Draft Initial Study and Notice of Intent to Adopt a Mitigated Negative Declaration for the Trinity Lutheran Church Campus Modification and Brandywine Homes a new 25-Unit Detached Single-Family Condominium Project in the City of Whittier, County of Los Angeles, California

Lead Agency:
City of Whittier
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Whittier, CA 90602-1772

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- This document is designed for double-sided printing -

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1 Introduction

The City of Whittier (Lead Agency) received applications for a General Plan Amendment (GPA), Zone Change (ZC), Tentative Parcel Map, Vesting Tentative Tract Map, Conditional Use Permit (CUP), and Development Review Permits from Trinity Lutheran Church of Whittier (property owner) as represented by Brandywine Homes, Incorporated (Applicant) for the development of the Trinity Lutheran church campus modification and Brandywine Homes new 25-unit detached single-family condominium project identified as Citrange. The approval of the applications constitute a *project* that is subject to review under the California Environmental Quality Act (CEQA) 1970 (Public Resources Code, Section 21000 et seq.), and the State CEQA Guidelines (California Code of Regulations, Section 15000 et. seq.).

This Initial Study has been prepared to assess the short-term, long-term, and cumulative environmental impacts that could result from the proposed church and residential project.

This report has been prepared to comply with Section 15063 of the State CEQA Guidelines, which sets forth the required contents of an Initial Study. These include:

- A description of the project, including the location of the project (See Section 2);
- Identification of the environmental setting (See Section 2.9);
- Identification of environmental effects by use of a checklist, matrix, or other methods, provided that entries on the checklist or other form are briefly explained to indicate that there is some evidence to support the entries (See Section 4);
- Discussion of ways to mitigate significant effects identified, if any (See Section 4);
- Examination of whether the project is compatible with existing zoning, plans, and other applicable land use controls (See Section 4.11); and
- The name(s) of the person(s) who prepared or participated in the preparation of the Initial Study (See Section 5).

1.1 – Purpose of CEQA

The body of state law known as *CEQA* was originally enacted in 1970 and has been amended a number of times since then. The legislative intent of these regulations is established in Section 21000 of the California Public Resources Code, as follows:

The Legislature finds and declares as follows:

a) The maintenance of a quality environment for the people of this state now and in the future is a matter of statewide concern.
b) It is necessary to provide a high-quality environment that at all times is healthful and pleasing to the senses and intellect of man.
c) There is a need to understand the relationship between the maintenance of high-quality ecological systems and the general welfare of the people of the state, including their enjoyment of the natural resources of the state.
d) The capacity of the environment is limited, and it is the intent of the Legislature that the government of the State takes immediate steps to identify any critical thresholds for the health and safety of the people of the state and take all coordinated actions necessary to prevent such thresholds being reached.
e) Every citizen has a responsibility to contribute to the preservation and enhancement of the environment.

f) The interrelationship of policies and practices in the management of natural resources and waste disposal requires systematic and concerted efforts by public and private interests to enhance environmental quality and to control environmental pollution.
g) It is the intent of the Legislature that all agencies of the state government which regulate activities of private individuals, corporations, and public agencies which are found to affect the quality of the environment, shall regulate such activities so that major consideration is given to preventing environmental damage, while providing a decent home and satisfying living environment for every Californian.

The Legislature further finds and declares that it is the policy of the State to:

a) Develop and maintain a high-quality environment now and in the future, and take all action necessary to protect, rehabilitate, and enhance the environmental quality of the state.
b) Take all action necessary to provide the people of this state with clean air and water, enjoyment of aesthetic, natural, scenic, and historic environmental qualities, and freedom from excessive noise.
c) Prevent the elimination of fish or wildlife species due to man's activities, insure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities and examples of the major periods of California history.
d) Ensure that the long-term protection of the environment, consistent with the provision of a decent home and suitable living environment for every Californian, shall be the guiding criterion in public decisions.
e) Create and maintain conditions under which man and nature can exist in productive harmony to fulfill the social and economic requirements of present and future generations.
f) Require governmental agencies at all levels to develop standards and procedures necessary to protect environmental quality.
g) Require governmental agencies at all levels to consider qualitative factors as well as economic and technical factors and long-term benefits and costs, in addition to short-term benefits and costs and to consider alternatives to proposed actions affecting the environment.

A concise statement of legislative policy, with respect to public agency consideration of projects for some form of approval, is found in Section 21002 of the Public Resources Code, quoted below:

> The Legislature finds and declares that it is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required by this division are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects. The Legislature further finds and declares that in the event specific economic, social, or other conditions make infeasible such project alternatives or such mitigation measures, individual projects may be approved in spite of one or more significant effects thereof.

1.2 – Public Comments

Comments from all agencies and individuals are invited regarding the information contained in this Initial Study. Such comments should explain any perceived deficiencies in the assessment of impacts, identify the information that is purportedly lacking in the Initial Study or indicate where the information may be found. All comments on the Initial Study are to be submitted to:

Ellen Fitzgerald, Senior Planner
City of Whittier, Community Development Department
13230 Penn Street, Whittier, CA 90602-1772
O: 562-567-9320 F: 562-567-2872
efitzgerald@cityofwhittier.org

Following a 20-day period of circulation and review of the Initial Study, all comments will be considered by the City of Whittier prior to adoption.

1.3 – Availability of Materials

All materials related to the preparation of this Initial Study are available for public review. To request an appointment to review these materials, please contact:

Ellen Fitzgerald, Senior Planner
City of Whittier, Community Development Department
13230 Penn Street, Whittier, CA 90602-1772
O: 562-567-9320 F: 562-567-2872
efitzgerald@cityofwhittier.org

2 Project Description

2.1 – Project Title

Trinity Lutheran Church Campus Modification and Brandywine Homes New 25-Unit Detached Single-Family Condominium Project identified as Citrange.

2.2 – Lead Agency Name and Address

City of Whittier, 13230 Penn Street, Whittier, CA 90602-1772

2.3 – Contact Person and Phone Number

Ellen Fitzgerald, Senior Planner 562-567-9320

2.4 – Project Location

Regionally, the project site is located in the City of Whittier, Los Angeles County, California. The City of Whittier (City) is located within the southeastern portion of Los Angeles County, approximately 20 miles southeast of Downtown Los Angeles; refer to Figure 1, Regional Context. The City is bordered by the unincorporated community of Hacienda Heights and the cities of La Habra Heights and Industry to the north/northeast. The City of Pico Rivera lies to the west, La Habra to the southeast and the Cities of Santa Fe Springs, La Mirada, Norwalk, and Orange County to the south. Regional access to the City is provided via Interstate Route 605), which is located near the City's western boundary. The project site is approximately one mile east of the Whittier Blvd./I-605 interchange.

The project encompasses one parcel located at 11716 Floral Drive, Whittier in Los Angeles County, California (Assessor's Identification Number 8132-022-007). The parcel is south of Floral Drive, west of Beverly Boulevard and directly adjacent to Dexter Middle School along its western boundary (see Figure 2, Vicinity Map). The parcel is 332.43 feet wide by approximately 494.32 feet deep with property frontage on Floral Drive only. The latitude and longitude is 33° 59' 28.57" North and 118° 03' 05.74" West.

2.5 – Project Sponsor's Name and Address

Owner:
Trinity Lutheran Church of Whittier
11716 Floral Drive
Whittier, CA 90601
562-699-7431

Applicant:
Brandywine Homes, Inc.
16580 Aston
Irvine, CA 92606
714-552-5161

Figure 1 Regional Context

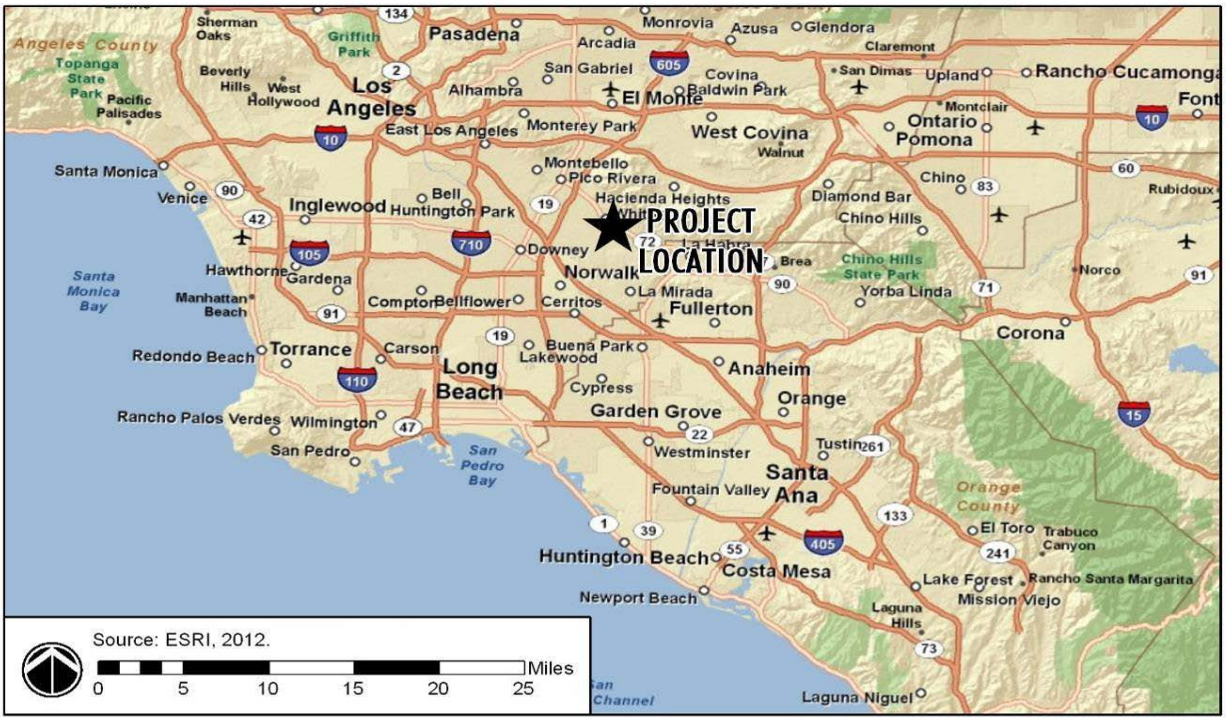


Figure 2 Vicinity Map



Imagery ©2020 MaxarTechnologies, U.S. Geological Survey, USDA Farm Service Agency, Map data ©2020

2.6 – General Plan Land Use Designation

The City of Whitter 1993 General Plan Land Use Map, as amended, designates the project site as Public and Quasi Public - Private School, which is intended for institutional uses.

The Proposed 2040 Envision Whittier General Plan Update Land Use Map designates the 3.59-acre parcel of land as Public and Quasi Public.

2.7 – Zoning

The project site is zoned R-1 Single-Family Residential Zone.

2.8 – Project Description

General Plan Amendment No. 19-0003 is a request to amend the Land Use Map from Public and Quasi Public - Private School to Medium Density Residential on a 3.59-acre parcel of land located at 11716 Floral Drive.

Change of Zone No. 19-0002 is a request to amend the Zoning Map from R-1 Low Density Residential to R-2 Medium Density Residential on the 3.59-acre parcel of land located at 11716 Floral Drive for the church and residential development.

Tentative Parcel Map No. 19-0003 (TPM 82832) proposes to subdivide the 3.59-acre subject area into two separate parcels. Parcel 1 consisting 2.56 acres is proposed for residential development and Parcel 2 at 1.03 acres will remain for the Trinity Lutheran Church facility.

Vesting Tentative Tract Map No. 19-0001 (VTTM 82802) proposes a 2.56-acre single lot map for residential condominium purposes.

Development Review No. DRP19-0073 involves the new construction and operation of a 25-unit detached single-family condominium project.

Conditional Use Permit No. 19-0009 will permit the continued operation of the church use on the smaller 1.03-acre campus.

Development Review No. DRP19-0074 involves modifications to an existing church facility that includes demolition of the existing 14,545 square feet church administration building with an attached gymnasium, two existing school classroom buildings comprising 13,334 square feet, and four existing smaller storage sheds totaling 1,125 square feet and remodeling the church by adding a new 2,794 square foot parish hall, adding new classrooms, offices and a reception area consisting of 2,590 square feet, reconfiguring the parking area and restriping the parking lot to accommodate the new design in the area to the west of the existing church structure, constructing a new front facade for the primary church structure and providing landscaping improvements along Floral Drive.

BACKGROUND

Trinity Lutheran Church has had a constant presence in Whittier for over 112 years, beginning in a small home in East Whittier in 1908. Trinity Lutheran formally organized with five families comprising charter membership on January 24, 1909. Over the next half-century, the congregation established deep roots in Whittier, relocating and constructing their school facilities on Floral Drive in 1950; and the eventual relocation of their congregation with the construction of a Parish Hall in 1958 and a large sanctuary in 1964. The Fireside Room fronting on Floral Drive was added in 1983.

In 1981, the City of Whittier processed Conditional Use Permit No. C81-06 to allow the continued use of the existing church and parochial school and permitted the expansion of the school facilities to accommodate their enrollment needs.

Trinity Lutheran School ceased operations in 2016, and the school buildings are currently vacant and in disrepair. The iconic main sanctuary and steeple was constructed in 1964 and needs refurbishment to fit the current needs of the congregation. Deferred maintenance at the facility is impacting the surrounding neighborhood. The church determined that a sale of the school property would allow them to preserve and modernize their existing location in Whittier.

PROJECT CHARACTERISTICS

The project is proposing a financing subdivision with two parcels: a 2.56 acre residential subdivision containing 25 detached airspace condominiums; and a 1.03 acre parcel to contain the existing Trinity Lutheran Church sanctuary, offices, as well as a new renovation and expansion of the parish meeting hall facility. The property owner proposes to sell Parcel 2 to a residential developer, Brandywine Homes, which will construct 25 single-family detached residential units, guest parking, and common area facilities. A one-lot Vesting Tentative Tract Map will be processed for condominium purposes on the 2.56-acres to allow for the residential development. The existing school administration and classroom buildings will be demolished before the residential project may be constructed. Refer to Appendix A Project Plans and Table 2.8-1, Proposed Uses.

Table 2.8-1

Proposed Uses

Proposed Use	DU	Sq. Ft.	Net Acres
Parcel 1 – Sanctuary, Offices, Meeting Hall		9,829	1.03
Parcel 2 - Single Family Detached Condominiums	25		2.56
Total	25	9,829	3.59

SITE ACCESS

Access to the residential portion of the project site will be from a singular non-gated 26-foot entry on Floral Drive, located to the easterly end of the frontage. Access to Trinity Lutheran Church will continue to use the existing 30-foot driveway on Floral Drive located at the west end of the frontage. The church will also maintain eight (8) diagonal parking stalls which will load directly from Floral Drive.

WALLS AND FENCES

A variety of walls, fences, and gates will be provided throughout the site, as noted below and as shown in Appendix A Project Plans - Conceptual Landscape Plan.

Project Entry/Northern Boundary: A new 6-foot high split face concrete masonry block (CMU) wall along Floral Drive with an Entry Monument.

Western/Eastern/Southern Property Boundary: A new 6-foot high split face CMU wall will be constructed.

Boundary between Church and Residential Property: A new 6-foot high tubular steel fence will be constructed.

Single Family Homes: A combination of vinyl fencing in private yards, with 6-foot high CMU walls in public areas will be constructed.

25-UNIT DETACHED SINGLE-FAMILY CONDOMINIUMS

On a future new parcel of 2.56 acres, the applicant, Brandywine Homes, proposes a total of 25 new, detached, condominium units which are designed as individual single-family residences in their "Citrange" project. Three different floor plans are proposed. Plan 1, with 1,953 square feet of living area is three bedrooms and 2.5 baths, Plan 2, 4 bedrooms and 2.5 baths and 1,969 square feet and Plan 3, with 4 bedrooms and 3 baths is 2,103 square feet. Each unit has a two-car garage.

The project applicant has designed the project to incorporate three architectural styles which are common in the city generally, but not extensively represented in the immediately adjacent neighborhood where there is no specific style, though many nearby residences are smaller, single-story, mid-century and ranch style homes built during the late 1940's to early 1960's. Larger, multi-family apartment structures adjoining the site which front on Beverly Boulevard and Magnolia Avenue were built at approximately the same time, with varying, indistinct architectural style. Three distinct styles, Cottage, Farmhouse and Spanish, are proposed. Style A, Cottage is noted in Green, Style B, Farmhouse in Blue, and Style C, Spanish, in Red as shown on the Project Plans in Appendix A. The typical features of each style are incorporated into each unit of that particular design, but based on the location of each unit, various enhancements are included. All homes will be constructed with solar photovoltaic systems standard and will incorporate the latest energy efficiency technology as required by the California Energy Commission.

The 25 residences served by a private driveway system, accessed from Floral Drive. Two residences will be oriented to face Floral Drive, with the remodeled church on the adjoining property. Existing land uses to the south and east are at equal or higher residential density. Homes plotted along these edges meet the required setback for R-2 zoning. The plan meets all requirements for R-2 zoning, including open space, setbacks and height restrictions.

The City of Whittier will collect approximately $420,000 in impact fees from this project, which will be used to enhance capital facilities related to municipal services. Additionally, Brandywine will provide in-kind improvements to the Floral Drive street frontage, including new sidewalk, landscaping, street-lighting, and removal of overhead utility lines. The site plan has been carefully designed to reduce privacy concerns with adjacent R-2 zoned homes located on Orange Avenue through the use of privacy windows facing the perimeter.

Parking

The parking requirements contained in Chapter 18.48 (Off-Street Parking) of the Whittier Municipal Code (WMC) are required for the project based on the following provisions:

- 2.25 spaces for each unit with three or more bedrooms, with two spaces required for ownership units to be provided within a garage. The remainder (.25 spaces per unit) may be uncovered.
- 1 guest parking space for each 4 units.

As required, each of the 25 units is designed with a garage, for a total of 50 garage spaces. In addition, 14 uncovered spaces are provided, 7 of these spaces are required guest spaces and 7 spaces are remainder spaces for the residential units. Per WMC Section 18.48.020, the remainder spaces "*may be leased/rented to residents by the project owner or homeowner's association or be designated as additional uncovered guest parking".* The number of spaces provided is in compliance with the number required at 64 spaces.

Site Demolition & Grading

Two school classroom buildings, an administrative building/gymnasium and four storage sheds will be demolished as part of the construction process. The site requires grading and import of approximately 8,905 cubic yards of fill material to support the proposed development. A haul route has not been specified at this time.

Landscaping

In Appendix A, Project Plans - Conceptual Landscape Plan, it illustrates the various of trees, shrubs, succulents, grasses, and vines that will be installed throughout the site for the following areas, uses, and amenities:

- Entry Monument
- Enhanced Paving
- Bench Seating
- Private Yards
- Vinyl Fencing in Private Yards
- Split Face Masonry Walls in Public Areas
- Covered Outdoor Dining/Cooking Area
- Multi-Use Lawn Area
- Mailbox

The applicant is proposing to landscape approximately 21,670 square feet of the entire project site.

Open Space

The proposed project includes both common and private open space. A total of 13,390 square feet of private open space (655 square feet per home) will be provided in enclosed rear/side yard spaces reserved for exclusive use. The City development standard requires 250 square feet of open space per dwelling unit per R2 standards. Common open space is provided into two public gathering areas central to the project site. A shade structure with seating, freestanding barbeque and picnic table is also provided for the project. A concrete walkway will provide access around the development for public accessibility to the on-site amenities as well as to Floral Drive.

New Infrastructure

Storm Drain – Stormwater will drain south and west through an on-site private drainage system and enter into two catch basins located in the eastern portion of the site. Storm water will be treated and released onto existing public drainage structures in Dexter Middle School utilizing historic drainage patterns, under agreement with the school district.

Sanitary Sewer – Because the site slopes down in elevation southward away from Floral Drive, a public sewer gravity connection is not feasible. Sewer collection will be accomplished by way of private sewer laterals and mains which will drain south and west to a proposed lift station which will then pump sewage through a force main connecting to a new manhole and the existing 6" sewer line in Floral Drive.

Domestic Water – Domestic water will be provided to the project through a connection to the existing main in Floral Drive and distributed through a private water system to individual meters for each house, and to a common irrigation meter. Fire sprinkler flow will be supplied by individual house meters.

Streets, Circulation and Parking – The residential portion of the project will take access from Floral Drive at the northeast corner of the site. Circulation will be achieved using a looping private drive aisle that meeting LA County Fire access standards. A shared parking agreement between the church and the home-owners association will allow for residential parking in the church lot on designated spaces during off-peak use periods.

Dry Utilities – The residential portion of the project will be served with a new underground electric distribution system which connects to the existing overhead power lines via a pole-mounted riser just east of the project entry on Floral Drive. A private street light system will be constructed within the tract.

Solid Waste Collection

Trash storage will be in the garage or side yard of each residential unit, and containers (green waste, landfill, and recyclables) will be picked up by Athens Services (City franchisee) weekly on Thursday. Appendix A, Project Plans illustrates the conceptual trash collection plan and truck maneuvering scheme.

REMODELED TRINITY LUTHERAN CHURCH

Trinity's footprint shrinks from 3.59 acres to 1.03 acres. The modifications to the existing church facility includes demolition of the existing 14,545 square feet church administration building with an attached gymnasium, two existing school classroom buildings comprising 13,334 square feet, and four existing smaller storage sheds totaling 1,125 square feet and remodeling the church by a reduction in fixed seating is shown on the site/floor plan, adding a new 2,794 square foot parish hall at the southern end of the existing sanctuary, adding new classrooms, administrative offices and a reception area to the north of the existing sanctuary consisting of 2,590 square feet, reconfiguring the parking area and restriping the parking lot to accommodate the new design in the area to the west of the existing church structure, constructing a new front facade for the primary church structure and providing landscaping improvements along Floral Drive.

The architectural style reflects clean lines of the Prairie Style movement, a transitional style melding the 1960s-style sanctuary with the 1940s & 1950s home styles found in the surrounding neighborhood.

A new façade will be added to the front of the existing sanctuary, and a new 2,794 square foot parish hall, at approximately 17 feet in height, with a flat roof will be constructed at the south end of the existing sanctuary. The church's iconic bell tower will remain in place, as will the main sanctuary building. A modern parking lot will be constructed at the location of the existing parking, but with the addition of safety lighting, landscaped islands, and trees. While not required, Trinity has agreed to allow for overflow residential guest parking beyond the required number of guest spaces, as a gesture to the neighborhood to prevent residential parking spillover. The new parking lot has been sized appropriately for the reformatted church buildings, and a parking demand study was conducted to determine the adequate number of parking spaces.

The addition of classroom and administrative space at the front of the existing structure will modify the view of the entry from Floral Drive. The existing open porch will be enclosed and additional square footage added, which will eliminate decorative stone covered walls and columns. Multiple entry doors will be replaced with a single door and windows. An expanded planter at the front, with ramps and landings, will be added, and finished with wire-cut brick. The remodeled church nave and sanctuary will result in the addition of entry doors at the west elevation, providing access from the parking lot. A new door will be added to the east elevation, as well as new windows corresponding with the front porch area changes and interior classroom and administrative offices addition. The exterior of the parish hall will be finished in smooth stucco to match the remodeled structure, and wire-cut brick trim will be incorporated on the façade, to match the proposed walls at the church ramps.

Access and Parking

The church portion of the project will take access from Floral Drive at the northwest corner, using a reconfigured 30-foot driveway. A shared parking agreement between the church and the home-owners association will allow for residential parking in the church lot on designated spaces during off-peak use periods. The Church will modify its current parking lot to a configuration with 48 off-street spaces.

Dry Utilities

The church portion of the project will utilize its existing electric meter and service connection.

PROJECT PHASING AND CONSTRUCTION

The proposed project will be constructed in the following phases: 1) demolition (2 weeks); 2) grading and foundation preparation (3 weeks); 3) underground utility mainline installation (2 months); 4) dry utility mainline installation (3 weeks); and 5) building construction (24 months). The project is anticipated to start construction in January 2022 and be completed in June 2024.

2.9 – Surrounding Land Uses and Setting

The City of Whittier is located in the eastern portion of Los Angeles County, 20 miles east of downtown Los Angeles. The City is on the southwestern slopes of the Puente Hills just east if the San Gabriel River and the San Gabriel River Freeway (State Route 605). The land features a sloping terrain on the north and east where the Puente Hills are located and becomes flat on the southern and western sections. Neighboring cities and communities include Pico Rivera and Los

Nietos on the west, Santa Fe Springs and La Mirada on the south, La Habra and La Habra Heights on the east, and the unincorporated communities of Hacienda Heights and Rowland Heights on the north.

The approximately 3.82 gross acre/3.59 net acre project site includes one parcel at 11716 Floral Drive (Assessor Parcel No. 8132-022-007) with direct access to Floral Drive, which borders the site's northern boundary.

The project site is currently in use for religious gathering & assembly, and formerly included a private school, and was developed in the 1960s by Trinity Lutheran Church. The school ceased operations in 2016 and related buildings are currently vacant. The church continues to operate its sanctuary, offices and meeting facilities on a weekly basis.

Table 2.9-1
Surrounding Land Uses

Direction	General Plan Designation	Zoning District	Existing Land Use
Project Site	P (Private School)	R-1 Single Family Residential	Church facility
North	Low Density Residential	R-1 Single Family Residential	Floral Drive and single-family residential
South	Medium Density Residential	R-2 Light Multiple Residential and R-1 Single Family Residential	Single-family residential
East	High Density Residential	R-4 Heavy Multiple Residential	Multiple-family residential buildings including the Magnolia Terrace Apartments
West	J (Junior High School)	R-1 Single Family Residential	Dexter Middle School and Palm Park Aquatic Center

2.10 – Required Approvals

The City of Whittier (lead agency under CEQA) will use this IS/MND in making decisions with regard to the approval of the 25-Unit Residential Condominium Development (Brandywine Residential Tract) and the Trinity Lutheran Church remodel/new construction project, subsequent construction and development of the project. The City of Whittier is the only land use authority for this project requiring the following approvals:

- General Plan Amendment No. 19-0003.
- Change of Zone No. 19-0002.
- Tentative Parcel Map No. 19-0003 (TPM 82832).
- Vesting Tentative Tract Map No. 19-0001 (VTTM 82802).
- Development Review No. DRP19-0073.
- Conditional Use Permit No. 19-0009, and

- Development Review No. DRP19-0074.

2.11 – Other Public Agencies Whose Approval is Required

The implementation of the proposed improvements would require the issuance of permits from various public agencies. The permits and approvals from lead, responsible, and trustee agencies that are necessary include:

Agencies that will review the proposed project include the following:

- Los Angeles County Fire Department approval of proposed site improvements.
- California Regional Water Quality Control Board for water quality permits.
- South Coast Air Quality Management District for Potential asbestos and lead-based paint clearances.
- State Department of Toxic Substances and Control for transport of hazardous waste materials.

2.12 – Tribal Consultation

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 significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

Yes. See Section 4.18 Tribal Cultural Resources for expanded discussion.

3 Determination

3.1 – 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	☐	Agriculture & Forestry Resources	☐	Air Quality
☐	Biological Resources	☐	Cultural Resources	☐	Energy
☐	Geology /Soils	☐	Greenhouse Gas Emissions	☐	Hazards & Hazardous Materials
☐	Hydrology/Water Quality	☐	Land Use / Planning	☐	Mineral Resources
☐	Noise	☐	Population / Housing	☐	Public Services
☐	Recreation	☐	Transportation	☐	Tribal Cultural Resources
☐	Utilities/Service Systems	☐	Wildfire	☐	Mandatory Findings of Significance

3.2 – Determination

☐	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.
☐	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 'potentially 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 adequately 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.

Name: Ellen Fitzgerald, Senior Planner Date

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) 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).

2) 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.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers 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: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than 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 "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses 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 explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and
   b) the mitigation measure identified, if any, to reduce the impact to less than significance.

4 Evaluation of Environmental Impacts

4.1 – Aesthetics

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?				☑
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				☑
c) Conflict with applicable zoning and other regulations governing scenic quality?			☑	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			☑	

Sources

Information used to prepare the Aesthetics section is from the following sources: aerial photographs of the project area, the *City of Whittier General Plan, 1993*, p. 5-20 and Exhibit 5-4: Design and Scenic Corridors and Entryways, the California Department of Transportation, California Scenic Highway Mapping System accessed July 30, 2021 and the City of Whittier *Municipal Code, Title 18 Zoning*.

Environmental Setting

The proposed project is located within an urbanized area, and the majority of the project area is developed. Scenic resources within the City and the City's Sphere of Influence include the Puente Hills to the north of the City, and scenic roadway corridors such as Colima Road, Turnbull Canyon Road, Beverly Boulevard, and Skyline Drive. Puente Hills provide a visual framework for the City and a break in urban development. The Puente Hills provide a valuable and unique visual amenity and are visible from almost any part of the City.

Discussion

a) **No Impact.** Scenic vistas can be impacted by development in two ways. First, a structure may be constructed that blocks the view of a vista. Second, the vista itself may be altered (i.e., development on a scenic hillside). The proposed project is located within an urbanized area visually dominated by residential and institutional land uses.

The proposed project is located on a predominately-developed site on Floral Drive within a fully urbanized area visually dominated by single-family and multiple-family residential land uses

together with institutional uses and surface street features. This site is not considered to be within or to comprise a portion of a scenic vista. Demolition of the existing structures, remodeling of the church facility and construction of the new 25 single-family residences would have no effect on a scenic vista. The proposed development is generally compatible in type and scale with the existing and planned surrounding development.

Due to the existing standards in place as identified in the Whittier Municipal Code, the relatively low scale of the proposed project, and the distance of the project from view sheds, no impacts on scenic vistas would occur. Therefore, no further analysis of this environmental issue is necessary.

b) **No Impact.** The project is not adjacent to a designated state scenic highway or eligible state scenic highway as identified on the California Scenic Highway Mapping System. Thus, the proposed project would not damage the integrity of existing visual resources or historic buildings located along a State Scenic Highway. No impact on scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway, would result with the demolition of the existing structures, remodeling of the church facility and construction of the new 25 single-family residences. No further analysis is required.

c) **Less Than Significant Impact.** Development of a proposed project could result in a significant impact if it resulted in substantial degradation of the existing visual character or quality of the site and its surroundings. Degradation of visual character or quality is defined by substantial changes to the existing site appearance through construction of structures such that they are poorly designed or conflict with the site's existing surroundings.

Construction of the proposed project would result in short-term impacts to the existing visual character and quality of the area. Construction activities would require the use of equipment and storage of materials within the project site. However, construction activities are temporary and would not result in any permanent visual impact. The landscaping and trees in the existing surface parking lot south of Floral Drive will be modified. The project would add 24 trees as part of the church remodel and 137 trees within the residential portion of the project.

Construction of the proposed buildings would alter the existing visual character of the site. Upon project completion, the church campus will be reconfigured and 25 new residences will be constructed. The proposed project is similar in use and building type as existing nearby buildings on Floral Drive and Beverly Boulevard. The immediate surroundings of the project site are a combination of institutional and residential uses. Surrounding buildings are generally one to three stories in height. The parcel will be enclosed with walls and fencing on the southern, eastern and western property lines. With specified design features included, the project will have less than significant impacts on the visual character of the site and the surroundings.

d) **Less Than Significant Impact.** Excessive or inappropriately directed lighting can adversely impact nighttime views by reducing the ability to see the night sky and stars. Glare can be caused from unshielded or misdirected lighting sources. Reflective surfaces (i.e., polished metal) can also cause glare. Impacts associated with glare range from simple nuisance to potentially dangerous situations (i.e., if glare is directed into the eyes of motorists).

There are lighting sources adjacent to this site, including freestanding street lights, light fixtures on buildings, pole-mounted lights, and vehicle headlights. The proposed project includes exterior parking lot and security lighting and building interior lighting. However, only outdoor lighting could have any effect on neighboring land uses. Light spillover and glare will be prevented by standard development review, which requires conformance to the City's development standards regarding light placement, luminosity, and light shield. Adherence to the City's standard lighting

control procedures would reduce any impact associated with new lighting to a less-than-significant level.

Mitigation Measures

No mitigation is necessary because Aesthetic impacts will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.2 – Agriculture and Forest Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?				☑
b) Conflict with existing zoning for agricultural use, or 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))?				☑
d) Result in the loss of forest land or conversion of forest land to non-forest use?				☑
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?				☑

Sources

Information used to prepare this section is from the following sources: California Department of Conservation, *Farmland Mapping and Monitoring Program of the California Resources Agency*; and California Department of Forestry and Fire Protection and the USDA Forest Service,

California Land Cover Mapping and Monitoring Program (LCMMP), Vegetation GIS files for Pacific Southwest Region.

Environmental Setting

The proposed project is located in a suburban area surrounded by residential and institutional uses. According to the California Department of Conservation, *Farmland Mapping and Monitoring Program* Map, the City is predominately designated as urban and built up land. There are no current Williamson Act Contract lands as shown on the 2012 Williamson Act Lands map for Whittier.

Discussion

a) **No Impact.** The proposed project will be located in a fully developed urbanized area. The map of Important Farmland in California (2010) prepared by the Department of Conservation does not identify the project as being Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. No Williamson Act contracts are active for the project. Therefore, because the site has not been designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, there is no impact from the project on these types of farmland.

b) **No Impact.** Currently, the project is designated as P- Private School. There are no agricultural zones within the City of Whittier, which is a fully urbanized community. The project would have no effect upon agricultural resources within the City of Whittier or any other neighboring city or unincorporated county area.

c) **No Impact.** Public Resources Code Section 12220(g) identifies forest land as *land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.* The project site and surrounding properties are not currently being managed or used for forest land as identified in Public Resources Code Section 12220(g). The USDA Forest Service vegetation maps for the project identify it as *urban* type, indicating that it is not capable of growing industrial wood tree species. Therefore, implementation of this project will have no impact to any timberland zoning.

d) **No Impact.** The project areas are developed; thus, there will be no loss of forest land or conversion of forest land to non-forest use as a result of this project. No impact will occur.

e) **No Impact.** The project areas are previously developed within an urban environment. The project would not encroach onto agricultural land and would not encourage the conversion of existing farmland to non-agricultural uses. None of the surrounding sites contain existing forest uses. Development of this project will not change the existing environment in a manner that will result in the conversion of forest land to a non-forest use. No impact will occur.

Mitigation Measures

No mitigation measures are necessary because Agricultural and Forestry impacts will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.3 – Air Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management 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?			☑	
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?		☑		
c) Expose sensitive receptors to substantial pollutant concentrations?			☑	
d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?			☑	

Sources

Information used to prepare this section is from the following sources: *City of Whittier General Plan*, 1993 and RK Engineering Group, Inc., Whittier Floral Residential Project Air Quality and Greenhouse Gas Analysis, City of Whittier, California prepared for Brandywine Homes and dated March 24, 2021.

Environmental Setting

Local jurisdictions, such as the City of Whittier, have the authority and responsibility to reduce air pollution through its police power and decision-making authority. Specifically, the City is responsible for the assessment and mitigation of air emissions resulting from its land use decisions. The City is also responsible for the implementation of transportation control measures as outlined in the 2016 AQMP. Examples of such measures include bus turnouts, energy-efficient streetlights, and synchronized traffic signals. In accordance with CEQA requirements and the CEQA review process, the City assesses the air quality impacts of new development projects, requires mitigation of potentially significant air quality impacts by conditioning discretionary permits, monitoring and enforcing implementation of such mitigation. In accordance with the CEQA requirements, the City does not, however, have the expertise to develop plans, programs, procedures, and methodologies to ensure that air quality within the City and region will meet federal and state standards. Instead, the City relies on the expertise of the SCAQMD and utilizes the SCAQMD CEQA Handbook and CalEEMod as the guidance documents for the environmental review of plans and development proposals within its jurisdiction.

Discussion

a) **Less Than Significant Impact.** The California Environmental Quality Act (CEQA) requires a discussion of any inconsistencies between a proposed project and applicable General Plans and Regional Plans (CEQA Guidelines Section 15125). The regional plan that applies to the proposed project includes the SCAQMD Air Quality Management Plan (AQMP). Therefore, this section discusses any potential inconsistencies of the proposed project with the AQMP.

The purpose of this discussion is to set forth the issues regarding consistency with the assumptions and objectives of the AQMP and discuss whether the proposed project would interfere with the region's ability to comply with Federal and State air quality standards. If the decision-makers determine that the proposed project is inconsistent, the lead agency may consider project modifications or inclusion of mitigation to eliminate the inconsistency.

The SCAQMD CEQA Handbook states that "New or amended General Plan Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP." Strict consistency with all aspects of the plan is usually not required. A proposed project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies.

The SCAQMD CEQA Handbook identifies two key indicators of consistency:

(1) Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.
(2) Whether the project will exceed the assumptions in the AQMP in 2016 or increments based on the year of project buildout and phase.

Criterion 1 - Increase in the Frequency or Severity of Violations

The results of the short-term construction emission levels and long-term operational emission levels show that the project would not result in significant impacts based on the SCAQMD regional and local thresholds of significance. Therefore, the proposed project would not contribute to the exceedance of an air pollutant concentration standard and is found to be consistent with the AQMP for the first criterion.

Criterion 2 - Exceed Assumptions in the AQMP

Consistency with the AQMP assumptions is determined by performing an analysis of the proposed project with the assumptions in the AQMP. The emphasis of this criterion is to ensure that the analyses conducted for the proposed project are based on the same forecasts as the AQMP. The 2016-2040 Regional Transportation/Sustainable Communities Strategy, prepared by the Southern California Association of Governments (SCAG), 2016, includes chapters on: the challenges in a changing region, creating a plan for our future, and the road to greater mobility and sustainable growth. These chapters currently respond directly to federal and state requirements placed on SCAG. Local governments are required to use these as the basis of their plans for purposes of consistency with applicable regional plans under CEQA.

The project requires a General Plan amendment from Private School use to Medium Density Residential. The proposed project is expected to result in increased operational emissions from mobile sources and energy sources, compared to the previously approved use. However, as shown in the regional and localized emissions analysis, the project is below the SCAQMD thresholds of significant for cumulative impacts. The impact is considered less than significant.

b) **Less Than Significant Impact with Mitigation Incorporated.** A project may have a significant impact if project related emissions would exceed federal, state, or regional standards or thresholds, or if project-related emissions would substantially contribute to existing or project air quality violations. The proposed project is located within the South Coast Air Basin, where efforts to attain state and federal air quality standards are governed by the South Coast Air Quality Management District (SCAQMD). Both the State of California (State) and the Federal government have established health-based ambient air quality standards (AAQS) for seven air pollutants (known as 'criteria pollutants'). These pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), inhalable particulate matter with a diameter of 10 microns or less (PM_{10}), fine particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$), and lead (Pb). The State has also established AAQS for additional pollutants. The AAQS are designed to protect the health and welfare of the populace within a reasonable margin of safety. Where the state and federal standards differ, California AAQS are more stringent than the national AAQS.

Short Term Air Quality Impacts - Construction

Regional Emissions - Construction

Regional air quality emissions include both on-site and off-site emissions associated with construction of the project. Regional daily emissions of criteria pollutants are compared to the SCAQMD regional thresholds of significance. As shown in Table 4.3-3, regional daily emissions of criteria pollutants are expected to be below the allowable thresholds of significance. CalEEMod daily emissions outputs are provided in Appendix B.

The project must follow all standard SCAQMD rules and requirements with regards to fugitive dust control. Compliance with the dust control is considered a standard requirement and included as part of the project's design features, not mitigation.

Table 4.3-1
Regional Construction Emissions – Unmitigated

Maximum Daily Emissions (lbs/day)[1]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Demolition	2.07	20.55	15.21	0.03	1.49	1.07
Site Preparation	1.58	18.31	11.07	0.03	1.40	0.74
Grading	2.22	31.48	12.80	0.05	4.30	2.39
Building Construction	2.10	16.35	15.08	0.03	0.96	0.82
Paving	1.00	9.37	12.25	0.02	0.66	0.50
Architectural Coating	32.10	1.41	1.89	0.00	0.10	0.09
Maximum[1]	33.10	31.48	15.08	0.05	4.30	2.39
SCAQMD Threshold	75	100	550	150	150	55
Exceeds Threshold (?)	**No**	**No**	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.

Table 4.3-1 shows that, the project's daily construction emissions will be below the applicable SCAQMD regional air quality standards and thresholds of significance. As a result, the project would not contribute substantially to an existing or projected air quality violation. Furthermore, by complying with the SCAQMD standards, the project would not contribute to 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors). The project's short-term construction impact on regional air resources is less than significant with mitigation.

Localized Emissions - Construction

Table 4.3-2 illustrates the construction related localized emissions and compares the results to SCAQMD LST thresholds. As shown in Table 4.3-2, the emissions will be below the SCAQMD thresholds of significance for localized construction emissions. The project must follow all standard SCAQMD rules and requirements with regards to fugitive dust control. Compliance with the dust control is considered a standard requirement and included as part of the project's design features, not mitigation.

Table 4.3-2
Localized Construction Emissions

Maximum Daily Emissions (lbs/day)[1]				
Activity	**NOx**	**CO**	**PM10**	**PM2.5**
On-site Emissions	20.21	14.56	3.42	2.13
SCAQMD Construction	114.0	861.0	7.0	4.0
Exceeds Threshold (?)	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes on-site project emissions only.

[2] Reference 2006-2008 SCAQMD Mass Rate Localized Significant Thresholds for construction and operation. SRA-5, Southeast LA County, 2-acre site, receptor distance 25 meters.

The project's short-term construction impact to localized air resources is less than significant.

Fugitive Dust - Construction

The Project is required to comply with regional rules that assist in reducing short-term air pollutant emissions associated with suspended particulate matter, also known as fugitive dust. Fugitive dust emissions are commonly associated with land clearing activities, cut and-fill grading operations, and exposure of soils to the air and wind. SCAQMD Rule 403 requires that fugitive dust is controlled with best-available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rules 402 and 403 require implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site. Applicable suppression techniques are as follows:

1. All active construction areas shall be watered two (2) times daily.

2. Speed on unpaved roads shall be reduced to less than 15 mph.
3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.
8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.
12. A fugitive dust control plan should be prepared and submitted to SCAQMD prior to the start of construction.

Localized construction emissions indicate daily construction emissions, with standard control measures, would be below the applicable thresholds established by the SCAQMD. The proposed project's short-term construction activities would cause less than significant Fugitive Dust impacts.

Long Term Air Quality Impacts - Operation

Regional Emissions - Operation

Long-term operational air pollutant impacts from the project are shown in Table 4.3-3. The project is not expected to exceed any of the allowable daily emissions thresholds for criteria pollutants at the regional level. CalEEMod daily emissions outputs are provided in Appendix B.

Table 4.3-3
Regional Operational Emissions

Maximum Daily Emissions (lbs/day)[1]						
Activity	**VOC**	**NOx**	**CO**	**SO2**	**PM10**	**PM2.5**
Mobile Sources	0.48	2.27	6.42	0.02	1.91	0.52
Energy Sources	0.02	0.19	0.09	0.00	0.02	0.02
Area Sources	1.18	0.39	2.30	0.00	0.04	0.04
Total	1.68	2.86	8.81	0.03	1.97	0.58
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold (?)	**No**	**No**	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.

The project's daily operational emissions will be below the applicable SCAQMD regional air quality standards and thresholds of significance, and the project would not contribute substantially to an existing or projected air quality violation. Furthermore, by complying with the SCAQMD standards, the project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). The project related long-term air quality impacts are less than significant.

Localized Operational Emissions - Operation

Table 4.3-4 shows the localized operational emissions and compares the results to SCAQMD Localized Significance Thresholds (LST) thresholds of significance. As shown in Table 4.3-4, the emissions will be below the SCAQMD thresholds of significance for localized operational emissions.

Table 4.3-4
Localized Operational Emissions

Maximum Daily Emissions (lbs/day)[1]				
LST Pollutants	**NOx** (lbs/day)	**CO** (lbs/day)	**PM10** (lbs/day)	**PM2.5** (lbs/day)
On-site Emissions[2]	0.70	2.71	0.15	0.08
SCAQMD Operation Threshold[3]	114.0	861.0	2.0	1.0
Exceeds Threshold (?)	**No**	**No**	**No**	**No**

[1] Maximum daily emission in summer or winter.

[2] Mobile source emissions include on-site vehicle emissions only. It is estimated that approximately 5% of mobile emissions will occur on the project site.

[3] Reference: 2006-2008 SCAQMD Mass Rate Localized Significant Thresholds for construction and operation Table C-1 through C-6; SRA 5, Southeast Los Angeles County, disturbance area of 2-acre and receptor distance of 25 meters.

The project will result in less than significant localized operational emissions impacts.

CO Hot Spot Emissions

A CO hot spot is a localized concentration of carbon monoxide (CO) that is above the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm. At the time of the publishing of the 1993 CEQA Air Quality Handbook, the SCAB was designated nonattainment, and projects were required to perform hot spot analyses to ensure they did not exacerbate an existing problem. Since this time, the SCAB has achieved attainment status and the potential for hot spots caused by vehicular traffic congestion has been greatly reduced. In fact, the SCAQMD Air Quality Management Plan (AQMP) found that peak CO concentrations were primarily the result of unusual meteorological and topographical conditions, not traffic congestion. Additionally, the 2003 SCAQMD AQMP found that, at four of the busiest intersections in SCAB, there were no CO hot

spots concentrations. Furthermore, in the 2003 SCAQMD AQMP found that, at four of the busiest intersections in Los Angeles, there were no CO hot spots concentrations. Therefore, it is reasonable to conclude that the project would not significantly increase traffic congestion in the vicinity of the site that would lead to the formation of CO Hot Spots. The project impact to CO Hot Spots is less than significant.

c) **Less Than Significant Impact.** Sensitive receptors are those segments of the population that are most susceptible to poor air quality such as children, the elderly, the sick, and athletes who perform outdoors. Land uses associated with sensitive receptors include residences, schools, playgrounds, childcare centers, outdoor athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Environmental analysis identified sensitive receptors near the project as adjacent residences and portions of Dexter Middle School within 25 meters of the project site boundary. To ensure mitigation of potential impacts, the project must comply with SCAQMD rules requiring construction best practices to mitigate airborne dust, erosion, exhaust, and VOC's.

Asbestos - Construction

Based on the California Division of Mines and Geology General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos, naturally occurring asbestos, found in serpentine and ultramafic rock, has not been shown to occur within in the vicinity of the project site. Therefore, the potential risk for naturally occurring asbestos (NOA) during project construction is small. However, in the event NOA is found on the site, the project will be required to comply with the National Emission Standard for Hazardous Air Pollutants (NESHAP) standards. An Asbestos NESHAP Notification Form shall be completed and submitted to the CARB immediately upon discovery of the contaminant. The project will be required to follow NESHAP standards for emissions control during site renovation, waste transport and waste disposal. A person certified in asbestos removal procedures will be required to supervise on-site activities.

The project also includes demolition of existing structures (school buildings and gymnasium) that would be subject to the National Emissions Standards for Asbestos (40CFR Part 61 Subpart M). Prior to demolition of existing structures, an asbestos evaluation must be completed in accordance with the Asbestos NESHAP regulations. Section 61.145 requires written notification of demolition operations. This notification should be typewritten and postmarked or delivered no later than ten (10) days prior to the beginning of the asbestos demolition or removal activity. By following the required asbestos abatement protocols, the project impact is less than significant.

Diesel Particulate Matter - Construction

The greatest potential for toxic air contaminant emissions from the project would be related to diesel particulate matter (DPM) emissions associated with heavy diesel equipment used during construction. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 30-year lifetime will contract cancer, based on the use of standard risk-assessment methodology.

As shown in Tables 4.3-1 and 4.3-2, construction-based particulate matter (PM) emissions (including diesel exhaust emissions) do not exceed regional or local thresholds. Given the short-term construction schedule, the proposed project's construction activity is not expected to be a long-term (i.e., 30 years) substantial source of toxic air contaminant emissions and corresponding individual cancer risk.

However, it should be noted that a quantified diesel health risk assessment (HRA) was not included within the scope of this analysis. In September 2000, the CARB adopted the Diesel Risk Reduction Plan, which recommends several control measures to reduce the risks associated with diesel particulate matter (DPM). The key elements of the Plan are to clean up existing engines through engine retrofit emission control devices, to adopt stringent standards for new diesel engines, to lower the sulfur content of diesel fuel, and implement advanced technology emission control devices on diesel engines.

The project is located adjacent to a middle school with outdoor play areas facing the project site, therefore, in order to ensure the level of DPM exposure is reduced as much as possible, the project shall implement the best available pollution control strategies to minimize potential health risks. The following DPM control measures include:

- Utilize low emission "clean diesel" equipment with new or modified engines (Tier 4 or better) that include diesel oxidation catalysts, diesel particulate filters or Moyer Program retrofits that meet CARB best available control technology.
- Establish staging areas for the construction equipment that are as distant as possible from adjacent sensitive receptors.
- Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.
- Use haul trucks with on-road engines instead of off-road engines for on-site hauling.
- Provide temporary dust barriers or construct perimeter walls during the first phase construction.

With pollution control strategies, the project impact is less than significant.

Toxic Air Contaminants - Operations

The project would consist of single family residential uses and a church. This type of project does not include major sources of toxic air contaminants (TAC) emissions that would result in significant exposure of sensitive receptors to substantial pollutant concentrations. Therefore, the project impact is considered less than significant.

d) **Less Than Significant Impact.** According to the CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural operations, wastewater treatment plants, landfills, and certain industrial operations (such as manufacturing uses that produce chemicals, paper, etc.). Odors are typically associated with industrial projects involving the use of chemicals, solvents, petroleum products, and other strong-smelling elements used in manufacturing processes, as well as sewage treatment facilities and landfills.

Odors - Construction

Heavy-duty equipment in the project area during construction will emit odors; however, the construction activity would cease to occur after individual construction is completed. The project is required to comply with Rule 402 during construction, which states that 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. No other sources of objectionable odors have been identified for the proposed Project. Therefore, the project impact from odor emissions is less than significant.

Odors - Operation

The proposed project does not contain land uses that would typically be associated with significant odor emissions. The project will be required to comply with standard building code requirements related to exhaust ventilation, as well as comply with SCAQMD Rule 402. Rule 402 requires that a person may 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. Project related odors are not expected to meet the criteria of being a nuisance. The project's operation would result in less than significant odor impacts.

Recommended Project Design Features

The following recommended project design features are considered standard building code requirements and best practices that will be included in the project design.

DF-1. Comply with the mandatory requirements of Title 24 part 11 of the California Building Standards Code (CALGreen) and the Title 24 Part 6 Building Efficiency Standards, including net zero energy requirements.

DF-2. Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and reduce the amount of turf.

DF-3. Comply with the mandatory requirements of CalRecycle's residential recycling program and implement zero waste strategies.

DF-4. Provide the necessary infrastructure to support electric vehicle charging for both the residential and commercial components of the project.

DF-5. Use electric powered landscaping equipment for landscape maintenance.

Mitigation Measures

The following mitigation measures are recommended to help ensure the project does expose sensitive receptors to substantial pollutant concentrations. In particular, given the close proximity of sensitive receptors, including children at Dexter Middle School, several standard dust control measures have been included as mitigation to ensure adequate enforcement and compliance.

Construction Mitigation Measures:

AIR-1 The project must follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

1. All active construction areas shall be watered two (2) times daily.
2. Speed on unpaved roads shall be reduced to less than 15 mph.
3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.

7. Construction sites shall be sandbagged for erosion control.
8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.
12. A fugitive dust control plan should be prepared and submitted to SCAQMD prior to the start of construction.

AIR-2 Prepare and implement a Construction Management Plan which will include Best Available Control Measures to be submitted to the City of Whittier.

AIR-3 Construction equipment shall be maintained in proper tune.

AIR-4 Require all construction equipment to have Tier 4 low emission "clean diesel" engines that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

AIR-5 All construction vehicles shall be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

AIR-6 Minimize the simultaneous operation of multiple construction equipment units.

AIR-7 The use of heavy construction equipment and earthmoving activity should be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.

AIR-8 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

AIR-9 Establish staging areas for the construction equipment that are as distant as possible from adjacent sensitive receptors (residential land uses).

AIR-10 Use haul trucks with on-road engines instead of off-road engines for on-site hauling.

AIR-11 Utilize zero VOC and low VOC paints and solvents, wherever possible.

AIR-12 Provide temporary dust barriers or construct perimeter walls during the first phase of construction.

Level of Significance After Mitigation

Air Quality impacts will be less than significant with design features and mitigation satisfied.

4.4 – Biological Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?				☑
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?				☑
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?				☑
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?				☑
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				☑
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?				☑

Sources

Information used to prepare this section is from the following sources: California Natural Diversity Database; United States Fish and Wildlife Service, National Wetlands Inventory, Wetlands Mapper; US Fish & Wildlife Services, Environmental Conservation Online System; California Department of Fish and Wildlife, California Regional Conservation Plans Map; Los Angeles County Department of Regional Planning. *2035 General Plan*. October 6, 2015. Chapter

9: Conservation and Natural Resources Element, Figure 9.3: Significant Ecological Areas and Coastal Resource Areas Policy Map, and *City of Whittier General Plan Update*, 1993.

Environmental Setting

The proposed project is located within an urbanized area, and the majority of the project area is developed.

Discussion

a) **No Impact.** Wildlife habitats within the City are generally limited to parks, nature preserves, and water body areas. The project site is developed. Formal landscaping currently exists on-site and will be enhanced with the new construction. The non-native vegetation is not habitat of any species identified as a candidate, sensitive, or special status species. The project site is not identified as critical habitat for Threatened and Endangered Species. Considering the highly disturbed nature of the project site surrounding areas, the probability of existence of designated species under the federal Endangered Species Act or California Special Concern Species is low. The proposed project would, therefore, not have a substantial adverse effect on any species identified as a candidate, sensitive, or special-status species in local or regional plans or by the California Department of Fish and Game (CDFG) or U.S. Fish and Wildlife Service (USFWS). Considering the lack of habitat on the property, no impacts to wildlife species of concern will occur.

b) **No Impact.** Land uses subject to this proposed project would occur in established urbanized areas and would not remove or impact any riparian habitat or other sensitive natural communities. No further environmental analysis is required.

c) **No Impact.** According to the federal National Wetlands Inventory, the project site does not contain riverine wetlands. The proposed project would not disturb any offsite wetlands. There are no on-site water features indicative of potential wetlands rather there is formal landscaping within parking areas and surrounding buildings. No impacts would occur.

d) **No Impact.** Project implementation would occur in established urbanized areas and would not alter or adversely impact any native resident or migratory fish or wildlife species, corridors or nursery sites. No further environmental analysis is required.

e) **No Impact.** The City has a tree removal policy that states that if more than five trees are to be removed, a tree removal permit application must be submitted to and approved by the City. The landscaping and trees in the existing surface parking lot south of Floral Drive will be modified. The proposed project would install new landscaping within the front and side setbacks and various other locations on the site. The project would add 24 trees as part of the church remodel and 137 trees within the residential portion of the project. The project would not affect any other natural biological resources; therefore the project will not result in any conflicts with local or other policies or standards to protect such resources. Impacts would be less than significant.

f) **No Impact.** The proposed project would not conflict with the provisions of an adopted Habitat Conservation Plan because the City of Whittier does not have an adopted Habitat Conservation Plan according to the US Fish & Wildlife Services, Environmental Conservation Online System (ECOS) mapping or any Natural Community Conservation Plan areas apply to the project site according to the California Department of Fish and Wildlife, California Regional Conservation Plans Map. Therefore, implementation of the proposed project would have no adverse impact. No impact would occur.

Mitigation Measures

No mitigation measures are necessary because Biological Resource impacts will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.5 – Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?				☑
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?		☑		
c) Disturb any human remains, including those interred outside of formal cemeteries?				☑

Sources

Information used to prepare this section is from the following sources: *City of Whittier General Plan Update*, 1993, GPA Consulting, Historical Evaluation of Trinity Lutheran Church located at 11716 Floral Drive, Whittier, CA prepared for Brandywine Homes and dated April 7, 2020 and ArchaeoPaleo Resource Management, Inc., Archaeological and Paleontological Resources Phase I Assessment for the 11716 Floral Drive – Brandywine Homes Development, City of Whittier, Los Angeles County, California dated May, 2021.

Environmental Setting

The proposed project is located within an urbanized area, and the majority of the project area is developed.

Discussion

a) **No Impact.** The City of Whittier is an urbanized community and nearly all properties within the City (except for areas such as protected park lands) have been previously disturbed and/or developed. The proposed project would not promote, encourage or enable activities that could

remove, degrade or in any way adversely impact local historic resources. Historic Resources within the City are regulated and protected pursuant to the City's Historic Resource Element of the General Plan.

GPA Consulting (GPA) conducted a site visit and reviewed previous records on the property located at 11716 Floral Drive in the City of Whittier. The property was constructed in 1958 as the Trinity Lutheran Church. The property was previously surveyed in a city-wide survey (2013-2015) but was not identified as a historical resource at that time. At the time of the survey, the survey team did not identify this property as one that would require further research or evaluation because it did not appear to meet the minimum qualifications as a historic resource as identified in the Historic Context Statement that was prepared as part of the citywide survey.

The site visit was conducted on Friday, April 3, 2020. All of the buildings located on the premises were constructed in 1958 in the Mid-Century Moderne style of architecture. The Walter F. Dexter Middle School is located to the west of the Trinity Lutheran Church on the same side of the street. Other surrounding buildings are mostly one-story, mid-century tract homes. The purpose of GPA review was to determine whether or not the conditions of the Lutheran Church located at 11716 Floral Drive have changed since the prior evaluation such that the property might qualify as a historical resource. After re-review of the subject property, GPA has determined that the property is a common example of its property type (mid-century modern) and that it would not qualify as a local historical resource or for the California Register of Historical Resources or the National Register of Historic Places due to a lack of historical significance. The conditions of the property have not changed since the prior evaluation in 2015. Therefore, the property is not a historical resource for the purposes of the California Environmental Quality Act (CEQA) or as a historical resource as defined in the City of Whittier's Municipal Code Sections 18.84.050 and 18.84.080. No further environmental analysis is required.

b) **Less Than Significant Impact with Mitigation Incorporated.** The property is a developed parcel in a fully urbanized area. At the time of the cultural records search by ArchaeoPaleo Resource Management, Inc. (APRMI), no prehistoric archaeological resources were identified within the immediate project location. The South Central Coastal Information Center (SCCIC) always states that just because nothing was previously recorded, does not mean that no sites or artifacts would be uncovered during project construction. Despite the absence of known and previously recorded prehistoric sites, there is still a potential to uncover prehistoric resources due to the close proximity of the San Gabriel River. Large water systems attracted animals for food and provided resources for tools, lures, and other materials for prehistoric and historic humans. Evidence of this is demonstrated by the "Los Angeles Man" site, located in West Los Angeles, which contained several prehistoric human skull fragments, and was discovered 11 feet deep in the ancient streambed and flood plains of Ballona Creek. Therefore, alluvial sediments from the floodplains of the San Gabriel River, which are known to be underlying the Project site, may contain prehistoric archaeological resources. No previous reports or studies were identified to have been conducted within the current project site, but a total of 12 reports and studies have been conducted within a 0.5-mile radius of the project location. Upon review and analysis of each report and/or study, no additional archaeological resources were identified.

The virtual field survey determined that the project location is located in a built environment consisting of a low density of non-residential buildings and high density of residential homes. APRMI also concludes that the built environment, identified at the time of the virtual survey, may result in indirect impacts caused by construction related vibrations which can cause permanent damage to any older sensitive structures. These structures should be monitored during construction related activities.

One historical landmark has been previously recorded within a 0.5-mile radius of the project location. This historic site (SCCIC Trinomial No. 19-178615) is designated as a California Historical Landmark, known as the Grave of George Caralambo, "Greek George". This resource will not be impacted by project development. The historic background of the City of Whittier and the presence of the identified historical landmark indicates a potential to uncover additional historic archaeological resources during construction related ground disturbing activities regarding this early historic time period. Trash refuge deposits, such as bottles, ceramics, houseware items, and other buried artifacts may be uncovered.

One historic building (SCCIC Trinomial No. 19-178565) was identified during the cultural records search. This structure is the historic Dorland House named after Willet Dorland, who moved his family from Chicago to Whittier in 1887. This property is located approximately 0.4 miles southeast of the project site. The Primary Record from the SCCIC, which has evaluated the historical significance of the home, has considered the Dorland house to be a local historic building under the City of Whittier and eligible for National Register designation. This historic building will not be affected by the development of the proposed project.

Due to the potential archeological sensitivity of the Project site, prior to the onset of construction, a qualified Lead Archaeologist will be retained, and qualified archaeological resource construction monitor(s), per Secretary of Interior (SOI) standards, will monitor and observe all project-related ground disturbances in native soil, under the guidance of the qualified Lead Archaeologist, who may not be on site, but should be available when required.

c) **No Impact.** It is unlikely that human remains could be uncovered during grading operations. Nonetheless, should suspected human remains be encountered, the contractor shall be required to notify the County Coroner in accordance with Section 7050.5 of the California Health and Safety Code, who must then determine whether the remains are of forensic interest. If the Coroner, with the aid of a supervising archaeologist, determines that the remains are or appear to be of a Native American, he/she would be required to contact the Native American Heritage Commission for further investigations and proper recovery of such remains, if necessary. Through this existing regulatory procedure, impacts to human remains would be avoided. Impact would be less than significant with application of existing regulations.

Conditions of Approval

In accordance with standard City procedures, a halt-work condition would be in place in the unlikely event that archaeological or paleontological resources are discovered during construction. The contractor would be required to halt work in the immediate area of the find and to retain a professional archaeologist or paleontologist, as applicable, to examine the materials to determine whether they are a "unique archaeological resource" as defined in Section 21083.2(g) of the State CEQA Statutes. If this determination is positive, the scientifically consequential information must be fully recovered by the archaeologist or paleontologist, as applicable, consistent with standard City protocol.

Mitigation Measures

Based on the potential sensitivity of the area, APRMI recommends the following mitigation measures that would reduce the potential affects to any archaeological impact.

CR-1: Prior to the start of construction, a qualified Lead Archaeologist who meets the standards of the Secretary of the Interior for Archaeology shall be retained. Under supervision of the Lead Archaeologist, a qualified archaeological resource construction monitor, who

meets the standards of the Secretary of the Interior for Archaeology, shall monitor all project-related, ground-disturbing construction activities (i.e., grading, excavation, etc.).

CR-2: If requested by the City of Whittier, a Cultural Resources Mitigation Monitoring Program (CRMMP) will be developed by the Lead Archaeologist prior to the start of ground disturbing activities.

CR-3: Prior to the commencement of grading or excavation activities, the Lead Archeologist retained for the Project, shall create a separate Worker's Environmental Awareness Program (WEAP) pamphlet that will be provided as training construction personnel to understand regulatory requirements for the protection of cultural resources. The Lead Archaeologist will teach provide the WEAP training. This training shall include examples of cultural resources and discuss the protocols to follow if discoveries are made.

CR-4: In the event that an archaeological resource is encountered during construction when a monitor is not on site, all construction shall cease within at least 50 feet of the discovery and the Principal Investigator and/or Lead Archaeologist must be notified immediately. If the monitor is present at the time of discovery, then the monitor will have the authority to temporarily divert the construction equipment around the find and notify the Principal Investigator and/or Lead Archaeologist until it is assessed for scientific significance. Work cannot resume in the direct area of the discovery until it is assessed by Principal Investigator and/or Lead Archaeologist and he/she indicates that construction can resume.

CR-5: If an archaeological discovery cannot be preserved in situ and requires an excavation team or requires additional time to collect cultural resources or the size of the discovery is more than a monitor can collect during standard daily monitoring services, a Discovery and Treatment Plan (DTP) will be developed and the area will be cordoned off and secured so that an archaeological resource excavation team, led by the Principal Investigator and/or Lead Archaeologist, may recover the cultural resources out of that contained area once the DTP has been approved by the City of Whittier. Once the Principal Investigator and/or Lead Archaeologist has determined that the collection process is complete for a given area or locality, construction activity will resume in that localized area.

CR-6: If human remains are encountered construction and/or excavation must cease within the general vicinity, and the remains must be inspected by the Los Angeles County coroner. If the coroner determines that they are Native American in origin, then the coroner must contact the NAHC. The NAHC will then determine and notify a Most Likely Descendant (MLD). The MLD must complete inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

CR-7: Once construction activities are complete, all significant cultural resources collected will be prepared in a properly equipped archaeological laboratory to a point ready for curation. The laboratory process will include, but not be limited to, artifact cleaning, analysis, identification, photographing, catalogued, and then delivered to a local accredited museum repository for permanent curation and storage. Accompanying notes, maps, and photographs shall also be filed at the repository. The cost of curation is assessed by the repository and is the responsibility of the Project proponent.

CR-8: At the conclusion of laboratory analysis and preparation for museum curation, a final report of findings will be prepared describing the results of the cultural mitigation

monitoring efforts associated with the project. The report will include a summary of the field and laboratory methods, an overview of the cultural background within the project vicinity, a list of cultural resources recovered (if any), an analysis of cultural resources recovered (if any) and their scientific significance, and recommendations. A copy of the report will be submitted to the City of Whittier, the appropriate California Historic Resources Information Center, and the designated museum repository.

Level of Significance After Mitigation

Cultural Resource impacts will be less than significant with standard conditions and mitigation satisfied.

4.6 – Energy

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?			☑	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			☑	

Sources

Information used to prepare this section is from the following sources: *City of Whittier General Plan Update*, 1993 and RK Engineering Group, Inc., Whittier Floral Residential Project Air Quality and Greenhouse Gas Analysis, City of Whittier, California prepared for Brandywine Homes and dated March 24, 2021.

Environmental Setting

Energy resources include electricity, natural gas and other fuels. 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. Energy production and energy use both result in the depletion of nonrenewable resources (e.g., oil, natural gas, coal, etc.) and emission of pollutants. Energy usage is typically quantified using the British Thermal Unit (BTU). The BTU is the amount of energy that is required to raise the temperature of one pound of water by one degree Fahrenheit. As points of reference, the approximate amount of energy contained in a gallon of gasoline, 100 cubic feet (one therm) of natural gas, and a kilowatt hour of electricity are 123,000 BTUs, 100,000 BTUs, and 3,400 BTUs, respectively.

Existing Electricity Consumption

Southern California Edison is the service provider for electric. The electricity generated is distributed through a network of transmission and distribution lines commonly called a power grid. Conveyance of electricity through transmission lines is typically responsive to market demands. The delivery of electricity involves a number of system components, including substations and transformers that lower transmission line power (voltage) to a level appropriate for on-site distribution and use. According to the California Energy Commission (CEC), total system electric generation for California in 2017 was 292,039 gigawatt-hours (GWh). California's non-CO2 emitting electric generation categories (nuclear, large hydroelectric, and renewable generation) accounted for more than 56 percent of total in-state generation for 2017. California's in-state electric generation was 206,336 GWh and electricity imports were 85,703 GWh.

Existing Natural Gas Consumption

Southern California Gas Company (SoCalGas) is responsible for providing natural gas supply to the City and is regulated by the California Public Utilities Commission and other state agencies. Natural gas is a combustible mixture of simple hydrocarbon compounds (primarily methane) that is used as a fuel source. Natural gas consumed in California is obtained from naturally occurring reservoirs and delivered through high-pressure transmission pipelines. The natural gas transportation system is a nationwide network. Natural gas is used in electricity generation, space heating, cooking, water heating, industrial processes, and as a transportation fuel. Natural gas is measured in terms of cubic feet. According to the CEC, nearly 45 percent of the natural gas burned in California was used for electricity generation, with the remainder consumed in the residential (21 percent), industrial (25 percent), and commercial (9 percent) sectors. In 2012, total natural gas demand in California for industrial, residential, commercial, and electric power generation was 2,313 billion cubic feet.

Existing Transportation Energy

According to the California Energy Commission, transportation accounts for nearly 37 percent of California's total energy consumption. Based on available fuel consumption data from the United States Energy Information Administration (USEIA), in 2015, California consumed a total of 342,523 thousand barrels of gasoline for transportation, which is equivalent to a total annual consumption of approximately 14.4 billion gallons by the transportation sector. California consumed a total of 80,487 thousand barrels of diesel fuel for transportation, which is equivalent to a total annual consumption of approximately 3.4 billion gallons by the transportation sector. Transportation fuels, primarily gasoline and diesel, would be provided by local or regional suppliers, vendors, and patrons. According to the California Air Resources Board on-road vehicle emissions factor (EMFAC2014) model, the average fuel economy for the fleet-wide mix of vehicles operating in the South Coast Air Basin region is approximately 20.17 miles per gallon for gasoline fueled vehicles and approximately 7.81 miles per gallon for diesel-fueled vehicles. Gasoline-fueled vehicles account for approximately 96 percent of the total vehicles and diesel-fueled vehicles account for approximately 3.6 percent of the total vehicles. Electric vehicles account for approximately 0.3 percent of the total vehicles.

Discussion

a) **Less Than Significant Impact.** According to the CEQA Guidelines § 15126.2(d), "uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement that provides access to a previously inaccessible area) generally commit future generations to similar

uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified." Therefore, the purpose of this analysis is to identify any significant irreversible environmental effects of project implementation that cannot be avoided.

Both construction and operation of the project would lead to the consumption of limited, slowly renewable, and non-renewable resources, committing such resources to uses that future generations would be unable to reverse. The new development would require the commitment of resources that include (1) building materials, (2) fuel and operational materials/resources and (3) the transportation of goods and people to and from the project.

During project construction, energy would be consumed in the form of electricity associated with the conveyance of water used for dust control and, on a limited basis, powering lights, electronic equipment, or other construction activities necessitating electrical power. Construction activities for residential units and church building typically do not involve the consumption of natural gas. Project construction would also consume energy in the form of petroleum-based fuels associated with the use of off-road construction vehicles and equipment on the project site, construction worker travel to and from the project site, and delivery and haul truck trips hauling solid waste from and delivering building materials to the project site. During project operation, energy would be consumed for multiple purposes, including heating, air conditioning, appliances, and use of electronics.

During project operations, energy would also be required for water transport, solid waste disposal, and vehicle trips. Estimated project operation total energy usage, which was estimated by CalEEMod as part of the greenhouse gas emissions analysis, is shown in Table 4.6-1**.** Vehicle miles traveled (VMT) were used as a surrogate for energy from consumption of transportation fuels. While a variety of factors govern the relationship between VMT and fuel energy, in general, an increase in VMT results from an increase in motor vehicle energy use. Note that the table does not include energy use by existing buildings and activities; to obtain a conservative estimate of energy use impact, existing use was assumed to be zero.

The new buildings will be designed and built in compliance with the California Green Building Standards (CAL Green) Code (California Code of Regulations, Title 24, Part 11), which includes mandatory measures for residential and nonresidential site development, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality (CBSC, 2017, p.2).

In the interest of energy efficiency, the residential buildings are being designed to have solar panels and battery storage, in addition to high-efficiency HVAC systems. This will assist in increasing reliance on renewable energy resources and decreasing reliance on natural gas and oil. Therefore, the energy usage of the new residential buildings will be substantially lower than it would be in absence of the Green Code. Additionally, the project would comply with all applicable regulations and codes which require achievement of various levels of energy efficiency in building construction, design and operation.

