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6158

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Beaumont] area used.
10 year storm 10 minute intensity = 2.300(In/Hr)
10 year storm 60 minute intensity = 0.890(In/Hr)
100 year storm 10 minute intensity = 3.410(In/Hr)
100 year storm 60 minute intensity = 1.320(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.890(In/Hr)
Slope of intensity duration curve = 0.5300

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 572.500(Ft.)
Top (of initial area) elevation = 2825.000(Ft.)
Bottom (of initial area) elevation = 2804.000(Ft.)
Difference in elevation = 21.000(Ft.)
Slope = 0.03668 s(percent)= 3.67
TC = k(0.356)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.753 min.
Rainfall intensity = 2.469(In/Hr) for a 10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.751
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 32.00
Pervious area fraction = 0.310; Impervious fraction = 0.690
Initial subarea runoff = 9.454(CFS)
Total initial stream area = 5.100(Ac.)
Pervious area fraction = 0.310
End of computations, total study area = 5.10 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.310
Area averaged RI index number = 32.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 10/04/23
File:proposed100yr.out

Proposed Conditions
100 Year Storm
Area A

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6158

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [Beaumont] area used.
10 year storm 10 minute intensity = 2.300(In/Hr)
10 year storm 60 minute intensity = 0.890(In/Hr)
100 year storm 10 minute intensity = 3.410(In/Hr)
100 year storm 60 minute intensity = 1.320(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.320(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

```
Initial area flow distance =   572.500(Ft.)
Top (of initial area) elevation =  2825.000(Ft.)
Bottom (of initial area) elevation =  2804.000(Ft.)
Difference in elevation =    21.000(Ft.)
Slope =    0.03668  s(percent)=       3.67
TC = k(0.356)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.753 min.
Rainfall intensity =      3.661(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.830
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  52.00
Pervious area fraction =  0.310; Impervious fraction =  0.690
Initial subarea runoff =     15.495(CFS)
Total initial stream area =        5.100(Ac.)
Pervious area fraction = 0.310
End of computations, total study area =            5.10 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.310
Area averaged RI index number =  32.0
```

Existing Unit Hydrograph Calculations
(100 Year, 24 Hour)

U n i t H y d r o g r a p h A n a l y s i s

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Study date 10/03/23 File: exuh24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6158

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Existing Hydrograph
Area A
100 Year, 24 Hour

Drainage Area = 5.10(Ac.) = 0.008 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 5.10(Ac.) = 0.008 Sq. Mi.
Length along longest watercourse = 541.50(Ft.)
Length along longest watercourse measured to centroid = 270.75(Ft.)
Length along longest watercourse = 0.103 Mi.
Length along longest watercourse measured to centroid = 0.051 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 151.1357 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.019 Hr.
Lag time = 1.13 Min.
25% of lag time = 0.28 Min.
40% of lag time = 0.45 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
5.10	3.00	15.30

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
5.10	7.00	35.70

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 3.000(In)
Area Averaged 100-Year Rainfall = 7.000(In)

Point rain (area averaged) = 7.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 7.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
5.100	32.00	0.310

Total Area Entered = 5.10(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
32.0	52.0	0.552	0.310	0.398	1.000	0.398
					Sum (F) =	0.398

Area averaged mean soil loss (F) (In/Hr) = 0.398
Minimum soil loss rate ((In/Hr)) = 0.199
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.652

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	441.219	67.726	3.481
2	0.167	882.438	32.274	1.659
		Sum =	100.000 Sum=	5.140

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.056	0.705	0.037	0.02
2	0.17	0.07	0.056	0.702	0.037	0.02
3	0.25	0.07	0.056	0.700	0.037	0.02
4	0.33	0.10	0.084	0.697	0.055	0.03
5	0.42	0.10	0.084	0.694	0.055	0.03
6	0.50	0.10	0.084	0.691	0.055	0.03
7	0.58	0.10	0.084	0.689	0.055	0.03
8	0.67	0.10	0.084	0.686	0.055	0.03
9	0.75	0.10	0.084	0.683	0.055	0.03
10	0.83	0.13	0.112	0.681	0.073	0.04
11	0.92	0.13	0.112	0.678	0.073	0.04
12	1.00	0.13	0.112	0.675	0.073	0.04
13	1.08	0.10	0.084	0.673	0.055	0.03
14	1.17	0.10	0.084	0.670	0.055	0.03
15	1.25	0.10	0.084	0.667	0.055	0.03
16	1.33	0.10	0.084	0.665	0.055	0.03
17	1.42	0.10	0.084	0.662	0.055	0.03
18	1.50	0.10	0.084	0.659	0.055	0.03
19	1.58	0.10	0.084	0.657	0.055	0.03
20	1.67	0.10	0.084	0.654	0.055	0.03
21	1.75	0.10	0.084	0.651	0.055	0.03
22	1.83	0.13	0.112	0.649	0.073	0.04
23	1.92	0.13	0.112	0.646	0.073	0.04
24	2.00	0.13	0.112	0.644	0.073	0.04
25	2.08	0.13	0.112	0.641	0.073	0.04
26	2.17	0.13	0.112	0.638	0.073	0.04
27	2.25	0.13	0.112	0.636	0.073	0.04
28	2.33	0.13	0.112	0.633	0.073	0.04
29	2.42	0.13	0.112	0.631	0.073	0.04
30	2.50	0.13	0.112	0.628	0.073	0.04
31	2.58	0.17	0.140	0.626	0.091	0.05
32	2.67	0.17	0.140	0.623	0.091	0.05
33	2.75	0.17	0.140	0.620	0.091	0.05
34	2.83	0.17	0.140	0.618	0.091	0.05
35	2.92	0.17	0.140	0.615	0.091	0.05
36	3.00	0.17	0.140	0.613	0.091	0.05
37	3.08	0.17	0.140	0.610	0.091	0.05
38	3.17	0.17	0.140	0.608	0.091	0.05
39	3.25	0.17	0.140	0.605	0.091	0.05
40	3.33	0.17	0.140	0.603	0.091	0.05
41	3.42	0.17	0.140	0.600	0.091	0.05
42	3.50	0.17	0.140	0.598	0.091	0.05
43	3.58	0.17	0.140	0.595	0.091	0.05
44	3.67	0.17	0.140	0.593	0.091	0.05

45	3.75	0.17	0.140	0.590	0.091	0.05
46	3.83	0.20	0.168	0.588	0.110	0.06
47	3.92	0.20	0.168	0.585	0.110	0.06
48	4.00	0.20	0.168	0.583	0.110	0.06
49	4.08	0.20	0.168	0.580	0.110	0.06
50	4.17	0.20	0.168	0.578	0.110	0.06
51	4.25	0.20	0.168	0.575	0.110	0.06
52	4.33	0.23	0.196	0.573	0.128	0.07
53	4.42	0.23	0.196	0.570	0.128	0.07
54	4.50	0.23	0.196	0.568	0.128	0.07
55	4.58	0.23	0.196	0.565	0.128	0.07
56	4.67	0.23	0.196	0.563	0.128	0.07
57	4.75	0.23	0.196	0.561	0.128	0.07
58	4.83	0.27	0.224	0.558	0.146	0.08
59	4.92	0.27	0.224	0.556	0.146	0.08
60	5.00	0.27	0.224	0.553	0.146	0.08
61	5.08	0.20	0.168	0.551	0.110	0.06
62	5.17	0.20	0.168	0.549	0.110	0.06
63	5.25	0.20	0.168	0.546	0.110	0.06
64	5.33	0.23	0.196	0.544	0.128	0.07
65	5.42	0.23	0.196	0.541	0.128	0.07
66	5.50	0.23	0.196	0.539	0.128	0.07
67	5.58	0.27	0.224	0.537	0.146	0.08
68	5.67	0.27	0.224	0.534	0.146	0.08
69	5.75	0.27	0.224	0.532	0.146	0.08
70	5.83	0.27	0.224	0.530	0.146	0.08
71	5.92	0.27	0.224	0.527	0.146	0.08
72	6.00	0.27	0.224	0.525	0.146	0.08
73	6.08	0.30	0.252	0.523	0.164	0.09
74	6.17	0.30	0.252	0.520	0.164	0.09
75	6.25	0.30	0.252	0.518	0.164	0.09
76	6.33	0.30	0.252	0.516	0.164	0.09
77	6.42	0.30	0.252	0.513	0.164	0.09
78	6.50	0.30	0.252	0.511	0.164	0.09
79	6.58	0.33	0.280	0.509	0.183	0.10
80	6.67	0.33	0.280	0.506	0.183	0.10
81	6.75	0.33	0.280	0.504	0.183	0.10
82	6.83	0.33	0.280	0.502	0.183	0.10
83	6.92	0.33	0.280	0.500	0.183	0.10
84	7.00	0.33	0.280	0.497	0.183	0.10
85	7.08	0.33	0.280	0.495	0.183	0.10
86	7.17	0.33	0.280	0.493	0.183	0.10
87	7.25	0.33	0.280	0.491	0.183	0.10
88	7.33	0.37	0.308	0.488	0.201	0.11
89	7.42	0.37	0.308	0.486	0.201	0.11
90	7.50	0.37	0.308	0.484	0.201	0.11
91	7.58	0.40	0.336	0.482	0.219	0.12
92	7.67	0.40	0.336	0.479	0.219	0.12

93	7.75	0.40	0.336	0.477	0.219	0.12
94	7.83	0.43	0.364	0.475	0.237	0.13
95	7.92	0.43	0.364	0.473	0.237	0.13
96	8.00	0.43	0.364	0.471	0.237	0.13
97	8.08	0.50	0.420	0.468	0.274	0.15
98	8.17	0.50	0.420	0.466	0.274	0.15
99	8.25	0.50	0.420	0.464	0.274	0.15
100	8.33	0.50	0.420	0.462	0.274	0.15
101	8.42	0.50	0.420	0.460	0.274	0.15
102	8.50	0.50	0.420	0.458	0.274	0.15
103	8.58	0.53	0.448	0.455	0.292	0.16
104	8.67	0.53	0.448	0.453	0.292	0.16
105	8.75	0.53	0.448	0.451	0.292	0.16
106	8.83	0.57	0.476	0.449	---	0.03
107	8.92	0.57	0.476	0.447	---	0.03
108	9.00	0.57	0.476	0.445	---	0.03
109	9.08	0.63	0.532	0.443	---	0.09
110	9.17	0.63	0.532	0.441	---	0.09
111	9.25	0.63	0.532	0.439	---	0.09
112	9.33	0.67	0.560	0.436	---	0.12
113	9.42	0.67	0.560	0.434	---	0.13
114	9.50	0.67	0.560	0.432	---	0.13
115	9.58	0.70	0.588	0.430	---	0.16
116	9.67	0.70	0.588	0.428	---	0.16
117	9.75	0.70	0.588	0.426	---	0.16
118	9.83	0.73	0.616	0.424	---	0.19
119	9.92	0.73	0.616	0.422	---	0.19
120	10.00	0.73	0.616	0.420	---	0.20
121	10.08	0.50	0.420	0.418	---	0.00
122	10.17	0.50	0.420	0.416	---	0.00
123	10.25	0.50	0.420	0.414	---	0.01
124	10.33	0.50	0.420	0.412	---	0.01
125	10.42	0.50	0.420	0.410	---	0.01
126	10.50	0.50	0.420	0.408	---	0.01
127	10.58	0.67	0.560	0.406	---	0.15
128	10.67	0.67	0.560	0.404	---	0.16
129	10.75	0.67	0.560	0.402	---	0.16
130	10.83	0.67	0.560	0.400	---	0.16
131	10.92	0.67	0.560	0.398	---	0.16
132	11.00	0.67	0.560	0.396	---	0.16
133	11.08	0.63	0.532	0.394	---	0.14
134	11.17	0.63	0.532	0.392	---	0.14
135	11.25	0.63	0.532	0.390	---	0.14
136	11.33	0.63	0.532	0.388	---	0.14
137	11.42	0.63	0.532	0.386	---	0.15
138	11.50	0.63	0.532	0.384	---	0.15
139	11.58	0.57	0.476	0.383	---	0.09
140	11.67	0.57	0.476	0.381	---	0.10

141	11.75	0.57	0.476	0.379	---	0.10
142	11.83	0.60	0.504	0.377	---	0.13
143	11.92	0.60	0.504	0.375	---	0.13
144	12.00	0.60	0.504	0.373	---	0.13
145	12.08	0.83	0.700	0.371	---	0.33
146	12.17	0.83	0.700	0.369	---	0.33
147	12.25	0.83	0.700	0.368	---	0.33
148	12.33	0.87	0.728	0.366	---	0.36
149	12.42	0.87	0.728	0.364	---	0.36
150	12.50	0.87	0.728	0.362	---	0.37
151	12.58	0.93	0.784	0.360	---	0.42
152	12.67	0.93	0.784	0.358	---	0.43
153	12.75	0.93	0.784	0.357	---	0.43
154	12.83	0.97	0.812	0.355	---	0.46
155	12.92	0.97	0.812	0.353	---	0.46
156	13.00	0.97	0.812	0.351	---	0.46
157	13.08	1.13	0.952	0.349	---	0.60
158	13.17	1.13	0.952	0.348	---	0.60
159	13.25	1.13	0.952	0.346	---	0.61
160	13.33	1.13	0.952	0.344	---	0.61
161	13.42	1.13	0.952	0.342	---	0.61
162	13.50	1.13	0.952	0.341	---	0.61
163	13.58	0.77	0.644	0.339	---	0.31
164	13.67	0.77	0.644	0.337	---	0.31
165	13.75	0.77	0.644	0.335	---	0.31
166	13.83	0.77	0.644	0.334	---	0.31
167	13.92	0.77	0.644	0.332	---	0.31
168	14.00	0.77	0.644	0.330	---	0.31
169	14.08	0.90	0.756	0.329	---	0.43
170	14.17	0.90	0.756	0.327	---	0.43
171	14.25	0.90	0.756	0.325	---	0.43
172	14.33	0.87	0.728	0.324	---	0.40
173	14.42	0.87	0.728	0.322	---	0.41
174	14.50	0.87	0.728	0.320	---	0.41
175	14.58	0.87	0.728	0.319	---	0.41
176	14.67	0.87	0.728	0.317	---	0.41
177	14.75	0.87	0.728	0.315	---	0.41
178	14.83	0.83	0.700	0.314	---	0.39
179	14.92	0.83	0.700	0.312	---	0.39
180	15.00	0.83	0.700	0.311	---	0.39
181	15.08	0.80	0.672	0.309	---	0.36
182	15.17	0.80	0.672	0.307	---	0.36
183	15.25	0.80	0.672	0.306	---	0.37
184	15.33	0.77	0.644	0.304	---	0.34
185	15.42	0.77	0.644	0.303	---	0.34
186	15.50	0.77	0.644	0.301	---	0.34
187	15.58	0.63	0.532	0.300	---	0.23
188	15.67	0.63	0.532	0.298	---	0.23

189	15.75	0.63	0.532	0.297	---	0.24
190	15.83	0.63	0.532	0.295	---	0.24
191	15.92	0.63	0.532	0.294	---	0.24
192	16.00	0.63	0.532	0.292	---	0.24
193	16.08	0.13	0.112	0.291	0.073	0.04
194	16.17	0.13	0.112	0.289	0.073	0.04
195	16.25	0.13	0.112	0.288	0.073	0.04
196	16.33	0.13	0.112	0.286	0.073	0.04
197	16.42	0.13	0.112	0.285	0.073	0.04
198	16.50	0.13	0.112	0.283	0.073	0.04
199	16.58	0.10	0.084	0.282	0.055	0.03
200	16.67	0.10	0.084	0.280	0.055	0.03
201	16.75	0.10	0.084	0.279	0.055	0.03
202	16.83	0.10	0.084	0.278	0.055	0.03
203	16.92	0.10	0.084	0.276	0.055	0.03
204	17.00	0.10	0.084	0.275	0.055	0.03
205	17.08	0.17	0.140	0.273	0.091	0.05
206	17.17	0.17	0.140	0.272	0.091	0.05
207	17.25	0.17	0.140	0.271	0.091	0.05
208	17.33	0.17	0.140	0.269	0.091	0.05
209	17.42	0.17	0.140	0.268	0.091	0.05
210	17.50	0.17	0.140	0.267	0.091	0.05
211	17.58	0.17	0.140	0.265	0.091	0.05
212	17.67	0.17	0.140	0.264	0.091	0.05
213	17.75	0.17	0.140	0.263	0.091	0.05
214	17.83	0.13	0.112	0.261	0.073	0.04
215	17.92	0.13	0.112	0.260	0.073	0.04
216	18.00	0.13	0.112	0.259	0.073	0.04
217	18.08	0.13	0.112	0.257	0.073	0.04
218	18.17	0.13	0.112	0.256	0.073	0.04
219	18.25	0.13	0.112	0.255	0.073	0.04
220	18.33	0.13	0.112	0.254	0.073	0.04
221	18.42	0.13	0.112	0.252	0.073	0.04
222	18.50	0.13	0.112	0.251	0.073	0.04
223	18.58	0.10	0.084	0.250	0.055	0.03
224	18.67	0.10	0.084	0.249	0.055	0.03
225	18.75	0.10	0.084	0.248	0.055	0.03
226	18.83	0.07	0.056	0.246	0.037	0.02
227	18.92	0.07	0.056	0.245	0.037	0.02
228	19.00	0.07	0.056	0.244	0.037	0.02
229	19.08	0.10	0.084	0.243	0.055	0.03
230	19.17	0.10	0.084	0.242	0.055	0.03
231	19.25	0.10	0.084	0.241	0.055	0.03
232	19.33	0.13	0.112	0.240	0.073	0.04
233	19.42	0.13	0.112	0.238	0.073	0.04
234	19.50	0.13	0.112	0.237	0.073	0.04
235	19.58	0.10	0.084	0.236	0.055	0.03
236	19.67	0.10	0.084	0.235	0.055	0.03

237	19.75	0.10	0.084	0.234	0.055	0.03
238	19.83	0.07	0.056	0.233	0.037	0.02
239	19.92	0.07	0.056	0.232	0.037	0.02
240	20.00	0.07	0.056	0.231	0.037	0.02
241	20.08	0.10	0.084	0.230	0.055	0.03
242	20.17	0.10	0.084	0.229	0.055	0.03
243	20.25	0.10	0.084	0.228	0.055	0.03
244	20.33	0.10	0.084	0.227	0.055	0.03
245	20.42	0.10	0.084	0.226	0.055	0.03
246	20.50	0.10	0.084	0.225	0.055	0.03
247	20.58	0.10	0.084	0.224	0.055	0.03
248	20.67	0.10	0.084	0.223	0.055	0.03
249	20.75	0.10	0.084	0.222	0.055	0.03
250	20.83	0.07	0.056	0.221	0.037	0.02
251	20.92	0.07	0.056	0.220	0.037	0.02
252	21.00	0.07	0.056	0.220	0.037	0.02
253	21.08	0.10	0.084	0.219	0.055	0.03
254	21.17	0.10	0.084	0.218	0.055	0.03
255	21.25	0.10	0.084	0.217	0.055	0.03
256	21.33	0.07	0.056	0.216	0.037	0.02
257	21.42	0.07	0.056	0.215	0.037	0.02
258	21.50	0.07	0.056	0.214	0.037	0.02
259	21.58	0.10	0.084	0.214	0.055	0.03
260	21.67	0.10	0.084	0.213	0.055	0.03
261	21.75	0.10	0.084	0.212	0.055	0.03
262	21.83	0.07	0.056	0.211	0.037	0.02
263	21.92	0.07	0.056	0.211	0.037	0.02
264	22.00	0.07	0.056	0.210	0.037	0.02
265	22.08	0.10	0.084	0.209	0.055	0.03
266	22.17	0.10	0.084	0.209	0.055	0.03
267	22.25	0.10	0.084	0.208	0.055	0.03
268	22.33	0.07	0.056	0.207	0.037	0.02
269	22.42	0.07	0.056	0.207	0.037	0.02
270	22.50	0.07	0.056	0.206	0.037	0.02
271	22.58	0.07	0.056	0.205	0.037	0.02
272	22.67	0.07	0.056	0.205	0.037	0.02
273	22.75	0.07	0.056	0.204	0.037	0.02
274	22.83	0.07	0.056	0.204	0.037	0.02
275	22.92	0.07	0.056	0.203	0.037	0.02
276	23.00	0.07	0.056	0.203	0.037	0.02
277	23.08	0.07	0.056	0.202	0.037	0.02
278	23.17	0.07	0.056	0.202	0.037	0.02
279	23.25	0.07	0.056	0.201	0.037	0.02
280	23.33	0.07	0.056	0.201	0.037	0.02
281	23.42	0.07	0.056	0.201	0.037	0.02
282	23.50	0.07	0.056	0.200	0.037	0.02
283	23.58	0.07	0.056	0.200	0.037	0.02
284	23.67	0.07	0.056	0.200	0.037	0.02