The commitment of resources required for the construction and operation of the project would limit the availability of such resources for future generations or for other uses during the life of the project. However, the use of such resources would be reduced when compared to what they would be in the absence of complying with the CAL Green Code. Therefore, energy consumption would not result in a substantial increase in energy production for energy providers and the energy demand associated with the project would be less than significant.

Table 4.6-1
Estimated Project Operational Energy Use

Energy Type	Units	Value
Onroad Motor Vehicle Travel	Vehicle miles traveled per year	887,215
Natural Gas Use	1,000 BTU per year	765,182
Electricity Use	Kilowatt-hours per year	244,596

Source: CalEEMod runs, contained in Appendix B.

b) **Less Than Significant Impact.** As mentioned above, the proposed project would be in compliance with the California Green Building Standards (CAL Green) Code (California Code of Regulations, Title 24, Part 11), which includes mandatory measures for residential nonresidential site development, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality (CBSC, 2019, p.2). Additionally, the City of Whittier does not have local energy plans. Given the area's warm climate, the most important alternative and renewable energy resource in Whittier is solar energy. This energy source has considerable potential and can be developed to substitute for oil, gas and other energy supplies. Solar energy's ability to substitute for fossil fuels can be an important tool in the battle against air pollution. The proposed project would install a solar photovoltaic (PV) system atop the buildings, which would further the City's goal of sustainability. Therefore, there would be no conflict, and there would be less than significant impacts.

Mitigation Measures

With the compliance with existing regulations, the project would not result in significant impacts associated with Energy.

Level of Significance After Mitigation

Not Applicable.

4.7 – Geology and Soils

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				

i) Rupture of a known 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.			☑	
ii) Strong seismic ground shaking?			☑	
iii) Seismic-related ground failure, including liquefaction?			☑	
iv) Landslides?			☑	
b) Result in substantial soil erosion or the loss of topsoil?			☑	
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?			☑	
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?			☑	
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?				☑
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		☑		

Sources

Information used to prepare this section is from the following sources: *City of Whittier General Plan Update*, 1993, Chapter 7 Public Safety; UC Davis Soil Resource Laboratory, SoilWeb, ArchaeoPaleo Resource Management, Inc., Archaeological and Paleontological Resources Phase I Assessment for the 11716 Floral Drive – Brandywine Homes Development, City of Whittier, Los Angeles County, California dated May, 2021, and Alta California Geotechnical Inc., Updated Geotechnical Report, 11716 Floral Drive, City of Whittier, County of Los Angeles, California prepared for Brandywine Homes dated November 24, 2020.

Environmental Setting

The City of Whittier is located along the southern section of the northwestern Puente Hills. West of the hills is a lowland plain that gently slopes to the southwest. The majority if the City is situated on the lowland surface.

Discussion

a.i) **Less Than Significant Impact.** Per Exhibit 7-3, Major Faults in Southern California and Exhibit 7-4 Compilation of the Whittier Fault of the Seismic Safety Element Background Report of the General Plan, the most significant fault system in the City is the Whittier-Elsinore fault zone. This fault zone runs parallel to the northwest City limits. The project site is located in the highly seismic Southern California region within the influence of several fault systems. However, the site does not lie within the boundaries of an Earthquake Fault Zone as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act.

Risks associated with surface rupture are low and there is no impact expected. However, because the project site is located in the seismically active Southern California, all habitable structures must be built to seismic standards established in the California Building Code (CBC). The CBC sets the standards in the State for the development of all buildings and sets requirements for structural design, plumbing and mechanical fixtures, fire and smoke protection, construction materials, interior finishes, and any other elements that make up construction of structures. The City's Building and Safety Department is responsible for implementing not only the CBC but any additional code requirements that the City may have. Adherence to all code requirements will ensure that impacts associated with seismic activity are less than significant and no additional mitigation is required.

Although the project site is located in seismically active Southern California, the site is not located within an Alquist-Priolo Earthquake Fault Zone. According to the City's 1993 General Plan and Alta California Geotechnical Inc. (ACGI) report , the Whittier area is crossed by the Whittier fault on its northern and eastern sections. Groundshaking and surface rupture hazards are associated with earthquakes along these faults. However, the project site is not located within the Whittler Fault Zone. Active faults are not known to exist within the project and a review of Special Publication 42 indicates the site is not within the California State designated earthquake fault zones (Bryant and Hart, 2007). Accordingly, the potential for fault surface rupture on the subject site is very low.

a.ii) **Less Than Significant Impact.** The Whittier-Elsinore fault zone could create substantial ground shaking if a seismic event occurred along that fault. Similarly, a strong seismic event on any other fault system in Southern California has the potential to create considerable levels of ground shaking throughout the City. The project site is subject to strong seismic ground shaking, as are virtually all properties in Southern California. Ground shaking hazards caused by earthquakes along other active regional faults exist. The 2019 California Building Code requires use-modified spectral accelerations and velocities for most structural designs. Seismic design parameters using soil profile types identified in the 2019 California Building Code are presented in Section 7.3.

The proposed buildings are subject to the seismic design criteria of the California Building Code (CBC). The 2019 California Building Code (CBC; Title 14, California Code of Regulations, Part 2) contains seismic safety provisions with the aim of preventing building collapse during a design earthquake, so that occupants would be able to evacuate after the earthquake. A design earthquake is one with a two percent chance of exceedance in 50 years, or an average return period of 2,475 years. Adherence to these requirements will reduce the potential of the building from collapsing during an earthquake, thereby minimizing injury and loss of life. Although structures may be damaged during earthquakes, adherence to seismic design requirements will minimize damage to property within the structure because the structure is designed not to collapse. The CBC is intended to provide minimum requirements to prevent major structural failure and loss of life. Adherence to existing regulations will reduce the risk of loss, injury, and death; impacts due to strong ground shaking will be less than significant.

a.iii) **Less Than Significant Impact.** Liquefaction is a mode of ground failure that results from the generation of high pore water pressures during earthquake ground shaking, causing loss of shear strength. Liquefaction is typically a hazard where loose sandy soils exist below groundwater. The California Geological Survey (CGS) has designated certain areas within southern California as potential liquefaction hazard zones. These are areas considered at a risk of liquefaction-related ground failure during a seismic event, based upon mapped surficial deposits and the presence of a relatively shallow water table. Per Exhibit 7-5, Relative Liquefaction Susceptibility of the Seismic Safety Element Background Report of the General Plan, most of the City is in areas of either very low or low liquefaction potential. ACGI determined that groundwater was not encountered during the subsurface investigation which extended to a depth of 26 feet. The regional groundwater map indicates that the historic high groundwater level is approximately 63 feet (CDMG, 1997). The site is not located in a liquefaction zone per the seismic hazard maps (California Geologic Survey, 1998). Based on the depth to groundwater, it is ACGI's opinion that the potential for liquefaction is minimal at the site.

a.iv) **Less Than Significant Impact.** Structures built below or on slopes subject to failure or landslides may expose people and structures to harm. Per Exhibit 7-6, Landslide Hazards of the Seismic Safety Element Background Report of the General Plan, the majority of the City is relatively flat and characterized by slopes that are not high (less than 50 feet) or steep (generally sloping flatter than 1-1/2:1, horizontal to vertical). There are areas associated with the Puente Hills formation that have shown previous evidence of landslides. ACGI determined that due to a lack of slopes within or nearby the property, seismically induced landsliding is not anticipated to pose a danger to the site. Impacts would be expected to be less than significant and no further environmental analysis is required.

b) **Less Than Significant Impact.** Topsoil is used to cover surface areas for the establishment and maintenance of vegetation due to its high concentrations of organic matter and microorganisms. Little, if any, native topsoil is likely to occur on site. During project construction, fill materials will be over-excavated to reveal underlying soils within the building footprint area. The project has the potential to expose surficial soils to wind and water erosion during construction activities.

Wind erosion will be minimized through soil stabilization measures required by South Coast Air Quality Management District (SCAQMD) Rule 403 (Fugitive Dust), such as daily watering. Construction of the project will be required to have a PM_{10} Dust Control Plan to identify best management practices for the control fugitive dust. The intent of SCAQMD Rule 403 is to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions. Elements of the Dust Control Plan may appear as notes on the grading plan that must be approved by the City prior to any site disturbance.

Water erosion will be prevented through the City's standard erosion control practices required pursuant to the California Building Code and the National Pollution Discharge Elimination System (NPDES), such as silt fencing or sandbags. Construction of the project will be required to have a Stormwater Pollution Prevention Plan (SWPPP). The project's SWPPP would identify typical best management practices specific towards fugitive dust and containment of sediment discharge and transport from the site. Once construction is completed, a Water Quality Management Plan (WQMP) must be implemented during the life of the project that includes best management practices (BMPs) specific towards maintenance of vegetative landscaping, drainage culverts/channels and drainage inlets. Following project construction, the site would be covered completely by paving, structures, and landscaping. Compliance with regulatory requirements of

the RWQCB and of SCAQMD would ensure that impacts with regard to soil erosion or loss of topsoil are less than significant and no mitigation is required.

The project has the potential to expose surficial soils to wind and water erosion during construction activities. Wind erosion will be minimized through soil stabilization measures required by South Coast Air Quality Management District (SCAQMD) Rule 403 (Fugitive Dust), such as daily watering. Water erosion will be prevented through the City's standard erosion control practices required pursuant to the California Building Code and the National Pollution Discharge Elimination System (NPDES), such as silt fencing or sandbags. Following project construction, the site would be covered completely by paving, structures, and landscaping. Impacts related to soil erosion would be less than significant with implementation of existing regulations.

c) **Less Than Significant Impact.** Impacts related to liquefaction and landslides are discussed above in Section 4.7.a. Lateral spreading is the downslope movement of surface sediment due to liquefaction in a subsurface layer. The downslope movement is due to gravity and earthquake shaking combined. Such movement can occur on slope gradients of as little as one degree. Lateral spreading typically damages pipelines, utilities, bridges, and structures.

Lateral spreading of the ground surface during a seismic activity usually occurs along the weak shear zones within a liquefiable soil layer and has been observed to generally take place toward a free face (i.e. retaining wall, slope, or channel) and to lesser extent on ground surfaces with a very gentle slope. Due to the absence of any substantial change in grade, the potential for lateral spread occurring within the project area is considered to be low. The project will be constructed in compliance with all applicable building code requirements regarding soil stability.

d) **Less Than Significant Impact.** The CBC requires special design considerations for foundations of structures built on soils with expansion indices greater than 20. ACGI conducted Expansion index testing on samples taken during their subsurface investigation. Based on the results, it is anticipated that the majority of materials onsite are "low" to "medium" in expansion potential ($21 \leq EI \leq 90$, Appendix C) when tested per ASTM D: 4829. The proposed project will comply with applicable building codes that account for the possibility of expansive soils.

e) **No Impact.** The entire City is served by an existing sewer system and therefore, has no need for septic tanks or any other alternative wastewater disposal systems. No further environmental analysis is required.

f) **Less Than Significant Impact with Mitigation Incorporated.** On February 18, 2020, ArchaeoPaleo Resource Management, Inc. (APRMI) requested a Vertebrate paleontological resources records check for the proposed project from the Vertebrate Paleontology Department of the Natural History Museum of Los Angeles County. The records check was conducted on March 2, 2020 by Dr. Sam McLeod, Vertebrate Collections Manager at the Natural History Museum of Los Angeles County (Appendix C). The records check consisted of a thorough review of the museum's paleontology collection records of recorded fossil sites in and/or near the project site. Mr. Miguel conducted an Invertebrate paleontological resources records check of the on-line Paleobiology Database (PBDB), a non-governmental, non-profit public resource for paleontological data. The purpose of this record check was to identify any known Invertebrate fossils localities within the project area. Geologic maps were also observed for any fossiliferous formations that are located within the project area.

The results of the paleontological resources records search conducted by Dr. Samuel A. McLeod states there are no previously known vertebrate fossil localities within the direct proposed project location, but there are fossil localities located in nearby sedimentary deposits that may occur at

depth within the project site. Alluvial fan deposits labeled as Quaternary alluvium is considered the predominate surficial deposit for the proposed project. McLeod states that at relatively shallow depths, Quaternary Alluvium could be exposed throughout the proposed project location but is unlikely to encounter significant fossil vertebrate remains. However, excavation that could extend deeper into the Older Quaternary Alluvium deposits, or the marine Pliocene Fernando Formation, may uncover significant vertebrate fossils. A toothed whale specimen, Odontoceti, was produced at Penn Park by Whittier College. At Leffingwell Road east of La Mirada Boulevard, a fossil horse specimen, Equus, was also discovered. Additionally, the invertebrate paleontological resources records check of the PBDB, conducted by Mr. Miguel of APRMI, indicate there is a potential to uncover specimens of gastropods, bivalves, and other marine invertebrates related to the marine formations of the area. Therefore, project excavation should be monitored closely to recover any fossil remains. Sediment samples, to SVP standards, should be collected and processed to determine if micro-fossil remains are apparent on project property. Any fossils recovered during construction monitoring services shall be curated in an accredited and permanent scientific institution for the benefit of research and for current and future generations.

Mitigation Measures

Based on the potential sensitivity of the area, APRMI recommends the following mitigation measures that would reduce the potential affects to any paleontological resource to a less than significant impact.

GEO-1: Prior to the start of construction, a qualified Lead Paleontologist who meets the standards of the Society of Vertebrate Paleontology shall be retained. Under supervision of the Lead Paleontologist, a qualified Paleontologist, who meets the standards of the Society of Vertebrate Paleontology, shall monitor all project-related, ground-disturbing construction activities (i.e., grading, excavation, etc.).

GEO-2: If requested by the City of Whittier, a Paleontological Resources Mitigation Monitoring Program (PRMMP) will be developed by the Lead Paleontologist prior to the start of ground disturbing activities.

GEO-3: Prior to the commencement of grading or excavation activities, the Lead Paleontologist retained for the construction of the Project, shall create a Worker's Environmental Awareness Program (WEAP) pamphlet that will be provided as training to construction personnel to understand regulatory requirements for the protection of cultural resources. This training shall include examples of paleontologic resources and provide protocols to follow if discoveries are made. The paleontologist will provide the training.

GEO-4: In the event that a paleontological resource is encountered when a monitor is not on site, all construction shall cease within at least 50 feet of the discovery and the Principal Investigator and/or Lead Paleontologist must be notified immediately. If the monitor is present at the time of discovery, then the monitor will have the authority to temporarily divert the construction equipment around the find and notify the Principal Investigator and/or Lead Paleontologist until it is assessed for scientific significance. Work cannot resume in the direct area of the discovery until it is assessed by the Principal Investigator and/or Lead Paleontologist and he/she indicates that construction can resume.

GEO-5: If a paleontological discovery requires an excavation team or requires additional time to collect specimens, or the size of the discovery is more than a monitor can collect during standard daily monitoring services, a Discovery and Treatment Plan (DTP) will be developed and the area will be cordoned off and secured so that a paleontological

resources excavation team, led by the Principal Investigator and/or Lead Paleontologist, may recover the fossilized specimens out of that contained area once the DTP has been approved by the City of Whittier. Once the Principal Investigator and/or Lead Paleontologist has determined that the collection process is complete for a given area or locality, construction activity will resume in that localized area.

GEO-6: If the paleontologic monitor determines that soil samples, to SVP standards, are required to check for microfossils, an area on site that is remote from construction but still on the project property, will be required to dry out the samples. The operation may require wet or dry screening and that determination will be made by the Lead Paleontologist.

GEO-7: Once construction activities are complete, all significant fossil remains collected will be prepared in a properly equipped paleontology laboratory to a point ready for curation. Laboratory preparation will include, but not be limited to, the careful removal of excess matrix from fossil remains, stabilizing and repairing specimens, identified to the lowest taxonomic level, analyzed, photographed, and catalogued before they are sent to the local repository for curation and permanent storage. Accompanying notes, maps, and photographs shall also be filed at the repository. The cost of curation is assessed by the repository and is the responsibility of the Project proponent. At the conclusion of laboratory work and museum curation, a final report of findings will be prepared describing the results of the paleontological mitigation monitoring efforts associated with the project. The report will include a summary of the field and laboratory methods, an overview of the geology and paleontology in the project vicinity, a list of taxa recovered (if any), an analysis of fossils recovered (if any) and their scientific significance, and recommendations. If the monitoring efforts produced fossils, then a copy of the report will also be submitted to a designated museum repository.

Level of Significance After Mitigation

Geology and Soils impacts will be less than significant with standard conditions and mitigation satisfied.

4.8 – Greenhouse Gas Emissions

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			☑	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			☑	

Sources

Information used to prepare this section is from the following source: *City of Whittier General Plan Update,* 1993 and RK Engineering Group, Inc., Whittier Floral Residential Project Air Quality and Greenhouse Gas Analysis, City of Whittier, California prepared for Brandywine Homes and dated March 24, 2021.

Environmental Setting

Constituent gases of the Earth's atmosphere, called atmospheric greenhouse gases (GHG), play a critical role in the Earth's radiation amount by trapping infrared radiation emitted from the Earth's surface, which otherwise would have escaped to space. Prominent greenhouse gases contributing to this process include carbon dioxide (CO2), methane (CH4), ozone, water vapor, nitrous oxide (N2O), and chlorofluorocarbons (CFCs). This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. Anthropogenic (caused or produced by humans) 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. Emissions of gases that induce global warming are attributable to human activities associated with industrial/manufacturing, agriculture, utilities, transportation, and residential land uses. Transportation is responsible for 41 percent of the State's greenhouse gas emissions, followed by electricity generation. Emissions of CO2 and nitrous oxide (NOx) are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO2, where CO2 is stored outside of the atmosphere, include uptake by vegetation and dissolution into the ocean.

The project is within the South Coast Air Basin, which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). A numerical threshold for determining the significance of greenhouse gas emissions in the South Coast Air Basin (Basin) has not officially been adopted by the SCAQMD. As an interim threshold based on guidance provided in the CAPCOA *CEQA and Climate Change* white paper, a non-zero threshold based on Approach 2 of the handbook will be used. Threshold 2.5 (Unit- Based Thresholds Based on Market Capture) establishes a numerical threshold based on capture of approximately 90 percent of emissions from future development. The latest threshold developed by SCAQMD using this method is 3,000 metric tons carbon dioxide equivalent (MTCO2E) per year for residential and commercial projects. This threshold is based on the review of 711 CEQA projects.

In response to the requirements of SB97, the State Resources Agency developed guidelines for the treatment of GHG emissions under CEQA. These new guidelines became state laws as part of Title 14 of the California Code of Regulations in March, 2010. The CEQA Appendix G guidelines were modified to include GHG as a required analysis element. A project would have a potentially significant impact if it:

- Generates GHG emissions, directly or indirectly, that may have a significant impact on the environment, or,

- Conflicts with an applicable plan, policy or regulation adopted to reduce GHG emissions.

Section 15064.4 of the Code specifies how significance of GHG emissions is to be evaluated. The process is broken down into quantification of project-related GHG emissions, making a determination of significance, and specification of any appropriate mitigation if impacts are found to be potentially significant. At each of these steps, the new GHG guidelines afford the lead agency with substantial flexibility.

Emissions identification may be quantitative, qualitative or based on performance standards. CEQA guidelines allow the lead agency to "select the model or methodology it considers most appropriate." The most common practice for transportation/combustion GHG emissions quantification is to use a computer model such as CalEEMod, as was used in the ensuing analysis.

The significance of those emissions then must be evaluated; the selection of a threshold of significance must take into consideration what level of GHG emissions would be cumulatively considerable. The guidelines are clear that they do not support a zero net emissions threshold. If the lead agency does not have sufficient expertise in evaluating GHG impacts, it may rely on thresholds adopted by an agency with greater expertise.

On December 5, 2008 the SCAQMD Governing Board adopted an Interim quantitative GHG Significance Threshold for industrial projects where the SCAQMD is the lead agency (e.g., stationary source permit projects, rules, plans, etc.) of 10,000 Metric Tons (MT) CO_2 equivalent/year. In September 2010, the Working Group released revisions that recommended a threshold of 3,000 MT CO_2e for commercial or residential land use types. This 3,000 MT/year recommendation has been used as a guideline for this analysis

Discussion

a) **Less Than Significant Impact.** Construction of the facilities and utilization would generate greenhouse gas (GHG) emissions from equipment emissions. Once occupied operational emissions including transportation, off-site electricity generation, on-site natural gas consumption, water conveyance, treatment and wastewater disposal and biogenic decay of organic solid waste will also generate GHG emissions.

Greenhouse Gas Emissions - Construction

Greenhouse gas emissions are estimated for on-site and off-site construction activity using CalEEMod. Table 4.8-1 shows the construction greenhouse gas emissions, including equipment and worker vehicle emissions for all phases of construction. Construction emissions are averaged over 30 years and added to the long-term operational emissions, pursuant to SCAQMD recommendations. CalEEMod annual GHG output calculations are provided in Appendix B.

Table 4.8-1
Construction Greenhouse Gas Emissions

Activity	Emissions ($MTCO_2e$)[1]		
	On-site	Off-site	Total
Demolition	44.53	7.55	52.08
Site Preparation	3.26	0.12	3.38
Grading	19.16	34.64	53.80
Building Construction	272.32	23.72	296.04
Paving	7.82	0.72	8.54
Architectural Coating	1.28	0.10	1.38
Total	303.84	59.30	363.14
Amortized over 30 years[2]	10.13	1.98	12.10

[1] $MTCO_2e$ = metric tons of carbon dioxide equivalents (includes carbon dioxide, methane, nitrous oxide, and/or hydrofluorocarbon).

[2] The emissions are amortized over 30 years and added to the operational emissions, pursuant to SCAQMD recommendations.

Because impacts from construction activities occur over a relatively short-term period of time, they contribute a relatively small portion of the overall lifetime project GHG emissions. By itself, the construction activities from this project are less than significant when compared to the thresholds recommended by SCAQMD. However, SCAQMD recommends that construction emissions be amortized over a 30-year project lifetime and added to the overall project operational emissions. In doing so, construction GHG emissions are included in the overall contribution of the project, as further discussed in the following section.

Greenhouse Gas Emissions - Operation

Greenhouse gas emissions are estimated for on-site and off-site operational activity using CalEEMod. Greenhouse gas emissions from mobile sources, area sources and energy sources are shown in Table 4.8-2. CalEEMod annual GHG output calculations are provided in Appendix B.

As shown in Table 4.8-2, the project GHG emissions are expected to be below the SCAQMD's Tier 3 approach, which limits GHG emissions to 3,000 $MTCO_2e$ for residential projects. The project related long-term GHG impacts are less than significant.

Table 4.8-2
Operational Greenhouse Gas Emissions

Emission Source	GHG Emissions ($MTCO_2e$)[1]
Mobile Source	377.54
Energy Source	119.29
Area Source	5.79
Water	14.13
Waste	23.31
Construction (30 year average)	12.10
Total Annual Emissions	**440.30**
SCAQMD Tier 3 Screening Threshold[2]	3,000
Exceed Tier 3 Threshold?	No

[1] $MTCO_2e$ = metric tons of carbon dioxide equivalents

[2] Per South Coast Air Quality Management District (SCAQMD) Draft Guidance Document - Interim CEQA Greenhouse Gas (GHG) Significance Threshold, October 2008

b) **Less Than Significant Impact.** Whittier has adopted the 2016 edition of the California Building Code (Title 24), including the California Green Building Standards Code. The project would be subject to the California Green Building Standards Code, which requires new buildings to reduce water consumption, employ building commissioning to increase building system efficiencies for large buildings, divert construction waste from landfills, and install low pollutant-emitting finish materials. The project does not include any feature (i.e. substantially alter energy demands) that would interfere with implementation of these State and City codes and plans. The City of Whittier does not have any additional plans, policies, standards, or regulations related to climate change and GHG emissions. Also, no other government-adopted plans or regulatory programs in effect at this time have established a specific performance standard to reduce GHG emissions from a single building project. The proposed project would not permit any land use operations that would conflict with any plans, policies or regulations related to the reduction of greenhouse gas emissions. No further environmental analysis is needed.

Mitigation Measures

No mitigation measures are necessary because impacts to Greenhouse Gas Emissions will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.9 – Hazards and Hazardous Materials

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			☑	
b) Create a significant hazard to the public or the environment through reasonable foreseeable upset and accident condition involving the release of hazardous materials into the environment?		☑		
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?		☑		
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			☑	
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?				☑
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			☑	
g) Expose people or structures, directly or indirectly to a significant risk of loss, injury or death involving wildland fires, including where wildlands?				☑

Sources

Information used to prepare this section is from the following sources: *City of Whittier Background Reports for the Whittier General Plan Update, 1993, Chapter 7 Public Safety Element*; California Department of Toxic Substances Control, EnviroStor; California State Water Resources Control Board, GeoTracker; California State Water Resources Control Board. Sites Identified with Waste Constituents Above Hazardous Waste Levels Outside the Waste Management Unit; California Department of Forestry and Fire Protection. Incorporated Fire Hazard Severity Zone:

City of Whittier. Very High Fire Hazard Severity Zones in LRA (Local Responsibility Area), September 2011; California Department of Transportation, Division of Aeronautics website, California Public Use Airport list; and Stantec Consulting Services Inc., 2017. Phase I and Phase II Environmental Site Assessment, 11716 Floral Drive, Whittier, California 90601. Prepared for Brandywine Homes. Dated August 31, 2017.

Environmental Setting

Hazardous Waste Site

The City of Whittier has properties listed on the State of California Hazardous Waste and Substances Site List pursuant to Government Code Section 65962.5. California Department of Toxic Substances Control Envirostar database.

Local Schools

The City is served by the following school districts: Whittier Union High School District, Whittier City School District, Fullerton Joint Union High School District, Whittier Elementary School District, the East Whittier Elementary School District, the Los Nietos School District and the Lowell Joint School District. The closest schools to the project include: Longfellow Elementary School at 6005 Magnolia Avenue, Whittier approximately 0.3 miles to the south; Walter F. Dexter Middle School located at 11532 Floral Drive, Whittier and immediately adjacent to the western site boundary; and Whittier High School located at 12417 Philadelphia Street, Whittier approximately 1 mile southeast of the project site.

Public Airports/Private Airstrips

There are no private or public airports located within the City limits of Whittier. Fullerton Municipal Airport is located approximately 7 miles southeast of the City.

Discussion

a) **Less Than Significant Impact.** The proposed project could result in a significant hazard to the public if the project includes the routine transport, use, or disposal of hazardous materials or places housing near a facility which routinely transports, uses, or disposes of hazardous materials. The proposed project is located within a primarily residential and institutional area within the city, and is not located in an industrial area. The routine use, transport, or disposal of hazardous materials is primarily associated with industrial uses that require such materials for manufacturing operations or produce hazardous wastes as by-products of production applications. The proposed project does not propose or facilitate any activity involving significant use, routine transport, or disposal of hazardous substances as part of religious facility or residential use.

During site preparation and construction, there would be a minor level of transport, use, and disposal of hazardous materials and wastes that are typical of construction projects. This would include fuels and lubricants for construction machinery, coating materials, etc. in addition to removal of arsenic tainted soils. Routine construction control measures and best management practices for hazardous materials storage, application, waste disposal, and accident prevention and clean up, etc. would be sufficient to reduce potential impacts to a less than significant level.

With regard to project operation, widely used hazardous materials common at residential uses include paints and other solvents, cleaners, and pesticides. The remnants of these and other products are disposed of as household hazardous waste (HHW) that includes used dead batteries, electronic wastes, and other wastes that are prohibited or discouraged from being disposed of at

local landfills. Regular operation and cleaning of the facility and residential units would not result in significant impacts involving use, storage, transport or disposal of hazardous wastes and substances. Use of common household hazardous materials and their disposal does not present a substantial health risk to the community. Impacts associated with the routine transport, use of hazardous materials or wastes will be less than significant.

b) **Less Than Significant Impact with Mitigation Incorporated.** All hazardous materials are required to be utilized and transported in accordance with their labeling pursuant to federal and state law. Routine construction practices include good housekeeping measures to prevent/contain/clean-up spills and contamination from fuels, solvents, concrete wastes and other waste materials.

Arsenic

Stantec performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM E-1527-13 (and Final Rule 40 CFR Part 312 et seq.) with respect to the property. The assessment revealed no evidence of recognized environmental conditions (RECs) in connection with the property except for the following:

> **Historical Agricultural Use.** Stantec's Interpretation of historical aerial photos indicate the property was used for agricultural land (orchards) before it was developed with the existing structures in circa 1960. Stantec recommended performing a shallow soil assessment at the property to evaluate whether residual pesticides or heavy metals associated with herbicide applications are present above regulatory screening levels, human health risk criteria or California hazardous waste levels.

To assess this REC, Stantec advanced four shallow soil borings (SB-01 through SB-04) to approximately 3 feet below ground surface (bgs) across the property. Soil samples were collected from each boring from one-foot and three-feet below ground surface (bgs). Soil samples from the one foot depth were submitted to the laboratory for analysis of organochlorine pesticides by EPA Method 8081 A and lead/arsenic by EPA Method 601 OB. Given the potential impact was from a surface application, the deeper soil samples were held in the laboratory pending receipt of the analysis from the shallow samples if impact of concern was present.

There were no detections of organochlorine pesticides above the laboratory reporting limits in any of the samples analyzed. The lead concentrations were below the US EPA Regional Screening Level (RSL) of 80 milligrams per kilogram (mg/kg) and within naturally-occurring background concentrations of 12.4 to 97 .1 mg/kg. Therefore, no additional assessment was recommended for the lead and organochlorine pesticides.

At soil boring locations SB-01, SB-02, and SB-03 arsenic was detected between 5.30 mg/kg and 9.42 mg/kg. These detected concentrations are above the U.S. EPA residential RSL of 0.067 mg/kg, but within the expected background concentrations for arsenic of 0.6 mg/kg to 12.0 mg/kg. The regulatory agencies use the background concentration as a guideline for action and therefore these detected levels are suitable for residential uses. Soil sample SB-04-01, had an elevated detection of arsenic at 65.1 mg/kg which is above maximum naturally-occurring regional background level of 12.0 mg/kg. To evaluate the vertical limits of impact at soil boring SB-04 the deeper sample from three feet bgs was analyzed. The deeper soil sample reported arsenic at 29.8 mg/kg, which is also above the maximum naturally-occurring regional background level of 12.0 mg/kg. Therefore, the vertical limits of impact were not defined.

On August 23, 2017, a deeper soil boring (SB-04A) was advanced to approximately six feet bgs adjacent to soil boring SB-04 to further vertically define the arsenic limit. The soil sample

collected at 4-feet bgs from SB-04A reported arsenic at 4.19 mg/kg which is below the maximum naturally-occurring regional background level of 12.0 mg/kg. Additional step-out borings (SB-05, SB-06, and SB-07) were advanced to the east, west, and southwest of SB-04. Soil borings SB-06 and SB-07 had concentrations below the naturally-occurring regional background level; however, SB-05 located approximately 40 feet to the west reported arsenic at 88.0 mg/kg at the 1-foot sample interval. The deeper soil sample from SB-05 collected from 3-feet reported arsenic at 3.85 mg/kg which is below the maximum naturally-occurring regional background level. Complete laboratory analytical reports are provided in Appendix E.

Based on the assessment completed to date, Stantec estimates that approximately 415 cubic yards (or approximately 623 tons) of soil impacted with arsenic above the residential screening level is present at the property in the vicinity of borings SB-04 and SB-5. The impacted soil does not appear to extent to deeper than four (4) feet. It is recommended that this soil be excavated and disposed of from the property, until the residual levels in the excavation base and sidewalls are below the screening levels.

During construction, BMPs would be required to be implemented by the City as well as standard construction controls and safety procedures that would avoid or minimize the potential for accidental release of these substances. The development would employ standard construction practices such that any materials released are appropriately contained and remediated as required by the Los Angeles County Fire Department (LACoFD), and the local Certified Unified Program Agency for hazardous materials in the region. With implementation of standard conditions and Mitigation Measure HAZ-1, hazard to the public or the environment through reasonable foreseeable upset and accident condition involving the release of hazardous materials into the environment would be less than significant.

Asbestos Containing Materials

Asbestos can be found in many applications, including sprayed-on or blanket-type insulation, pipe wraps, mastics, floor and ceiling tiles, wallboard, mortar, roofing materials, and a variety of other materials commonly used in construction. The greatest asbestos-related human health risks are associated with friable asbestos, which is ACM that can be reduced to powder by hand pressure. Friable asbestos can become airborne and be inhaled, and has been associated with specific types of respiratory disease. The manufacturing and use of asbestos in most building products was curtailed during the late 1970s.

For the building planned for demolition, samples of suspect ACM should be collected for laboratory analysis of asbestos prior to any renovation or building demolition, in order to determine the need for compliance with EPA National Emission Standard for Hazardous Air Pollutants (NESHAP) regulations. Given the age of the existing building on the Property (circa 1960s), the presence of ACM is considered very probable. Stantec recommends conducting a comprehensive, pre-demolition ACM survey in accordance with the sampling protocol of the Asbestos Hazard Emergency Response Act (AHERA) prior to any activities with the potential to disturb building materials to determine whether ACM are present. Further, in the event ACM is detected, Stantec recommends proper removal and disposal of the materials identified prior to any activities with the potential to disturb them.

Lead-Based Paint

Concern for lead-based paint (LBP) is primarily related to residential structures. The EPA's Final Rule on Disclosure of Lead-Based Paint in Housing (40 CFR Part 7 45) defines LBP as paint or other surface coatings that contain lead equal to or in excess of 1.0 milligram per square centimeter or 0.5 percent by weight. The risk of lead toxicity in LBP varies based upon the

condition of the paint and the year of its application. The U.S. Department of Housing and Urban Development (HUD) has identified the following risk factors:

- The age of the dwelling as follows: maximum risk is from paint applied before 1950.
- There is severe risk from paint applied before 1960.
- There is moderate risk from deteriorated paint applied before 1970.
- There is slight risk from the paint that is intact but applied before 1977.
- The condition of the painted surfaces.
- The presence of children and certain types of households in the building.
- Previously reported cases of lead poisoning in the building or area.

Due to the age of the structures (constructed circa 1960s), LBP is likely to be present at the Property. If present, Stantec recommends that LBP be removed from the property in accordance with all applicable laws prior to any activities with the potential to disturb painted surfaces.

c) **Less Than Significant Impact with Mitigation Incorporated.** The closest schools to the project include: Longfellow Elementary School at 6005 Magnolia Avenue, Whittier approximately 0.3 miles to the south; Walter F. Dexter Middle School located at 11532 Floral Drive, Whittier and immediately adjacent to the western site boundary; and Whittier High School located at 12417 Philadelphia Street, Whittier approximately 1 mile southeast of the project site. Operation of the proposed project—a 25-unit residential and church remodel project—would not generate any hazardous emissions, and storage, handling, production or disposal of acutely hazardous materials is not required or proposed for any aspect of this project. As discussed in Section 4.8.b, existing regulations address potential off-site construction-related hazards associated with demolition of the existing onsite structures. Impact would be less than significant with implementation of existing regulations and Mitigation Measures listed in Section 4.8.b.

d) **Less than Significant Impact.** A review of known electronic database listings for possible hazardous waste generating establishments, as well as sites with known environmental concerns was conducted. Facilities were identified by county, state, or federal agencies that generate, store, or dispose of hazardous materials. The project is not located on the State of California Hazardous Waste and Substances Site List pursuant to Government Code Section 65962.5 as identified on the California Department of Toxic Substances Control Envirostar database. Impacts will be less than significant.

e) **No Impact.** There are no private or public airports located within 2 miles of the project area. The project would not alter air traffic patterns or encourage future developments that could conflict with established Federal Aviation Administration (FAA) flight protection zones. Therefore, the project would not result in safety hazards from proximity to airports for people living in the project area or excessive noise for people residing or working in the project area. No impact will occur.

f) **Less Than Significant Impact.** The proposed development is an infill project. The project would increase the population of the area by approximately 65 persons. Given the increase in built square footage on the site, the proposed project may increase employment in the area. Per State Fire and Building Codes, sufficient space will have to be provided around the building for emergency personnel and equipment access and emergency evacuation. All project elements, including landscaping, would be sited with sufficient clearance from existing and proposed structures so as not to interfere with emergency access to and evacuation from the units. The project would comply with the California Fire Code (Title 24, California Code of Regulations, Section 9). The site plan includes access points from Floral Drive for the church and residential development.

The project driveways would allow emergency access and evacuation from the site, and would be constructed to California Fire Code specifications. Over the long term, the project would not impair implementation of or physically interfere with an adopted emergency response plan or evacuation plan because no permanent public street or lane closures are proposed. Construction work in the street associated with the development would be limited to lateral utility connections, construction of driveways on Floral Drive, installation of street trees, and extensions of the storm drain and water systems; all of which would be limited to nominal potential traffic diversion. Project impacts would be less than significant.

g) **No Impact.** The project site is located within an urbanized area of the City of Whittier and is not located within a fire hazard zone, as identified on the latest Fire Hazard Severity Zone (FHSZ) maps prepared by the California Department of Forestry and Fire Protection (CALFIRE). There are no wildland conditions in the urbanized area that the project site is located. No impact would occur.

Mitigation Measures

Based on the potential for hazardous materials, Stantec recommends the following mitigation measures that would reduce the potential affects to any hazards to a less than significant impact.

HM-1: During demolition activities, additional soil sampling and soil remediation shall be completed for localized contamination as per the recommendations of the Phase II ESA. If contamination exists in levels determined to be hazardous, such soil shall be removed and disposed of consistent with State regulations. Documentation verifying appropriate disposal of hazardous wastes/soils from demolition activities shall be provided to the City Community Development Director prior to commencement of building construction. The applicant shall bear the cost of implementing this mitigation.

HM-2: Due to the age of the existing buildings and the potential presence of ACMs and LBP, prior to the commencement of demolition, the project proponent shall retain a qualified environmental consultant to conduct a comprehensive survey of the existing building to be demolished (i.e., the classrooms and administration building) to confirm the presence or absence of ACMs and LBP. A comprehensive survey of ACMs and a comprehensive LBP survey of painted surfaces in the structures to be demolished shall occur prior to any demolition activities to confirm the presence or absence of ACMs or LBP to prevent potential exposure to workers and/or building occupants.

- If the existing buildings are found to contain any ACMs or LBP, a detailed Hazardous Material Abatement Plan shall be prepared, approved, and implemented. The Hazardous Material Abatement Plan shall include a site-specific scope of work and specifications for the proper disposal of hazardous materials. The Hazardous Material Abatement Plan shall be prepared and implemented in accordance with the Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP) and all other federal and state standards and regulations.

- The Hazardous Material Abatement Plan shall require that all ACMs and LBP be removed and properly disposed of in accordance applicable laws.

- The Hazardous Material Abatement Plan shall be implemented prior to demolition activities to ensure that any hazardous materials are properly

identified, removed, and disposed of offsite at a landfill that can accept asbestos and any other hazardous materials removed from the site.

- A qualified environmental consultant shall be present on the project site during demolition activities and shall monitor compliance with the Hazardous Material Abatement Plan.

Level of Significance After Mitigation

Hazards and Hazardous Materials impacts will be less than significant with standard conditions and mitigation satisfied.

4.10 – Hydrology and Water Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?			☑	
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?			☑	
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) result in substantial erosion or siltation on- or off-site;			☑	
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;			☑	
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			☑	

iv) impede or redirect flood flows?			☑	
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?			☑	
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			☑	

Sources

Information used to prepare this section is from the following sources: *City of Whittier General Plan Update, 1993*; Whittier Municipal Code; Flood Insurance Rate Maps (FIRM), KES Technologies Inc., Hydrology & Hydraulics Study TTM82802 in the City of Whittier, California prepared for Trinity Lutheran Church dated December, 2020 and KES Technologies Inc., Low Impact Development (LID) Mitigation Plan 11716 Floral Drive, Whittier, CA prepared for Brandywine Homes dated December, 2020.

Environmental Setting

The developed portions of Whittier are served by an extensive municipal storm drain network that is maintained by the City and designed to collect all urban runoff. These drain eventually to the Los Angeles River. While existing flood control structures have provided significant protection from uncontrolled flooding, inadequacies in the local drainage system have caused occasional localized flooding.

Federal and State Oversight

The federal Clean Water Act (CWA) is the principal federal law that provides for the protection of water quality. The primary objectives of the CWA are to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters," and to make all surface waters "fishable" and "swimmable." The U.S. Environmental Protection Agency (EPA) is the designated federal agency responsible for implementing the CWA and it has further delegated authority to the State Water Resources Control Board (SWRCB) and associated Regional Water Quality Control Boards (RWQCB) for compliance with the CWA. Relevant programs identified in the CWA include the National Pollution Discharge Elimination System (NDPES) program which regulates discharge of pollutants from known sources (point sources), as well as non-point sources, into waters of the United States through the issuance of permits. As part of the NPDES program, a Storm Water Pollution Prevention Plan (SWPPP) must be prepared for construction activities affecting greater than one acre because the discharge of stormwater during construction is considered a non-point source of water pollution.

Stormwater Pollution Prevention Plans

According the Storm Water Program run by the State Water Resources Control Board (SWRCB), the property owners shall also prepare a SWPPP in accordance with state requirements. All construction projects which could potentially have an adverse impact on the City's municipal separate storm sewer system or waters of the State shall install and/or implement appropriate construction and post-construction BMPs, as listed in their SWPPP.

Discussion

a) **Less Than Significant Impact.** A project normally would have an impact on surface water quality if discharges associated with the project would create pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code (CWC), or that cause regulatory standards to be violated as defined in the applicable National Pollutant Discharge Elimination System (NPDES) stormwater permit or Water Quality Control Plan for the receiving water body. For the purpose of this specific issue, a significant impact could occur if the project would discharge water that does not meet the quality standards of the agencies which regulate surface water quality and water discharge into stormwater drainage systems. Significant impacts could also occur if the project does not comply with all applicable regulations with regard to surface water quality as governed by the State Water Resources Control Board (SWRCB). These regulations include preparation of a Storm Water Quality Management Plan (SWQMP) to reduce potential post-construction water quality impacts.

Discharges into stormwater drains or channels from construction sites of one acre or larger are regulated by the General Permit for Storm Water Discharges Associated with Construction Activity issued by the State Water Quality Control Board. The General Permit was issued pursuant to National Pollutant Discharge Elimination System (NPDES) regulations of the Environmental Protection Agency (EPA), as authorized by the Clean Water Act. Compliance with the General Permit involves developing and implementing a Storm Water Pollution Prevention Plan (SWPPP) specifying best management practices (BMPs) that the project would use to minimize pollution of stormwater. The SWPPP BMPs would follow the guidelines set forth by the State Water Resources Control Board (SWRCB).

The project applicant will be required to comply with NPDES permit requirements through the preparation and implementation of a SWPPP for construction activities. The City's Public Works Director will review the application for compliance with applicable regulations and to ensure that no water quality standards or discharge requirements are violated. In addition, the Public Works Department has conditioned the following:

- Prior to any site grading, a Standard Urban Stormwater Management Plan (SUSMP), utilizing Best Management Practices to control or reduce the discharge of pollutants to the maximum extent practical, shall be prepared and approved by the City's Public Works Department.

With regard to long-term stormwater management, the project applicant/developer is required to comply with Whittier Municipal Code Chapter 8.36, stormwater and runoff pollution control requirements. In addition, the applicant/developer will be required to prepare a water quality management plan (WQMP) to implement measures as outlined by the Los Angeles RWQCB, which typically include, but are not limited to: 1) guidance, operation and maintenance for all source control, site design, and treatment control BMPs; and 2) operation and maintenance activities, which include maximizing canopy interception and water conservation, landscape planning, roof runoff controls, efficient irrigation, storm drain system signage, trash storage areas and litter control, employee training/education program, protect slopes and channels, common area catch basin inspection, energy dissipaters, pervious concrete/alternative materials, and storm filter filtration systems. Standard conditions of the WQMP will also include providing a thorough description of operation and maintenance activities, and providing a schedule of the frequency of operation and maintenance for each BMP. The inclusion of the aforementioned standard conditions, which reflect the Los Angeles RWQCB's WQMP and BMP requirements, sufficiently address stormwater runoff and would reduce impacts to water quality standards or waste discharge requirements to a less-than-significant level with implementation of the standard regulatory requirements.

b) **Less Than Significant Impact.** If the project removed an existing groundwater recharge area or substantially reduced runoff that results in groundwater recharge, a potentially significant impact could occur. Groundwater levels beneath the site are estimated to be more than 63 feet below the ground surface, according to records referenced in the geotechnical report for the project site. Project-related grading would not reach these depths and no disturbance of groundwater is anticipated. The proposed building footprint areas and paved parking areas would increase impervious surface coverage on the site. The total amount of infiltration on site would be decreased over existing conditions. Since this site is currently developed and is not managed for groundwater supplies, this change in infiltration would not have a significant effect on groundwater supplies or recharge.

The project would be required to comply with Chapter 13.42 (Water Conservation in Landscaping) and 13.43 (Water Efficient Landscaping) of the City of Whittier Municipal Code, which would lessen the project's demand for water resources. Also, CBC Title 24 water efficiency measures require a demonstrated 20 percent reduction in the use of potable water. The project's landscaping plans include drought tolerant landscaping materials. Compliance with Title 24 and the City's Water Conservation in Landscaping and Water Efficient Landscaping Ordinances will reduce the proposed project's impacts to groundwater supplies to a level of less than significant. Water supply is further discussed in Checklist Response 4.19.

c.i) **Less Than Significant Impact.** Potentially significant impacts to the existing drainage pattern of the site or area could occur if development of the project results in substantial on- or off-site erosion or siltation. There are no streams cross the project site; thus, the project would not alter any stream course. The project will collect and convey run-off from upstream areas and convey these flows through the site, to the storm drainage system. A site drainage plan is required by the City of Whittier and would be reviewed by the City Engineer. The final grading and drainage plan shall be approved by the City Engineer during plan check review. Erosion and siltation reduction measures would be implemented during construction consistent with an approved SWPPP, which will demonstrate compliance with the City's NPDES permit. At the completion of construction, the project would consist of impervious surfaces and landscaped areas, and would therefore not be prone to substantial erosion. Impacts will be less than significant.

c.ii) **Less Than Significant Impact.** The project will not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite as determined by the City's Public Works Department. Impacts will be less than significant.

c.iii) **Less Than Significant Impact.** The City's existing storm water drainage system is adequate to accommodate runoff from any future land uses subject to the provisions of this project. The existing site currently resides as church site and school use. The exiting site surface flows to the west through the existing fence/wall into the western adjacent parcels as demonstrated by the existing contours. Currently the existing site is 38% pervious. The proposed development is proposed as 23% impervious. The proposed development will outlet less flows as predevelopment. The proposed site will capture and bio-filtrate the required LID flow by use of flow through filters. Any flow in addition to this flow will bypass the filters and flow to the westerly school parcel through a parkway drain. Once in the school parcel the flow travels within the curb and gutter to the nearest catch basin. Once in County maintained storm drain storm flows ultimately outlet into the San Gabriel River. No current water quality BMP are in place and utilized on the current site. The proposed main system will be sized for a 100-year storm event. Prior to outletting into the public system, storm water flows will be encouraged to flow through landscape areas. These systems can be representative for a typical site treatment train. Per the project soils report the soils underlying the subject project have an existing infiltration rate of 0.1 in/hr, therefore infiltration is infeasible. The project would not adversely affect provisions for

retention and infiltration of stormwater consistent with the City's Low Impact Development (LID) policies.

c.iv) **Less Than Significant Impact.** The Federal Emergency Management Agency (FEMA) produces maps (Flood Insurance Rate Map) that identify areas that are located in flood zones. The proposed project is not located within a 100-year floodplain, as mapped by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. The project site is identified as Zone X, defined by FEMA as areas outside the 0.2 percent annual chance floodplain on Panel 06037C01835F, effective September 26, 2008. Therefore, the project will not impede or redirect flood flows. Impacts will be less than significant.

d) **Less Than Significant Impact.** According to Exhibit 7-8 of the Seismic Safety Element Background Report, most of Whittier is not within a zone influenced by the inundation of seiche, tsunami, or mudflow. The proposed project would not result in any increased risk of inundation to any properties.

e) **Less Than Significant Impact.** The church remodel and residential development project will not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. All structures to be constructed will be required to meet and comply with all applicable city and State building codes to reduce impacts to water quality to less-than-significant level.

Mitigation Measures

No mitigation measures are necessary because Hydrology impacts will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.11 – Land Use and Planning

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?				☑
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?			☑	

Sources

Information used to prepare this section is from the following sources: *City of Whittier General Plan Update*, 1993.

Environmental Setting

The City of Whittier is located in the eastern portion of Los Angeles County, 15 miles east of downtown Los Angeles. The City is on the southwestern slopes of the Puente Hills just east if the San Gabriel River and the San Gabriel River Freeway (State Route 605). The land features a sloping terrain on the north and east where the Puente Hills are located and becomes flat on the southern and western sections. The Uptown Whittier project area encompasses approximately 185 acres in the City of Whittier, generally bounded by Hadley Street on the north, Painter Avenue on the east, Penn Street on the south, and Pickering Avenue on the west.

Discussion

a) **No Impact.** The proposed project is surrounded by institutional and residential uses. The proposed residential and church remodel project is consistent and compatible with the surrounding land uses along Floral Drive and Beverly Boulevard and will not divide an established community. The project does not propose construction of any new roadway, flood control channel, or other structure that would physically divide any portion of the community. Therefore, no impact will occur.

b) **Less than Significant Impact.** The project would not conflict with the City's General Plan or any other applicable land use plans and policies. The project is consistent with goals and objectives in the existing Land Use Element of the General Plan. The project site is in the P – Private School land use category as identified by the Land Use Element of the City of Whittier General Plan, 1993. The project is requesting a General Plan Amendment No. 19-0003 to amend the Land Use Map from Public and Quasi Public - Private School to Medium Density Residential on a 3.59-acre parcel of land located at 11716 Floral Drive. They are also requesting Change of Zone No. 19-0002 to amend the Zoning Map from Zone Change from R-1 Low Density Residential to R-2 Medium Density Residential on the 3.59-acre parcel of land located at 11716 Floral Drive for the church and residential development. The proposed development plan of 25 homes is at about 66% of what the zoning would allow (9.8du/ac vs. max of 15 du/ac). The R-4 development Magnolia Terrace located immediately east is constructed at 32.7du/ac, and the existing duplexes located on Orange Drive to the south are developed at 12.4 du/ac. The proposed development, at 9.8du/ac is at a lower density than both adjacent neighborhoods. The project does not conflict with the intent or implementation of the General Plan or Zoning. Impacts will be less than significant.

Mitigation Measures

No mitigation measures are necessary because impacts to Land Use and Planning will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.12 – Mineral Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?				☑
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?				☑

Sources

Information used to prepare this section is from the *City of Whittier General Plan Update*, 1993.

Environmental Setting

Tertiary sedimentary formations on the Puente Hills contain conglomerate and sandstone deposits which may be used for aggregate. Thus, the hills have a potential for these resources, although insufficient data is available to determine if the deposits in the Puente Hills are significant and can be economically mined. No significant aggregate resources have been identified by the State Department of Mines and Geology in the Whittier area.

Discussion

a-b) **No Impact.** The project is located within a fully urbanized City of Whittier. The project does not propose any alteration of local mineral resource land uses and there are no mineral resource activities that would be altered or displaced by project implementation. No further discussion is required.

Mitigation Measures

No mitigation measures are necessary because Mineral impacts will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.13 – Noise

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?		☑		
b) Generation of excessive groundborne vibration or groundborne noise levels?		☑		
c) For a project located within the vicinity or 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?				☑

Sources

Information used to prepare this section is from the following sources: *City of Whittier General Plan Update*, 1993; *City of Whittier Municipal Code, and* RK Engineering Group, Inc., Whittier Floral Residential Project Noise Impact Study, City of Whittier, California prepared for Brandywine Homes dated March 24, 2021.

Environmental Setting

Noise Terminology

The unit of measurement used to describe a noise level is the decibel (dB). The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, the "A-weighted" noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. Noise levels using A- weighted measurements are written dB(A) or dBA. Decibels are measured on a logarithmic scale, which means a doubling of the energy of a noise source, such as a doubled traffic volume, would increase the noise levels by 3 dBA; halving of the energy would result in a 3 dBA decrease.

Average noise levels over a period of minutes or hours are usually expressed as dBA Leq, or the equivalent noise level for that period of time. For example, Leq(3) would represent a 3-hour average. When no period is specified, a one-hour average is assumed.

It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA; that a change of 5 dBA is readily perceptible, and that an increase (decrease) of 10 dBA sounds twice (half) as loud. This definition is recommended by Caltrans publication, *Transportation's Traffic Noise Analysis Protocol for New Highway and Reconstruction Projects*.

Vibration

Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of groundborne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Noise Standards

State Regulations

State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation. Title 24 of the California Code of Regulations, also known as the California Building Standards Code, establishes building standards applicable to all occupancies throughout the state. The code provides acoustical regulations for both exterior-to-interior sound insulation, as well as sound and impact isolation between adjacent spaces of various occupied units. Title 24 regulations state that interior noise levels generated by exterior noise sources shall not exceed 45 dBA Ldn/CNEL, with windows closed, in any habitable room for general residential uses.

City of Whittier General Plan

The Whittier Noise Guidelines for land use planning reflects the City's interpretation of noise guidelines promulgated by the California Office of Noise Control. The guidelines provide the City with an integral tool to gauge the compatibility of land uses relative to existing and future noise levels.

Vibration Standards

The City of Whittier does not have a published vibration impact criterion. The California Department of Transportation (Caltrans) has published one of the seminal works for the analysis of groundborne noise and vibration relating to transportation- and construction-induced vibrations and although the project is not subject to the regulations, it serves as a useful tool to evaluate vibration impacts. A vibration impact would generally be considered significant if it involves any construction-related or operations-related impacts in excess of 0.2 +inches per second (in/sec) PPV.

Discussion

a) **Less Than Significant Impact with Mitigation Incorporated.** Infill development involves construction in close proximity to existing residents and businesses. Environmental review of the potential noise impacts during construction identified no significant impacts for ground-borne vibration/noise. Temporary noise impacts during construction are to be mitigated by use of a construction management plan, construction of a 6' high block wall at the perimeter,

and a prohibition on pile driving. Design features include the following measures: working only within approved construction hours; building construction to provide 45dBA sound attenuation for new residents, and use of specified windows, sealing techniques, and mechanical ventilation where required.

Project construction noise levels are expected to be below the recommended 8-hour construction noise threshold provided by the FTA for adverse community reaction at the adjacent residential, taking into account the mitigation measures mentioned below. However, the project construction would still generate noise levels in exceedance of ambient conditions at the adjacent residential land uses. As a result, several mitigation measures are recommended to reduce construction noise impacts to the surrounding sensitive land uses:

N-1: The project shall prepare a construction management plan to be approved by the City of Whittier Community Development Department prior to initiating construction. The construction management plan shall include best management practices to reduce construction noise levels. Best management practices may include the following:

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).
- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.
- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.
- Post a sign in a readily visible location at the project site that indicates the dates and duration of construction activities, as well as provide a telephone number where residents can enquire about the construction process and register complaints to an assigned construction noise disturbance coordinator.

N-2: The project shall construct the six (6) foot high concrete masonry unit (CMU) block perimeter wall at the first phase of the construction and prior to performing the major demolition or grading activities. The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the project site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking.

b) **Less Than Significant Impact with Mitigation Incorporated.** A significant impact would occur if project construction or operation results in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Project related construction activity is not expected to cause any damage potential to the nearest structures. The annoyance potential of vibration from construction activities would range from "distinctly perceptible" to "strongly perceptible".

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structures. The nearest sensitive receptors are the residential structures located adjacent to the project site to the east and south of the property line. All structures surrounding the project site are considered "new residential structures". No historical or fragile buildings are known to be located within the vicinity of the site.

The construction of the proposed project is not expected to require the use of substantial vibration inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during construction of the project would be the operation of equipment such as bulldozer activity during site preparation, loading trucks during grading and excavation, and vibratory rollers during paving. The construction vibration assessment utilizes the referenced vibration levels and methodology set-forth within the Caltrans Transportation and Construction Induced Vibration Guidance Manual.

Project related construction activity is not expected to cause any damage potential to the nearest structures. The annoyance potential of vibration from construction activities would range from "distinctly perceptible" to "strongly perceptible". To help mitigate any potential impacts from vibration, the following measure is proposed.

N-3: No impact pile driving activities shall be permitted on the project site during construction. If impact pile driving is required, a follow-up noise and vibration impact assessment shall be conducted prior to start of any pile driving activity.

c) **No Impact.** No airport land use plans apply to the area, and the proposed project is not located within two miles of an airport. The project falls outside any airport's noise contours for excessive noise. Therefore, residents or workers would not be exposed to excessive airport noise levels and there would be no impact. No further environmental analysis is necessary.

Recommended Project Design Features

The following design features, while not generally considered mitigation under CEQA, are provided to help ensure the project meets the City/State standards for interior noise exposure within a residential dwelling. Design features included standard rules and requirements and best practices that are provided for consideration as part of the conditions of approval for the project.

DF-1 The project shall incorporate building construction techniques that achieve the minimum interior noise standard of 45 dBA CNEL for all residential units.

DF-2 A "windows closed" condition is expected to be required for all residential units within the project site to meet the interior noise standard. To accommodate a windows closed conditions, all units shall be equipped with adequate fresh air ventilation, per the requirements of the California Uniform Building Code (UBC).

DF-3 The project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls). Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

DF-4 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-5 All HVAC units should partially enclosed behind a noise screening wall and shielded from line of sight of any adjacent property line.

DF-6 Delivery, loading/unloading activity, and trash pick-up hours should be limited to daytime (7 a.m. – 9 p.m.) hours only.

DF-7 Limit engine idling time for all delivery vehicles and moving trucks to 5 minutes or less.

DF-8 Construction-related noise activities shall comply with the requirements set forth in the City of Whittier Municipal Code Chapter 8.32 Noise Control and Chapter 15.06 Construction Hours.

- Work authorized under or requiring a building or other permit shall take place only between the hours of 7:00 a.m. and 8:00 p.m. Monday through Saturday, unless authorized in writing by the City Manager or necessitated to protect life and/or property.
- Use of heavy equipment (dump trucks, graders, jack hammers, etc. are only permitted Monday through Friday from 7:00 a.m. to 6:00 p.m. and Saturday from 8:00 a.m. to 5:00 p.m.
- No work is permitted on Sundays or federal holidays.
- Work, as used in the section, includes all preparation, cleanup and material deliveries.

Mitigation Measures

Based on the potential for noise and vibration impacts, RK Engineer Group recommends the following mitigation measures that would reduce the potential affects to any surrounding properties to a less than significant impact.

N-1: The project shall prepare a construction management plan to be approved by the City of Whittier Community Development Department prior to initiating construction. The construction management plan shall include best management practices to reduce construction noise levels. Best management practices may include the following:

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).
- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.
- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.
- Post a sign in a readily visible location at the project site that indicates the dates and duration of construction activities, as well as provide a telephone number

where residents can enquire about the construction process and register complaints to an assigned construction noise disturbance coordinator.

N-2: The project shall construct the six (6) foot high concrete masonry unit (CMU) block perimeter wall at the first phase of the construction and prior to performing the major demolition or grading activities. The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the project site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking.

N-3: No impact pile driving activities shall be permitted on the project site during construction. If impact pile driving is required, a follow-up noise and vibration impact assessment shall be conducted prior to start of any pile driving activity.

Level of Significance After Mitigation

Noise impacts will be less than significant with standard conditions and mitigation satisfied.

4.14 – Population and Housing

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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)?			☑	
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				☑

Sources

Information used to prepare this section is from the following sources: State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2021 with 2010 Census Benchmark*. Sacramento, California, May 2021; and *City of Whittier General Plan Housing Element Update 2014-2021*, October 14, 2013.

Environmental Setting

Estimated population of Whittier for 2021 is 86,196 and has an estimated 2.59 persons per household. According to the City's General Plan Housing Element Update 2014-2021, Table 4-1, Whittier *RHNA,* the City estimates that a total of 878 new housing units are needed in varying income levels. These are based on SCAG's *Regional Housing Needs Assessment* for Whittier.

Discussion

a) **Less Than Significant Impact.** The proposed project would induce direct population growth with construction of 25 residential units and remodeling of the Trinity Lutheran Church. The project constitutes infill development on a portion of land currently developed with Church buildings and a surface parking lot. The proposed project would construct 25 new residential units. The estimated population increase generated from the proposed project would range between 65 residents. As of January 1, 2021, the City of Whittier had an estimated population of 86,196 residents (DOF, 2021). Implementation of the project is consistent with the overall intent of the City of Whittier to provide adequate housing opportunities to meet its fair share of projected housing needs. Additionally, the estimated increase in population resulting from the project has been anticipated by the City and the region. Therefore, impacts from substantial population growth would be less than significant.

The increased population and housing resulting from the project would not necessarily cause direct adverse physical environmental effects; however, indirect physical environmental effects such as project-related traffic or air quality impacts could occur. These indirect physical environmental effects associated with the project are analyzed in Section 4.3 Air Quality and Section 4.17 Transportation of this IS/MND. The project may require extension of some existing utilities from the project site into the right-of-way of adjacent streets (for the connection of utilities such as water or sewer lines). However, the project constitutes infill development and does not propose infrastructure improvements (such as new roads or other infrastructure) not already established in and near the project site. Therefore, no indirect impacts associated with the extension of roads and other infrastructure would occur.

b) **No Impact.** The project site is currently developed with existing church buildings and a large surface parking lot. No housing exists onsite and no one currently resides on the project site. Therefore, the project would not displace any housing or people and the project would not necessitate the construction of replacement housing. No impact would occur.

Mitigation Measures

No mitigation measures are necessary because impacts to Population and Housing will be less than significant.

Level of Significance After Mitigation

Not Applicable

4.15 – Public Services

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new of 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:				
Fire Protection?			☑	
Police Protection?			☑	
Schools?			☑	
Parks?			☑	
Other public facilities?			☑	

Sources

Information used to prepare this section is from the following sources: City of Whittier *General Plan Update*, 1993; and Great!Schools Website.

Environmental Setting

Fire Protection

The Los Angeles County Fire Department (LACoFD) provides fire protection and emergency medical response services in the City of Whittier. LACoFD also provides prevention services (e.g., inspections, permits, and drills) within its jurisdiction. LACoFD has mutual aid agreements with other jurisdictions and practices unified command in response to potential emergencies. Property tax and special tax revenues generated fund the LACoFD.

Police Protection

The Whittier Police Department (WPD), headquartered at 13200 Penn Street, provides police protection to the City, including the project site. The WPD serves the cities of Whittier and Santa Fe Springs, an area encompassing 21.4 miles and an estimated population of approximately 105,787 persons, according to Department of Finance 2019 estimates. The members of the WPD who serve the citizens of Santa Fe Springs are stationed out of the Police Service Center, which is

located in the City of Santa Fe Springs. WPD has 120 sworn police officers, or a ratio of 1.175 police officers for every 1,000 persons. WPD also has 58 civilian staff. Eighty-five officers are assigned to Whittier and 35 are assigned to Santa Fe Springs. The current WPD police headquarters was opened in November 2010 and was built to accommodate necessary growth and expansion. The WPD could increase its resources and still be contained in the present facility, if necessary.

Schools

The City is served by the following school districts: Whittier Union High School District, Whittier City School District, Fullerton Joint Union High School District, Whittier Elementary School District, the East Whittier Elementary School District, the Los Nietos School District and the Lowell Joint School District. The closest schools to the project include: Longfellow Elementary School at 6005 Magnolia Avenue, Whittier approximately 0.3 miles to the south; Walter F. Dexter Middle School located at 11532 Floral Drive, Whittier and immediately adjacent to the western site boundary; and Whittier High School located at 12417 Philadelphia Street, Whittier approximately 1 mile southeast of the project site.

Pursuant to the Leroy F. Green School Facilities Act (AB 2926), future project proponents will be required to pay developer fees prior to the issuance of building permits, at the then current rate. This fee will help support provision of school services for the community as a whole.

Parks

See Section 4.15, Recreation for discussion on parks.

Discussion

a) **Less Than Significant Impact.** The Los Angeles County Fire Department (LACoFD) provides fire protection and emergency medical response services in the City of Whittier. LACoFD also provides prevention services (e.g., inspections, permits, and drills) within its jurisdiction. LACoFD has mutual aid agreements with other jurisdictions and practices unified command in response to potential emergencies. The project site is served by Fire Station 17, which is located to the southeast of the project site. Fire Station 17, located at 12006 Hadley Street, is staffed an engine company. Based on the distance to the project site, Engine 17 is estimated to have an emergency response time of less than five minutes. The proposed project development proposal has been reviewed by LACoFD to ensure that public safety is considered and addressed, including appropriate access and fire-flow water rates. The project would replace an existing vacant use, and as such could result in an increase in calls for fire protection and emergency medical services. Whether a specific project results in a need for new or expanded fire protection facilities depends partly on the level of demand for fire protection the project generates, and partly on the distance from the project site to the nearest existing fire station.

The project is a proposed infill site. The project is within close proximity to a fire station. Therefore, the project would not have a significant impact on fire response times and would not otherwise create a substantially greater need for fire protection services than already exists. No new or expanded fire protection facilities would be required as a result of this project. Furthermore, the proposed residential and church site does not propose to use substantially hazardous materials or engage in hazardous activities that will require new or modified fire protection equipment to meet potential emergency demand. According to LACoFD, no significant impacts to fire response time or paramedic response time would occur as a result of this project. Impacts related to expansion of fire protection services will be less than significant.

b) **Less Than Significant Impact.** The Whittier Police Department does not anticipate any significant increase in the average call response time of five to eight minutes resulting from proposed buildout of the project. The proposed residential and church project will not result in any unique or more extensive crime problems that cannot be handled with the existing level of police resources. No new or expanded police facilities would need to be constructed as a result of this project. Impacts related to expansion of police protection services will be less than significant.

c) **Less Than Significant Impact.** As a new residential land use, it would have a population increase of approximately 65 persons and would generate a potential direct demand for school facilities. Pursuant to the Leroy F. Green School Facilities Act (AB 2926), the project proponent will be required to pay developer fees to the Whittier Elementary School District, prior to the issuance of building permits, at the then current rate charged to single-family residential development projects. This fee will help support provision of school services for the community as a whole. According to AB 2926, payment of developer fees constitutes adequate mitigation for any project-related impacts to school facilities. Impacts to the school facilities will be less than significant.

d) Less Than Significant Impact. Demand for park and recreational facilities are generally the direct result of residential development. The project will be providing open space amenities including an outdoor dining space, multi-use open space areas and a barbeque area. No substantial demand for park and recreation facilities will result. Impacts will be less than significant.

e) Less Than Significant Impact. No other impacts have been identified that would require the provision of new or physically-altered governmental facilities. The development projects will continue to be subject to sewer, transportation, and storm water impact fees.

Mitigation Measures

No mitigation measures are necessary because impacts to Public Services will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.16 – Recreation

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

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?			☑	
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?			☑	

Sources

Information used to prepare this section is from the following sources: *City of Whittier General Plan Update*, 1993.

Environmental Setting

Exhibit 5-2, Recreational Opportunities in the Environmental Resources Management Element of the General Plan identifies the parks and recreational facilities within the City.

Discussion

a) **Less Than Significant Impact.** The project involves the construction of 25 residential units and remodeling of the church campus. The residential portion of the project also proposes two common open space areas of approximately 21,670 square feet. The proposed open space amenities include an outdoor dining space with a barbeque and common open space areas. The closest public park to the site is Palm Park approximately 0.2 mile to the west at 5703 Palm Avenue. The park offers the following amenities:

- Play Equipment
- Barbecues, Sinks, & Stoves
- Basketball Court
- Horseshoe Pit
- Swimming Pool
- Restrooms
- Picnic Tables
- Fitness Stations
- Tennis Center

The addition of 65 persons to the city is expected to marginally increase the use of existing neighborhood and regional parks, but this increased use would be partially offset by the proposed open space on the project site as described above. Landscape plans for the project are contained in Appendix A. The provision of open space and amenities onsite would reduce impacts to existing recreational facilities. Additionally, the project applicant would pay any applicable park or recreational impact fees required by the city. Therefore, the project would have a less than significant impact on parks or other recreational facilities.

b) **Less Than Significant Impact.** As described above, the project includes recreational facilities for residents. Furthermore, the project would not require the construction or expansion of recreational facilities outside the limits of the project site. Therefore, there would be no significant adverse physical effect on the environment, and less than significant impacts would occur with project implementation.

Mitigation Measures

No mitigation measures are necessary because Recreation impacts will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.17 – Transportation

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a) Conflict with an applicable program plan, ordinance or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			☑	
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?			☑	
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			☑	
d) Result in inadequate emergency access?			☑	

Sources

Information used to prepare this section is from the following sources: *City of Whittier General Plan Update*, 1993 and RK Engineering Group, Inc., Whittier Floral Residential Project Traffic Impact Analysis & Parking Study, City of Whittier, California prepared for Brandywine Homes dated March 26, 2021.

Environmental Setting

The City of Whittier is located in the eastern portion of Los Angeles County, 20 miles east of downtown Los Angeles. The City is on the southwestern slopes of the Puente Hills just east if the San Gabriel River and the San Gabriel River Freeway (State Route 605). The land features a sloping terrain on the north and east where the Puente Hills are located and becomes flat on the southern and western sections. The project takes access from Floral Drive via two driveways.

Discussion

a) **Less than Significant Impact.** The project involves remodeling an existing church campus and new construction of 25 residential units. It is not intended to conflict with a program plan, ordinance or policy addressing the circulation system.

On-street parking was identified by City staff as a potential impact to evaluate. Current utilization of weekday on-street parking on Floral Drive peaks at 74% along the north side of the street during the AM school rush hour. Parking along the south side of Floral peaks at 70% at 11:00 am. Parking in the Trinity lot peaks at 15% capacity during mid-day. On Sundays, on-street parking peaks at 68% near mid-night along the north side of Floral, while the church lot peaks at 79% capacity during mid-morning services. Both the church and residential project are providing the required number of parking space (64 residential, 48 church) to meet City code. It is not anticipated that parking from the proposed project will impact the on-street parking capacity given the orientation of the residential project away from Floral Drive and the ability for residential spill-over parking (if required) to utilize the church lot as temporary overflow.

The project is projected to generate 19 trips during the AM peak hour and 26 trips during the PM Peak hour. Compared to the current R-1 zoning, the volumes increase by 8 trips during AM peak and by 11 trips during PM peak. It is important to note that prior to the Trinity School closure, trips to and from this location were significantly higher during the peak hour relative to the proposed single-family residential use. The traffic study found that current traffic conditions near the project are functioning at acceptable service levels, although Beverly/Floral is approaching capacity (81.3%) during the AM peak only. With the addition of trips from the proposed project, the Beverly/Floral capacity increases to 82.0% during AM peak. All other intersections remain unchanged in terms of level of service with the proposed project. No further environmental analysis is required.

b) **Less than Significant Impact.** Trip generation is a measure or forecast of the number of trips that begin or end at a particular site, and is a function of the extent and types of land use proposed as part of a project. Vehicular traffic generation characteristics for projects are estimated based on established rates. These rates identify the probable traffic generation of various land uses based on studies of developments in comparable settings. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be considered to have a less than significant transportation impact.

Effective July 1, 2020, the longstanding metric of roadway level of service (LOS), which is typically measured in terms of auto delay or volume-to-capacity, will no longer be considered a significant impact under the California Environmental Quality Act (CEQA). Pursuant to the 2020 CEQA Guidelines, Section 15064.3, *"Generally, vehicle miles traveled is the most appropriate measure of transportation impacts. Other relevant considerations may include the effects of the project on transit and non-motorized travel."*

For land use projects, the CEQA guidelines provides the following criteria for analyzing Transportation Impacts and VMT:

- Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact.
- Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact.

- Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

The City of Whittier is still in the process of adopting criteria for the uniform evaluation of VMT impacts under CEQA, including the preferred analysis methodology, modeling requirements, and thresholds of significance. Per Section 15064.3 (a)(3) of the CEQA Guidelines, a qualitative analysis is allowable if existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered. Hence, this study primarily evaluates the project's effect on transit and non-motorized travel and does not rely on a numerical threshold of significance for determining impact. The State of California Governor's Office of Planning and Research (OPR) Technical Advisory on Evaluating Transportation Impacts in CEQA serves as a general guidance document for the Traffic Assessment.

The following factors are reviewed with regards to VMT for this project:

a. Proximity to Transit
b. Access to Multi-Modal Transportation
c. Diversifying Land Use

Proximity to Transit

As specified in the CEQA guidelines, generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. A high-quality transit corridor is defined by the Southern California Association of Governments (SCAG) as being a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

- Bus Route 7.
  The project site is located approximately 350 feet (~0.07 miles) from the nearest bus stop along the Norwalk Transit System bus route. The Norwalk Transit System shuttle operates daily from 4:07 a.m. to 9:11 p.m. Fares are only 1.25 dollars per trip for adults and are 60 cents to seniors (62 years and older) and persons with disabilities / Medicare. Children under the age of 5 are allowed to ride free of charge. The Norwalk Transit System provides southeastern Los Angeles County residents access to major destinations and connectivity to the nearby cities of Norwalk, Santa Fe Springs, Downey, Whittier and El Monte.

- Bus Route 1.
  The project site is located approximately 3,969 feet (0.7 miles) from another bus route provided by the Norwalk Transit System. Bus Route 1 shares the same fare rates as described for Bus Route 7. The Norwalk Transit System shuttle operates from 5:29 a.m. to 10:47 p.m. The Norwalk Transit System Bus Route 1 travels northbound and southbound between the Woodruff / Rosecrans station and the Rio Hondo College station with service headway as low as 30 minutes during peak commute times.

- Bus Line 274.
  The project site is located approximately 4,224 feet (0.8) miles from Bus Line 274 which is provided by Foothill Transit. The Foothill Transit shuttle operates daily from 5:00 a.m. to 9:32 p.m. Foothill Transit provides users various payment options and transit passes which allow for one-time payments, daily/monthly subscriptions, and subscriptions that allow use of other local transportation agencies partnered with Foothill Transit. Bus Line 274 travels northbound and southbound between the cities of Whittier and Baldwin Park.

- Montebello / Commerce Metrolink Station.

The project site is located approximately 5.9 miles from the Montebello / Commerce Metrolink Station. Metrolink provides regional rail access to LA, Ventura, San Bernardino, Orange, Riverside, and San Diego Counties.

Since the project is located within one-half mile of multiple bus stops (Beverly Boulevard/Floral Drive, Norwalk Boulevard/Beverly Boulevard, Workman Mill Road/Sierra Morena Avenue) the project is in close proximity to public transit. The Norwalk Transit System Bus Routes 1 and 7 and Foothill Transit Bus Line 274 do not provide service intervals less than 15 minutes during peak commute hours to qualify as high-quality transit corridors. However, they do provide alternative transportations options to serve the project and would be expected to have a reduction effect on VMT. The Norwalk Transit System Bus Routes 1 and 7 and Foothill Transit Bus Line 274 Bus Route Schedules are shown in Appendix I.

Access to Multi-Modal Transportation

In addition to the proximity of the site to transit described above, the project is located approximately 1,056 feet (0.2 miles) to the Palm Park Center with pedestrian access provided via Palm Avenue and Floral Drive. The project site is also located approximately 3,168 feet (0.60 miles) from the closest Class-2 Bike Path facility located at the intersection of Norwalk Boulevard – Workman Mill Road/Beverly Boulevard.

Diversifying Land Use

Section 21099 of the California Public Resources Code states that the criteria for determining the significance of transportation impacts must promote a diversity of land uses. This includes prioritizing infill developments. The project would consist of a detached multi-family residential project with an increase in land use density resulting in 9.8 dwelling units per acre. The project would be located approximately 528 feet (0.10 miles) from the adjacent Dexter Middle School.

The California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures, August 2010 report states increasing the density of land use can achieve up to 30% reduction in VMT. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose, for example, studies have shown that transit ridership increases with density. The TRB Special Report 298 literature suggests that doubling neighborhood density across a metropolitan area might lower household VMT by about 5 to 12 percent. Therefore, as a result of the increased density, the project would help to reduce VMT compared to existing church use and surrounding predominantly single family neighborhood. Hence, the proposed project is presumed to have a less than significant transportation impact based on VMT.

Transportation Demand Management Strategies

The following transportation demand management (TDM) strategies are provided to help further reduce project VMT.

- Provide all residents with information regarding the availability of transit options in the vicinity of the site, including the Norwalk Transit System Bus Routes, Foothill Transit Bus Lines, and Montebello / Commerce Metrolink Station.

- The project should notify future residents of the site that the City of Whittier offers discounted bus passes to residents.

The proposed project meets the CEQA requirements for reducing VMT by providing an infill project that would increase the land use density of the site. Additional VMT reduction strategies may also be incorporated with the project. Therefore, the project's transportation impact is considered less than significant.

c) **Less Than Significant Impact.** A significant impact would occur if the proposed project substantially increased an existing hazardous geometric design feature or introduced incompatible uses to the existing traffic pattern. The project shall ensure adequate sight distance is provided at each project access location intersecting a public roadway per the California Department of Transportation (Caltrans) standards. The California Highway Design Manual, Section 405.1 indicates that the minimum corner sight distance for intersections of private roads shall be equal to the stopping sight distance given in Table 201.1 of the Highway Design Manual. Floral Drive is classified as a Local Street with a posted speed limit of 25 mph. The minimum required corner sight distance for a private roadway intersection is 150 feet. In order to ensure adequate sight distance is maintained, the following recommendations are provided:

- A limited use area shall be maintained where a clear line of sight can be established.
- The limited use area shall be used for the purpose of prohibiting or clearing obstructions to maintain adequate sight distance at intersections.
- Limited use area to be kept clear of all obstructions over 30 inches high, including vegetation.
- No trees, walls, or any obstructions shall be allowed in the limited use area.
- The toe of the slope shall not encroach into the limited use area.

By complying with the sight distance recommendations, the project would not substantially increase hazards due to sight distance. The design of the development under the provisions of the Municipal Code would comply with all applicable City regulations. The project would not create or encourage any hazardous transportation-related design features or incompatible uses. No further environmental analysis is required.

d) **Less Than Significant Impact.** A significant impact would occur if the design of the proposed project would not satisfy emergency access requirements of the Los Angeles County Fire Department or in any other way threaten the ability of emergency vehicles to access and serve the project area or adjacent uses.

Construction

Project construction could temporarily close sidewalks and street lane(s) along Floral Drive, which could temporarily impact emergency access. However, implementation of a Transportation Map Plan would ensure that traffic circulation during construction would be less than significant.

Operation

The project would comply with applicable City regulations, such as the requirement to comply with the City's fire code to provide adequate emergency access, as well as the California Building Standards Code. Prior to the issuance of building permits, the City of Whittier would review project site plans, including location of all buildings, fences, access driveways and other features that may affect emergency access. The site design includes access and fire lanes that would accommodate emergency ingress and egress by fire trucks, police units, and ambulance/paramedic vehicles. All onsite access and sight-distance requirements would be in accordance with all applicable design requirements. The City's review process and compliance with applicable regulations and standards would ensure that adequate emergency access would be provided. Therefore, the project would not result in inadequate emergency access and there would be less than significant impacts.

Mitigation Measures

No mitigation measures are necessary because Transportation impacts will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.18 – Tribal Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project 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:				
a) 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?			☑	
b) 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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		☑		

Sources

Information used to prepare this section is from the following sources: Notice of Project Applications to Native American Tribes dated June 7, 2019 and June 27, 2019, and *City of Whittier General Plan Update*, 1993.

Environmental Setting

Senate Bill 18

Senate Bill 18 California Government Code §65352.3 (adopted pursuant to the requirements of SB 18) requires local governments to contact, refer plans to, and consult with tribal organizations prior to making a decision to adopt or amend a general or specific plan, or to designate open space that includes Native American Cultural Places. The tribal organizations eligible to consult have traditional lands in a local government's jurisdiction, and are identified, upon request, by the Native American Heritage Commission (NAHC). As noted in the California Office of Planning and Research's Tribal Consultation Guidelines (2005), "the intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places."

Assembly Bill 52

Assembly Bill 52 (AB 52) requires meaningful consultation with California Native American Tribes on potential impacts on TCRs, as defined in Public Resources Code § 21074. TCRs are sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either eligible or listed in the California Register of Historical Resources or local register of historical resources (CNRA, 2007).

As part of the AB 52 process, Native American tribes must submit a written request to the lead agency to be notified of projects within their traditionally and culturally affiliated area. The lead agency must provide written, formal notification to those tribes within 14 days of deciding to undertake a project. The tribe must respond to the lead agency within 30 days of receiving this notification if they want to engage in consultation on the project, and the lead agency must begin the consultation process within 30 days of receiving the tribe's request. Consultation concludes when either (1) the parties agree to mitigation measures to avoid a significant effect on a tribal cultural resource, or (2) a party, acting in good faith and after reasonable effort, concludes mutual agreement cannot be reached.

Discussion

a) **Less Than Significant Impact.** Project implementation would not result in any specific construction activities involving extensive excavation, and therefore would not be anticipated to significantly affect or destroy any Native American tribal cultural resources. No tribal cultural resources 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 § 5020.1(k). Therefore, there will be no impacts as a result of the project. While the probability of encountering a significant tribal cultural resource or human remains is low, any occurrence or discovery is subject to existing protections under California law. No further environmental analysis is required.

b) **Less Than Significant Impact with Mitigation Incorporated.** To comply with California Government Code requirements, the City of Whittier contacted the Native American Heritage Commission to obtain a list of tribes with cultural and traditional affiliations within the area encompassed by the City of Whittier. The NAHC identified tribal representatives to be notified of the City's proposed General Plan Amendment, Zone Change and Development Review Permits under Senate Bill 18 on March 5, 2020. The City of Whittier sent letters on March 11, 2020. No tribes responded within the 90-day period.

The City of Whittier (the lead agency) initiated AB 52 outreach to local tribes for the Trinity Church Remodel and Brandywine Homes Project. The City prepared letters to the two tribes on their list for AB 52 contact, informing them of the project. The letters were sent on February 21, 2020. The letters were sent via certified mail to: Andrew Salas, Chairman, Gabrieleño Band of

Mission Indians – Kizh Nation (Gabrieleño – Kizh Nation); and Joseph Ontiveros, Cultural Resource Director, Soboba Band of Luiseño Indians. The letters conveyed that the recipient had 30 days from the receipt of the letter to request AB 52 consultation regarding the project.

Chairman Salas requested a consultation on the project. An AB 52 consultation meeting was held between the Gabrieleño – Kizh Nation and Ellen Fitzgerald, Senior Planner with the City of Whittier on May 27, 2020. The City agreed to mitigation measure language for tribal cultural resources provided by the Gabrieleño – Kizh Nation. This mitigation language has been adapted as TCR-1 and TCR-2 below. Consultation was concluded with the incorporation of the measures as conditions upon development. To date, there have been no responses from the remaining tribe. The response period having been passed, the City has determined that the AB 52 consultation process has concluded.

No sites were documented in the Native American Heritage Commission's SLF search. No resources as defined by Public Resources Code § 21074 have been identified. Additionally, the project site has not been recommended for historic designation for prehistoric and TCRs. No specific tribal resources have been identified. No prehistoric or historic archaeological resources were observed during the field survey.

A mitigation measure for minimizing impacts on potential TCRs is applicable to the project site because the land at the site remained relatively undisturbed due to use for orchard farming into the mid-20th century, and the immediate area has been urban with residential and institutional buildings since the 1960s. Therefore, while the potential for subsurface prehistoric cultural deposits is considered to be low, most construction work on the Church campus was completed prior to implementation of CEQA guidelines.

Mitigation measure TCR-1 described below requires consultation of a qualified archaeologist and the local Native American representative, if unanticipated discoveries are made during construction activities. With implementation of TCR-1, potential project impacts on TCRs would be less than significant.

As previously discussed**,** the project would be built on disturbed land, within a developed suburban setting. No human remains have been previously identified or recorded onsite. The project proposes grading activities for the implementation of infrastructure that includes water, sewer, and utility lines. Grading activities associated with development of the project would involve new subsurface disturbance and could result in the unanticipated discovery of unknown human remains, including those interred outside of formal cemeteries. In the unlikely event of an unexpected discovery, implementation of mitigation measures TCR-2 dealing with associated funerary objects, and TCR-3 dealing with human remains would ensure that impacts related to the accidental discovery of human remains would be less than significant.

Mitigation Measures

TCR-1: Prior to the issuance of a grading permit, the project applicant shall communicate with representatives of the Gabrieleño Band of Mission Indians – Kizh Nation and present evidence of such communication to the City of Whittier Community Development Department Director, or designee, demonstrating the following shall occur:

- On-call monitoring services by a qualified Native American Monitor to address unanticipated prehistoric or tribal resources. The Native American Monitor shall

be present at the pre-grading conference to establish procedures for tribal cultural resource surveillance.

- Native American Indian Sensitivity Training by a qualified Native American Monitor for construction personnel. The training session shall include a handout and focus on how to identify Native American resources encountered during earthmoving activities and the procedures followed if resources are discovered, the duties of the Native American Monitor of Gabrieleño Ancestry, and the general steps the Monitor would follow in conducting a salvage investigation.

- Construction Monitoring by a qualified Native American Monitor for ground-disturbing construction activities, as follows:

-
  - Initial clearing and rough grading activities (e.g., pavement removal, auguring, boring, grading, excavation, potholing, and trenching);
  - Spot checking of previously disturbed soils that have not been previously monitored; and
  - Monitoring previously undisturbed native soils.

- The Native American Monitor(s) shall complete monitoring logs on a daily basis when onsite. The logs shall provide descriptions of the daily activities, including construction activities, locations, soil, and any cultural materials identified. The onsite monitoring shall end when the project site grading and excavation activities of previously undisturbed native soils are completed, or when the Tribal Representatives and Monitor have indicated that the site has a low potential for tribal cultural resources. The Tribal Monitor shall provide a monitoring final report, with daily logs, to the project applicant.

TCR-2: Associated funerary objects are objects that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later; other items made exclusively for burial purposes or to contain human remains can also be considered as associated funerary objects. If funerary objects are discovered during grading or archeological excavations, they shall be treated in the same manner as bone fragments that remain intact and the construction contractor and/or qualified archeologist shall consult with the Gabrieleño Band of Mission Indians – Kizh Nation (Tribe).

TCR-3: As specified by California Health and Safety Code Section 7050.5, if human remains are found on the project site during construction or during archaeological work, the Los Angeles County Coroner's office shall be immediately notified and no further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie adjacent remains shall occur until the Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.98. The Coroner would determine within two working days of being notified, if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) within 24 hours. The NAHC would make a determination as to the Most Likely Descendent.

In the case where discovered human remains cannot be fully documented and recovered on the same day, the remains shall be covered with muslin cloth and a steel plate that can be moved by heavy equipment placed over the excavation

opening to protect the remains. If this type of covering is not available, a 24-hour guard shall be posted outside of working hours. If the remains are Native American, the Tribe shall make every effort to recommend diverting the project and keeping the remains in situ and protected. If the project cannot be diverted, it may be determined that burials shall be removed and the project applicant shall arrange a designated site location within the footprint of the project for the respectful reburial of the human remains and/or ceremonial objects, if possible. The Tribe shall work closely with the qualified archaeologist to ensure that the excavation is treated carefully, ethically and respectfully. If data recovery is approved by the Tribe, documentation shall be taken which includes, at a minimum, detailed descriptive notes and sketches. Additional types of documentation shall be approved by the Tribe for data recovery purposes. Cremations shall either be removed in bulk or by means as necessary to ensure complete recovery of all material. If the discovery of human remains includes four (4) or more burials, the location shall be considered a cemetery and a separate treatment plan shall be created. The project applicant shall consult with the Tribe regarding avoidance of cemetery sites.

Once complete, a final report of all activities shall be submitted to the NAHC. The Tribe does not authorize any scientific study or the utilization of any invasive diagnostics on human remains without prior review and approval of study plans.

Each occurrence of human remains and associated funerary objects shall be stored using opaque cloth bags. All human remains, funerary objects, sacred objects and objects of cultural patrimony shall be removed to a secure container onsite if possible. These items shall be retained and reburied within six months of recovery. The site of reburial/repatriation shall be on the project site but at a location mitigated between the Tribe and the landowner at a site to be protected in perpetuity. There shall be no publicity regarding any cultural materials recovered.

Level of Significance After Mitigation

Tribal Cultural Resource impacts will be less than significant with standard conditions and mitigation satisfied.

4.19 – Utilities and Service Systems

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?			☑	

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?			☑	
c) Result in a determination by the wastewater 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?			☑	
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?			☑	
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			☑	

Sources

Information used to prepare this section is from the following sources: CalRecycle Website; and Whittier General Plan Update, 1993, KES Technologies Inc., Sanitary Sewer Analysis for Tract 82802 Floral Drive, City of Whittier prepared for Brandywine Homes dated April 26, 2020, City of Whittier, Water and Sewer Will Serve Letter dated September 13, 2017, Charter Communications, Will Serve Letter dated October 3, 2017, Frontier Communications, Will Serve Letter dated May 8, 2020, SoCalGas, Will Serve Letter dated September 21, 2017, and Southern California Edison, Will Serve Letter dated September 12, 2017.

Environmental Setting

The City of Whittier is located in the eastern portion of Los Angeles County, 20 miles east of downtown Los Angeles. The City is on the southwestern slopes of the Puente Hills just east if the San Gabriel River and the San Gabriel River Freeway (State Route 605). The land features a sloping terrain on the north and east where the Puente Hills are located and becomes flat on the southern and western sections.

Discussion

a) thru e) **Less Than Significant Impact.** The proposed project would require offsite improvements including sewer, domestic water, fire water, irrigation, and dry utilities connections to existing utility infrastructure in Floral Drive.

Wastewater Treatment – The project proposes offsite sewer improvements to connect the sewer lines from the project site to the existing sewer network under streets located adjacent to the site. As detailed in the City's General Plan EIR, the City of Whittier provides wastewater collection service to the majority of parcels within the City limits.

Project Wastewater Generation – The project is estimated to generate 100 gallons per day (gpd) of wastewater per unit, or a total of 2,500 gpd. Sufficient wastewater treatment capacity is available in the region, and project development would not require construction of new or expanded wastewater treatment facilities. Impacts would be less than significant.

Sanitary Sewer – Information on sanitary sewers serving the project site is based on the Sanitary Sewer Analysis completed by KES Technologies Inc. in April 2020; a copy of this report is included as Appendix J. The subject project site proposes to construct 25 detached residential units and one church site. Each unit will have its own dedicated sewer lateral joining to the on site private main within the private drive aisles. The private main flows into a sewer lift station that force mains effluent flows to the public right of way in Floral Drive. When the sewer flows into the public right of way it will be in a gravity condition. The church site will connect directly into Floral Drive. The existing site is currently a school site for proposed housing. The church site is currently a church that will be renovated. For the purpose of this study the proposed and existing flows for the church are expected to remain the same.

In accordance with the City of Whittier and the Uniform Plumbing Code, the subject site was designed to accommodate flows based on Estimate Average Daily Sewer Flows per the Los Angeles County Table. Per the existing table the anticipated sewer flow is 300 gallons per day for residential units having 3 or more bedrooms. The total amount of units for the subject site is 25 units resulting in a maximum demand of (25 units * 300 GPD) 7500 GPD. The proposed development will be in addition to the flow monitored maximum flow of 0.049 MGD (0.076 cfs). Therefore the combine flows within the existing 6" line in Floral is 7500.049 GPD. The results from this sewer analysis using methods provided by the Uniform Plumbing Code, demonstrate that the flows of the subject site, would generate a calculated peak flow of 0.012 cfs resulting in a combine depth of effluent within the existing line in Floral of a maximum of 0.12 feet and a velocity of 2.42 fps. Sewer capacity has been evaluated by the City and will be conveyed through a private sanitary sewer system to Floral Drive. Upgrades downstream in Palm Avenue are scheduled for 2023 as part of the City's capital improvement program and will provide capacity to adequately handle sewer flow from the project. The project will be conditioned to pay a sewer impact fee of $31,000.

Project Wastewater Flow – Sewer flows and depths in post-project conditions were estimated by adding estimated project wastewater flows and depths to existing conditions. The sewers in Floral Drive have capacities to accommodate post-project wastewater flows and depths, and no new or expanded sewers would be required to accommodate the proposed project. Therefore, project impacts on sanitary sewers would be less than significant.

Domestic Water – The City relies on imported water and local groundwater. The project would extend existing water mainlines in Floral Drive to the project site. Whittier Public Works will supply domestic water to the project and capacity has been determined to be adequate. The project would result in a nominal increase in water demand compared to existing conditions and therefore, the project would have a less than significant impact regarding domestic water supplies.

Fire Water - The project proposes new fire water lines to the project site via installation of fire water laterals from the street to the project site. Whittier Public Works will supply fire water to the project and capacity has been determined to be adequate. The project would result in a nominal increase in water demand compared to existing conditions and therefore, the project would have a less than significant impact regarding fire water supplies.

Stormwater - The proposed development would maintain existing drainage patterns and discharge locations. In addition, the proposed project is greater than one acre and is therefore required to obtain a National Pollutant Discharge Elimination System permit and consequently develop and implement a Storm Water Pollution Prevention Plan (SWPPP). Urban runoff from the project will be detained on site and filtered prior to discharge into the public storm drain system to comply with the Regional Water Board's MS4 stormwater permit. Stormwater flows will outfall

into Canobie Avenue at Dexter Middle School and will be maintained at historic discharge rates. Therefore, impacts regarding stormwater would be less than significant.

Electric Power: Electric power for the City of Whittier is provided by Southern California Edison (SCE). The proposed project is located in a developed area, and infrastructure for providing electric power to the area is well established. SCE typically utilizes existing utility corridors to reduce environmental impacts, and has energy-efficiency programs to reduce energy usage and maintain reliable service throughout the year. The project would be constructed in accordance with all applicable Title 24 regulations, and would not necessitate the construction or relocation of electric power facilities. The project is located across from the southern terminus of Westmont Drive. A single outdated streetlight is located at the intersection. As part of the project improvements, the overhead streetlight wiring will be placed underground, and three new, modern LED streetlights will be installed along the Floral Drive frontage. The new lights will provide enhanced illumination at the intersection and greatly improve nighttime safety of pedestrians and vehicles traveling on Floral Drive. Overhead electric facilities at the southwest corner of the project near Orange Avenue will be reconfigured to avoid conflicts with new construction. Therefore, a less than significant impact would occur.

Natural Gas: The Southern California Gas Company (SoCalGas) is the primary distributor of retail and wholesale natural gas across Southern California, including the City of Whittier. SoCalGas provides services to residential, commercial, and industrial consumers, and also provides gas for electric generation customers. SoCalGas expects total gas demand to decline 0.74 percent annually from 2018 to 2035 as a result of energy-efficiency standards and programs, renewable electricity goals, modest economic growth in its service region, and advanced metering infrastructure. Moreover, SoCalGas plans on implementing aggressive energy-efficiency programs that will result in natural gas savings across all sectors that will ensure longevity of its natural gas supplies and adequate generation rates. Therefore, anticipated natural gas supply is adequate to meet demand in the SoCalGas region, and the proposed project is not expected to impact this determination. Thus, no natural gas facilities would have to be constructed or relocated as a result of the proposed project, and a less than significant impact would occur.

Telecommunications Facilities: Cable services, including internet, phone, and television, are provided in the City of Whittier by Charter Communications and Frontier Communications. The proposed project would not interfere with operation of their facilities, and a less than significant impact would occur. Overhead telecom facilities along Floral Drive will also be placed underground during construction.

Mitigation Measures

No mitigation measures are necessary because impacts to Utilities will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.20 – Wildfire

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?			☑	
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from wildfire or the uncontrolled spread of wildfire?			☑	
b) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may result temporary or ongoing impacts to the environment?			☑	
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?			☑	

Sources

Information used to prepare this section is from the following sources: *City of Whittier General Plan Update*, 1993 *and* California Department of Forestry and Fire Protection. Incorporated Fire Hazard Severity Zone: City of Whittier. Very High Fire Hazard Severity Zones in LRA (Local Responsibility Area).

Environmental Setting

The Floral Drive project site is located within an urbanized area of the City of Whittier and is not located within a fire hazard zone, as identified on the latest Fire Hazard Severity Zone (FHSZ) maps prepared by the California Department of Forestry and Fire Protection (CALFIRE).

Discussion

a) thru d) **Less Than Significant Impact.** The project site is located within an urbanized area of the City of Whittier and is not located within a fire hazard zone, as identified on the latest Fire Hazard Severity Zone (FHSZ) maps prepared by the California Department of Forestry and Fire Protection (CALFIRE). There are no wildland conditions in the urbanized area that the project area is located. The project would not be expected to impair emergency plans, exacerbate wildfire risks or expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of wildfire. The project would not require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may result temporary or ongoing impacts to the environment. The project would not 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. The project area is relatively flat and characterized with slopes that are not high (less than 10 percent) or steep. Therefore this impact would be less than significant and no mitigation is required.

Mitigation Measures

No mitigation measures are necessary because impacts to Wildfires will be less than significant.

Level of Significance After Mitigation

Not Applicable.

4.21 – Mandatory Findings of Significance

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?		☑		
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)?			☑	

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

Sources

Information used to prepare this section is from Sections 4.1 through 4.20 above.

Discussion

a) **Less Than Significant Impact with Mitigation Incorporated.** The project is located within an urbanized area, which provides low habitat value for special-status plant and wildlife species. Additionally, as detailed in City of Whittier General Plan EIR, the City is almost completely urbanized and landscaped with mostly non-native species. The proposed project would not substantially impact any scenic vistas, scenic resources, or the visual character of the area, as discussed in Section 4.1, and would not result in excessive light or glare. The environmental analysis provided in Section 4.3 concludes that impacts related to emissions of criteria pollutants and other air quality impacts will be less than significant with Mitigation Measures AIR-1 through AIR-12 incorporated. The project would not significantly impact any sensitive plants, plant communities, fish, wildlife or habitat for any sensitive species, as discussed in Section 4.4. As detailed in Section 4.5, Cultural Resources, implementation of Mitigation Measures CUL-1 through CUL-8 would ensure that impacts on archeological resources would be less than significant. Sections 4.8 and 4.10 conclude that impacts related to climate change and hydrology and water quality will be less than significant. Based on the preceding analysis of potential impacts in the responses to items 4.1 thru 4.20, no evidence is presented that this project would degrade the quality of the environment with the mitigation measures incorporated.

b) **Less Than Significant.** Cumulative impacts can result from the interactions of environmental changes resulting from one proposed project with changes resulting from other past, present, and future projects that affect the same resources, utilities and infrastructure systems, public services, transportation network elements, air basin, watershed, or other physical conditions. Such impacts could be short-term and temporary, usually consisting of overlapping construction impacts, as well as long term, due to the permanent land use changes involved in the project. The proposed text amendments will generally result in less than significant environmental impacts, as discussed herein. There are no short-term impacts related to pollutant emissions and therefore, will not exceed maximum thresholds.

The proposed project would not significantly cumulatively affect the environment. Water supplies have been studied in the Urban Water Management Plans. Continued efforts towards water conservation, as required by State law, would reduce water demands; the project would result in a less than significant cumulative impact on water supply and other resources. As indicated in Section 4.17 herein, the proposed project would not result in any significant traffic impacts to transportation. Long-term cumulative effects will have no significant impact on air quality. The project amendments would not contribute to any cumulative growth effects beyond what is anticipated for the City's future in the General Plan.

c) **Less Than Significant Impact with Mitigation Incorporated.** As detailed in Section 4.7, Geology and Soils, implementation of Mitigation Measures GEO-1 through GEO-7 would ensure that impacts on paleontological resources would be less than significant. Additionally as described in Section 4.8, Hazards and Hazardous Materials, after implementation of Mitigation Measures HM-1 and HM-2, potential impacts from arsenic, ACMs, and LBP during project construction would be less than significant.

Regarding Noise, as detailed in Section 4.13, with implementation of Mitigation Measures N-1 through N-3, the proposed project would result in less than significant impacts to sensitive receivers from noise and vibration. Noise levels associated with operation of the project are expected to be comparable to those of nearby residential areas. In addition, noise from activities associated with the new development would be similar to that occurring now. Therefore, noise from onsite sources would be less than significant.

Regarding emergency services such a police and fire, the project is anticipated to generate between 65 residents, which would have a minimal impact on demand for fire services. Additionally, the project applicant would pay any applicable fire/development fees, per the City's fee schedule. Thus, the project's impacts on fire protection services would be less than significant.

During the construction phase, the project could temporarily impact street traffic adjacent to the project site during the construction phase due to roadway improvements and potential extension of construction activities into the right-of-way. Project construction could reduce the number of lanes or temporarily close a portion of adjacent roads. Traffic impacts are anticipated during the construction phase of the project and would only impact the adjacent streets/intersections. As detailed in Section 4.16, Transportation, the project would have less than significant traffic impacts both during project construction and operation, and no mitigation is warranted.

Based on the analysis of the proposed project's impacts in the responses to items 4.1 thru 4.20, after the implementation of mitigation measures, potential adverse environmental effects were found to be less than significant on human beings, either directly or indirectly. Therefore, less than significant impacts would occur. For this reason, the City has concluded that this project can be implemented without causing significant adverse environmental effects and determined that the Mitigated Negative Declaration is the appropriate type of CEQA documentation.

5 References

5.1 – List of Preparers

City of Whittier (Lead Agency)

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PGN (Environmental Analysis)

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5.2 – Persons and Organizations Consulted

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Air Quality

Construction Mitigation Measures:

AIR-1 The project must follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

13. All active construction areas shall be watered two (2) times daily.
14. Speed on unpaved roads shall be reduced to less than 15 mph.
15. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
16. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
17. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
18. Access points shall be washed or swept daily.
19. Construction sites shall be sandbagged for erosion control.
20. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
21. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
22. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
23. Replace the ground cover of disturbed areas as quickly possible.
24. A fugitive dust control plan should be prepared and submitted to SCAQMD prior to the start of construction.

AIR-2 Prepare and implement a Construction Management Plan which will include Best Available Control Measures to be submitted to the City of Whittier.

AIR-3 Construction equipment shall be maintained in proper tune.

AIR-4 Require all construction equipment to have Tier 4 low emission "clean diesel" engines that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

AIR-5 All construction vehicles shall be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

AIR-6 Minimize the simultaneous operation of multiple construction equipment units.

AIR-7 The use of heavy construction equipment and earthmoving activity should be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.

AIR-8 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

AIR-9 Establish staging areas for the construction equipment that are as distant as possible from adjacent sensitive receptors (residential land uses).

AIR-10 Use haul trucks with on-road engines instead of off-road engines for on-site hauling.

AIR-11 Utilize zero VOC and low VOC paints and solvents, wherever possible.

AIR-12 Provide temporary dust barriers or construct perimeter walls during the first phase of construction.

Cultural Resources

CR-1: Prior to the start of construction, a qualified Lead Archaeologist who meets the standards of the Secretary of the Interior for Archaeology shall be retained. Under supervision of the Lead Archaeologist, a qualified archaeological resource construction monitor, who meets the standards of the Secretary of the Interior for Archaeology, shall monitor all project-related, ground-disturbing construction activities (i.e., grading, excavation, etc.).

CR-2: If requested by the City of Whittier, a Cultural Resources Mitigation Monitoring Program (CRMMP) will be developed by the Lead Archaeologist prior to the start of ground disturbing activities.

CR-3: Prior to the commencement of grading or excavation activities, the Lead Archeologist retained for the Project, shall create a separate Worker's Environmental Awareness Program (WEAP) pamphlet that will be provided as training construction personnel to understand regulatory requirements for the protection of cultural resources. The Lead Archaeologist will teach provide the WEAP training. This training shall include examples of cultural resources and discuss the protocols to follow if discoveries are made.

CR-4: In the event that an archaeological resource is encountered during construction when a monitor is not on site, all construction shall cease within at least 50 feet of the discovery and the Principal Investigator and/or Lead Archaeologist must be notified immediately. If the monitor is present at the time of discovery, then the monitor will have the authority to temporarily divert the construction equipment around the find and notify the Principal Investigator and/or Lead Archaeologist until it is assessed for scientific significance. Work cannot resume in the direct area of the discovery until it is assessed by Principal Investigator and/or Lead Archaeologist and he/she indicates that construction can resume.

CR-5: If an archaeological discovery cannot be preserved in situ and requires an excavation team or requires additional time to collect cultural resources or the size of the discovery is more than a monitor can collect during standard daily monitoring services, a Discovery and Treatment Plan (DTP) will be developed and the area will be cordoned off and secured so that an archaeological resource excavation team, led by the Principal Investigator and/or Lead Archaeologist, may recover the cultural resources out of that contained area once the DTP has been approved by the City of Whittier. Once the Principal Investigator and/or Lead Archaeologist has determined that the collection process is complete for a given area or locality, construction activity will resume in that localized area.

CR-6: If human remains are encountered construction and/or excavation must cease within the general vicinity, and the remains must be inspected by the Los Angeles County coroner.

If the coroner determines that they are Native American in origin, then the coroner must contact the NAHC. The NAHC will then determine and notify a Most Likely Descendant (MLD). The MLD must complete inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

CR-7: Once construction activities are complete, all significant cultural resources collected will be prepared in a properly equipped archaeological laboratory to a point ready for curation. The laboratory process will include, but not be limited to, artifact cleaning, analysis, identification, photographing, catalogued, and then delivered to a local accredited museum repository for permanent curation and storage. Accompanying notes, maps, and photographs shall also be filed at the repository. The cost of curation is assessed by the repository and is the responsibility of the Project proponent.

CR-8: At the conclusion of laboratory analysis and preparation for museum curation, a final report of findings will be prepared describing the results of the cultural mitigation monitoring efforts associated with the project. The report will include a summary of the field and laboratory methods, an overview of the cultural background within the project vicinity, a list of cultural resources recovered (if any), an analysis of cultural resources recovered (if any) and their scientific significance, and recommendations. A copy of the report will be submitted to the City of Whittier, the appropriate California Historic Resources Information Center, and the designated museum repository.

Geological and Soils

GEO-1: Prior to the start of construction, a qualified Lead Paleontologist who meets the standards of the Society of Vertebrate Paleontology shall be retained. Under supervision of the Lead Paleontologist, a qualified Paleontologist, who meets the standards of the Society of Vertebrate Paleontology, shall monitor all project-related, ground-disturbing construction activities (i.e., grading, excavation, etc.).

GEO-2: If requested by the City of Whittier, a Paleontological Resources Mitigation Monitoring Program (PRMMP) will be developed by the Lead Paleontologist prior to the start of ground disturbing activities.

GEO-3: Prior to the commencement of grading or excavation activities, the Lead Paleontologist retained for the construction of the Project, shall create a Worker's Environmental Awareness Program (WEAP) pamphlet that will be provided as training to construction personnel to understand regulatory requirements for the protection of cultural resources. This training shall include examples of paleontologic resources and provide protocols to follow if discoveries are made. The paleontologist will provide the training.

GEO-4: In the event that a paleontological resource is encountered when a monitor is not on site, all construction shall cease within at least 50 feet of the discovery and the Principal Investigator and/or Lead Paleontologist must be notified immediately. If the monitor is present at the time of discovery, then the monitor will have the authority to temporarily divert the construction equipment around the find and notify the Principal Investigator and/or Lead Paleontologist until it is assessed for scientific significance. Work cannot resume in the direct area of the discovery until it is assessed by the Principal Investigator and/or Lead Paleontologist and he/she indicates that construction can resume.

GEO-5: If a paleontological discovery requires an excavation team or requires additional time to collect specimens, or the size of the discovery is more than a monitor can collect during standard daily monitoring services, a Discovery and Treatment Plan (DTP) will be developed and the area will be cordoned off and secured so that a paleontological resources excavation team, led by the Principal Investigator and/or Lead Paleontologist, may recover the fossilized specimens out of that contained area once the DTP has been approved by the City of Whittier. Once the Principal Investigator and/or Lead Paleontologist has determined that the collection process is complete for a given area or locality, construction activity will resume in that localized area.

GEO-6: If the paleontologic monitor determines that soil samples, to SVP standards, are required to check for microfossils, an area on site that is remote from construction but still on the project property, will be required to dry out the samples. The operation may require wet or dry screening and that determination will be made by the Lead Paleontologist.

GEO-7: Once construction activities are complete, all significant fossil remains collected will be prepared in a properly equipped paleontology laboratory to a point ready for curation. Laboratory preparation will include, but not be limited to, the careful removal of excess matrix from fossil remains, stabilizing and repairing specimens, identified to the lowest taxonomic level, analyzed, photographed, and catalogued before they are sent to the local repository for curation and permanent storage. Accompanying notes, maps, and photographs shall also be filed at the repository. The cost of curation is assessed by the repository and is the responsibility of the Project proponent. At the conclusion of laboratory work and museum curation, a final report of findings will be prepared describing the results of the paleontological mitigation monitoring efforts associated with the project. The report will include a summary of the field and laboratory methods, an overview of the geology and paleontology in the project vicinity, a list of taxa recovered (if any), an analysis of fossils recovered (if any) and their scientific significance, and recommendations. If the monitoring efforts produced fossils, then a copy of the report will also be submitted to a designated museum repository.

Hazards and Hazardous Materials

HM-1: During demolition activities, additional soil sampling and soil remediation shall be completed for localized contamination as per the recommendations of the Phase II ESA. If contamination exists in levels determined to be hazardous, such soil shall be removed and disposed of consistent with State regulations. Documentation verifying appropriate disposal of hazardous wastes/soils from demolition activities shall be provided to the City Community Development Director prior to commencement of building construction. The applicant shall bear the cost of implementing this mitigation.

HM-2: Due to the age of the existing buildings and the potential presence of ACMs and LBP, prior to the commencement of demolition, the project proponent shall retain a qualified environmental consultant to conduct a comprehensive survey of the existing building to be demolished (i.e., the classrooms and administration building) to confirm the presence or absence of ACMs and LBP. A comprehensive survey of ACMs and a comprehensive LBP survey of painted surfaces in the structures to be demolished shall occur prior to any demolition activities to confirm the presence or absence of ACMs or LBP to prevent potential exposure to workers and/or building occupants.

- If the existing buildings are found to contain any ACMs or LBP, a detailed Hazardous Material Abatement Plan shall be prepared, approved, and implemented. The Hazardous Material Abatement Plan shall include a

site-specific scope of work and specifications for the proper disposal of hazardous materials. The Hazardous Material Abatement Plan shall be prepared and implemented in accordance with the Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP) and all other federal and state standards and regulations.

- The Hazardous Material Abatement Plan shall require that all ACMs and LBP be removed and properly disposed of in accordance applicable laws.

- The Hazardous Material Abatement Plan shall be implemented prior to demolition activities to ensure that any hazardous materials are properly identified, removed, and disposed of offsite at a landfill that can accept asbestos and any other hazardous materials removed from the site.

- A qualified environmental consultant shall be present on the project site during demolition activities and shall monitor compliance with the Hazardous Material Abatement Plan.

Noise

N-1: The project shall prepare a construction management plan to be approved by the City of Whittier Community Development Department prior to initiating construction. The construction management plan shall include best management practices to reduce construction noise levels. Best management practices may include the following:

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).
- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.
- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.
- Post a sign in a readily visible location at the project site that indicates the dates and duration of construction activities, as well as provide a telephone number where residents can enquire about the construction process and register complaints to an assigned construction noise disturbance coordinator.

N-2: The project shall construct the six (6) foot high concrete masonry unit (CMU) block perimeter wall at the first phase of the construction and prior to performing the major demolition or grading activities. The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the project site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking.

N-3: No impact pile driving activities shall be permitted on the project site during construction. If impact pile driving is required, a follow-up noise and vibration impact assessment shall be conducted prior to start of any pile driving activity.

Tribal Cultural Resources

TCR-1: Prior to the issuance of a grading permit, the project applicant shall communicate with representatives of the Gabrieleño Band of Mission Indians – Kizh Nation and present evidence of such communication to the City of Whittier Community Development Department Director, or designee, demonstrating the following shall occur:

- On-call monitoring services by a qualified Native American Monitor to address unanticipated prehistoric or tribal resources. The Native American Monitor shall be present at the pre-grading conference to establish procedures for tribal cultural resource surveillance.
- Native American Indian Sensitivity Training by a qualified Native American Monitor for construction personnel. The training session shall include a handout and focus on how to identify Native American resources encountered during earthmoving activities and the procedures followed if resources are discovered, the duties of the Native American Monitor of Gabrieleño Ancestry, and the general steps the Monitor would follow in conducting a salvage investigation.
- Construction Monitoring by a qualified Native American Monitor for ground-disturbing construction activities, as follows:
  - Initial clearing and rough grading activities (e.g., pavement removal, auguring, boring, grading, excavation, potholing, and trenching);
  - Spot checking of previously disturbed soils that have not been previously monitored; and
  - Monitoring previously undisturbed native soils.
- The Native American Monitor(s) shall complete monitoring logs on a daily basis when onsite. The logs shall provide descriptions of the daily activities, including construction activities, locations, soil, and any cultural materials identified. The onsite monitoring shall end when the project site grading and excavation activities of previously undisturbed native soils are completed, or when the Tribal Representatives and Monitor have indicated that the site has a low potential for tribal cultural resources. The Tribal Monitor shall provide a monitoring final report, with daily logs, to the project applicant.

TCR-2: Associated funerary objects are objects that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later; other items made exclusively for burial purposes or to contain human remains can also be considered as associated funerary objects. If funerary objects are discovered during grading or archeological excavations, they shall be treated in the same manner as bone fragments that remain intact and the construction contractor and/or qualified archeologist shall consult with the Gabrieleño Band of Mission Indians – Kizh Nation (Tribe).

TCR-3: As specified by California Health and Safety Code Section 7050.5, if human remains are found on the project site during construction or during archaeological work, the Los Angeles County Coroner's office shall be immediately notified and no further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie adjacent remains shall occur until the Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.98. The Coroner would determine within two working days of being notified, if the remains are subject to his or

her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) within 24 hours. The NAHC would make a determination as to the Most Likely Descendent.

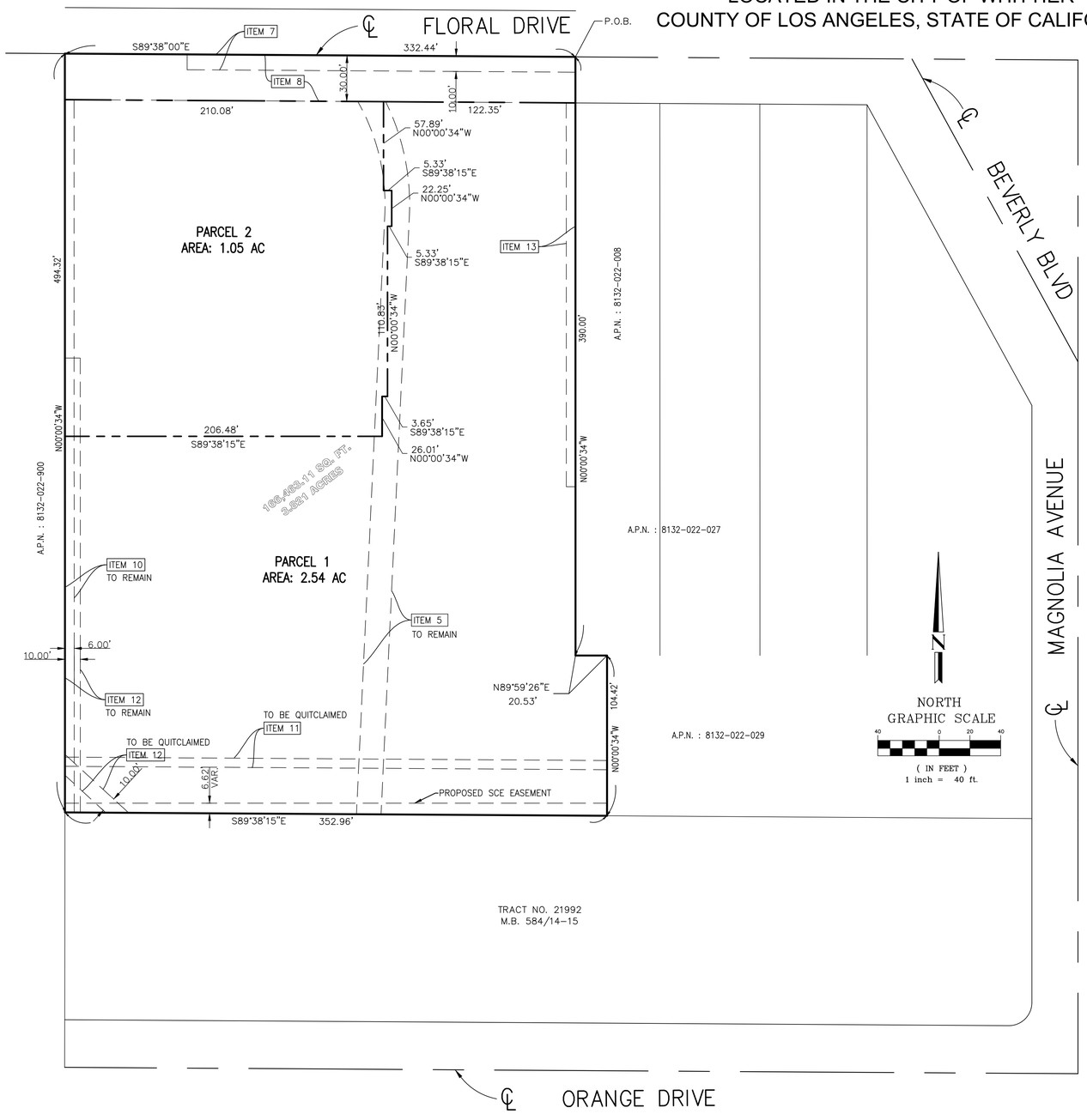
In the case where discovered human remains cannot be fully documented and recovered on the same day, the remains shall be covered with muslin cloth and a steel plate that can be moved by heavy equipment placed over the excavation opening to protect the remains. If this type of covering is not available, a 24-hour guard shall be posted outside of working hours. If the remains are Native American, the Tribe shall make every effort to recommend diverting the project and keeping the remains in situ and protected. If the project cannot be diverted, it may be determined that burials shall be removed and the project applicant shall arrange a designated site location within the footprint of the project for the respectful reburial of the human remains and/or ceremonial objects, if possible. The Tribe shall work closely with the qualified archaeologist to ensure that the excavation is treated carefully, ethically and respectfully. If data recovery is approved by the Tribe, documentation shall be taken which includes, at a minimum, detailed descriptive notes and sketches. Additional types of documentation shall be approved by the Tribe for data recovery purposes. Cremations shall either be removed in bulk or by means as necessary to ensure complete recovery of all material. If the discovery of human remains includes four (4) or more burials, the location shall be considered a cemetery and a separate treatment plan shall be created. The project applicant shall consult with the Tribe regarding avoidance of cemetery sites.

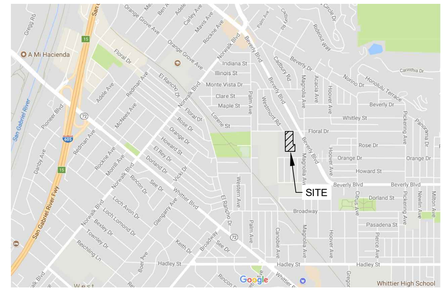
Once complete, a final report of all activities shall be submitted to the NAHC. The Tribe does not authorize any scientific study or the utilization of any invasive diagnostics on human remains without prior review and approval of study plans.

Each occurrence of human remains and associated funerary objects shall be stored using opaque cloth bags. All human remains, funerary objects, sacred objects and objects of cultural patrimony shall be removed to a secure container onsite if possible. These items shall be retained and reburied within six months of recovery. The site of reburial/repatriation shall be on the project site but at a location mitigated between the Tribe and the landowner at a site to be protected in perpetuity. There shall be no publicity regarding any cultural materials recovered.

Appendix A Project Plans (Tentative Parcel Map No. 82832, Vesting Tentative Tract Map No. 82802, Grading and Utility Plan, Development Review No. DRP19-0073 (Residential) Site Plan, Floor Plans, Elevations, Landscape Plan, Wall & Fence Plan, Color & Materials and Lighting Plan and Development Review No. DRP19-0074 (Church) Site Plan, Floor Plans, Elevations and Landscape Plan

TENTATIVE PARCEL MAP NO. 82832
(FOR LAND DIVISION PURPOSES)
LOCATED IN THE CITY OF WHITTIER
COUNTY OF LOS ANGELES, STATE OF CALIFORNIA





VICINITY MAP
NOT TO SCALE

TITLE INFORMATION
THE FOLLOWING TITLE INFORMATION WAS DERIVED FROM A PRELIMINARY REPORT FOR TITLE INSURANCE PREPARED BY FIRST AMERICAN TITLE INSURANCE COMPANY, ORDER NO.: OSA-5463765 (tc) AND BEING DATED AGUGUST 12, 2020 AT 7:30 A.M.

TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:
TRINITY LUTHERAN CHURCH OF WHITTIER, CALIFORNIA, A CORPORATION

LEGAL DESCRIPTION
REAL PROPERTY IN THE CITY OF WHITTIER, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

THAT PORTION OF THE EAST HALF OF LOT 11 OF COHN'S PARTITION OF LOTS 1, 2, 3, 4, 11, 12, 13 AND 22 OF WEST WHITTIER TRACT, IN THE CITY OF WHITTIER, AS PER MAP RECORDED IN BOOK 60 PAGE 2, MISCELLANEOUS RECORDS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, LYING WESTERLY OF THE FOLLOWING DESCRIBED LINE:

BEGINNING AT A POINT IN THE NORTH LINE OF SAID LOT 11 OF COHN'S PARTITION, DISTANT WESTERLY 297.565 FEET FROM THE NORTHEAST CORNER OF SAID LOT 11; THENCE SOUTHERLY PARALLEL WITH THE EASTERLY LINE OF SAID LOT TO THE WESTERLY PROLONGATION OF THE NORTHERLY LINE OF THE LAND DESCRIBED IN DEED TO LENNIEL E. TAYLOR AND WIFE RECORDED JULY 2, 1946 IN BOOK 23425 PAGE 106, OFFICIAL RECORDS OF SAID COUNTY; THENCE EASTERLY ALONG SAID PROLONGATION, 20 FEET, MORE OR LESS, TO THE WESTERLY LINE OF SAID LAND; THENCE SOUTHERLY ALONG SAID WESTERLY LINE AND PROLONGATION THEREOF, TO THE SOUTHERLY LINE OF SAID LOT.

EXCEPT THAT PORTION WITHIN THE LINES OF TRACT NO. 21992 AS SHOWN ON MAP RECORDED IN BOOK 584 PAGES 14 AND 15 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

APN: 8132-022-007

SCHEDULE B EXCEPTIONS

[ ]	INDICATES ITEM PLOTTED HEREON.
ITEM 1:	GENERAL AND SPECIAL TAXES AND ASSESSMENTS FOR THE FISCAL YEAR 2017-2018, A LIEN NOT YET DUE OR PAYABLE.
ITEM 2:	THE LIEN OF SPECIAL TAX ASSESSED PURSUANT TO CHAPTER 2.5 COMMENCING WITH SECTION 53311 OF THE CALIFORNIA GOVERNMENT CODE FOR THE WHITTIER SCHOOLS COMMUNITY FACILITIES DISTRICT OF THE WHITTIER CITY SCHOOL DISTRICT, AS DISCLOSED BY NOTICE OF SPECIAL TAX LIEN RECORDED MARCH 12, 1997 AS INSTRUMENT NO. 97-369987 OF OFFICIAL RECORDS, NONE NOW DUE AND OWNING.
ITEM 3:	THE LIEN OF SUPPLEMENTAL TAXES, IF ANY, ASSESSED PURSUANT TO CHAPTER 3.5 COMMENCING WITH SECTION 75 OF THE CALIFORNIA REVENUE AND TAXATION CODE.
ITEM 4:	AN EASEMENT TO USE AND MAINTAIN IRRIGATION DITCHES AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 999, PAGE 53 OF OFFICIAL RECORDS.
ITEM 5:	AN EASEMENT FOR THE CONSTRUCTION OF NECESSARY DITCHES FOR CONVEYING WATER, AND RIGHT TO ENTRY UPON SAID LAND FOR THE PURPOSE OF MAINTAINING SAID DITCHES AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 1050, PAGE 249 OF OFFICIAL RECORDS.
ITEM 6:	AN EASEMENT FOR CONSTRUCTION AND MAINTENANCE OF A STORM DRAIN AND APPURTENANCES AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 14121, PAGE 22 OF OFFICIAL RECORDS.
ITEM 7:	AN EASEMENT FOR PUBLIC UTILITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 29000, PAGE 310 OF OFFICIAL RECORDS.
ITEM 8:	AN EASEMENT FOR PUBLIC STREET AND ROAD AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 39875, PAGE 127 OF OFFICIAL RECORDS.
ITEM 9:	AN EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 41704, PAGE 46 OF OFFICIAL RECORDS.
ITEM 10:	AN EASEMENT FOR PUBLIC UTILITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 41914, PAGE 327 OF OFFICIAL RECORDS.
ITEM 11:	AN EASEMENT FOR PUBLIC UTILITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 50538, PAGE 371 OF OFFICIAL RECORDS.
ITEM 12:	AN EASEMENT FOR PUBLIC UTILITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK D2393, PAGE 85 OF OFFICIAL RECORDS.
ITEM 13:	THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "AGREEMENT" RECORDED JUNE 20, 1963 AS INSTRUMENT NO. 5143 IN BOOK M1289, PAGE 988 OF OFFICIAL RECORDS.
ITEM 14:	A DEED OF TRUST TO SECURE AN ORIGINAL INDEBTEDNESS OF $890,555.79 RECORDED OCTOBER 05, 2011 AS INSTRUMENT NO. 20111349482 OF OFFICIAL RECORDS. DATED: AUGUST 31, 2011 TRUSTOR: TRINITY LUTHERAN CHURCH OF WHITTIER, CALIFORNIA TRUSTEE: LUTHERAN CHURCH EXTENSION FUND-MISSOURI SYNOD, A MISSOURI CORPORATION BENEFICIARY: LUTHERAN CHURCH EXTENSION FUND-MISSOURI SYNOD
ITEM 15:	THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "RESOLUTION NO. 2011-12-R7" RECORDED FEBRUARY 10, 2012 AS INSTRUMENT NO. 20120233349 OF OFFICIAL RECORDS.
ITEM 16:	RIGHTS OF THE PUBLIC IN AND TO THAT PORTION OF THE LAND LYING WITHIN ANY ROAD, STREET, ALLEY OR HIGHWAY.
ITEM 17:	WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS.
ITEM 18:	RIGHTS OF PARTIES IN POSSESSION.

BENCHMARK:
L&T IN N. CB 150MM (0.5 FT) E/O BCR @ NW COR WHITTIER BLVD & BROADWAY LACDPW BM # 6629 ELEVATION = 61.16' ADJUSTED YEAR 2005.

LAND AREA:
166,463.11 SQUARE FEET +/- (3.821 ACRES)

BASIS OF BEARINGS:
THE BEARINGS SHOWN HEREON ARE BASED ON THE CENTERLINE OF FLORAL DRIVE, SHOWN AS N89°38'00"W ON TRACT NO. 21992, IN BOOK 284 OF MISC. MAPS PAGES 14-15 IN THE COUNTY OF LOS ANGELES, CA.

ADDRESS:
11716 FLORAL DR WHITTIER CA 90601

DATE OF SURVEY:
JULY 08, 2017

FLOOD ZONE:
THE SUBJECT PROPERTY LIES WITHIN ZONE "X" OF FLOOD INSURANCE RATE MAP PANEL NUMBER 06037C0183SF, HAVING AN EFFECTIVE DATE OF 09-26-2008, IN LOS ANGELES COUNTY, CALIFORNIA.

ZONE "X" AREAS TO BE DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

EXISTING LAND USE:
CHURCH AND SCHOOL PURPOSES

PROPOSED LAND USE:
FOR LAND SUBDIVISION PURPOSES

ENGINEER INFORMATION

KES TECHNOLOGIES
1 VENTURE STE 130
IRVINE, CA 92618
PHONE NO. 949-339-5331

DIGALERT
DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

REVISIONS

NO	DATE	INITIAL	DESCRIPTION	APP	DATE

OWNER/DEVELOPER:
BRANDYWINE HOMES, INC.
16580 ASTON
IRVINE, CA 92606
(949) 296-2400

PREPARED BY :

KES TECHNOLOGIES INC
CIVIL ENGINEERING
LAND PLANNING AND SURVEYING
1 VENTURE STE 130
IRVINE, CALIFORNIA 92618
PHONE (949) 339-5331
FAX (866) 426-2201

REGISTERED PROFESSIONAL ENGINEER
ALI MONSHIZADEH
C67674
EXP. 06/30/2021
CIVIL
STATE OF CALIFORNIA

I hereby certify that:
1. These plans have been prepared under my supervision:
2. The grading shown hereon will not divert drainage from its natural downstream course or obstruct the drainage of adjacent properties:
3. All specimen trees located on this properly are shown:
4. Existing ground contours and elevations were obtained by field survey on/aerial topography flown on MAY, 2018

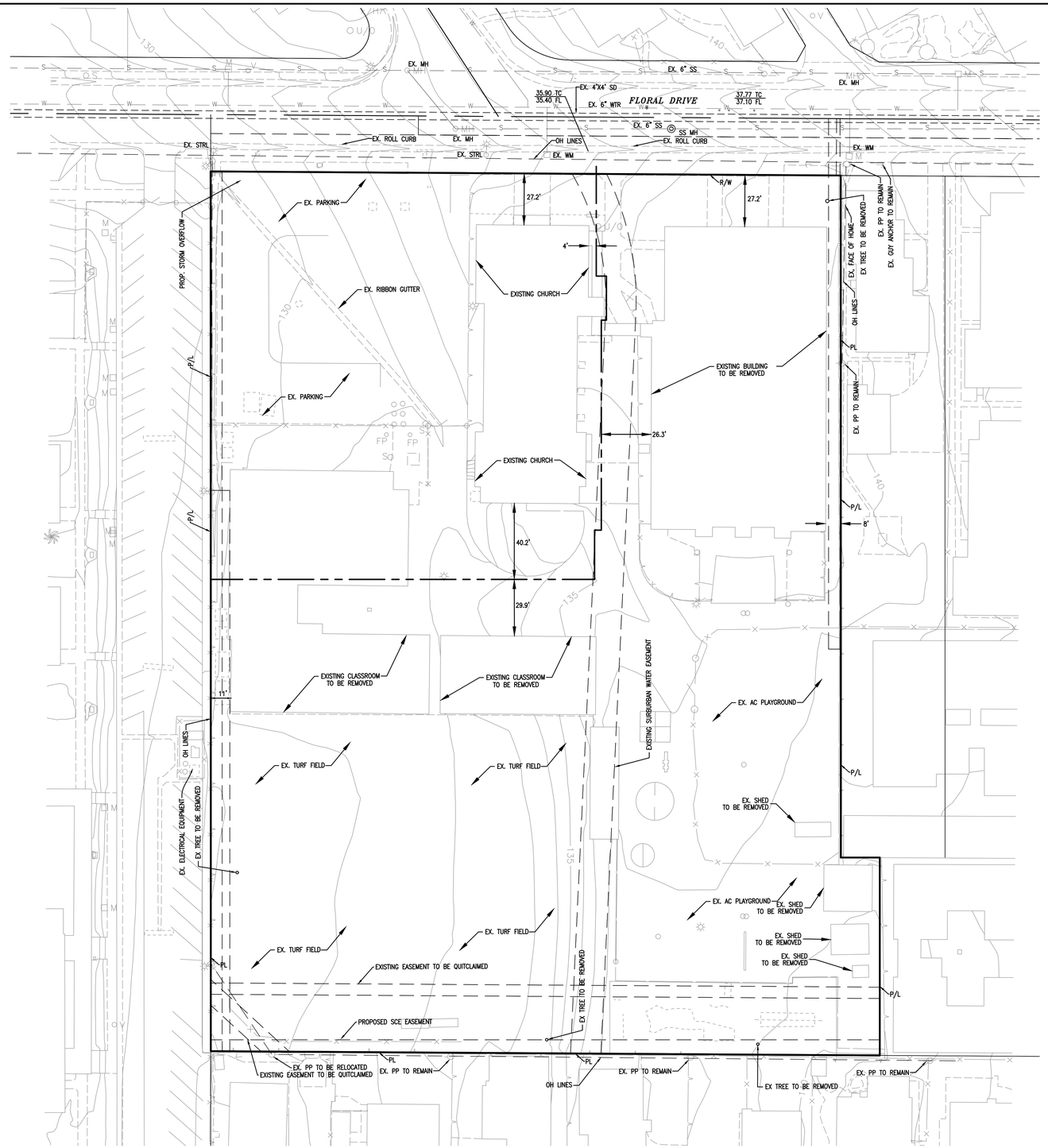
ENGINEER _____ DATE _____
RCE 67674 EXP. DATE 6-31-21

TENTATIVE PARCEL NO. 82832
(FOR LAND DIVISION PURPOSES)
TENTATIVE PARCEL MAP
LOCATED IN THE CITY OF WHITTIER
THE COUNTY OF LOS ANGELES, STATE OF CA

SHEET 1 OF 2

SCALE: AS SHOWN | DRAWN BY: DSK | CHECKED BY: AM

CITY OF WHITTIER



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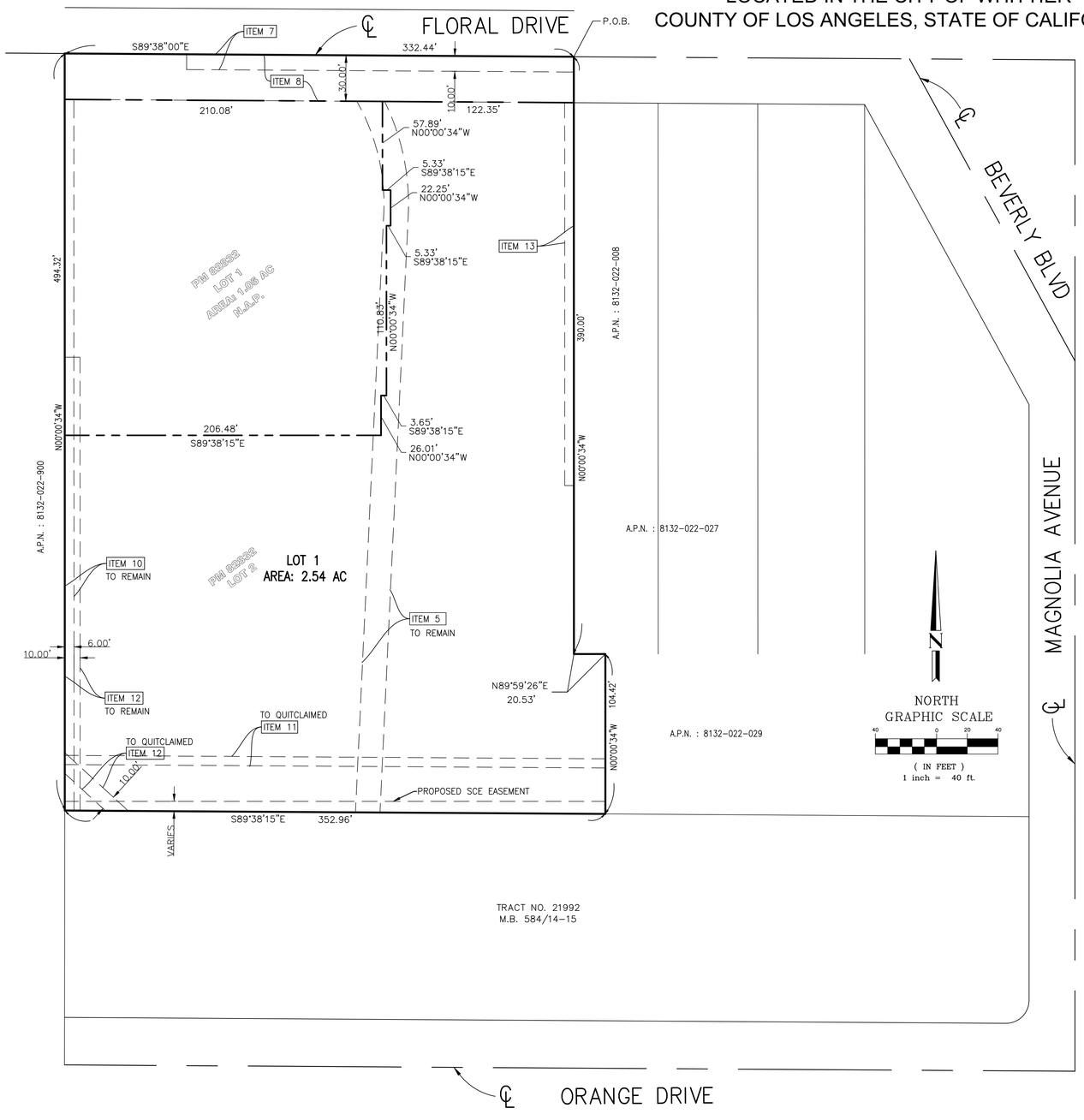
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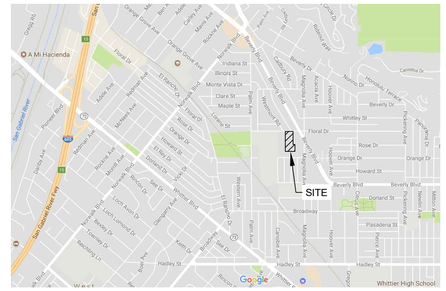
SHEET 2 OF 2

SCALE: AS SHOWN | DRAWN BY: DSK | CHECKED BY: AM

CITY OF WHITTIER

VESTING TENTATIVE TRACT NO. 82802
(FOR CONDOMINIUM PURPOSES)
LOCATED IN THE CITY OF WHITTIER
COUNTY OF LOS ANGELES, STATE OF CALIFORNIA





VICINITY MAP
NOT TO SCALE

TITLE INFORMATION
THE FOLLOWING TITLE INFORMATION WAS DERIVED FROM A PRELIMINARY REPORT FOR TITLE INSURANCE PREPARED BY FIRST AMERICAN TITLE INSURANCE COMPANY, ORDER NO.: OSA-5463765 (tc) AND BEING DATED AGUGUST 12, 2020 AT 7:30 A.M.

TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:
TRINITY LUTHERAN CHURCH OF WHITTIER, CALIFORNIA, A CORPORATION

LEGAL DESCRIPTION
REAL PROPERTY IN THE CITY OF WHITTIER, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

THAT PORTION OF THE EAST HALF OF LOT 11 OF COHN'S PARTITION OF LOTS 1, 2, 3, 4, 11, 12, 13 AND 22 OF WEST WHITTIER TRACT, IN THE CITY OF WHITTIER, AS PER MAP RECORDED IN BOOK 60 PAGE 2, MISCELLANEOUS RECORDS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, LYING WESTERLY OF THE FOLLOWING DESCRIBED LINE:

BEGINNING AT A POINT IN THE NORTH LINE OF SAID LOT 11 OF COHN'S PARTITION, DISTANT WESTERLY 297.565 FEET FROM THE NORTHEAST CORNER OF SAID LOT 11; THENCE SOUTHERLY PARALLEL WITH THE EASTERLY LINE OF SAID LOT TO THE WESTERLY PROLONGATION OF THE NORTHERLY LINE OF THE LAND DESCRIBED IN DEED TO LENNIEL E. TAYLOR AND WIFE RECORDED JULY 2, 1946 IN BOOK 23425 PAGE 106, OFFICIAL RECORDS OF SAID COUNTY; THENCE EASTERLY ALONG SAID PROLONGATION, 20 FEET, MORE OR LESS, TO THE WESTERLY LINE OF SAID LAND; THENCE SOUTHERLY ALONG SAID WESTERLY LINE AND PROLONGATION THEREOF, TO THE SOUTHERLY LINE OF SAID LOT.