285	23.75	0.07	0.056	0.199	0.037	0.02
286	23.83	0.07	0.056	0.199	0.037	0.02
287	23.92	0.07	0.056	0.199	0.037	0.02
288	24.00	0.07	0.056	0.199	0.037	0.02
Sum =		100.0			Sum =	33.1

Flood volume = Effective rainfall 2.76(In)
times area 5.1(Ac.)/[(In)/(Ft.)] = 1.2(Ac.Ft)
Total soil loss = 4.24(In)
Total soil loss = 1.801(Ac.Ft)
Total rainfall = 7.00(In)
Flood volume = 51127.4 Cubic Feet
Total soil loss = 78462.3 Cubic Feet

Peak flow rate of this hydrograph = 3.141(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0005	0.07	Q	|	|	|	|
0+10	0.0012	0.10	Q	|	|	|	|
0+15	0.0018	0.10	Q	|	|	|	|
0+20	0.0028	0.13	Q	|	|	|	|
0+25	0.0038	0.15	Q	|	|	|	|
0+30	0.0048	0.15	Q	|	|	|	|
0+35	0.0059	0.15	Q	|	|	|	|
0+40	0.0069	0.15	Q	|	|	|	|
0+45	0.0079	0.15	Q	|	|	|	|
0+50	0.0092	0.18	Q	|	|	|	|
0+55	0.0106	0.20	Q	|	|	|	|
1+ 0	0.0120	0.20	Q	|	|	|	|
1+ 5	0.0131	0.17	Q	|	|	|	|
1+10	0.0142	0.15	Q	|	|	|	|
1+15	0.0152	0.15	Q	|	|	|	|
1+20	0.0162	0.15	Q	|	|	|	|
1+25	0.0173	0.15	Q	|	|	|	|
1+30	0.0183	0.15	Q	|	|	|	|
1+35	0.0193	0.15	Q	|	|	|	|
1+40	0.0204	0.15	Q	|	|	|	|
1+45	0.0214	0.15	Q	|	|	|	|
1+50	0.0227	0.18	Q	|	|	|	|
1+55	0.0241	0.20	Q	|	|	|	|
2+ 0	0.0254	0.20	Q	|	|	|	|

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2+ 5       0.0268      0.20  Q          |          |          |          |
2+10       0.0282      0.20  Q          |          |          |          |
2+15       0.0296      0.20  QV         |          |          |          |
2+20       0.0310      0.20  QV         |          |          |          |
2+25       0.0323      0.20  QV         |          |          |          |
2+30       0.0337      0.20  QV         |          |          |          |
2+35       0.0353      0.23  QV         |          |          |          |
2+40       0.0371      0.25  |Q         |          |          |          |
2+45       0.0388      0.25  |Q         |          |          |          |
2+50       0.0405      0.25  |Q         |          |          |          |
2+55       0.0422      0.25  |Q         |          |          |          |
3+ 0       0.0440      0.25  |Q         |          |          |          |
3+ 5       0.0457      0.25  |Q         |          |          |          |
3+10       0.0474      0.25  |Q         |          |          |          |
3+15       0.0491      0.25  |Q         |          |          |          |
3+20       0.0509      0.25  |Q         |          |          |          |
3+25       0.0526      0.25  |Q         |          |          |          |
3+30       0.0543      0.25  |Q         |          |          |          |
3+35       0.0560      0.25  |Q         |          |          |          |
3+40       0.0578      0.25  |Q         |          |          |          |
3+45       0.0595      0.25  |QV        |          |          |          |
3+50       0.0614      0.28  |QV        |          |          |          |
3+55       0.0635      0.30  |QV        |          |          |          |
4+ 0       0.0656      0.30  |QV        |          |          |          |
4+ 5       0.0677      0.30  |QV        |          |          |          |
4+10       0.0697      0.30  |QV        |          |          |          |
4+15       0.0718      0.30  |QV        |          |          |          |
4+20       0.0741      0.33  |QV        |          |          |          |
4+25       0.0765      0.35  |QV        |          |          |          |
4+30       0.0789      0.35  |QV        |          |          |          |
4+35       0.0814      0.35  |QV        |          |          |          |
4+40       0.0838      0.35  |QV        |          |          |          |
4+45       0.0862      0.35  |QV        |          |          |          |
4+50       0.0888      0.38  |Q V       |          |          |          |
4+55       0.0916      0.40  |Q V       |          |          |          |
5+ 0       0.0944      0.40  |Q V       |          |          |          |
5+ 5       0.0966      0.33  |Q V       |          |          |          |
5+10       0.0987      0.30  |Q V       |          |          |          |
5+15       0.1008      0.30  |Q V       |          |          |          |
5+20       0.1031      0.33  |Q V       |          |          |          |
5+25       0.1055      0.35  |Q V       |          |          |          |
5+30       0.1079      0.35  |Q V       |          |          |          |
5+35       0.1106      0.38  |Q V       |          |          |          |
5+40       0.1133      0.40  |Q V       |          |          |          |
5+45       0.1161      0.40  |Q V       |          |          |          |
5+50       0.1189      0.40  |Q  V      |          |          |          |
5+55       0.1216      0.40  |Q  V      |          |          |          |
6+ 0       0.1244      0.40  |Q  V      |          |          |          |
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 6+ 5       0.1274      0.43  |Q  V     |          |          |          |
 6+10       0.1305      0.45  |Q  V     |          |          |          |
 6+15       0.1336      0.45  |Q  V     |          |          |          |
 6+20       0.1367      0.45  |Q  V     |          |          |          |
 6+25       0.1398      0.45  |Q  V     |          |          |          |
 6+30       0.1429      0.45  |Q  V     |          |          |          |
 6+35       0.1462      0.48  |Q  V     |          |          |          |
 6+40       0.1497      0.50  | Q  V    |          |          |          |
 6+45       0.1531      0.50  | Q  V    |          |          |          |
 6+50       0.1566      0.50  | Q  V    |          |          |          |
 6+55       0.1600      0.50  | Q  V    |          |          |          |
 7+ 0       0.1635      0.50  | Q  V    |          |          |          |
 7+ 5       0.1669      0.50  | Q  V    |          |          |          |
 7+10       0.1704      0.50  | Q  V    |          |          |          |
 7+15       0.1739      0.50  | Q  V    |          |          |          |
 7+20       0.1775      0.54  | Q   V   |          |          |          |
 7+25       0.1813      0.55  | Q   V   |          |          |          |
 7+30       0.1851      0.55  | Q   V   |          |          |          |
 7+35       0.1892      0.59  | Q   V   |          |          |          |
 7+40       0.1933      0.60  | Q   V   |          |          |          |
 7+45       0.1974      0.60  | Q   V   |          |          |          |
 7+50       0.2018      0.64  | Q   V   |          |          |          |
 7+55       0.2063      0.65  | Q    V  |          |          |          |
 8+ 0       0.2108      0.65  | Q    V  |          |          |          |
 8+ 5       0.2157      0.72  | Q    V  |          |          |          |
 8+10       0.2209      0.75  |  Q   V  |          |          |          |
 8+15       0.2261      0.75  |  Q   V  |          |          |          |
 8+20       0.2313      0.75  |  Q   V  |          |          |          |
 8+25       0.2364      0.75  |  Q    V |          |          |          |
 8+30       0.2416      0.75  |  Q    V |          |          |          |
 8+35       0.2470      0.79  |  Q    V |          |          |          |
 8+40       0.2526      0.80  |  Q    V |          |          |          |
 8+45       0.2581      0.80  |  Q    V |          |          |          |
 8+50       0.2605      0.35  |Q      V |          |          |          |
 8+55       0.2615      0.15  Q       V |          |          |          |
 9+ 0       0.2626      0.16  Q       V |          |          |          |
 9+ 5       0.2651      0.36  |Q       V|          |          |          |
 9+10       0.2683      0.47  |Q       V|          |          |          |
 9+15       0.2716      0.48  |Q       V|          |          |          |
 9+20       0.2756      0.59  | Q      V|          |          |          |
 9+25       0.2800      0.64  | Q      V|          |          |          |
 9+30       0.2845      0.65  | Q      V|          |          |          |
 9+35       0.2898      0.76  |  Q     V|          |          |          |
 9+40       0.2954      0.82  |  Q      V          |          |          |
 9+45       0.3011      0.83  |  Q      V          |          |          |
 9+50       0.3076      0.94  |  Q      V          |          |          |
 9+55       0.3144      0.99  |  Q      V          |          |          |
10+ 0       0.3213      1.00  |   Q     V          |          |          |
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10+ 5       0.3236      0.33  |Q         |V         |          |          |
10+10       0.3238      0.02  Q          |V         |          |          |
10+15       0.3239      0.03  Q          |V         |          |          |
10+20       0.3242      0.04  Q          |V         |          |          |
10+25       0.3245      0.05  Q          |V         |          |          |
10+30       0.3250      0.06  Q          |V         |          |          |
10+35       0.3288      0.56  | Q        |V         |          |          |
10+40       0.3343      0.80  |  Q       |V         |          |          |
10+45       0.3399      0.81  |  Q       |V         |          |          |
10+50       0.3455      0.82  |  Q       |V         |          |          |
10+55       0.3512      0.83  |  Q       |V         |          |          |
11+ 0       0.3570      0.84  |  Q       | V        |          |          |
11+ 5       0.3622      0.75  |  Q       | V        |          |          |
11+10       0.3671      0.72  | Q        | V        |          |          |
11+15       0.3721      0.73  | Q        | V        |          |          |
11+20       0.3772      0.74  | Q        | V        |          |          |
11+25       0.3823      0.75  | Q        |  V       |          |          |
11+30       0.3875      0.76  |  Q       |  V       |          |          |
11+35       0.3915      0.57  | Q        |  V       |          |          |
11+40       0.3948      0.49  |Q         |  V       |          |          |
11+45       0.3982      0.50  |Q         |  V       |          |          |
11+50       0.4024      0.60  | Q        |  V       |          |          |
11+55       0.4069      0.66  | Q        |  V       |          |          |
12+ 0       0.4116      0.67  | Q        |   V      |          |          |
12+ 5       0.4209      1.36  |    Q     |   V      |          |          |
12+10       0.4326      1.70  |     Q    |   V      |          |          |
12+15       0.4444      1.71  |     Q    |    V     |          |          |
12+20       0.4569      1.81  |      Q   |    V     |          |          |
12+25       0.4697      1.87  |      Q   |     V    |          |          |
12+30       0.4827      1.88  |      Q   |     V    |          |          |
12+35       0.4970      2.08  |       Q  |     V    |          |          |
12+40       0.5121      2.19  |       Q  |      V   |          |          |
12+45       0.5272      2.19  |       Q  |      V   |          |          |
12+50       0.5431      2.30  |        Q |       V  |          |          |
12+55       0.5593      2.36  |        Q |        V |          |          |
13+ 0       0.5756      2.37  |        Q |        V |          |          |
13+ 5       0.5953      2.86  |          |Q        V          |          |
13+10       0.6167      3.10  |          | Q       |V         |          |
13+15       0.6381      3.11  |          | Q       |V         |          |
13+20       0.6596      3.12  |          | Q       | V        |          |
13+25       0.6812      3.13  |          | Q       |  V       |          |
13+30       0.7029      3.14  |          | Q       |  V       |          |
13+35       0.7172      2.08  |       Q  |         |   V      |          |
13+40       0.7280      1.57  |     Q    |         |   V      |          |
13+45       0.7389      1.58  |     Q    |         |    V     |          |
13+50       0.7499      1.59  |     Q    |         |    V     |          |
13+55       0.7609      1.60  |     Q    |         |    V     |          |
14+ 0       0.7720      1.61  |     Q    |         |     V    |          |
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14+ 5       0.7858      2.01  |       Q |          |     V   |          |
14+10       0.8010      2.20  |       Q |          |      V  |          |
14+15       0.8162      2.21  |       Q |          |      V  |          |
14+20       0.8309      2.12  |       Q |          |       V |          |
14+25       0.8452      2.09  |       Q |          |       V |          |
14+30       0.8596      2.09  |       Q |          |        V|          |
14+35       0.8741      2.10  |       Q |          |        V|          |
14+40       0.8887      2.11  |       Q |          |         V          |
14+45       0.9032      2.12  |       Q |          |         V          |
14+50       0.9172      2.03  |       Q |          |          |V        |
14+55       0.9309      1.99  |      Q  |          |          |V        |
15+ 0       0.9447      2.00  |      Q  |          |          | V       |
15+ 5       0.9579      1.91  |      Q  |          |          | V       |
15+10       0.9708      1.87  |      Q  |          |          |  V      |
15+15       0.9837      1.88  |      Q  |          |          |  V      |
15+20       0.9960      1.79  |      Q  |          |          |  V      |
15+25       1.0081      1.75  |      Q  |          |          |   V     |
15+30       1.0202      1.76  |      Q  |          |          |   V     |
15+35       1.0297      1.38  |    Q    |          |          |    V    |
15+40       1.0380      1.20  |   Q     |          |          |    V    |
15+45       1.0463      1.21  |   Q     |          |          |    V    |
15+50       1.0547      1.22  |   Q     |          |          |    V    |
15+55       1.0631      1.22  |   Q     |          |          |     V   |
16+ 0       1.0716      1.23  |   Q     |          |          |     V   |
16+ 5       1.0753      0.53  | Q       |          |          |     V   |
16+10       1.0767      0.20  Q         |          |          |     V   |
16+15       1.0780      0.20  Q         |          |          |     V   |
16+20       1.0794      0.20  Q         |          |          |     V   |
16+25       1.0808      0.20  Q         |          |          |     V   |
16+30       1.0822      0.20  Q         |          |          |     V   |
16+35       1.0833      0.17  Q         |          |          |     V   |
16+40       1.0844      0.15  Q         |          |          |     V   |
16+45       1.0854      0.15  Q         |          |          |     V   |
16+50       1.0864      0.15  Q         |          |          |      V  |
16+55       1.0875      0.15  Q         |          |          |      V  |
17+ 0       1.0885      0.15  Q         |          |          |      V  |
17+ 5       1.0900      0.22  Q         |          |          |      V  |
17+10       1.0917      0.25  |Q        |          |          |      V  |
17+15       1.0934      0.25  |Q        |          |          |      V  |
17+20       1.0952      0.25  |Q        |          |          |      V  |
17+25       1.0969      0.25  |Q        |          |          |      V  |
17+30       1.0986      0.25  |Q        |          |          |      V  |
17+35       1.1004      0.25  |Q        |          |          |      V  |
17+40       1.1021      0.25  |Q        |          |          |      V  |
17+45       1.1038      0.25  |Q        |          |          |      V  |
17+50       1.1053      0.22  Q         |          |          |      V  |
17+55       1.1067      0.20  Q         |          |          |      V  |
18+ 0       1.1081      0.20  Q         |          |          |      V  |
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18+ 5	1.1094	0.20	Q	|	|	|	V |
18+10	1.1108	0.20	Q	|	|	|	V |
18+15	1.1122	0.20	Q	|	|	|	V |
18+20	1.1136	0.20	Q	|	|	|	V |
18+25	1.1150	0.20	Q	|	|	|	V |
18+30	1.1163	0.20	Q	|	|	|	V |
18+35	1.1175	0.17	Q	|	|	|	V |
18+40	1.1185	0.15	Q	|	|	|	V |
18+45	1.1196	0.15	Q	|	|	|	V |
18+50	1.1204	0.12	Q	|	|	|	V |
18+55	1.1210	0.10	Q	|	|	|	V |
19+ 0	1.1217	0.10	Q	|	|	|	V |
19+ 5	1.1227	0.13	Q	|	|	|	V |
19+10	1.1237	0.15	Q	|	|	|	V |
19+15	1.1247	0.15	Q	|	|	|	V |
19+20	1.1260	0.18	Q	|	|	|	V |
19+25	1.1274	0.20	Q	|	|	|	V |
19+30	1.1288	0.20	Q	|	|	|	V |
19+35	1.1299	0.17	Q	|	|	|	V |
19+40	1.1309	0.15	Q	|	|	|	V |
19+45	1.1320	0.15	Q	|	|	|	V |
19+50	1.1328	0.12	Q	|	|	|	V |
19+55	1.1335	0.10	Q	|	|	|	V |
20+ 0	1.1342	0.10	Q	|	|	|	V |
20+ 5	1.1351	0.13	Q	|	|	|	V |
20+10	1.1361	0.15	Q	|	|	|	V |
20+15	1.1372	0.15	Q	|	|	|	V |
20+20	1.1382	0.15	Q	|	|	|	V |
20+25	1.1392	0.15	Q	|	|	|	V |
20+30	1.1403	0.15	Q	|	|	|	V |
20+35	1.1413	0.15	Q	|	|	|	V |
20+40	1.1423	0.15	Q	|	|	|	V |
20+45	1.1434	0.15	Q	|	|	|	V |
20+50	1.1442	0.12	Q	|	|	|	V |
20+55	1.1449	0.10	Q	|	|	|	V|
21+ 0	1.1455	0.10	Q	|	|	|	V|
21+ 5	1.1465	0.13	Q	|	|	|	V|
21+10	1.1475	0.15	Q	|	|	|	V|
21+15	1.1485	0.15	Q	|	|	|	V|
21+20	1.1493	0.12	Q	|	|	|	V|
21+25	1.1500	0.10	Q	|	|	|	V|
21+30	1.1507	0.10	Q	|	|	|	V|
21+35	1.1516	0.13	Q	|	|	|	V|
21+40	1.1527	0.15	Q	|	|	|	V|
21+45	1.1537	0.15	Q	|	|	|	V|
21+50	1.1545	0.12	Q	|	|	|	V|
21+55	1.1552	0.10	Q	|	|	|	V|
22+ 0	1.1559	0.10	Q	|	|	|	V|

22+ 5	1.1568	0.13	Q	|	|	|	V|
22+10	1.1579	0.15	Q	|	|	|	V|
22+15	1.1589	0.15	Q	|	|	|	V|
22+20	1.1597	0.12	Q	|	|	|	V|
22+25	1.1604	0.10	Q	|	|	|	V|
22+30	1.1611	0.10	Q	|	|	|	V|
22+35	1.1618	0.10	Q	|	|	|	V|
22+40	1.1625	0.10	Q	|	|	|	V|
22+45	1.1631	0.10	Q	|	|	|	V|
22+50	1.1638	0.10	Q	|	|	|	V|
22+55	1.1645	0.10	Q	|	|	|	V|
23+ 0	1.1652	0.10	Q	|	|	|	V|
23+ 5	1.1659	0.10	Q	|	|	|	V|
23+10	1.1666	0.10	Q	|	|	|	V|
23+15	1.1673	0.10	Q	|	|	|	V|
23+20	1.1680	0.10	Q	|	|	|	V|
23+25	1.1687	0.10	Q	|	|	|	V|
23+30	1.1694	0.10	Q	|	|	|	V|
23+35	1.1701	0.10	Q	|	|	|	V|
23+40	1.1707	0.10	Q	|	|	|	V|
23+45	1.1714	0.10	Q	|	|	|	V|
23+50	1.1721	0.10	Q	|	|	|	V|
23+55	1.1728	0.10	Q	|	|	|	V|
24+ 0	1.1735	0.10	Q	|	|	|	V|
24+ 5	1.1737	0.03	Q	|	|	|	V

Proposed Unit Hydrograph Calculations
(100 Year, 24 Hour)

U n i t H y d r o g r a p h A n a l y s i s

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Study date 10/04/23 File: propuh24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6158

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Proposed Hydrograph
Area A
100 Year, 24 Hour

Drainage Area = 5.10(Ac.) = 0.008 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 5.10(Ac.) = 0.008 Sq. Mi.
Length along longest watercourse = 572.50(Ft.)
Length along longest watercourse measured to centroid = 310.20(Ft.)
Length along longest watercourse = 0.108 Mi.
Length along longest watercourse measured to centroid = 0.059 Mi.
Difference in elevation = 21.00(Ft.)
Slope along watercourse = 193.6769 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.019 Hr.
Lag time = 1.16 Min.
25% of lag time = 0.29 Min.
40% of lag time = 0.47 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
5.10	3.00	15.30

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
5.10	7.00	35.70

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 3.000(In)
Area Averaged 100-Year Rainfall = 7.000(In)

Point rain (area averaged) = 7.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 7.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
5.100	32.00	0.690

Total Area Entered = 5.10(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
32.0	52.0	0.552	0.690	0.209	1.000	0.209
					Sum (F) =	0.209

Area averaged mean soil loss (F) (In/Hr) = 0.209
Minimum soil loss rate ((In/Hr)) = 0.105
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.350

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	430.016	67.046	3.446
2	0.167	860.031	32.954	1.694
		Sum =	100.000 Sum=	5.140

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.056	0.371	0.020	0.04
2	0.17	0.07	0.056	0.369	0.020	0.04
3	0.25	0.07	0.056	0.368	0.020	0.04
4	0.33	0.10	0.084	0.366	0.029	0.05
5	0.42	0.10	0.084	0.365	0.029	0.05
6	0.50	0.10	0.084	0.363	0.029	0.05
7	0.58	0.10	0.084	0.362	0.029	0.05
8	0.67	0.10	0.084	0.361	0.029	0.05
9	0.75	0.10	0.084	0.359	0.029	0.05
10	0.83	0.13	0.112	0.358	0.039	0.07
11	0.92	0.13	0.112	0.356	0.039	0.07
12	1.00	0.13	0.112	0.355	0.039	0.07
13	1.08	0.10	0.084	0.354	0.029	0.05
14	1.17	0.10	0.084	0.352	0.029	0.05
15	1.25	0.10	0.084	0.351	0.029	0.05
16	1.33	0.10	0.084	0.349	0.029	0.05
17	1.42	0.10	0.084	0.348	0.029	0.05
18	1.50	0.10	0.084	0.347	0.029	0.05
19	1.58	0.10	0.084	0.345	0.029	0.05
20	1.67	0.10	0.084	0.344	0.029	0.05
21	1.75	0.10	0.084	0.342	0.029	0.05
22	1.83	0.13	0.112	0.341	0.039	0.07
23	1.92	0.13	0.112	0.340	0.039	0.07
24	2.00	0.13	0.112	0.338	0.039	0.07
25	2.08	0.13	0.112	0.337	0.039	0.07
26	2.17	0.13	0.112	0.336	0.039	0.07
27	2.25	0.13	0.112	0.334	0.039	0.07
28	2.33	0.13	0.112	0.333	0.039	0.07
29	2.42	0.13	0.112	0.332	0.039	0.07
30	2.50	0.13	0.112	0.330	0.039	0.07
31	2.58	0.17	0.140	0.329	0.049	0.09
32	2.67	0.17	0.140	0.327	0.049	0.09
33	2.75	0.17	0.140	0.326	0.049	0.09
34	2.83	0.17	0.140	0.325	0.049	0.09
35	2.92	0.17	0.140	0.323	0.049	0.09
36	3.00	0.17	0.140	0.322	0.049	0.09
37	3.08	0.17	0.140	0.321	0.049	0.09
38	3.17	0.17	0.140	0.319	0.049	0.09
39	3.25	0.17	0.140	0.318	0.049	0.09
40	3.33	0.17	0.140	0.317	0.049	0.09
41	3.42	0.17	0.140	0.315	0.049	0.09
42	3.50	0.17	0.140	0.314	0.049	0.09
43	3.58	0.17	0.140	0.313	0.049	0.09
44	3.67	0.17	0.140	0.312	0.049	0.09

45	3.75	0.17	0.140	0.310	0.049	0.09
46	3.83	0.20	0.168	0.309	0.059	0.11
47	3.92	0.20	0.168	0.308	0.059	0.11
48	4.00	0.20	0.168	0.306	0.059	0.11
49	4.08	0.20	0.168	0.305	0.059	0.11
50	4.17	0.20	0.168	0.304	0.059	0.11
51	4.25	0.20	0.168	0.302	0.059	0.11
52	4.33	0.23	0.196	0.301	0.069	0.13
53	4.42	0.23	0.196	0.300	0.069	0.13
54	4.50	0.23	0.196	0.299	0.069	0.13
55	4.58	0.23	0.196	0.297	0.069	0.13
56	4.67	0.23	0.196	0.296	0.069	0.13
57	4.75	0.23	0.196	0.295	0.069	0.13
58	4.83	0.27	0.224	0.293	0.078	0.15
59	4.92	0.27	0.224	0.292	0.078	0.15
60	5.00	0.27	0.224	0.291	0.078	0.15
61	5.08	0.20	0.168	0.290	0.059	0.11
62	5.17	0.20	0.168	0.288	0.059	0.11
63	5.25	0.20	0.168	0.287	0.059	0.11
64	5.33	0.23	0.196	0.286	0.069	0.13
65	5.42	0.23	0.196	0.285	0.069	0.13
66	5.50	0.23	0.196	0.283	0.069	0.13
67	5.58	0.27	0.224	0.282	0.078	0.15
68	5.67	0.27	0.224	0.281	0.078	0.15
69	5.75	0.27	0.224	0.280	0.078	0.15
70	5.83	0.27	0.224	0.278	0.078	0.15
71	5.92	0.27	0.224	0.277	0.078	0.15
72	6.00	0.27	0.224	0.276	0.078	0.15
73	6.08	0.30	0.252	0.275	0.088	0.16
74	6.17	0.30	0.252	0.274	0.088	0.16
75	6.25	0.30	0.252	0.272	0.088	0.16
76	6.33	0.30	0.252	0.271	0.088	0.16
77	6.42	0.30	0.252	0.270	0.088	0.16
78	6.50	0.30	0.252	0.269	0.088	0.16
79	6.58	0.33	0.280	0.267	---	0.01
80	6.67	0.33	0.280	0.266	---	0.01
81	6.75	0.33	0.280	0.265	---	0.01
82	6.83	0.33	0.280	0.264	---	0.02
83	6.92	0.33	0.280	0.263	---	0.02
84	7.00	0.33	0.280	0.261	---	0.02
85	7.08	0.33	0.280	0.260	---	0.02
86	7.17	0.33	0.280	0.259	---	0.02
87	7.25	0.33	0.280	0.258	---	0.02
88	7.33	0.37	0.308	0.257	---	0.05
89	7.42	0.37	0.308	0.256	---	0.05
90	7.50	0.37	0.308	0.254	---	0.05
91	7.58	0.40	0.336	0.253	---	0.08
92	7.67	0.40	0.336	0.252	---	0.08

93	7.75	0.40	0.336	0.251	---	0.09
94	7.83	0.43	0.364	0.250	---	0.11
95	7.92	0.43	0.364	0.249	---	0.12
96	8.00	0.43	0.364	0.247	---	0.12
97	8.08	0.50	0.420	0.246	---	0.17
98	8.17	0.50	0.420	0.245	---	0.17
99	8.25	0.50	0.420	0.244	---	0.18
100	8.33	0.50	0.420	0.243	---	0.18
101	8.42	0.50	0.420	0.242	---	0.18
102	8.50	0.50	0.420	0.241	---	0.18
103	8.58	0.53	0.448	0.239	---	0.21
104	8.67	0.53	0.448	0.238	---	0.21
105	8.75	0.53	0.448	0.237	---	0.21
106	8.83	0.57	0.476	0.236	---	0.24
107	8.92	0.57	0.476	0.235	---	0.24
108	9.00	0.57	0.476	0.234	---	0.24
109	9.08	0.63	0.532	0.233	---	0.30
110	9.17	0.63	0.532	0.232	---	0.30
111	9.25	0.63	0.532	0.231	---	0.30
112	9.33	0.67	0.560	0.229	---	0.33
113	9.42	0.67	0.560	0.228	---	0.33
114	9.50	0.67	0.560	0.227	---	0.33
115	9.58	0.70	0.588	0.226	---	0.36
116	9.67	0.70	0.588	0.225	---	0.36
117	9.75	0.70	0.588	0.224	---	0.36
118	9.83	0.73	0.616	0.223	---	0.39
119	9.92	0.73	0.616	0.222	---	0.39
120	10.00	0.73	0.616	0.221	---	0.40
121	10.08	0.50	0.420	0.220	---	0.20
122	10.17	0.50	0.420	0.219	---	0.20
123	10.25	0.50	0.420	0.218	---	0.20
124	10.33	0.50	0.420	0.217	---	0.20
125	10.42	0.50	0.420	0.215	---	0.20
126	10.50	0.50	0.420	0.214	---	0.21
127	10.58	0.67	0.560	0.213	---	0.35
128	10.67	0.67	0.560	0.212	---	0.35
129	10.75	0.67	0.560	0.211	---	0.35
130	10.83	0.67	0.560	0.210	---	0.35
131	10.92	0.67	0.560	0.209	---	0.35
132	11.00	0.67	0.560	0.208	---	0.35
133	11.08	0.63	0.532	0.207	---	0.32
134	11.17	0.63	0.532	0.206	---	0.33
135	11.25	0.63	0.532	0.205	---	0.33
136	11.33	0.63	0.532	0.204	---	0.33
137	11.42	0.63	0.532	0.203	---	0.33
138	11.50	0.63	0.532	0.202	---	0.33
139	11.58	0.57	0.476	0.201	---	0.27
140	11.67	0.57	0.476	0.200	---	0.28

141	11.75	0.57	0.476	0.199	---	0.28
142	11.83	0.60	0.504	0.198	---	0.31
143	11.92	0.60	0.504	0.197	---	0.31
144	12.00	0.60	0.504	0.196	---	0.31
145	12.08	0.83	0.700	0.195	---	0.50
146	12.17	0.83	0.700	0.194	---	0.51
147	12.25	0.83	0.700	0.193	---	0.51
148	12.33	0.87	0.728	0.192	---	0.54
149	12.42	0.87	0.728	0.191	---	0.54
150	12.50	0.87	0.728	0.190	---	0.54
151	12.58	0.93	0.784	0.189	---	0.59
152	12.67	0.93	0.784	0.188	---	0.60
153	12.75	0.93	0.784	0.187	---	0.60
154	12.83	0.97	0.812	0.186	---	0.63
155	12.92	0.97	0.812	0.186	---	0.63
156	13.00	0.97	0.812	0.185	---	0.63
157	13.08	1.13	0.952	0.184	---	0.77
158	13.17	1.13	0.952	0.183	---	0.77
159	13.25	1.13	0.952	0.182	---	0.77
160	13.33	1.13	0.952	0.181	---	0.77
161	13.42	1.13	0.952	0.180	---	0.77
162	13.50	1.13	0.952	0.179	---	0.77
163	13.58	0.77	0.644	0.178	---	0.47
164	13.67	0.77	0.644	0.177	---	0.47
165	13.75	0.77	0.644	0.176	---	0.47
166	13.83	0.77	0.644	0.175	---	0.47
167	13.92	0.77	0.644	0.175	---	0.47
168	14.00	0.77	0.644	0.174	---	0.47
169	14.08	0.90	0.756	0.173	---	0.58
170	14.17	0.90	0.756	0.172	---	0.58
171	14.25	0.90	0.756	0.171	---	0.58
172	14.33	0.87	0.728	0.170	---	0.56
173	14.42	0.87	0.728	0.169	---	0.56
174	14.50	0.87	0.728	0.168	---	0.56
175	14.58	0.87	0.728	0.168	---	0.56
176	14.67	0.87	0.728	0.167	---	0.56
177	14.75	0.87	0.728	0.166	---	0.56
178	14.83	0.83	0.700	0.165	---	0.54
179	14.92	0.83	0.700	0.164	---	0.54
180	15.00	0.83	0.700	0.163	---	0.54
181	15.08	0.80	0.672	0.162	---	0.51
182	15.17	0.80	0.672	0.162	---	0.51
183	15.25	0.80	0.672	0.161	---	0.51
184	15.33	0.77	0.644	0.160	---	0.48
185	15.42	0.77	0.644	0.159	---	0.48
186	15.50	0.77	0.644	0.158	---	0.49
187	15.58	0.63	0.532	0.158	---	0.37
188	15.67	0.63	0.532	0.157	---	0.38

189	15.75	0.63	0.532	0.156	---	0.38
190	15.83	0.63	0.532	0.155	---	0.38
191	15.92	0.63	0.532	0.154	---	0.38
192	16.00	0.63	0.532	0.154	---	0.38
193	16.08	0.13	0.112	0.153	0.039	0.07
194	16.17	0.13	0.112	0.152	0.039	0.07
195	16.25	0.13	0.112	0.151	0.039	0.07
196	16.33	0.13	0.112	0.150	0.039	0.07
197	16.42	0.13	0.112	0.150	0.039	0.07
198	16.50	0.13	0.112	0.149	0.039	0.07
199	16.58	0.10	0.084	0.148	0.029	0.05
200	16.67	0.10	0.084	0.147	0.029	0.05
201	16.75	0.10	0.084	0.147	0.029	0.05
202	16.83	0.10	0.084	0.146	0.029	0.05
203	16.92	0.10	0.084	0.145	0.029	0.05
204	17.00	0.10	0.084	0.144	0.029	0.05
205	17.08	0.17	0.140	0.144	0.049	0.09
206	17.17	0.17	0.140	0.143	0.049	0.09
207	17.25	0.17	0.140	0.142	0.049	0.09
208	17.33	0.17	0.140	0.142	0.049	0.09
209	17.42	0.17	0.140	0.141	0.049	0.09
210	17.50	0.17	0.140	0.140	0.049	0.09
211	17.58	0.17	0.140	0.139	---	0.00
212	17.67	0.17	0.140	0.139	---	0.00
213	17.75	0.17	0.140	0.138	---	0.00
214	17.83	0.13	0.112	0.137	0.039	0.07
215	17.92	0.13	0.112	0.137	0.039	0.07
216	18.00	0.13	0.112	0.136	0.039	0.07
217	18.08	0.13	0.112	0.135	0.039	0.07
218	18.17	0.13	0.112	0.135	0.039	0.07
219	18.25	0.13	0.112	0.134	0.039	0.07
220	18.33	0.13	0.112	0.133	0.039	0.07
221	18.42	0.13	0.112	0.133	0.039	0.07
222	18.50	0.13	0.112	0.132	0.039	0.07
223	18.58	0.10	0.084	0.131	0.029	0.05
224	18.67	0.10	0.084	0.131	0.029	0.05
225	18.75	0.10	0.084	0.130	0.029	0.05
226	18.83	0.07	0.056	0.130	0.020	0.04
227	18.92	0.07	0.056	0.129	0.020	0.04
228	19.00	0.07	0.056	0.128	0.020	0.04
229	19.08	0.10	0.084	0.128	0.029	0.05
230	19.17	0.10	0.084	0.127	0.029	0.05
231	19.25	0.10	0.084	0.126	0.029	0.05
232	19.33	0.13	0.112	0.126	0.039	0.07
233	19.42	0.13	0.112	0.125	0.039	0.07
234	19.50	0.13	0.112	0.125	0.039	0.07
235	19.58	0.10	0.084	0.124	0.029	0.05
236	19.67	0.10	0.084	0.124	0.029	0.05

237	19.75	0.10	0.084	0.123	0.029	0.05
238	19.83	0.07	0.056	0.122	0.020	0.04
239	19.92	0.07	0.056	0.122	0.020	0.04
240	20.00	0.07	0.056	0.121	0.020	0.04
241	20.08	0.10	0.084	0.121	0.029	0.05
242	20.17	0.10	0.084	0.120	0.029	0.05
243	20.25	0.10	0.084	0.120	0.029	0.05
244	20.33	0.10	0.084	0.119	0.029	0.05
245	20.42	0.10	0.084	0.119	0.029	0.05
246	20.50	0.10	0.084	0.118	0.029	0.05
247	20.58	0.10	0.084	0.118	0.029	0.05
248	20.67	0.10	0.084	0.117	0.029	0.05
249	20.75	0.10	0.084	0.117	0.029	0.05
250	20.83	0.07	0.056	0.116	0.020	0.04
251	20.92	0.07	0.056	0.116	0.020	0.04
252	21.00	0.07	0.056	0.115	0.020	0.04
253	21.08	0.10	0.084	0.115	0.029	0.05
254	21.17	0.10	0.084	0.114	0.029	0.05
255	21.25	0.10	0.084	0.114	0.029	0.05
256	21.33	0.07	0.056	0.114	0.020	0.04
257	21.42	0.07	0.056	0.113	0.020	0.04
258	21.50	0.07	0.056	0.113	0.020	0.04
259	21.58	0.10	0.084	0.112	0.029	0.05
260	21.67	0.10	0.084	0.112	0.029	0.05
261	21.75	0.10	0.084	0.112	0.029	0.05
262	21.83	0.07	0.056	0.111	0.020	0.04
263	21.92	0.07	0.056	0.111	0.020	0.04
264	22.00	0.07	0.056	0.110	0.020	0.04
265	22.08	0.10	0.084	0.110	0.029	0.05
266	22.17	0.10	0.084	0.110	0.029	0.05
267	22.25	0.10	0.084	0.109	0.029	0.05
268	22.33	0.07	0.056	0.109	0.020	0.04
269	22.42	0.07	0.056	0.109	0.020	0.04
270	22.50	0.07	0.056	0.108	0.020	0.04
271	22.58	0.07	0.056	0.108	0.020	0.04
272	22.67	0.07	0.056	0.108	0.020	0.04
273	22.75	0.07	0.056	0.107	0.020	0.04
274	22.83	0.07	0.056	0.107	0.020	0.04
275	22.92	0.07	0.056	0.107	0.020	0.04
276	23.00	0.07	0.056	0.107	0.020	0.04
277	23.08	0.07	0.056	0.106	0.020	0.04
278	23.17	0.07	0.056	0.106	0.020	0.04
279	23.25	0.07	0.056	0.106	0.020	0.04
280	23.33	0.07	0.056	0.106	0.020	0.04
281	23.42	0.07	0.056	0.105	0.020	0.04
282	23.50	0.07	0.056	0.105	0.020	0.04
283	23.58	0.07	0.056	0.105	0.020	0.04
284	23.67	0.07	0.056	0.105	0.020	0.04

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285  23.75     0.07      0.056         0.105     0.020         0.04
286  23.83     0.07      0.056         0.105     0.020         0.04
287  23.92     0.07      0.056         0.105     0.020         0.04
288  24.00     0.07      0.056         0.105     0.020         0.04
    Sum =     100.0                                    Sum =    53.3
      Flood volume = Effective rainfall      4.44(In)
       times area       5.1(Ac.)/[(In)/(Ft.)] =       1.9(Ac.Ft)
      Total soil loss =      2.56(In)
      Total soil loss =     1.088(Ac.Ft)
      Total rainfall =      7.00(In)
      Flood volume =       82180.5 Cubic Feet
      Total soil loss =       47409.2 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      3.973(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ---------------------------------------------------------------------------
   0+ 5       0.0009      0.13  Q         |         |         |         |
   0+10       0.0022      0.19  Q         |         |         |         |
   0+15       0.0034      0.19  Q         |         |         |         |
   0+20       0.0052      0.25  Q         |         |         |         |
   0+25       0.0071      0.28  VQ        |         |         |         |
   0+30       0.0090      0.28  VQ        |         |         |         |
   0+35       0.0110      0.28  VQ        |         |         |         |
   0+40       0.0129      0.28  VQ        |         |         |         |
   0+45       0.0148      0.28  VQ        |         |         |         |
   0+50       0.0172      0.34  VQ        |         |         |         |
   0+55       0.0198      0.37  VQ        |         |         |         |
   1+ 0       0.0224      0.37  VQ        |         |         |         |
   1+ 5       0.0245      0.31  VQ        |         |         |         |
   1+10       0.0264      0.28  VQ        |         |         |         |
   1+15       0.0284      0.28  VQ        |         |         |         |
   1+20       0.0303      0.28  VQ        |         |         |         |
   1+25       0.0322      0.28  VQ        |         |         |         |
   1+30       0.0342      0.28  VQ        |         |         |         |
   1+35       0.0361      0.28  VQ        |         |         |         |
   1+40       0.0380      0.28  VQ        |         |         |         |
   1+45       0.0400      0.28  VQ        |         |         |         |
   1+50       0.0423      0.34  VQ        |         |         |         |
   1+55       0.0449      0.37  VQ        |         |         |         |
   2+ 0       0.0475      0.37  |Q        |         |         |         |
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2+ 5	0.0501	0.37	|Q	|	|	|	|
2+10	0.0527	0.37	|Q	|	|	|	|
2+15	0.0552	0.37	|Q	|	|	|	|
2+20	0.0578	0.37	|Q	|	|	|	|
2+25	0.0604	0.37	|Q	|	|	|	|
2+30	0.0630	0.37	|Q	|	|	|	|
2+35	0.0660	0.44	|Q	|	|	|	|
2+40	0.0692	0.47	|Q	|	|	|	|
2+45	0.0724	0.47	|Q	|	|	|	|
2+50	0.0756	0.47	|Q	|	|	|	|
2+55	0.0789	0.47	|Q	|	|	|	|
3+ 0	0.0821	0.47	|Q	|	|	|	|
3+ 5	0.0853	0.47	|Q	|	|	|	|
3+10	0.0885	0.47	|Q	|	|	|	|
3+15	0.0918	0.47	|Q	|	|	|	|
3+20	0.0950	0.47	|QV	|	|	|	|
3+25	0.0982	0.47	|QV	|	|	|	|
3+30	0.1014	0.47	|QV	|	|	|	|
3+35	0.1046	0.47	|QV	|	|	|	|
3+40	0.1079	0.47	|QV	|	|	|	|
3+45	0.1111	0.47	|QV	|	|	|	|
3+50	0.1147	0.53	| Q	|	|	|	|
3+55	0.1186	0.56	| Q	|	|	|	|
4+ 0	0.1225	0.56	| Q	|	|	|	|
4+ 5	0.1264	0.56	| Q	|	|	|	|
4+10	0.1302	0.56	| Q	|	|	|	|
4+15	0.1341	0.56	| Q	|	|	|	|
4+20	0.1384	0.62	| Q	|	|	|	|
4+25	0.1429	0.66	| QV	|	|	|	|
4+30	0.1474	0.66	| QV	|	|	|	|
4+35	0.1519	0.66	| QV	|	|	|	|
4+40	0.1564	0.66	| QV	|	|	|	|
4+45	0.1609	0.66	| QV	|	|	|	|
4+50	0.1659	0.72	| QV	|	|	|	|
4+55	0.1710	0.75	| QV	|	|	|	|
5+ 0	0.1762	0.75	| QV	|	|	|	|
5+ 5	0.1805	0.62	| QV	|	|	|	|
5+10	0.1844	0.56	| QV	|	|	|	|
5+15	0.1882	0.56	| QV	|	|	|	|
5+20	0.1925	0.62	| Q V	|	|	|	|
5+25	0.1970	0.66	| Q V	|	|	|	|
5+30	0.2016	0.66	| Q V	|	|	|	|
5+35	0.2065	0.72	| Q V	|	|	|	|
5+40	0.2117	0.75	| Q V	|	|	|	|
5+45	0.2168	0.75	| Q V	|	|	|	|
5+50	0.2220	0.75	| Q V	|	|	|	|
5+55	0.2271	0.75	| Q V	|	|	|	|
6+ 0	0.2323	0.75	| Q V	|	|	|	|