EXCEPT THAT PORTION WITHIN THE LINES OF TRACT NO. 21992 AS SHOWN ON MAP RECORDED IN BOOK 584 PAGES 14 AND 15 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

APN: 8132-022-007

SCHEDULE B EXCEPTIONS

	INDICATES ITEM PLOTTED HEREON.
ITEM 1:	GENERAL AND SPECIAL TAXES AND ASSESSMENTS FOR THE FISCAL YEAR 2017-2018, A LIEN NOT YET DUE OR PAYABLE.
ITEM 2:	THE LIEN OF SPECIAL TAX ASSESSED PURSUANT TO CHAPTER 2.5 COMMENCING WITH SECTION 53311 OF THE CALIFORNIA GOVERNMENT CODE FOR THE WHITTIER SCHOOLS COMMUNITY FACILITIES DISTRICT OF THE WHITTIER CITY SCHOOL DISTRICT, AS DISCLOSED BY NOTICE OF SPECIAL TAX LIEN RECORDED MARCH 12, 1997 AS INSTRUMENT NO. 97-369987 OF OFFICIAL RECORDS, NONE NOW DUE AND OWNING.
ITEM 3:	THE LIEN OF SUPPLEMENTAL TAXES, IF ANY, ASSESSED PURSUANT TO CHAPTER 3.5 COMMENCING WITH SECTION 75 OF THE CALIFORNIA REVENUE AND TAXATION CODE.
ITEM 4:	AN EASEMENT TO USE AND MAINTAIN IRRIGATION DITCHES AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 999, PAGE 53 OF OFFICIAL RECORDS.
ITEM 5:	AN EASEMENT FOR THE CONSTRUCTION OF NECESSARY DITCHES FOR CONVEYING WATER, AND RIGHT TO ENTRY UPON SAID LAND FOR THE PURPOSE OF MAINTAINING SAID DITCHES AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 1050, PAGE 249 OF OFFICIAL RECORDS.
ITEM 6:	AN EASEMENT FOR CONSTRUCTION AND MAINTENANCE OF A STORM DRAIN AND APPURTENANCES AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 14121, PAGE 22 OF OFFICIAL RECORDS.
ITEM 7:	AN EASEMENT FOR PUBLIC UTILITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 29000, PAGE 310 OF OFFICIAL RECORDS.
ITEM 8:	AN EASEMENT FOR PUBLIC STREET AND ROAD AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 39875, PAGE 127 OF OFFICIAL RECORDS.
ITEM 9:	AN EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 41704, PAGE 46 OF OFFICIAL RECORDS.
ITEM 10:	AN EASEMENT FOR PUBLIC UTILITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 41914, PAGE 327 OF OFFICIAL RECORDS.
ITEM 11:	AN EASEMENT FOR PUBLIC UTILITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK 50538, PAGE 371 OF OFFICIAL RECORDS.
ITEM 12:	AN EASEMENT FOR PUBLIC UTILITY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED IN BOOK D2393, PAGE 85 OF OFFICIAL RECORDS.
ITEM 13:	THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "AGREEMENT" RECORDED JUNE 20, 1963 AS INSTRUMENT NO. 5143 IN BOOK M1289, PAGE 988 OF OFFICIAL RECORDS.
ITEM 14:	A DEED OF TRUST TO SECURE AN ORIGINAL INDEBTEDNESS OF $890,555.79 RECORDED OCTOBER 05, 2011 AS INSTRUMENT NO. 20111349482 OF OFFICIAL RECORDS. DATED: AUGUST 31, 2011 TRUSTOR: TRINITY LUTHERAN CHURCH OF WHITTIER, CALIFORNIA TRUSTEE: LUTHERAN CHURCH EXTENSION FUND-MISSOURI SYNOD, A MISSOURI CORPORATION BENEFICIARY: LUTHERAN CHURCH EXTENSION FUND-MISSOURI SYNOD
ITEM 15:	THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "RESOLUTION NO. 2011-12-R7" RECORDED FEBRUARY 10, 2012 AS INSTRUMENT NO. 20120233349 OF OFFICIAL RECORDS.
ITEM 16:	RIGHTS OF THE PUBLIC IN AND TO THAT PORTION OF THE LAND LYING WITHIN ANY ROAD, STREET, ALLEY OR HIGHWAY.
ITEM 17:	WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS.
ITEM 18:	RIGHTS OF PARTIES IN POSSESSION.

BENCHMARK:
L&T IN N. CB 150MM (0.5 FT) E/O BCR @ NW COR WHITTIER BLVD & BROADWAY LACDPW BM # 6629 ELEVATION = 61.16' ADJUSTED YEAR 2005.

LAND AREA:
166,463.11 SQUARE FEET +/- (3.821 ACRES)

BASIS OF BEARINGS:
THE BEARINGS SHOWN HEREON ARE BASED ON THE CENTERLINE OF FLORAL DRIVE, SHOWN AS N89°38'00"W ON TRACT NO. 21992, IN BOOK 284 OF MISC. MAPS PAGES 14-15 IN THE COUNTY OF LOS ANGELES, CA.

ADDRESS:
11716 FLORAL DR WHITTIER CA 90601

DATE OF SURVEY:
JULY 08, 2017

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ZONE "X" AREAS TO BE DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

DEMOLITION NOTE:
THE ENTIRE SITE IS PROPOSED TO BE DEMOLISHED, NO EXISTING STRUCTURES TO REMAIN ON SITE, NO EXISTING TREES TO REMAIN ON SITE.

EXISTING LAND USE:
CHURCH AND SCHOOL PURPOSES

PROPOSED LAND USE:
RESIDENTIAL 25 DETACHED CONDOMINIUM

ENGINEER INFORMATION
KES TECHNOLOGIES
1 VENTURE STE 130
IRVINE, CA 92618
PHONE NO. 949-339-5331

LEGEND

●	UTILITY POLE	▣	SIGNAL PULLBOX	CL	CENTER LINE
(S)	SEWER MANHOLE	◩	CABLE TV PULLBOX	PP	POWER POLE
(D)	STORM DRAIN MANHOLE	⬒	TELEPHONE PULLBOX	BW	BACK OF WALK
(T)	TELEPHONE MANHOLE	▣	COMMUNICATIONS PULLBOX	TW	TOP OF WALL
(U)	UNKNOWN MANHOLE	▣	STREET LIGHT PULLBOX	AC	ASPHALT PAVEMENT
	FIRE HYDRANT	■	UNKNOWN PULLBOX	(12.56)	EXISTING ELEVATION
	FLOOD LIGHT	▽	FIRE DEPT CONNECTION	℄	CENTERLINE
	HOSE BIB		IRON FENCE		SLOPE
(C)	SEWER CLEANOUT		CHAIN LINK FENCE		PHONE BOOTH
	WATER VALVE		WOOD FENCE	CONCRETE	CONCRETE
	GAS VALVE		BLOCK WALL	(I)	IRRIGATION VALVE
	WATER METER		TREE	●	GUARD POST (GP)
	GAS METER		PALM		CENTERLINE
	WATER VAULT		PINE		PROPERTY LINE
	GAS VAULT		BUSH		FLOW LINE
	TELEPHONE VAULT	TE	TRASH ENCLOSURE		UTILITY MARKER
	ELECTRIC VAULT	TR	ELECTRICAL TRANSFORMER		GRATE
	MONITORING WELL	EP	EDGE OF PAVEMENT		HANDICAP
	STREET LIGHT	FS	FINISHED SURFACE		FLAG POLE
	TRAFFIC SIGNAL	FF	FINISHED FLOOR	(F)	FIRE SPRINKLER RISER
GR	GAS RISER	NG	NATURAL GROUND		SURVEY MONUMENT
	GUY WIRE	TC	TOP OF CURB		SIGN POST
(R)	RAILROAD SIGNAL	FL	FLOW LINE	CFS	CUBIC FEET PER SECOND
	CAR STOP	TG	TOP OF GRATE	INV	INVERT
	LIGHT POLE	GB	GRADE BREAK		AERIAL TARGET
PCC	PORTLAND CONC CEMENT	DDC	DOUBLE DETECTER CHECK VALVE	IRR	IRRIGATION
MH	MAN HOLE			PA	PLANTER
LP	LIGHT POLE	CO	CLEAN OUT	PB	PULL BOX
CB	CATCH BASIN	CB	CATCH BASIN	MH	MANHOLE
ST	STREET LIGHT	PIV	POST INDICATOR VALVE	ARV	AIR RELEASE VALVE

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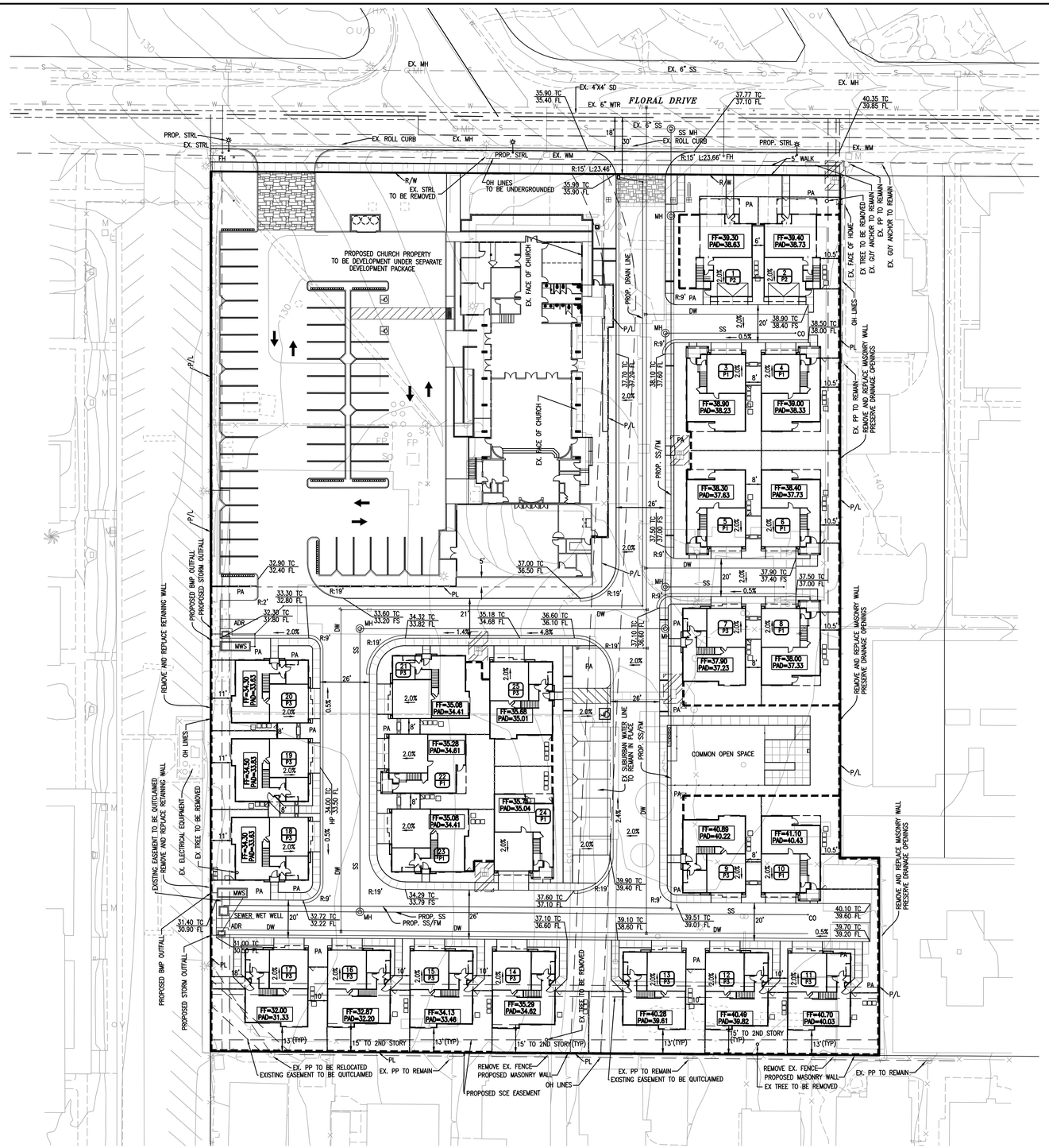
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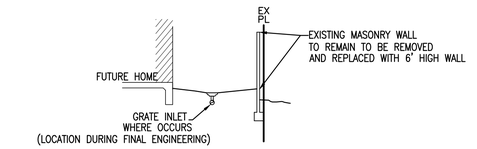
VESTING TENTATIVE TRACT NO. 82802
(FOR CONDOMINIUM PURPOSES)
TENTATIVE MAP
LOCATED IN THE CITY OF WHITTIER
THE COUNTY OF LOS ANGELES, STATE OF CA

SHEET 1 OF 3

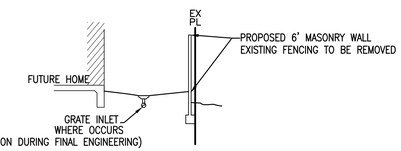
SCALE: AS SHOWN | DRAWN BY: DSK | CHECKED BY: AM

CITY OF WHITTIER

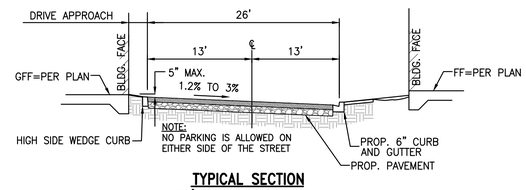




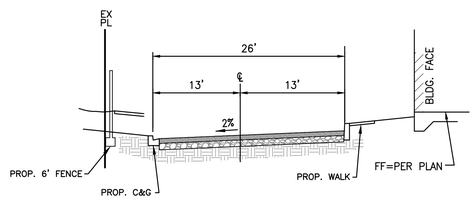
EAST PL SECTION
LOOKING NORTH N.T.S.



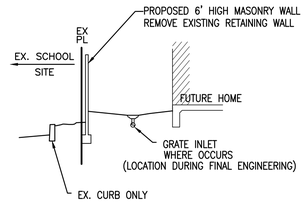
SOUTH PL SECTION
LOOKING EAST N.T.S.



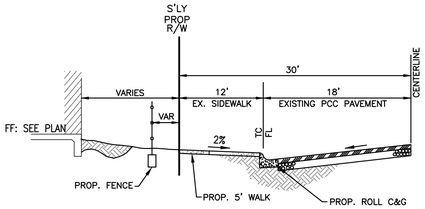
TYPICAL SECTION
26' MAIN DRIVE AISLE
NTS



26' MAIN ENTRY DRIVE AISLE
NTS



WEST PL SECTION
LOOKING NORTH N.T.S.

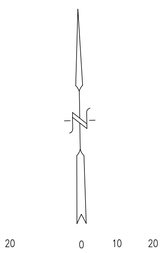


FLORAL DRIVE STREET SECTION
N.T.S.

PRELIMINARY EARTHWORK SUMMARY:
QUANTITIES FOR PLAN CHECKING PURPOSES ONLY
QUANTITIES NOT TO BE USED AS GRADING PAY QUANTITIES

RAW CUT	6453 CY
SPOILS	900 CY
RAW IMPORT	400 CY
OVER EXCAVATION	7744 CY
ADJUSTED IMPORT	8905 CY
EXPORT	5792 CY

ASSUMPTIONS:
1. SITE SUBSIDENCE IS ASSUMED NEGLIGIBLE.
2. ENTIRE SITE TO BE OVER-EXCAVATED.



STREET LIGHT NOTE:
PROJECT TO INSTALL NEW LS2 TYPE STREET LIGHTS ALONG FLORAL PER CITY OF WHITTIER STREET LIGHTING POLICY

STREET TREE NOTE:
PROJECT TO INSTALL STREET TREES ALONG FRONTAGE PER CITY OF WHITTIER STANDARDS

FIRE WATER NOTE:
PROPOSED PUBLIC FIRE HYDRANTS

WATER NOTE:
PROPOSED PUBLIC MAIN: 8" MAIN LATERAL PVC
PROPOSED HOUSE LATERALS: 1.5" PVC

SEWER NOTE:
PROPOSED SEWER/ALLEY MAIN: 6" MAIN LATERAL PVC
PROPOSED HOUSE LATERALS: 4" PVC
ALL PROPOSED MAIN LINE SEWER TO BE PRIVATE
ALL PROPOSED ALLEY SEWER LATERALS TO BE PRIVATE

PROPOSED EASEMENT
AN EASEMENT IS PROPOSED OVER ALL VEHICULAR PAVEMENT AREA FOR INGRESS/EGRESS AND UTILITY PURPOSES.

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RCE 67674 EXP. DATE 6-31-21

VESTING TENTATIVE TRACT NO. 82802 (FOR CONDOMINIUM PURPOSES)
GRADING AND UTILITY PLAN
LOCATED IN THE CITY OF WHITTIER THE COUNTY OF LOS ANGELES, STATE OF CA

SHEET 2 OF 3

SCALE: AS SHOWN | DRAWN BY: DSK | CHECKED BY: AM

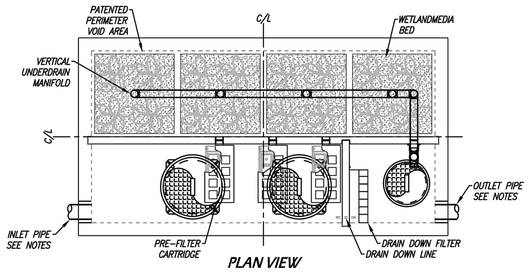
CITY OF WHITTIER



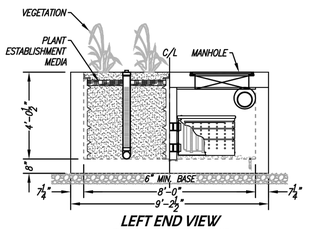
CATCH BASIN STENCILING DETAIL

NTS

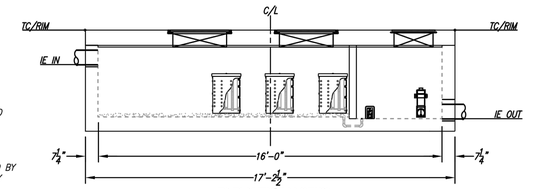
SITE SPECIFIC DATA			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			7.26
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø3.07"
MAXIMUM PICK WEIGHT (LBS)			TBD
NOTES:			



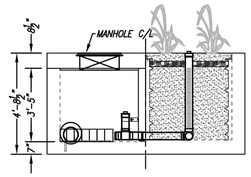
PLAN VIEW



LEFT END VIEW
BIOFILTRATION/PRETREATMENT



ELEVATION VIEW



RIGHT END VIEW
DISCHARGE/BIOFILTRATION

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.

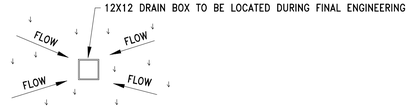
TREATMENT FLOW (CFS)	0.462
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

THE PRODUCT DESCRIBED MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

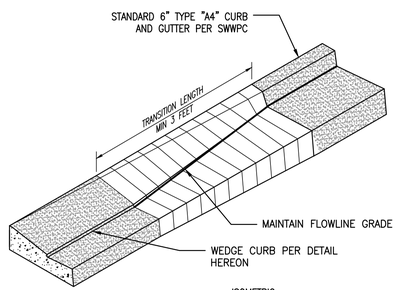
PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MODULAR WETLANDS SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MODULAR WETLANDS SYSTEMS IS PROHIBITED.

MODULAR WETLANDS
www.ModularWetlands.com | (855) 5MOD-WET

MWS-L-8-16-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

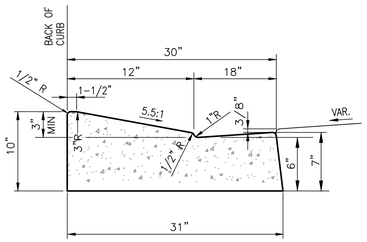


TYPICAL PLANTER AREA DRAINAGE

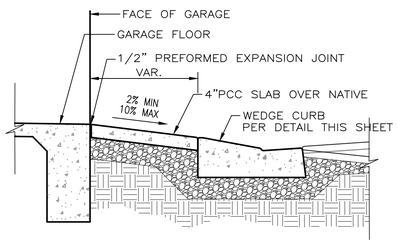


ISOMETRIC

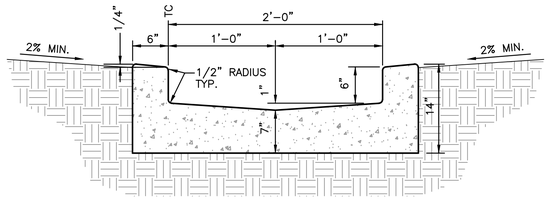
6" CURB TO WEDGE CURB TRANSITION
NTS



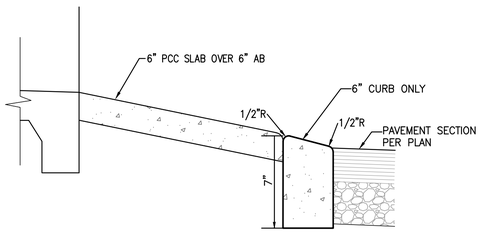
LOW SIDE WEDGE CURB
NTS



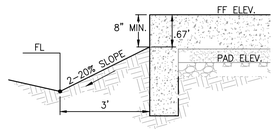
LOW SIDE WEDGE APRON DETAIL
NTS



CONCRETE U-CHANNEL DETAIL



HIGH SIDE WEDGE CURB DETAIL
NTS



SIDE YARD GRADING DETAIL
NTS

DIGALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

REVISIONS

NO	DATE	INITIAL	DESCRIPTION	APP	DATE

OWNER/DEVELOPER:
BRANDYWINE HOMES, INC
16580 ASTON
IRVINE, CA 92606
(949) 296-2400

PREPARED BY :
KES TECHNOLOGIES INC
CIVIL ENGINEERING
LAND PLANNING AND SURVEYING
1 VENTURE STE 130
IRVINE, CALIFORNIA 92618
PHONE (949) 339-5331
FAX (866) 426-2201

REGISTERED PROFESSIONAL ENGINEER
ALI MONSHIZADEH
C67674
EXP. 06/30/2021
CIVIL
STATE OF CALIFORNIA

I hereby certify that:
1. These plans have been prepared under my supervision:
2. The grading shown hereon will not divert drainage from its natural downstream course or obstruct the drainage of adjacent properties:
3. All specimen trees located on this properly are shown:
4. Existing ground contours and elevations were obtained by field survey on/aerial topography flown on MAY, 2018

ENGINEER _____ DATE _____
RCE 67674 EXP. DATE 6-31-21

VESTING TENTATIVE TRACT NO. 82802
(FOR CONDOMINIUM PURPOSES)
GRADING AND UTILITY PLAN
LOCATED IN THE CITY OF WHITTIER
THE COUNTY OF LOS ANGELES, STATE OF CA

SHEET 3 OF 3

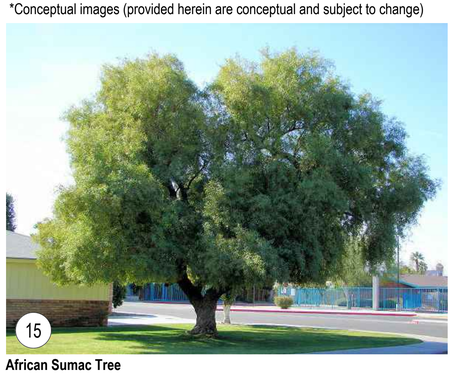
SCALE: AS SHOWN | DRAWN BY: DSK | CHECKED BY: AM

CITY OF WHITTIER



Deodar Cedar Tree

*Conceptual images (provided herein are conceptual and subject to change)



African Sumac Tree



LEGEND

1. Central community open space and open lawn area with freestanding BBQ, shade structure, benches, & picnic table for small social events and group gatherings. See L-3 Enlargement.
2. Main project entry & monumentation with pedestrian portal and enhanced vehicular colored concrete paving, See L-2 Enlargement.
3. Two community cluster mailboxes and one parcel locker, per USPS review and approval.
4. Proposed wall, pilaster, gate or fence, per Wall & Fence Plan.
5. 4' wide community natural colored concrete sidewalk, with light broom finish.
6. Accessible parking stall and striping, per Civil plans.
7. Guest parking stall.
8. Natural gray concrete driveway with broom finish.
9. Private concrete patio / yard area, homeowner maintained.
10. Common area landscape, builder installed and HOA maintained.
11. Property line.
12. Public street R.O.W.
13. Public street sidewalk, per Civil plans.
14. Transformer to be screened with landscape, quantity and final locations to be determined.
15. Proposed trees per sheet L-3 (Planting plan).
16. (3) Large 48" box trees for parking shade.



*Conceptual image - CBU Mailboxes (Aluminum, in Dark Brown color by www.mailboxes.com)





*Conceptual image - Pilasters at main project entry

0 15' 30' 60'

Scale: 1" = 30'

Brandywine Homes

Schematic Landscape Plan

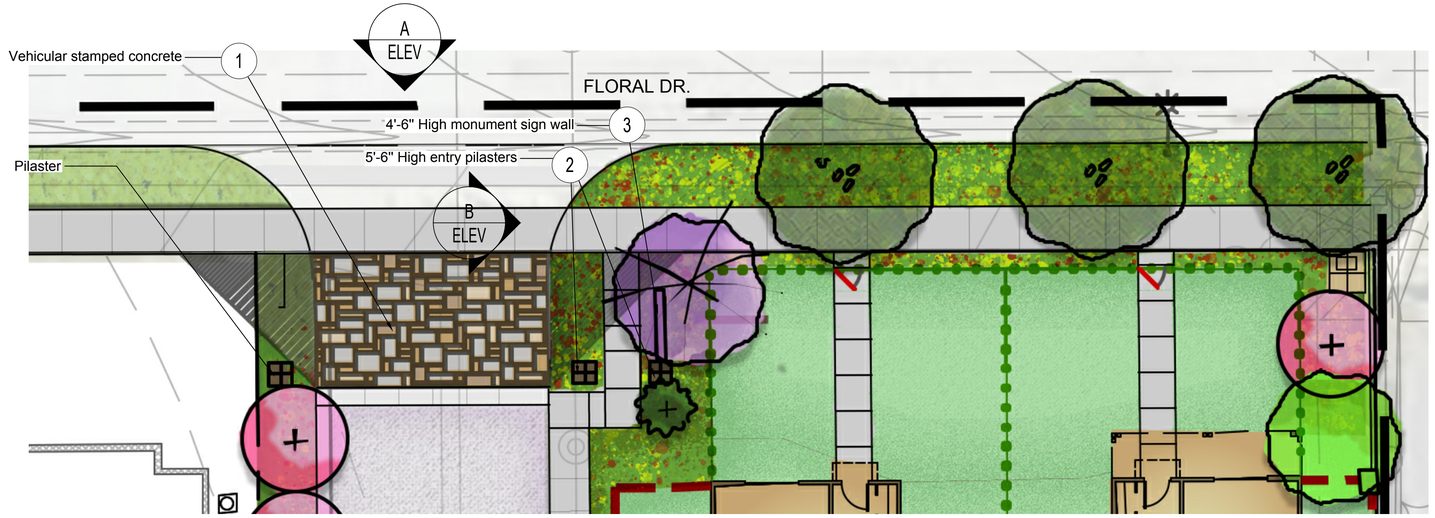
Schematic - 6th City Submittal | Project No.: BH09-D
Tract No: 82802 | Date: June 14, 2021

L-1

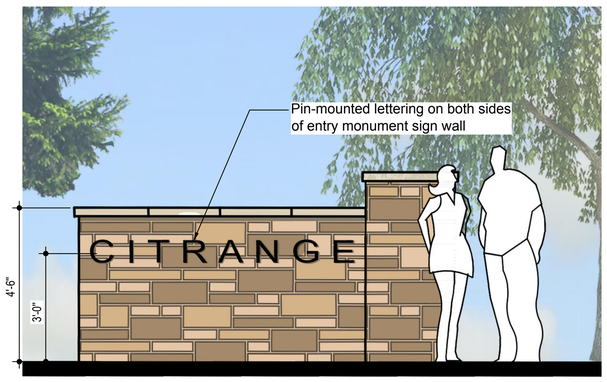
Citrange - 11716 Floral Drive, Whittier CA



Elevation 'A' - Project Entry
1/4" = 1'-0"



Plan View - Main Project Entry
1/8" = 1'-0"



3 **Elevation 'B' - Project Monument Sign Wall**
1/2" = 1'-0"



Vehicular Stamped Concrete (Image above represents pattern)
Color to match: Orco (80mm) in Borrego color.



Stone Veneer over CMU Pilasters - Hill Country
Limestone (Bandera) by Coronado Stone Products

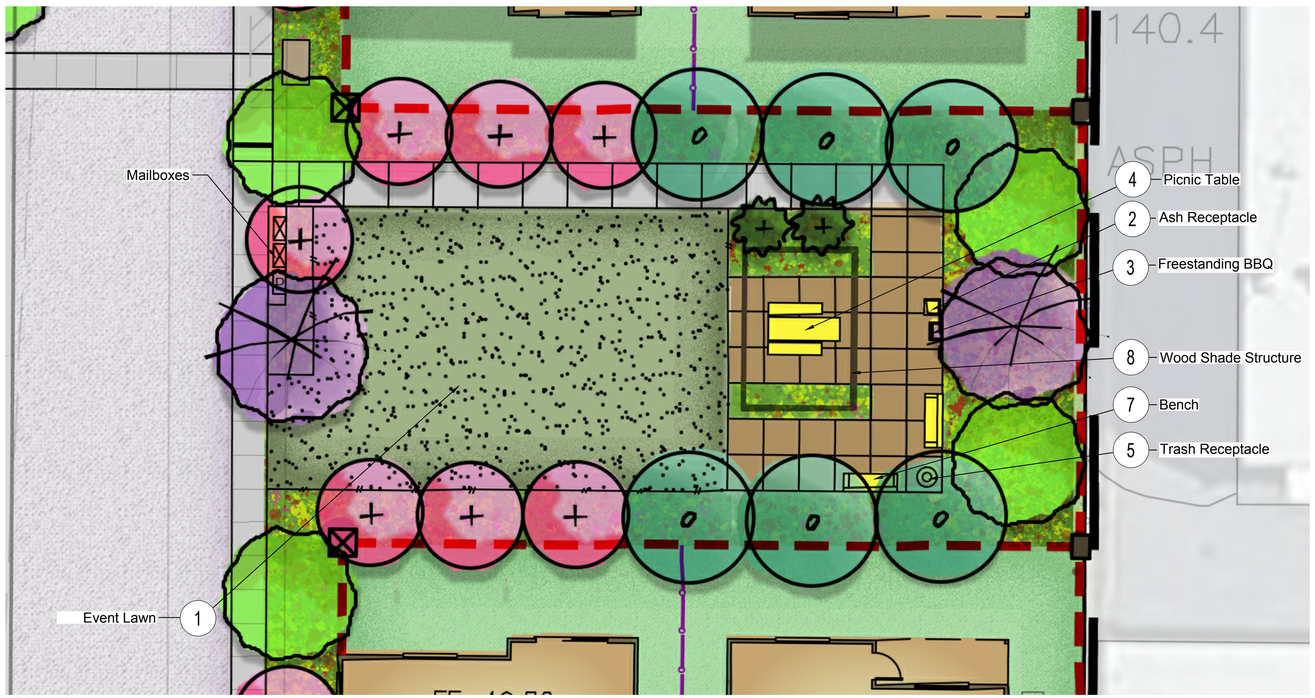
Main Project Entry & Monument Feature - Enlargement

Brandywine Homes

Schematic - 6th City Submittal | Project No.: BH09-D
Tract No: 82802 | Date: June 14, 2021

L-2

Citrange - 11716 Floral Drive, Whittier CA



Plan View





*Conceptual images of active / passive activities that can take place on event lawn area.



Enhanced Colored Concrete Paving - Davis Color 'Palomino 5447' in Light Broom Finish & Saw-cut Joints.



*Conceptual image of Trash Receptacle, Model# TJ3F43P, black or dark brown color (WabashValley.com).



*Conceptual image of ADA Picnic Table (model # SG207P, black or dark brown color by WabashValley.com)



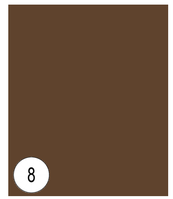
*Conceptual image of Grill (Charcoal model# Grill 21-00, by Dumor)



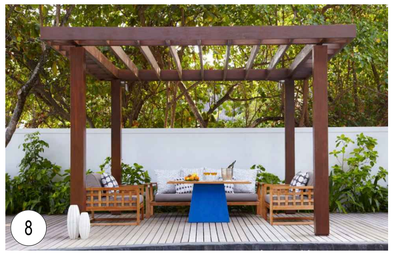
*Conceptual image of Hot Ash Dispenser (model # 16RE-00024, natural color by "ParknPool.com).



*Conceptual image of Bench, Bench 500 , black or dark brown color (Dumor.com).



Wood Color - Walnut



0 4' 8' 16'
Scale: 1/8" = 1'-0"

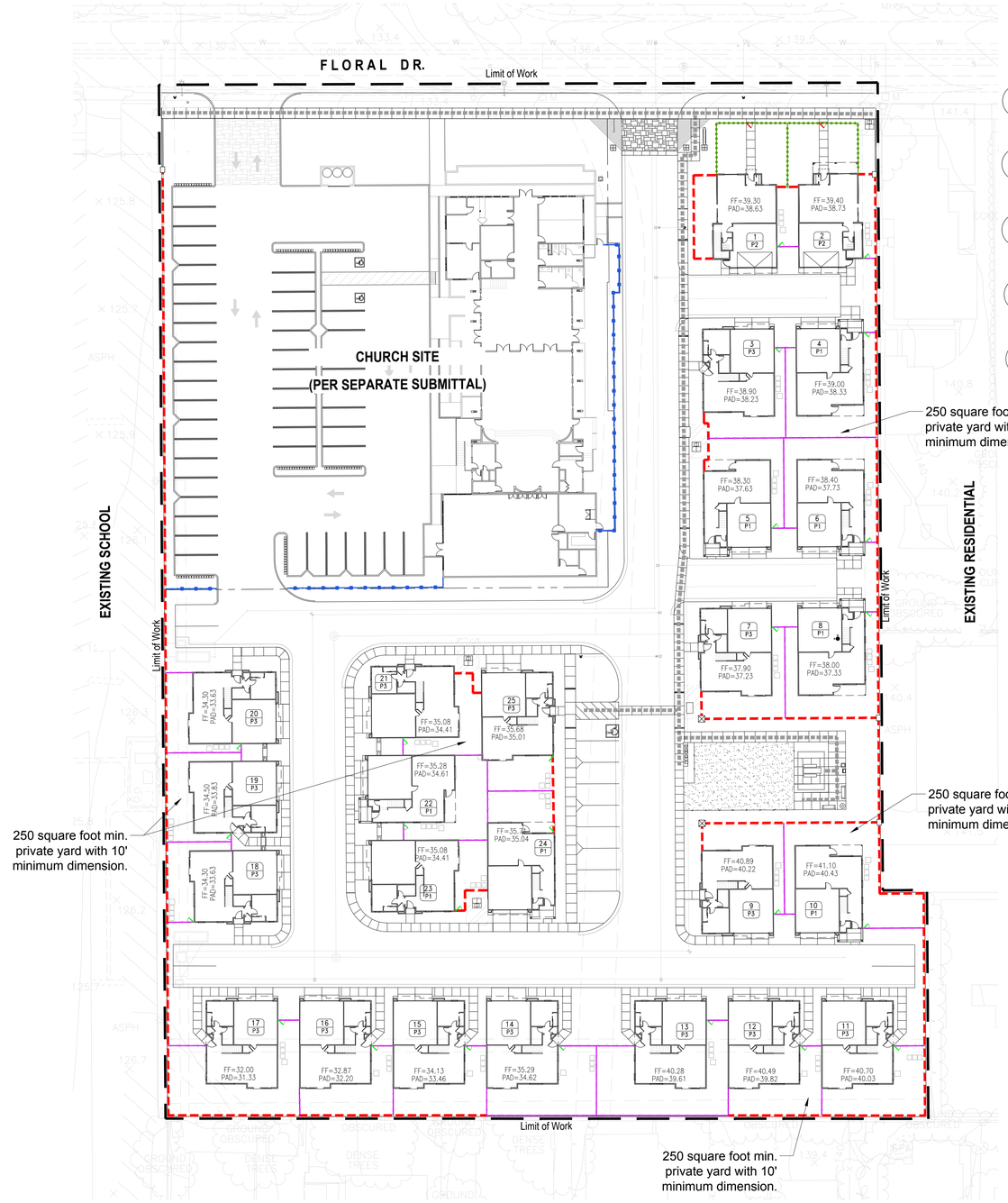
Community Open Space - Enlargement

Brandywine Homes

Schematic - 6th City Submittal | Project No.: BH09-D
Tract No: 82802 | Date: June 14, 2021

L-3

Citrange - 11716 Floral Drive, Whittier CA



Plan View

WALL, FENCE & GATE LEGEND

1. 6'-0" High split-face CMU wall, with 2" high precision CMU cap (tan color).
2. 5'-6" High vinyl fence (white color).
3. 5'-6" High tube steel fence (black paint color).
4. 3'-0" High vinyl picket fence (white color).
5. 6'-6" High (16" sq.) split-face block pilaster, with 18" sq. (4" H). precision CMU cap (tan color).
6. 6'-6" High (12"W x16"L) rectangular split-face block pilaster, with 4" H precision CMU cap (tan color).
7. 5'-6" High vinyl private yard gate (white color).
8. 3'-0" High vinyl pedestrian gate (white color).
9. 5'-6" High stone veneer over CMU pilaster with 5'-0" High entry monument feature with 3" cap.

ADA path of travel.

* See Sheet L-5 and L-6 for materials & colors specifications.

0 15' 30' 60'

Scale: 1" = 30'

Schematic Wall & Fence Plan

Brandywine Homes

Schematic - 6th City Submittal | Project No.: BH09-D
Tract No: 82802 | Date: June 14, 2021

L-4

Citrange - 11716 Floral Drive, Whittier CA

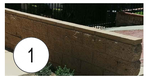
LEGEND

1. 8x4x16 Precision Cap
2. 6x6x16 split face CMU block
3. Grout
4. Concrete footing.
5. Horizontal rebar.
6. Vertical rebar.
7. Finish grade.
8. Amended top soil per soils report, where occurs.
9. 90% compacted sub-grade.

NOTES

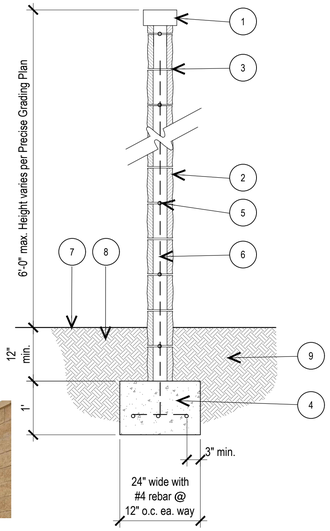
A. Refer to Construction plan for all type, color, finish and manufacturer applications.
B. Refer to Precise Grading Plans for wall heights.







Color: Tan



SECTION

WL-FS-SF-CU-02.dwg

1 SPLIT-FACE BLOCK WALL

Scale: 3/4" = 1'-0"

LEGEND

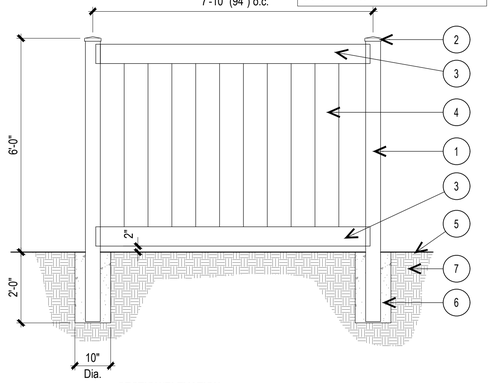
1. 5" x 5" Vinyl post.
2. 5" x 5" Vinyl post cap.
3. 2" x 6-1/2" Vinyl Deco rail.
4. 1" x 8" T&G Vinyl picket panels.
5. Finish grade.
6. Concrete footing, slope to drain.
7. Compacted subgrade.

NOTES

A. Fence Manufacturer:TW Fenceworks - John Rodriguez (805) 933-4522 Office (805) 310-9752 Cell
B. Post and Rail Fence. Install per Manufacturer's specifications.
C. Contractor to verify that fence heights meet City standards.



Color: White



SECTION/ELEVATION

_FE-OV-VN-SD-01 .dwg

2 VINYL FENCE

Scale: 1/2" = 1'-0"

LEGEND

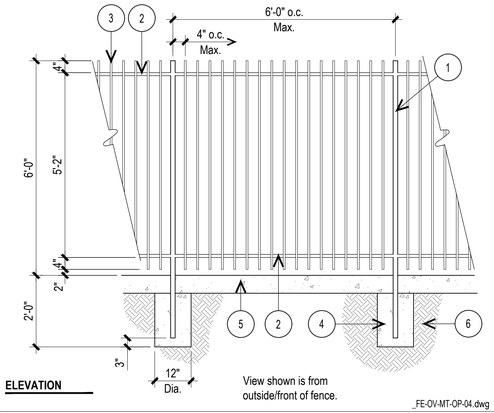
1. 1-1/2" sq. tubular steel post.
2. 1" x 1-1/2" tubular steel top and bottom rail.
3. 1/2" sq. tubular steel pickets, attach on front of rail.
4. Concrete footing. Hold 4" below finish grade.
5. Concrete header at pool fence. Refer to det. , LC-50X
6. Compacted subgrade.

NOTES

A. Refer to Construction Schedule for all type, color, finish and manufacturers.
B. Grind all welds smooth. Treat fields welds to prevent welds.



Color: Black



ELEVATION

View shown is from outside/front of fence.

_FE-OV-MT-OP-04.dwg

3 TUBULAR STEEL FENCE

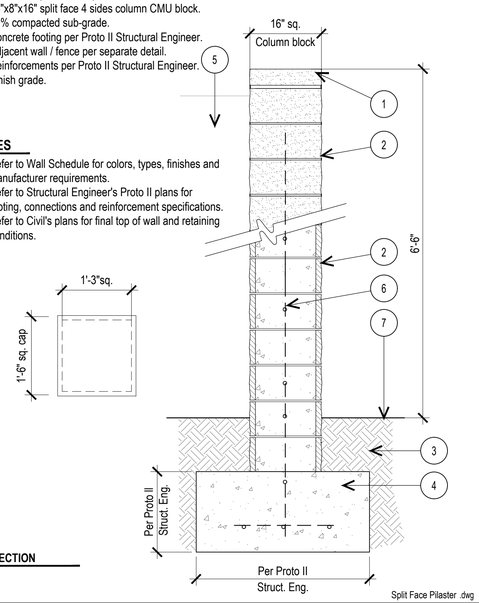
Scale: 1/2" = 1'-0"

LEGEND

1. 18"x4"x16" precision cap.
2. 16"x8"x16" split face 4 sides column CMU block.
3. 90% compacted sub-grade.
4. Concrete footing per Proto II Structural Engineer.
5. Adjacent wall / fence per separate detail.
6. Reinforcements per Proto II Structural Engineer.
7. Finish grade.

NOTES

A. Refer to Wall Schedule for colors, types, finishes and manufacturer requirements.
B. Refer to Structural Engineer's Proto II plans for footing, connections and reinforcement specifications.
C. Refer to Civil's plans for final top of wall and retaining conditions.

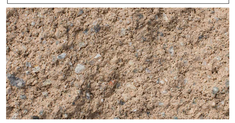


SECTION



5 6

Color: Tan



*Conceptual images (provided herein are conceptual and subject to change)

Split Face Pilaster .dwg

5 6 SPLIT FACE PILASTER

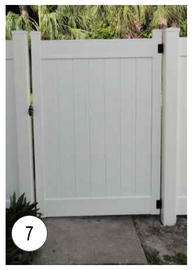
Scale: 3/4" = 1'-0"

LEGEND

1. 2 x 6 vinyl cap.
2. 1 x 6 T&G vinyl infill.
3. 2 x 4 vinyl top, bottom, and side rails.
4. 1 x 4 vinyl plant-on.
5. 2 x 4 vinyl cross brace.
6. 2 x 4 vinyl jamb. Center on wall.
7. 4 x 4 vinyl ledger.
8. Concrete fence footing.
9. Align top of gate with top of fence.
10. Heavy duty metal tee hinges.
11. Heavy duty metal latch.
12. House wall.
13. Adjacent fence - per plan.
14. Lag bolts to adjacent house wall - countersink.
15. Finish surface / grade.

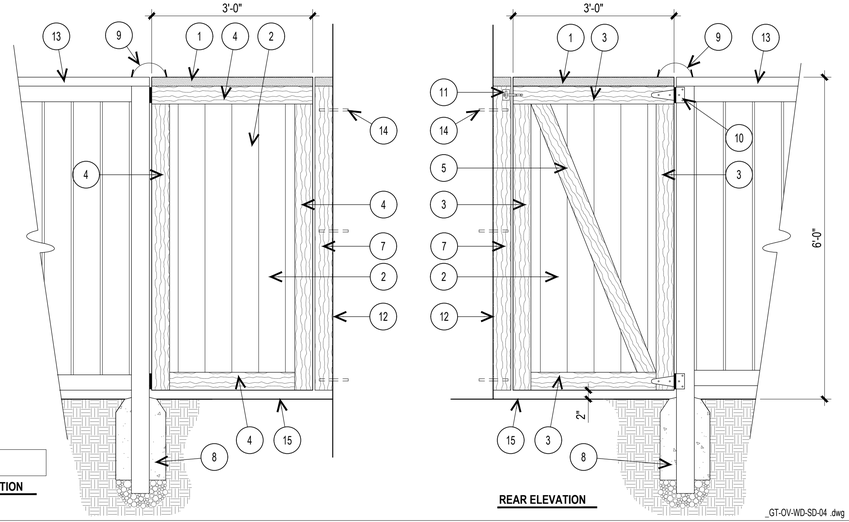
NOTES

A. Refer to Construction Plan for all type, color, finish and manufacturer applications.
B. Gates to swing into yard.
C. Side yard fence returns shall meet house perpendicularly at 90°.



Color: White

FRONT ELEVATION



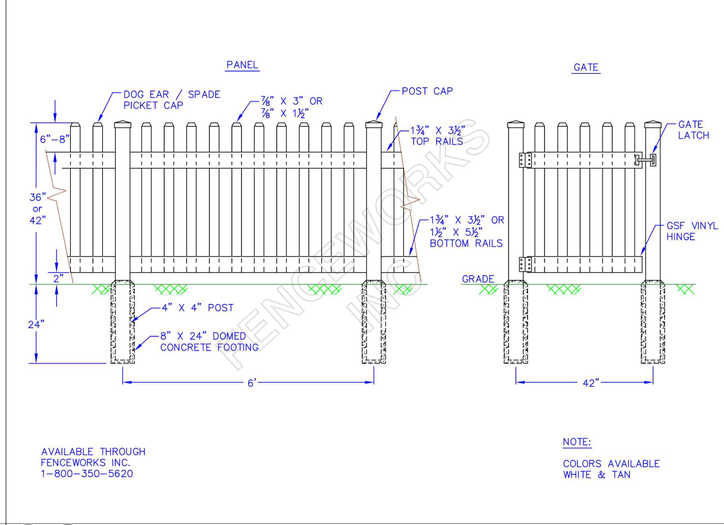
TOP VIEW

REAR ELEVATION

_GT-OV-WD-SD-04 .dwg

7 VINYL PRIVATE YARD GATE

Scale: 3/4" = 1'-0"



AVAILABLE THROUGH FENCEWORKS INC. 1–800–350–5620

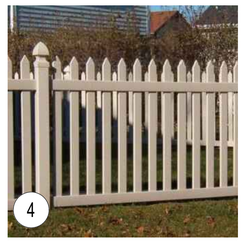
NOTE:

COLORS AVAILABLE WHITE & TAN



8

Color: White



4

Color: White

_GT-OV-WD-SD-04 .dwg

4 8 VINYL PEDESTRIAN FENCE AND GATE

Scale: NTS

Schematic Wall & Fence Details and Images

Brandywine Homes

Schematic - 6th City Submittal | Project No.: BH09-D
Tract No: 82802 | Date: June 14, 2021

L-5

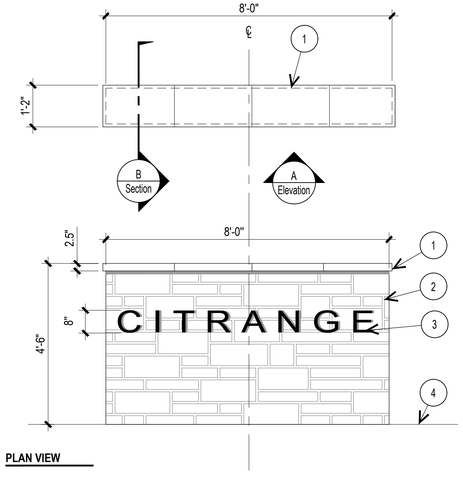
Citrange - 11716 Floral Drive, Whittier CA

LEGEND

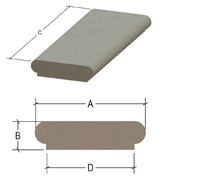
1. Pre-cast cap. VP-MC14ST by www.valoriprecast.com
2. Stone veneer over CMU block-Stone veneer to match adjacent pilasters.
3. Pin-mounted Aluminum lettering per owner.
4. Finish grade.
5. 90% Compacted sub-grade.
6. Concrete footing.

NOTES

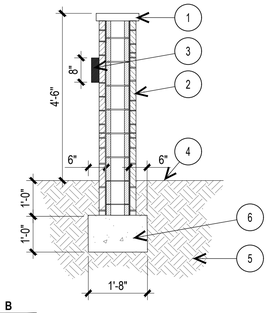
A. Sign up-lighting per owner. Contractor to coordinate electrical needs.



PLAN VIEW



PART #	A	B	C	D
VP-MC14ST	14"	2.5"	24"	12"



SECTION B





Color: Hill Country Limestone (Bandera) by Coronado Stone Products

Entry Sign-WL-FS-SO .dwg

9 MONUMENT SIGN WALL

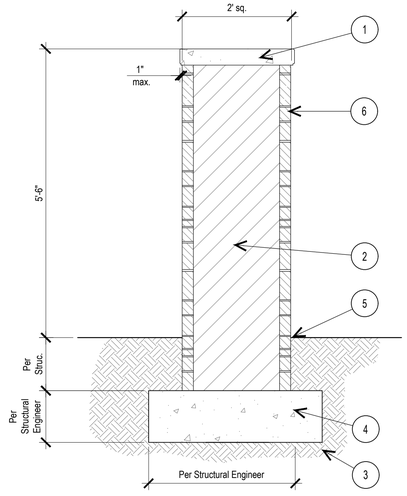
Scale: 1/2" = 1'-0"

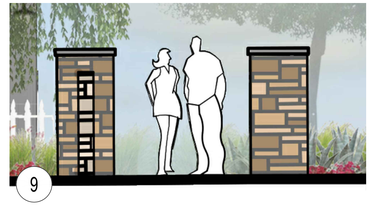
LEGEND

1. Pre-cast cap.
2. CMU core and reinforcing, per Structural Engineer.
3. 90% Compacted sub-grade.
4. Concrete footing, per Structural Engineer.
5. Finish grade.
6. Stone veneer - See Construction Schedule.

NOTES

A. Contractor shall refer to Structural Engineer and Soils reports for all CMU, reinforcing, connections, and footing requirements.
B. Refer to Construction Plan for all colors, types, finishes, and manufacturer requirements.







Color: Hill Country Limestone (Bandera) by Coronado Stone Products

Perimeter Stone Pilaster .dwg

9 STONE VENEER PILASTER

Scale: 1/2"=1'-0"

Schematic Wall & Fence Details and Images

Brandywine Homes

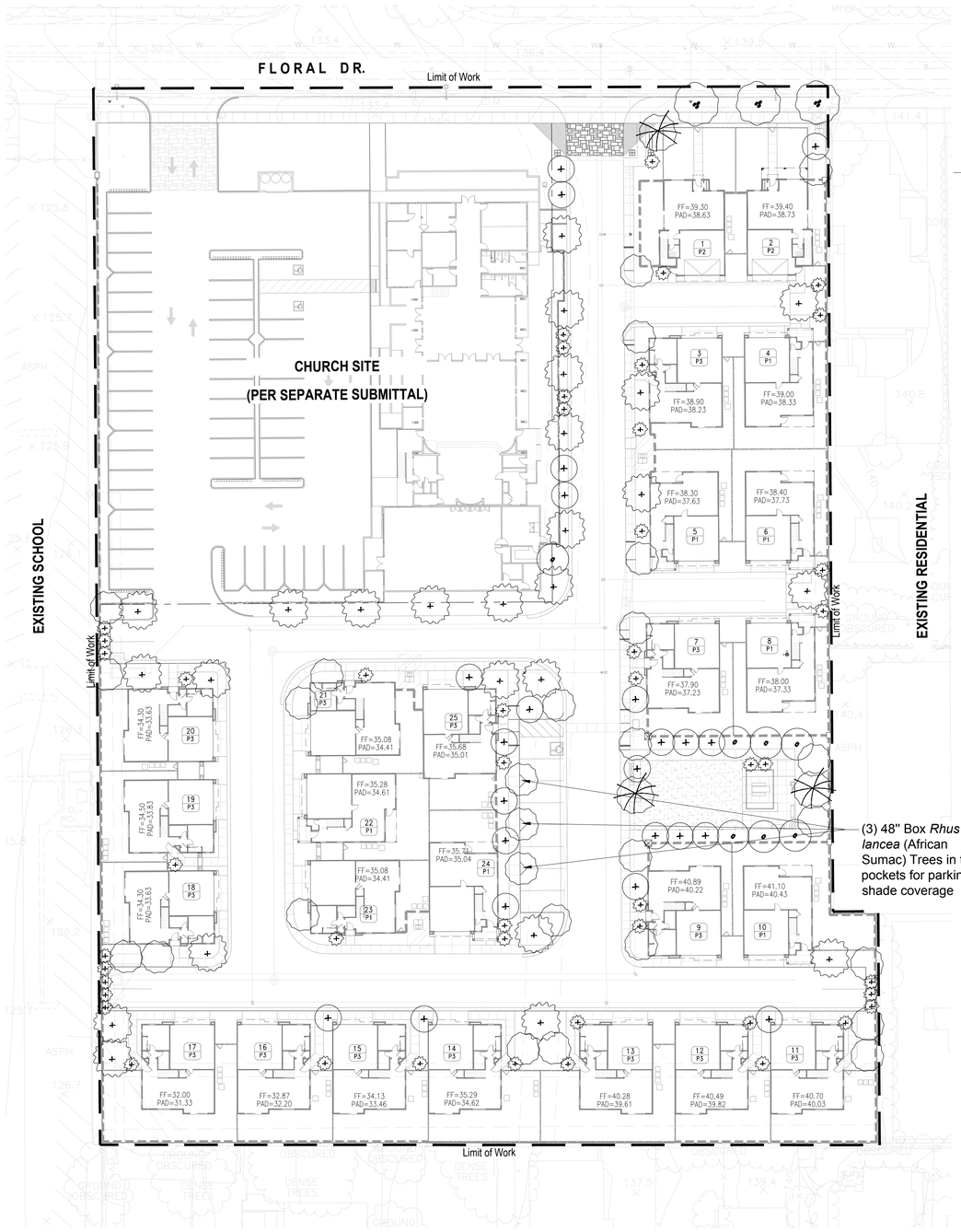
Schematic - 6th City Submittal | Project No.: BH09-D
Tract No: 82802 | Date: June 14, 2021

L-6

Citrange - 11716 Floral Drive, Whittier CA

SHRUBS and GROUND COVER		WUCOLS (R3)
Anigozanthos	Kangaroo Paw	Low
Agave sp.	Agave	Low
Aloe sp.	Aloe	Low
Bougainvillea sp.	Bougainvillea	Low
Callistemon citrinus 'Little John'	Dwarf Bottlebrush	Low
Carex divulsa	Berkeley Sedges	Low
Carissa m. 'Green Carpet'	Dwarf Natal Plum	Low
Chamaerops humilis	Mediterranean Fan Palm	Low
Cordyline 'Pink Passion'	Pink Passion Dracaena Palm	Low
Dasylirion longissimum	Mexican Grass Tree	Low
Delosperma cooperi	Trailing Ice Plant	Low
Dianella revoluta 'Little Rev'	Little Rev™ Flax Lily	Low
Iris sp.	Iris	Low
Kalanchoe thyrsiflora	Flapjack Paddle Plant	Low
Lavandula stoechas 'Larkman Hazel'	Hazel™ Spanish Lavender	Low
Ligustrum japonicum "Texanum"	Japanese Privet	Low
Nassella pulchra	Purple Needlegrass	Low
Muhlenbergia rigens	Deer Grass	Low
Rhaphiolepis indica 'Clara"	India Hawthorn	Low
Rosmarinus p. 'Huntington Carpet'	Groundcover Rosemary	Low
Trachelospermum jasminoides	Star Jasmine	Low
Westringia sp.	Westringia	Low
Xylosma congestum 'Compact'	Compact Xylosma	Low
Yucca gloriosa	Spanish Dagger	Low

VINES & ESPALIERS		WUCOLS (R3)
Bougainvillea 'Monka' (Oo-La-La® Bougainvillea)	Bougainvillea	Low
Macfadyena unguis-cati	Cat's Claw Vine	Low



Plan View

PLANTING LEGEND

Symbol	Type/Form	Suggestions	Trunk	Size	Wucols (R3)	Qty.
		Botanical Name (Common Name)				
	TREES					
	Focal	Acacia stephenophila (Shoestring Acacia)	Single	36" Box	Low	3
	Evergreen	Cedrus deodara (Deodar Cedar)	Single	24" Box	Low	3
	Evergreen Flowering	Arbutus unedo (Strawberry Tree)	Multi	24" Box	Low	22
	Street	Tristania conferta (Brisbane Box)	Single	24" Box	Moderate	25
	Medium	Rhus lancea (African Sumac)	Single	24" Box 48" Box	Low	24 (3)
	Medium Screen	Geijera parviflora (Australian Willow)	Single	15 gal	Moderate	8
	Columnar	Cupressus sempervirens (Italian Cypress)	Single	15 gal	Low	47

Total: 135

GENERAL PLANTING / IRRIGATION NOTES (For Future Construction Document Phase):

1. Irrigation (including spray and/or drip) will be provided, in the Construction Document phase, and to be installed per local California water regulations (AB1881) and City of Whittier Water Efficiency standards.
2. Transformers, back-flow preventers & other above-ground utilities to be screened with landscape as permitted per local codes & regulations.
3. The plant palette listed provides a list of plant materials and sizes to select from when preparing final landscape construction documents for this project. However, substitutions may be required due to availability, soils tests, or other conditions.
4. All trees within 5' of hardscape to be installed with (24") deep root barriers.
5. SHRUB MIX: 50% 15 GAL, 50% 5 GAL
6. GROUNDCOVER MIX: 50% 1 GAL, 50% 4" Potted

POLICE DEPARTMENT RECOMMENDATIONS:

Landscaping

All landscaping including but not limited to, walkways planters and the parking lot, should follow the 2' x 6' rule in order to provide natural surveillance, as poor landscaping can reduce visibility. It is recommended all landscaping should meet the minimum, Crime Prevention Through Environmental Design (CEPTED) Guidelines as follows:

1. All shrubs or ground cover vegetation should be no higher than 2 feet in height.
2. Tree canopies should be no lower than 6 feet in height.
3. Avoid creating areas of potential concealment by using "lacy" vegetation.
4. Avoid using vegetation that requires constant maintenance and upkeep as to avoid excessive growth potentially compromising the 2' x 6' rule.

0 15' 30' 60'
Scale: 1" = 30'

Schematic Planting Plan

Brandywine Homes

Schematic - 6th City Submittal | Project No.: BH09-D
Tract No: 82802 | Date: June 14, 2021

L-7

Citrange - 11716 Floral Drive, Whittier CA



PLAN 2A - COTTAGE - SCHEME 1

PLAN 2B -FARMHOUSE

STREET SCENE



VICINITY MAP, N.T.S.

SHEET INDEX

Architecture

A0.1 Cover Sheet
A1.0 Site Plan
A1.1 Open Space Exhibit
A1.2 Street Scenes
A1.3 Street Scenes
A1.4 Street Section
A1.5 Street Section
A1.6 Street Section
A2.0 Plan 1A Elevations - Scheme 1
A2.1 Plan 1A Elevations - Scheme 2
A2.2 Plan 1A Alternate Elevations
A2.3 Plan 2A Elevations
A2.4 Plan 2B Elevations
A2.5 Plan 3B Elevations
A2.6 Plan 3B Alternate Elevations
A2.7 Plan 3B Alternate Elevations
A2.8 Plan 3C Elevations
A2.9 Plan 3C Alternate Elevations
A3.0 Plan 1 Floor Plans
A3.1 Plan 2 Floor Plans
A3.2 Plan 3 Floor Plans

Civil

C1.0 Topographic Survey
C2.0 Preliminary Grading & Drainage Plan
C2.1 Cross Sections
C3.0 Preliminary Utility Plan
C4.0 Stormwater Control Plan
C4.1 Stormwater Control Details

Landscape

L1 Overall Conceptual Landscape Plan
L2 Conceptual Wall and Fence Plan
L3 Conceptual Planting Plan

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BRANDYWINE HOMES

CITRANGE
WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
DRB Hearing
Submittal Date: 03.18.2021

COVER SHEET

A0.1



Project Summary

Total Site Area:	3.59 Acres	Building Code Designations:	R-3
Church Site Area:	1.03 Acres	Construction Type:	V-B
Residential Site Area:	2.56 Acres	Fire Sprinkler Req:	13D
Residential Dwelling Units:	25 DU		
Residential Density:	9.8 DU/AC		

Plan Summary

Plan	Type	No.Units	Area
P 1	3 BD / 2.5 BA	8	1,953 SF
P 2 (Alley Loaded)	3 BD / 2.5 BA	2	1,967 SF
P 3	4 BD / 3 BA	15	2,103 SF

Residential Parking Required	Resident Parking	Guest Parking
Resident Parking: 25 x 2.25 spaces/Unit	57	
Guest Parking: 25 x 0.25 Spaces/Unit		7

Residential Parking Provided	Resident Parking	Guest Parking
Resident Garages:	50	
Resident Open Parking:	7	
Guest Open Parking:		7
Total Onsite Parking Provided	57 Resident Spaces	7 Guest Spaces

Development Standards - Per R2 Standards

Standard	Required	Provided
Front Yard	20'	20'
Interior Side Yard	3' per CRC, no internal lot lines	4'Min, 3' Min. at Plan 2
Exterior Side Yard	5' Min.	10' Min.
Rear Yard Setback	5' Min.	10' Min.
Height Limit	35'	<35'
Private Open Space	250 sf per unit, 10' Min.	655 sf/unit
Total Open Space	350 sf per unit =8,750 sf	21,670 sf = 866 sf/unit
Building Coverage	60% Max.	±31,500 sf - 29%

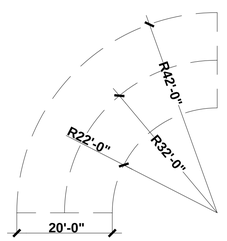
Notes:

1. Fire Hydrant
2. Alternate Elevation: privacy windows at Second story bedrooms
3. Resident Open Parking
4. Mail Kiosk
5. Property Line
6. First Floor Setback
7. Guest Parking - 10'x20'
8. Path of Travel
9. Trash Containers
10. A/C Condenser
11. Accessible Parking
12. Private Garage - 20'x20' Clear
13. Entry Monument
14. Portico Wall

Style Plotting:

- Style A - Cottage Scheme 1
- Style A - Cottage Scheme 2
- Style B - Farmhouse
- Style C - Spanish

Fire Radius



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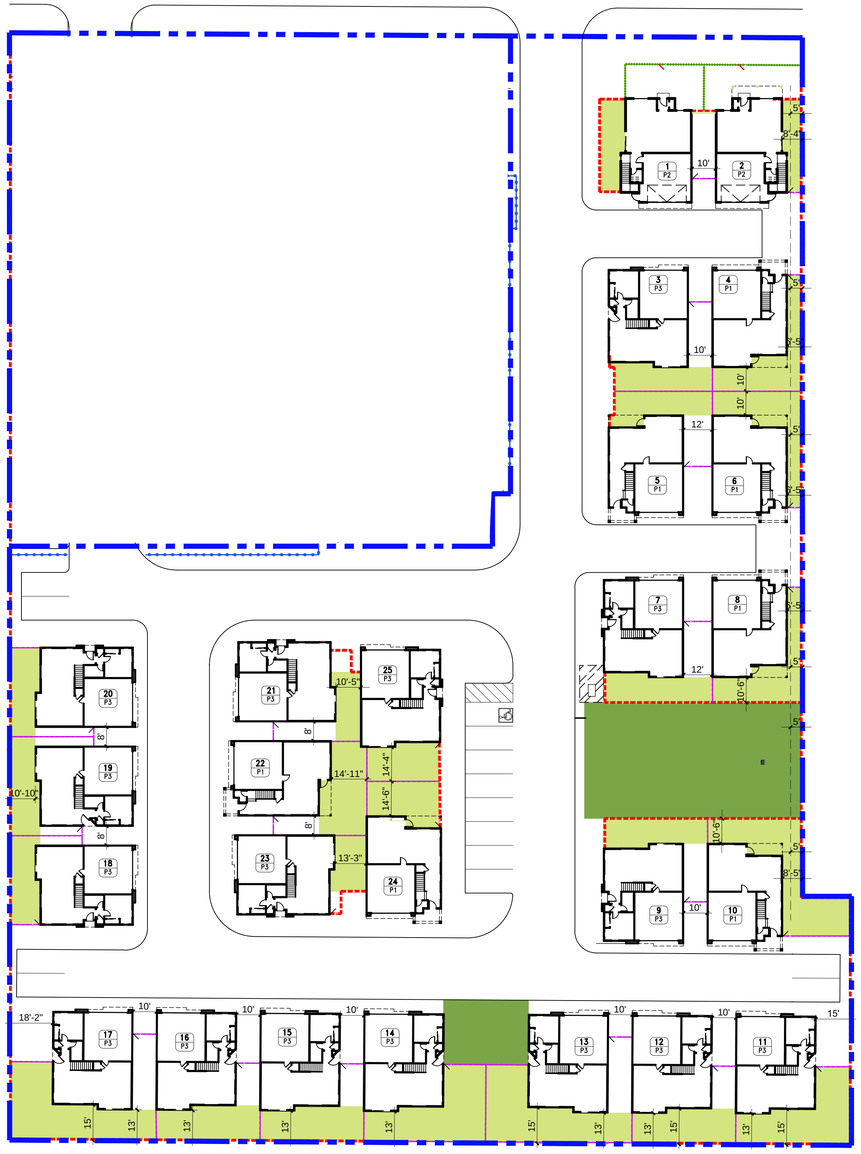
CITRANGE
WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
DRB Hearing
Submittal Date: 03.18.2021

0 15 30 60

SITE PLAN

A1.0



Open Space

Standard	Required	Provided
Private Open Space	250 sf per unit, 10' Min.	15,695 sf= 628 sf/unit
Common Open Space	-	5,280 sf
Total Open Space	350 sf per unit = 8,750 sf	±21,670 sf= 866 sf/unit

Private Open Space (10' Min. Dimension)

Common Open Space (10' Min. Dimension)

Lot No.	Plan Type	Private Open Space (10' Min Dim.
1	2	380
2	2	275
3	2	445
4	2	715
5	3	445
6	1	715
7	3	470
8	3	730
9	1	470
10	1	1145
11	3	1150
12	1	600
13	1	1125
14	3	1025
15	1	620
16	3	600
17	3	1150
18	3	430
19	3	480
20	1	425
21	3	310
22	1	690
23	3	320
24	1	510
25	3	470
Total Private Open Space		15695

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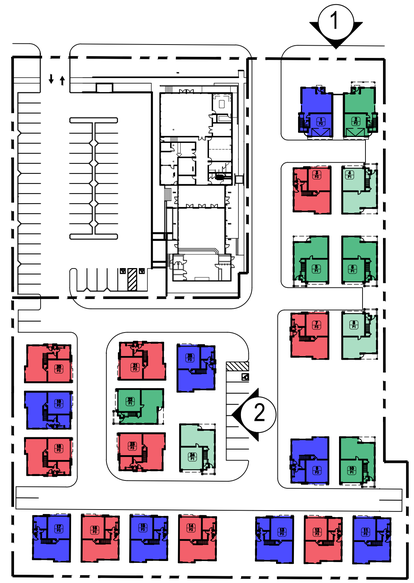
SITE PLAN
OPEN SPACE EXHIBIT

A1.1



PLAN 2A - COTTAGE

PLAN 2B - FARMHOUSE



KEY MAP - 1/64"=1'-0"

1. STREET SCENE AT FLORAL DRIVE



PLAN 1A - COTTAGE

PLAN 3B -FARMHOUSE

2. INTERNAL STREET SCENE

2. Montage Ave. View

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Plot Date: 06.03.2021
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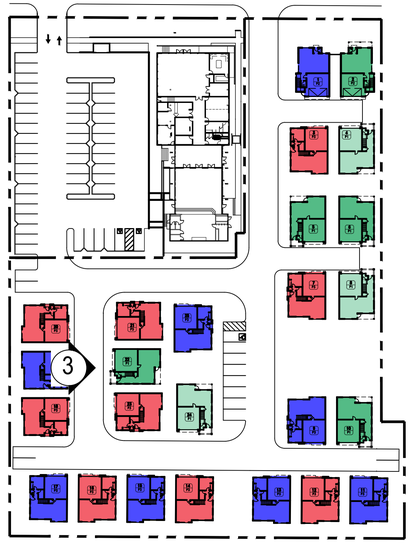
0 4 8 12

STREET SCENE
Plan 2 and Plan 3

A1.2



3. INTERNAL STREET SCENE



KEY MAP - 1/64"=1'-0"

PLAN 3C - SPANISH

PLAN 1A - COTTAGE

PLAN 3C - SPANISH

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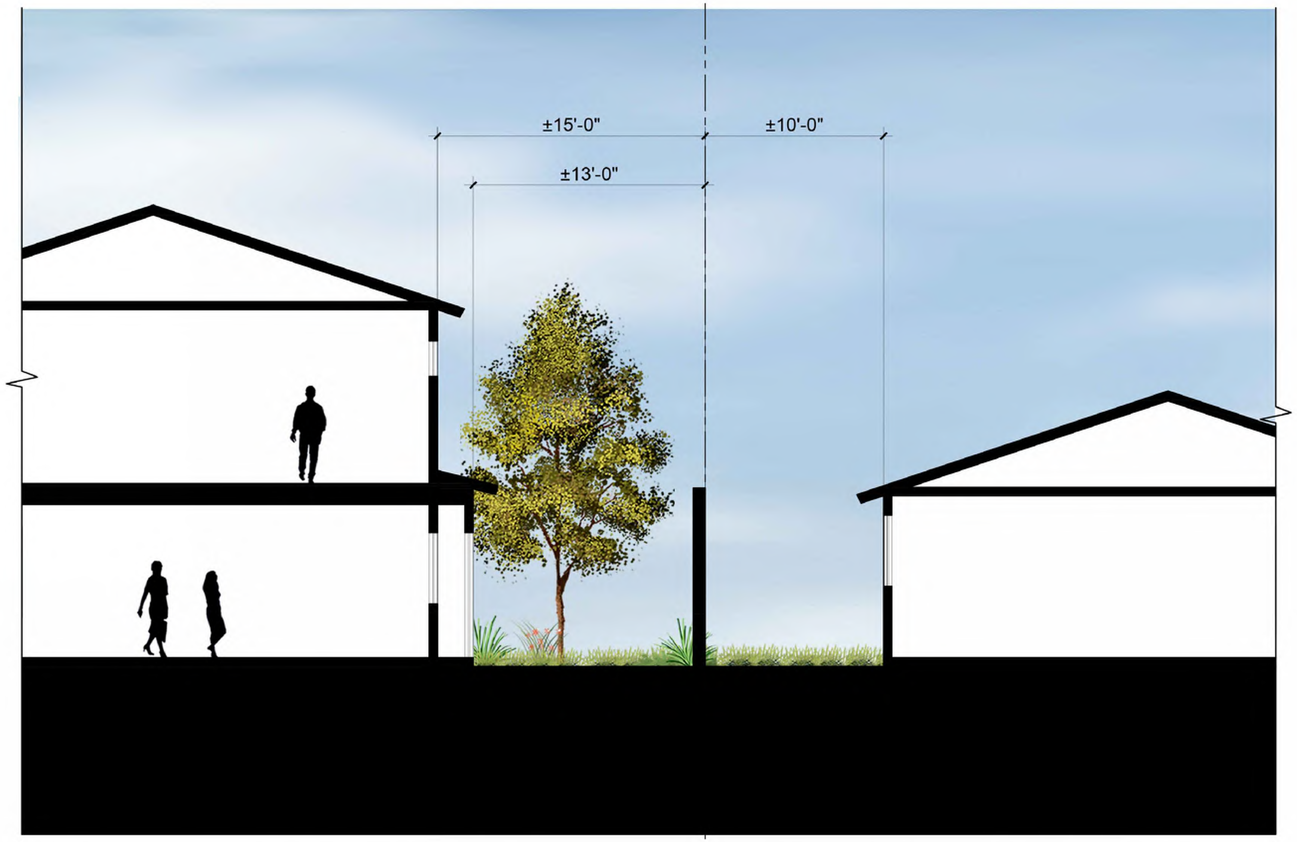
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Plot Date: 06.03.2021
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0 4 8 12