6+ 5	0.2379	0.81	| Q V |	|	|	|
6+10	0.2437	0.84	| Q V |	|	|	|
6+15	0.2495	0.84	| Q V |	|	|	|
6+20	0.2553	0.84	| Q V |	|	|	|
6+25	0.2611	0.84	| Q V |	|	|	|
6+30	0.2669	0.84	| Q V |	|	|	|
6+35	0.2691	0.32	|Q V |	|	|	|
6+40	0.2696	0.07	Q V |	|	|	|
6+45	0.2701	0.07	Q V |	|	|	|
6+50	0.2706	0.08	Q V |	|	|	|
6+55	0.2712	0.09	Q V |	|	|	|
7+ 0	0.2719	0.09	Q V |	|	|	|
7+ 5	0.2726	0.10	Q V |	|	|	|
7+10	0.2733	0.11	Q V |	|	|	|
7+15	0.2741	0.11	Q V |	|	|	|
7+20	0.2755	0.21	Q V |	|	|	|
7+25	0.2774	0.27	|Q V |	|	|	|
7+30	0.2793	0.27	|Q V |	|	|	|
7+35	0.2819	0.38	|Q V |	|	|	|
7+40	0.2848	0.43	|Q V |	|	|	|
7+45	0.2878	0.44	|Q V |	|	|	|
7+50	0.2915	0.54	| Q V |	|	|	|
7+55	0.2956	0.59	| Q V |	|	|	|
8+ 0	0.2997	0.60	| Q V |	|	|	|
8+ 5	0.3052	0.80	| Q V |	|	|	|
8+10	0.3114	0.90	| Q V |	|	|	|
8+15	0.3176	0.90	| Q V |	|	|	|
8+20	0.3239	0.91	| Q V |	|	|	|
8+25	0.3302	0.91	| Q V |	|	|	|
8+30	0.3365	0.92	| Q V |	|	|	|
8+35	0.3436	1.02	| Q V |	|	|	|
8+40	0.3510	1.08	| Q V |	|	|	|
8+45	0.3584	1.08	| Q V |	|	|	|
8+50	0.3666	1.18	| Q V |	|	|	|
8+55	0.3751	1.24	| Q V |	|	|	|
9+ 0	0.3837	1.24	| Q V |	|	|	|
9+ 5	0.3936	1.44	| Q V |	|	|	|
9+10	0.4042	1.54	| Q V |	|	|	|
9+15	0.4149	1.55	| Q V |	|	|	|
9+20	0.4263	1.65	| Q V|	|	|	|
9+25	0.4380	1.70	| Q V|	|	|	|
9+30	0.4498	1.71	| Q V|	|	|	|
9+35	0.4622	1.81	| Q V|	|	|	|
9+40	0.4751	1.86	| Q V |	|	|	|
9+45	0.4880	1.87	| Q V |	|	|	|
9+50	0.5015	1.97	| Q V |	|	|	|
9+55	0.5155	2.03	| Q V |	|	|	|
10+ 0	0.5295	2.03	| Q |V |	|	|	|

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10+ 5       0.5388      1.36  |    Q    |V        |         |         |
10+10       0.5460      1.03  |   Q     |V        |         |         |
10+15       0.5531      1.04  |   Q     |V        |         |         |
10+20       0.5603      1.04  |   Q     |V        |         |         |
10+25       0.5675      1.05  |   Q     | V       |         |         |
10+30       0.5748      1.06  |   Q     | V       |         |         |
10+35       0.5854      1.54  |     Q   | V       |         |         |
10+40       0.5977      1.79  |      Q  | V       |         |         |
10+45       0.6101      1.79  |      Q  | V       |         |         |
10+50       0.6225      1.80  |      Q  |  V      |         |         |
10+55       0.6349      1.80  |      Q  |  V      |         |         |
11+ 0       0.6473      1.81  |      Q  |  V      |         |         |
11+ 5       0.6591      1.72  |     Q   |  V      |         |         |
11+10       0.6707      1.67  |     Q   |   V     |         |         |
11+15       0.6822      1.68  |     Q   |   V     |         |         |
11+20       0.6938      1.68  |     Q   |   V     |         |         |
11+25       0.7055      1.69  |     Q   |   V     |         |         |
11+30       0.7171      1.69  |     Q   |    V    |         |         |
11+35       0.7275      1.51  |     Q   |    V    |         |         |
11+40       0.7373      1.42  |    Q    |    V    |         |         |
11+45       0.7471      1.42  |    Q    |    V    |         |         |
11+50       0.7576      1.52  |     Q   |     V   |         |         |
11+55       0.7684      1.58  |     Q   |     V   |         |         |
12+ 0       0.7793      1.58  |     Q   |     V   |         |         |
12+ 5       0.7949      2.26  |        Q|     V   |         |         |
12+10       0.8128      2.60  |         Q      V  |         |         |
12+15       0.8307      2.60  |         Q      V  |         |         |
12+20       0.8494      2.71  |         Q       V |         |         |
12+25       0.8684      2.76  |         |Q      V |         |         |
12+30       0.8874      2.76  |         |Q      V |         |         |
12+35       0.9078      2.96  |         |Q       V|         |         |
12+40       0.9289      3.06  |         | Q      V|         |         |
12+45       0.9500      3.07  |         | Q       V         |         |
12+50       0.9718      3.17  |         | Q       V         |         |
12+55       0.9940      3.22  |         | Q       |V        |         |
13+ 0       1.0162      3.22  |         | Q       |V        |         |
13+ 5       1.0418      3.71  |         |   Q     | V       |         |
13+10       1.0690      3.95  |         |    Q    | V       |         |
13+15       1.0963      3.96  |         |    Q    |  V      |         |
13+20       1.1236      3.96  |         |    Q    |  V      |         |
13+25       1.1509      3.97  |         |    Q    |   V     |         |
13+30       1.1783      3.97  |         |    Q    |   V     |         |
13+35       1.1983      2.92  |         |Q        |    V    |         |
13+40       1.2149      2.40  |        Q|         |    V    |         |
13+45       1.2314      2.40  |        Q|         |     V   |         |
13+50       1.2480      2.41  |        Q|         |     V   |         |
13+55       1.2646      2.41  |        Q|         |     V   |         |
14+ 0       1.2813      2.42  |        Q|         |      V  |         |
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14+ 5       1.3006      2.81  |          |Q         |      V  |          |
14+10       1.3213      3.00  |          | Q        |       V |          |
14+15       1.3420      3.01  |          | Q        |       V |          |
14+20       1.3621      2.91  |          |Q         |       V |          |
14+25       1.3818      2.87  |          |Q         |        V|          |
14+30       1.4016      2.88  |          |Q         |        V|          |
14+35       1.4215      2.88  |          |Q         |         V          |
14+40       1.4414      2.89  |          |Q         |         V          |
14+45       1.4613      2.89  |          |Q         |         V          |
14+50       1.4805      2.80  |          |Q         |          |V        |
14+55       1.4995      2.75  |          |Q         |          |V        |
15+ 0       1.5185      2.76  |          |Q         |          | V       |
15+ 5       1.5369      2.67  |          Q          |          | V       |
15+10       1.5549      2.62  |          Q          |          | V       |
15+15       1.5730      2.63  |          Q          |          |  V      |
15+20       1.5905      2.54  |          Q          |          |  V      |
15+25       1.6076      2.49  |         Q|          |          |   V     |
15+30       1.6248      2.50  |         Q|          |          |   V     |
15+35       1.6394      2.11  |        Q |          |          |   V     |
15+40       1.6527      1.93  |      Q   |          |          |    V    |
15+45       1.6660      1.93  |      Q   |          |          |    V    |
15+50       1.6793      1.94  |      Q   |          |          |    V    |
15+55       1.6927      1.94  |      Q   |          |          |    V    |
16+ 0       1.7061      1.94  |      Q   |          |          |     V   |
16+ 5       1.7122      0.89  |  Q       |          |          |     V   |
16+10       1.7148      0.37  |Q         |          |          |     V   |
16+15       1.7174      0.37  |Q         |          |          |     V   |
16+20       1.7200      0.37  |Q         |          |          |     V   |
16+25       1.7225      0.37  |Q         |          |          |     V   |
16+30       1.7251      0.37  |Q         |          |          |     V   |
16+35       1.7273      0.31  |Q         |          |          |     V   |
16+40       1.7292      0.28  |Q         |          |          |     V   |
16+45       1.7311      0.28  |Q         |          |          |     V   |
16+50       1.7331      0.28  |Q         |          |          |     V   |
16+55       1.7350      0.28  |Q         |          |          |     V   |
17+ 0       1.7369      0.28  |Q         |          |          |     V   |
17+ 5       1.7397      0.41  |Q         |          |          |     V   |
17+10       1.7430      0.47  |Q         |          |          |     V   |
17+15       1.7462      0.47  |Q         |          |          |      V  |
17+20       1.7494      0.47  |Q         |          |          |      V  |
17+25       1.7526      0.47  |Q         |          |          |      V  |
17+30       1.7558      0.47  |Q         |          |          |      V  |
17+35       1.7569      0.16  Q          |          |          |      V  |
17+40       1.7570      0.01  Q          |          |          |      V  |
17+45       1.7570      0.01  Q          |          |          |      V  |
17+50       1.7588      0.25  |Q         |          |          |      V  |
17+55       1.7614      0.37  |Q         |          |          |      V  |
18+ 0       1.7639      0.37  |Q         |          |          |      V  |
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18+ 5       1.7665      0.37  |Q        |         |         |       V  |
18+10       1.7691      0.37  |Q        |         |         |       V  |
18+15       1.7717      0.37  |Q        |         |         |       V  |
18+20       1.7742      0.37  |Q        |         |         |       V  |
18+25       1.7768      0.37  |Q        |         |         |       V  |
18+30       1.7794      0.37  |Q        |         |         |       V  |
18+35       1.7815      0.31  |Q        |         |         |       V  |
18+40       1.7835      0.28  |Q        |         |         |       V  |
18+45       1.7854      0.28  |Q        |         |         |       V  |
18+50       1.7869      0.22  Q         |         |         |       V  |
18+55       1.7882      0.19  Q         |         |         |       V  |
19+ 0       1.7895      0.19  Q         |         |         |       V  |
19+ 5       1.7912      0.25  Q         |         |         |       V  |
19+10       1.7931      0.28  |Q        |         |         |        V |
19+15       1.7951      0.28  |Q        |         |         |        V |
19+20       1.7974      0.34  |Q        |         |         |        V |
19+25       1.8000      0.37  |Q        |         |         |        V |
19+30       1.8026      0.37  |Q        |         |         |        V |
19+35       1.8048      0.31  |Q        |         |         |        V |
19+40       1.8067      0.28  |Q        |         |         |        V |
19+45       1.8086      0.28  |Q        |         |         |        V |
19+50       1.8101      0.22  Q         |         |         |        V |
19+55       1.8114      0.19  Q         |         |         |        V |
20+ 0       1.8127      0.19  Q         |         |         |        V |
20+ 5       1.8144      0.25  Q         |         |         |        V |
20+10       1.8164      0.28  |Q        |         |         |        V |
20+15       1.8183      0.28  |Q        |         |         |        V |
20+20       1.8202      0.28  |Q        |         |         |        V |
20+25       1.8222      0.28  |Q        |         |         |        V |
20+30       1.8241      0.28  |Q        |         |         |        V |
20+35       1.8260      0.28  |Q        |         |         |        V |
20+40       1.8280      0.28  |Q        |         |         |        V |
20+45       1.8299      0.28  |Q        |         |         |        V |
20+50       1.8314      0.22  Q         |         |         |        V |
20+55       1.8327      0.19  Q         |         |         |        V |
21+ 0       1.8340      0.19  Q         |         |         |        V |
21+ 5       1.8357      0.25  Q         |         |         |        V |
21+10       1.8376      0.28  |Q        |         |         |        V |
21+15       1.8396      0.28  |Q        |         |         |         V|
21+20       1.8411      0.22  Q         |         |         |         V|
21+25       1.8423      0.19  Q         |         |         |         V|
21+30       1.8436      0.19  Q         |         |         |         V|
21+35       1.8454      0.25  Q         |         |         |         V|
21+40       1.8473      0.28  |Q        |         |         |         V|
21+45       1.8492      0.28  |Q        |         |         |         V|
21+50       1.8507      0.22  Q         |         |         |         V|
21+55       1.8520      0.19  Q         |         |         |         V|
22+ 0       1.8533      0.19  Q         |         |         |         V|
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   22+ 5       1.8550      0.25  Q          |          |          |         V|
   22+10       1.8570      0.28  |Q         |          |          |         V|
   22+15       1.8589      0.28  |Q         |          |          |         V|
   22+20       1.8604      0.22  Q          |          |          |         V|
   22+25       1.8617      0.19  Q          |          |          |         V|
   22+30       1.8630      0.19  Q          |          |          |         V|
   22+35       1.8643      0.19  Q          |          |          |         V|
   22+40       1.8656      0.19  Q          |          |          |         V|
   22+45       1.8668      0.19  Q          |          |          |         V|
   22+50       1.8681      0.19  Q          |          |          |         V|
   22+55       1.8694      0.19  Q          |          |          |         V|
   23+ 0       1.8707      0.19  Q          |          |          |         V|
   23+ 5       1.8720      0.19  Q          |          |          |         V|
   23+10       1.8733      0.19  Q          |          |          |         V|
   23+15       1.8746      0.19  Q          |          |          |         V|
   23+20       1.8759      0.19  Q          |          |          |         V|
   23+25       1.8772      0.19  Q          |          |          |         V|
   23+30       1.8784      0.19  Q          |          |          |         V|
   23+35       1.8797      0.19  Q          |          |          |         V|
   23+40       1.8810      0.19  Q          |          |          |         V|
   23+45       1.8823      0.19  Q          |          |          |         V|
   23+50       1.8836      0.19  Q          |          |          |         V|
   23+55       1.8849      0.19  Q          |          |          |         V|
   24+ 0       1.8862      0.19  Q          |          |          |         V|
   24+ 5       1.8866      0.06  Q          |          |          |          V
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Basin Routing Calculations

BASINROUTE100.out

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 11/05/23

CALVARY CHAPEL
BASIN ROUTING 100YR

Program License Serial Number 6158

********** HYDROGRAPH INFORMATION **********

From study/file name: propuh24100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 289
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 3.973 (CFS)
Total volume = 1.887 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 1.000 to Point/Station 2.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 289
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.999	0.037	0.060	0.037	0.037
1.000	0.038	0.710	0.036	0.040
4.000	0.154	0.710	0.152	0.156
5.000	0.322	0.710	0.320	0.324
6.000	0.549	3.710	0.536	0.562
6.500	0.667	6.221	0.646	0.688
6.700	0.721	7.359	0.696	0.746

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 1.0 1.99 2.98 3.97	Depth (Ft.)
0.083	0.13	0.00	0.000	OI | | | |	0.01
0.167	0.19	0.00	0.001	OI | | | |	0.04
0.250	0.19	0.00	0.003	OI | | | |	0.07
0.333	0.25	0.01	0.004	O I | | | |	0.11
0.417	0.28	0.01	0.006	O I | | | |	0.16
0.500	0.28	0.01	0.008	O I | | | |	0.21
0.583	0.28	0.02	0.010	O I | | | |	0.26
0.667	0.28	0.02	0.012	O I | | | |	0.31
0.750	0.28	0.02	0.013	O I | | | |	0.36
0.833	0.34	0.02	0.015	O I | | | |	0.41
0.917	0.37	0.03	0.018	O I | | | |	0.47
1.000	0.37	0.03	0.020	O I | | | |	0.54
1.083	0.31	0.04	0.022	O I | | | |	0.60
1.167	0.28	0.04	0.024	O I | | | |	0.64
1.250	0.28	0.04	0.026	O I | | | |	0.69
1.333	0.28	0.04	0.027	O I | | | |	0.73
1.417	0.28	0.05	0.029	O I | | | |	0.78
1.500	0.28	0.05	0.030	O I | | | |	0.82
1.583	0.28	0.05	0.032	O I | | | |	0.86
1.667	0.28	0.05	0.034	O I | | | |	0.91
1.750	0.28	0.06	0.035	O I | | | |	0.95
1.833	0.34	0.06	0.037	O I | | | |	0.99
1.917	0.37	0.44	0.038	| O | | |	1.00

2.000	0.37	0.35	0.037	OI				1.00
2.083	0.37	0.38	0.037	O				1.00
2.167	0.37	0.37	0.037	OI				1.00
2.250	0.37	0.38	0.037	O				1.00
2.333	0.37	0.37	0.037	O				1.00
2.417	0.37	0.37	0.037	O				1.00
2.500	0.37	0.37	0.037	O				1.00
2.583	0.44	0.42	0.038	O				1.00
2.667	0.47	0.47	0.038	O				1.00
2.750	0.47	0.47	0.038	O				1.00
2.833	0.47	0.47	0.038	O				1.00
2.917	0.47	0.47	0.038	O				1.00
3.000	0.47	0.47	0.038	O				1.00
3.083	0.47	0.47	0.038	O				1.00
3.167	0.47	0.47	0.038	O				1.00
3.250	0.47	0.47	0.038	O				1.00
3.333	0.47	0.47	0.038	O				1.00
3.417	0.47	0.47	0.038	O				1.00
3.500	0.47	0.47	0.038	O				1.00
3.583	0.47	0.47	0.038	O				1.00
3.667	0.47	0.47	0.038	O				1.00
3.750	0.47	0.47	0.038	O				1.00
3.833	0.53	0.51	0.038	O				1.00
3.917	0.56	0.56	0.038	O				1.00
4.000	0.56	0.56	0.038	O				1.00
4.083	0.56	0.56	0.038	O				1.00
4.167	0.56	0.56	0.038	O				1.00
4.250	0.56	0.56	0.038	O				1.00
4.333	0.62	0.60	0.038	OI				1.00
4.417	0.66	0.65	0.038	O				1.00
4.500	0.66	0.66	0.038	O				1.00
4.583	0.66	0.65	0.038	O				1.00
4.667	0.66	0.66	0.038	O				1.00
4.750	0.66	0.66	0.038	O				1.00
4.833	0.72	0.70	0.038	O				1.00
4.917	0.75	0.71	0.038	OI				1.00
5.000	0.75	0.71	0.038	OI				1.01
5.083	0.62	0.71	0.038	O				1.01
5.167	0.56	0.60	0.038	O				1.00
5.250	0.56	0.55	0.038	O				1.00
5.333	0.62	0.61	0.038	OI				1.00
5.417	0.66	0.65	0.038	O				1.00
5.500	0.66	0.66	0.038	O				1.00
5.583	0.72	0.70	0.038	O				1.00
5.667	0.75	0.71	0.038	OI				1.00
5.750	0.75	0.71	0.038	OI				1.01
5.833	0.75	0.71	0.039	OI				1.02
5.917	0.75	0.71	0.039	OI				1.03

6.000	0.75	0.71	0.039	| OI |	|	|	|	1.03
6.083	0.81	0.71	0.040	| OI |	|	|	|	1.04
6.167	0.84	0.71	0.041	| OI |	|	|	|	1.07
6.250	0.84	0.71	0.041	| OI |	|	|	|	1.09
6.333	0.84	0.71	0.042	| OI |	|	|	|	1.11
6.417	0.84	0.71	0.043	| OI |	|	|	|	1.14
6.500	0.84	0.71	0.044	| OI |	|	|	|	1.16
6.583	0.32	0.71	0.043	| I O |	|	|	|	1.14
6.667	0.07	0.71	0.040	I O |	|	|	|	1.05
6.750	0.07	0.18	0.037	IO |	|	|	|	1.00
6.833	0.08	0.06	0.037	O |	|	|	|	1.00
6.917	0.09	0.07	0.037	O |	|	|	|	1.00
7.000	0.09	0.10	0.037	O |	|	|	|	1.00
7.083	0.10	0.10	0.037	O |	|	|	|	1.00
7.167	0.11	0.10	0.037	O |	|	|	|	1.00
7.250	0.11	0.11	0.037	O |	|	|	|	1.00
7.333	0.21	0.18	0.037	|O |	|	|	|	1.00
7.417	0.27	0.26	0.037	| O |	|	|	|	1.00
7.500	0.27	0.27	0.037	| O |	|	|	|	1.00
7.583	0.38	0.34	0.037	| OI |	|	|	|	1.00
7.667	0.43	0.43	0.038	| O |	|	|	|	1.00
7.750	0.44	0.44	0.038	| O |	|	|	|	1.00
7.833	0.54	0.51	0.038	| O |	|	|	|	1.00
7.917	0.59	0.59	0.038	| O |	|	|	|	1.00
8.000	0.60	0.60	0.038	| O |	|	|	|	1.00
8.083	0.80	0.71	0.038	| OI |	|	|	|	1.00
8.167	0.90	0.71	0.039	| O I|	|	|	|	1.03
8.250	0.90	0.71	0.040	| O I|	|	|	|	1.06
8.333	0.91	0.71	0.042	| O I|	|	|	|	1.10
8.417	0.91	0.71	0.043	| O I|	|	|	|	1.13
8.500	0.92	0.71	0.045	| O I|	|	|	|	1.17
8.583	1.02	0.71	0.046	| O I |	|	|	|	1.22
8.667	1.08	0.71	0.049	| O I |	|	|	|	1.28
8.750	1.08	0.71	0.051	| O I |	|	|	|	1.34
8.833	1.18	0.71	0.054	| O |I |	|	|	|	1.42
8.917	1.24	0.71	0.058	| O |I |	|	|	|	1.51
9.000	1.24	0.71	0.061	| O | I |	|	|	|	1.60
9.083	1.44	0.71	0.066	| O | I |	|	|	|	1.71
9.167	1.54	0.71	0.071	| O | I |	|	|	|	1.85
9.250	1.55	0.71	0.077	| O | I |	|	|	|	2.00
9.333	1.65	0.71	0.083	| O | I |	|	|	|	2.16
9.417	1.70	0.71	0.090	| O | I |	|	|	|	2.33
9.500	1.71	0.71	0.096	| O | I |	|	|	|	2.51
9.583	1.81	0.71	0.104	| O | I |	|	|	|	2.70
9.667	1.86	0.71	0.111	| O | I|	|	|	|	2.90
9.750	1.87	0.71	0.119	| O | I|	|	|	|	3.10
9.833	1.97	0.71	0.128	| O | I|	|	|	|	3.32
9.917	2.03	0.71	0.137	| O | I |	|	|	|	3.55

10.000	2.03	0.71	0.146	O	I			3.78
10.083	1.36	0.71	0.152	O	I			3.96
10.167	1.03	0.71	0.156	O	I			4.01
10.250	1.04	0.71	0.158	O	I			4.02
10.333	1.04	0.71	0.160	O	I			4.04
10.417	1.05	0.71	0.163	O	I			4.05
10.500	1.06	0.71	0.165	O	I			4.07
10.583	1.54	0.71	0.169	O	I			4.09
10.667	1.79	0.71	0.176	O	I			4.13
10.750	1.79	0.71	0.183	O	I			4.17
10.833	1.80	0.71	0.191	O	I			4.22
10.917	1.80	0.71	0.198	O	I			4.26
11.000	1.81	0.71	0.206	O	I			4.31
11.083	1.72	0.71	0.213	O	I			4.35
11.167	1.67	0.71	0.220	O	I			4.39
11.250	1.68	0.71	0.226	O	I			4.43
11.333	1.68	0.71	0.233	O	I			4.47
11.417	1.69	0.71	0.240	O	I			4.51
11.500	1.69	0.71	0.246	O	I			4.55
11.583	1.51	0.71	0.253	O	I			4.59
11.667	1.42	0.71	0.258	O	I			4.62
11.750	1.42	0.71	0.263	O	I			4.65
11.833	1.52	0.71	0.268	O	I			4.68
11.917	1.58	0.71	0.274	O	I			4.71
12.000	1.58	0.71	0.280	O	I			4.75
12.083	2.26	0.71	0.288	O	I			4.80
12.167	2.60	0.71	0.300	O	I			4.87
12.250	2.60	0.71	0.313	O	I			4.95
12.333	2.71	0.76	0.326	O	I			5.02
12.417	2.76	0.94	0.339	O	I			5.08
12.500	2.76	1.10	0.351	O	I			5.13
12.583	2.96	1.25	0.363	O	I			5.18
12.667	3.06	1.40	0.374	O	I			5.23
12.750	3.07	1.55	0.385	O	I			5.28
12.833	3.17	1.68	0.396	O	I			5.32
12.917	3.22	1.82	0.406	O	I			5.37
13.000	3.22	1.94	0.415	O	I			5.41
13.083	3.71	2.07	0.425	O	I			5.45
13.167	3.95	2.22	0.437	O	I			5.50
13.250	3.96	2.38	0.448	O	I			5.56
13.333	3.96	2.51	0.458	O	I			5.60
13.417	3.97	2.64	0.468	O	I			5.64
13.500	3.97	2.76	0.477	O	I			5.68
13.583	2.92	2.82	0.481	OI				5.70
13.667	2.40	2.80	0.480	I O				5.70
13.750	2.40	2.77	0.478	I O				5.69
13.833	2.41	2.74	0.475	I O				5.68
13.917	2.41	2.71	0.473	I O				5.67

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14.000    2.42    2.68      0.471  |        |        |  I O  |        |      5.66
14.083    2.81    2.68      0.471  |        |        |    OI |        |      5.66
14.167    3.00    2.70      0.472  |        |        |    O  I        |      5.66
14.250    3.01    2.72      0.474  |        |        |    O  I        |      5.67
14.333    2.91    2.74      0.476  |        |        |     OI|        |      5.68
14.417    2.87    2.76      0.477  |        |        |     OI|        |      5.68
14.500    2.88    2.77      0.478  |        |        |     OI|        |      5.69
14.583    2.88    2.78      0.478  |        |        |     OI|        |      5.69
14.667    2.89    2.79      0.479  |        |        |     OI|        |      5.69
14.750    2.89    2.79      0.480  |        |        |     OI|        |      5.69
14.833    2.80    2.80      0.480  |        |        |     O |        |      5.70
14.917    2.75    2.80      0.480  |        |        |     O |        |      5.70
15.000    2.76    2.79      0.480  |        |        |     O |        |      5.69
15.083    2.67    2.79      0.479  |        |        |    IO |        |      5.69
15.167    2.62    2.77      0.478  |        |        |    IO |        |      5.69
15.250    2.63    2.76      0.477  |        |        |    IO |        |      5.68
15.333    2.54    2.75      0.476  |        |        |   I O |        |      5.68
15.417    2.49    2.73      0.474  |        |        |   IO  |        |      5.67
15.500    2.50    2.71      0.473  |        |        |   IO  |        |      5.67
15.583    2.11    2.67      0.470  |        |        |I   O  |        |      5.65
15.667    1.93    2.61      0.466  |        |      I|    O  |        |      5.63
15.750    1.93    2.55      0.462  |        |      I|   O   |        |      5.61
15.833    1.94    2.50      0.457  |        |      I|   O   |        |      5.60
15.917    1.94    2.45      0.454  |        |      I|  O    |        |      5.58
16.000    1.94    2.41      0.450  |        |      I|  O    |        |      5.57
16.083    0.89    2.32      0.444  |       I|       | O     |        |      5.54
16.167    0.37    2.17      0.433  |  I     |       |O      |        |      5.49
16.250    0.37    2.02      0.421  |  I     |       O       |        |      5.44
16.333    0.37    1.87      0.410  |  I     |      O|       |        |      5.39
16.417    0.37    1.74      0.400  |  I     |     O |       |        |      5.34
16.500    0.37    1.62      0.391  |  I     |    O  |       |        |      5.30
16.583    0.31    1.51      0.383  | I      |   O   |       |        |      5.27
16.667    0.28    1.41      0.375  | I      |  O    |       |        |      5.23
16.750    0.28    1.31      0.367  | I      | O     |       |        |      5.20
16.833    0.28    1.22      0.361  | I      |O      |       |        |      5.17
16.917    0.28    1.14      0.354  | I      |O      |       |        |      5.14
17.000    0.28    1.06      0.349  | I     O       |       |        |      5.12
17.083    0.41    1.00      0.344  |  I    O       |       |        |      5.10
17.167    0.47    0.95      0.340  |  I   O|       |       |        |      5.08
17.250    0.47    0.91      0.337  |  I   O|       |       |        |      5.07
17.333    0.47    0.87      0.334  |  I   O|       |       |        |      5.05
17.417    0.47    0.84      0.332  |  I  O |       |       |        |      5.04
17.500    0.47    0.80      0.329  |  I  O |       |       |        |      5.03
17.583    0.16    0.76      0.326  |I    O |       |       |        |      5.02
17.667    0.01    0.71      0.321  I    O  |       |       |        |      5.00
17.750    0.01    0.71      0.317  I    O  |       |       |        |      4.97
17.833    0.25    0.71      0.313  | I  O  |       |       |        |      4.94
17.917    0.37    0.71      0.310  |  I O  |       |       |        |      4.93
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18.000	0.37	0.71	0.307	I O				4.91
18.083	0.37	0.71	0.305	I O				4.90
18.167	0.37	0.71	0.303	I O				4.89
18.250	0.37	0.71	0.301	I O				4.87
18.333	0.37	0.71	0.298	I O				4.86
18.417	0.37	0.71	0.296	I O				4.84
18.500	0.37	0.71	0.294	I O				4.83
18.583	0.31	0.71	0.291	I O				4.82
18.667	0.28	0.71	0.288	I O				4.80
18.750	0.28	0.71	0.285	I O				4.78
18.833	0.22	0.71	0.282	I O				4.76
18.917	0.19	0.71	0.279	I O				4.74
19.000	0.19	0.71	0.275	I O				4.72
19.083	0.25	0.71	0.272	I O				4.70
19.167	0.28	0.71	0.269	I O				4.68
19.250	0.28	0.71	0.266	I O				4.66
19.333	0.34	0.71	0.263	I O				4.65
19.417	0.37	0.71	0.260	I O				4.63
19.500	0.37	0.71	0.258	I O				4.62
19.583	0.31	0.71	0.256	I O				4.60
19.667	0.28	0.71	0.253	I O				4.59
19.750	0.28	0.71	0.250	I O				4.57
19.833	0.22	0.71	0.247	I O				4.55
19.917	0.19	0.71	0.243	I O				4.53
20.000	0.19	0.71	0.240	I O				4.51
20.083	0.25	0.71	0.236	I O				4.49
20.167	0.28	0.71	0.233	I O				4.47
20.250	0.28	0.71	0.230	I O				4.45
20.333	0.28	0.71	0.227	I O				4.44
20.417	0.28	0.71	0.224	I O				4.42
20.500	0.28	0.71	0.221	I O				4.40
20.583	0.28	0.71	0.218	I O				4.38
20.667	0.28	0.71	0.215	I O				4.37
20.750	0.28	0.71	0.212	I O				4.35
20.833	0.22	0.71	0.209	I O				4.33
20.917	0.19	0.71	0.206	I O				4.31
21.000	0.19	0.71	0.202	I O				4.29
21.083	0.25	0.71	0.199	I O				4.27
21.167	0.28	0.71	0.196	I O				4.25
21.250	0.28	0.71	0.193	I O				4.23
21.333	0.22	0.71	0.190	I O				4.21
21.417	0.19	0.71	0.186	I O				4.19
21.500	0.19	0.71	0.182	I O				4.17
21.583	0.25	0.71	0.179	I O				4.15
21.667	0.28	0.71	0.176	I O				4.13
21.750	0.28	0.71	0.173	I O				4.11
21.833	0.22	0.71	0.170	I O				4.09
21.917	0.19	0.71	0.166	I O				4.07

22.000	0.19	0.71	0.163	I O				4.05
22.083	0.25	0.71	0.159	I O				4.03
22.167	0.28	0.71	0.156	I O				4.01
22.250	0.28	0.71	0.153	I O				3.98
22.333	0.22	0.71	0.150	I O				3.90
22.417	0.19	0.71	0.147	I O				3.81
22.500	0.19	0.71	0.143	I O				3.72
22.583	0.19	0.71	0.140	I O				3.63
22.667	0.19	0.71	0.136	I O				3.53
22.750	0.19	0.71	0.132	I O				3.44
22.833	0.19	0.71	0.129	I O				3.35
22.917	0.19	0.71	0.125	I O				3.25
23.000	0.19	0.71	0.122	I O				3.16
23.083	0.19	0.71	0.118	I O				3.07
23.167	0.19	0.71	0.114	I O				2.97
23.250	0.19	0.71	0.111	I O				2.88
23.333	0.19	0.71	0.107	I O				2.79
23.417	0.19	0.71	0.104	I O				2.69
23.500	0.19	0.71	0.100	I O				2.60
23.583	0.19	0.71	0.096	I O				2.51
23.667	0.19	0.71	0.093	I O				2.42
23.750	0.19	0.71	0.089	I O				2.32
23.833	0.19	0.71	0.086	I O				2.23
23.917	0.19	0.71	0.082	I O				2.14
24.000	0.19	0.71	0.078	I O				2.04
24.083	0.06	0.71	0.074	I O				1.94
24.167	0.00	0.71	0.070	I O				1.82
24.250	0.00	0.71	0.065	I O				1.69
24.333	0.00	0.71	0.060	I O				1.56
24.417	0.00	0.71	0.055	I O				1.44
24.500	0.00	0.71	0.050	I O				1.31
24.583	0.00	0.71	0.045	I O				1.19
24.667	0.00	0.71	0.040	I O				1.06
24.750	0.00	0.19	0.037	IO				1.00
24.833	0.00	0.06	0.036	O				0.98
24.917	0.00	0.06	0.036	O				0.97
25.000	0.00	0.06	0.036	O				0.96
25.083	0.00	0.06	0.035	O				0.95
25.167	0.00	0.06	0.035	O				0.94
25.250	0.00	0.06	0.034	O				0.93
25.333	0.00	0.06	0.034	O				0.92
25.417	0.00	0.05	0.034	O				0.91
25.500	0.00	0.05	0.033	O				0.90
25.583	0.00	0.05	0.033	O				0.89
25.667	0.00	0.05	0.033	O				0.88
25.750	0.00	0.05	0.032	O				0.87
25.833	0.00	0.05	0.032	O				0.86
25.917	0.00	0.05	0.031	O				0.85

26.000	0.00	0.05	0.031	O	|	|	|	0.84
26.083	0.00	0.05	0.031	O	|	|	|	0.83
26.167	0.00	0.05	0.030	O	|	|	|	0.82
26.250	0.00	0.05	0.030	O	|	|	|	0.81
26.333	0.00	0.05	0.030	O	|	|	|	0.80
26.417	0.00	0.05	0.029	O	|	|	|	0.79
26.500	0.00	0.05	0.029	O	|	|	|	0.79
26.583	0.00	0.05	0.029	O	|	|	|	0.78
26.667	0.00	0.05	0.028	O	|	|	|	0.77
26.750	0.00	0.05	0.028	O	|	|	|	0.76
26.833	0.00	0.05	0.028	O	|	|	|	0.75
26.917	0.00	0.04	0.027	O	|	|	|	0.74
27.000	0.00	0.04	0.027	O	|	|	|	0.73
27.083	0.00	0.04	0.027	O	|	|	|	0.73
27.167	0.00	0.04	0.027	O	|	|	|	0.72
27.250	0.00	0.04	0.026	O	|	|	|	0.71
27.333	0.00	0.04	0.026	O	|	|	|	0.70
27.417	0.00	0.04	0.026	O	|	|	|	0.69
27.500	0.00	0.04	0.025	O	|	|	|	0.69
27.583	0.00	0.04	0.025	O	|	|	|	0.68
27.667	0.00	0.04	0.025	O	|	|	|	0.67
27.750	0.00	0.04	0.025	O	|	|	|	0.66
27.833	0.00	0.04	0.024	O	|	|	|	0.66
27.917	0.00	0.04	0.024	O	|	|	|	0.65
28.000	0.00	0.04	0.024	O	|	|	|	0.64
28.083	0.00	0.04	0.024	O	|	|	|	0.63
28.167	0.00	0.04	0.023	O	|	|	|	0.63
28.250	0.00	0.04	0.023	O	|	|	|	0.62
28.333	0.00	0.04	0.023	O	|	|	|	0.61
28.417	0.00	0.04	0.022	O	|	|	|	0.61
28.500	0.00	0.04	0.022	O	|	|	|	0.60
28.583	0.00	0.04	0.022	O	|	|	|	0.59
28.667	0.00	0.04	0.022	O	|	|	|	0.59
28.750	0.00	0.03	0.022	O	|	|	|	0.58
28.833	0.00	0.03	0.021	O	|	|	|	0.57
28.917	0.00	0.03	0.021	O	|	|	|	0.57
29.000	0.00	0.03	0.021	O	|	|	|	0.56
29.083	0.00	0.03	0.021	O	|	|	|	0.56
29.167	0.00	0.03	0.020	O	|	|	|	0.55
29.250	0.00	0.03	0.020	O	|	|	|	0.54
29.333	0.00	0.03	0.020	O	|	|	|	0.54
29.417	0.00	0.03	0.020	O	|	|	|	0.53
29.500	0.00	0.03	0.019	O	|	|	|	0.53
29.583	0.00	0.03	0.019	O	|	|	|	0.52
29.667	0.00	0.03	0.019	O	|	|	|	0.51
29.750	0.00	0.03	0.019	O	|	|	|	0.51
29.833	0.00	0.03	0.019	O	|	|	|	0.50
29.917	0.00	0.03	0.018	O	|	|	|	0.50