STREET SCENE
Plan 1 and Plan 3

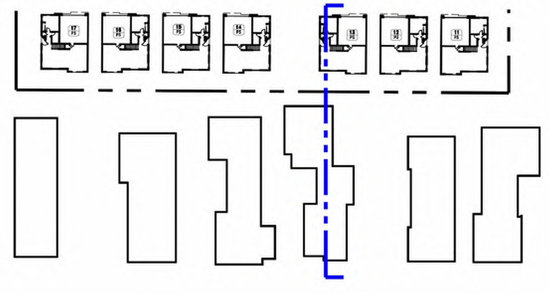
A1.3



Proposed SFD

Existing SFD

KEY MAP - NTS



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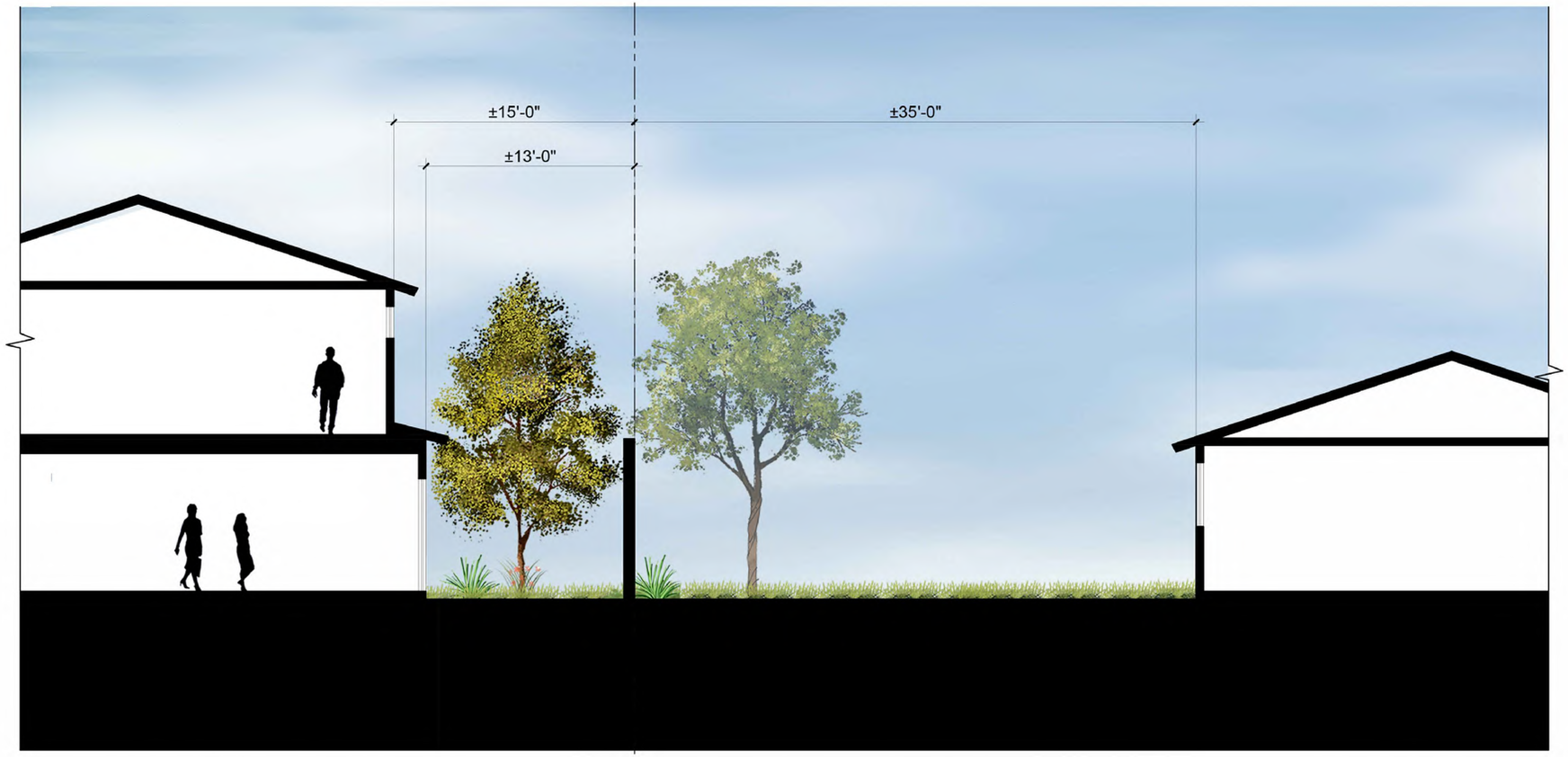
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WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
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Submittal Date: 03.18.2021

0 2 4 8

SITE SECTION
At South PL

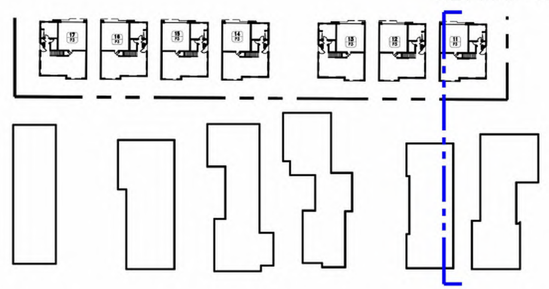
A1.4



Proposed SFD

Existing SFD

KEY MAP - NTS



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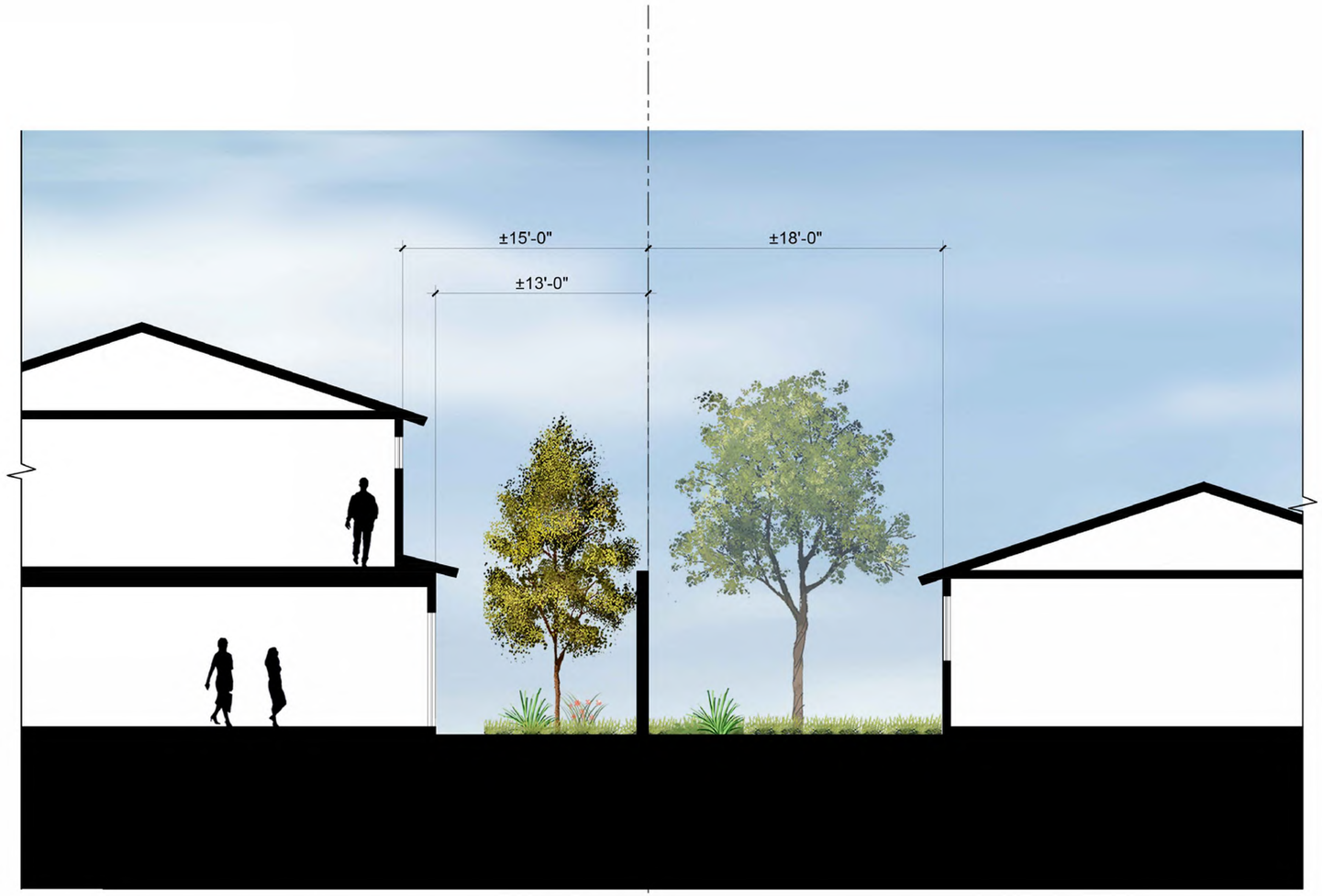
CITRANGE
WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
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0 2 4 8

SITE SECTION
At South PL

A1.5



Proposed SFD

Existing SFD

KEY MAP - NTS



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0 2 4 8

SITE SECTION
At South PL

A1.6

Material Legend

1. Flat Tile Roof
2. Stucco
3. Siding
4. Light Fixture
5. Sectional Garage Door
6. Decorative Corbels
7. Gable Accent
8. Trim
9. Window Shutters
10. Vinyl Windows
11. Rafter Tails
12. Brick Facade
13. Board and Batten Siding
14. Portico Wall
15. Private Yard Fencing/Perimeter Wall



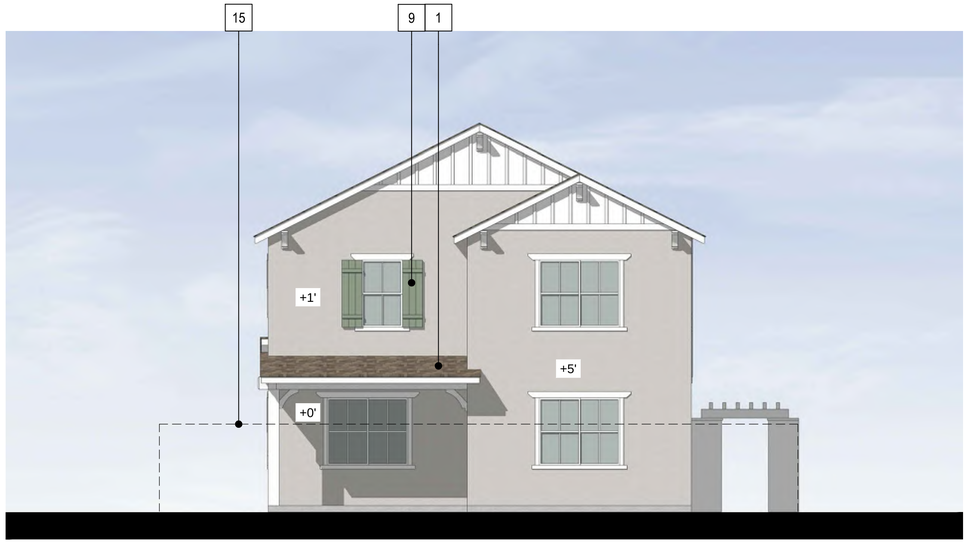
Left Privacy Elevation at Paired Conditions
Units: 6,10
Units with Portico: 22



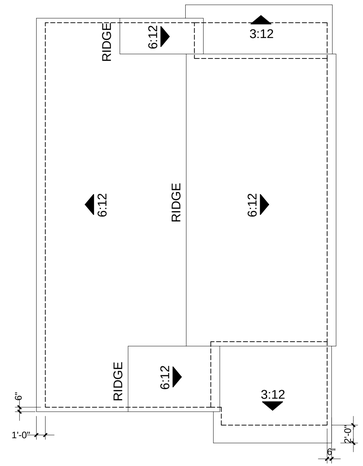
Front Elevation
Units: 6,10
Units with Portico: 22



Right Elevation
Units: 6,10
Units with Portico: 22



Rear Elevation
Units: 6,10
Units with Portico: 22



Roof Plan
1/8" = 1'-0"

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0 4 8 12

ELEVATIONS
Plan 1A "Cottage" - Scheme 1

A2.0



Left Privacy Elevation at Paired Conditions

Units: 4,8



Front Elevation

Units: 4,8

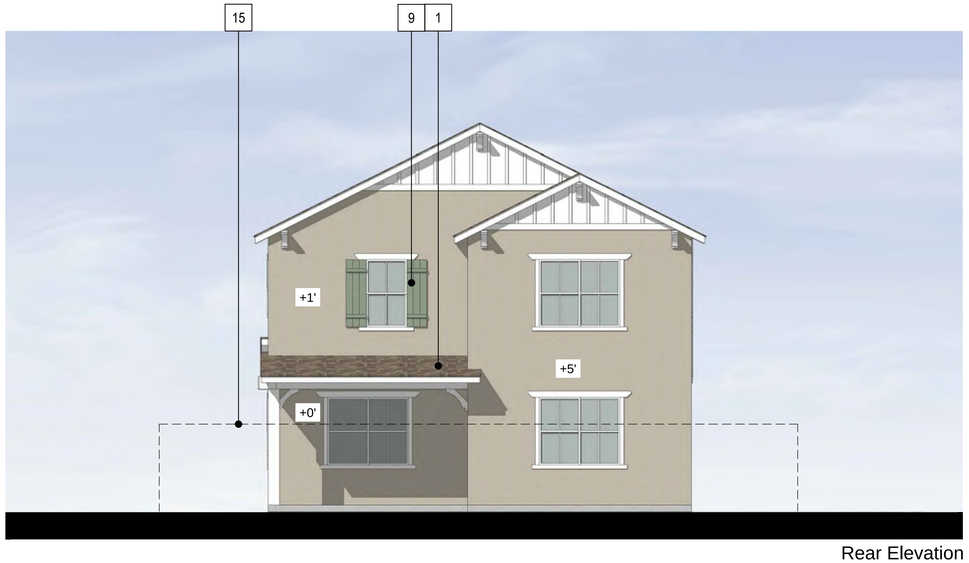
Material Legend

1. Flat Tile Roof
2. Stucco
3. Siding
4. Light Fixture
5. Sectional Garage Door
6. Decorative Corbels
7. Gable Accent
8. Trim
9. Window Shutters
10. Vinyl Windows
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14. Portico Wall
15. Private Yard Fencing/Perimeter Wall



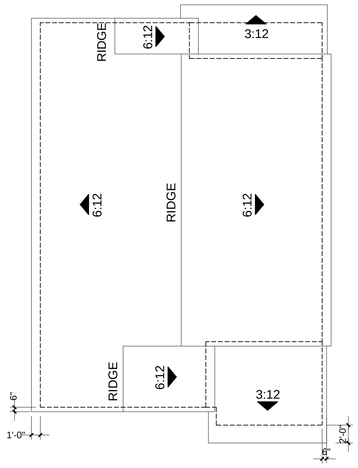
Right Elevation

Units: 4,8



Rear Elevation

Units: 4,8



Roof Plan

1/8" = 1'-0"

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Submittal Date: 03.18.2021

0 4 8 12

ELEVATIONS
Plan 1A "Cottage" - Scheme 2

A2.1



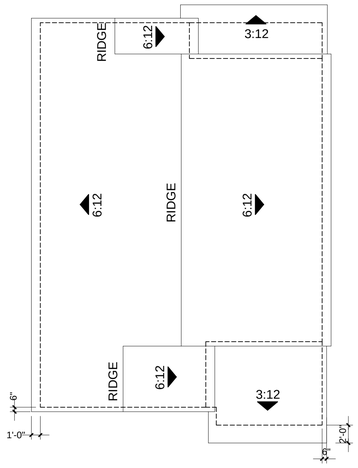
Alternative Right Elevation - Scheme 1

Units: 5



Alternative Right Elevation - Scheme 2

Units: 24



Roof Plan

1/8" = 1'-0"

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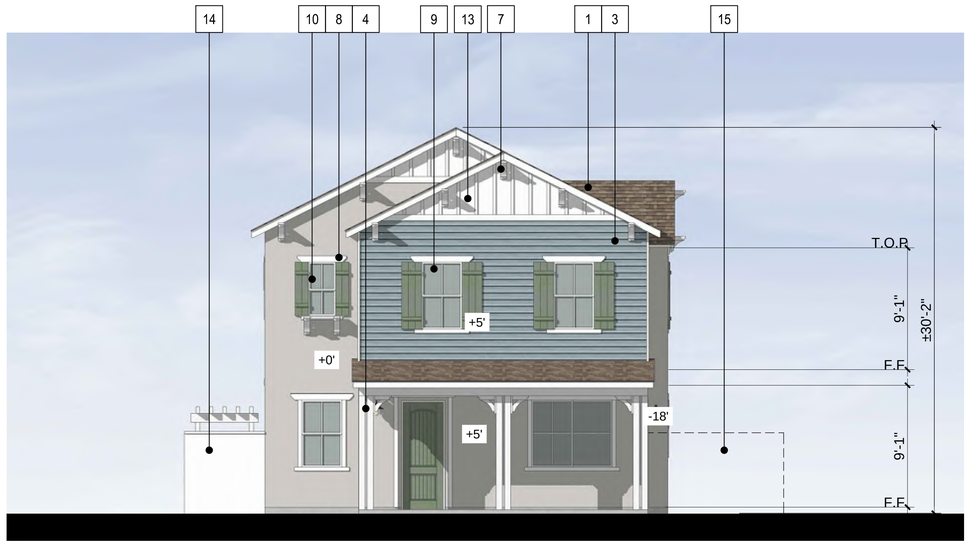
ELEVATIONS
Plan 1A "Cottage" Enhanced Along Internal Street

A2.2



Left Elevation

Units: 2



Front Elevation

Units: 2

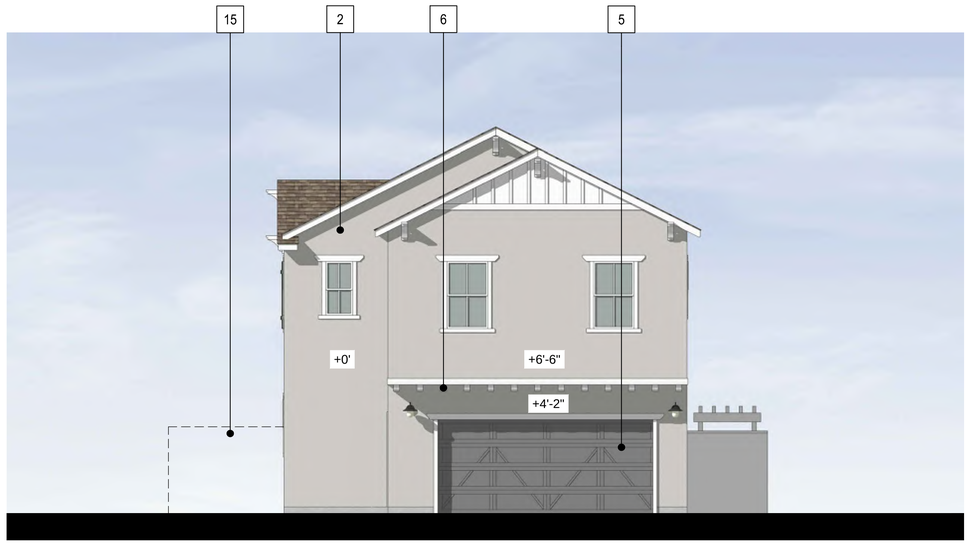
Material Legend

1. Flat Tile Roof
2. Stucco
3. Siding
4. Light Fixture
5. Sectional Garage Door
6. Decorative Corbels
7. Gable Accent
8. Trim
9. Window Shutters
10. Vinyl Windows
11. Rafter Tails
12. Brick Facade
13. Board and Batten Siding
14. Portico Wall
15. Private Yard Fencing/Perimeter Wall



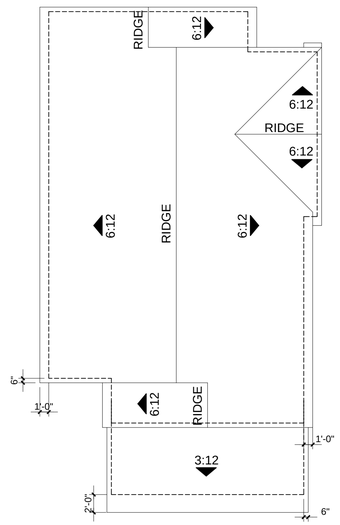
Right Elevation

Units: 2



Rear Elevation

Units: 2



Roof Plan

1/8" = 1'-0"

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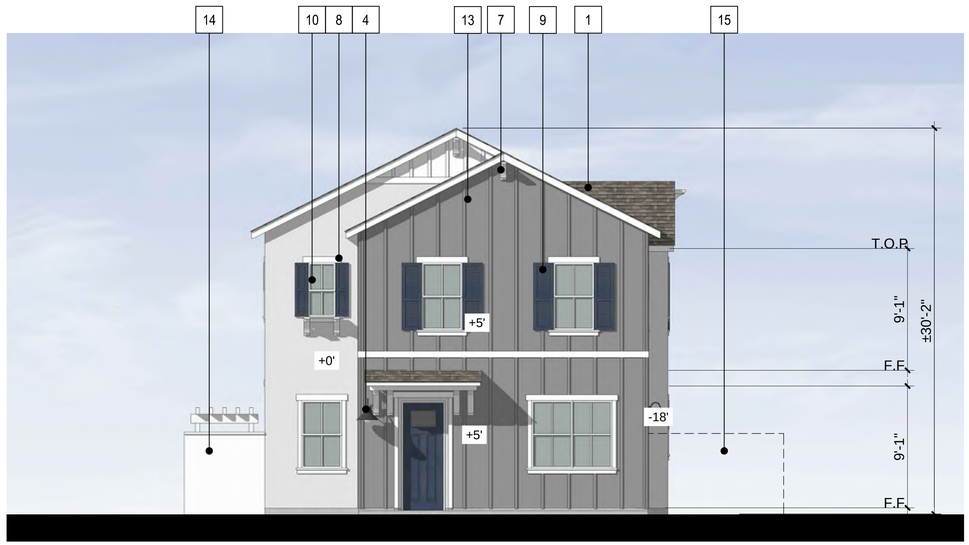
ELEVATIONS
Plan 2A "Cottage" - Scheme 1

A2.3



Left Elevation

Units: 1



Front Elevation

Units: 1

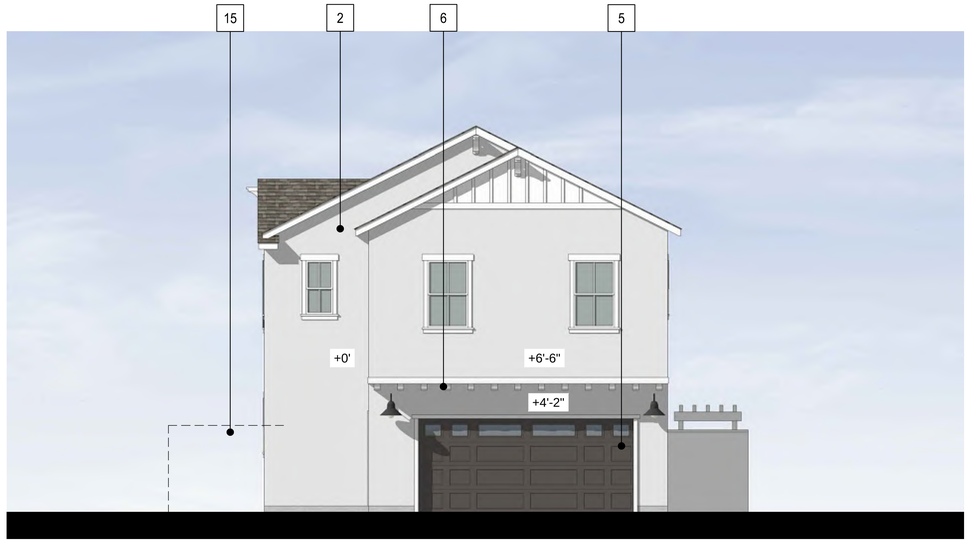
Material Legend

1. Flat Tile Roof
2. Stucco
3. Siding
4. Light Fixture
5. Sectional Garage Door
6. Decorative Corbels
7. Gable Accent
8. Trim
9. Window Shutters
10. Vinyl Windows
11. Rafter Tails
12. Brick Facade
13. Board and Batten Siding
14. Portico Wall
15. Private Yard Fencing/Perimeter Wall



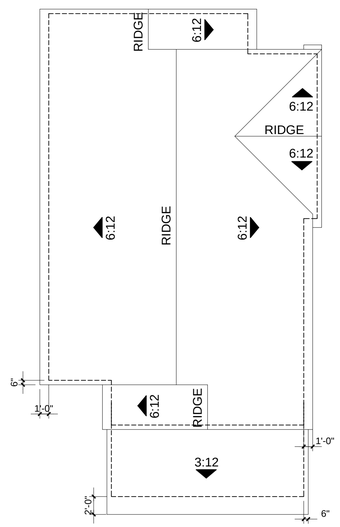
Right Elevation

Units: 1



Rear Elevation

Units: 1



Roof Plan

1/8" = 1'-0"

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WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
DRB Hearing
Submittal Date: 03.18.2021

0 4 8 12

ELEVATIONS
Plan 2B "Farmhouse"

A2.4



Left Elevation

Units: 9,25



Front Elevation

Units: 9,25

Material Legend

1. Flat Tile Roof
2. Stucco
3. Siding
4. Light Fixture
5. Sectional Garage Door
6. Decorative Corbels
7. Gable Accent
8. Trim
9. Window Shutters
10. Vinyl Windows
11. Rafter Tails
12. Brick Facade
13. Board and Batten Siding
14. Portico Wall
15. Private Yard Fencing/Perimeter Wall



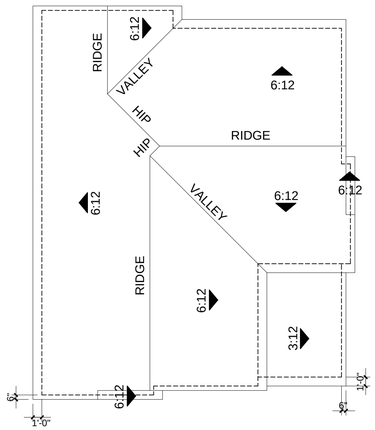
Right Elevation

Units: 9,25



Rear Elevation

Units: 9,25



Roof Plan

1/8" = 1'-0"

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CITRANGE
WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
DRB Hearing
Submittal Date: 03.18.2021

0 4 8 12

ELEVATIONS
Plan 3B "Farmhouse"

A2.5



Alternative Front Elevation

Units: 11,13,15,17



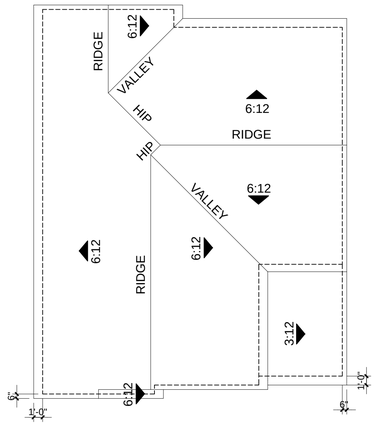
Alternative Right Elevation

Units: 11,13,15,17



Alternative Rear Elevation

Units: 11,13,15,17



Roof Plan

1/8" = 1'-0"

ktgy

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888.456.5849
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BRANDYWINE HOMES

CITRANGE
WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
DRB Hearing
Submittal Date: 03.18.2021

0 4 8 12

ELEVATIONS
Plan 3B "Farmhouse" at Privacy Condition

A2.6



Alternative Front Elevation

Units: 19



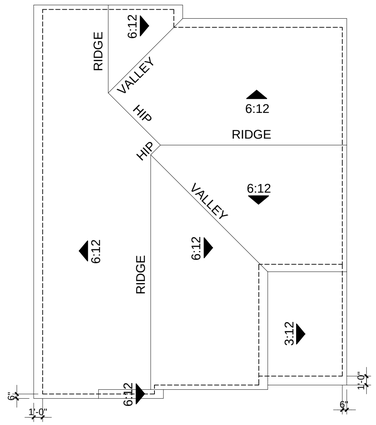
Alternative Right Elevation

Units: 19



Alternative Rear Elevation

Units: 19



Roof Plan

1/8" = 1'-0"

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BRANDYWINE HOMES

CITRANGE
WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
DRB Hearing
Submittal Date: 03.18.2021

0 4 8 12

ELEVATIONS
Plan 3B "Farmhouse" Alternative

A2.7



Left Elevation
Units: 7
Units with Portico: 18,20,21,23



Front Elevation
Units: 7
Units with Portico: 18,20,21,23

Material Legend

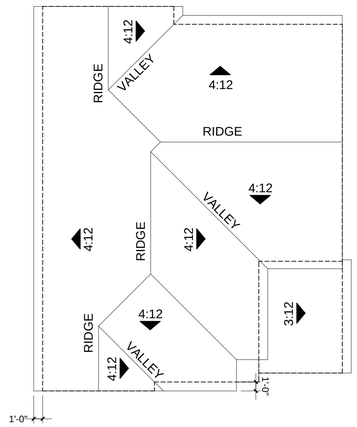
1. S Tile Roof
2. Stucco
3. Light Fixture
4. Decorative Finial
5. Sectional Garage Door
6. Decorative Corbels
7. Gable Accent
8. Trim
9. Window Shutters
10. Vinyl Windows
11. Portico Wall
12. Private Yard Fencing/Perimeter Wall
13. Decorative Tile



Right Elevation
Units: 7
Units with Portico: 18,20,21,23



Rear Elevation
Units: 7
Units with Portico: 18,20,21,23



Roof Plan
1/8" = 1'-0"

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BRANDYWINE HOMES

CITRANGE
WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
DRB Hearing
Submittal Date: 03.18.2021

0 4 8 12

ELEVATIONS
Plan 3C "Spanish"

A2.8

Material Legend

1. S Tile Roof
2. Stucco
3. Light Fixture
4. Decorative Finial
5. Sectional Garage Door
6. Decorative Corbels
7. Gable Accent
8. Trim
9. Window Shutters
10. Vinyl Windows
11. Portico Wall
12. Private Yard Fencing/Perimeter Wall
13. Decorative Tile



Alternative Front Elevation

Units: 3,12,14,16



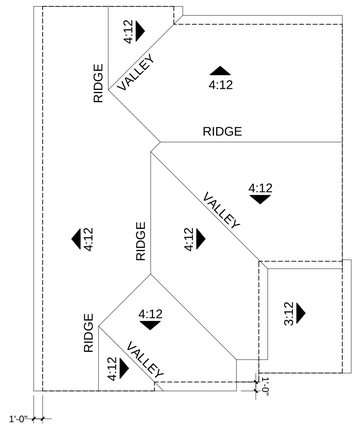
Alternative Right Elevation

Units: 3,12,14,16



Alternative Rear Elevation

Units: 12,14,16



Roof Plan

1/8" = 1'-0"

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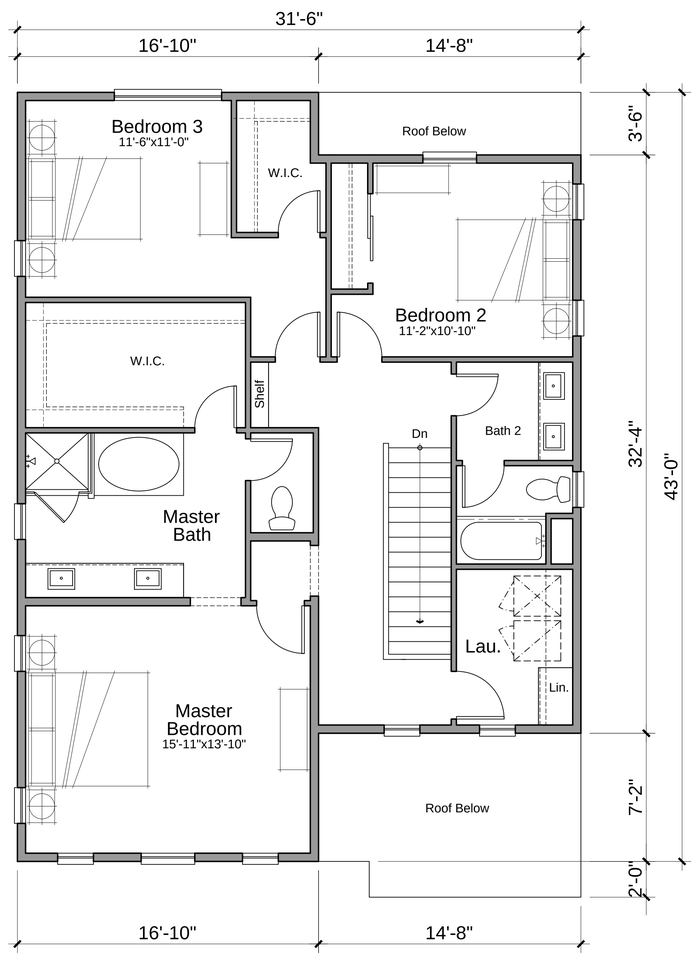
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WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
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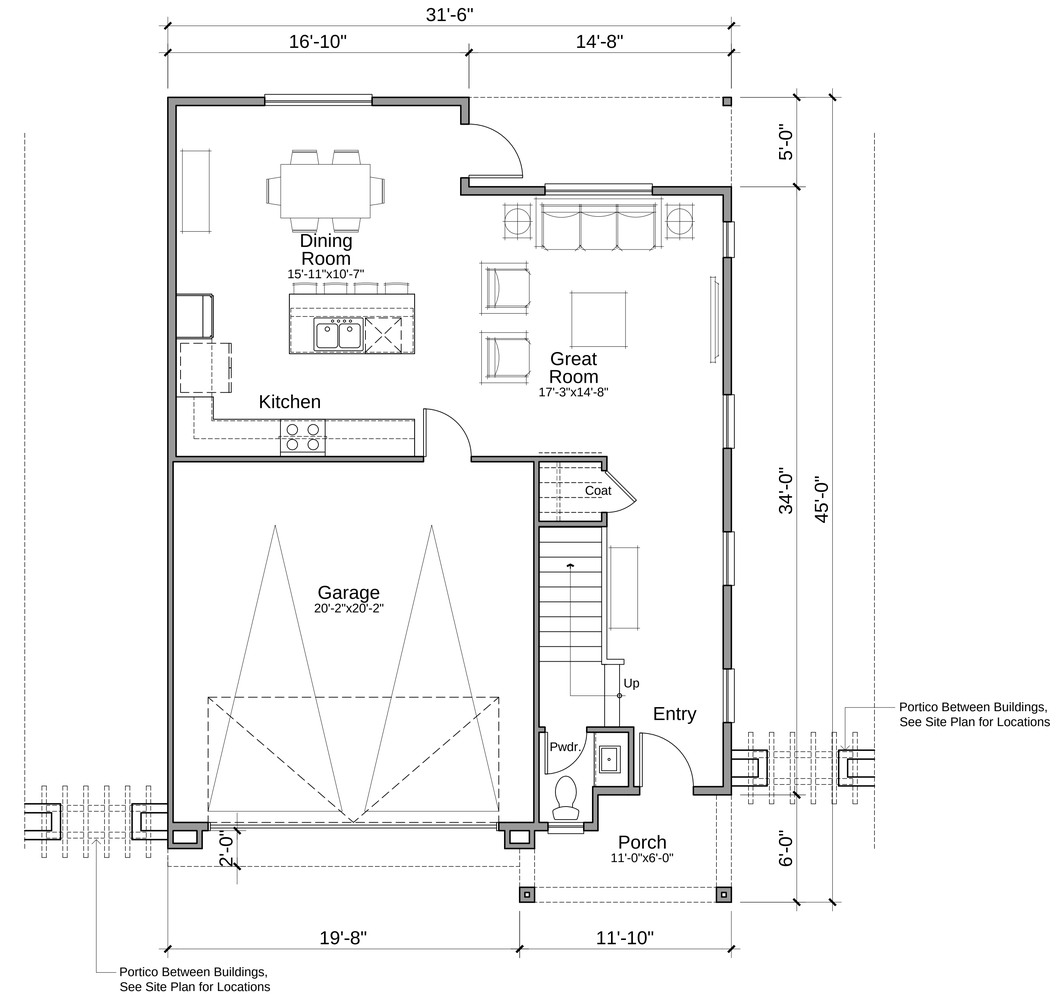
0 4 8 12

ELEVATIONS
Plan 3C "Spanish" at Privacy Condition

A2.9



SECOND FLOOR



FIRST FLOOR

PLAN 1 (3 BED / 2.5 BATH)	
FIRST FLOOR	781 SQ. FT.
SECOND FLOOR	1172 SQ. FT.
TOTAL	1,953 SQ. FT.
GARAGE	422 SQ. FT.

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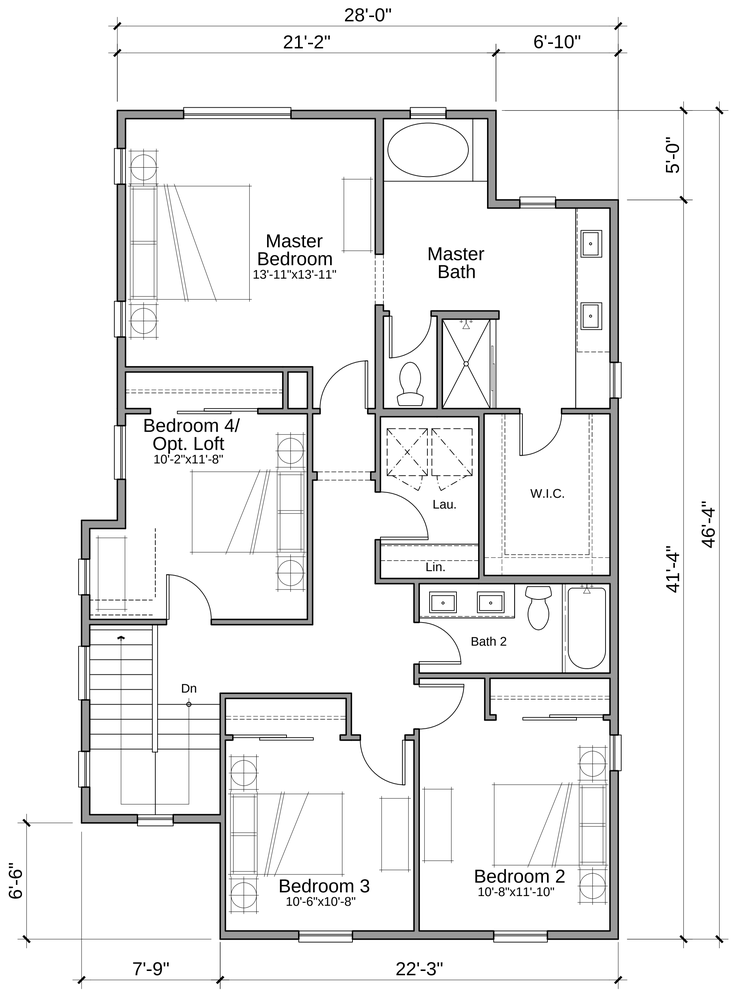
CITRANGE
WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
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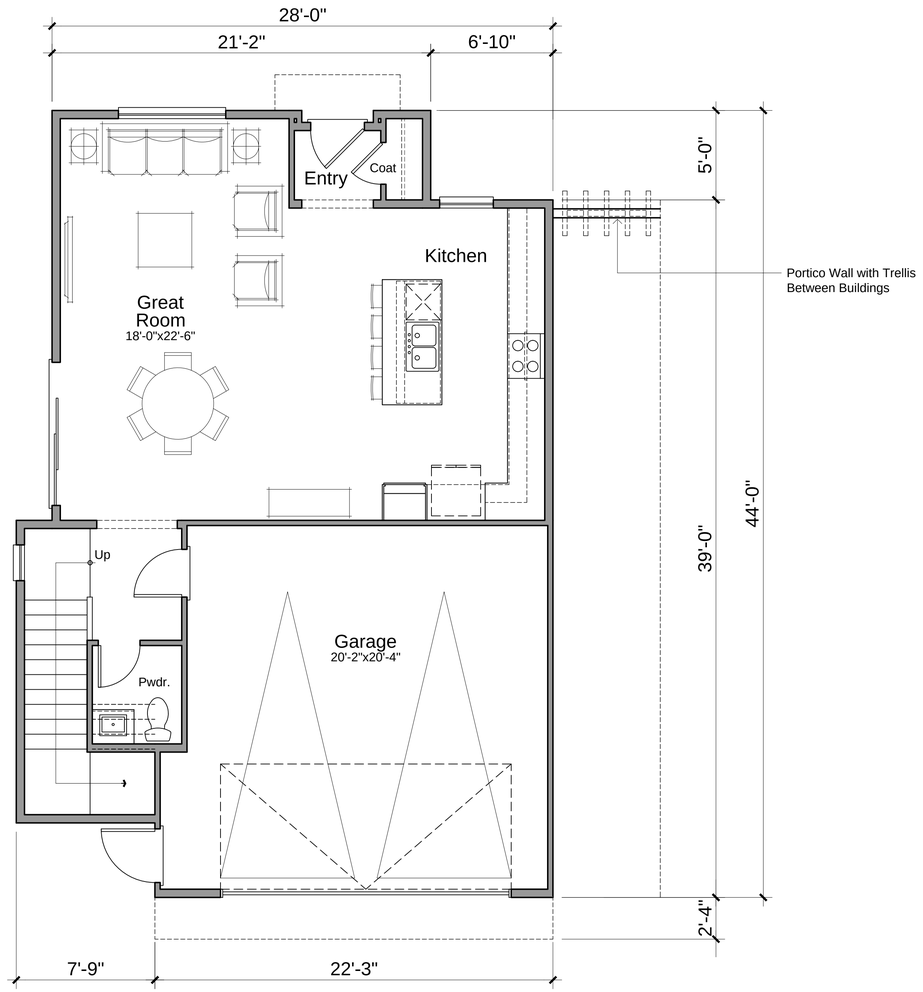
0 2 4 8

FLOOR PLANS
PLAN 1

A3.0



SECOND FLOOR



FIRST FLOOR

PLAN 2 (4 BED / 2.5 BATH)	
FIRST FLOOR	766 SQ. FT.
SECOND FLOOR	1201 SQ. FT.
TOTAL	1,967 SQ. FT.
GARAGE	425 SQ. FT.

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BRANDYWINE HOMES

CITRANGE
WHITTIER, CA # 2019-0500

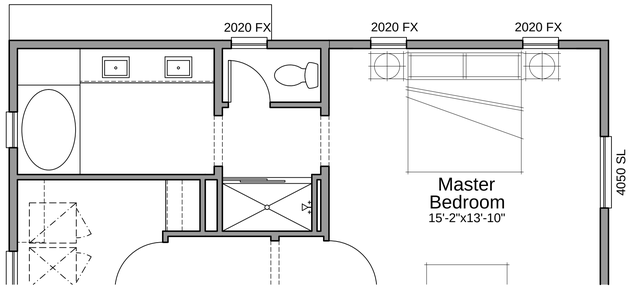
CONCEPT DESIGN
Plot Date: 06.03.2021
DRB Hearing
Submittal Date: 03.18.2021

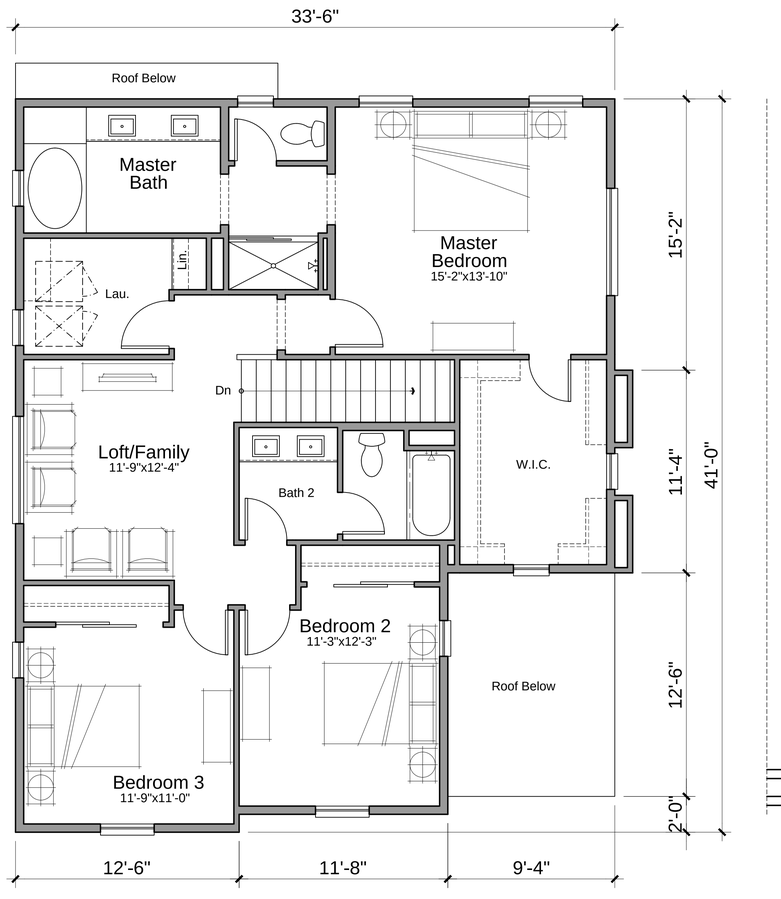
0 2 4 8

FLOOR PLANS
PLAN 2

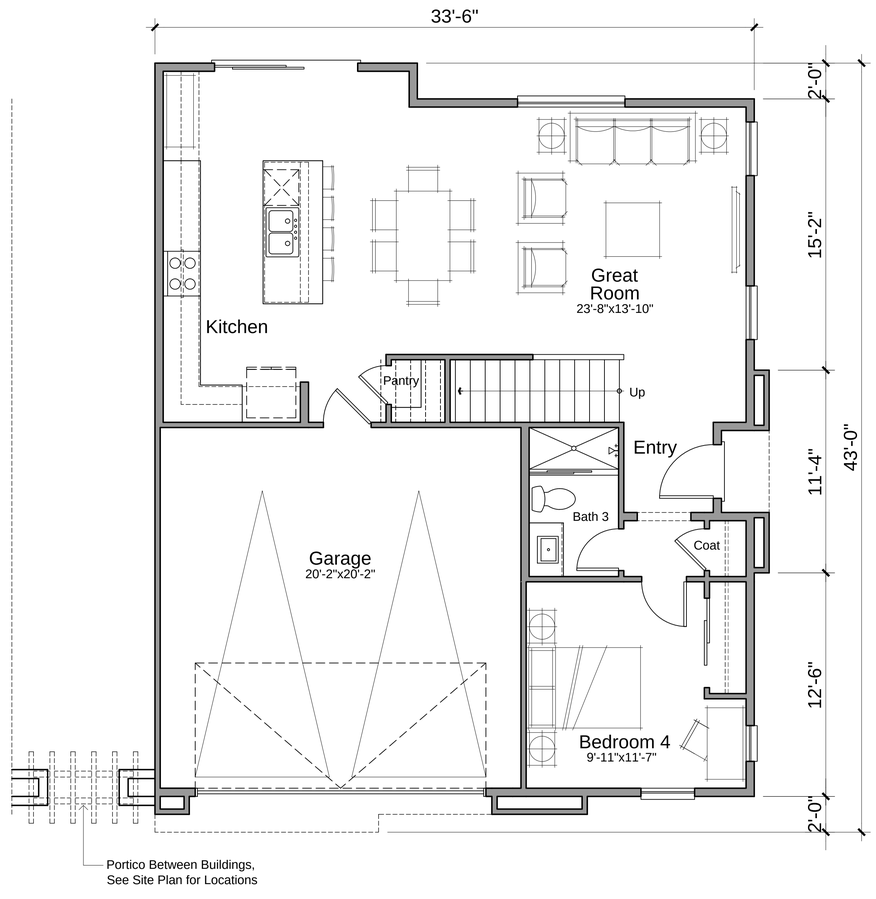
A3.1

Alternate Second Floor
at Lots 11-17

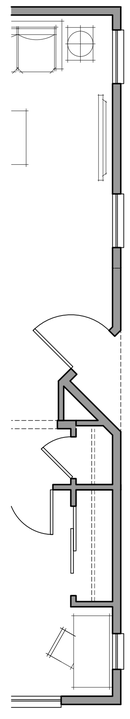




SECOND FLOOR



FIRST FLOOR



Alternate First Floor
at Lots 11-17,19

PLAN 3 (4 BED / 3 BATH)	
FIRST FLOOR	905 SQ. FT.
SECOND FLOOR	1198 SQ. FT.
TOTAL	2,103 SQ. FT.
GARAGE	422 SQ. FT.

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BRANDYWINE HOMES

CITRANGE
WHITTIER, CA # 2019-0500

CONCEPT DESIGN
Plot Date: 06.03.2021
DRB Hearing
Submittal Date: 03.18.2021

0 2 4 8

FLOOR PLANS
PLAN 3

A3.2

Style A - Cottage - Color Scheme

STUCCO (SCHEME 1)
SW 7029

STUCCO (SCHEME 2)
SW 9591



ROOFING
Eagle Roofing - Ponderosa
5809 Lomita Range



GARAGE
SW 7074

ENTRY DOOR/SHUTTER
SW 6193

SIDING
SW 6242

TRIM
SW 7005

WINDOW FRAME
WHITE

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BRANDYWINE HOMES

Whittier Floral
#2019-0500

Color Sample Board

Style B - Farmhouse - Color Scheme

STUCCO
SW 7063

SIDING
SW 7074



ROOFING
Eagle Roofing - Ponderosa
5810 Avondale Blend

GARAGE
SW 7048

ENTRY DOOR/SHUTTER
SW 6537

TRIM
SW 7757

WINDOW FRAME
WHITE



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Whittier Floral
#2019-0500

Color Sample Board

Style C - Spanish - Color Scheme

STUCCO
SW 7100



ROOFING
Eagle Roofing
8830 Albuquerque Blend

ENTRY DOOR
SW 6096

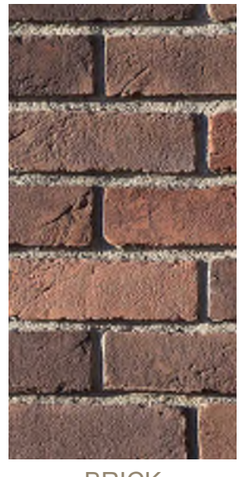
SHUTTER
SW 0017



WINDOW FRAME
WHITE



CERAMIC SPANISH TILE
Tierra Y Fuego
Capistrano 1 Santa Barbara



BRICK
ElDorado- ThundaBrick
Hartford

GARAGE
SW 6083

TRIM 1
SW 7032

TRIM 2
SW 0054

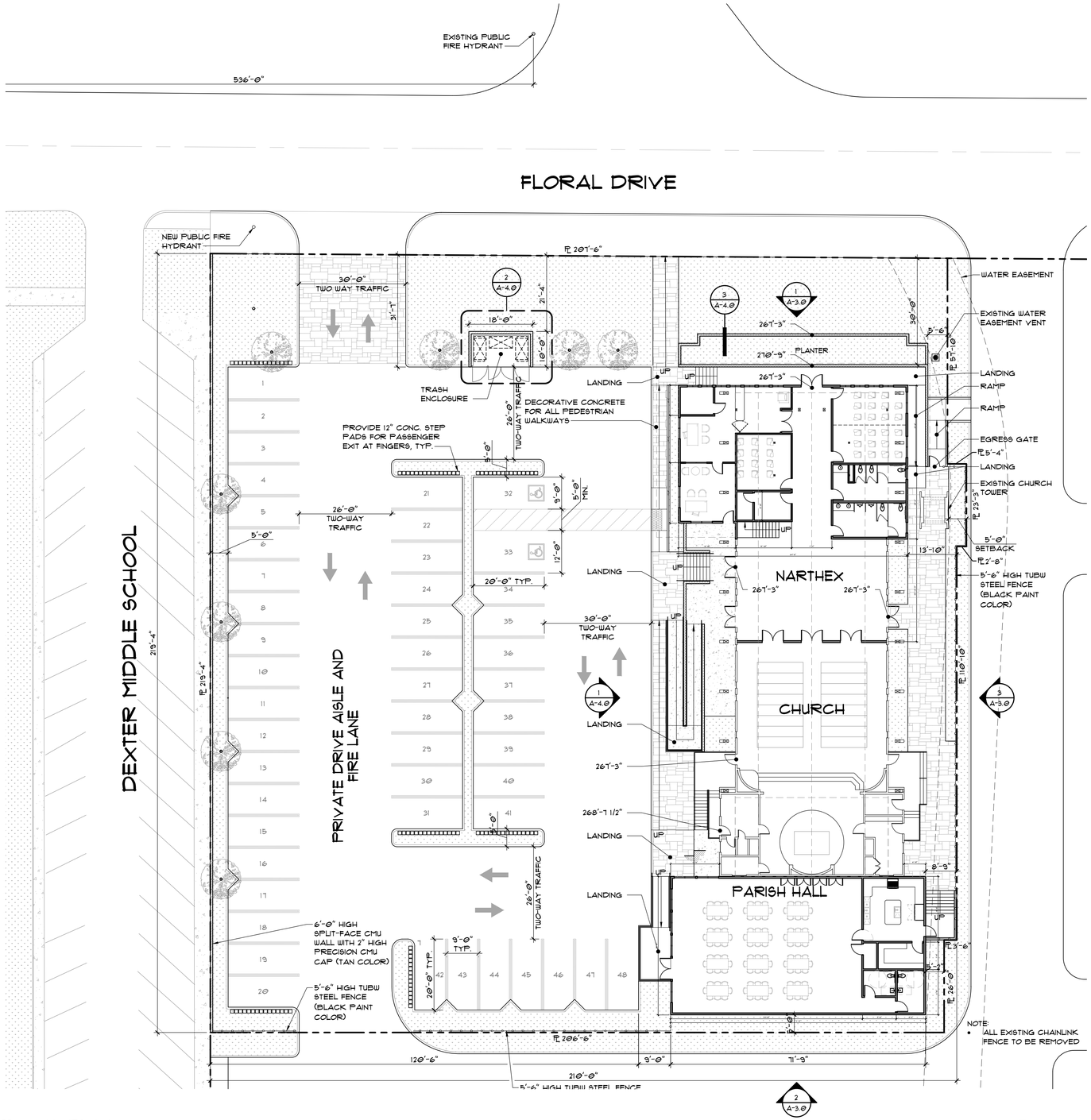
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BRANDYWINE HOMES

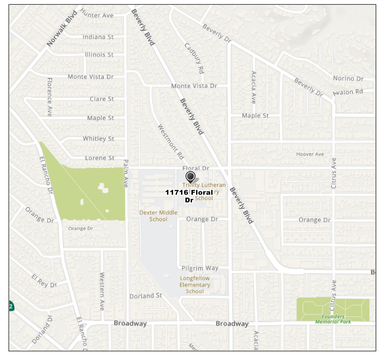
Whittier Floral

#2019-0500

Color Sample Board



1 SITE PLAN
SCALE: 1/16" = 1'-0"



2 VICINITY MAP
SCALE: N.T.S.

LOT COVERAGE

BUILDING FOOTPRINT:	9,823 SQ. FT
LOT AREA:	45,746 SQ. FT
LOT COVERAGE:	21.5%

BUILDING AREA:

CHURCH:	3,063 SQ. FT
NARTHEX:	1,374 SQ. FT
PARISH HALL:	2,784 SQ. FT.
ADMIN / SCHOOL:	2,590 SQ. FT.
BUILDING AREA:	9,823 SQ. FT.
TRASH ENCL AREA:	180 SQ. FT.

CHURCH PARKING SUMMARY:

• WMC 18.48.020: 1/3 SEATS AND 1/100 S.F. OF AREA DEVOTED TO ASSEMBLY PURPOSES WITHOUT FIXED SEATS

PARKING REQUIRED:
SEATING IN SANCTUARY: 144
(144 / 3 = 48)

PARKING PROVIDED:	
STANDARD:	46
ACCESSIBLE:	2
TOTAL STALLS PROVIDED:	48

LANDSCAPE:

NEW:	6,148 SQ.FT.
LOT TOTAL:	45,746 SQ.FT.
LOT COVERAGE:	13.85 %

LEGEND

- LANDSCAPE
- NEW DECORATIVE CONCRETE WALKWAY AND DRIVEWAY ENTRY
- NEW CONCRETE WALKWAY
- 5'-6" HIGH TUBE STEEL FENCE (BLACK PAINT COLOR)
- 6'-0" HIGH SPLIT-FACE CMU WALL, WITH 2" HIGH PRECISION CMU CAP AND PILASTERS AT 15'-0" O.C. (TAN COLOR)
- 42" ABOVE CHURCH FINISH FLOOR HIGH CMU WALL TO BE CLAD WITH PER WALL TYPE
- 42" ABOVE CHURCH FINISH FLOOR HIGH VINYL FENCE

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF REMODELING CHURCH TO INCLUDE NEW PARISH HALL, CLASSROOMS, OFFICE AND RECEPTION, NEW PARKING AND STRIPING

PROJECT DIRECTORY:

OWNER: TRINITY LUTHERAN CHURCH
11716 FLORAL DR
WHITTIER CA 90601
PHONE:(562) 693-7431
EMAIL: PASTOR.PERCY@TRINITYWHITTIER.ORG

ARCHITECT: PICKARD ARCHITECTS
13215 PENN ST. SUITE 300
WHITTIER, CA 90602
PHONE: (562) 945-8821
EMAIL: R.ARROYO@PICKARD.COM

LOT DESCRIPTION:

ASSESSORS PARCEL #: 8132-022-007

LEGAL DESCRIPTION : COHN'S PARTITION OF LOTS 1,2,3,4,11,12,13 AND 22 OF THE WEST WHITTIER TRACT LOT EX OF ST COM N 0°23' E 165 FT AND N 89°37' W 217.04 FT FROM INTERSECTION OF W LINE OF MAGNOLIA AVE WITH S LINE OF LOT 11 TH N 89°37' W 352.96 FT TH N 0°23' E 495 FT TH S 89°37' E 332.435 FT TH S 0°23' W 330 FT TH S 89°37' E 20.525 FT TH S 0°23' W 165 FT TO BEG PART OF LOT 11

TYPE: SINGLE-FAMILY RESIDENTIAL / R-1

ADDRESS:
11716 FLORAL DR. WHITTIER CA 90601

CONSTRUCTION TYPE:	V-B & III	
OCCUPANCY:	CHURCH	
ZONING:	EXISTING:	R-1, SINGLE FAMILY RESIDENTIAL
	PROPOSED:	R-2 LIGHT MULTIPLE RESIDENTIAL ZONE

SHEET INDEX:

A-1.0 SITE PLAN & TITLE SHEET
A-2.0 FLOOR PLANS, ROOF PLAN & SECTIONS
A-3.0 ELEVATIONS
PL1 PRELIMINARY LANDSCAPE PLAN
PL2 PRELIMINARY PLANT MATERIALS
PL3 PRELIMINARY PLANT MATERIALS

TRINITY LUTHERAN CHURCH

11716 FLORAL DR. WHITTIER, CA 90601

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REVISIONS
- PLANNING - 1ST SUBMITTAL 07.31.19
- PLANNING - 2ND SUBMITTAL 02.11.21
- PLANNING - 3RD SUBMITTAL 03.25.21

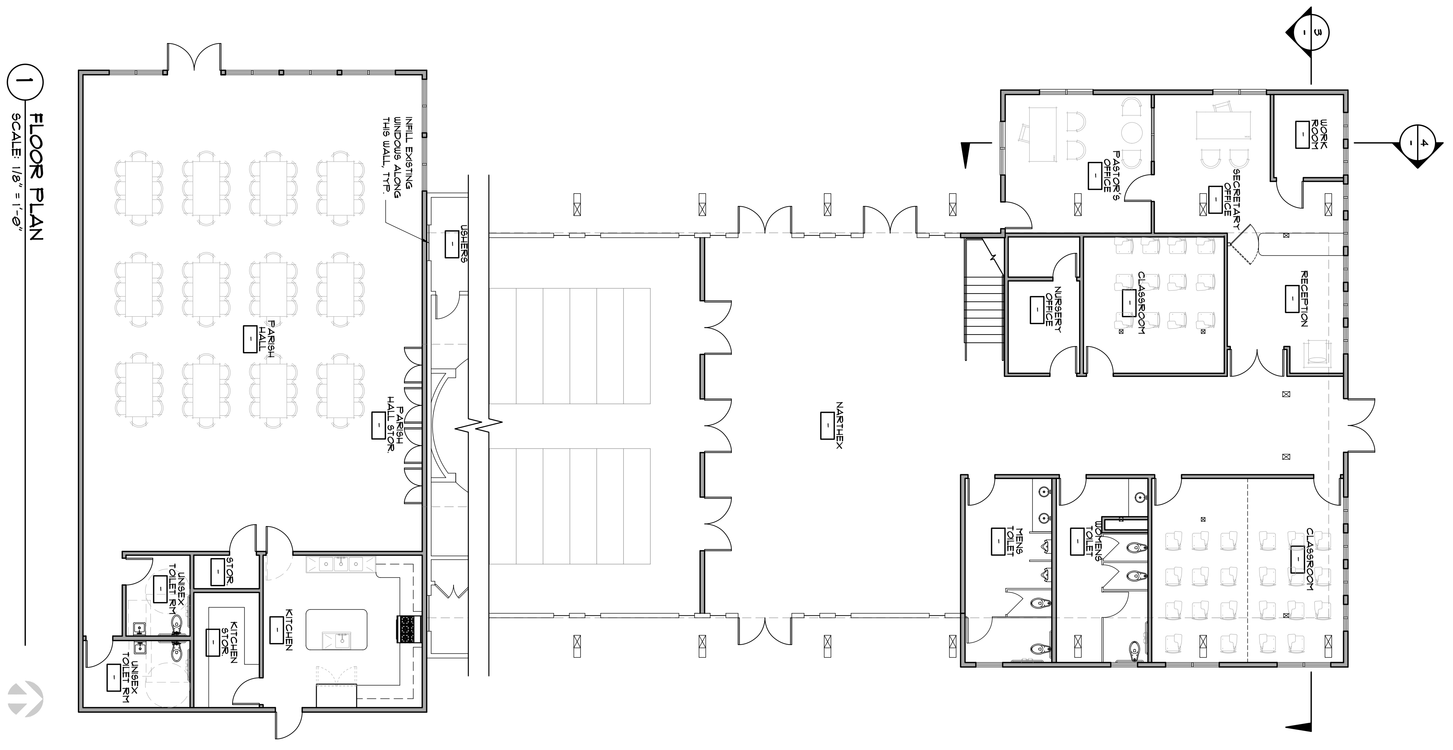
March 25, 2021
2017019.01
PRELIMINARY REVIEW APPLICATION NO. 19-0003

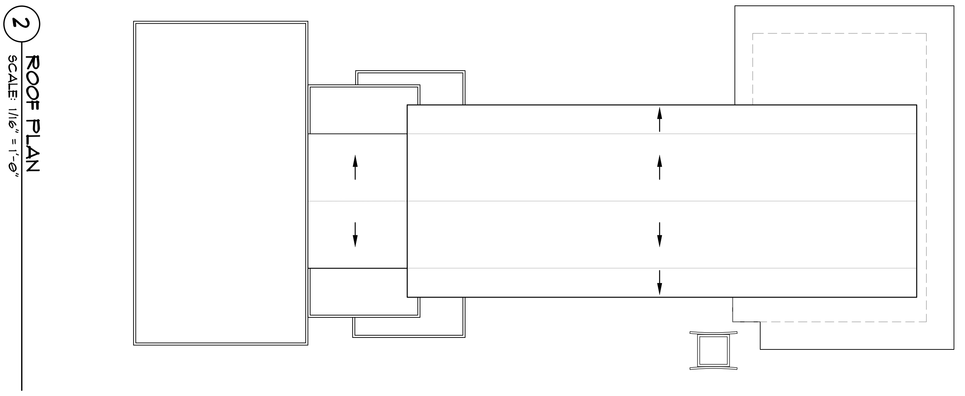
A-1.0
SITE PLAN / TITLE SHEET

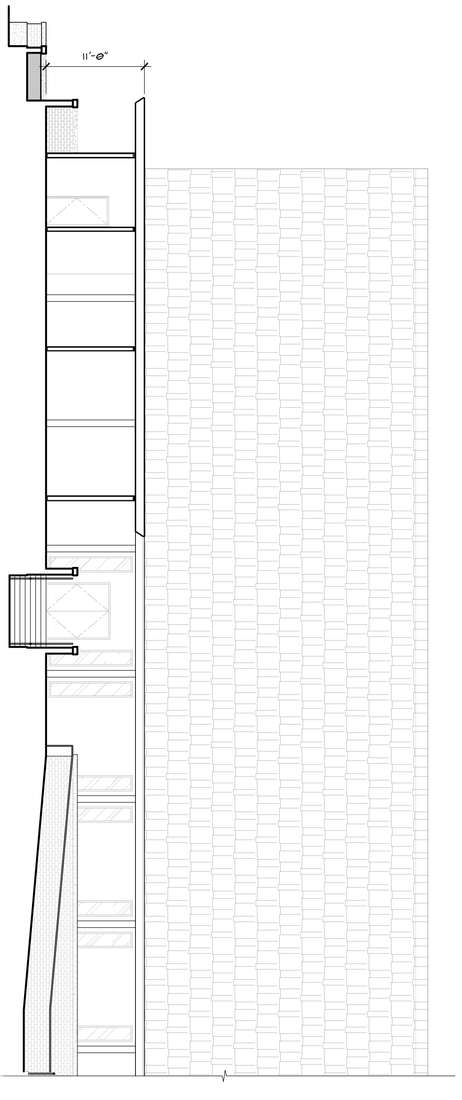
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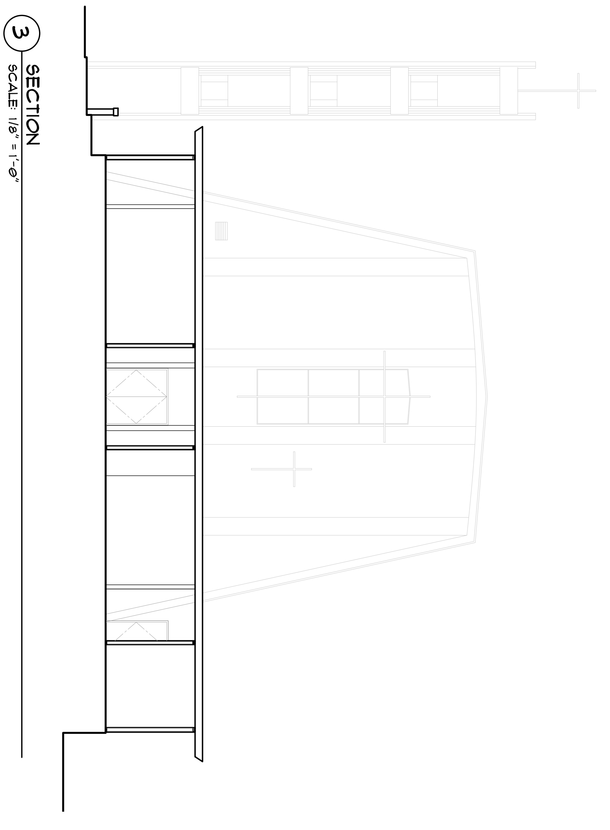
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TRINITY LUTHERAN CHURCH

A-2.0

FLOOR PLAN / ROOF PLAN / SECTIONS

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■	PLANNING - 3RD SUBMITTAL	03.25.21

March 25, 2021

2017019.01

PRELIMINARY REVIEW APPLICATION NO. **19-0003**

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562 . 945 . 8821

1 NORTH ELEVATION
SCALE: 1/8" = 1'-0"

2 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

3 EAST ELEVATION
SCALE: 1/8" = 1'-0"

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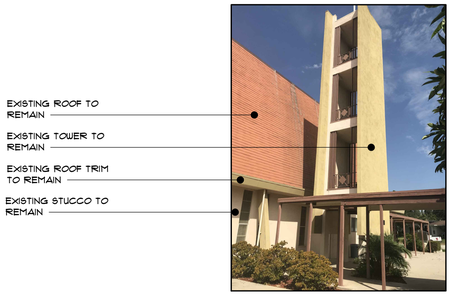
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A-3.0
ELEVATIONS

March 25, 2021
2017019.01

PRELIMINARY REVIEW APPLICATION NO. **19-0003**

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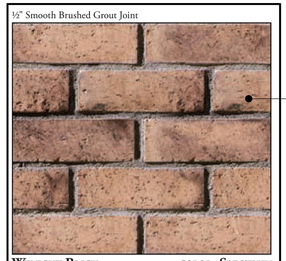


EXISTING ROOF TO REMAIN

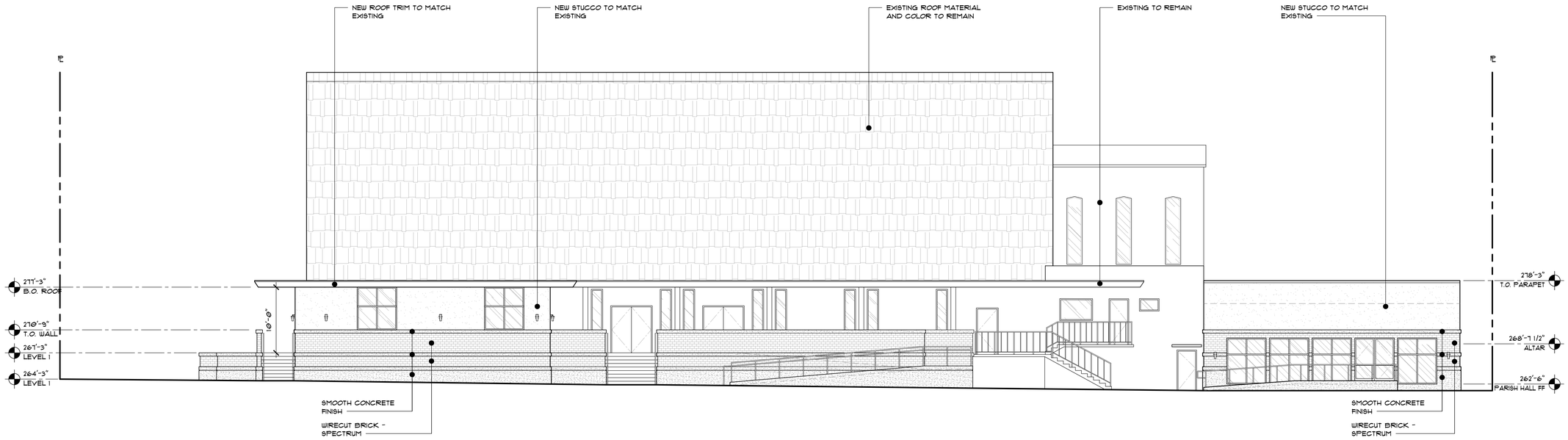
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EXISTING ROOF TRIM TO REMAIN

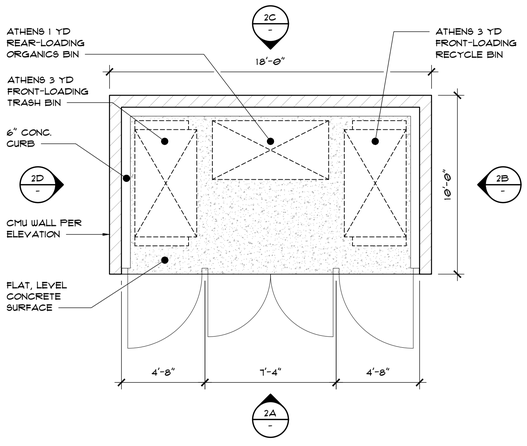
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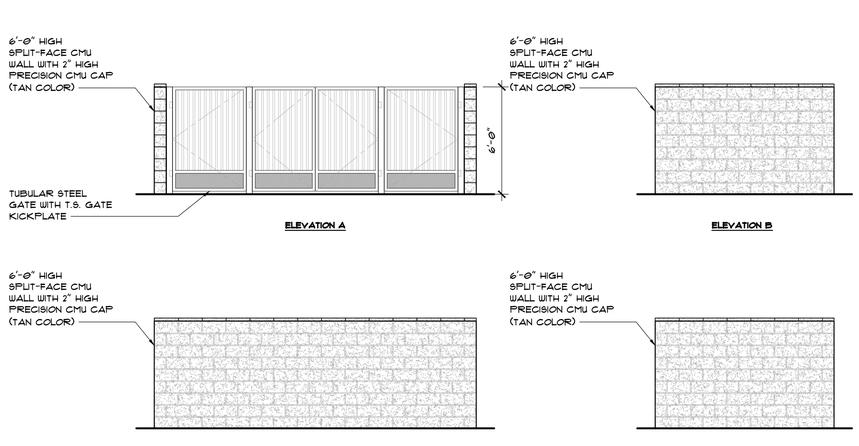
NEW CORONADO STONE PRODUCTS - WIRECUT BRICK, COLOR: SPECTRUM



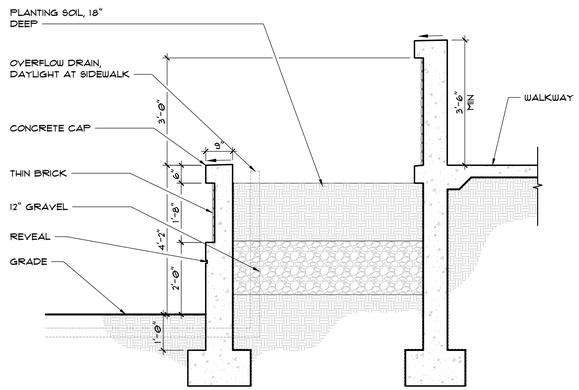
1 WEST ELEVATION
SCALE: 1/8" = 1'-0"



FLOOR PLAN



2 TRASH ENCLOSURE
SCALE: 1/4" = 1'-0"



3 PLANTER DETAIL
SCALE: 1/2" = 1'-0"

PICKARD
ARCHITECTS
562.945.8821

A-4.0
ELEVATIONS

March 25, 2021
2017019.01

PRELIMINARY REVIEW APPLICATION NO. **19-0003**

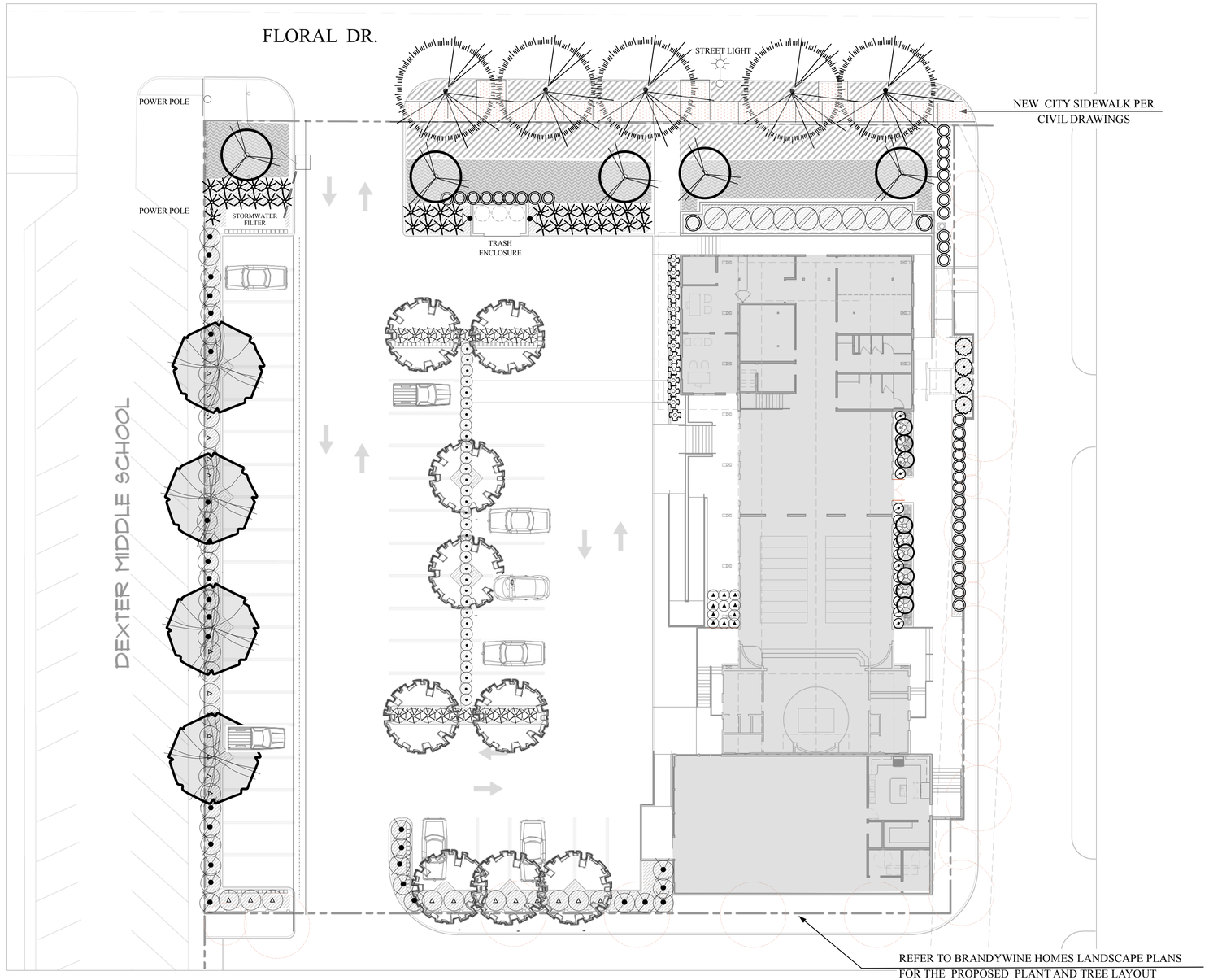
TRINITY LUTHERAN CHURCH

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REVISIONS
- PLANNING - 1ST SUBMITTAL 07.31.19
- PLANNING - 2ND SUBMITTAL 02.11.21
- PLANNING - 3RD SUBMITTAL 03.25.21

11716 FLORAL DR. WHITTIER, CA 90601

C:\Dropbox (Pickard Architects)\Pickard Architects Team Folder\Projects\2017\2017019.01 Lutheran Church Parking\Documents\400 Design Development\Drawings\Sheets\2017019.01_Planning.dwg



GRAPHIC SCALE

24 8 0 16 32

1" = 16'-0"

IRRIGATION NOTES:

A Water Conserving Irrigation System with a Smart Controller. New valves and mainlines will be installed along with Low– Flow Spray or Dripline emission devices. The New Irrigation System will comply with City Water Efficiency Ordinances..

N

PROJECT SITE CALCULATIONS

TOTAL LOT AREA: 44,378 SF

LANDSCAPE AREA: 6,148 SF.

LANDSCAPE AREA %: 13.85%

PLANTING LEGEND

SYMBOL/ PLANT NO.	Common Name/ *Botanical Name* DESCRIPTION	QTY.	UNIT	WUCOLS– REGION 3
TREES				
T1	Deodar Cedar *Cedrus deodara*	5	24 " Box	LOW
T2	Holly Oak *Quercus ilex*	9	36 " Box	LOW
T3	Pink Tabebuia *Tabebuia ipe*	4	36 " Box	MED
T4	Crape Myrtle– Watermelon Red *Lagerstroemia indica*	6	36" Box	MED
SHRUBS				
1	Dwarf Coast Rosemary *Westringia fruticosa Grey Box ['WES04'] PP25,675*	33	5 Gal	LOW
2	Kangarooo Paw *Anigozanthos flavidus 'Orange'*	20	5 Gal	LOW
3	Silver Edge Lavender *Lavandula intermedia 'Silver Edge'*	14	5 Gal	LOW
4	*Shark Bay Aniseed Boronia* *Boronia crenulata 'Shark Bay'*	26	5 Gal.	MED
5	Little John Bottle Brush *Callistemon v. 'Little John'*	30	5 Gal.	LOW
6	Dwarf Strawberry Tree *Arbutus unedo 'compacta'*	4	5 Gal.	LOW
7	Dwarf Yeddo Hawthorne *Rhaphiolepis umbellata 'Minor'*	38	5 Gal.	LOW
8	'Vico Yellow' - Smithers Select Yellow *Clivia miniata hybrids*	17	5 Gal.	LOW
9	Dwarf Myrtle *Myrtus compacta*	11	5 Gal.	LOW
10	Lady Palm *Rhapis excelsa*	9	15 Gal.	LOW
11	Japanese Camellia *Camellia japonica ' Kramer's Supreme'*	9	5 Gal.	LOW
12	Muhly Grass *Muhlenbergia capillaris*	37	5 Gal.	LOW
VINES				
V1	Violet Trumpet Vine *Clytostoma callistegioides*	2	5 Gal.	MED

GROUNDCOVERS

G1	Buchloe dactyloides 'UC Verde'- (Buffalo Grass) 2" plugs; plant at 6" on center on triangular spacing. LOW
G2	. Achillea 'Moonshine' (Fern Leaf Yarrow) . One Gallon size; plant at 18" on center on triangular spacing. LOW
G3	Carex oshimensis 'Evergold' - Variegated Japanese Sedge . One Gallon size; plant at 18" on center on triangular spacing. MED
G4	3" Depth of Shredded "Gorilla Hair" Mulch throughout entire planting area

NOTES: Parking lot plantings shall be maintained at 2ft. Height for visibility per the Police Department comments.

3RD SUBMITTAL 3.25.2021

LICENSED LANDSCAPE ARCHITECT THOMAS A BIHR, No. 4115 4.23.21 4.27.2020 Date STATE OF CALIFORNIA

TRINITY LUTHERAN CHURCH
11716 FLORAL DRIVE, WHITTIER CA 90601

THOMAS A. BIHR
10448 PORTADADR. WHITTIER CA
LANDSCAPE ARCHITECT 4115

PRELIMINARY LANDSCAPE PLAN PL1
SCALE: 1" = 16'0" 3-18-2020 SHEET 1 OF 3


T1 Cedrus deodara


2 Kangaroo Paws


3 Lavender


4 Boronia


T3Tabebuia ipe


6 Dwarf Strawberry Tree

© Robert Perry

T2 Holly Oak


1 Dwarf Coast Rosemary


5 Little John Bottle Brush

THIRD SUBMITTAL

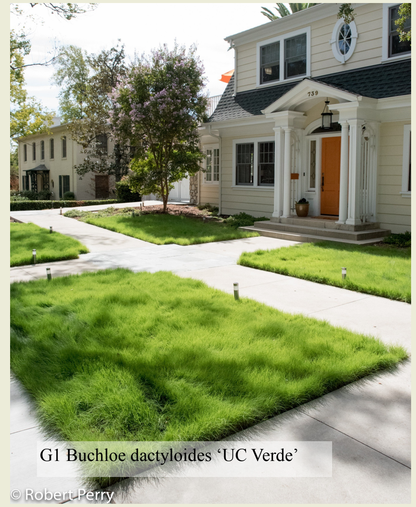
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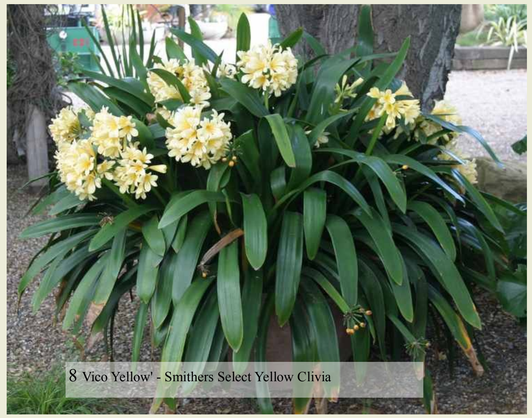
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LANDSCAPE ARCHITECT 4115

PRELIMINARY PLANT MATERIALS PL2
3-18-2020 SHEET 2 OF 3


7 Dwarf Yeddo Hawthorne


10 Rhapis Palm


G1 Buchloe dactyloides 'UC Verde'
© Robert Perry

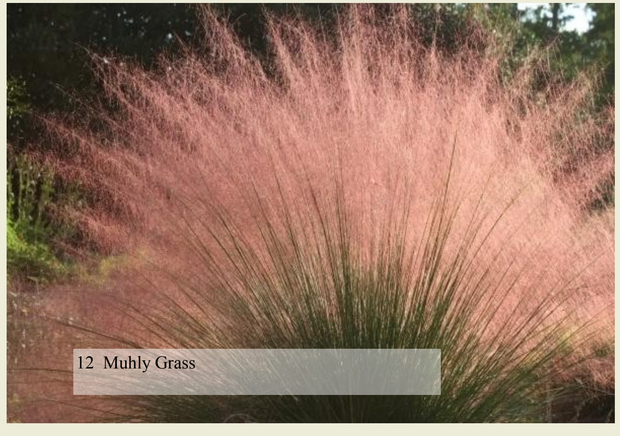

8 Vico Yellow' - Smithers Select Yellow Clivia


11 Kramer's Supreme Camellia


V1 Violet Trumpet Vine


G2 Moonshine Yarrow


9 Dwarf Myrtle
© Robert Perry


12 Muhly Grass


G3 Variegated Japanese Sedge

THIRD SUBMITTAL

TRINITY LUTHERAN CHURCH
11716 FLORAL DRIVE, WHITTIER CA 90601

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10448 PORTADADR. WHITTIER CA
LANDSCAPE ARCHITECT 4115

PRELIMINARY PLANT MATERIALS PL3
3-18-2020 SHEET 3 OF 3

BUILDING MOUNTED LIGHTS

11716 Floral Drive - Building Mounted Light Fixtures

	Cottage	Farmhouse	Spanish
Front Entry			
	Progress Lighting: Beufort P560049-031 - 11"	Progress Lighting: Cedar Springs P560091-031 - 11"	Progress Lighting: Cardiff P560167-020 - 16"
Garage			
	Progress Lighting: Beufort P560050-031 - 14"	Progress Lighting: Cedar Springs P560091-031 - 11"	Progress Lighting: Cardiff P560167-020 - 16"

PRIVATE STREETLIGHT, RESIDENTIAL

CATALOG NUMBER: MVA-63-LED-MT-3-4-SLVC-III-PT-RSA-7-412-TXBZ-BCN-4

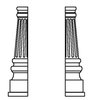


PT - Post Top

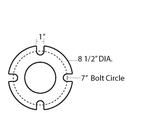
TEXTURED BRONZE - TXBZ



SHAFT CROSS SECTION



TWO PIECE CAST ALUMINUM BASE COVER



BASE PLATE



ANCHOR BOLTS

Anchor bolts are fabricated from hot rolled steel bar with minimum yield strength of 55,000 psi. These are hot dip galvanized in accordance to ASTM A-153.

LED ENGINE INFORMATION

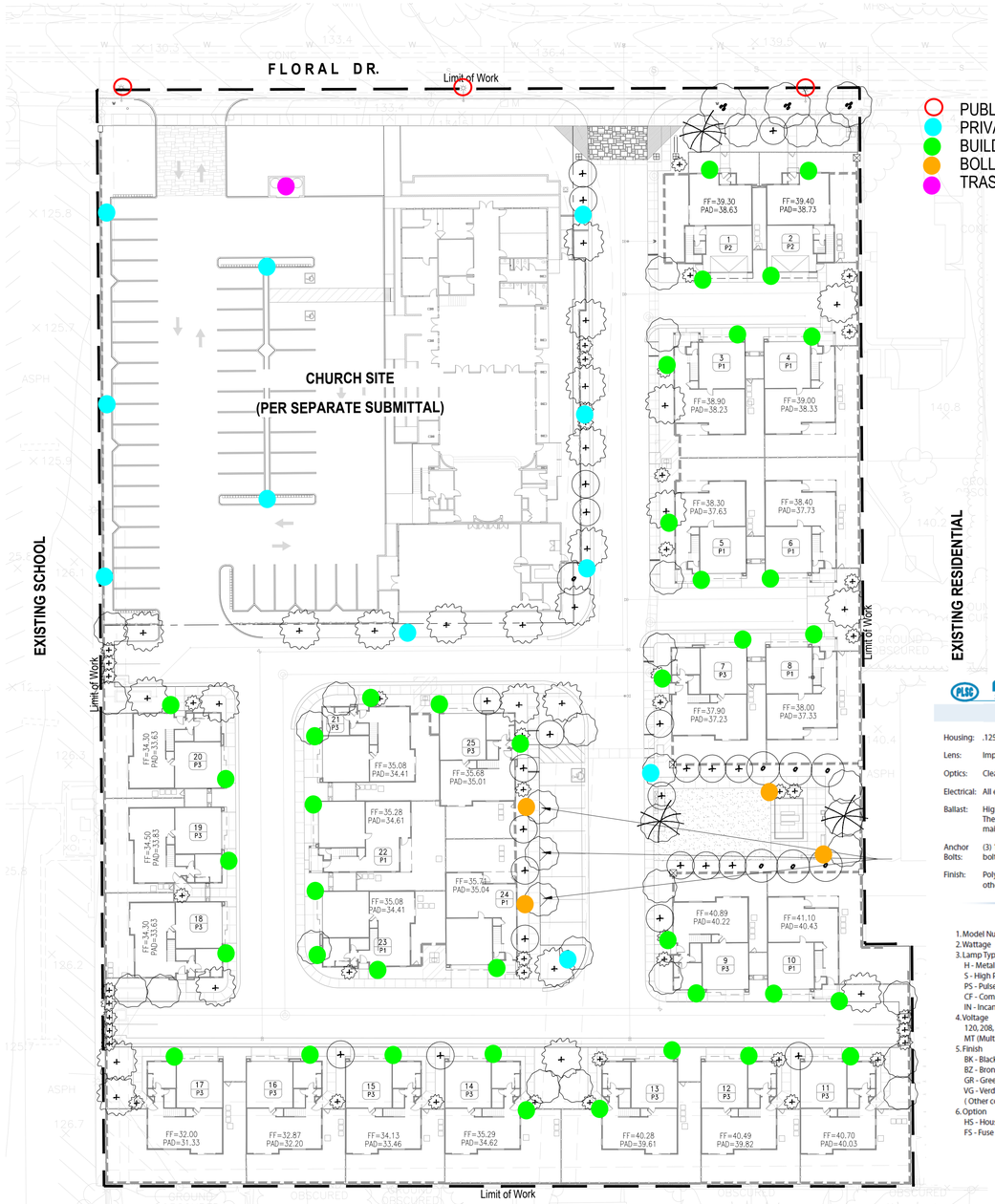
DELIVERED LUMINS	6200
WATTAGE	63
COLOR TEMPERATURE	4000K
CRI	>77
MILLIAMPS	350
OVERHEATING PROTECTION	YES
OPERATING POSITION	UNIVERSAL
AVERAGE LIFETIME 50% FAILURE	50000 HOURS
DIODE MANUFACTURER	PHILIPS LUXEON REBEL
LUMEN MAINTENANCE AT END OF LIFE	70%
INPUT VOLTAGE	120-277

SPECIFICATIONS

Housing:	Corrosion resistant, cast A356 aluminum alloy, .188" min. wall thickness.
LED:	63 watts, multi-tap.
Lens:	Seeded Lens. Impact resistant, UV stabilized, polycarbonate lens, visual comfort.
Optics:	Type 3 light distribution.
Pole:	Round Straight Aluminum. Fabricated from 6063 extruded tubing, heat treated to produce a T6 temper. The anchor base shall be cast from a 356 alloy aluminum heat treated to a T6 condition. The base telescopes and pole shaft are circumferentially welded top and bottom.
Finish:	Textured Bronze polyester powder fuse coating.

PACIFIC LIGHTING & STANDARDS COMPANY
LYNWOOD, CA

DESIGNER: JOHN MOORE	DATE:	CATALOG NUMBER: MVA-63-LED-MT-3-4-SLVC-III-PT-RSA-7-412-TXBZ-BCN-4
DRAWN: JOSEPH	12/20/18	
CHECKED:		PROJECT NAME: BRANDYWINE DEVELOPMENT
REVISION:		
APPROVED:		CUSTOMER: KSS LIGHTING: MEGAN
DWG:	SCALE: NONE	PAGE 1 OF 1



Plan View

- PUBLIC STREETLIGHT
- PRIVATE STREETLIGHT
- BUILDING-MOUNTED LIGHT
- BOLLARD LIGHT
- TRASH ENCLOSURE LIGHT

BOLLARD LIGHT

PACIFIC LIGHTING & STANDARDS CO.
2831 Los Flores Blvd, Lynwood, CA 90262 Tel. 310.603.9344 Fax. 310.603.9421

BDR SERIES

Housing: .125" thick extruded aluminum

Lens: Impact resistant clear acrylic.

Optics: Clear Borosilicate glass refractor.

Electrical: All electrical components are UL approved.

Ballast: High power factor - 20°C starting temperature. The ballast is removable as a unit for easy maintenance.

Anchor Bolts: (3) 1/2"x 12"x 2" galvanized on 5 1/2" bolt circle

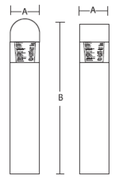
Finish: Polyester powder fuse coating is standard; other finishes are available upon request.

Ordering Information:

1. Model Number
2. Wattage
3. Lamp Type
   H - Metal Halide
   S - High Pressure Sodium
   PS - Pulse Start
   CF - Compact Fluorescent*
   IN - Incandescent
4. Voltage
   120, 208, 240, 277, 480 and
   MT (Multi Tap) - 120, 208, 240, 277
5. Finish
   BK - Black
   BZ - Bronze
   GR - Green
   VG - Verde Green
   (Other color upon request)
6. Option
   HS - House Sheild
   FS - Fuse



WATTAGE 175 MAX	A	B
	8"	42"



CHURCH PRIVATE STREETLIGHT

PACIFIC LIGHTING & STANDARDS CO
2831 Los Flores Blvd, Lynwood, CA 90262 Tel. 310.603.9344 Fax. 310.603.9421



LA SERIES

The LA series is the classic, modern-style luminaire. The unit's high performance output is ideal for parking lots. It can also serve your street lighting applications. This fixture is supplied with cut-off reflector system (when using the convex lens) and full cut-off when using the flat lens to meet the **dark sky** requirements.

ARCHITECTURAL



The housing is made of .080" minimum wall thickness extruded aluminum. The arm is .125" wall thickness extruded aluminum and shall attach to the fixture with two thru bolts.

The lamp is properly positioned to provide the appropriate IES light pattern. The reflector is constructed of segmented specular aluminum available on Type 1, 2, 3, FT and 5 light distributions.

All electrical components are UL listed with electromagnetic high power factor ballast for HID lamps in voltages of 120 to 480 or an electronic ballast for compact fluorescent lamp in 120 or 277 volts. Ballasts are mounted on a removable tray for easy maintenance.



Pacific Lighting & Standards Co.

11

UL LISTED FOR WET LOCATIONS
www.pacificlighting.com

0 15' 30' 60'
Scale: 1" = 30'

Brandywine Homes

Schematic Lighting Plan

Schematic - 5th City Submittal | Project No.: BH09-D
Tract No: 82802 | Date: Mar. 16, 2021

L-7

Citrange - 11716 Floral Drive, Whittier CA


MAGILIGHT





Appendix B Air Quality and Greenhouse Gas Analysis

WHITTIER FLORAL RESIDENTIAL PROJECT
AIR QUALITY AND GREENHOUSE GAS ANALYSIS
City of Whittier



WHITTIER FLORAL RESIDENTIAL PROJECT
AIR QUALITY AND GREENHOUSE GAS ANALYSIS
City of Whittier, California

Prepared for:

Mr. Brian Geis
BRANDYWINE HOMES
16580 Aston
Irvine, CA 92606

Prepared by:

RK ENGINEERING GROUP, INC.
4000 Westerly Place, Suite 280
Newport Beach, CA 92660

Bryan Estrada, AICP, PTP
Darshan Shivaiah, M.S

March 24, 2021

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1.0 Introduction

The purpose of this air quality and greenhouse gas (GHG) analysis is to determine whether the estimated criteria air pollutants and greenhouse gas emissions generated from the construction and operation of the proposed Whittier Floral Residential Project (hereinafter referred to as project) would cause significant impacts to air resources.

This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The methodology follows the California Air Resources Board (CARB), the South Coast Air Quality Management District (SCAQMD), and City of Whittier recommendations for quantification of emissions and evaluation of potential impacts.

1.1 Site Location

The proposed Whittier Floral Residential Developmental project site is located at 11716 Floral Drive, in the City of Whittier, California. The project site is located within the South Coast Air Basin (SCAB), the SCAQMD *Metropolitan* Forecast Area, and the *Southeast Los Angeles County-5*.

The project site is bounded by residential uses to the north, east and south and Dexter Middle School to the West.

The project site is zoned for Low Density Residential (R-1) and the City of Whittier General Plan land use map designates the project site as Private School.

The project site is currently in use by the Trinity Lutheran Church for religious gathering & assembly, and formerly included a private school. The school ceased operations and related buildings are currently vacant. The Church continues to operate its sanctuary, offices and meeting facilities on a weekly basis.

The project location map is provided in Exhibit A.

1.2 Project Description

The project proposes to construct and operate 25 single family detached dwelling units. The project site is currently occupied by the Trinity Lutheran Church upon a 3.59-acre lot for religious gathering and assembly. The Church plans to subdivide the property into two

parcels; one (1) 2.56-acre lot for the residential development project and one (1) 1.03-acre lot for the Church, which will remain in operation.

The residential project will displace the former church school buildings on-site which are currently vacant. The Church also proposes to expand the sanctuary building by an additional 2,809 sqaure feet. The site plan used for this analysis, provided by KTGY Architecture, is illustrated in Exhibit B. Table 1 summarizes the proposed project land uses.

Table 1
Land Use Summary

Land Use	Quantity	Metric[1]
Single Family Residential	25	Dwelling Units
Church	2,809	S.F.

The project consist of demolition of 13,334 square feet of school buildings and 14,545 square feet of the gymnasium building as part of the construction process. The site requires grading and import of approximately 8,905 cubic yards of fill material during grading phase.

The project requires a General Plan amendment to change the land use from Private School to Medium Density Residential land use and requires a zone change from Low Density Residential (R-1) to Medium Density Residential (R-2).

Construction of the project is estimated to begin in the year 2021 and last approximately 17 months. Construction activities are expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. The project is expected to be operational in the year 2022.

It should be noted that the project site plan has been slightly modified compared to the plan that what was originally used in this air quality and GHG analysis. The changes to the latest site plan resulted in a net decrease of one (1) dwelling unit. However, the quantified emissions analysis presented in this report is still based on the original plan of 26 dwelling units. As a result, the findings of this report are conservative and the overall impact from the modified project would be slightly less than reported. No additional sources of pollution or impacts would result from the modified plan.

1.3 Sensitive Receptors

Sensitive receptors are considered land uses or other types of population groups that are more sensitive to air pollution exposure. Sensitive population groups include children, the elderly, the acutely and chronically ill, and those with cardio-respiratory diseases. For CEQA purposes, the SCAQMD considers a sensitive receptor to be a location where a sensitive individual could remain for 24-hours or longer, such as residences, hospitals, and schools (etc), as described in the Localized Significance Threshold Methodology (SCAQMD 2008a, page 3-2).

The nearest sensitive land uses are considered the residential homes located adjacent to the project site to the north, south and east, and Dexter Middle School to the west of the site. Sensitive receptors are located within 25 meters of the project site.

1.4 Summary of Analysis Results

Table 2 provides a summary of the CEQA air quality impact analysis results.

Table 2
CEQA Air Quality Impact Criteria

Air Quality Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with, or obstruct implementation of, the applicable air quality plan?			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?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?		X		
e) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			X	

Table 3 provides a summary of the CEQA GHG impact criteria analysis results.

Table 3
CEQA GHG Impact Criteria

GHG Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
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 emissions of greenhouse gases?			X	

1.5 Recommended Mitigation Measures

The following mitigation measures are recommended to help ensure the project does expose sensitive receptors to substantial pollutant concentrations. In particular, given the close proximity of sensitive receptors, including children at Dexter Middle School, several standard dust control measures have been included as mitigation to ensure adequate enforcement and compliance.

Construction Mitigation Measures:

MM-1 The project must follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

1. All active construction areas shall be watered two (2) times daily.
2. Speed on unpaved roads shall be reduced to less than 15 mph.
3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.
8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).

9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.
12. A fugitive dust control plan should be prepared and submitted to SCAQMD prior to the start of construction.

MM-2 Prepare and implement a Construction Management Plan which will include Best Available Control Measures to be submitted to the City of Whittier.

MM-3 Construction equipment shall be maintained in proper tune.

MM-4 Require all construction equipment to have Tier 4 low emission "clean diesel" engines that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

MM-5 All construction vehicles shall be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

MM-6 Minimize the simultaneous operation of multiple construction equipment units.

MM-7 The use of heavy construction equipment and earthmoving activity should be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.

MM-8 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

MM-9 Establish staging areas for the construction equipment that are as distant as possible from adjacent sensitive receptors (residential land uses).

MM-10 Use haul trucks with on-road engines instead of off-road engines for on-site hauling.

MM-11 Utilize zero VOC and low VOC paints and solvents, wherever possible.

MM-12 Provide temporary dust barriers or construct perimeter walls during the first phase of construction.

1.6 Recommended Project Design Features

The following recommended project design features are considered standard building code requirements and best practices that will be included in the project design.

DF-1. Comply with the mandatory requirements of Title 24 part 11 of the California Building Standards Code (CALGreen) and the Title 24 Part 6 Building Efficiency Standards, including net zero energy requirements.

DF-2. Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and reduce the amount of turf.

DF-3. Comply with the mandatory requirements of CalRecycle's residential recycling program and implement zero waste strategies.

DF-4. Provide the necessary infrastructure to support electric vehicle charging for both the residential and commercial components of the project.

DF-5. Use electric powered landscaping equipment for landscape maintenance.

2.0 Air Quality Setting

The Federal Clean Air Act (§ 7602) defines air pollution as any agent or combination of such agents, including any physical, chemical, biological, or radioactive substance which is emitted into or otherwise enters the ambient air. Household combustion devices, motor vehicles, industrial facilities and forest fires are common sources of air pollution. Air pollution can cause disease, allergies and death. It affects soil, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate. It can also cause damage to and deterioration of property, present hazards to transportation, and negatively impact the economy.

This section provides background information on criteria air pollutants, the applicable federal, state and local regulations concerning air pollution, and the existing physical setting of the project within the context of local air quality.

2.1 Description of Air Pollutants[1].

The following section describes the air pollutants of concern related to the project. Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health. The following descriptions of criteria air pollutants have been provided by the SCAQMD.

- **Carbon Monoxide (CO)** is a colorless, odorless, toxic gas produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, and competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs in the body. The ambient air quality standard for carbon monoxide is intended to protect persons whose medical condition already compromises their circulatory system's ability to deliver oxygen. These medical conditions include certain heart ailments, chronic lung diseases, and anemia. Persons with these conditions have reduced exercise capacity even when exposed to relatively low levels of CO. Fetuses are at risk because their blood has an even greater affinity to bind with CO. Smokers are also at risk from ambient CO levels because smoking

[1] SCAQMD. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning (May 6, 2005)

increases the background level of CO in their blood. The South Coast basin has recently achieved attainment status for carbon monoxide by both USEPA and CARB.

- **Nitrogen Dioxide (NO_2)** is a byproduct of fuel combustion. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts quickly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_x. NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO_2 is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in young children has also been observed at concentrations below 0.3 parts per million (ppm). NO_2 absorbs blue light which results in a brownish red cast to the atmosphere and reduced visibility. Although NO_2 concentrations have not exceeded national standards since 1991 and the state hourly standard since 1993, NO_x emissions remain of concern because of their contribution to the formation of O_3 and particulate matter.

- **Ozone (O_3)** is one of a number of substances called photochemical oxidants that are formed when volatile organic compounds (VOC) and NO_x react in the presence of ultraviolet sunlight. O_3 concentrations in the South Coast basin are typically among the highest in the nation, and the damaging effects of photochemical smog, which is a popular name for a number of oxidants in combination, are generally related to the concentrations of O_3. Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the subgroups most susceptible to O_3 effects. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient O_3 levels and increases in daily hospital admission rates, as well as mortality, has also been reported. The South Coast Air Basin is designated by the USEPA as an extreme non-attainment area for ozone. Although O_3 concentrations have declined substantially since the early 1990s, the South Coast basin continues to have peak O_3 levels that exceed both state and federal standards.

- **Fine Particulate Matter (PM_{10})** consists of extremely small suspended particles or droplets 10 microns or smaller in diameter that can lodge in the lungs, contributing to respiratory problems. PM_{10} arises from such sources as re-entrained road dust, diesel soot, combustion products, tire and brake abrasion, construction operations, and fires. It is also formed in the atmosphere from NO_x and SO_2 reactions with ammonia. PM_{10} scatters light and significantly reduces visibility. Inhalable particulates

pose a serious health hazard, alone or in combination with other pollutants. More than half of the smallest particles inhaled will be deposited in the lungs and can cause permanent lung damage. Inhalable particulates can also have a damaging effect on health by interfering with the body's mechanism for clearing the respiratory tract or by acting as a carrier of an absorbed toxic substance. The South Coast basin has recently achieved federal attainment status for PM_{10}, but is non-attainment based on state requirements.

- **Ultra-Fine Particulate Matter ($PM_{2.5}$)** is defined as particulate matter with a diameter less than 2.5 microns and is a subset of PM_{10}. $PM_{2.5}$ consists mostly of products from the reaction of NO_x and SO_2 with ammonia, secondary organics, finer dust particles, and the combustion of fuels, including diesel soot. $PM_{2.5}$ can cause exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease, declines in pulmonary function growth in children, and increased risk of premature death from heart or lung diseases in the elderly. Daily fluctuations in $PM_{2.5}$ levels have been related to hospital admissions for acute respiratory conditions, school absences, and increased medication use in children and adults with asthma. The South Coast basin is designated as non-attainment for $PM_{2.5}$ by both federal and state standards.

- **Sulfur dioxide (SO_2)** is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Health effects include acute respiratory symptoms and difficulty in breathing for children. Individuals with asthma may experience constriction of airways with exposure to SO_2. Though SO_2 concentrations have been reduced to levels well below state and federal standards, further reductions in SO_2 emissions are needed because SO_2 is a precursor to sulfate and PM_{10}. The South Coast basin is considered a SO_2 attainment area by USEPA and CARB.

- **Lead (Pb)** is a toxic heavy metal that can be emitted into the air through some industrial processes, burning of leaded gasoline and past use of lead-based consumer products. Lead is a neurotoxin that accumulates in soft tissues and bones, damages the nervous system, and causes blood disorders. It is particularly problematic in children, in that permanent brain damage may result, even if blood levels are promptly normalized with treatment. Concentrations of lead once exceeded the state and federal air quality standards by a wide margin, but as a result of the removal of lead from motor vehicle gasoline, ambient air quality standards for lead have not been exceeded since 1982. Though special monitoring sites immediately downwind of lead sources recorded localized violations of the state standard in 1994, no violations have been recorded since. Consequently, the South Coast basin is designated as an attainment area for lead by both the USEPA and CARB. This report

does not analyze lead emissions from the project, as it is not expected to emit lead in any significant measurable quantity.

- **Volatile Organic Compounds (VOC),** although not actually a criteria air pollutant, VOCs are regulated by the SCAQMD because they cause chemical reactions which contribute to the formation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, contributing to higher PM_{10} and lower visibility levels. Sources of VOCs include combustion engines, and evaporative emissions associated with fuel, paints and solvents, asphalt paving, and the use of household consumer products such as aerosols. Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOC. Some hydrocarbon components classified as VOC emissions are hazardous air pollutants. Benzene, for example, is a hydrocarbon component of VOC emissions that are known to be a human carcinogen. The term reactive organic gases (ROG) are often used interchangeably with VOC.

- **Toxic Air Contaminants (TACs)** are defined as air pollutants which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health, and for which there is no concentration that does not present some risk. This contrasts with the criteria pollutants, in that there is no threshold level for TAC exposure below which adverse health impacts are not expected to occur. The majority of the estimated health risk from TACs can be attributed to a relatively few compounds, the most common being diesel particulate matter (DPM) from diesel engine exhaust. In addition to DPM, benzene and 1,3-butadiene are also significant contributors to overall ambient public health risk in California.

2.2 Federal and State Ambient Air Quality Standards

The Federal Clean Air Act, which was last amended in 1990, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for criteria pollutants considered harmful to public health and the environment. The State of California has also established additional and more stringent California Ambient Air Quality Standards (CAAQS) in addition to the seven criteria pollutants designated by the federal government.

AAQS are designed to protect the health and welfare of the populace with a reasonable margin of safety. The standards are divided into two categories, primary standards and secondary standards. Primary standards are implemented to provide protection for the "sensitive" populations such as those with asthma, or the children and elderly. Secondary standards are to provide protection against visible pollution as well as damage to the surrounding environment, including animals, crops, and buildings.

Table 4 shows the Federal and State Ambient Air Quality Standards.

Table 4
Federal and State Ambient Air Quality Standards (AAQS)[1]

Air Pollutant	Averaging Time [2]	Federal Standard (NAAQS)[2]	California Standard (CAAQS)[2]
Ozone	1 Hour	--	0.09 ppm
	8 Hour	0.070 ppm	0.070 ppm
Carbon Monoxide (CO)	1 Hour	35 ppm	20 ppm
	8 Hour	9 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1 Hour	0.100 ppm	0.18 ppm
	Annual	0.053 ppm	0.030 ppm
Sulfur Dioxide (SO_2)	1 Hour	0.075 ppm	0.25 ppm
	3 Hour	0.5 ppm[3]	--
	24 Hour	--	0.04 ppm
Particulate Matter (PM_{10})	24 Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
	Mean	--	20 $\mu g/m^3$
Particulate Matter (PM2.5)	24 Hour	35 $\mu g/m^3$	--
	Annual	12 $\mu g/m^3$	12 $\mu g/m^3$
Lead	30-day	--	1.5 $\mu g/m$
	Quarter	1.5 $\mu g/m$	--
	3-month average	0.15 $\mu g/m$	--
Visibility reducing particles	8 Hour	--	0.23/km extinction coefficient. (10-mile visibility standard)
Sulfates	24 Hour	--	25 $\mu g/m$
Vinyl chloride	24 Hour	--	0.01 ppm
Hydrogen sulfide	24 Hour	--	0.03 ppm

[1] Source: USEPA: https://www.epa.gov/criteria-air-pollutants/naaqs-table and
CARB: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards

[2] ppm = parts per million of air, by volume; µg/m3 = micrograms per cubic meter; Annual = Annual Arithmetic Mean; 30-day = 30-day average; Quarter = Calendar quarter.

[3] Secondary standards

Several pollutants listed in Table 4 are not addressed in this analysis. Lead is not included because the project is not anticipated to emit lead. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed. The project is not expected to generate or be exposed to vinyl chloride because proposed project uses do not utilize the chemical processes that create this pollutant and there are no such uses in the project vicinity. The proposed project is not expected to cause exposure to hydrogen sulfide because it would not generate hydrogen sulfide in any substantial quantity.

2.3 Attainment Status

The Clean Air Act requires states to prepare a State Implementation Plan (SIP) to ensure air quality meets the NAAQS. The California Air Resources Board (CARB) provides designations of attainment for air basins where AAQS are either met or exceeded. If the AAQS are met, the area is designated as being in "attainment", if the air pollutant concentrations exceed the AAQS, than the area is designated as being "nonattainment". If there is inadequate or inconclusive data to make a definitive attainment designation, the area is considered "unclassified."

National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

When a state submits a request to the EPA to re-designate a nonattainment area to attainment, the Clean Air Act (CAA) section 175A(a) requires that the state (or states, if the area is a multi-state area) submit a maintenance plan ensuring the area can maintain the air quality standard for which the area is to be re-designated for at least 10 years following the effective date of re-designation. Table 5 lists the attainment status for the criteria pollutants in the South Coast Air Basin (SCAB).

Table 5
South Coast Air Basin Attainment Status[1]

Pollutant	State Status	National Status
Ozone	Nonattainment	Nonattainment (Extreme)[2]
Carbon monoxide	Attainment	Attainment (Maintenance)
Nitrogen dioxide	Attainment	Attainment (Maintenance)
PM_{10}	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$	Nonattainment	Nonattainment
Lead	Attainment	Nonattainment (Partial)[3]

[1] Source: California Air Resources Board. http://www.arb.ca.gov/desig/adm/adm.htm
[2] 8-Hour Ozone.
[2] Partial Nonattainment designation – Los Angeles County portion of Basin only.

2.4 South Coast Air Quality Management District (SCAQMD)

The agency responsible for air pollution control for the South Coast Air Basin (SCAB) is the South Coast Air Quality Management District (SCAQMD). SCAQMD is responsible for controlling emissions primarily from stationary sources. SCAQMD maintains air quality monitoring stations throughout the SCAB. SCAQMD, in coordination with the Southern California Association of Governments, is also responsible for developing, updating, and implementing the Air Quality Management Plan (AQMP) for the SCAB. An AQMP is a plan prepared and implemented by an air pollution district for a county or region designated as nonattainment of the federal and/or California ambient air quality standards. The term nonattainment area is used to refer to an air SCAB where one or more ambient air quality standards are exceeded.

Every three (3) years the SCAQMD prepares a new AQMP, updating the previous plan and having a 20-year horizon. The latest version is the 2016 AQMP. The 2016 AQMP is a regional blueprint for achieving the federal air quality standards and healthful air. While air quality has dramatically improved over the years, the SCAB still exceeds federal public health standards for both ozone and particulate matter (PM) and experiences some of the worst air pollution in the nation. The 2016 AQMP includes both stationary and mobile source strategies to ensure that rapidly approaching attainment deadlines are met, that public health is protected to the maximum extent feasible, and that the region is not faced with burdensome sanctions if the Plan is not approved or if the NAAQS are not met on time.

The most significant air quality challenge in the SCAB is to reduce nitrogen oxide (NOx) emissions sufficiently to meet the upcoming ozone standard deadlines. Based on the inventory and modeling results, 522 tons per day (tpd) of total SCAB NOx 2012 emissions are projected to drop to 255 tpd and 214 tpd in the 8-hour ozone attainment years of 2023 and 2031 respectively, due to continued implementation of already adopted regulatory actions ("baseline emissions"). The analysis suggests that total SCAB emissions of NOx must be reduced to approximately 141 tpd in 2023 and 96 tpd in 2031 to attain the 8-hour ozone standards. This represents an additional 45 percent reduction in NOx in 2023, and an additional 55 percent NOx reduction beyond 2031 levels.

The SCAQMD establishes a program of rules and regulations to obtain attainment of the state and federal standards in conjunction with the AQMP. Several of the rules and regulations that may be applicable to this project include, but are not limited to, the following:

SCAQMD Rule 402 prohibits a person from discharging 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.

SCAQMD Rule 403 governs emissions of fugitive dust during construction and operation activities. Compliance with this rule is achieved through application of standard Best Management Practices, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph, and establishing a permanent ground cover on finished sites.

SCAQMD Rule 445 restricts wood burning devices from being installed into any new development and is intended to reduce the emissions of particulate matter for wood burning devices.

SCAQMD Rule 1113 governs the sale, use, and manufacturing of architectural coating and limits the VOC content in paints and paint solvents. This rule regulates the VOC content of paints available during construction. Therefore, all paints and solvents used during construction and operation of project must comply with Rule 1113.

SCAQMD Rule 1143 governs the manufacture, sale, and use of paint thinners and solvents used in thinning of coating materials, cleaning of coating application equipment,

and other solvent cleaning operations by limiting their VOC content. This rule regulates the VOC content of solvents used during construction. Solvents used during the construction phase must comply with this rule.

SCAQMD Rule 1186 limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency or special district such as water, air, sanitation, transit, or school district.

SCAQMD Rule 1303 governs the permitting of re-located or new major emission sources, requiring Best Available Control Measures and setting significance limits for PM10 among other pollutants.

SCAQMD Rule 2202 On-Road Motor Vehicle Mitigation Options, is to provide employers with a menu of options to reduce mobile source emissions generated from employee commutes, to comply with federal and state Clean Air Act requirements, Health & Safety Code Section 40458, and Section 182(d)(1)(B) of the federal Clean Air Act. It applies to any employer who employs 250 or more employees on a full or part-time basis at a worksite for a consecutive six-month period calculated as a monthly average.

2.5 South Coast Air Basin

The project is located within the South Coast Air SCAB (SCAB). To the west of the SCAB is the Pacific Ocean. To the north and east are the San Gabriel, San Bernardino, and San Jacinto mountains, while the southern limit of the SCAB is the San Diego County line. The SCAB consists of Orange County, all of Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County.

The local dominant wind blows predominantly from the south-southwest with relatively low velocities. The annual average annual wind speed is about 10 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 SCAB.

The region also experiences periods of hot, dry winds from the desert, known as Santa Ana winds. If the Santa Ana winds are strong, they can surpass the sea breeze, which blows from the ocean to the land, and carry the suspended dust and pollutants out to the ocean. If the winds are weak, they are opposed by the sea breeze and cause stagnation, resulting in high pollution events.

The annual average temperature varies little throughout much of the SCAB, ranging from the low to middle 60s (°F). With more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas.

The mountains surrounding the region form natural horizontal barriers to the dispersion of air contaminants. Air pollution created in the coastal regions and Los Angeles metropolitan area are transported inland until reaching the mountains, where the combination of mountains and temperature inversion layers generally prevent further dispersion. This poor ventilation results in a gradual degradation of air quality from the coastal areas to inland areas of the SCAB. Air stagnation may occur during the early evening and early morning periods of transition between day and nighttime flows.

Temperature inversions are an important feature that limits the vertical depth through which pollution can be mixed. During the summer, coastal areas are characterized by a sharp discontinuity between the cool marine air at the surface and the warm, sinking air aloft within the high-pressure cell over the ocean to the west. This marine/subsidence inversion allows for good local mixing, but acts like a giant lid over the SCAB. The air remains stagnant, as the average wind speed in downtown Los Angeles becomes less than five mph.

The second type of inversion forms on clear winter nights when cold air off the mountains sinks to the valley floor while the air aloft over the valley remains warm. This forms radiation inversions. These inversions, in conjunction with calm winds, trap pollutants such as those from automobile exhaust near their source. They lead to air pollution "hotspots" in heavily developed coastal areas of the SCAB, although onshore breezes often push the pollutants along canyons into the inland valleys. Summers are often periods of hazy visibility and occasionally unhealthful air, while winter air quality impacts tend to be highly localized and can consist of elevated levels of nitrogen dioxide and fine particulate matter.

2.6 Local Climate and Meteorology

The weather station closest to the project site is a National Weather Service Cooperative weather station located at Montebello station, (045790). Climatological data from the National Weather Service at this station is summarized in Table 6.

Table 6
Meteorological Summary[1]

Month	Average Temperature (°F)			Mean Precipitation (inches)
	Max.	Min.	Mean	
January	69.4	47.8	58.6	3.69
February	71.1	48.9	60.0	3.56
March	72.9	50.4	61.6	2.82
Total	77.6	53.2	65.3	0.78
May	79.4	57.2	68.2	0.19
June	83.7	60.8	72.3	0.06
July	88.5	64.2	76.4	0.01
August	89.7	65.2	77.4	0.02
September	87.9	63.6	75.8	0.17
October	82.6	58.3	70.4	0.28
November	75.4	51.4	63.4	1.26
December	70.8	47.2	59.0	1.94
Annual	**79.1**	**55.7**	**67.4**	**14.78**

[1] Source: Western Regional Climate Center 2016-2019. Averages derived from measurements recorded between 1979 and 2011 at Montebello, (045790).

2.7 Local Air Quality

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates of the existing emissions in the Basin provided in the Final 2016 Air Quality Management Plan, prepared by SCAQMD, March 2017, indicate that collectively, mobile sources account for 60 percent of the VOC, 90 percent of the NOx emissions, 95 percent of the CO emissions and 34 percent of directly emitted PM2.5, with another 13 percent of PM2.5 from road dust.

The SCAQMD has divided the SCAB into fourteen general forecasting areas and thirty eight Source Receptor Areas (SRA) for monitoring and reporting local air quality. The SCAQMD provides daily reports of the current air quality conditions in each general forecast area and SRA. The monitoring areas provide a general representation of the local meteorological, terrain, and air quality conditions within the SCAB.

The project is located within the Metropolitan general forecasting area and North Orange County air monitoring area (SRA-16).

Table 7 summarizes the published air quality monitoring data from 2015 through 2017, which is the most recent 3-year period available. These pollutant levels were used to comprise a "background" for the project location and existing local air quality. For criteria pollutants not monitored at the North Orange County station, data from the nearest monitoring station with a comparable setting were used.

Table 7
Local Air Quality

Air Pollutant Location	Averaging Time	Item	2015	2016	2017
Carbon Monoxide -- South Coastal LA County 3	1 Hour	Max 1-Hour (ppm)	3.3	3.3	3.9
		Exceeded State Standard (20 ppm)	No	No	No
		Exceeded National Standard (35 ppm)	No	No	No
	8 Hour	Max 8 Hour (ppm)	2.2	2.2	2.5
		Exceeded State Standard (9 ppm)	No	No	No
		Exceeded National Standard (9 ppm)	No	No	No
Ozone -- South Coastal LA County 3	1 Hour	Max 1-Hour (ppm)	0.087	0.079	0.084
		Days > State Standard (0.09 ppm)	0	0	0
	8 Hour	Max 8 Hour (ppm)	0.066	0.059	0.068
		Days > State Standard (0.07 ppm)	0	0	0
		Days >National Standard (0.070 ppm)	0	0	0
Nitrogen Dioxide -- South Coastal LA County 3	1 Hour	Max 1-Hour (ppm)	0.1018	0.0756	0.0774
		Exceeded State Standard (0.18 ppm)	No	No	No
	Annual	Annual Average (ppm)	0.0198	0.0185	0.0178
		Exceeded >State Standard (0.030 ppm)	No	No	No
		Exceeded >National Standard (0.053 ppm)	No	No	No
Sulfur Dioxide -- South Coastal LA County 3	1 Hour	Max 1 Hour (ppm)	0.0375	0.0178	0.0157
		Exceed State Standard (0.25 ppm)	No	No	No
		Exceed National Standard (0.075 ppm)	No	No	No
Coarse Particles (PM10) -- South Coastal LA County 3	24 Hour	Max 24-Hour ($\mu g/m^3$)	80	75	79
		Days > State Standard (50 $\mu g/m^3$)	6	8	9
		Days >National Standard (150 $\mu g/m^3$)	0	0	0
	Annual	Annual Average ($\mu g/m^3$)	31.5	31.9	33.0
		Exceeded State Standard (20 $\mu g/m^3$)	Yes	Yes	Yes
Fine Particulates (PM2.5) -- South Coastal LA County 2	24 Hour	Max 24-Hour ($\mu g/m^3$)	48.3	28.93	56.39
		Days >National Standard (35 $\mu g/m^3$)	4	0	7
	Annual	Annual Average ($\mu g/m^3$)	10.26	9.62	11.12
		Exceeded State Standard (12 $\mu g/m^3$)	No	No	No
		Exceeded National Standard (15 $\mu g/m^3$)	No	No	No

Source: EPA and ARB websites www.epa.gov/air/data.index.html and www.arb.ca.gov/adam/welcome.html
$\mu g/m^3$ = micrograms per cubic meter
ARB = California Air Resource Board
EPA= Environmental Protection Agency
ppm = part per million
(- -) = Data not provided

3.0 Global Climate Change Setting

Global climate change is the change in the average weather of the earth that is measured by such things as alterations in temperature, wind patterns, storms, and precipitation. Current data shows that the recent period of warming is occurring more rapidly than past geological events. The average global surface temperature has increased by approximately 1.4° Fahrenheit since the early 20th Century. 1.4° Fahrenheit may seem like a small change, but it's an unusual event in Earth's recent history, and as we are seeing, even small changes in temperature can cause enormous changes in the environment.

The planet's climate record, preserved in tree rings, ice cores, and coral reefs, shows that the global average temperature has been stable over long periods of time. For example, at the end of the last ice age, when the Northeast United States was covered by more than 3,000 feet of ice, average global temperatures were only 5° to 9° Fahrenheit cooler than today. The Intergovernmental Panel on Climate Change (IPCC), which includes more than 1,300 scientists from the United States and other countries, forecasts a temperature rise of 2.5° to 10° Fahrenheit over the next century. Therefore, significant changes to the environment are expected in the near future.

The consequences of global climate change include more frequent and severe weather, worsening air pollution by increasing ground level ozone, higher rates of plant and animal extinction, more acidic and oxygen depleted oceans, strain on food and water resources, and threats to densely populated coastal and low lying areas from sea level rise.

The impacts of climate change are already visible in the Southwest United States. In California, the consequences of climate change include;

- A rise in sea levels resulting in the displacement of coastal businesses and residencies
- A reduction in the quality and supply of water from the Sierra snowpack
- Increased risk of large wildfires
- Exacerbation of air quality problems
- Reductions in the quality and quantity of agricultural products
- An increased temperature and extreme weather events
- A decrease in the health and productivity of California's forests

3.1 Greenhouse Gases

Most scientists agree the main cause of the current global warming trend is anthropogenic (human-induced) augmentation of the greenhouse effect. The greenhouse effect refers to the way gases in the earth's atmosphere trap and re-emits long wave infrared radiation, acting like a blanket insulating the earth. Activities such as fossil fuel combustion, industrial processes, agriculture, and waste decomposition have elevated the concentration of greenhouse gases in the atmosphere beyond the level of naturally occurring concentrations.

GHGs comprise less than 0.1 percent of the total atmospheric composition, yet they play an essential role in influencing climate. Greenhouse gases include naturally occurring compounds such as carbon dioxide (CO_2), methane (CH_4), water vapor (H_2O), and nitrous oxide (N_2O), while others are synthetic. Man-made GHGs include the chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs), as well as sulfur hexafluoride (SF_6). Different GHGs have different effects on the Earth's warming. GHGs differ from each other in their ability to absorb energy (their "radiative efficiency") and how long they stay in the atmosphere, also known as the "lifetime".

The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO_2. The larger the GWP, the more than a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases and allows policymakers to compare emissions reduction opportunities across sectors and gases.

Table 8 lists the 100-year GWP of GHGs from the Intergovernmental Panel on Climate Change (IPCC) fourth assessment report (AR4).

Table 8
Global Warming Potential of Greenhouse Gases[1, 2]

Gas Name	Formula	Lifetime (years)	GWP
Carbon Dioxide	CO_2		1
Methane	CH_4	12	25
Nitrous Oxide	N_2O	114	298
Sulphur Hexafluoride	SF_6	3200	22,800
Nitrogen Trifluoride	NF_3	740	17,200
Hexafluoroethane (PFC-116)	C_2F_6	10,000	12,200
Octafluoropropane (PFC-218)	C_3F_8	2,600	8,830
Octafluorocyclobutane (PFC-318)	C_4F_8	3,200	10,300
Tetrafluoromethane (PFC-14)	CF_4	50,000	7,390
Hydrofluorocarbon 125	HFC-125	29	3,500
Hydrofluorocarbon 134a	HFC-134a	14	1,430
Hydrofluorocarbon 143a	HFC-143a	52	4,470
Hydrofluorocarbon 152a	HFC-152a	1	124
Hydrofluorocarbon 227ea	HFC-227ea	34	3,220
Hydrofluorocarbon 23	HFC-23	270	14,800
Hydrofluorocarbon 236fa	HFC-236fa	240	9,810
Hydrofluorocarbon 245fa	HFC-245fa	8	1,030
Hydrofluorocarbon 32	HFC-32	5	675
Hydrofluorocarbon 365mfc	HFC-365mfc	9	794
Hydrofluorocarbon 43-10mee	HFC-43-10mee	16	1,640

[1] Source: IPCC Fourth Assessment Report (AR4)
[2] GWPs are used to convert GHG emission values to "carbon dioxide equivalent" (CO_2e) units

3.2 GHG Regulatory Setting - International

Intergovernmental Panel on Climate Change. In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change to assess the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

United Nations. The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC) (signed on March 21, 1994). Under the Convention, governments gather and share information on greenhouse gas emissions, national policies, and best practices; launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change. The 2014 UN Climate Change Conference in Lima Peru provided a unique opportunity to engage all countries to assess how developed countries are implementing actions to reduce emissions.

Kyoto Protocol. The Kyoto Protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. It has been estimated that if the commitments outlined in the Kyoto Protocol are met, global GHG emissions could be reduced by an estimated 5 percent from 1990 levels during the first commitment period of 2008 – 2012 (UNFCCC 1997). On December 8, 2012, the Doha Amendment to the Kyoto Protocol was adopted. The amendment includes: New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from 2013 – 2020, a revised list of greenhouse gases (GHG) to be reported on by Parties in the second commitment period, and Amendments to several articles of the Kyoto Protocol, which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.

The Paris Agreement. The Paris agreement is the first comprehensive global climate agreement to be ratified by the United States, United Nations, China, and India; the largest producers of greenhouse gas emissions in the world. The agreement was negotiated by a total of 195 nations and entered into force on November 4, 2016. The central aim is to strengthen the global response to the threat of climate change by keeping the global temperature rise this century well below 2 degrees Celsius compared to pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change. Currently, 122 parties have ratified the agreement. The Trump

administration has recently indicated the United States federal government will no longer participate in the Paris agreement.

3.3 GHG Regulatory Setting – National

Greenhouse Gas Endangerment. On December 2, 2009, the EPA announced that GHGs threaten the public health and welfare of the American people. The EPA also states that GHG emissions from on-road vehicles contribute to that threat. The decision was based on *Massachusetts v. EPA* (Supreme Court Case 05-1120) which argued that GHGs are air pollutants covered by the Clean Air Act and that the EPA has authority to regulate those emissions.

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy (CAFE) law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. On April 1, 2010, the EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) announced a joint final rule establishing a national program that would reduce greenhouse gas emissions and improve fuel economy for new cars and trucks sold in the United States.

The first phase of the national program applied to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They required these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards were estimated to cut carbon dioxide emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

The second phase of the national program for passenger cars, light-duty trucks, and medium-duty passenger vehicles covers model years 2017 through 2025. The final standards were established in 2012 and were projected to result in an average industry fleetwide level of 163 grams/mile of carbon dioxide (CO2) in model year 2025, which is equivalent to 54.5 miles per gallon (mpg) if achieved exclusively through fuel economy improvements.

The EPA and the U.S. Department of Transportation also implemented the first national standards to reduce greenhouse gas emissions and improve the fuel efficiency of medium-

and heavy-duty engines and vehicles trucks and buses in 2010. The standards applied to all on-road vehicles rated at a gross vehicle weight at or above 8,500 pounds, and the engines that power them, except those covered by the current GHG emissions and CAFE standards for light duty vehicles, for model year 2014 to 2018. In 2016, the EPA and NHTSA finalized phase 2 of the standards which applied to model years 2018 through 2027.

Under the direction of the current Trump administration, the NHTSA and EPA propose to amend the Corporate Average Fuel Economy (CAFE) and greenhouse gas emissions standards for passenger cars and light trucks and establish new standards, covering model years 2021 through 2026.

Mandatory Reporting of Greenhouse Gases. On January 1, 2010, the EPA started requiring large emitters of heat-trapping emissions to begin collecting GHG data under a new reporting system. Under the rule, suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of greenhouse gas emissions are required to submit annual reports to the EPA.

Climate Adaptation Planning. The EPA's Climate Change Adaptation Plan identifies priority actions the EPA will take to incorporate considerations of climate change into its programs, policies, rules and operations to ensure they are effective under future climatic conditions. Under the Trump administration, the EPA has said it would continue to advance climate adaptation efforts and that the agency recognizes the challenges that communities face in adapting to a changing climate. The EPA currently runs the Climate Change Adaptation Resource Center (ARC-X) to help local governments prepare for climate change.

3.4 GHG Regulatory Setting – State of California

Tables 9 and 10 show the current climate change legislation and executive orders issued in the State of California.

Table 9
California Climate Change Legislation

Date	Legislation	Description
July 26, 2017	Assembly Bill 617 (Christina Garcia, Chapter 136, Statutes of 2017)	Companion to Cap-and-Trade Extension Establishes a groundbreaking program to measure and reduce air pollution from mobile and stationary sources at the neighborhood level in the communities most impacted by air pollutants. Requires the Air Resources Board to work closely with local air districts and communities to establish neighborhood air quality monitoring networks and to develop and implement plans to reduce emissions. The focus on community-based air monitoring and emission reductions will provide a national model for enhanced community protection.
July 25, 2017	Assembly Bill 398 (Eduardo Garcia, Chapter 135, Statutes of 2017)	Cap-and-Trade Extension Extends and improves the Cap and Trade Program, which will enable the state to meet its 2030 emission reduction goals in the most cost-effective manner. Furthermore, extending the Cap and Trade Program will provide billions of dollars in auction proceeds to invest in communities across California.
September 19, 2016	Senate Bill 1383 (Lara, Chapter 395, Statutes of 2016)	Short-lived Climate Pollutants Establishes statewide reduction targets for short-lived climate pollutants.
September 8, 2016	Assembly Bill 197 (Eduardo Garcia, Chapter 250, Statutes of 2016)	**Greenhouse gas regulations** Prioritizes direct emission reductions from large stationary sources and mobile sources.
September 8, 2016	Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016)	**Greenhouse Gas emission reduction target for 2030** Establishes a statewide greenhouse gas (GHG) emission reduction target of 40 percent below 1990 levels by 2030.
October 7, 2015	Senate Bill 350 (De León, Chapter 547, Statutes of 2015)	**Clean Energy and Pollution Reduction Act of 2015** Establishes targets to increase retail sales of renewable electricity to 50 percent by 2030 and double the energy efficiency savings in electricity and natural gas end uses by 2030.
September 21, 2014	Senate Bill 605 (Lara, Chapter 523, Statutes of 2014)	**Short-lived climate pollutants** Requires the State Air Resources Board to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants by January 1, 2016.

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Table 9
California Climate Change Legislation

Date	Legislation	Description
September 21, 2014	Senate Bill 1275 (De León, Chapter 530, Statutes of 2014)	**Charge Ahead California Initiative** Establishes a state goal of 1 million zero-emission and near-zero-emission vehicles in service by 2020. Amends the enhanced fleet modernization program to provide a mobility option. Establishes the Charge Ahead California Initiative requiring planning and reporting on vehicle incentive programs, and increasing access to and benefits from zero-emission vehicles for disadvantaged, low-income, and moderate-income communities and consumers.
September 21, 2014	Senate Bill1204 (Lara, Chapter 524, Statutes of 2014)	**California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology Program** Creates the California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology Program funded by the Greenhouse Gas Reduction Fund for development, demonstration, precommercial pilot, and early commercial deployment of zero- and near-zero emission truck, bus, and off-road vehicle and equipment technologies, with priority given to projects benefiting disadvantaged communities.
September 28, 2013	Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013)	Alternative fuel and vehicle technologies: funding programs Extends until January 1, 2024, extra fees on vehicle registrations, boat registrations, and tire sales in order to fund the AB 118, Carl Moyer, and AB 923 programs that support the production, distribution, and sale of alternative fuels and vehicle technologies and air emissions reduction efforts. The bill suspends until 2024 ARB's regulation requiring gasoline refiners to provide hydrogen fueling stations and appropriates up to $220 million, of AB 118 money to create a hydrogen fueling infrastructure in the state.
September 28, 2013	Assembly Bill 1092 (Levine, Chapter 410, Statutes of 2013)	Building standards: electric vehicle charging infrastructure Requires the Building Standards Commission to adopt mandatory building standards for the installation of future electric vehicle charging infrastructure for parking spaces in multifamily dwellings and nonresidential development.

Table 9
California Climate Change Legislation

Date	Legislation	Description
September 30, 2012	Senate Bill 535 (De León, Chapter 830, Statutes of 2012)	Greenhouse Gas Reduction Fund and Disadvantaged Communities Requires the California Environmental Protection Agency to identify disadvantaged communities; requires that 25% of all funds allocated pursuant to an investment plan for the use of moneys collected through a cap-and-trade program be allocated to projects that benefit disadvantaged communities and 10 those 25% be use within disadvantaged communities; and requires the Department of Finance to include a description of how these requirements are fulfilled in an annual report.
September 30, 2012	Assembly Bill 1532 (J. Perez, Chapter 807, Statutes of 2012)	Greenhouse Gas Reduction Fund in the Budget Requires the Department of Finance to develop and submit to the Legislature an investment plan every three years for the use of the Greenhouse Gas Reduction Fund; requires revenue collected pursuant to a market-based compliance mechanism to be appropriated in the Annual Budget Act; requires the department to report annually to the Legislature on the status of projects funded; and specifies that findings issued by the Governor related to "linkage" as part of a market-base compliance mechanism are not subject to judicial review.
April 12, 2011	Senate Bill X1-2 (Simitian, Chapter 1, Statutes of 2011)	Governor Edmund G. Brown, Jr. signed Senate Bill X1-2 into law to codify the ambitious 33 percent by 2020 goal. SBX1-2 directs California Public Utilities Commission's Renewable Energy Resources Program to increase the amount of electricity generated from eligible renewable energy resources per year to an amount that equals at least 20% of the total electricity sold to retail customers in California per year by December 31, 2013, 25% by December 31, 2016 and 33% by December 31, 2020. The new RPS goals applies to all electricity retailers in the state including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. This new RPS preempts the California Air Resources Boards' 33 percent Renewable Electricity Standard.
September 29, 2011	Assembly Bill 1504 (Skinner, Chapter 534, Statutes of 2010)	Forest resources and carbon sequestration. Bill requires Department of Forestry and Fire Protection and Air Resources Board to assess the capacity of its forest and rangeland regulations to meet or exceed the state's greenhouse goals, pursuant to AB 32.

Table 9
California Climate Change Legislation

Date	Legislation	Description
September 30, 2008	Senate Bill 375 (Steinberg, Chapter 728, Statutes of 2008)	Sustainable Communities & Climate Protection Act of 2008 requires Air Resources Board to develop regional greenhouse gas emission reduction targets for passenger vehicles. ARB is to establish targets for 2020 and 2035 for each region covered by one of the State's 18 metropolitan planning organizations.
October 14, 2007	Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007)	Alternative Fuels and Vehicles Technologies The bill would create the Alternative and Renewable Fuel and Vehicle Technology Program, to be administered by the Energy Commission, to provide funding to public projects to develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies.
August 24, 2007	Senate Bill 97 (Dutton, Chapter 187, Statutes of 2007)	Directs Governor's Office of Planning and Research to develop CEQA guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions."
July 18. 2006	Assembly Bill 1803 (Committee on Budget, Chapter 77, Statutes of 2006)	Greenhouse gas inventory transferred to Air Resources Board from the Energy Commission.
August 21, 2006	Senate Bill 1 (Murray, Chapter 132, Statutes of 2006)	California's Million Solar Roofs plan is enhanced by PUC and CEC's adoption of the California Solar Initiative. SB1 directs PUC and CEC to expand this program to more customers and requiring the state's municipal utilities to create their own solar rebate programs. This bill would require beginning January 1, 2011, a seller of new homes to offer the option of a solar energy system to all customers negotiating to purchase a new home constructed on land meeting certain criteria and to disclose certain information.
September 26, 2006	Senate Bill 107 (Simitian, Chapter 464, Statutes of 2006)	SB 107 directs California Public Utilities Commission's Renewable Energy Resources Program to increase the amount of renewable electricity (Renewable Portfolio Standard) generated per year, from 17% to an amount that equals at least 20% of the total electricity sold to retail customers in California per year by December 31, 2010.

Table 9
California Climate Change Legislation

Date	Legislation	Description
September 27, 2006	Assembly Bill 32 (Núñez, Chapter 488, Statutes of 2006)	California Global Warming Solutions Act of 2006. This bill would require Air Resources Board (ARB) to adopt a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020. ARB shall adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program. AB 32 directs Climate Action Team established by the Governor to coordinate the efforts set forth under Executive Order S-3-05 to continue its role in coordinating overall climate policy.
September 12, 2002	Senate Bill 1078 (Sher, Chapter 516, Statutes of 2002)	This bill establishes the California Renewables Portfolio Standard Program, which requires electric utilities and other entities under the jurisdiction of the California Public Utilities Commission to meet 20% of their renewable power by December 31, 2017 for the purposes of increasing the diversity, reliability, public health and environmental benefits of the energy mix.
September 7, 2002	Senate Bill 812 (Sher, Chapter 423, Statutes of 2002)	This bill added forest management practices to the California Climate Action Registry members' reportable emissions actions and directed the Registry to adopt forestry procedures and protocols to monitor, estimate, calculate, report and certify carbon stores and carbon dioxide emissions that resulted from the conservation-based management of forests in California.
July 22, 2002	Assembly Bill 1493 (Pavley, Chapter 200, Statutes of 2002)	The "Pavley" bill requires the registry, in consultation with the State Air Resources Board, to adopt procedures and protocols for the reporting and certification of reductions in greenhouse gas emissions from mobile sources for use by the state board in granting the emission reduction credits. This bill requires the state board to develop and adopt, by January 1, 2005, regulations that achieve the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks.
October 11, 2001	Senate Bill 527 (Sher, Chapter 769, Statutes of 2001)	This bill revises the functions and duties of the California Climate Action Registry and requires the Registry, in coordination with CEC to adopt third-party verification metrics, developing GHG emissions protocols and qualifying third-party organizations to provide technical assistance and certification of emissions baselines and inventories. SB 527 amended SB 1771 to emphasize third-party verification.