30.000	0.00	0.03	0.018	O	|	|	|	0.49
30.083	0.00	0.03	0.018	O	|	|	|	0.49
30.167	0.00	0.03	0.018	O	|	|	|	0.48
30.250	0.00	0.03	0.018	O	|	|	|	0.47
30.333	0.00	0.03	0.017	O	|	|	|	0.47
30.417	0.00	0.03	0.017	O	|	|	|	0.46
30.500	0.00	0.03	0.017	O	|	|	|	0.46
30.583	0.00	0.03	0.017	O	|	|	|	0.45
30.667	0.00	0.03	0.017	O	|	|	|	0.45
30.750	0.00	0.03	0.016	O	|	|	|	0.44
30.833	0.00	0.03	0.016	O	|	|	|	0.44
30.917	0.00	0.03	0.016	O	|	|	|	0.43
31.000	0.00	0.03	0.016	O	|	|	|	0.43
31.083	0.00	0.03	0.016	O	|	|	|	0.42
31.167	0.00	0.03	0.016	O	|	|	|	0.42
31.250	0.00	0.02	0.015	O	|	|	|	0.42
31.333	0.00	0.02	0.015	O	|	|	|	0.41
31.417	0.00	0.02	0.015	O	|	|	|	0.41
31.500	0.00	0.02	0.015	O	|	|	|	0.40
31.583	0.00	0.02	0.015	O	|	|	|	0.40
31.667	0.00	0.02	0.015	O	|	|	|	0.39
31.750	0.00	0.02	0.014	O	|	|	|	0.39
31.833	0.00	0.02	0.014	O	|	|	|	0.38
31.917	0.00	0.02	0.014	O	|	|	|	0.38
32.000	0.00	0.02	0.014	O	|	|	|	0.38
32.083	0.00	0.02	0.014	O	|	|	|	0.37
32.167	0.00	0.02	0.014	O	|	|	|	0.37
32.250	0.00	0.02	0.013	O	|	|	|	0.36
32.333	0.00	0.02	0.013	O	|	|	|	0.36
32.417	0.00	0.02	0.013	O	|	|	|	0.36
32.500	0.00	0.02	0.013	O	|	|	|	0.35
32.583	0.00	0.02	0.013	O	|	|	|	0.35
32.667	0.00	0.02	0.013	O	|	|	|	0.34
32.750	0.00	0.02	0.013	O	|	|	|	0.34
32.833	0.00	0.02	0.012	O	|	|	|	0.34
32.917	0.00	0.02	0.012	O	|	|	|	0.33
33.000	0.00	0.02	0.012	O	|	|	|	0.33
33.083	0.00	0.02	0.012	O	|	|	|	0.32
33.167	0.00	0.02	0.012	O	|	|	|	0.32
33.250	0.00	0.02	0.012	O	|	|	|	0.32
33.333	0.00	0.02	0.012	O	|	|	|	0.31
33.417	0.00	0.02	0.012	O	|	|	|	0.31
33.500	0.00	0.02	0.011	O	|	|	|	0.31
33.583	0.00	0.02	0.011	O	|	|	|	0.30
33.667	0.00	0.02	0.011	O	|	|	|	0.30
33.750	0.00	0.02	0.011	O	|	|	|	0.30
33.833	0.00	0.02	0.011	O	|	|	|	0.29
33.917	0.00	0.02	0.011	O	|	|	|	0.29

34.000	0.00	0.02	0.011	O	|	|	|	0.29
34.083	0.00	0.02	0.011	O	|	|	|	0.28
34.167	0.00	0.02	0.010	O	|	|	|	0.28
34.250	0.00	0.02	0.010	O	|	|	|	0.28
34.333	0.00	0.02	0.010	O	|	|	|	0.27
34.417	0.00	0.02	0.010	O	|	|	|	0.27
34.500	0.00	0.02	0.010	O	|	|	|	0.27
34.583	0.00	0.02	0.010	O	|	|	|	0.27
34.667	0.00	0.02	0.010	O	|	|	|	0.26
34.750	0.00	0.02	0.010	O	|	|	|	0.26
34.833	0.00	0.02	0.010	O	|	|	|	0.26
34.917	0.00	0.02	0.009	O	|	|	|	0.25
35.000	0.00	0.02	0.009	O	|	|	|	0.25
35.083	0.00	0.01	0.009	O	|	|	|	0.25
35.167	0.00	0.01	0.009	O	|	|	|	0.25
35.250	0.00	0.01	0.009	O	|	|	|	0.24
35.333	0.00	0.01	0.009	O	|	|	|	0.24
35.417	0.00	0.01	0.009	O	|	|	|	0.24
35.500	0.00	0.01	0.009	O	|	|	|	0.23
35.583	0.00	0.01	0.009	O	|	|	|	0.23
35.667	0.00	0.01	0.009	O	|	|	|	0.23
35.750	0.00	0.01	0.008	O	|	|	|	0.23
35.833	0.00	0.01	0.008	O	|	|	|	0.22
35.917	0.00	0.01	0.008	O	|	|	|	0.22
36.000	0.00	0.01	0.008	O	|	|	|	0.22
36.083	0.00	0.01	0.008	O	|	|	|	0.22
36.167	0.00	0.01	0.008	O	|	|	|	0.21
36.250	0.00	0.01	0.008	O	|	|	|	0.21
36.333	0.00	0.01	0.008	O	|	|	|	0.21
36.417	0.00	0.01	0.008	O	|	|	|	0.21
36.500	0.00	0.01	0.008	O	|	|	|	0.21
36.583	0.00	0.01	0.008	O	|	|	|	0.20
36.667	0.00	0.01	0.007	O	|	|	|	0.20
36.750	0.00	0.01	0.007	O	|	|	|	0.20
36.833	0.00	0.01	0.007	O	|	|	|	0.20
36.917	0.00	0.01	0.007	O	|	|	|	0.19
37.000	0.00	0.01	0.007	O	|	|	|	0.19
37.083	0.00	0.01	0.007	O	|	|	|	0.19
37.167	0.00	0.01	0.007	O	|	|	|	0.19
37.250	0.00	0.01	0.007	O	|	|	|	0.19
37.333	0.00	0.01	0.007	O	|	|	|	0.18
37.417	0.00	0.01	0.007	O	|	|	|	0.18
37.500	0.00	0.01	0.007	O	|	|	|	0.18
37.583	0.00	0.01	0.007	O	|	|	|	0.18
37.667	0.00	0.01	0.007	O	|	|	|	0.18
37.750	0.00	0.01	0.006	O	|	|	|	0.17
37.833	0.00	0.01	0.006	O	|	|	|	0.17
37.917	0.00	0.01	0.006	O	|	|	|	0.17

38.000	0.00	0.01	0.006	O	|	|	|	0.17
38.083	0.00	0.01	0.006	O	|	|	|	0.17
38.167	0.00	0.01	0.006	O	|	|	|	0.16
38.250	0.00	0.01	0.006	O	|	|	|	0.16
38.333	0.00	0.01	0.006	O	|	|	|	0.16
38.417	0.00	0.01	0.006	O	|	|	|	0.16
38.500	0.00	0.01	0.006	O	|	|	|	0.16
38.583	0.00	0.01	0.006	O	|	|	|	0.16
38.667	0.00	0.01	0.006	O	|	|	|	0.15
38.750	0.00	0.01	0.006	O	|	|	|	0.15
38.833	0.00	0.01	0.006	O	|	|	|	0.15
38.917	0.00	0.01	0.006	O	|	|	|	0.15
39.000	0.00	0.01	0.005	O	|	|	|	0.15
39.083	0.00	0.01	0.005	O	|	|	|	0.15
39.167	0.00	0.01	0.005	O	|	|	|	0.14
39.250	0.00	0.01	0.005	O	|	|	|	0.14
39.333	0.00	0.01	0.005	O	|	|	|	0.14
39.417	0.00	0.01	0.005	O	|	|	|	0.14
39.500	0.00	0.01	0.005	O	|	|	|	0.14
39.583	0.00	0.01	0.005	O	|	|	|	0.14
39.667	0.00	0.01	0.005	O	|	|	|	0.13
39.750	0.00	0.01	0.005	O	|	|	|	0.13
39.833	0.00	0.01	0.005	O	|	|	|	0.13
39.917	0.00	0.01	0.005	O	|	|	|	0.13
40.000	0.00	0.01	0.005	O	|	|	|	0.13
40.083	0.00	0.01	0.005	O	|	|	|	0.13
40.167	0.00	0.01	0.005	O	|	|	|	0.13
40.250	0.00	0.01	0.005	O	|	|	|	0.12
40.333	0.00	0.01	0.005	O	|	|	|	0.12
40.417	0.00	0.01	0.005	O	|	|	|	0.12
40.500	0.00	0.01	0.004	O	|	|	|	0.12
40.583	0.00	0.01	0.004	O	|	|	|	0.12
40.667	0.00	0.01	0.004	O	|	|	|	0.12
40.750	0.00	0.01	0.004	O	|	|	|	0.12
40.833	0.00	0.01	0.004	O	|	|	|	0.11
40.917	0.00	0.01	0.004	O	|	|	|	0.11
41.000	0.00	0.01	0.004	O	|	|	|	0.11
41.083	0.00	0.01	0.004	O	|	|	|	0.11
41.167	0.00	0.01	0.004	O	|	|	|	0.11
41.250	0.00	0.01	0.004	O	|	|	|	0.11
41.333	0.00	0.01	0.004	O	|	|	|	0.11
41.417	0.00	0.01	0.004	O	|	|	|	0.11
41.500	0.00	0.01	0.004	O	|	|	|	0.11
41.583	0.00	0.01	0.004	O	|	|	|	0.10
41.667	0.00	0.01	0.004	O	|	|	|	0.10
41.750	0.00	0.01	0.004	O	|	|	|	0.10
41.833	0.00	0.01	0.004	O	|	|	|	0.10
41.917	0.00	0.01	0.004	O	|	|	|	0.10

42.000	0.00	0.01	0.004	O	|	|	|	0.10
42.083	0.00	0.01	0.004	O	|	|	|	0.10
42.167	0.00	0.01	0.004	O	|	|	|	0.10
42.250	0.00	0.01	0.004	O	|	|	|	0.10
42.333	0.00	0.01	0.003	O	|	|	|	0.09
42.417	0.00	0.01	0.003	O	|	|	|	0.09
42.500	0.00	0.01	0.003	O	|	|	|	0.09
42.583	0.00	0.01	0.003	O	|	|	|	0.09
42.667	0.00	0.01	0.003	O	|	|	|	0.09
42.750	0.00	0.01	0.003	O	|	|	|	0.09
42.833	0.00	0.01	0.003	O	|	|	|	0.09
42.917	0.00	0.01	0.003	O	|	|	|	0.09
43.000	0.00	0.01	0.003	O	|	|	|	0.09
43.083	0.00	0.01	0.003	O	|	|	|	0.09
43.167	0.00	0.01	0.003	O	|	|	|	0.08
43.250	0.00	0.00	0.003	O	|	|	|	0.08
43.333	0.00	0.00	0.003	O	|	|	|	0.08
43.417	0.00	0.00	0.003	O	|	|	|	0.08
43.500	0.00	0.00	0.003	O	|	|	|	0.08
43.583	0.00	0.00	0.003	O	|	|	|	0.08
43.667	0.00	0.00	0.003	O	|	|	|	0.08
43.750	0.00	0.00	0.003	O	|	|	|	0.08
43.833	0.00	0.00	0.003	O	|	|	|	0.08
43.917	0.00	0.00	0.003	O	|	|	|	0.08
44.000	0.00	0.00	0.003	O	|	|	|	0.08
44.083	0.00	0.00	0.003	O	|	|	|	0.07
44.167	0.00	0.00	0.003	O	|	|	|	0.07
44.250	0.00	0.00	0.003	O	|	|	|	0.07
44.333	0.00	0.00	0.003	O	|	|	|	0.07
44.417	0.00	0.00	0.003	O	|	|	|	0.07
44.500	0.00	0.00	0.003	O	|	|	|	0.07
44.583	0.00	0.00	0.003	O	|	|	|	0.07
44.667	0.00	0.00	0.003	O	|	|	|	0.07
44.750	0.00	0.00	0.003	O	|	|	|	0.07
44.833	0.00	0.00	0.002	O	|	|	|	0.07
44.917	0.00	0.00	0.002	O	|	|	|	0.07
45.000	0.00	0.00	0.002	O	|	|	|	0.07
45.083	0.00	0.00	0.002	O	|	|	|	0.07
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45.333	0.00	0.00	0.002	O	|	|	|	0.06
45.417	0.00	0.00	0.002	O	|	|	|	0.06
45.500	0.00	0.00	0.002	O	|	|	|	0.06
45.583	0.00	0.00	0.002	O	|	|	|	0.06
45.667	0.00	0.00	0.002	O	|	|	|	0.06
45.750	0.00	0.00	0.002	O	|	|	|	0.06
45.833	0.00	0.00	0.002	O	|	|	|	0.06
45.917	0.00	0.00	0.002	O	|	|	|	0.06

46.000	0.00	0.00	0.002	O	|	|	|	0.06
46.083	0.00	0.00	0.002	O	|	|	|	0.06
46.167	0.00	0.00	0.002	O	|	|	|	0.06
46.250	0.00	0.00	0.002	O	|	|	|	0.06
46.333	0.00	0.00	0.002	O	|	|	|	0.06
46.417	0.00	0.00	0.002	O	|	|	|	0.05
46.500	0.00	0.00	0.002	O	|	|	|	0.05
46.583	0.00	0.00	0.002	O	|	|	|	0.05
46.667	0.00	0.00	0.002	O	|	|	|	0.05
46.750	0.00	0.00	0.002	O	|	|	|	0.05
46.833	0.00	0.00	0.002	O	|	|	|	0.05
46.917	0.00	0.00	0.002	O	|	|	|	0.05
47.000	0.00	0.00	0.002	O	|	|	|	0.05
47.083	0.00	0.00	0.002	O	|	|	|	0.05
47.167	0.00	0.00	0.002	O	|	|	|	0.05
47.250	0.00	0.00	0.002	O	|	|	|	0.05
47.333	0.00	0.00	0.002	O	|	|	|	0.05
47.417	0.00	0.00	0.002	O	|	|	|	0.05
47.500	0.00	0.00	0.002	O	|	|	|	0.05
47.583	0.00	0.00	0.002	O	|	|	|	0.05
47.667	0.00	0.00	0.002	O	|	|	|	0.05
47.750	0.00	0.00	0.002	O	|	|	|	0.05
47.833	0.00	0.00	0.002	O	|	|	|	0.04
47.917	0.00	0.00	0.002	O	|	|	|	0.04
48.000	0.00	0.00	0.002	O	|	|	|	0.04
48.083	0.00	0.00	0.002	O	|	|	|	0.04
48.167	0.00	0.00	0.002	O	|	|	|	0.04
48.250	0.00	0.00	0.002	O	|	|	|	0.04
48.333	0.00	0.00	0.002	O	|	|	|	0.04
48.417	0.00	0.00	0.002	O	|	|	|	0.04
48.500	0.00	0.00	0.002	O	|	|	|	0.04
48.583	0.00	0.00	0.002	O	|	|	|	0.04
48.667	0.00	0.00	0.001	O	|	|	|	0.04
48.750	0.00	0.00	0.001	O	|	|	|	0.04
48.833	0.00	0.00	0.001	O	|	|	|	0.04
48.917	0.00	0.00	0.001	O	|	|	|	0.04
49.000	0.00	0.00	0.001	O	|	|	|	0.04
49.083	0.00	0.00	0.001	O	|	|	|	0.04
49.167	0.00	0.00	0.001	O	|	|	|	0.04
49.250	0.00	0.00	0.001	O	|	|	|	0.04
49.333	0.00	0.00	0.001	O	|	|	|	0.04
49.417	0.00	0.00	0.001	O	|	|	|	0.04
49.500	0.00	0.00	0.001	O	|	|	|	0.04
49.583	0.00	0.00	0.001	O	|	|	|	0.04
49.667	0.00	0.00	0.001	O	|	|	|	0.04
49.750	0.00	0.00	0.001	O	|	|	|	0.03
49.833	0.00	0.00	0.001	O	|	|	|	0.03
49.917	0.00	0.00	0.001	O	|	|	|	0.03

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50.167	0.00	0.00	0.001	O	|	|	|	0.03
50.250	0.00	0.00	0.001	O	|	|	|	0.03
50.333	0.00	0.00	0.001	O	|	|	|	0.03
50.417	0.00	0.00	0.001	O	|	|	|	0.03
50.500	0.00	0.00	0.001	O	|	|	|	0.03
50.583	0.00	0.00	0.001	O	|	|	|	0.03
50.667	0.00	0.00	0.001	O	|	|	|	0.03
50.750	0.00	0.00	0.001	O	|	|	|	0.03
50.833	0.00	0.00	0.001	O	|	|	|	0.03
50.917	0.00	0.00	0.001	O	|	|	|	0.03
51.000	0.00	0.00	0.001	O	|	|	|	0.03
51.083	0.00	0.00	0.001	O	|	|	|	0.03
51.167	0.00	0.00	0.001	O	|	|	|	0.03
51.250	0.00	0.00	0.001	O	|	|	|	0.03
51.333	0.00	0.00	0.001	O	|	|	|	0.03
51.417	0.00	0.00	0.001	O	|	|	|	0.03
51.500	0.00	0.00	0.001	O	|	|	|	0.03
51.583	0.00	0.00	0.001	O	|	|	|	0.03
51.667	0.00	0.00	0.001	O	|	|	|	0.03
51.750	0.00	0.00	0.001	O	|	|	|	0.03
51.833	0.00	0.00	0.001	O	|	|	|	0.03
51.917	0.00	0.00	0.001	O	|	|	|	0.03
52.000	0.00	0.00	0.001	O	|	|	|	0.03
52.083	0.00	0.00	0.001	O	|	|	|	0.03
52.167	0.00	0.00	0.001	O	|	|	|	0.03
52.250	0.00	0.00	0.001	O	|	|	|	0.02
52.333	0.00	0.00	0.001	O	|	|	|	0.02
52.417	0.00	0.00	0.001	O	|	|	|	0.02
52.500	0.00	0.00	0.001	O	|	|	|	0.02
52.583	0.00	0.00	0.001	O	|	|	|	0.02
52.667	0.00	0.00	0.001	O	|	|	|	0.02
52.750	0.00	0.00	0.001	O	|	|	|	0.02
52.833	0.00	0.00	0.001	O	|	|	|	0.02
52.917	0.00	0.00	0.001	O	|	|	|	0.02
53.000	0.00	0.00	0.001	O	|	|	|	0.02
53.083	0.00	0.00	0.001	O	|	|	|	0.02
53.167	0.00	0.00	0.001	O	|	|	|	0.02
53.250	0.00	0.00	0.001	O	|	|	|	0.02
53.333	0.00	0.00	0.001	O	|	|	|	0.02
53.417	0.00	0.00	0.001	O	|	|	|	0.02
53.500	0.00	0.00	0.001	O	|	|	|	0.02
53.583	0.00	0.00	0.001	O	|	|	|	0.02
53.667	0.00	0.00	0.001	O	|	|	|	0.02
53.750	0.00	0.00	0.001	O	|	|	|	0.02
53.833	0.00	0.00	0.001	O	|	|	|	0.02
53.917	0.00	0.00	0.001	O	|	|	|	0.02

54.000	0.00	0.00	0.001	O	|	|	|	0.02
54.083	0.00	0.00	0.001	O	|	|	|	0.02
54.167	0.00	0.00	0.001	O	|	|	|	0.02
54.250	0.00	0.00	0.001	O	|	|	|	0.02
54.333	0.00	0.00	0.001	O	|	|	|	0.02
54.417	0.00	0.00	0.001	O	|	|	|	0.02
54.500	0.00	0.00	0.001	O	|	|	|	0.02
54.583	0.00	0.00	0.001	O	|	|	|	0.02
54.667	0.00	0.00	0.001	O	|	|	|	0.02
54.750	0.00	0.00	0.001	O	|	|	|	0.02
54.833	0.00	0.00	0.001	O	|	|	|	0.02
54.917	0.00	0.00	0.001	O	|	|	|	0.02
55.000	0.00	0.00	0.001	O	|	|	|	0.02
55.083	0.00	0.00	0.001	O	|	|	|	0.02
55.167	0.00	0.00	0.001	O	|	|	|	0.02
55.250	0.00	0.00	0.001	O	|	|	|	0.02
55.333	0.00	0.00	0.001	O	|	|	|	0.02

**********HYDROGRAPH DATA**********

Number of intervals = 664
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 2.816 (CFS)
Total volume = 1.886 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

APPENDIX F: CASQA GUIDELINES AND SIZING CALCULATIONS

3.5 Bioretention Facility

Type of BMP	LID – Bioretention
Treatment Mechanisms	Infiltration, Evapotranspiration, Evaporation, Biofiltration
Maximum Drainage Area	This BMP is intended to be integrated into a project's landscaped area in a distributed manner. Typically, contributing drainage areas to Bioretention Facilities range from less than 1 acre to a maximum of around 10 acres.
Other Names	Rain Garden, Bioretention Cell, Bioretention Basin, Biofiltration Basin, Landscaped Filter Basin, Porous Landscape Detention

Description

Bioretention Facilities are shallow, vegetated basins underlain by an engineered soil media. Healthy plant and biological activity in the root zone maintain and renew the macro-pore space in the soil and maximize plant uptake of pollutants and runoff. This keeps the Best Management Practice (BMP) from becoming clogged and allows more of the soil column to function as both a sponge (retaining water) and a highly effective and self-maintaining biofilter. In most cases, the bottom of a Bioretention Facility is unlined, which also provides an opportunity for infiltration to the extent the underlying onsite soil can accommodate. When the infiltration rate of the underlying soil is exceeded, fully biotreated flows are discharged via underdrains. Bioretention Facilities therefore will inherently achieve the maximum feasible level of infiltration and evapotranspiration and achieve the minimum feasible (but highly biotreated) discharge to the storm drain system.