Table 9
California Climate Change Legislation

Date	Legislation	Description
September 30, 2000	Senate Bill 1771 (Sher, Chapter 1018, Statutes of 2000)	SB 1771 establishes the creation of the non-profit organization, the California Climate Action Registry and specifies functions and responsibilities to develop a process to identify and qualify third-party organizations approved to provide technical assistance and advice in monitoring greenhouse gas emissions and setting greenhouse gas (GHG) emissions baselines in coordination with CEC. Also, the bill directs the Registry to enable participating entities to voluntarily record their annual GHG emissions inventories. Also, SB 1771 directs CEC to update the state's greenhouse gas inventory from an existing 1998 report and continuing to update it every five years.
September 28, 1988	Assembly Bill 4420 (Sher, Chapter 1506, Statutes of 1988)	The California Energy Commission (CEC) was statutorily directed to prepare and maintain the inventory of greenhouse gas emissions (GHG) and to study the effects of GHGs and the climate change impacts on the state's energy supply and demand, economy, environment, agriculture, and water supplies. The study also required recommendations for avoiding, reducing, and addressing related impacts - and required the CEC to coordinate the study and any research with federal, state, academic, and industry research projects.

[1] Source: http://www.climatechange.ca.gov/state/legislation.html

Table 10
California Climate Change Executive Orders

Date	Governor's Executive Order	Description
July 17, 2015	Executive Order # B-32-15	EO-B-32-15 directs State agencies to develop an integrated freight action plan by July 2016. Among other things, the plan calls for targets for transportation efficiency and a transition to near-zero-emission technologies.
April 29, 2015	Executive Order # B-30-15	EO-B-30-15 sets a greenhouse gas (GHG) emissions target for 2030 at 40 percent below 1990 levels.
April 25, 2012	Executive Order # B-18-12	EO-B-18-12 calls for significant reductions in state agencies' energy purchases and GHG emissions. The Executive Order included a Green Building Action Plan, which provided additional details and specific requirements for the implementation of the Executive Order
March 23, 2012	Executive Order # B-16-12	EO-B-16-12 orders State agencies to facilitate the rapid commercialization of zero-emission vehicles (ZEVs). The Executive Order sets a target for the number of 1.5 million ZEVs in California by 2025. Also, the Executive Order sets as a target for 2050 a reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels.
November 14, 2008	Executive Order # S-13-08	EO-S-13-08 directs state agencies to plan for sea level rise and climate impacts through coordination of the state Climate Adaptation Strategy.
January 18, 2007	Executive Order # S-01-07	EO-S-01-07 establishes the 2020 target and Low Carbon Fuel Standard. The EO directs the Secretary of Cal/EPA as coordinator of 2020 target activities and requires the Secretary to report back to the Governor and Legislature biannually on progress toward meeting the 2020 target.
October 18, 2006	Executive Order # S-20-06	EO-S-20-06 establishes responsibilities and roles of the Secretary of Cal/EPA and state agencies in climate change.
April 25, 2006	Executive Order # S-06-06	EO-S-06-06 directs Secretary of Cal/EPA to participate in the Bio-Energy Interagency Working Group and addresses biofuels and bioenergy from renewable resources.
June 1, 2005	Executive Order # S-03-05	EO-S-3-05 establishes greenhouse gas emission reduction targets, creates the Climate Action Team and directs the Secretary of Cal/EPA to coordinate efforts with meeting the targets with the heads of other state agencies. The EO requires the Secretary to report back to the Governor and Legislature biannually on progress toward meeting the GHG targets, GHG impacts to California, Mitigation and Adaptation Plans.
December 14, 2004	Executive Order # S-20-04	EO-S-20-04 (Green Buildings) directs state agencies to reduce energy use in state owned buildings by 20% by 2015 and increase energy efficiency.

[1] Source: http://www.climatechange.ca.gov/state/executive_orders.html

3.5 City of Whittier General Plan Air Quality Element

The City of Whittier describes several goals and policies for addressing air quality and greenhouse gas in the General Plan Environmental Resources Element. The City of Whittier recognizes the importance of ongoing land use planning, development, and public education measures to reduce air pollution.

The project should comply with all applicable goals and polices of the General Plan in order to have a less than significant impact. The broad goals of the General Plan related to air quality are as follows:

Goal 6: Reduce emissions associated with energy consumption.

Policy 6.2: Encourage incorporation of energy conservation features in new developments and in the renovation of existing development.

Policy 6.3: Support passive solar design in new construction.

Policy 6.4: Support public participation in recycling programs to reduce emissions associated with manufacture and waste disposal.

Policy 6.5: Support use of drought-resistant vegetation in City landscaping areas and new development to reduce energy needed to pump water.

Goal 7: Reduce fugitive dust emissions.

Policy 7.1: Encourage feasible fugitive dust reduction techniques to be utilized during construction activities.

Policy 7.2: Support the use of efficient equipment procedures in cleaning streets and parking areas.

Policy 7.3: Support subdivision design which minimizes grading and maintains the natural topography to the maximum extent feasible.

Goal 8: Reduce potential air pollution emission and impacts through siting and building design standards.

Policy 7.1: Support the use of low polluting construction materials and coatings.

Policy 7.2: Assess the air pollution impacts of all projects uniformly.

Policy 7.3: Actively encourage the separation of sensitive receptors from potential carbon monoxide hotspots.

Policy 7.3: Encourage the provision of bus shelters, turn-out lanes, etc. in new developments to promote the use of public transit.

3.6 GHG Emissions Inventory

Table 11 shows the latest GHG emission inventories at the national, state, regional and local levels.

Table 11
GHG Emissions Inventory[1]

United States (2016)[2]	State of California (2016)[3]	SCAG (2008)[4]	City of Whittier
6,511 $MMTCO_2e$	429 $MMTCO_2e$	230.7 $MMTCO_2e$	--

$MMTCO_2e$ = Million Metric Tons of Carbon Dioxide Equivalent

[2] https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

[3] https://www.arb.ca.gov/cc/inventory/data/data.htm

[4] http://www.scag.ca.gov/programs/Pages/GreenhouseGases.aspx

4.0 Modeling Parameters and Assumptions

The California Emissions Estimator Model Version 2016.3.2 (CalEEMod) was used to calculate criteria air pollutants and GHG emissions from the construction and operation of the project. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify criteria air pollutant and GHG emissions.

The model quantifies direct emissions from construction and operation activities (including vehicle use), as well as indirect emissions, such as GHG emissions from off-site energy generation, solid waste disposal, vegetation planting and/or removal, and water use. The model also identifies mitigation measures to reduce criteria pollutant and GHG emissions. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California air districts.

It should be noted that the project site plan has been slightly modified compared to the plan that what was originally used in this air quality and GHG analysis. The changes to the latest site plan resulted in a net decrease of one (1) dwelling unit. However, the quantified emissions analysis presented in this report is still based on the original plan of 26 dwelling units. As a result, the findings of this report are conservative and the overall impact from the modified project would be slightly less than reported. No additional sources of pollution or impacts would result from the modified plan.

4.1 Construction Assumptions

Construction of the project is assumed to begin in the year 2021 and last approximately 17 months. Construction activity will consist of demolition of approximately 27,879 square feet of buildings, site preparation, grading, building construction, paving, and architectural coating. The grading phase requires soil import of approximately 8,905 cubic yard of fill materials. Construction phases are not expected to overlap.

The project's construction schedule is based on the project phasing and description provided by the applicant. The demolition phase will take approximately two months, grading phase will take approximately one month, and the building construction phase is scheduled to last 12 months. Site preparation, paving and architectural coating phase duration are based on the CalEEMod defaults.

The CalEEMod default construction equipment list is based on survey data and the size of the site. The parameters used to estimate construction emissions, such as the worker and

vendor trips and trip lengths, utilize the CalEEMod defaults. The construction equipment list is shown in Table 12.

The quantity of fugitive dust estimated by CalEEMod is based on the number of equipment used during site preparation and grading. CalEEMod estimates the worst-case fugitive dust impacts will occur during the grading phase. The maximum daily disturbance footprint would be 2.0 acres per 8-hour day with all equipment in use.

Based on recent discussions with SCAQMD, the Fact Sheet for Applying CalEEMod to Localized Significance Thresholds should no longer be used to determine disturbance acreage.

Table 12
Construction Equipment Assumptions Phase [1]

Phase	Equipment	Amount	Hours Per Day	Soil Disturbance Rate (Acres/ 8hr-Day)	Equipment Daily Disturbance Footprint (Acres)	Total Phase Daily Disturbance Footprint (Acres)
Demolition	Concrete/Industrial Saws	1	8	0.0	0.0	2.0
	Rubber Tired Dozers	1	8	0.5	0.5	
	Tractors/Loaders/Backhoes	3	8	0.5	1.5	
Site Preparation	Graders	1	8	0.5	0.5	1.4
	Scrapers	1	8	0.5	0.5	
	Tractors/Loaders/Backhoes	1	7	0.5	0.4	
Grading	Graders	1	8	0.5	0.5	1.9
	Rubber Tired Dozers	1	8	0.5	0.5	
	Tractors/Loaders/Backhoes	2	7	0.5	0.875	
Building Construction	Cranes	1	8	0.0	0.0	0.4
	Forklifts	2	7	0.0	0.0	
	Generator Sets	1	8	0.0	0.0	
	Tractors/Loaders/Backhoes	1	6	0.5	0.4	
	Welders	3	8	0.0	0.0	
Paving	Cement and Mortar Mixers	1	8	0.0	0.0	0.5
	Pavers	1	8	0.0	0.0	
	Paving Equipment	1	8	0.0	0.0	
	Rollers	2	8	0.0	0.0	
	Tractors/Loaders/Backhoes	1	8	0.5	0.5	
Architectural Coating	Air Compressors	1	6	0.0	0.0	0.0

[1] CalEEMod Defaults

4.2 Localized Construction Analysis Modeling Parameters

CalEEMod calculates construction emissions based on the number of equipment hours and the maximum daily disturbance activity possible for each piece of equipment. This report identifies the following parameters in the project design or applicable mitigation measures in order to compare CalEEMod reported emissions against the localized significance threshold lookup tables:

1) The off-road equipment list (including type of equipment, horsepower, and hours of operation) assumed for the day of construction activity with maximum emissions.
2) The maximum number of acres disturbed on the peak day.
3) Any emission control devices added onto off-road equipment.
4) Specific dust suppression techniques used on the day of construction activity with maximum emissions.

4.3 Operational Assumptions

Operational emissions occur over the life of the project and are considered "long-term" sources of emissions. Operational emissions include both direct and indirect sources. This section briefly describes the operational sources of emissions analyzed for the project.

4.3.1 Mobile Source Emissions

Mobile source emissions are the largest source of long-term air pollutants from the operation of the project. Mobile sources are direct sources of project emissions that are primarily attributed to tailpipe exhaust and road dust (tire, brake, clutch, and road surface wear) from motor vehicles traveling to and from the site.

Estimates of mobile source emissions require information on four parameters: trip generation, trip length, vehicle/fleet mix, and emission factors (quantity of emission for each mile traveled or time spent idling by each vehicle).

The trip generation rates for this project are based on the Whittier Floral Residential Project Traffic Impact Analysis and Parking Study, March 2021, and the latest version of the ITE Trip Generation Manual.

Trip summary information is shown in Table 13.

Table 13
Trip Generation Rates

Land Use	ITE Code	Units[1]	Daily Trip Rate[2]		
			Weekday	Saturday	Sunday
Single Family Housing	210	DU	9.44	9.54	8.55
Church	560	TSF	6.95	5.99	27.63

[1] DU = Dwelling Unit; TSF = Thousand Square Feet
[2] Source: ITE Trip Generation Manual 10th Edition

Operational vehicle trip assumptions include trip lengths, trip type, and diverted/pass-by trips. The CalEEMod default trip assumptions are shown in Table 14.

Table 14
Operational Vehicle Trip Assumptions[1]

Land Use	Residential Trips[2]								
	Trip Length (miles)			Trip Percent (%)			Trip Type (%)		
	H-W	H-S	H-O	H-W	H-S	H-O	Prim.	Divert	Pass-By
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Church	16.60	8.40	6.90	0.00	95.0	5.0	64	25	11

[1] CalEEMod Defaults
[2] Residential Trips:
H-W = Home-Work; H-S = Home-Shopping; H-O = Home-Other.

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The Emission Factors (EMFAC) 2014 model is used to estimate the mobile source emissions are embedded in the CalEEMod emissions model. No adjustments have been made to default emission factors.

The project's total vehicle miles traveled is shown in the table 15 for this project.

Table 15
Operational Vehicle Miles Traveled

Land Use	Annual Vehicle Miles Traveled (VMT)
Single Family Housing	828,679
Church	58,536
Total	**887,215**

[1] CalEEMod Defaults

The operational vehicle fleet mix is shown in Table 16. The fleet mix for the project is based on CalEEMod default.

Table 16
Vehicle Mix for Trips[1]

YUY	Vehicle Mix (%)
Light Duty Automobile (LDA)	54.65%
Light Duty Truck (LDTI)	4.50%
Light Duty Truck (LDT2)	20.40%
Medium Duty Truck (MDV)	12.04%
Light Heavy Truck (LHD1)	1.57%
Light Heavy Truck (LHD2)	0.62%
Medium Heavy Truck (MHD)	2.01%
Heavy Heavy Truck (HHD)	3.07%
Other Bus (OBUS)	0.25%
Urban Bus (UBUS)	0.22%
Motorcycle (MCY)	0.51%

Table 16
Vehicle Mix for Trips[1]

YUY	Vehicle Mix (%)
School Bus (SBUS)	0.07%
Motor Home (MH)	0.09%
Total	**100.0%**

[1] CalEEMod defaults

4.3.2 Energy Source Emissions

Energy usage includes both direct and indirect sources of emissions. Direct sources of emissions include on-site natural gas usage (non-hearth) for heating, while indirect emissions include electricity generated by offsite power plants. Natural gas use is measured in units of a thousand British Thermal Units (kBTU) per size metric for each land use subtype and electricity use is measured in kilowatt hours (kWh) per size metric for each land use subtype.

CalEEMod divides building electricity and natural gas use into uses that are subject to Title 24 standards and those that are not. Lighting electricity usage is also calculated as a separate category in CalEEMod. For electricity, Title 24 uses include the major building envelope systems covered by Part 6 (California Energy Code) of Title 24, such as space heating, space cooling, water heating, and ventilation. Non-Title 24 uses include all other end uses, such as appliances, electronics, and other miscellaneous plug-in uses. Because some lighting is not considered as part of the building envelope energy budget, and since a separate mitigation measure is applicable to this end use, CalEEMod makes lighting a separate category.

For natural gas, uses are likewise categorized as Title 24 or Non-Title 24. Title 24 uses include building heating and hot water end uses. Non-Title 24 natural gas uses include cooking and appliances (including pool/spa heaters).

The baseline values are based on the California Energy Commission (CEC) sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies.

Table 17 shows the total annual expected electricity and natural gas usage for the proposed project.

Table 17
Electricity and Natural Gas Usage

Land Use	Electricity Usage[1] (KWhr/yr)[2]	Natural Gas Usage[1] (KBTU/yr)[2]
Single Family Housing	213,416	714,339
Church	31,179.9	50,842.9
Total	**244,595.9**	**765,518.9**

[1] CalEEMod default estimates.

[2] KWhr/yr = Kilowatt Hours per Year
KBTU/yr = Thousand British Thermal Units per Year

4.3.3 Area Source Emissions

Area source emissions are direct sources of emissions that fall under four categories; hearths, consumer products, architectural coatings, and landscaping equipment. Per SCAQMD rule 445, no wood burning devices are allowed in new developments; therefore, no wood hearths are included in this project.

Consumer products are various solvents used in non-industrial applications which emit ROGs during their product use. These typically include cleaning supplies, kitchen aerosols, cosmetics and toiletries.

4.3.4 Other Sources of Operational Emissions

Water. Greenhouse gas emissions are generated from the upstream energy required to supply and treat the water used on the project site. Indirect emissions from water usage are counted as part of the project's overall impact. The estimated water usage for the project is reported in Table 18 and recommendations to reduce water usage are discussed in Section 6.0.

Waste. CalEEMod calculates the indirect GHG emissions associated with waste that is disposed of at a landfill. The program uses annual waste disposal rates from the California Department of Resources Recycling and Recovery (CalRecycle) data for individual land uses. The program quantifies the GHG emissions associated with the decomposition of the waste which generates methane based on the total amount of degradable organic carbon.
The estimated waste generation by the project is reported in Table 18 and recommendations to reduce waste generation in landfills are discussed in Section 6.0

Table 18
Operational Water Usage and Waste Generation

Land Use	Water Usage (gallons/year)			Waste Generation (tons/year)[1]
	Indoor	Outdoor	Total	
Single Family Housing	1,694,005	1,067,959	2,761,964	30.34
Church	87,922	137,519	225,441	16.02
Total	**1,781,927**	**1,205,478**	**2,987,405**	**46.36**

[1] CalEEMod default estimates.

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5.0 Significance Thresholds

5.1 Air Quality Regional Significance Thresholds

The SCAQMD has established air quality emissions thresholds for criteria air pollutants for the purposes of determining whether a project may have a significant effect on the environment per Section 15002(g) of the Guidelines for implementing CEQA. By complying with the thresholds of significance, the project would be in compliance with the SCAQMD Air Quality Management Plan (AQMP) and the federal and state air quality standards.

Table 19 lists the air quality significance thresholds for the six air pollutants analyzed in this report. Lead is not included as part of this analysis as the project is not expected to emit lead in any significant measurable quantity.

Table 19
SCAQMD Regional Significance Thresholds

Pollutant	Construction (lbs/day)	Operation (lbs/day)
NO_X	100	55
VOC	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
CO	550	550

[1] Source: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf

5.2 Air Quality Localized Significance Thresholds

Air quality emissions were analyzed using the SCAQMD's Mass Rate Localized Significant Threshold (LST) Look-up Tables.

Table 20 lists the Localized Significance Thresholds (LST) used to determine whether a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard.

LSTs are developed based on the ambient concentrations of four applicable air pollutants for source receptor area (SRA) 5 – Southeast Los Angeles County.

The nearest existing sensitive receptors are located along the northern, southern and eastern property line of the site, less than 25 meters from potential areas of on-site construction and operational activity. Although receptors are located closer than 25 meters to the site, SCAQMD LST methodology states that projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters.

The daily disturbance area is calculated to be 2 acres, LST threshold for 2-acre disturbance area has been used.

Table 20
SCAQMD Localized Significance Thresholds[1] (LST)

Pollutant	Construction (lbs/day)	Operational (lbs/day)
NO_X	114.0	114.0
CO	861.0	861.0
PM_{10}	7.0	2.0
$PM_{2.5}$	4.0	1.0

[1] Source: SCAQMD Mass Rate Localized Significance Thresholds for 2-acre site in SRA-5 at 25 meters

5.3 Microscale CO Concentration Standards

The significance of localized CO impacts depends on whether ambient CO levels in the vicinity of the project are above or below federal or state standards. If ambient levels are below the standards, a project is considered to have a significant impact if project emissions result in an exceedance of the AAQS. If ambient levels already exceed State or federal standards, project emissions are considered significant if they increase 1-hour CO concentrations by 1.0 ppm or more or 8-hour CO concentrations by 0.45 ppm or more.

Current CO levels in the SCAB are in attainment of both federal and state standards, and local air quality monitoring data indicates there have not been any localized exceedances of CO over the past three years. Therefore, the project must not contribute to an exceedance of a federal or state ambient air quality standard.

5.4 GHG Significance Thresholds

5.4.1 SCAQMD Recommended GHG Thresholds

For quantifiable analysis purposes, the project GHG emissions are also compared to the SCAQMD *Interim CEQA Greenhouse Gas (GHG) Significance Thresholds, December 2008.* The purpose of the SCAQMD thresholds of significance is to assist local agencies with determining the impact of a project for CEQA. SCAQMD's objective in providing the GHG guidelines is to establish a performance standard that will ultimately contribute to reducing GHG emissions below 1990 levels, and thus achieve the requirements of the California Global Warming Solutions Act (AB 32). The SCAQMD has held several GHG Significance Thresholds Stakeholder Working Group meetings where staff has presented updated recommendations that serve in addendum to the interim document.

The SCAQMD describes a five-tiered approach for determining GHG Significance Thresholds.

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

- **Tier 2 -** 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.

For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment based on the following tiers.

- **Tier 3 -** Consists of screening values that are intended to capture 90 percent of the GHG emissions from projects. If a project's emissions are under the screening thresholds, then the project is less than significant. SCAQMD has presented two options that lead agencies could choose for screening values. Option #1 sets the thresholds for residential projects to 3,500 $MTCO_2e$/year, commercial projects to 1,400 $MTCO_2e$/year), and the mixed use to 3,000 $MTCO_2e$/year. Option #2 sets a single numerical threshold for all non-industrial projects of 3,000 $MTCO_2e$/year. The current staff recommendation is to use option #2, but allows lead agencies to choose option #1 if they prefer. Regardless of which option a lead agency chooses to follow, it is recommended that the same option is consistently used for all projects.

Table 21 shows the screening levels described in option #2, which has been used previously in the City of Whittier.

Table 21
SCAQMD Tier 3 GHG Screening Values

Land Use	Screening Value
Industrial Projects	10,000 $MTCO_2e/Yr$
Residential/Commercial Projects	3,000 $MTCO_2e/Yr$

- **Tier 4 -** includes three performance standard compliance options to demonstrate that a project is not significant for GHG emissions.

  Compliance Option 1 consists of achieving a target percentage reduction in emission compared to the business as usual (BAU) methodology. The project proponent would need to incorporate design features into the project and/or implement GHG mitigation measures to demonstrate a 30 percent reduction in GHG emissions below BAU that is consistent with the current applicable goals of AB 32 in the State of the California.

  Compliance Option 2 consists of early compliance with AB 32 through early implementation of CARB's Scoping Plan Measures. This option is intended for projects in sectors subject to the Scoping Plan Measures.

  Compliance Option 3 consists of establishing efficiency-based performance standards at the plan level (program-level projects such as general plans) and project level. Efficiency standards are based on the amount of GHG emissions ($MTCO_2e$/year) per Service Population (SP). SP is defined as the sum of the residential and employment populations provided by a project.

Table 22
SCAQMD Tier 4 Efficiency Thresholds

Project Type	Efficiency Thresholds[1]	
	Target Year 2020	Target Year 2035
Plan (Program) Level	6.6 $MTCO_2e/yr/SP$	4.1 $MTCO_2e/yr/SP$
Project Level	4.8 $MTCO_2e/yr/SP$	3.0 $MTCO_2e/yr/SP$

- **Tier 5 –** involves implementing off-site mitigation or the purchasing of offsets to reduce GHG emissions to less than the proposed screening level. The project proponent would be required to provide offsets for the life of the project, which is defined as 30 years.

By complying with the SCAQMD GHG thresholds of significance, the project is considered to be in compliance with the applicable State GHG legislation.

6.0 Air Quality Impact Analysis

Consistent with CEQA and the State CEQA Guidelines, a significant impact related to air quality would occur if the proposed project is determined to:

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

b) 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.

c) Expose sensitive receptors to substantial pollutant concentrations.

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

6.1 Short Term Air Quality Impacts - Construction

6.1.1 Regional Emissions - Construction

Regional air quality emissions include both on-site and off-site emissions associated with construction of the project. Regional daily emissions of criteria pollutants are compared to the SCAQMD regional thresholds of significance.

As shown in Table 23, regional daily emissions of criteria pollutants are expected to be below the allowable thresholds of significance.

CalEEMod daily emissions outputs are provided in Appendix A.

Table 23
Regional Construction Emissions - Unmitigated

Maximum Daily Emissions (lbs/day)[1]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Demolition	2.07	20.55	15.21	0.03	1.49	1.07
Site Preparation	1.58	18.31	11.07	0.03	1.40	0.74
Grading	2.22	31.48	12.80	0.05	4.30	2.39
Building Construction	2.10	16.35	15.08	0.03	0.96	0.82
Paving	1.00	9.37	12.25	0.02	0.66	0.50
Architectural Coating	32.10	1.41	1.89	0.00	0.10	0.09
Maximum[1]	33.10	31.48	15.08	0.05	4.30	2.39
SCAQMD Threshold	75	100	550	150	150	55
Exceeds Threshold (?)	**No**	**No**	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.

The project must follow all standard SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 6.1.3. Compliance with the dust control is considered a standard requirement and included as part of the project's design features, not mitigation.

Table 23 shows that, the project's daily construction emissions will be below the applicable SCAQMD regional air quality standards and thresholds of significance. As a result, the project would not contribute substantially to an existing or projected air quality violation.

Furthermore, by complying with the SCAQMD standards, the project would not contribute to 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The project's short-term construction impact on regional air resources is less than significant with mitigation.

6.1.2 Localized Emissions - Construction

Table 24 illustrates the construction related localized emissions and compares the results to SCAQMD LST thresholds. As shown in Table 24, the emissions will be below the SCAQMD thresholds of significance for localized construction emissions. The project must follow all standard SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 6.1.3. Compliance with the dust control is considered a standard requirement and included as part of the project's design features, not mitigation.

The project's short-term construction impact to localized air resources is less than significant.

Table 24
Localized Construction Emissions

Maximum Daily Emissions (lbs/day)[1]				
Activity	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$**
On-site Emissions	20.21	14.56	3.42	2.13
SCAQMD Construction Threshold[2]	114.0	861.0	7.0	4.0
Exceeds Threshold (?)	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes on-site project emissions only.
[2] Reference 2006-2008 SCAQMD Mass Rate Localized Significant Thresholds for construction and operation. SRA-5, Southeast LA County, 2-acre site, receptor distance 25 meters.

6.1.3 Fugitive Dust - Construction

The Project is required to comply with regional rules that assist in reducing short-term air pollutant emissions associated with suspended particulate matter, also known as fugitive dust. Fugitive dust emissions are commonly associated with land clearing activities, cut-and-fill grading operations, and exposure of soils to the air and wind. SCAQMD Rule 403 requires that fugitive dust is controlled with best-available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rules 402 and 403 require implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site.

Applicable suppression techniques are as follows:

1. All active construction areas shall be watered two (2) times daily.
2. Speed on unpaved roads shall be reduced to less than 15 mph.

3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.
8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.
12. A fugitive dust control plan should be prepared and submitted to SCAQMD prior to the start of construction.

Localized construction emissions, shown in Section 6.1.2, indicate daily construction emissions, with standard control measures, would be below the applicable thresholds established by the SCAQMD. **The proposed project's short-term construction activities would cause less than significant Fugitive Dust impacts.**

6.1.4 Odors - Construction

Heavy-duty equipment in the project area during construction will emit odors; however, the construction activity would cease to occur after individual construction is completed. The project is required to comply with Rule 402 during construction, which states that 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. No other sources of objectionable odors have been identified for the proposed Project. **Therefore, the project impact from odor emissions is less than significant.**

6.1.5 Asbestos - Construction

Based on the California Division of Mines and Geology General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos, naturally occurring asbestos, found in serpentine and ultramafic rock, has not been shown to occur within in the vicinity of the project site. Therefore, the potential risk for naturally occurring asbestos (NOA) during project construction is small. However, in the event NOA is found on the site, the project will be required to comply with the National Emission Standard for Hazardous Air Pollutants (NESHAP) standards. An Asbestos NESHAP Notification Form shall be completed and submitted to the CARB immediately upon discovery of the contaminant. The project will be required to follow NESHAP standards for emissions control during site renovation, waste transport and waste disposal. A person certified in asbestos removal procedures will be required to supervise on-site activities.

The project also includes demolition of existing structures (school buildings and gymnasium) that would be subject to the National Emissions Standards for Asbestos (40CFR Part 61 Subpart M). Prior to demolition of existing structures, an asbestos evaluation must be completed in accordance with the Asbestos NESHAP regulations. Section 61.145 requires written notification of demolition operations. Asbestos NESHAP demolition/Renovation Notification Form can be downloaded at http://www.arb.ca.gov/enf/asbestosform.pdf.

This notification should be typewritten and postmarked or delivered no later than ten (10) days prior to the beginning of the asbestos demolition or removal activity.

By following the required asbestos abatement protocols, **the project impact is less than significant**.

6.1.6 Diesel Particulate Matter - Construction

The greatest potential for toxic air contaminant emissions from the project would be related to diesel particulate matter (DPM) emissions associated with heavy diesel equipment used during construction. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 30-year lifetime will contract cancer, based on the use of standard risk-assessment methodology.

As shown in Tables 23 and 24, construction-based particulate matter (PM) emissions (including diesel exhaust emissions) do not exceed regional or local thresholds. Given the short-term construction schedule, the proposed project's construction activity is not expected to be a long-term (i.e., 30 years) substantial source of toxic air contaminant emissions and corresponding individual cancer risk.

However, it should be noted that a quantified diesel health risk assessment (HRA) was not included within the scope of this analysis. In September 2000, the CARB adopted the Diesel Risk Reduction Plan, which recommends several control measures to reduce the risks associated with diesel particulate matter (DPM). The key elements of the Plan are to clean up existing engines through engine retrofit emission control devices, to adopt stringent standards for new diesel engines, to lower the sulfur content of diesel fuel, and implement advanced technology emission control devices on diesel engines.

The project is located adjacent to a middle school with outdoor play areas facing the project site, therefore, in order to ensure the level of DPM exposure is reduced as much as possible, the project shall implement the best available pollution control strategies to minimize potential health risks. The following DPM control measures include:

- Utilize low emission "clean diesel" equipment with new or modified engines (Tier 4 or better) that include diesel oxidation catalysts, diesel particulate filters or Moyer Program retrofits that meet CARB best available control technology.

- Establish staging areas for the construction equipment that are as distant as possible from adjacent sensitive receptors;

- Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible;

- Use haul trucks with on-road engines instead of off-road engines for on-site hauling.

- Provide temporary dust barriers or construct perimeter walls during the first phase of construction.

6.2 Long Term Air Quality Impacts - Operation

6.2.1 Regional Emissions - Operation

Long-term operational air pollutant impacts from the project are shown in Table 25. The project is not expected to exceed any of the allowable daily emissions thresholds for criteria pollutants at the regional level. CalEEMod daily emissions outputs are provided in Appendix A.

The project's daily operational emissions will be below the applicable SCAQMD regional air quality standards and thresholds of significance, and the project would not contribute substantially to an existing or projected air quality violation. Furthermore, by complying with the SCAQMD standards, the project would not contribute to 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The project related long-term air quality impacts are less than significant.

Table 25
Regional Operational Emissions

Maximum Daily Emissions (lbs/day)[1]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Mobile Sources	0.48	2.27	6.42	0.02	1.91	0.52
Energy Sources	0.02	0.19	0.09	0.00	0.02	0.02
Area Sources	1.18	0.39	2.30	0.00	0.04	0.04
Total	1.68	2.86	8.81	0.03	1.97	0.58
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold (?)	**No**	**No**	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.

6.2.2 Localized Operational Emissions - Operation

Table 26 shows the localized operational emissions and compares the results to SCAQMD Localized Significance Thresholds (LST) thresholds of significance. As shown in Table 26, the emissions will be below the SCAQMD thresholds of significance for localized

operational emissions. **The project will result in less than significant localized operational emissions impacts.**

Table 26
Localized Operational Emissions

Maximum Daily Emissions (lbs/day)[1]				
LST Pollutants	NOx (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
On-site Emissions[2]	0.70	2.71	0.15	0.08
SCAQMD Operation Threshold[3]	114.0	861.0	2.0	1.0
Exceeds Threshold (?)	**No**	**No**	**No**	**No**

[1] Maximum daily emission in summer or winter.
[2] Mobile source emissions include on-site vehicle emissions only. It is estimated that approximately 5% of mobile emissions will occur on the project site.
[3] Reference: 2006-2008 SCAQMD Mass Rate Localized Significant Thresholds for construction and operation Table C-1 through C-6; SRA 5, Southeast Los Angeles County, disturbance area of 2-acre and receptor distance of 25 meters.

6.2.3 Odors - Operation

Land uses that commonly receive odor complaints include agricultural uses (farming and livestock), chemical plants, composting operations, dairies, fiberglass molding facilities, food processing plants, landfills, refineries, rail yards, and wastewater treatment plants. The proposed project does not contain land uses that would typically be associated with significant odor emissions.

The project will be required to comply with standard building code requirements related to exhaust ventilation, as well as comply with SCAQMD Rule 402. Rule 402 requires that a person may 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. Project related odors are not expected to meet the criteria of being a nuisance. **The project's operation would result in less than significant odor impacts.**

6.2.4 Toxic Air Contaminants - Operations

The project would consist of single family residential uses and a church. This type of project does not include major sources of toxic air contaminants (TAC) emissions that would result in significant exposure of sensitive receptors to substantial pollutant concentrations. Therefore, **the project impact is considered less than significant.**

6.3 CO Hot Spot Emissions

A CO hot spot is a localized concentration of carbon monoxide (CO) that is above the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm. At the time of the publishing of the 1993 CEQA Air Quality Handbook, the SCAB was designated nonattainment, and projects were required to perform hot spot analyses to ensure they did not exacerbate an existing problem. Since this time, the SCAB has achieved attainment status and the potential for hot spots caused by vehicular traffic congestion has been greatly reduced. In fact, the SCAQMD Air Quality Management Plan (AQMP) found that peak CO concentrations were primarily the result of unusual meteorological and topographical conditions, not traffic congestion. Additionally, the 2003 SCAQMD AQMP found that, at four of the busiest intersections in SCAB, there were no CO hot spots concentrations.

Furthermore, in the 2003 SCAQMD AQMP found that, at four of the busiest intersections in Los Angeles, there were no CO hot spots concentrations. Therefore, it is reasonable to conclude that the project would not significantly increase traffic congestion in the vicinity of the site that would lead to the formation of CO Hot Spots. **The project impact to CO Hot Spots is less than significant.**

6.4 SCAQMD Air Quality Management Plan Consistency

CEQA requires a discussion of any inconsistencies between a proposed project and applicable General Plans and Regional Plans (CEQA Guidelines Section 15125). The regional plan that applies to the proposed project includes the SCAQMD AQMP. Therefore, this section discusses any potential inconsistencies in the proposed project with the AQMP.

The purpose of this discussion is to set forth the issues regarding consistency with the assumptions and objectives of the AQMP and discuss whether the proposed project would interfere with the region's ability to comply with Federal and State air quality standards. If

the decision-makers determine that the proposed project is inconsistent, the lead agency may consider project modifications or inclusion of mitigation to eliminate the inconsistency.

The SCAQMD CEQA Handbook states that "New or amended General Plan Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP." Strict consistency with all aspects of the plan is usually not required. A proposed project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies.

The SCAQMD CEQA Handbook identifies two key indicators of consistency:

(1) Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.

(2) Whether the project will exceed the assumptions in the AQMP in 2016 or increments based on the year of project buildout and phase.

6.4.1 Criterion 1 - Increase in the Frequency or Severity of Violations

The results of the short-term construction emission levels and long-term operational emission levels show that the project would not result in significant impacts based on the SCAQMD regional and local thresholds of significance. Therefore, the proposed project would not contribute to the exceedance of an air pollutant concentration standard and is found to be consistent with the AQMP for the first criterion.

6.4.2 Criterion 2 - Exceed Assumptions in the AQMP

Consistency with the AQMP assumptions is determined by performing an analysis of the proposed project with the assumptions in the AQMP. The emphasis of this criterion is to ensure that the analyses conducted for the proposed project are based on the same forecasts as the AQMP. The 2016-2040 Regional Transportation/Sustainable Communities Strategy, prepared by the Southern California Association of Governments (SCAG), 2016, includes chapters on: the challenges in a changing region, creating a plan for our future, and the road to greater mobility and sustainable growth. These chapters currently respond directly to federal and state requirements placed on SCAG. Local governments are required

to use these as the basis of their plans for purposes of consistency with applicable regional plans under CEQA.

The project requires a General Plan amendment from Private School use to Medium Density Residential. The proposed project is expected to result in increased operational emissions from mobile sources and energy sources, compared to the previously approved use. However, as shown in the regional and localized emissions analysis, the project is below the SCAQMD thresholds of significant for cumulative impacts. **The impact is considered less than significant.**

7.0 Greenhouse Gas Impact Analysis

Consistent with CEQA Guidelines, a significant impact related to greenhouse gas would occur if the proposed project is determined to:

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

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

7.1 Greenhouse Gas Emissions - Construction

Greenhouse gas emissions are estimated for on-site and off-site construction activity using CalEEMod. Table 27 shows the construction greenhouse gas emissions, including equipment and worker vehicle emissions for all phases of construction. Construction emissions are averaged over 30 years and added to the long-term operational emissions, pursuant to SCAQMD recommendations.

CalEEMod annual GHG output calculations are provided in Appendix B.

Table 27
Construction Greenhouse Gas Emissions

Activity	Emissions ($MTCO_2e$)[1]		
	On-site	Off-site	Total
Demolition	44.53	7.55	52.08
Site Preparation	3.26	0.12	3.38
Grading	19.16	34.64	53.80
Building Construction	272.32	23.72	296.04
Paving	7.82	0.72	8.54
Architectural Coating	1.28	0.10	1.38
Total	303.84	59.30	363.14
Amortized over 30 years[2]	10.13	1.98	12.10

[1] $MTCO_2e$ = metric tons of carbon dioxide equivalents (includes carbon dioxide, methane, nitrous oxide, and/or hydrofluorocarbon).
[2] The emissions are amortized over 30 years and added to the operational emissions, pursuant to SCAQMD recommendations.

Because impacts from construction activities occur over a relatively short-term period of time, they contribute a relatively small portion of the overall lifetime project GHG emissions. By itself, the construction activities from this project are less than significant when compared to the thresholds recommended by SCAQMD. However, SCAQMD recommends that construction emissions be amortized over a 30-year project lifetime and added to the overall project operational emissions. In doing so, construction GHG emissions are included in the overall contribution of the project, as further discussed in the following section.

7.2 Greenhouse Gas Emissions - Operation

Greenhouse gas emissions are estimated for on-site and off-site operational activity using CalEEMod. Greenhouse gas emissions from mobile sources, area sources and energy sources are shown in Table 28. CalEEMod annual GHG output calculations are provided in Appendix B.

Table 28
Operational Greenhouse Gas Emissions

Emission Source	GHG Emissions ($MTCO_2e$)[1]
Mobile Source	377.54
Energy Source	119.29
Area Source	5.79
Water	14.13
Waste	23.31
Construction (30 year average)	12.10
Total Annual Emissions	**440.30**
SCAQMD Tier 3 Screening Threshold[2]	3,000
Exceed Tier 3 Threshold?	No

[1] $MTCO_2e$ = metric tons of carbon dioxide equivalents

[2] Per South Coast Air Quality Management District (SCAQMD) Draft Guidance Document - Interim CEQA Greenhouse Gas (GHG) Significance Threshold, October 2008

As shown in Table 28, the project GHG emissions are expected to be below the SCAQMD's Tier 3 approach, which limits GHG emissions to 3,000 $MTCO_2e$ for residential projects.

The project related long-term GHG impacts are less than significant.

8.0 References

The following references were used in the preparing this analysis.

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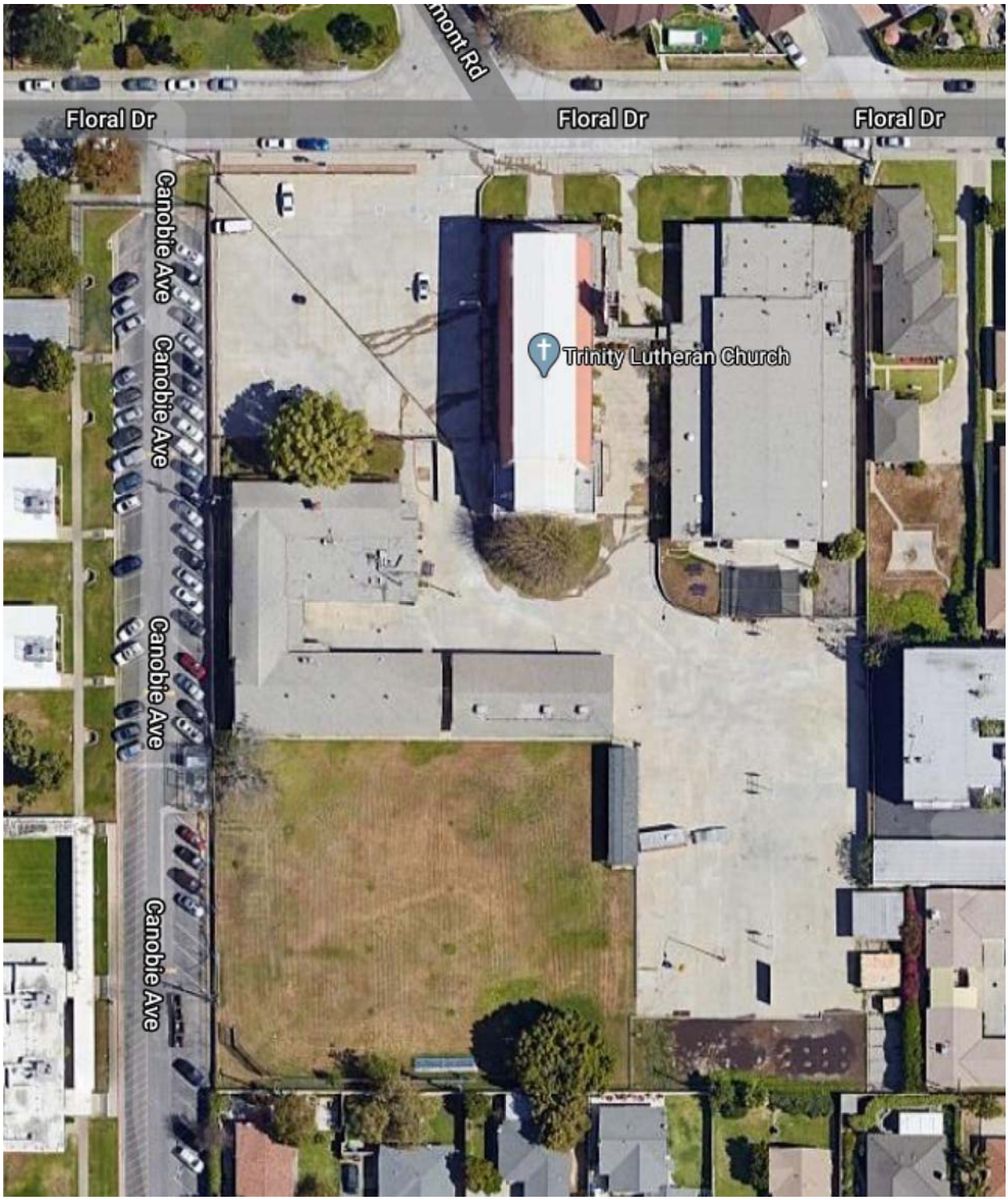
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Exhibits

Exhibit A
Location Map



N

Exhibit B
Site Plan



N

Appendices

Appendix A

Daily Emissions Calculations Output
(CalEEMod)

Whittier Floral Residential Project AQ & GHG Analysis

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Place of Worship	2.81	1000sqft	0.06	2,809.00	0
Single Family Housing	26.00	Dwelling Unit	2.56	46,800.00	74

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project would consist of constructing and operating 26 dwelling units of detached condominiums on a 2.56 acres site and 2809 s.f. of church expansion.

Construction Phase - Construction phase length is based on the information provided by the client.

Grading - The site requires grading and import of approximately 8,905 cubic yards of fill material to support the proposed development.

Demolition - A total of 27,879 sf of building area is expected to be demolished.

Vehicle Trips - Trip rates are based on Whittier Floral Residential Project TIA, RK Engineering 2020

Woodstoves - Per SCAQMD rule 445, no wood burning devices are allowed in new developments; therefore, no wood hearths are included in this project.

Water And Wastewater -

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	220.00	261.00
tblConstructionPhase	NumDays	20.00	42.00
tblConstructionPhase	NumDays	6.00	21.00
tblConstructionPhase	PhaseEndDate	1/12/2022	5/2/2022
tblConstructionPhase	PhaseEndDate	12/15/2021	4/4/2022
tblConstructionPhase	PhaseEndDate	1/28/2021	3/1/2021
tblConstructionPhase	PhaseEndDate	2/10/2021	4/2/2021
tblConstructionPhase	PhaseEndDate	12/29/2021	4/18/2022
tblConstructionPhase	PhaseEndDate	2/2/2021	3/4/2021
tblConstructionPhase	PhaseStartDate	12/30/2021	4/19/2022
tblConstructionPhase	PhaseStartDate	2/11/2021	4/3/2021
tblConstructionPhase	PhaseStartDate	2/3/2021	3/5/2021
tblConstructionPhase	PhaseStartDate	12/16/2021	4/5/2022
tblConstructionPhase	PhaseStartDate	1/29/2021	3/2/2021

tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	1.30	0.00
tblGrading	MaterialImported	0.00	8,905.00
tblLandUse	LandUseSquareFeet	2,810.00	2,809.00
tblLandUse	LotAcreage	8.44	2.56
tblVehicleTrips	ST_TR	10.37	5.99
tblVehicleTrips	ST_TR	9.91	9.54
tblVehicleTrips	SU_TR	36.63	27.63
tblVehicleTrips	SU_TR	8.62	8.55
tblVehicleTrips	WD_TR	9.11	6.95
tblVehicleTrips	WD_TR	9.52	9.44
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.2193	31.4837	15.2063	0.0544	7.3968	1.0446	8.3480	3.5980	0.9749	4.4743	0.0000	5,656.5014	5,656.5014	0.8895	0.0000	5,678.7386
2022	32.1009	14.9103	14.8341	0.0270	0.1677	0.7037	0.8458	0.0445	0.6745	0.7126	0.0000	2,491.8854	2,491.8854	0.5464	0.0000	2,503.1278
Maximum	**32.1009**	**31.4837**	**15.2063**	**0.0544**	**7.3968**	**1.0446**	**8.3480**	**3.5980**	**0.9749**	**4.4743**	**0.0000**	**5,656.5014**	**5,656.5014**	**0.8895**	**0.0000**	**5,678.7386**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.2193	31.4837	15.2063	0.0544	3.3508	1.0446	4.3019	1.5186	0.9749	2.3949	0.0000	5,656.5014	5,656.5014	0.8895	0.0000	5,678.7386
2022	32.1009	14.9103	14.8341	0.0270	0.1677	0.7037	0.8458	0.0445	0.6745	0.7126	0.0000	2,491.8854	2,491.8854	0.5464	0.0000	2,503.1278
Maximum	**32.1009**	**31.4837**	**15.2063**	**0.0544**	**3.3508**	**1.0446**	**4.3019**	**1.5186**	**0.9749**	**2.3949**	**0.0000**	**5,656.5014**	**5,656.5014**	**0.8895**	**0.0000**	**5,678.7386**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.49**	**0.00**	**44.01**	**57.09**	**0.00**	**40.09**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.1774	0.3914	2.3036	2.4500e-003		0.0415	0.0415		0.0415	0.0415	0.0000	471.8630	471.8630	0.0127	8.5800e-003	474.7373
Energy	0.0226	0.1940	0.0882	1.2300e-003		0.0156	0.0156		0.0156	0.0156		246.6341	246.6341	4.7300e-003	4.5200e-003	248.0997
Mobile	0.4765	2.2728	6.4160	0.0233	1.8909	0.0188	1.9097	0.5060	0.0175	0.5236		2,369.9072	2,369.9072	0.1188		2,372.8765
Total	**1.6765**	**2.8582**	**8.8078**	**0.0270**	**1.8909**	**0.0759**	**1.9668**	**0.5060**	**0.0747**	**0.5807**	**0.0000**	**3,088.4043**	**3,088.4043**	**0.1362**	**0.0131**	**3,095.7135**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.1774	0.3914	2.3036	2.4500e-003		0.0415	0.0415		0.0415	0.0415	0.0000	471.8630	471.8630	0.0127	8.5800e-003	474.7373
Energy	0.0226	0.1940	0.0882	1.2300e-003		0.0156	0.0156		0.0156	0.0156		246.6341	246.6341	4.7300e-003	4.5200e-003	248.0997
Mobile	0.4765	2.2728	6.4160	0.0233	1.8909	0.0188	1.9097	0.5060	0.0175	0.5236		2,369.9072	2,369.9072	0.1188		2,372.8765
Total	**1.6765**	**2.8582**	**8.8078**	**0.0270**	**1.8909**	**0.0759**	**1.9668**	**0.5060**	**0.0747**	**0.5807**	**0.0000**	**3,088.4043**	**3,088.4043**	**0.1362**	**0.0131**	**3,095.7135**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2021	3/1/2021	5	42	
2	Site Preparation	Site Preparation	3/2/2021	3/4/2021	5	3	
3	Grading	Grading	3/5/2021	4/2/2021	5	21	
4	Building Construction	Building Construction	4/3/2021	4/4/2022	5	261	
5	Paving	Paving	4/5/2022	4/18/2022	5	10	
6	Architectural Coating	Architectural Coating	4/19/2022	5/2/2022	5	10	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 10.5

Acres of Paving: 0

Residential Indoor: 94,770; Residential Outdoor: 31,590; Non-Residential Indoor: 4,214; Non-Residential Outdoor: 1,405; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Scrapers	1	8.00	367	0.48
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	127.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	880.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	11.00	3.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6534	0.0000	0.6534	0.0989	0.0000	0.0989			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715		2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**0.6534**	**1.0409**	**1.6943**	**0.0989**	**0.9715**	**1.0704**		**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0252	0.8111	0.1902	2.3600e-003	0.0529	2.4900e-003	0.0554	0.0145	2.3800e-003	0.0169		255.9492	255.9492	0.0174		256.3835
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0557	0.0383	0.5236	1.4900e-003	0.1453	1.1700e-003	0.1465	0.0385	1.0800e-003	0.0396		148.0401	148.0401	4.3600e-003		148.1491
Total	**0.0809**	**0.8494**	**0.7138**	**3.8500e-003**	**0.1982**	**3.6600e-003**	**0.2018**	**0.0530**	**3.4600e-003**	**0.0565**		**403.9893**	**403.9893**	**0.0217**		**404.5326**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2499	0.0000	0.2499	0.0378	0.0000	0.0378			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715	0.0000	2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**0.2499**	**1.0409**	**1.2908**	**0.0378**	**0.9715**	**1.0093**	**0.0000**	**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0252	0.8111	0.1902	2.3600e-003	0.0529	2.4900e-003	0.0554	0.0145	2.3800e-003	0.0169		255.9492	255.9492	0.0174		256.3835
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0557	0.0383	0.5236	1.4900e-003	0.1453	1.1700e-003	0.1465	0.0385	1.0800e-003	0.0396		148.0401	148.0401	4.3600e-003		148.1491
Total	**0.0809**	**0.8494**	**0.7138**	**3.8500e-003**	**0.1982**	**3.6600e-003**	**0.2018**	**0.0530**	**3.4600e-003**	**0.0565**		**403.9893**	**403.9893**	**0.0217**		**404.5326**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457		2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**1.5908**	**0.7019**	**2.2926**	**0.1718**	**0.6457**	**0.8175**		**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0343	0.0236	0.3222	9.1000e-004	0.0894	7.2000e-004	0.0901	0.0237	6.7000e-004	0.0244		91.1016	91.1016	2.6800e-003		91.1687
Total	**0.0343**	**0.0236**	**0.3222**	**9.1000e-004**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.7000e-004**	**0.0244**		**91.1016**	**91.1016**	**2.6800e-003**		**91.1687**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6085	0.0000	0.6085	0.0657	0.0000	0.0657			0.0000			0.0000
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457	0.0000	2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**0.6085**	**0.7019**	**1.3103**	**0.0657**	**0.6457**	**0.7114**	**0.0000**	**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0343	0.0236	0.3222	9.1000e-004	0.0894	7.2000e-004	0.0901	0.0237	6.7000e-004	0.0244		91.1016	91.1016	2.6800e-003		91.1687
Total	**0.0343**	**0.0236**	**0.3222**	**9.1000e-004**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.7000e-004**	**0.0244**		**91.1016**	**91.1016**	**2.6800e-003**		**91.1687**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425		1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**6.5523**	**0.9158**	**7.4681**	**3.3675**	**0.8425**	**4.2100**		**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3494	11.2407	2.6356	0.0327	0.7327	0.0345	0.7672	0.2009	0.0330	0.2339		3,547.0129	3,547.0129	0.2407		3,553.0308
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0429	0.0295	0.4028	1.1400e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		113.8770	113.8770	3.3600e-003		113.9609
Total	**0.3923**	**11.2701**	**3.0384**	**0.0338**	**0.8445**	**0.0354**	**0.8799**	**0.2305**	**0.0338**	**0.2643**		**3,660.8899**	**3,660.8899**	**0.2441**		**3,666.9916**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.5063	0.0000	2.5063	1.2881	0.0000	1.2881			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425	0.0000	1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**2.5063**	**0.9158**	**3.4220**	**1.2881**	**0.8425**	**2.1306**	**0.0000**	**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3494	11.2407	2.6356	0.0327	0.7327	0.0345	0.7672	0.2009	0.0330	0.2339		3,547.0129	3,547.0129	0.2407		3,553.0308
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0429	0.0295	0.4028	1.1400e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		113.8770	113.8770	3.3600e-003		113.9609
Total	**0.3923**	**11.2701**	**3.0384**	**0.0338**	**0.8445**	**0.0354**	**0.8799**	**0.2305**	**0.0338**	**0.2643**		**3,660.8899**	**3,660.8899**	**0.2441**		**3,666.9916**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0451	16.0275	14.5629	0.0250		0.8173	0.8173		0.7831	0.7831		2,288.9355	2,288.9355	0.4503		2,300.1935
Total	**2.0451**	**16.0275**	**14.5629**	**0.0250**		**0.8173**	**0.8173**		**0.7831**	**0.7831**		**2,288.9355**	**2,288.9355**	**0.4503**		**2,300.1935**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.1200e-003	0.2913	0.0762	7.7000e-004	0.0192	6.0000e-004	0.0198	5.5300e-003	5.7000e-004	6.1000e-003		82.4642	82.4642	4.8600e-003		82.5856
Worker	0.0472	0.0324	0.4431	1.2600e-003	0.1230	9.9000e-004	0.1240	0.0326	9.2000e-004	0.0335		125.2647	125.2647	3.6900e-003		125.3570
Total	**0.0563**	**0.3237**	**0.5192**	**2.0300e-003**	**0.1422**	**1.5900e-003**	**0.1438**	**0.0381**	**1.4900e-003**	**0.0396**		**207.7289**	**207.7289**	**8.5500e-003**		**207.9426**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0451	16.0275	14.5629	0.0250		0.8173	0.8173		0.7831	0.7831	0.0000	2,288.9355	2,288.9355	0.4503		2,300.1935
Total	**2.0451**	**16.0275**	**14.5629**	**0.0250**		**0.8173**	**0.8173**		**0.7831**	**0.7831**	**0.0000**	**2,288.9355**	**2,288.9355**	**0.4503**		**2,300.1935**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.1200e-003	0.2913	0.0762	7.7000e-004	0.0192	6.0000e-004	0.0198	5.5300e-003	5.7000e-004	6.1000e-003		82.4642	82.4642	4.8600e-003		82.5856
Worker	0.0472	0.0324	0.4431	1.2600e-003	0.1230	9.9000e-004	0.1240	0.0326	9.2000e-004	0.0335		125.2647	125.2647	3.6900e-003		125.3570
Total	**0.0563**	**0.3237**	**0.5192**	**2.0300e-003**	**0.1422**	**1.5900e-003**	**0.1438**	**0.0381**	**1.4900e-003**	**0.0396**		**207.7289**	**207.7289**	**8.5500e-003**		**207.9426**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731		2,289.2813	2,289.2813	0.4417		2,300.3230
Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**		**2,289.2813**	**2,289.2813**	**0.4417**		**2,300.3230**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	8.5600e-003	0.2770	0.0720	7.6000e-004	0.0192	5.2000e-004	0.0197	5.5300e-003	5.0000e-004	6.0300e-003		81.7458	81.7458	4.6900e-003		81.8630
Worker	0.0442	0.0293	0.4088	1.2100e-003	0.1230	9.6000e-004	0.1239	0.0326	8.9000e-004	0.0335		120.8584	120.8584	3.3400e-003		120.9418
Total	**0.0527**	**0.3063**	**0.4808**	**1.9700e-003**	**0.1422**	**1.4800e-003**	**0.1437**	**0.0381**	**1.3900e-003**	**0.0395**		**202.6041**	**202.6041**	**8.0300e-003**		**202.8048**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731	0.0000	2,289.2813	2,289.2813	0.4417		2,300.3230
Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**	**0.0000**	**2,289.2813**	**2,289.2813**	**0.4417**		**2,300.3230**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	8.5600e-003	0.2770	0.0720	7.6000e-004	0.0192	5.2000e-004	0.0197	5.5300e-003	5.0000e-004	6.0300e-003		81.7458	81.7458	4.6900e-003		81.8630
Worker	0.0442	0.0293	0.4088	1.2100e-003	0.1230	9.6000e-004	0.1239	0.0326	8.9000e-004	0.0335		120.8584	120.8584	3.3400e-003		120.9418
Total	**0.0527**	**0.3063**	**0.4808**	**1.9700e-003**	**0.1422**	**1.4800e-003**	**0.1437**	**0.0381**	**1.3900e-003**	**0.0395**		**202.6041**	**202.6041**	**8.0300e-003**		**202.8048**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500		1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9412**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**		**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

3.6 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0602	0.0399	0.5574	1.6500e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		164.8069	164.8069	4.5500e-003		164.9206
Total	**0.0602**	**0.0399**	**0.5574**	**1.6500e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**164.8069**	**164.8069**	**4.5500e-003**		**164.9206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500	0.0000	1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9412**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**	**0.0000**	**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

3.6 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0602	0.0399	0.5574	1.6500e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		164.8069	164.8069	4.5500e-003		164.9206
Total	**0.0602**	**0.0399**	**0.5574**	**1.6500e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**164.8069**	**164.8069**	**4.5500e-003**		**164.9206**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	31.8883					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**32.0929**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	8.0300e-003	5.3200e-003	0.0743	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		21.9743	21.9743	6.1000e-004		21.9894
Total	**8.0300e-003**	**5.3200e-003**	**0.0743**	**2.2000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0900e-003**		**21.9743**	**21.9743**	**6.1000e-004**		**21.9894**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	31.8883					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**32.0929**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	8.0300e-003	5.3200e-003	0.0743	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		21.9743	21.9743	6.1000e-004		21.9894
Total	**8.0300e-003**	**5.3200e-003**	**0.0743**	**2.2000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0900e-003**		**21.9743**	**21.9743**	**6.1000e-004**		**21.9894**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4765	2.2728	6.4160	0.0233	1.8909	0.0188	1.9097	0.5060	0.0175	0.5236		2,369.9072	2,369.9072	0.1188		2,372.8765
Unmitigated	0.4765	2.2728	6.4160	0.0233	1.8909	0.0188	1.9097	0.5060	0.0175	0.5236		2,369.9072	2,369.9072	0.1188		2,372.8765

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Place of Worship	19.53	16.83	77.64	58,536	58,536
Single Family Housing	245.44	248.04	222.30	828,679	828,679
Total	264.97	264.87	299.94	887,215	887,215

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Place of Worship	16.60	8.40	6.90	0.00	95.00	5.00	64	25	11
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Place of Worship	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Single Family Housing	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0226	0.1940	0.0882	1.2300e-003		0.0156	0.0156		0.0156	0.0156		246.6341	246.6341	4.7300e-003	4.5200e-003	248.0997
NaturalGas Unmitigated	0.0226	0.1940	0.0882	1.2300e-003		0.0156	0.0156		0.0156	0.0156		246.6341	246.6341	4.7300e-003	4.5200e-003	248.0997

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Place of Worship	139.296	1.5000e-003	0.0137	0.0115	8.0000e-005		1.0400e-003	1.0400e-003		1.0400e-003	1.0400e-003		16.3877	16.3877	3.1000e-004	3.0000e-004	16.4851
Single Family Housing	1957.09	0.0211	0.1804	0.0768	1.1500e-003		0.0146	0.0146		0.0146	0.0146		230.2464	230.2464	4.4100e-003	4.2200e-003	231.6146
Total		**0.0226**	**0.1940**	**0.0882**	**1.2300e-003**		**0.0156**	**0.0156**		**0.0156**	**0.0156**		**246.6341**	**246.6341**	**4.7200e-003**	**4.5200e-003**	**248.0997**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Place of Worship	0.139296	1.5000e-003	0.0137	0.0115	8.0000e-005		1.0400e-003	1.0400e-003		1.0400e-003	1.0400e-003		16.3877	16.3877	3.1000e-004	3.0000e-004	16.4851
Single Family Housing	1.95709	0.0211	0.1804	0.0768	1.1500e-003		0.0146	0.0146		0.0146	0.0146		230.2464	230.2464	4.4100e-003	4.2200e-003	231.6146
Total		**0.0226**	**0.1940**	**0.0882**	**1.2300e-003**		**0.0156**	**0.0156**		**0.0156**	**0.0156**		**246.6341**	**246.6341**	**4.7200e-003**	**4.5200e-003**	**248.0997**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.1774	0.3914	2.3036	2.4500e-003		0.0415	0.0415		0.0415	0.0415	0.0000	471.8630	471.8630	0.0127	8.5800e-003	474.7373
Unmitigated	1.1774	0.3914	2.3036	2.4500e-003		0.0415	0.0415		0.0415	0.0415	0.0000	471.8630	471.8630	0.0127	8.5800e-003	474.7373

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0874					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.9823					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0429	0.3666	0.1560	2.3400e-003		0.0296	0.0296		0.0296	0.0296	0.0000	468.0000	468.0000	8.9700e-003	8.5800e-003	470.7811
Landscaping	0.0649	0.0248	2.1476	1.1000e-004		0.0119	0.0119		0.0119	0.0119		3.8630	3.8630	3.7300e-003		3.9562
Total	**1.1774**	**0.3914**	**2.3036**	**2.4500e-003**		**0.0415**	**0.0415**		**0.0415**	**0.0415**	**0.0000**	**471.8630**	**471.8630**	**0.0127**	**8.5800e-003**	**474.7373**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0874					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.9823					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0429	0.3666	0.1560	2.3400e-003		0.0296	0.0296		0.0296	0.0296	0.0000	468.0000	468.0000	8.9700e-003	8.5800e-003	470.7811
Landscaping	0.0649	0.0248	2.1476	1.1000e-004		0.0119	0.0119		0.0119	0.0119		3.8630	3.8630	3.7300e-003		3.9562
Total	**1.1774**	**0.3914**	**2.3036**	**2.4500e-003**		**0.0415**	**0.0415**		**0.0415**	**0.0415**	**0.0000**	**471.8630**	**471.8630**	**0.0127**	**8.5800e-003**	**474.7373**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Whittier Floral Residential Project AQ & GHG Analysis

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Place of Worship	2.81	1000sqft	0.06	2,809.00	0
Single Family Housing	26.00	Dwelling Unit	2.56	46,800.00	74

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Whittier Floral Residential Project AQ & GHG Analysis - Los Angeles-South Coast County, Summer

Project Characteristics -

Land Use - The project would consist of constructing and operating 26 dwelling units of detached condominiums on a 2.56 acres site and 2809 s.f. of church expansion.

Construction Phase - Construction phase length is based on the information provided by the client.

Grading - The site requires grading and import of approximately 8,905 cubic yards of fill material to support the proposed development.

Demolition - A total of 27,879 sf of building area is expected to be demolished.

Vehicle Trips - Trip rates are based on Whittier Floral Residential Project TIA, RK Engineering 2020

Woodstoves - Per SCAQMD rule 445, no wood burning devices are allowed in new developments; therefore, no wood hearths are included in this project.