Siting Considerations

These facilities work best when they are designed in a relatively level area. Unlike other BMPs, Bioretention Facilities can be used in smaller landscaped spaces on the site, such as:

- ✓ Parking islands
- ✓ Medians
- ✓ Site entrances

Landscaped areas on the site (such as may otherwise be required through minimum landscaping ordinances), can often be designed as Bioretention Facilities. This can be accomplished by:

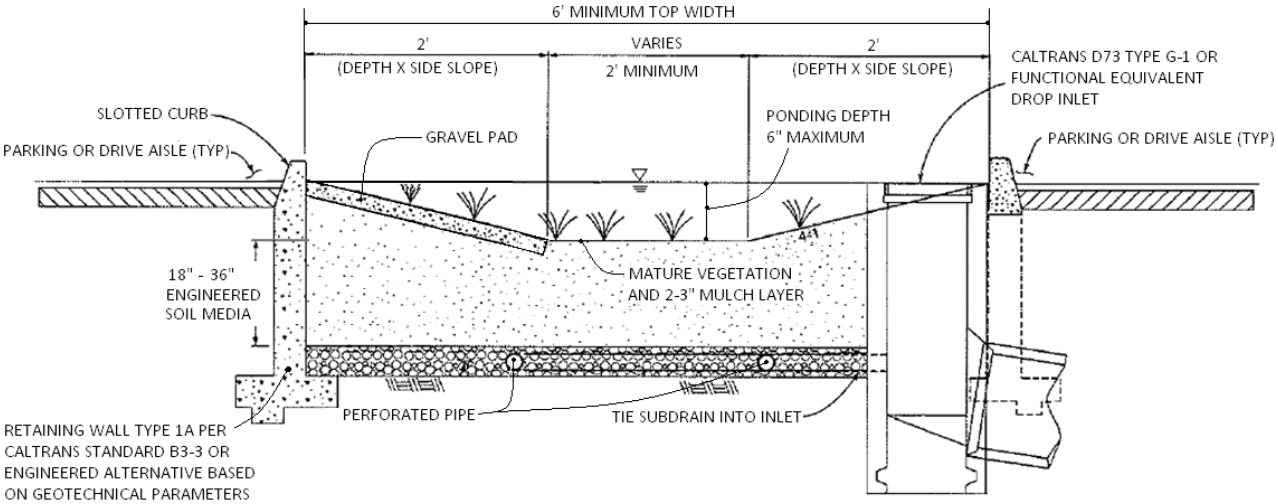
- *Depressing* landscaped areas below adjacent impervious surfaces, rather than elevating those areas
- Grading the site to direct runoff from those impervious surfaces *into* the Bioretention Facility, rather than away from the landscaping
- Sizing and designing the depressed landscaped area as a Bioretention Facility as described in this Fact Sheet

Bioretention Facilities should however not be used downstream of areas where large amounts of sediment can clog the system. Placing a Bioretention Facility at the toe of a steep slope should also be avoided due to the potential for clogging the engineered soil media with erosion from the slope, as well as the potential for damaging the vegetation.

Design and Sizing Criteria

The recommended cross section necessary for a Bioretention Facility includes:

- Vegetated area
- 18' minimum depth of engineered soil media
- 12' minimum gravel layer depth with 6' perforated pipes (added flow control features such as orifice plates may be required to mitigate for HCOC conditions)



While the 18-inch minimum engineered soil media depth can be used in some cases, it is recommended to use 24 inches or a preferred 36 inches to provide an adequate root zone for the chosen plant palate. Such a design also provides for improved removal effectiveness for nutrients. The recommended ponding depth inside of a Bioretention Facility is 6 inches; measured from the flat bottom surface to the top of the water surface as shown in Figure 1.

Because this BMP is filled with an engineered soil media, pore space in the soil and gravel layer is assumed to provide storage volume. However, several considerations must be noted:

- Surcharge storage above the soil surface (6 inches) is important to assure that design flows do not bypass the BMP when runoff exceeds the soil's absorption rate.
- In cases where the Bioretention Facility contains engineered soil media deeper than 36 inches, the pore space within the engineered soil media can only be counted to the 36-inch depth.
- A maximum of 30 percent pore space can be used for the soil media whereas a maximum of 40 percent pore space can be use for the gravel layer.

Figure 1: Standard Layout for a Bioretention Facility

Engineered Soil Media Requirements

The engineered soil media shall be comprised of 85 percent mineral component and 15 percent organic component, by volume, drum mixed prior to placement. The mineral component shall be a Class A sandy loam topsoil that meets the range specified in Table 1 below. The organic component shall be nitrogen stabilized compost[1], such that nitrogen does not leach from the media.

Table 1: Mineral Component Range Requirements

Percent Range	Component
70-80	Sand
15-20	Silt
5-10	Clay

The trip ticket, or certificate of compliance, shall be made available to the inspector to prove the engineered mix meets this specification.

Vegetation Requirements

Vegetative cover is important to minimize erosion and ensure that treatment occurs in the Bioretention Facility. The area should be designed for at least 70 percent mature coverage throughout the Bioretention Facility. To prevent the BMP from being used as walkways, Bioretention Facilities shall be planted with a combination of small trees, densely planted shrubs, and natural grasses. Grasses shall be native or ornamental; preferably ones that do not need to be mowed. The application of fertilizers and pesticides should be minimal. To maintain oxygen levels for the vegetation and promote biodegradation, it is important that vegetation not be completely submerged for any extended period of time. Therefore, a maximum of 6 inches of ponded water shall be used in the design to ensure that plants within the Bioretention Facility remain healthy.

A 2 to 3-inch layer of standard shredded aged hardwood mulch shall be placed as the top layer inside the Bioretention Facility. The 6-inch ponding depth shown in Figure 1 above shall be measured from the top surface of the 2 to 3-inch mulch layer.

Curb Cuts

To allow water to flow into the Bioretention Facility, 1-foot-wide (minimum) curb cuts should be placed approximately every 10 feet around the perimeter of the Bioretention Facility. Figure 2 shows a curb cut in a Bioretention Facility. Curb cut flow lines must be at or above the V_{BMP} water surface level.

[1] For more information on compost, visit the US Composting Council website at: http://compostingcouncil.org/



Figure 2: Curb Cut located in a Bioretention Facility

To reduce erosion, a gravel pad shall be placed at each inlet point to the Bioretention Facility. The gravel should be 1- to 1.5-inch diameter in size. The gravel should overlap the curb cut opening a minimum of 6 inches. The gravel pad inside the Bioretention Facility should be flush with the finished surface at the curb cut and extend to the bottom of the slope.

In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet. See Figure 3.

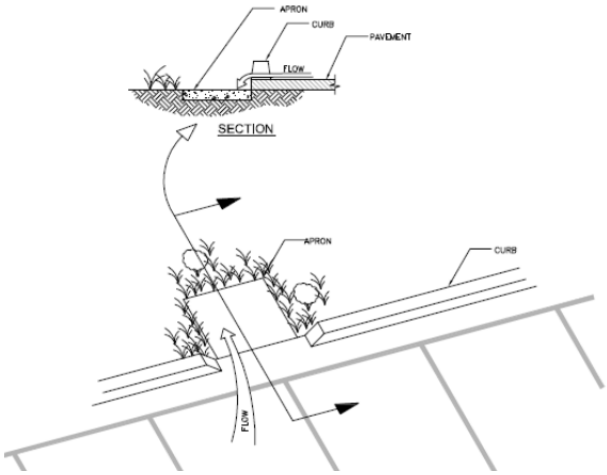


Figure 3: Apron located in a Bioretention Facility

Terracing the Landscaped Filter Basin

It is recommended that Bioretention Facilities be level. In the event the facility site slopes and lacks proper design, water would fill the lowest point of the BMP and then discharge from the basin without being treated. To ensure that the water will be held within the Bioretention Facility on sloped sites, the BMP must be terraced with nonporous check dams to provide the required storage and treatment capacity.

The terraced version of this BMP shall be used on non-flat sites with no more than a 3 percent slope. The surcharge depth cannot exceed 0.5 feet, and side slopes shall not exceed 4:1. Table 2 below shows the spacing of the check dams, and slopes shall be rounded up (i.e., 2.5 percent slope shall use 10' spacing for check dams).

Table 2: Check Dam Spacing

6" Check Dam Spacing	
Slope	**Spacing**
1%	*25'*
2%	*15'*
3%	*10'*

Roof Runoff

Roof downspouts may be directed towards Bioretention Facilities. However, the downspouts must discharge onto a concrete splash block to protect the Bioretention Facility from erosion.

Retaining Walls

It is recommended that Retaining Wall Type 1A, per Caltrans Standard B3-3 or equivalent, be constructed around the entire perimeter of the Bioretention Facility. This practice will protect the sides of the Bioretention Facility from collapsing during construction and maintenance or from high service loads adjacent to the BMP. Where such service loads would not exist adjacent to the BMP, an engineered alternative may be used if signed by a licensed civil engineer.

Side Slope Requirements

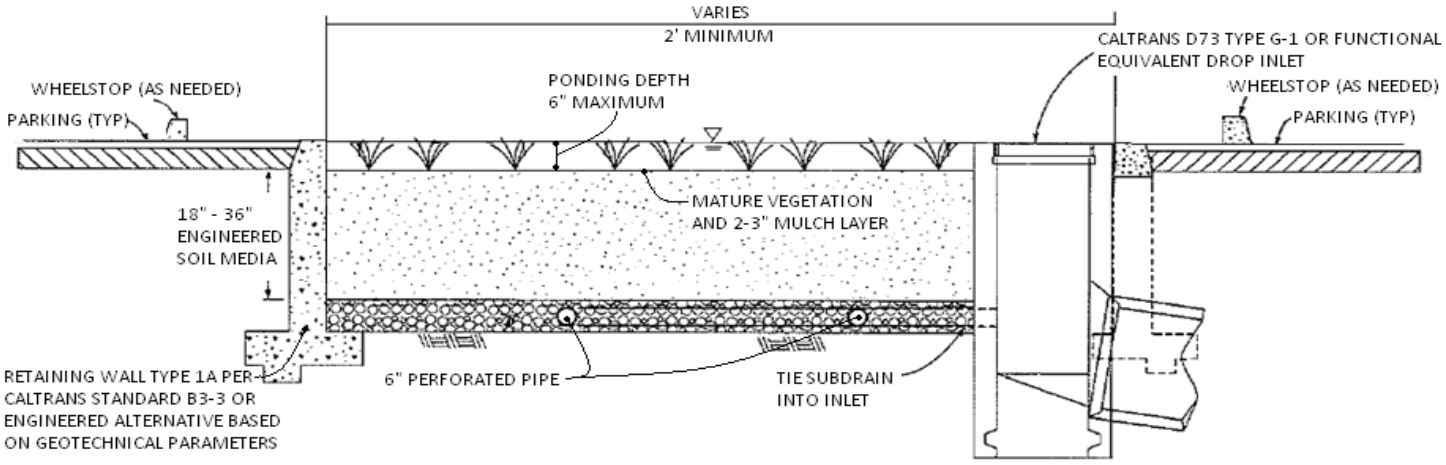
Bioretention Facilities Requiring Side Slopes

The design should assure that the Bioretention Facility does not present a tripping hazard. Bioretention Facilities proposed near pedestrian areas, such as areas parallel to parking spaces or along a walkway, must have a gentle slope to the bottom of the facility. Side slopes inside of a Bioretention Facility shall be 4:1. A typical cross section for the Bioretention Facility is shown in Figure 1.

Bioretention Facilities Not Requiring Side Slopes

Where cars park perpendicular to the Bioretention Facility, side slopes are not required. A 6-inch maximum drop may be used, and the Bioretention Facility must be planted with trees and shrubs to prevent pedestrian access. In this case, a curb is not placed around the Bioretention Facility,

but wheel stops shall be used to prevent vehicles from entering the Bioretention Facility, as shown in Figure 4.



Planter Boxes

Bioretention Facilities can also be placed above ground as planter boxes. Planter boxes must have a minimum width of 2 feet, a maximum surcharge depth of 6 inches, and no side slopes are necessary. Planter boxes must be constructed so as to ensure that the top surface of the engineered soil media will remain level. This option may be constructed of concrete, brick, stone or other stable materials that will not warp or bend. Chemically treated wood or galvanized steel, which has the ability to contaminate stormwater, should not be used. Planter boxes must be lined with an impermeable liner on all sides, including the bottom. Due to the impermeable liner, the inside bottom of the planter box shall be designed and constructed with a cross fall, directing treated flows within the subdrain layer toward the point where subdrain exits the planter box, and subdrains shall be oriented with drain holes oriented down. These provisions will help avoid excessive stagnant water within the gravel underdrain layer. Similar to the in-ground Bioretention Facility versions, this BMP benefits from healthy plants and biological activity in the root zone. Planter boxes should be planted with appropriately selected vegetation.



Figure 5: Planter Box
Source: LA Team Effort

Overflow

An overflow route is needed in the Bioretention Facility design to bypass stored runoff from storm events larger than V_{BMP} or in the event of facility or subdrain clogging. Overflow systems must connect to an acceptable discharge point, such as a downstream conveyance system as shown in Figure 1 and Figure 4. The inlet to the overflow structure shall be elevated inside the Bioretention Facility to be flush with the ponding surface for the design capture volume (V_{BMP}) as shown in Figure 4. This will allow the design capture volume to be fully treated by the Bioretention Facility, and for larger events to safely be conveyed to downstream systems. The overflow inlet shall **not** be located in the entrance of a Bioretention Facility, as shown in Figure 6.

Underdrain Gravel and Pipes

An underdrain gravel layer and pipes shall be provided in accordance with Appendix B – Underdrains.



Figure 6: Incorrect Placement of an Overflow Inlet.

Inspection and Maintenance Schedule

The Bioretention Facility area shall be inspected for erosion, dead vegetation, soggy soils, or standing water. The use of fertilizers and pesticides on the plants inside the Bioretention Facility should be minimized.

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris • Replace damaged grass and/or plants • Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.
After storm events	• Inspect areas for ponding
Annually	• Inspect/clean inlets and outlets

Bioretention Facility Design Procedure

1) Enter the area tributary, A_T, to the Bioretention Facility.

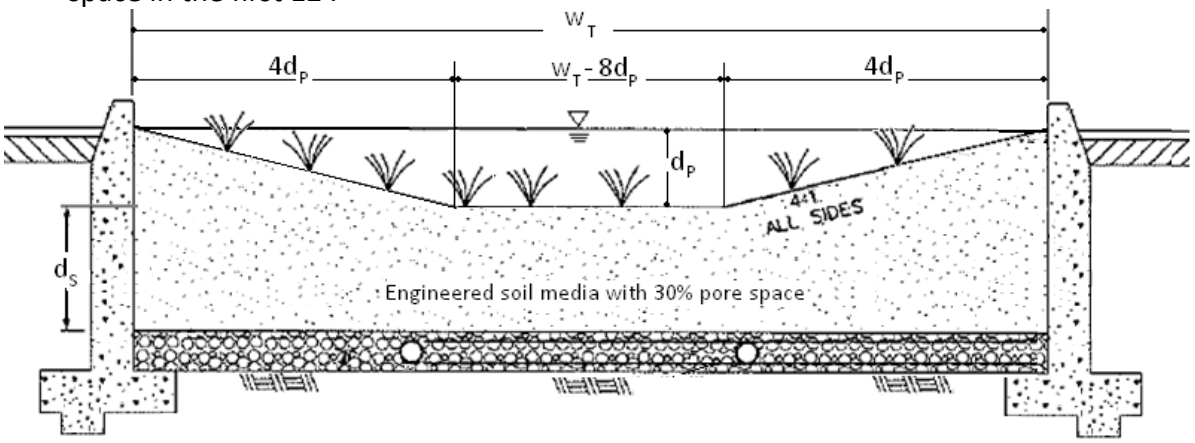
2) Enter the Design Volume, $V_{BMP,}$ determined from Section 2.1 of this Handbook.

3) Select the type of design used. There are two types of Bioretention Facility designs: the standard design used for most project sites that include side slopes, and the modified design used when the BMP is located perpendicular to the parking spaces or with planter boxes that do not use side slopes.

4) Enter the depth of the engineered soil media, d_S. The minimum depth for the engineered soil media can be 18' in limited cases, but it is recommended to use 24' or a preferred 36' to provide an adequate root zone for the chosen plant palette. Engineered soil media deeper than 36' will only get credit for the pore space in the first 36'.

5) Enter the top width of the Bioretention Facility.

6) Calculate the total effective depth, d_E, within the Bioretention Facility. The maximum allowable pore space of the soil media is 30% while the maximum allowable pore space for the gravel layer is 40%. Gravel layer deeper than 12' will only get credit for the pore space in the first 12'.



a. For the design with side slopes the following equation shall be used to determine the total effective depth. Where, d_P is the depth of ponding within the basin.

$$d_E(\text{ft}) = \frac{0.3 \times \left[\left(w_T(\text{ft}) \times d_S(\text{ft})\right) + 4\left(d_P(\text{ft})\right)^2\right] + 0.4 \times 1(\text{ft}) + d_P(\text{ft})\left[4d_P(\text{ft}) + \left(w_T(\text{ft}) - 8d_P(\text{ft})\right)\right]}{w_T(\text{ft})}$$

This above equation can be simplified if the maximum ponding depth of 0.5' is used. The equation below is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = (0.3 \times d_S(\text{ft}) + 0.4 \text{ x } 1(\text{ft})) - \left(\frac{0.7\ (\text{ft}^2)}{w_T(\text{ft})}\right) + 0.5(\text{ft})$$

b. For the design without side slopes the following equation shall be used to determine the total effective depth:

$$d_E(\text{ft}) = d_P(\text{ft}) + [(0.3) \times d_S(\text{ft}) + (0.4) \times 1(\text{ft})]$$

The equation below, using the maximum ponding depth of 0.5', is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = 0.5\ (\text{ft}) + [(0.3) \times d_S(\text{ft}) + (0.4) \times 1(\text{ft})]$$

7) Calculate the minimum surface area, A_M, required for the Bioretention Facility. This does not include the curb surrounding the Bioretention Facility or side slopes.

$$A_M(\text{ft}^2) = \frac{V_{BMP}(\text{ft}^3)}{d_E\ (\text{ft})}$$

8) Enter the proposed surface area. This area shall not be less than the minimum required surface area.

9) Verify that side slopes are no steeper than 4:1 in the standard design, and are not required in the modified design.

10) Provide the diameter, minimum 6 inches, of the perforated underdrain used in the Bioretention Facility. See Appendix B for specific information regarding perforated pipes.

11) Provide the slope of the site around the Bioretention Facility, if used. The maximum slope is 3 percent for a standard design.

12) Provide the check dam spacing, if the site around the Bioretention Facility is sloped.

13) Describe the vegetation used within the Bioretention Facility.

References Used to Develop this Fact Sheet

Anderson, Dale V. "Landscaped Filter Basin Soil Requirements." Riverside, May 2010.

California Department of Transportation. CalTrans Standard Plans. 15 September 2005. May 2010 <http://www.dot.ca.gov/hq/esc/oe/project_plans/HTM/stdplns-met-new99.htm>.

Camp Dresser and McKee Inc.; Larry Walker Associates. California Stormwater Best Management Practice Handbook for New Development and Redevelopment. California Stormwater Quality Association (CASQA), 2004.

Contra Costa Clean Water Program. Stormwater Quality Requirements for Development Applications. 3rd Edition. Contra Costa, 2006.

County of Los Angeles Public Works. Stormwater Best Management Practice Design and Maintenance Manual. Los Angeles, 2009.

Kim, Hunho, Eric A. Seagren and Allen P. Davis. "Engineered Bioretention for Removal of Nitrate from Stormwater Runoff." Water Environment Research 75.4 (2003): 355-366.

LA Team Effort. LA Team Effort: FREE Planter Boxes for Businesses. 2 November 2009. May 2010 <http://lateameffort.blogspot.com/2009/11/free-planter-boxes-for-businesses-est.html>.

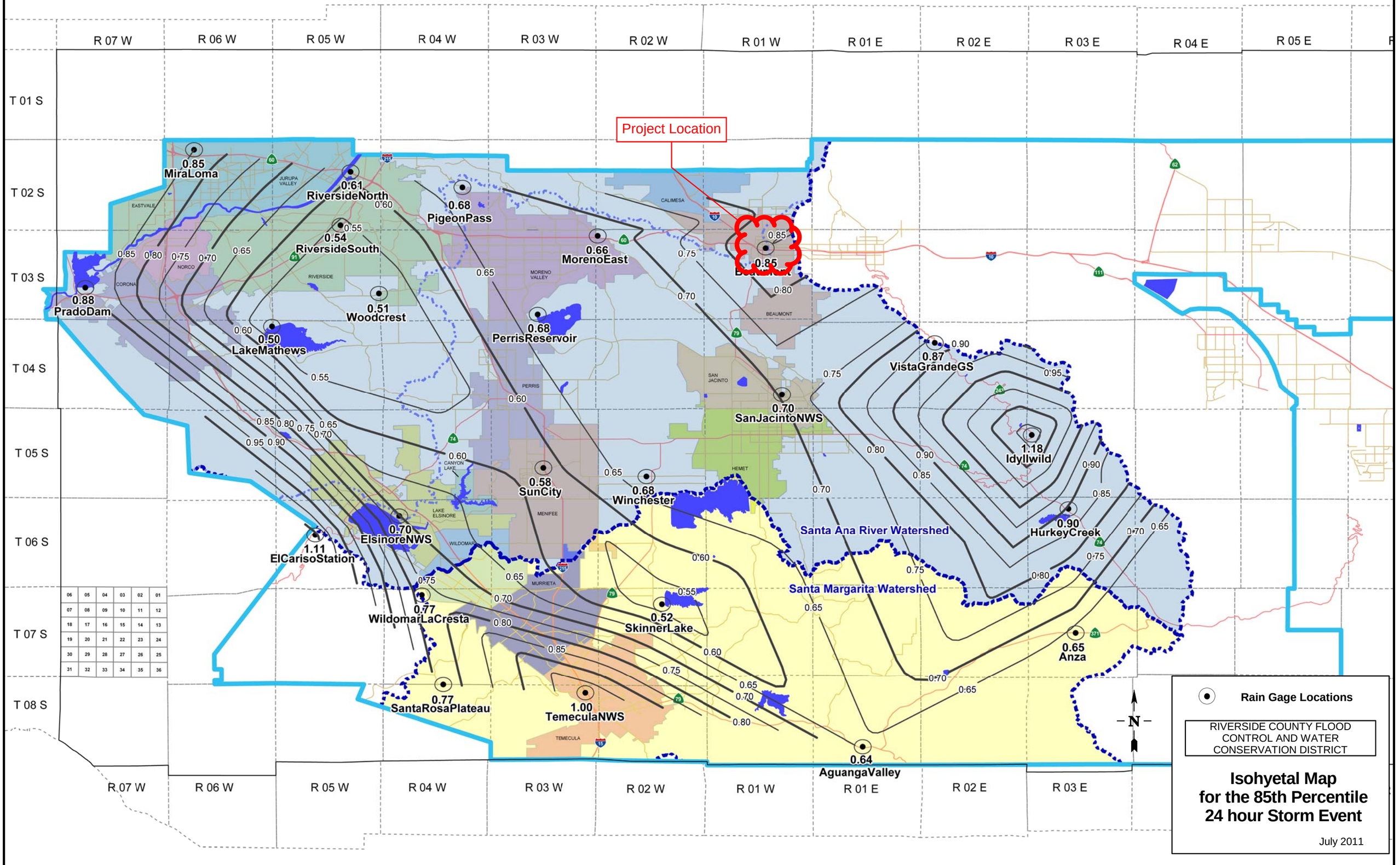
Montgomery County Maryland Department of Permitting Services Water Resources Section. Biofiltration (BF). Montgomery County, 2005.

Program, Ventura Countywide Stormwater Quality Management. Technical Guidance Manual for Stormwater Quality Control Measures. Ventura, 2002.

United States Environmental Protection Agency. Storm Water Technology Fact Sheet Bioretention. Washington D.C, 1999.

Urban Drainage and Flood Control District. Urban Storm Drainage Criteria Manual Volume 3 - Best Management Practices. Vol. 3. Denver, 2008. 3 vols.

Urbonas, Ben R. Stormwater Sand Filter Sizing and Design: A Unit Operations Approach. Denver: Urban Drainage and Flood Control District, 2002.


Project Location
R 07 W
R 06 W
R 05 W
R 04 W
R 03 W
R 02 W
R 01 W
R 01 E
R 02 E
R 03 E
R 04 E
R 05 E
T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S
0.85 MiraLoma
0.61 RiversideNorth
0.54 RiversideSouth
0.68 PigeonPass
0.66 MorenoEast
0.85
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.90 HurkeyCreek
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley
Santa Ana River Watershed
Santa Margarita Watershed
JURUPA VALLEY
EASTVALE
CORONA
NORCO
RIVERSIDE
MORENO VALLEY
CALIMESA
BEAUMONT
SAN JACINTO
PERRIS
HEMET
CANYON LAKE
LAKE ELSINORE
MENIFEE
WILDOMAR
MURRIETA
TEMECULA
Rain Gage Locations
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Isohyetal Map for the 85th Percentile 24 hour Storm Event
July 2011
N

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

(Note this worksheet shall ***only*** *be used in conjunction with BMP designs from the* ***LID BMP Design Handbook****)*

Company Name ERSC — Date 10/4/2023

Designed by — Case No

Company Project Number/Name — Calvary Chapel Beaumont

BMP Identification

BMP NAME / ID DMA A

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E — D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume,* V_{BMP} *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A Imperv.	*27000*	*Roofs*	*1*	*0.89*	*24084*			
DMA Imperv.	*118800*	*Concrete or Asphalt*	*1*	*0.89*	*105969.6*			
DMA A Pervious	*76357*	*Ornamental Landscaping*	*0.1*	*0.11*	*8434.2*			
	222157	***Total***			**138487.8**	**0.85**	***9809.6***	***15670***

Notes:

Bioretention Facility - Design Procedure	BMP ID: A	Legend:	Required Entries / Calculated Cells

Company Name:	Calvary Chapel	Date:	10/4/2023
Designed by:	ERSC INC.	County/City Case No.:	

Design Volume

Enter the area tributary to this feature	A_T=	5.1	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	9,900	ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	3.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	10.0	ft
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$	d_E =	1.73	ft
Minimum Surface Area, A_m $A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$	A_M =	5,723	ft^2
Proposed Surface Area	A=	9,058	ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	4	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		0.5	%
6" Check Dam Spacing		0	feet
Describe Vegetation:			

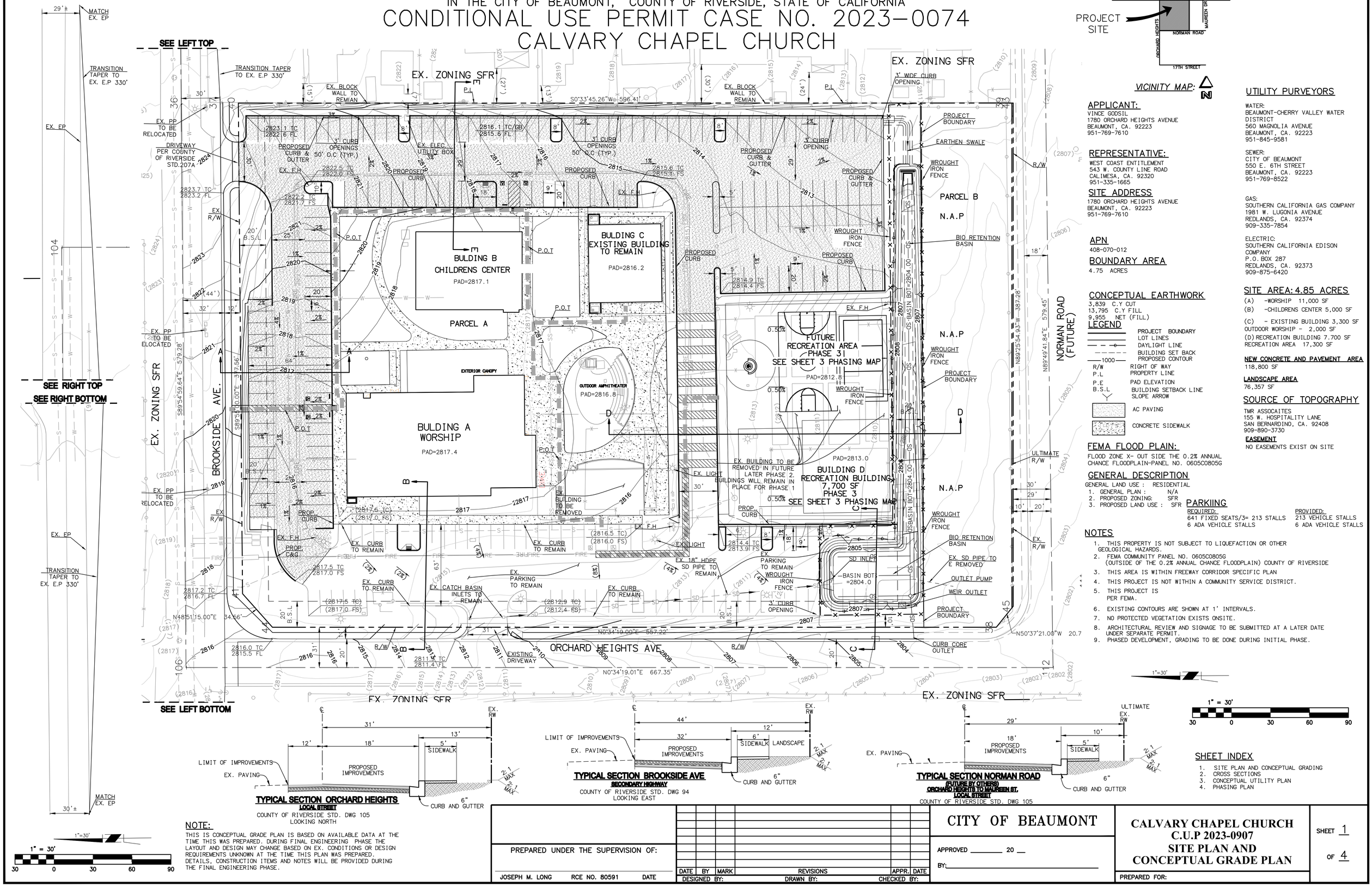
Notes:

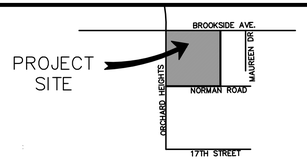
APPENDIX G: CONCEPTUAL GRADING PLAN

IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

CONDITIONAL USE PERMIT CASE NO. 2023-0074

CALVARY CHAPEL CHURCH





VICINITY MAP:

APPLICANT:
VINCE GODSIL
1780 ORCHARD HEIGHTS AVENUE
BEAUMONT, CA. 92223
951-769-7610

REPRESENTATIVE:
WEST COAST ENTITLEMENT
543 W. COUNTY LINE ROAD
CALIMESA, CA. 92320
951-335-1665

SITE ADDRESS
1780 ORCHARD HEIGHTS AVENUE
BEAUMONT, CA. 92223
951-769-7610

APN
408-070-012

BOUNDARY AREA
4.75 ACRES

CONCEPTUAL EARTHWORK
3,839 C.Y CUT
13,795 C.Y FILL
9,955 NET (FILL)

LEGEND
- PROJECT BOUNDARY / LOT LINES
- DAYLIGHT LINE
- BUILDING SET BACK / PROPOSED CONTOUR
- 1000 — R/W RIGHT OF WAY
- P.L PROPERTY LINE
- P.E PAD ELEVATION
- B.S.L BUILDING SETBACK LINE / SLOPE ARROW
- AC PAVING
- CONCRETE SIDEWALK

FEMA FLOOD PLAIN:
FLOOD ZONE X- OUT SIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN-PANEL NO. 0605C0805G

GENERAL DESCRIPTION
GENERAL LAND USE : RESIDENTIAL
1. GENERAL PLAN : N/A
2. PROPOSED ZONING: SFR
3. PROPOSED LAND USE : SFR

PARKIING

REQUIRED:	PROVIDED:
641 FIXED SEATS/3= 213 STALLS	213 VEHICLE STALLS
6 ADA VEHICLE STALLS	6 ADA VEHICLE STALLS

NOTES
1. THIS PROPERTY IS NOT SUBJECT TO LIQUEFACTION OR OTHER GEOLOGICAL HAZARDS.
2. FEMA COMMUNITY PANEL NO. 0605C0805G (OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) COUNTY OF RIVERSIDE
3. THIS AREA IS WITHIN FREEWAY CORRIDOR SPECIFIC PLAN
4. THIS PROJECT IS NOT WITHIN A COMMUNITY SERVICE DISTRICT.
5. THIS PROJECT IS PER FEMA.
6. EXISTING CONTOURS ARE SHOWN AT 1' INTERVALS.
7. NO PROTECTED VEGETATION EXISTS ONSITE.
8. ARCHITECTURAL REVIEW AND SIGNAGE TO BE SUBMITTED AT A LATER DATE UNDER SEPARATE PERMIT.
9. PHASED DEVELOPMENT, GRADING TO BE DONE DURING INITIAL PHASE.

UTILITY PURVEYORS
WATER:
BEAUMONT-CHERRY VALLEY WATER DISTRICT
560 MAGNOLIA AVENUE
BEAUMONT, CA. 92223
951-845-9581

SEWER:
CITY OF BEAUMONT
550 E. 6TH STREET
BEAUMONT, CA. 92223
951-769-8522

GAS:
SOUTHERN CALIFORNIA GAS COMPANY
1981 W. LUGONIA AVENUE
REDLANDS, CA. 92374
909-335-7854

ELECTRIC:
SOUTHERN CALIFORNIA EDISON COMPANY
P.O. BOX 287
REDLANDS, CA. 92373
909-875-6420

SITE AREA: 4.85 ACRES
(A) -WORSHIP 11,000 SF
(B) -CHILDRENS CENTER 5,000 SF
(C) - EXISTING BUILDING 3,300 SF
OUTDOOR WORSHIP - 2,000 SF
(D) RECREATION BUILDING 7.700 SF
RECREATION AREA 17,300 SF

NEW CONCRETE AND PAVEMENT AREA
118,800 SF

LANDSCAPE AREA
76,357 SF

SOURCE OF TOPOGRAPHY
TMR ASSOCAITES
155 W. HOSPITALITY LANE
SAN BERNARDINO, CA. 92408
909-890-3730

EASEMENT
NO EASEMENTS EXIST ON SITE

TYPICAL SECTION ORCHARD HEIGHTS
LOCAL STREET
COUNTY OF RIVERSIDE STD. DWG 105
LOOKING NORTH

TYPICAL SECTION BROOKSIDE AVE
SECONDARY HIGHWAY
COUNTY OF RIVERSIDE STD. DWG 94
LOOKING EAST

TYPICAL SECTION NORMAN ROAD
(FUTURE BY OTHERS)
ORCHARD HEIGHTS TO MAUREEN ST.
LOCAL STREET
COUNTY OF RIVERSIDE STD. DWG 105

1" = 30'
30 0 30 60 90

SHEET INDEX

1. SITE PLAN AND CONCEPTUAL GRADING
2. CROSS SECTIONS
3. CONCEPTUAL UTILITY PLAN
4. PHASING PLAN

NOTE:
THIS IS CONCEPTUAL GRADE PLAN IS BASED ON AVAILABLE DATA AT THE TIME THIS WAS PREPARED. DURING FINAL ENGINEERING PHASE THE LAYOUT AND DESIGN MAY CHANGE BASED ON EX. CONDITIONS OR DESIGN REQUIREMENTS UNKNOWN AT THE TIME THIS PLAN WAS PREPARED. DETAILS, CONSTRUCTION ITEMS AND NOTES WILL BE PROVIDED DURING THE FINAL ENGINEERING PHASE.

1" = 30'
30 0 30 60 90

PREPARED UNDER THE SUPERVISION OF:

JOSEPH M. LONG RCE NO. 80591 DATE

DATE	BY	MARK	REVISIONS	APPR.	DATE

DESIGNED BY: DRAWN BY: CHECKED BY:

CITY OF BEAUMONT

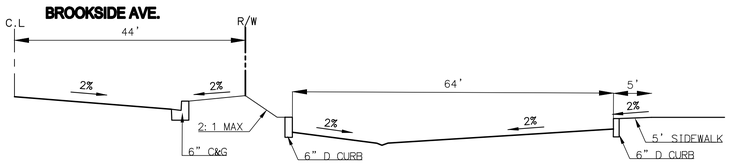
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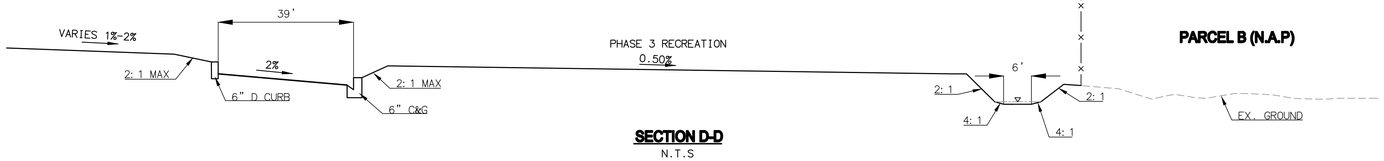
CALVARY CHAPEL CHURCH
C.U.P 2023-0907
SITE PLAN AND CONCEPTUAL GRADE PLAN

PREPARED FOR:

SHEET 1 OF 4

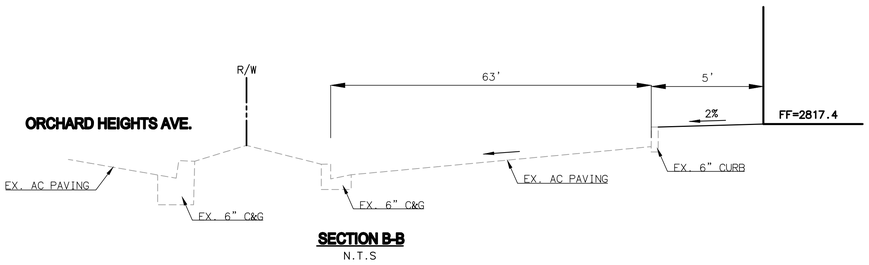


SECTION A-A
N.T.S

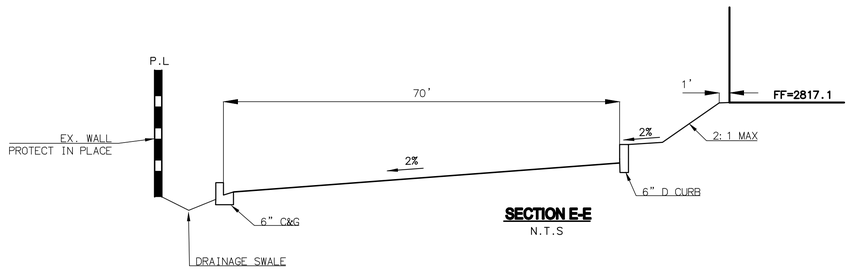


SECTION D-D
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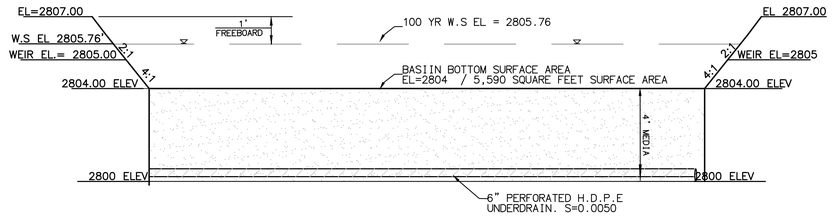
THIS CONCEPTUAL GRADING SECTION IS FOR
INITIAL CONCEPTUAL BASIN DESIGN PURPOSES ONLY.
DETAILS AND CONSTRUCTION ITEMS WILL BE PROVIDED AT FINAL ENG. PHASE



SECTION B-B
N.T.S



SECTION E-E
N.T.S



SECTION C-C
N.T.S

THIS CONCEPTUAL GRADING SECTION IS FOR
INITIAL CONCEPTUAL BASIN DESIGN PURPOSES ONLY.
DETAILS AND CONSTRUCTION ITEMS WILL BE PROVIDED AT FINAL ENG. PHASE

PREPARED UNDER THE SUPERVISION OF:

JOSEPH M. LONG RCE NO. 80591 DATE

DATE	BY	MARK	REVISIONS	APPR.	DATE

DESIGNED BY: DRAWN BY: CHECKED BY:

CITY OF BEAUMONT

APPROVED _____ 20 __

BY:_____

CALVARY CHAPEL CHURCH
C.U.P 2023-0907

PREPARED FOR:

SHEET 2
OF 4