Water And Wastewater -

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	220.00	261.00
tblConstructionPhase	NumDays	20.00	42.00
tblConstructionPhase	NumDays	6.00	21.00
tblConstructionPhase	PhaseEndDate	1/12/2022	5/2/2022
tblConstructionPhase	PhaseEndDate	12/15/2021	4/4/2022
tblConstructionPhase	PhaseEndDate	1/28/2021	3/1/2021
tblConstructionPhase	PhaseEndDate	2/10/2021	4/2/2021
tblConstructionPhase	PhaseEndDate	12/29/2021	4/18/2022
tblConstructionPhase	PhaseEndDate	2/2/2021	3/4/2021
tblConstructionPhase	PhaseStartDate	12/30/2021	4/19/2022
tblConstructionPhase	PhaseStartDate	2/11/2021	4/3/2021
tblConstructionPhase	PhaseStartDate	2/3/2021	3/5/2021
tblConstructionPhase	PhaseStartDate	12/16/2021	4/5/2022
tblConstructionPhase	PhaseStartDate	1/29/2021	3/2/2021

tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	1.30	0.00
tblGrading	MaterialImported	0.00	8,905.00
tblLandUse	LandUseSquareFeet	2,810.00	2,809.00
tblLandUse	LotAcreage	8.44	2.56
tblVehicleTrips	ST_TR	10.37	5.99
tblVehicleTrips	ST_TR	9.91	9.54
tblVehicleTrips	SU_TR	36.63	27.63
tblVehicleTrips	SU_TR	8.62	8.55
tblVehicleTrips	WD_TR	9.11	6.95
tblVehicleTrips	WD_TR	9.52	9.44
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.2193	31.4837	15.2063	0.0544	7.3968	1.0446	8.3480	3.5980	0.9749	4.4743	0.0000	5,656.5014	5,656.5014	0.8895	0.0000	5,678.7386
2022	32.1009	14.9103	14.8341	0.0270	0.1677	0.7037	0.8458	0.0445	0.6745	0.7126	0.0000	2,491.8854	2,491.8854	0.5464	0.0000	2,503.1278
Maximum	**32.1009**	**31.4837**	**15.2063**	**0.0544**	**7.3968**	**1.0446**	**8.3480**	**3.5980**	**0.9749**	**4.4743**	**0.0000**	**5,656.5014**	**5,656.5014**	**0.8895**	**0.0000**	**5,678.7386**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.2193	31.4837	15.2063	0.0544	3.3508	1.0446	4.3019	1.5186	0.9749	2.3949	0.0000	5,656.5014	5,656.5014	0.8895	0.0000	5,678.7386
2022	32.1009	14.9103	14.8341	0.0270	0.1677	0.7037	0.8458	0.0445	0.6745	0.7126	0.0000	2,491.8854	2,491.8854	0.5464	0.0000	2,503.1278
Maximum	**32.1009**	**31.4837**	**15.2063**	**0.0544**	**3.3508**	**1.0446**	**4.3019**	**1.5186**	**0.9749**	**2.3949**	**0.0000**	**5,656.5014**	**5,656.5014**	**0.8895**	**0.0000**	**5,678.7386**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.49**	**0.00**	**44.01**	**57.09**	**0.00**	**40.09**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.1774	0.3914	2.3036	2.4500e-003		0.0415	0.0415		0.0415	0.0415	0.0000	471.8630	471.8630	0.0127	8.5800e-003	474.7373
Energy	0.0226	0.1940	0.0882	1.2300e-003		0.0156	0.0156		0.0156	0.0156		246.6341	246.6341	4.7300e-003	4.5200e-003	248.0997
Mobile	0.4765	2.2728	6.4160	0.0233	1.8909	0.0188	1.9097	0.5060	0.0175	0.5236		2,369.9072	2,369.9072	0.1188		2,372.8765
Total	**1.6765**	**2.8582**	**8.8078**	**0.0270**	**1.8909**	**0.0759**	**1.9668**	**0.5060**	**0.0747**	**0.5807**	**0.0000**	**3,088.4043**	**3,088.4043**	**0.1362**	**0.0131**	**3,095.7135**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.1774	0.3914	2.3036	2.4500e-003		0.0415	0.0415		0.0415	0.0415	0.0000	471.8630	471.8630	0.0127	8.5800e-003	474.7373
Energy	0.0226	0.1940	0.0882	1.2300e-003		0.0156	0.0156		0.0156	0.0156		246.6341	246.6341	4.7300e-003	4.5200e-003	248.0997
Mobile	0.4765	2.2728	6.4160	0.0233	1.8909	0.0188	1.9097	0.5060	0.0175	0.5236		2,369.9072	2,369.9072	0.1188		2,372.8765
Total	**1.6765**	**2.8582**	**8.8078**	**0.0270**	**1.8909**	**0.0759**	**1.9668**	**0.5060**	**0.0747**	**0.5807**	**0.0000**	**3,088.4043**	**3,088.4043**	**0.1362**	**0.0131**	**3,095.7135**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2021	3/1/2021	5	42	
2	Site Preparation	Site Preparation	3/2/2021	3/4/2021	5	3	
3	Grading	Grading	3/5/2021	4/2/2021	5	21	
4	Building Construction	Building Construction	4/3/2021	4/4/2022	5	261	
5	Paving	Paving	4/5/2022	4/18/2022	5	10	
6	Architectural Coating	Architectural Coating	4/19/2022	5/2/2022	5	10	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 10.5

Acres of Paving: 0

Residential Indoor: 94,770; Residential Outdoor: 31,590; Non-Residential Indoor: 4,214; Non-Residential Outdoor: 1,405; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Scrapers	1	8.00	367	0.48
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	127.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	880.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	11.00	3.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6534	0.0000	0.6534	0.0989	0.0000	0.0989			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715		2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**0.6534**	**1.0409**	**1.6943**	**0.0989**	**0.9715**	**1.0704**		**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0252	0.8111	0.1902	2.3600e-003	0.0529	2.4900e-003	0.0554	0.0145	2.3800e-003	0.0169		255.9492	255.9492	0.0174		256.3835
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0557	0.0383	0.5236	1.4900e-003	0.1453	1.1700e-003	0.1465	0.0385	1.0800e-003	0.0396		148.0401	148.0401	4.3600e-003		148.1491
Total	**0.0809**	**0.8494**	**0.7138**	**3.8500e-003**	**0.1982**	**3.6600e-003**	**0.2018**	**0.0530**	**3.4600e-003**	**0.0565**		**403.9893**	**403.9893**	**0.0217**		**404.5326**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2499	0.0000	0.2499	0.0378	0.0000	0.0378			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715	0.0000	2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**0.2499**	**1.0409**	**1.2908**	**0.0378**	**0.9715**	**1.0093**	**0.0000**	**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0252	0.8111	0.1902	2.3600e-003	0.0529	2.4900e-003	0.0554	0.0145	2.3800e-003	0.0169		255.9492	255.9492	0.0174		256.3835
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0557	0.0383	0.5236	1.4900e-003	0.1453	1.1700e-003	0.1465	0.0385	1.0800e-003	0.0396		148.0401	148.0401	4.3600e-003		148.1491
Total	**0.0809**	**0.8494**	**0.7138**	**3.8500e-003**	**0.1982**	**3.6600e-003**	**0.2018**	**0.0530**	**3.4600e-003**	**0.0565**		**403.9893**	**403.9893**	**0.0217**		**404.5326**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457		2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**1.5908**	**0.7019**	**2.2926**	**0.1718**	**0.6457**	**0.8175**		**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0343	0.0236	0.3222	9.1000e-004	0.0894	7.2000e-004	0.0901	0.0237	6.7000e-004	0.0244		91.1016	91.1016	2.6800e-003		91.1687
Total	**0.0343**	**0.0236**	**0.3222**	**9.1000e-004**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.7000e-004**	**0.0244**		**91.1016**	**91.1016**	**2.6800e-003**		**91.1687**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6085	0.0000	0.6085	0.0657	0.0000	0.0657			0.0000			0.0000
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457	0.0000	2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**0.6085**	**0.7019**	**1.3103**	**0.0657**	**0.6457**	**0.7114**	**0.0000**	**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0343	0.0236	0.3222	9.1000e-004	0.0894	7.2000e-004	0.0901	0.0237	6.7000e-004	0.0244		91.1016	91.1016	2.6800e-003		91.1687
Total	**0.0343**	**0.0236**	**0.3222**	**9.1000e-004**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.7000e-004**	**0.0244**		**91.1016**	**91.1016**	**2.6800e-003**		**91.1687**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425		1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**6.5523**	**0.9158**	**7.4681**	**3.3675**	**0.8425**	**4.2100**		**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3494	11.2407	2.6356	0.0327	0.7327	0.0345	0.7672	0.2009	0.0330	0.2339		3,547.0129	3,547.0129	0.2407		3,553.0308
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0429	0.0295	0.4028	1.1400e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		113.8770	113.8770	3.3600e-003		113.9609
Total	**0.3923**	**11.2701**	**3.0384**	**0.0338**	**0.8445**	**0.0354**	**0.8799**	**0.2305**	**0.0338**	**0.2643**		**3,660.8899**	**3,660.8899**	**0.2441**		**3,666.9916**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.5063	0.0000	2.5063	1.2881	0.0000	1.2881			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425	0.0000	1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**2.5063**	**0.9158**	**3.4220**	**1.2881**	**0.8425**	**2.1306**	**0.0000**	**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3494	11.2407	2.6356	0.0327	0.7327	0.0345	0.7672	0.2009	0.0330	0.2339		3,547.0129	3,547.0129	0.2407		3,553.0308
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0429	0.0295	0.4028	1.1400e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		113.8770	113.8770	3.3600e-003		113.9609
Total	**0.3923**	**11.2701**	**3.0384**	**0.0338**	**0.8445**	**0.0354**	**0.8799**	**0.2305**	**0.0338**	**0.2643**		**3,660.8899**	**3,660.8899**	**0.2441**		**3,666.9916**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0451	16.0275	14.5629	0.0250		0.8173	0.8173		0.7831	0.7831		2,288.9355	2,288.9355	0.4503		2,300.1935
Total	**2.0451**	**16.0275**	**14.5629**	**0.0250**		**0.8173**	**0.8173**		**0.7831**	**0.7831**		**2,288.9355**	**2,288.9355**	**0.4503**		**2,300.1935**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.1200e-003	0.2913	0.0762	7.7000e-004	0.0192	6.0000e-004	0.0198	5.5300e-003	5.7000e-004	6.1000e-003		82.4642	82.4642	4.8600e-003		82.5856
Worker	0.0472	0.0324	0.4431	1.2600e-003	0.1230	9.9000e-004	0.1240	0.0326	9.2000e-004	0.0335		125.2647	125.2647	3.6900e-003		125.3570
Total	**0.0563**	**0.3237**	**0.5192**	**2.0300e-003**	**0.1422**	**1.5900e-003**	**0.1438**	**0.0381**	**1.4900e-003**	**0.0396**		**207.7289**	**207.7289**	**8.5500e-003**		**207.9426**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0451	16.0275	14.5629	0.0250		0.8173	0.8173		0.7831	0.7831	0.0000	2,288.9355	2,288.9355	0.4503		2,300.1935
Total	**2.0451**	**16.0275**	**14.5629**	**0.0250**		**0.8173**	**0.8173**		**0.7831**	**0.7831**	**0.0000**	**2,288.9355**	**2,288.9355**	**0.4503**		**2,300.1935**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.1200e-003	0.2913	0.0762	7.7000e-004	0.0192	6.0000e-004	0.0198	5.5300e-003	5.7000e-004	6.1000e-003		82.4642	82.4642	4.8600e-003		82.5856
Worker	0.0472	0.0324	0.4431	1.2600e-003	0.1230	9.9000e-004	0.1240	0.0326	9.2000e-004	0.0335		125.2647	125.2647	3.6900e-003		125.3570
Total	**0.0563**	**0.3237**	**0.5192**	**2.0300e-003**	**0.1422**	**1.5900e-003**	**0.1438**	**0.0381**	**1.4900e-003**	**0.0396**		**207.7289**	**207.7289**	**8.5500e-003**		**207.9426**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731		2,289.2813	2,289.2813	0.4417		2,300.3230
Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**		**2,289.2813**	**2,289.2813**	**0.4417**		**2,300.3230**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	8.5600e-003	0.2770	0.0720	7.6000e-004	0.0192	5.2000e-004	0.0197	5.5300e-003	5.0000e-004	6.0300e-003		81.7458	81.7458	4.6900e-003		81.8630
Worker	0.0442	0.0293	0.4088	1.2100e-003	0.1230	9.6000e-004	0.1239	0.0326	8.9000e-004	0.0335		120.8584	120.8584	3.3400e-003		120.9418
Total	**0.0527**	**0.3063**	**0.4808**	**1.9700e-003**	**0.1422**	**1.4800e-003**	**0.1437**	**0.0381**	**1.3900e-003**	**0.0395**		**202.6041**	**202.6041**	**8.0300e-003**		**202.8048**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731	0.0000	2,289.2813	2,289.2813	0.4417		2,300.3230
Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**	**0.0000**	**2,289.2813**	**2,289.2813**	**0.4417**		**2,300.3230**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	8.5600e-003	0.2770	0.0720	7.6000e-004	0.0192	5.2000e-004	0.0197	5.5300e-003	5.0000e-004	6.0300e-003		81.7458	81.7458	4.6900e-003		81.8630
Worker	0.0442	0.0293	0.4088	1.2100e-003	0.1230	9.6000e-004	0.1239	0.0326	8.9000e-004	0.0335		120.8584	120.8584	3.3400e-003		120.9418
Total	**0.0527**	**0.3063**	**0.4808**	**1.9700e-003**	**0.1422**	**1.4800e-003**	**0.1437**	**0.0381**	**1.3900e-003**	**0.0395**		**202.6041**	**202.6041**	**8.0300e-003**		**202.8048**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500		1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9412**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**		**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

3.6 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0602	0.0399	0.5574	1.6500e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		164.8069	164.8069	4.5500e-003		164.9206
Total	**0.0602**	**0.0399**	**0.5574**	**1.6500e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**164.8069**	**164.8069**	**4.5500e-003**		**164.9206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500	0.0000	1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9412**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**	**0.0000**	**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

3.6 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0602	0.0399	0.5574	1.6500e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		164.8069	164.8069	4.5500e-003		164.9206
Total	**0.0602**	**0.0399**	**0.5574**	**1.6500e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**164.8069**	**164.8069**	**4.5500e-003**		**164.9206**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	31.8883					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**32.0929**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	8.0300e-003	5.3200e-003	0.0743	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		21.9743	21.9743	6.1000e-004		21.9894
Total	**8.0300e-003**	**5.3200e-003**	**0.0743**	**2.2000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0900e-003**		**21.9743**	**21.9743**	**6.1000e-004**		**21.9894**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	31.8883					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**32.0929**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	8.0300e-003	5.3200e-003	0.0743	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		21.9743	21.9743	6.1000e-004		21.9894
Total	**8.0300e-003**	**5.3200e-003**	**0.0743**	**2.2000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0900e-003**		**21.9743**	**21.9743**	**6.1000e-004**		**21.9894**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4765	2.2728	6.4160	0.0233	1.8909	0.0188	1.9097	0.5060	0.0175	0.5236		2,369.9072	2,369.9072	0.1188		2,372.8765
Unmitigated	0.4765	2.2728	6.4160	0.0233	1.8909	0.0188	1.9097	0.5060	0.0175	0.5236		2,369.9072	2,369.9072	0.1188		2,372.8765

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Place of Worship	19.53	16.83	77.64	58,536	58,536
Single Family Housing	245.44	248.04	222.30	828,679	828,679
Total	264.97	264.87	299.94	887,215	887,215

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Place of Worship	16.60	8.40	6.90	0.00	95.00	5.00	64	25	11
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Place of Worship	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Single Family Housing	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0226	0.1940	0.0882	1.2300e-003		0.0156	0.0156		0.0156	0.0156		246.6341	246.6341	4.7300e-003	4.5200e-003	248.0997
NaturalGas Unmitigated	0.0226	0.1940	0.0882	1.2300e-003		0.0156	0.0156		0.0156	0.0156		246.6341	246.6341	4.7300e-003	4.5200e-003	248.0997

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Place of Worship	139.296	1.5000e-003	0.0137	0.0115	8.0000e-005		1.0400e-003	1.0400e-003		1.0400e-003	1.0400e-003		16.3877	16.3877	3.1000e-004	3.0000e-004	16.4851
Single Family Housing	1957.09	0.0211	0.1804	0.0768	1.1500e-003		0.0146	0.0146		0.0146	0.0146		230.2464	230.2464	4.4100e-003	4.2200e-003	231.6146
Total		**0.0226**	**0.1940**	**0.0882**	**1.2300e-003**		**0.0156**	**0.0156**		**0.0156**	**0.0156**		**246.6341**	**246.6341**	**4.7200e-003**	**4.5200e-003**	**248.0997**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Place of Worship	0.139296	1.5000e-003	0.0137	0.0115	8.0000e-005		1.0400e-003	1.0400e-003		1.0400e-003	1.0400e-003		16.3877	16.3877	3.1000e-004	3.0000e-004	16.4851
Single Family Housing	1.95709	0.0211	0.1804	0.0768	1.1500e-003		0.0146	0.0146		0.0146	0.0146		230.2464	230.2464	4.4100e-003	4.2200e-003	231.6146
Total		**0.0226**	**0.1940**	**0.0882**	**1.2300e-003**		**0.0156**	**0.0156**		**0.0156**	**0.0156**		**246.6341**	**246.6341**	**4.7200e-003**	**4.5200e-003**	**248.0997**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.1774	0.3914	2.3036	2.4500e-003		0.0415	0.0415		0.0415	0.0415	0.0000	471.8630	471.8630	0.0127	8.5800e-003	474.7373
Unmitigated	1.1774	0.3914	2.3036	2.4500e-003		0.0415	0.0415		0.0415	0.0415	0.0000	471.8630	471.8630	0.0127	8.5800e-003	474.7373

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0874					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.9823					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0429	0.3666	0.1560	2.3400e-003		0.0296	0.0296		0.0296	0.0296	0.0000	468.0000	468.0000	8.9700e-003	8.5800e-003	470.7811
Landscaping	0.0649	0.0248	2.1476	1.1000e-004		0.0119	0.0119		0.0119	0.0119		3.8630	3.8630	3.7300e-003		3.9562
Total	**1.1774**	**0.3914**	**2.3036**	**2.4500e-003**		**0.0415**	**0.0415**		**0.0415**	**0.0415**	**0.0000**	**471.8630**	**471.8630**	**0.0127**	**8.5800e-003**	**474.7373**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0874					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.9823					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0429	0.3666	0.1560	2.3400e-003		0.0296	0.0296		0.0296	0.0296	0.0000	468.0000	468.0000	8.9700e-003	8.5800e-003	470.7811
Landscaping	0.0649	0.0248	2.1476	1.1000e-004		0.0119	0.0119		0.0119	0.0119		3.8630	3.8630	3.7300e-003		3.9562
Total	**1.1774**	**0.3914**	**2.3036**	**2.4500e-003**		**0.0415**	**0.0415**		**0.0415**	**0.0415**	**0.0000**	**471.8630**	**471.8630**	**0.0127**	**8.5800e-003**	**474.7373**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

Annual Emission Calculations Output
(CalEEMod)

Whittier Floral Residential Project AQ & GHG Analysis

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Place of Worship	2.81	1000sqft	0.06	2,809.00	0
Single Family Housing	26.00	Dwelling Unit	2.56	46,800.00	74

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Whittier Floral Residential Project AQ & GHG Analysis - Los Angeles-South Coast County, Annual

Project Characteristics -

Land Use - The project would consist of constructing and operating 26 dwelling units of detached condominiums on a 2.56 acres site and 2809 s.f. of church expansion.

Construction Phase - Construction phase length is based on the information provided by the client.

Grading - The site requires grading and import of approximately 8,905 cubic yards of fill material to support the proposed development.

Demolition - A total of 27,879 sf of building area is expected to be demolished.

Vehicle Trips - Trip rates are based on Whittier Floral Residential Project TIA, RK Engineering 2020

Woodstoves - Per SCAQMD rule 445, no wood burning devices are allowed in new developments; therefore, no wood hearths are included in this project.

Water And Wastewater -

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	220.00	261.00
tblConstructionPhase	NumDays	20.00	42.00
tblConstructionPhase	NumDays	6.00	21.00
tblConstructionPhase	PhaseEndDate	1/12/2022	5/2/2022
tblConstructionPhase	PhaseEndDate	12/15/2021	4/4/2022
tblConstructionPhase	PhaseEndDate	1/28/2021	3/1/2021
tblConstructionPhase	PhaseEndDate	2/10/2021	4/2/2021
tblConstructionPhase	PhaseEndDate	12/29/2021	4/18/2022
tblConstructionPhase	PhaseEndDate	2/2/2021	3/4/2021
tblConstructionPhase	PhaseStartDate	12/30/2021	4/19/2022
tblConstructionPhase	PhaseStartDate	2/11/2021	4/3/2021
tblConstructionPhase	PhaseStartDate	2/3/2021	3/5/2021
tblConstructionPhase	PhaseStartDate	12/16/2021	4/5/2022
tblConstructionPhase	PhaseStartDate	1/29/2021	3/2/2021

tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	1.30	0.00
tblGrading	MaterialImported	0.00	8,905.00
tblLandUse	LandUseSquareFeet	2,810.00	2,809.00
tblLandUse	LotAcreage	8.44	2.56
tblVehicleTrips	ST_TR	10.37	5.99
tblVehicleTrips	ST_TR	9.91	9.54
tblVehicleTrips	SU_TR	36.63	27.63
tblVehicleTrips	SU_TR	8.62	8.55
tblVehicleTrips	WD_TR	9.11	6.95
tblVehicleTrips	WD_TR	9.52	9.44
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.2742	2.3891	1.9385	3.8200e-003	0.1114	0.1128	0.2243	0.0449	0.1071	0.1520	0.0000	328.9999	328.9999	0.0619	0.0000	330.5467
2022	0.2285	0.5463	0.5593	1.0000e-003	5.5300e-003	0.0261	0.0316	1.4800e-003	0.0249	0.0264	0.0000	84.2596	84.2596	0.0160	0.0000	84.6602
Maximum	**0.2742**	**2.3891**	**1.9385**	**3.8200e-003**	**0.1114**	**0.1128**	**0.2243**	**0.0449**	**0.1071**	**0.1520**	**0.0000**	**328.9999**	**328.9999**	**0.0619**	**0.0000**	**330.5467**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.2742	2.3891	1.9385	3.8200e-003	0.0590	0.1128	0.1718	0.0216	0.1071	0.1287	0.0000	328.9996	328.9996	0.0619	0.0000	330.5464
2022	0.2285	0.5463	0.5593	1.0000e-003	5.5300e-003	0.0261	0.0316	1.4800e-003	0.0249	0.0264	0.0000	84.2595	84.2595	0.0160	0.0000	84.6601
Maximum	**0.2742**	**2.3891**	**1.9385**	**3.8200e-003**	**0.0590**	**0.1128**	**0.1718**	**0.0216**	**0.1071**	**0.1287**	**0.0000**	**328.9996**	**328.9996**	**0.0619**	**0.0000**	**330.5464**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**44.83**	**0.00**	**20.49**	**50.24**	**0.00**	**13.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2021	3-31-2021	0.8330	0.8330
2	4-1-2021	6-30-2021	0.6106	0.6106
3	7-1-2021	9-30-2021	0.6063	0.6063
4	10-1-2021	12-31-2021	0.6066	0.6066
5	1-1-2022	3-31-2022	0.5408	0.5408
6	4-1-2022	6-30-2022	0.2435	0.2435
		Highest	0.8330	0.8330

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2039	7.6800e-003	0.2704	4.0000e-005		1.8500e-003	1.8500e-003		1.8500e-003	1.8500e-003	0.0000	5.7451	5.7451	5.2000e-004	1.0000e-004	5.7872
Energy	4.1300e-003	0.0354	0.0161	2.3000e-004		2.8500e-003	2.8500e-003		2.8500e-003	2.8500e-003	0.0000	118.7664	118.7664	4.0000e-003	1.4100e-003	119.2879
Mobile	0.0825	0.4324	1.1231	4.0800e-003	0.3367	3.4200e-003	0.3402	0.0903	3.1900e-003	0.0935	0.0000	377.0490	377.0490	0.0195	0.0000	377.5356
Waste						0.0000	0.0000		0.0000	0.0000	9.4107	0.0000	9.4107	0.5562	0.0000	23.3145
Water						0.0000	0.0000		0.0000	0.0000	0.5653	11.6601	12.2254	0.0586	1.4700e-003	14.1273
Total	**0.2905**	**0.4755**	**1.4096**	**4.3500e-003**	**0.3367**	**8.1200e-003**	**0.3449**	**0.0903**	**7.8900e-003**	**0.0982**	**9.9760**	**513.2206**	**523.1965**	**0.6387**	**2.9800e-003**	**540.0524**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2039	7.6800e-003	0.2704	4.0000e-005		1.8500e-003	1.8500e-003		1.8500e-003	1.8500e-003	0.0000	5.7451	5.7451	5.2000e-004	1.0000e-004	5.7872
Energy	4.1300e-003	0.0354	0.0161	2.3000e-004		2.8500e-003	2.8500e-003		2.8500e-003	2.8500e-003	0.0000	118.7664	118.7664	4.0000e-003	1.4100e-003	119.2879
Mobile	0.0825	0.4324	1.1231	4.0800e-003	0.3367	3.4200e-003	0.3402	0.0903	3.1900e-003	0.0935	0.0000	377.0490	377.0490	0.0195	0.0000	377.5356
Waste						0.0000	0.0000		0.0000	0.0000	9.4107	0.0000	9.4107	0.5562	0.0000	23.3145
Water						0.0000	0.0000		0.0000	0.0000	0.5653	11.6601	12.2254	0.0586	1.4700e-003	14.1273
Total	**0.2905**	**0.4755**	**1.4096**	**4.3500e-003**	**0.3367**	**8.1200e-003**	**0.3449**	**0.0903**	**7.8900e-003**	**0.0982**	**9.9760**	**513.2206**	**523.1965**	**0.6387**	**2.9800e-003**	**540.0524**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**	**0.00**

3.0 Construction Detail

Construction Phase

Whittier Floral Residential Project AQ & GHG Analysis - Los Angeles-South Coast County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2021	3/1/2021	5	42	
2	Site Preparation	Site Preparation	3/2/2021	3/4/2021	5	3	
3	Grading	Grading	3/5/2021	4/2/2021	5	21	
4	Building Construction	Building Construction	4/3/2021	4/4/2022	5	261	
5	Paving	Paving	4/5/2022	4/18/2022	5	10	
6	Architectural Coating	Architectural Coating	4/19/2022	5/2/2022	5	10	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 10.5

Acres of Paving: 0

Residential Indoor: 94,770; Residential Outdoor: 31,590; Non-Residential Indoor: 4,214; Non-Residential Outdoor: 1,405; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Scrapers	1	8.00	367	0.48
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	127.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	880.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	11.00	3.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0137	0.0000	0.0137	2.0800e-003	0.0000	2.0800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0419	0.4136	0.3043	5.1000e-004		0.0219	0.0219		0.0204	0.0204	0.0000	44.2498	44.2498	0.0113	0.0000	44.5327
Total	**0.0419**	**0.4136**	**0.3043**	**5.1000e-004**	**0.0137**	**0.0219**	**0.0356**	**2.0800e-003**	**0.0204**	**0.0225**	**0.0000**	**44.2498**	**44.2498**	**0.0113**	**0.0000**	**44.5327**

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.3000e-004	0.0176	4.1000e-003	5.0000e-005	1.0900e-003	5.0000e-005	1.1400e-003	3.0000e-004	5.0000e-005	3.5000e-004	0.0000	4.8406	4.8406	3.4000e-004	0.0000	4.8490
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1700e-003	9.1000e-004	0.0103	3.0000e-005	2.9900e-003	2.0000e-005	3.0200e-003	7.9000e-004	2.0000e-005	8.2000e-004	0.0000	2.6997	2.6997	8.0000e-005	0.0000	2.7017
Total	**1.7000e-003**	**0.0185**	**0.0144**	**8.0000e-005**	**4.0800e-003**	**7.0000e-005**	**4.1600e-003**	**1.0900e-003**	**7.0000e-005**	**1.1700e-003**	**0.0000**	**7.5403**	**7.5403**	**4.2000e-004**	**0.0000**	**7.5507**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.2500e-003	0.0000	5.2500e-003	7.9000e-004	0.0000	7.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0419	0.4136	0.3043	5.1000e-004		0.0219	0.0219		0.0204	0.0204	0.0000	44.2498	44.2498	0.0113	0.0000	44.5326
Total	**0.0419**	**0.4136**	**0.3043**	**5.1000e-004**	**5.2500e-003**	**0.0219**	**0.0271**	**7.9000e-004**	**0.0204**	**0.0212**	**0.0000**	**44.2498**	**44.2498**	**0.0113**	**0.0000**	**44.5326**

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.3000e-004	0.0176	4.1000e-003	5.0000e-005	1.0900e-003	5.0000e-005	1.1400e-003	3.0000e-004	5.0000e-005	3.5000e-004	0.0000	4.8406	4.8406	3.4000e-004	0.0000	4.8490
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1700e-003	9.1000e-004	0.0103	3.0000e-005	2.9900e-003	2.0000e-005	3.0200e-003	7.9000e-004	2.0000e-005	8.2000e-004	0.0000	2.6997	2.6997	8.0000e-005	0.0000	2.7017
Total	**1.7000e-003**	**0.0185**	**0.0144**	**8.0000e-005**	**4.0800e-003**	**7.0000e-005**	**4.1600e-003**	**1.0900e-003**	**7.0000e-005**	**1.1700e-003**	**0.0000**	**7.5403**	**7.5403**	**4.2000e-004**	**0.0000**	**7.5507**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3200e-003	0.0274	0.0161	4.0000e-005		1.0500e-003	1.0500e-003		9.7000e-004	9.7000e-004	0.0000	3.2290	3.2290	1.0400e-003	0.0000	3.2551
Total	**2.3200e-003**	**0.0274**	**0.0161**	**4.0000e-005**	**2.3900e-003**	**1.0500e-003**	**3.4400e-003**	**2.6000e-004**	**9.7000e-004**	**1.2300e-003**	**0.0000**	**3.2290**	**3.2290**	**1.0400e-003**	**0.0000**	**3.2551**

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	4.0000e-005	4.5000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.1187	0.1187	0.0000	0.0000	0.1188
Total	**5.0000e-005**	**4.0000e-005**	**4.5000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1187**	**0.1187**	**0.0000**	**0.0000**	**0.1188**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.1000e-004	0.0000	9.1000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3200e-003	0.0274	0.0161	4.0000e-005		1.0500e-003	1.0500e-003		9.7000e-004	9.7000e-004	0.0000	3.2290	3.2290	1.0400e-003	0.0000	3.2551
Total	**2.3200e-003**	**0.0274**	**0.0161**	**4.0000e-005**	**9.1000e-004**	**1.0500e-003**	**1.9600e-003**	**1.0000e-004**	**9.7000e-004**	**1.0700e-003**	**0.0000**	**3.2290**	**3.2290**	**1.0400e-003**	**0.0000**	**3.2551**

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	4.0000e-005	4.5000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.1187	0.1187	0.0000	0.0000	0.1188
Total	**5.0000e-005**	**4.0000e-005**	**4.5000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1187**	**0.1187**	**0.0000**	**0.0000**	**0.1188**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0688	0.0000	0.0688	0.0354	0.0000	0.0354	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0192	0.2122	0.1025	2.2000e-004		9.6200e-003	9.6200e-003		8.8500e-003	8.8500e-003	0.0000	19.0091	19.0091	6.1500e-003	0.0000	19.1628
Total	**0.0192**	**0.2122**	**0.1025**	**2.2000e-004**	**0.0688**	**9.6200e-003**	**0.0784**	**0.0354**	**8.8500e-003**	**0.0442**	**0.0000**	**19.0091**	**19.0091**	**6.1500e-003**	**0.0000**	**19.1628**

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7100e-003	0.1218	0.0284	3.4000e-004	7.5600e-003	3.6000e-004	7.9300e-003	2.0800e-003	3.5000e-004	2.4300e-003	0.0000	33.5410	33.5410	2.3300e-003	0.0000	33.5992
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	3.5000e-004	3.9700e-003	1.0000e-005	1.1500e-003	1.0000e-005	1.1600e-003	3.1000e-004	1.0000e-005	3.1000e-004	0.0000	1.0384	1.0384	3.0000e-005	0.0000	1.0391
Total	**4.1600e-003**	**0.1222**	**0.0324**	**3.5000e-004**	**8.7100e-003**	**3.7000e-004**	**9.0900e-003**	**2.3900e-003**	**3.6000e-004**	**2.7400e-003**	**0.0000**	**34.5794**	**34.5794**	**2.3600e-003**	**0.0000**	**34.6384**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0263	0.0000	0.0263	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0192	0.2122	0.1025	2.2000e-004		9.6200e-003	9.6200e-003		8.8500e-003	8.8500e-003	0.0000	19.0091	19.0091	6.1500e-003	0.0000	19.1628
Total	**0.0192**	**0.2122**	**0.1025**	**2.2000e-004**	**0.0263**	**9.6200e-003**	**0.0359**	**0.0135**	**8.8500e-003**	**0.0224**	**0.0000**	**19.0091**	**19.0091**	**6.1500e-003**	**0.0000**	**19.1628**

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7100e-003	0.1218	0.0284	3.4000e-004	7.5600e-003	3.6000e-004	7.9300e-003	2.0800e-003	3.5000e-004	2.4300e-003	0.0000	33.5410	33.5410	2.3300e-003	0.0000	33.5992
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	3.5000e-004	3.9700e-003	1.0000e-005	1.1500e-003	1.0000e-005	1.1600e-003	3.1000e-004	1.0000e-005	3.1000e-004	0.0000	1.0384	1.0384	3.0000e-005	0.0000	1.0391
Total	**4.1600e-003**	**0.1222**	**0.0324**	**3.5000e-004**	**8.7100e-003**	**3.7000e-004**	**9.0900e-003**	**2.3900e-003**	**3.6000e-004**	**2.7400e-003**	**0.0000**	**34.5794**	**34.5794**	**2.3600e-003**	**0.0000**	**34.6384**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1994	1.5627	1.4199	2.4400e-003		0.0797	0.0797		0.0764	0.0764	0.0000	202.4575	202.4575	0.0398	0.0000	203.4533
Total	**0.1994**	**1.5627**	**1.4199**	**2.4400e-003**		**0.0797**	**0.0797**		**0.0764**	**0.0764**	**0.0000**	**202.4575**	**202.4575**	**0.0398**	**0.0000**	**203.4533**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.1000e-004	0.0289	7.8300e-003	7.0000e-005	1.8400e-003	6.0000e-005	1.9000e-003	5.3000e-004	6.0000e-005	5.9000e-004	0.0000	7.2100	7.2100	4.4000e-004	0.0000	7.2211
Worker	4.6100e-003	3.5900e-003	0.0406	1.2000e-004	0.0118	1.0000e-004	0.0119	3.1200e-003	9.0000e-005	3.2100e-003	0.0000	10.6061	10.6061	3.1000e-004	0.0000	10.6139
Total	**5.5200e-003**	**0.0325**	**0.0484**	**1.9000e-004**	**0.0136**	**1.6000e-004**	**0.0138**	**3.6500e-003**	**1.5000e-004**	**3.8000e-003**	**0.0000**	**17.8162**	**17.8162**	**7.5000e-004**	**0.0000**	**17.8350**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1994	1.5627	1.4199	2.4400e-003		0.0797	0.0797		0.0764	0.0764	0.0000	202.4573	202.4573	0.0398	0.0000	203.4531
Total	**0.1994**	**1.5627**	**1.4199**	**2.4400e-003**		**0.0797**	**0.0797**		**0.0764**	**0.0764**	**0.0000**	**202.4573**	**202.4573**	**0.0398**	**0.0000**	**203.4531**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.1000e-004	0.0289	7.8300e-003	7.0000e-005	1.8400e-003	6.0000e-005	1.9000e-003	5.3000e-004	6.0000e-005	5.9000e-004	0.0000	7.2100	7.2100	4.4000e-004	0.0000	7.2211
Worker	4.6100e-003	3.5900e-003	0.0406	1.2000e-004	0.0118	1.0000e-004	0.0119	3.1200e-003	9.0000e-005	3.2100e-003	0.0000	10.6061	10.6061	3.1000e-004	0.0000	10.6139
Total	**5.5200e-003**	**0.0325**	**0.0484**	**1.9000e-004**	**0.0136**	**1.6000e-004**	**0.0138**	**3.6500e-003**	**1.5000e-004**	**3.8000e-003**	**0.0000**	**17.8162**	**17.8162**	**7.5000e-004**	**0.0000**	**17.8350**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0612	0.4819	0.4737	8.3000e-004		0.0232	0.0232		0.0222	0.0222	0.0000	68.5344	68.5344	0.0132	0.0000	68.8650
Total	**0.0612**	**0.4819**	**0.4737**	**8.3000e-004**		**0.0232**	**0.0232**		**0.0222**	**0.0222**	**0.0000**	**68.5344**	**68.5344**	**0.0132**	**0.0000**	**68.8650**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.9000e-004	9.2800e-003	2.5100e-003	2.0000e-005	6.2000e-004	2.0000e-005	6.4000e-004	1.8000e-004	2.0000e-005	2.0000e-004	0.0000	2.4189	2.4189	1.4000e-004	0.0000	2.4225
Worker	1.4600e-003	1.1000e-003	0.0127	4.0000e-005	3.9800e-003	3.0000e-005	4.0100e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.4636	3.4636	1.0000e-004	0.0000	3.4660
Total	**1.7500e-003**	**0.0104**	**0.0152**	**6.0000e-005**	**4.6000e-003**	**5.0000e-005**	**4.6500e-003**	**1.2400e-003**	**5.0000e-005**	**1.2900e-003**	**0.0000**	**5.8825**	**5.8825**	**2.4000e-004**	**0.0000**	**5.8885**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0612	0.4819	0.4737	8.3000e-004		0.0232	0.0232		0.0222	0.0222	0.0000	68.5344	68.5344	0.0132	0.0000	68.8649
Total	**0.0612**	**0.4819**	**0.4737**	**8.3000e-004**		**0.0232**	**0.0232**		**0.0222**	**0.0222**	**0.0000**	**68.5344**	**68.5344**	**0.0132**	**0.0000**	**68.8649**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.9000e-004	9.2800e-003	2.5100e-003	2.0000e-005	6.2000e-004	2.0000e-005	6.4000e-004	1.8000e-004	2.0000e-005	2.0000e-004	0.0000	2.4189	2.4189	1.4000e-004	0.0000	2.4225
Worker	1.4600e-003	1.1000e-003	0.0127	4.0000e-005	3.9800e-003	3.0000e-005	4.0100e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.4636	3.4636	1.0000e-004	0.0000	3.4660
Total	**1.7500e-003**	**0.0104**	**0.0152**	**6.0000e-005**	**4.6000e-003**	**5.0000e-005**	**4.6500e-003**	**1.2400e-003**	**5.0000e-005**	**1.2900e-003**	**0.0000**	**5.8825**	**5.8825**	**2.4000e-004**	**0.0000**	**5.8885**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.7100e-003	0.0467	0.0585	9.0000e-005		2.4400e-003	2.4400e-003		2.2500e-003	2.2500e-003	0.0000	7.7550	7.7550	2.4600e-003	0.0000	7.8165
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.7100e-003**	**0.0467**	**0.0585**	**9.0000e-005**		**2.4400e-003**	**2.4400e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**7.7550**	**7.7550**	**2.4600e-003**	**0.0000**	**7.8165**

3.6 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.3000e-004	2.6100e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7156	0.7156	2.0000e-005	0.0000	0.7161
Total	**3.0000e-004**	**2.3000e-004**	**2.6100e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.7156**	**0.7156**	**2.0000e-005**	**0.0000**	**0.7161**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.7100e-003	0.0467	0.0585	9.0000e-005		2.4400e-003	2.4400e-003		2.2500e-003	2.2500e-003	0.0000	7.7550	7.7550	2.4600e-003	0.0000	7.8165
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.7100e-003**	**0.0467**	**0.0585**	**9.0000e-005**		**2.4400e-003**	**2.4400e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**7.7550**	**7.7550**	**2.4600e-003**	**0.0000**	**7.8165**

3.6 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.3000e-004	2.6100e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7156	0.7156	2.0000e-005	0.0000	0.7161
Total	**3.0000e-004**	**2.3000e-004**	**2.6100e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.7156**	**0.7156**	**2.0000e-005**	**0.0000**	**0.7161**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1594					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**0.1605**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.5000e-004	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0954	0.0954	0.0000	0.0000	0.0955
Total	**4.0000e-005**	**3.0000e-005**	**3.5000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0954**	**0.0954**	**0.0000**	**0.0000**	**0.0955**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1594					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**0.1605**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.5000e-004	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0954	0.0954	0.0000	0.0000	0.0955
Total	**4.0000e-005**	**3.0000e-005**	**3.5000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0954**	**0.0954**	**0.0000**	**0.0000**	**0.0955**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0825	0.4324	1.1231	4.0800e-003	0.3367	3.4200e-003	0.3402	0.0903	3.1900e-003	0.0935	0.0000	377.0490	377.0490	0.0195	0.0000	377.5356
Unmitigated	0.0825	0.4324	1.1231	4.0800e-003	0.3367	3.4200e-003	0.3402	0.0903	3.1900e-003	0.0935	0.0000	377.0490	377.0490	0.0195	0.0000	377.5356

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Place of Worship	19.53	16.83	77.64	58,536	58,536
Single Family Housing	245.44	248.04	222.30	828,679	828,679
Total	264.97	264.87	299.94	887,215	887,215

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Place of Worship	16.60	8.40	6.90	0.00	95.00	5.00	64	25	11
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Place of Worship	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Single Family Housing	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	77.9334	77.9334	3.2200e-003	6.7000e-004	78.2122
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	77.9334	77.9334	3.2200e-003	6.7000e-004	78.2122
NaturalGas Mitigated	4.1300e-003	0.0354	0.0161	2.3000e-004		2.8500e-003	2.8500e-003		2.8500e-003	2.8500e-003	0.0000	40.8330	40.8330	7.8000e-004	7.5000e-004	41.0757
NaturalGas Unmitigated	4.1300e-003	0.0354	0.0161	2.3000e-004		2.8500e-003	2.8500e-003		2.8500e-003	2.8500e-003	0.0000	40.8330	40.8330	7.8000e-004	7.5000e-004	41.0757

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Place of Worship	50842.9	2.7000e-004	2.4900e-003	2.0900e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	2.7132	2.7132	5.0000e-005	5.0000e-005	2.7293
Single Family Housing	714339	3.8500e-003	0.0329	0.0140	2.1000e-004		2.6600e-003	2.6600e-003		2.6600e-003	2.6600e-003	0.0000	38.1199	38.1199	7.3000e-004	7.0000e-004	38.3464
Total		**4.1200e-003**	**0.0354**	**0.0161**	**2.2000e-004**		**2.8500e-003**	**2.8500e-003**		**2.8500e-003**	**2.8500e-003**	**0.0000**	**40.8330**	**40.8330**	**7.8000e-004**	**7.5000e-004**	**41.0757**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Place of Worship	50842.9	2.7000e-004	2.4900e-003	2.0900e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	2.7132	2.7132	5.0000e-005	5.0000e-005	2.7293
Single Family Housing	714339	3.8500e-003	0.0329	0.0140	2.1000e-004		2.6600e-003	2.6600e-003		2.6600e-003	2.6600e-003	0.0000	38.1199	38.1199	7.3000e-004	7.0000e-004	38.3464
Total		**4.1200e-003**	**0.0354**	**0.0161**	**2.2000e-004**		**2.8500e-003**	**2.8500e-003**		**2.8500e-003**	**2.8500e-003**	**0.0000**	**40.8330**	**40.8330**	**7.8000e-004**	**7.5000e-004**	**41.0757**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Place of Worship	31179.9	9.9346	4.1000e-004	8.0000e-005	9.9701
Single Family Housing	213416	67.9988	2.8100e-003	5.8000e-004	68.2420
Total		**77.9333**	**3.2200e-003**	**6.6000e-004**	**78.2122**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Place of Worship	31179.9	9.9346	4.1000e-004	8.0000e-005	9.9701
Single Family Housing	213416	67.9988	2.8100e-003	5.8000e-004	68.2420
Total		**77.9333**	**3.2200e-003**	**6.6000e-004**	**78.2122**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2039	7.6800e-003	0.2704	4.0000e-005		1.8500e-003	1.8500e-003		1.8500e-003	1.8500e-003	0.0000	5.7451	5.7451	5.2000e-004	1.0000e-004	5.7872
Unmitigated	0.2039	7.6800e-003	0.2704	4.0000e-005		1.8500e-003	1.8500e-003		1.8500e-003	1.8500e-003	0.0000	5.7451	5.7451	5.2000e-004	1.0000e-004	5.7872

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0159					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1793					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.4000e-004	4.5800e-003	1.9500e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.3070	5.3070	1.0000e-004	1.0000e-004	5.3386
Landscaping	8.1100e-003	3.1000e-003	0.2685	1.0000e-005		1.4800e-003	1.4800e-003		1.4800e-003	1.4800e-003	0.0000	0.4381	0.4381	4.2000e-004	0.0000	0.4486
Total	**0.2039**	**7.6800e-003**	**0.2704**	**4.0000e-005**		**1.8500e-003**	**1.8500e-003**		**1.8500e-003**	**1.8500e-003**	**0.0000**	**5.7451**	**5.7451**	**5.2000e-004**	**1.0000e-004**	**5.7872**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0159					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1793					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.4000e-004	4.5800e-003	1.9500e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.3070	5.3070	1.0000e-004	1.0000e-004	5.3386
Landscaping	8.1100e-003	3.1000e-003	0.2685	1.0000e-005		1.4800e-003	1.4800e-003		1.4800e-003	1.4800e-003	0.0000	0.4381	0.4381	4.2000e-004	0.0000	0.4486
Total	**0.2039**	**7.6800e-003**	**0.2704**	**4.0000e-005**		**1.8500e-003**	**1.8500e-003**		**1.8500e-003**	**1.8500e-003**	**0.0000**	**5.7451**	**5.7451**	**5.2000e-004**	**1.0000e-004**	**5.7872**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	12.2254	0.0586	1.4700e-003	14.1273
Unmitigated	12.2254	0.0586	1.4700e-003	14.1273

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Place of Worship	0.0879218 / 0.137519	0.8795	2.9000e-003	7.0000e-005	0.9743
Single Family Housing	1.694 / 1.06796	11.3459	0.0557	1.4000e-003	13.1530
Total		**12.2254**	**0.0586**	**1.4700e-003**	**14.1273**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Place of Worship	0.0879218 / 0.137519	0.8795	2.9000e-003	7.0000e-005	0.9743
Single Family Housing	1.694 / 1.06796	11.3459	0.0557	1.4000e-003	13.1530
Total		**12.2254**	**0.0586**	**1.4700e-003**	**14.1273**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	9.4107	0.5562	0.0000	23.3145
Unmitigated	9.4107	0.5562	0.0000	23.3145

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Place of Worship	16.02	3.2519	0.1922	0.0000	8.0565
Single Family Housing	30.34	6.1588	0.3640	0.0000	15.2580
Total		**9.4107**	**0.5562**	**0.0000**	**23.3145**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Place of Worship	16.02	3.2519	0.1922	0.0000	8.0565
Single Family Housing	30.34	6.1588	0.3640	0.0000	15.2580
Total		**9.4107**	**0.5562**	**0.0000**	**23.3145**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix C Historical Evaluation

CONSULTING

GPA

April 7, 2020

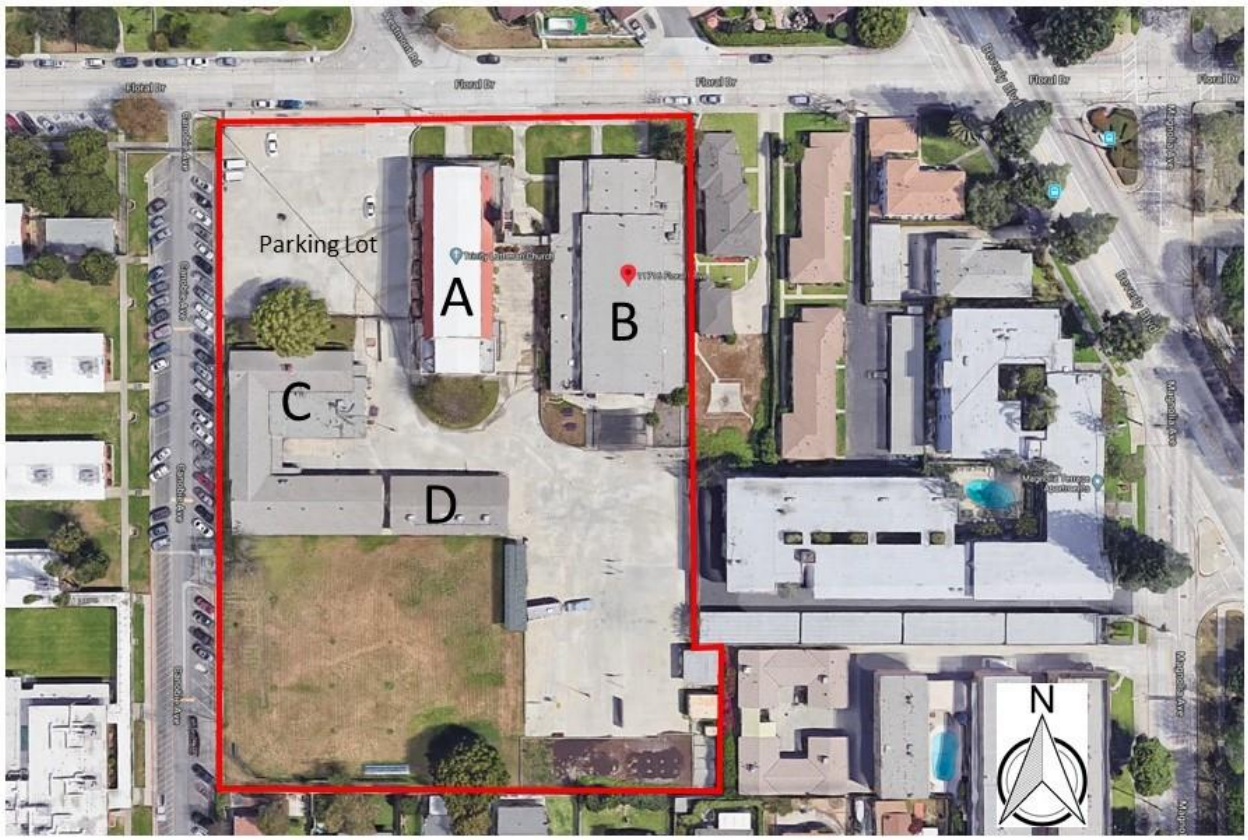
Brian Geis
Brandywine Homes
16580 Aston
Irvine, CA 92606
Via e-mail: brian@brandywine-homes.com

RE: Historical Evaluation of Trinity Lutheran Church located at 11716 Floral Drive, Whittier, CA

Dear Brian:

At the request of the City, I have conducted a site visit and reviewed previous records on the property located at 11716 Floral Drive in the City of Whittier. This property was constructed in 1958 as the Trinity Lutheran Church. The purpose of the review was to determine whether the property would qualify as a historical resource as defined in the City of Whittier's Municipal Code Sections 18.84.050 and 18.84.080. This property was previously surveyed in a city-wide survey (2013-2015) but was not identified as a historical resource at that time. Brandywine Homes has purchased the property with the intent to develop the land. The City's planning staff has requested the applicant to have an architectural historian confirm that this property still would not qualify as a historical resource, per the City's local historic preservation ordinance.

The site visit was conducted on Friday, April 3, 2020. The church property is located within a primarily residential neighborhood on the south side of Floral Drive between Palm Avenue and Beverly Boulevard. The property contains four buildings, a few small ancillary sheds/outbuildings, a parking lot, and large open areas covered in grass and asphalt (refer to Map 1 on the following page). The entire premise is surrounded by fencing. The primary building (Building A) consists of the main sanctuary (refer to Images 1-6). A secondary building is located to the east of the Sanctuary that appears to serve as an Administrative/Office and/or Fellowship Building (Building B) (refer to Images 7-8). There are two large buildings to the rear (south) of the property; one is a U-shaped building (Building C) and the other is a large rectangular building (Building D); both appear to be used as classroom space (refer to Images 9-14). All of the buildings located on the premises were constructed in 1958 in the Mid-Century Moderne style of architecture. The Walter F. Dexter Middle School is located to the west of the Trinity Lutheran Church on the same side of the street. Other surrounding buildings are mostly one-story, mid-century tract homes.



Map A: Aerial view of the Lutheran Church located at 11716 Floral Drive in Whittier showing the location of each building on the parcel. (*Image courtesy of Google Maps*)



Image 1: View of Sanctuary (Building A) and Office/Administration (Building B) looking southeast. (GPA, 2020)



Image 2: View of Sanctuary (Building A), looking south. (GPA, 2020)

		
Image 3: View of Sanctuary (Building A) looking southwest. (GPA, 2020)		**Image 4**: View of Sanctuary (Building A) looking east (GPA, 2020)
		
Image 5: View of Sanctuary (Building A) looking northwest (GPA, 2020)		**Image 6**: Walkway between Sanctuary (Building A) and Office/Administration (Building B) looking south (GPA, 2020)
		
Image 7: Office/Administration (Building B) looking southeast. (GPA, 2020)		**Image 8**: Office/Administration (Building B) looking south. (GPA, 2020)

		
Image 9: View of Building C and Building D looking southwest. (GPA, 2020)		**Image 10**: View of Building D looking south. (GPA, 2020)
		
Image 11: View of Building D and northeast corner of Classroom Building C looking south. (GPA, 2020)		**Image 12**: View of Classroom Building C looking southwest. (GPA, 2020)
		
Image 13: View of Classroom Building C looking southwest. (GPA, 2020)		**Image 14**: View of Classroom Building C looking south from parking lot. (GPA, 2020)

From 2013 to 2015, GPA Consulting prepared a historic resources survey of the non-residential properties in the City of Whittier that were constructed prior to 1967 on behalf of the City's Community Development Department, Planning Division. The property located at 11716 Floral Drive was included in that city-wide survey. At the time of the survey, the survey team did not identify this property as one that would require further research or evaluation because it did not appear to meet the minimum qualifications as a historic resource as identified in the Historic Context Statement that was prepared as part of the citywide survey.

There were other religious properties that were identified in the survey as well, some of which were constructed within the same decade in the same style:

- St. Mary's Roman Catholic Church, 12625 Penn Street, Mid-Century Modern (3S)
- Plymouth Congregational Church, 11815 Pilgrim Way, Mid-Century Modern (3S)
- First Baptist Church, 13106 Bailey Street, Classical Revival (3S)
- First United Methodist Church, 13222 Bailey Street, Gothic Revival/Classical Revival/Mid-Century Modern (5S3)
- Saint Bruno's Catholic Church Sanctuary Building, 15720 Citrustree Rd., Mid-Century Modern (3S)
- Church of God, 10550 Whittier Blvd., Vernacular (6Z)

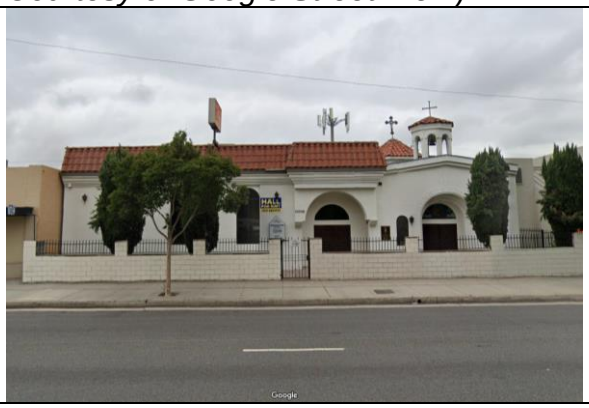
Images of those properties are provided below:



Image 15: St. Mary's Roman Catholic Church, 12625 Penn Street. (*Image Courtesy of Google Street View*)



Image 16: Plymouth Congregational Church, 11815 Pilgrim Way. (*Image Courtesy of Google Street View*)

		
Image 17: First Baptist church, 13106 Bailey Street. (*Image Courtesy of Google Street View*)		**Image 18:** First United Methodist Church, 13222 Bailey Street. (*Image Courtesy of Google Street View*)
		
Image 19: Saint Bruno's Catholic Church Sanctuary Building, 15720 Citrustree Rd. (*Image Courtesy of Google Street View*)		**Image 20:** Church of God, 10550 Whittier Blvd. (*Image Courtesy of Google Street View*)

With the exception of 10550 Whittier Blvd., all of the other ecclesiastical properties were identified as either eligible for listing on the City's local register or individually eligible for the California Register of Historical Resources.

The purpose of this review is to determine whether or not the conditions of the Lutheran Church located at 11716 Floral Drive have changed since the prior evaluation such that the property might qualify as a historical resource. To conduct this review, GPA conducted a site visit on April 3, 2020 and photographed the site. GPA reviewed the prior information compiled on the property as part of the survey and compared the property to any previous photographs that were taken at the time of the survey.

After re-review of the subject property, GPA has determined that the property is a common example of its property type (mid-century modern) and that it would not qualify as a local historical resource or for the California Register of Historical Resources or the National Register of Historic Places due to a lack of historical significance. The

conditions of the property have not changed since the prior evaluation in 2015. Therefore, the property is not a historical resource for the purposes of the California Environmental Quality Act (CEQA) or as a historical resource as defined in the City of Whittier's Municipal Code Sections 18.84.050 and 18.84.080.

I want to thank you for your consideration of these comments and please feel free to contact me with any further questions that you may have at (310) 796-6520.

Sincerely,



Andrea Galvin
President
GPA Consulting

Appendix D Geotechnical Report

ALTA CALIFORNIA
GEOTECHNICAL INC.

170 North Maple Street, Suite 108
Corona, CA 92880
www.altageotechnical.com

BRANDYWINE HOMES
16580 Aston Street
Irvine, California 92606

November 24, 2020
Project No. 2-0124

Attention: Brian Geis

Subject: **UPDATED GEOTECHNICAL REPORT**
11716 Floral Drive
City of Whittier, County of Los Angeles, California

References: See Appendix A

Dear Mr. Geis:

Alta California Geotechnical, Inc. (Alta) is pleased to present this updated geotechnical report for the proposed residential development located at 11716 Floral Drive, in the City of Whittier, County of Los Angeles, California. This report is based on the previous subsurface investigation conducted by Alta, laboratory testing, and review of the referenced reports.

Alta's review of the data and site plan indicates that the proposed development is feasible, from a geotechnical perspective, provided that the recommendations presented in this report are incorporated into the grading and improvement plans and implemented during site development.

Also included in this report are:

- Discussion of the site geotechnical conditions;
- Recommendations for remedial and site grading, including unsuitable soil removals;
- Geotechnical site construction recommendations;
- Foundation design parameters.

If you have any questions or should you require any additional information, please contact the undersigned at (951) 509-7090. Alta appreciates the opportunity to provide geotechnical consulting services for your project.

Sincerely,
Alta California Geotechnical, Inc.

SCOTT A. GRAY/RGE 2857
Reg. Exp.: 12-31-20
Registered Geotechnical Engineer
President

THOMAS J. MCCARTHY/CEG 2080
Reg. Exp.: 9-30-22
Certified Engineering Geologist
Vice President

Distribution: (1) Addressee

FR: SAG: 2-0124, November 24, 2020 (Updated Geo Report, Floral Dr., Whittier)



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APPENDIX C: PREVIOUS LABORATORY TESTING
APPENDIX D: MAINTENANCE CONSIDERATIONS
APPENDIX E: EARTHWORK SPECIFICATIONS

1.0 INTRODUCTION

The following report presents Alta's findings, conclusions, and geotechnical recommendations for the proposed residential development, located at 11716 Floral Drive, in the City of Whittier, County of Los Angeles, California.

1.1 Purpose

The purpose of this report is to examine the existing onsite geotechnical conditions and assess the impacts that the geotechnical conditions may have on the proposed development. The property is depicted on the enclosed Site Plan (Plate 1). This report is suitable for use in developing grading plans and engineer's cost estimates.

1.2 Scope of Work

Alta's *Scope of Work* for this geotechnical investigation included the following:

- Review of published geologic information of the site;
- Review the referenced geotechnical report;
- Compile relevant subsurface information from the previous report;
- Evaluate engineering geologic and geotechnical engineering data, including laboratory data, to develop recommendations for site remedial grading including specialized grading techniques for unsuitable soil removals along the property boundary, import soil, foundations and utilities;
- Prepare this report and accompanying exhibits.

1.3 Report Limitations

The conclusions and recommendations presented in this report are based on the field and laboratory information generated during the previous investigation, and a review of the referenced reports. The information contained in this report is intended to be used for development of grading plans and preliminary construction cost estimates.

2.0 PROJECT DESCRIPTION

2.1 Site Location and Existing Conditions

The approximately 2.55-acre, L-shaped site is relatively flat and currently occupied by several buildings and paved, and lawn playgrounds associated with the Trinity Lutheran School. The site is bounded to the north by Floral Drive, to the east and south by private property, and to the west by a parking lot. Buried private utility lines may be present onsite. Review of vintage air photos (Historic Aerials, 2020), as early as 1953, indicates that two of the existing structures were developed in 1953. By 1972, the site appears to have been completely developed to its current condition.

2.2 Proposed Development

Based on our review of the Site Plan, the eastern and southern existing structures and site improvements are to be demolished, and twenty-five (25) residential structures, and one (1) open space with associated improvements will be developed. It is anticipated that the existing church building along with the associated asphalt parking lot will remain in-place. Alta anticipates that remedial grading will be required to develop the site to support the proposed structures with shallow foundations and reinforced concrete slabs-on-grade.

3.0 SITE INVESTIGATION

3.1 Previous Investigation and Laboratory Testing

Alta conducted a subsurface investigation on August 3, 2017, consisting of the excavation, logging and select sampling of five (5) hollow-stem auger borings and the excavation of two (2) additional borings for infiltration testing (Alta, 2017). The locations of the borings are shown on Plate 1 and the boring logs are presented in Appendix B.

Laboratory testing was performed on bulk and ring samples obtained during the field investigation. A brief description of the laboratory test procedures and the test results are presented in Appendix C.

3.2 Previous Infiltration Testing

It is Alta's understanding that the project may utilize infiltration systems for storm water disposal. Details of the system are not known at this time.

Infiltration testing was undertaken using two five (5) foot-deep borings (P-1 and P-2). The testing was performed on August 4, 2017 in general accordance with the County of Los Angeles Department of Public Works LID Standards Manual. The two test wells were presoaked, and water level reading were recorded every 30 minutes. During the test, the borings were filled with water and measured every 30 minutes until the readings stabilized.

The data was then adjusted to provide an infiltration rate utilizing the Porchet Method. The resulting infiltration rates are 0.4 inches per hour for P-1 and 0.5 inches per hour for P-2 (Alta, 2017), which do not include a factor of safety. Recommendations for infiltration BMP design are presented in Section 6.3.

4.0 GEOLOGIC CONDITIONS

4.1 Geologic and Geomorphic Setting

Regionally, the site is located in the Peninsular Ranges geomorphic province, which characterizes the southwest portion of southern California. The Peninsular Ranges province is composed of plutonic and metamorphic rock, lesser amounts of Tertiary volcanic and sedimentary rock, and Quaternary drainage in-fills and sedimentary veneers. The proposed project is located on the Santa Ana sub-block (Jennings and Bryant, 2010, 1985), which is bounded by the Whittier segment of the Elsinore fault zone to the east and by the Newport-Inglewood fault zone to the west.

4.2 Stratigraphy

Based on our literature review and subsurface investigation, the site is underlain by undocumented artificial fill and younger alluvial deposits. These geologic units are briefly described below.

4.2.1 Artificial Fill - Undocumented

The undocumented artificial fill observed at the site consists mainly of dark brown silty sand and sandy clay in a moist, moderately dense or firm condition. The unit was logged to a depth of 5 feet below the ground surface, and is underlain by young alluvial fan deposits.

4.2.2 Young Alluvial Fan Deposits

The young alluvial deposits observed at the site consist mainly of brown tannish brown, and yellowish brown silty sand and sandy silt in a moist, moderately dense/firm condition. Porosity was observed within the alluvium onsite. The unit was logged to a depth of 26 feet below the ground surface and is overlain by undocumented artificial fill.

4.3 Geologic Structure

4.3.1 Tectonic Framework

Jennings and Bryant (2010, 1985) defined eight structural provinces within California that have been classified by predominant regional fault trends and similar fold structure. These provinces are in turn divided into blocks and sub-blocks that are defined by “major Quaternary faults.” These blocks and sub-blocks exhibit similar structural features. Within this framework, the subject site is located within Structural Province I, which is controlled by the dominant northwest trend of the San Andreas Fault and is divided into two blocks, the Coast Range Block and the Peninsular Range Block. The Peninsular Range Block, on which this site is located, is characterized by a series of parallel, northwest trending faults

that exhibit right lateral dip-slip movement. These faults are terminated by the Transverse Range block to the north and extend southward to the Baja Peninsula. These northwest trending faults divide the Peninsular Range block into eight sub-blocks. The Santa Ana Sub-block, one of the eight sub-blocks, is bound on the east by the Elsinore fault zone and on the west by the Newport-Inglewood fault zone. The site is located in the Santa Ana sub-block, 0.5 miles southwest of the Whittier-Elsinore Fault Zone and approximately 21.8 miles northeast of the Newport Inglewood Fault Zone (USGS, 2008).

4.3.2 Regionally Mapped Active Faults

Several large, active fault systems including the Whittier- Elsinore Newport-Inglewood, and the San Andreas occur in the region surrounding the site. These fault systems have been studied extensively and in a large part control the geologic structure of southern California.

4.3.3 Geologic Structure

Based upon our site investigation and literature review, the onsite sediments are of Holocene age, and are not fractured, folded, or faulted.

4.4 Groundwater

Groundwater was not encountered to a depth of 26 feet below the ground surface. A review of a regional groundwater map indicates that historic groundwater level is at approximately 63 feet (CDMG, 1997).

4.5 Earthquake Hazards

The subject site is located in southern California, which is a tectonically active area. The type and magnitude of seismic hazards affecting a site are dependent on the distance to the causative fault and the intensity and magnitude of the seismic event. The seismic hazard may be primary, such as surface rupture

and/or ground shaking, or secondary, such as liquefaction and/or ground lurching.

4.5.1 Local and Regional Faulting

The nearest known active faults (movement occurring ≤ 11,700 years ago) are the Whittier-Elsinore fault zone, the Puente Hills fault, the Elysian Park fault, the Raymond fault, the San Jose fault, the Verdugo, the Sierra Madre the Clamshell-Sawpit, and the Newport-Inglewood fault zone, located approximately 0.5, 7.2, 9.7, 15.6, 16.7, 18.2, 19.8, 21.2 and 21.8 miles from the site (USGS, 2008).

4.5.2 Surface Rupture

Active faults are not known to exist within the project and a review of Special Publication 42 indicates the site is not within the California State designated earthquake fault zones (Bryant and Hart, 2007). Accordingly, the potential for fault surface rupture on the subject site is very low.

4.5.3 Seismicity

Ground shaking hazards caused by earthquakes along other active regional faults exist. The 2019 California Building Code requires use-modified spectral accelerations and velocities for most structural designs. Seismic design parameters using soil profile types identified in the 2019 California Building Code are presented in Section 7.3.

4.5.4 Liquefaction

Seismic agitation of relatively loose saturated sands, silty sands, and some silts can result in a buildup of pore pressure. If the pore pressure exceeds the overburden stresses, a temporary quick condition known as liquefaction can occur. Liquefaction effects can manifest in several ways including: 1) loss of bearing; 2) lateral spread; 3) dynamic settlement;

and 4) flow failure. Lateral spreading has typically been the most damaging mode of failure.

In general, the more recent that a sediment has been deposited, the more likely it will be susceptible to liquefaction. Other factors that must be considered are: groundwater, confining stresses, relative density, and the intensity and duration of seismically-induced ground shaking.

Groundwater was not encountered during the subsurface investigation which extended to a depth of 26 feet. The regional groundwater map indicates that the historic high groundwater level is approximately 63 feet (CDMG, 1997). The site is not located in a liquefaction zone per the seismic hazard maps (California Geologic Survey, 1998). Based on the depth to groundwater, it is Alta's opinion that the potential for liquefaction is minimal at the site.

4.5.5 Dry Sand Settlement

Dry sand settlement is the process of non-uniform settlement of the ground surface during a seismic event. Based on our subsurface investigation and our removal/recompaction recommendations, the potential for dry sand settlement is anticipated to be low and within foundation design tolerances.

4.5.6 Seismically Induced Landsliding

Due to a lack of slopes within or nearby the property, seismically induced landsliding is not anticipated to pose a danger to the site.

5.0 ENGINEERING PROPERTIES AND ANALYSIS

5.1 Materials Properties

Presented herein is a general discussion of the engineering properties of the onsite materials that will be encountered during construction of the proposed

project. Descriptions of the soil (Unified Soil Classification System) are presented on the boring logs in Appendix B.

5.1.1 Excavation Characteristics

Based on the data provided from the subsurface investigations, it is our opinion that the majority of the on-site materials possess favorable excavation characteristics such that conventional earth moving equipment can be utilized.

5.1.2 Compressibility

The artificial fill and upper portions of the young alluvial fan deposits onsite are considered compressible and unsuitable to support the proposed improvements. Recommended removal depths are presented in Section 6.1.2.

5.1.3 Hydro-Consolidation

Hydro-consolidation is the effect of introducing water into soil that is prone to collapse. Upon loading and initial wetting, the soil structure and apparent strength are altered resulting in almost immediate settlement. That settlement can have adverse impacts on engineered structures, particularly in areas where it is manifested differentially. Differential settlements are typically associated with differential wetting, irregularities in the subsurface soil conditions, or irregular loading patterns.

Based on our laboratory testing (Appendix C), the potential for hydro-collapse onsite is minimal and should be within foundation tolerances upon the completion of the recommended unsuitable soil removals.

5.1.4 Expansion Potential

Expansion index testing was performed on samples taken during our subsurface investigation. Based on the results, it is anticipated that the majority of materials onsite are "low" to "medium" in expansion potential (21≤EI≤90, Appendix C) when tested per ASTM D: 4829.

5.1.5 Earthwork Adjustments

The values presented in Table 5-1 are deemed appropriate for estimating purposes and may be used in an effort to balance earthwork quantities. As is the case with every project, contingencies should be made to adjust the earthwork balance when grading is in-progress and actual conditions are better defined.

TABLE 5-1
Earthwork Adjustment Factors

Geologic Unit	Adjustment Factor Range	Average
Artificial Fill/Young alluvial fan deposits	Shrink 14% to 16%	15%

5.1.6 Chemical Analyses

Chemical testing was performed on samples of material underlying the proposed site. Soluble sulfate test results indicate that the soluble sulfate concentrations of the soils tested are classified as negligible (Category S0) per ACI 318-14.

Negligible chloride levels were detected in the onsite soils. Resistivity testing conducted as part of this investigation, indicates that the soils are corrosive to very corrosive to buried metals (Romanoff, 1989). Additional discussions on corrosion are presented in Section 7.9. Corrosion tests results are presented in Appendix C.

5.2 Engineering Analysis

Presented below is a general discussion of the engineering analysis methods that were utilized to develop the conclusions and recommendations presented in this report.

5.2.1 Bearing Capacity and Lateral Earth Pressures

Ultimate bearing capacity values were obtained using the graphs and formula presented in NAVFAC DM-7.1. Allowable bearing was determined by applying a factor of safety of at least 3 to the ultimate bearing capacity. Static lateral earth pressures were calculated using Rankine methods for active and passive cases. If it is desired to use Coulomb forces, a separate analysis specific to the application can be conducted.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the previous subsurface investigation and our staff's previous experience in the area, it is Alta's opinion that the development of the site is feasible from a geotechnical perspective. Presented below are recommendations that should be incorporated into site development and construction plans.

6.1 General Earthwork Recommendations

All grading shall be accomplished under the observation and testing of the project geotechnical consultant in accordance with the recommendations contained herein and the City of Whittier criteria.

6.1.1 Site Preparation

Vegetation, construction debris, and other deleterious materials are unsuitable as structural fill material and should be disposed of off-site prior to commencing grading/construction. Any septic tanks, seepage pits or wells should be abandoned as per the County of Los Angeles Department of Health Services.

Existing concrete should be removed prior to the placement of engineered fill. The demolished concrete may be incorporated into compacted, engineered fills after it is crushed to a maximum size of six (6) inches. Prior to placement as engineered fill any protruding steel rebar should be cut from the concrete pieces and disposed of offsite.

Existing asphaltic concrete should be removed prior to the placement of engineered fill. From a geotechnical perspective, this material may be incorporated into compacted, engineered fills after it is crushed to a maximum size of six (6) inches. The crushed asphalt should not be placed under residential structures, but rather, it can be placed in approved non-residential areas, such as streets, parking areas or open space.

These recommendations should be verified by the environmental consultant.

6.1.2 Unsuitable Soil Removals

The artificial fill and the upper portions of the young alluvial fan deposits onsite are compressible and as such, are not suitable to support the proposed structures. Accordingly, it is recommended to remove and re-compact the upper five (5) to seven (7) feet of existing soils, extending a minimum of five (5) feet horizontally outside the structures. This recommended removal combined with the foundation recommendations presented in Section 7.1 should provide suitable support for the proposed structures. The Project Geotechnical Consultant should observe the removal bottom prior to placing fill. If unsuitable soils such as undocumented artificial fill are exposed upon the completion of the removals recommended above, additional removals may be required.

This recommended removal is based on the assumptions that limited fill above the existing ground surface will be placed onsite.

For fill areas in streets, in general, a minimum removal and recompaction of the upper two (2) feet of natural soils is recommended, however all undocumented artificial fill shall be removed and recompacted. For cuts greater than two (2) feet in street areas, removals are not required. For cuts less than two (2) feet, the two (2) foot removal and recompaction applies.

Material removed as part of the unsuitable soil removals can be used as artificial fill, provided it is free of deleterious materials.

6.1.3 Compaction Standards

All fill and processed natural ground shall be compacted to a minimum relative compaction of 90 percent, as determined by ASTM Test Method: D-1557. Fill material should be moisture conditioned to optimum moisture or above, and as generally discussed in Alta's Earthwork Specification Section presented in Appendix F. Compaction shall be achieved with the use of sheepsfoot rollers or similar kneading type equipment. Mixing and moisture conditioning will be required in order to achieve the recommended moisture conditions.

6.1.4 Groundwater/Seepage

It is anticipated that groundwater will not be encountered during construction. It is possible that perched water conditions could be encountered depending on the time of year construction occurs.

6.1.5 Documentation of Removals

All removal/over-excavation bottoms should be observed and approved by the project Geotechnical Consultant prior to fill placement.

Consideration should be given to surveying the removal bottoms and undercuts after approval by the geotechnical consultant and prior to the placement of fill. Staking should be provided in order to verify undercut locations and depths.

6.1.6 Treatment of Removal Bottoms

At the completion of removals/over-excavation, the exposed removal bottom should be ripped to a minimum depth of eight (8) inches, moisture-conditioned to above optimum moisture content and compacted in-place to the project standards.

6.1.7 Fill Placement

After removals, scarification, and compaction of in-place materials are completed, additional fill may be placed. Fill should be placed in eight-inch bulk maximum lifts, moisture conditioned to optimum moisture content or above, compacted and tested as grading/construction progresses until final grades are attained.

6.1.8 Mixing

Mixing of materials may be necessary to prevent layering of different soil types and/or different moisture contents. The mixing should be accomplished prior to and as part of compaction of each fill lift.

6.1.9 Import Soils

Import soils, if necessary, should consist of clean, structural quality, compactable materials similar to the on-site soils and should be free of trash, debris or other objectionable materials. The project Geotechnical Consultant should be notified not less than 72 hours in advance of the locations of any soils proposed for import. Import sources should be sampled, tested, and approved by the project Geotechnical Consultant at the source prior to the importation of the soils to the site. The project

Civil Engineer should include these requirements on plans and specifications for the project.

6.1.10 Utility Trenches

6.1.10.1 Excavation

Utility trenches should be supported, either by laying back excavations or shoring, in accordance with applicable OSHA standards. In general, existing site soils are classified as Soil Types "B" and “C” per OSHA standards. Upon completion of the recommended removals and recompaction, the artificial fill will be classified as Soil Type "B". The Project Geotechnical Consulting should be consulted if geologic conditions vary from what is presented in this report.

6.1.10.2 Backfill

Trench backfill should be compacted to at least 90 percent of maximum dry density as determined by ASTM D-1557. Onsite soils will not be suitable for use as bedding material but will be suitable for use in backfill provided oversized materials are removed. No surcharge loads should be imposed above excavations. This includes spoil piles, lumber, concrete trucks, or other construction materials and equipment. Drainage above excavations should be directed away from the banks. Care should be taken to avoid saturation of the soils. Compaction should be accomplished by mechanical means. Jetting of native soils will not be acceptable.

Under-slab trenches should also be compacted to project specifications. If select granular backfill (SE > 30) is used, compaction by flooding will be acceptable.

6.1.11 Backcut Stability

Temporary backcuts, if required during unsuitable soil removals, should be made no steeper than 1:1 without review and approval of the geotechnical consultant. Flatter backcuts may be necessary where geologic conditions dictate and where minimum width dimensions are to be maintained.

Care should be taken during remedial grading operations in order to minimize risk of failure. Should failure occur, complete removal of the disturbed material will be required.

In consideration of the inherent instability created by temporary construction backcuts for removals, it is imperative that grading schedules are coordinated to minimize the unsupported exposure time of these excavations. Once started, these excavations and subsequent fill operations should be maintained to completion without intervening delays imposed by avoidable circumstances. In cases where five-day workweeks comprise a normal schedule, grading should be planned to avoid exposing at-grade or near-grade excavations through a non-work weekend. Where improvements may be affected by temporary instability, either on or offsite, further restrictions such as slot cutting, extending work days, implementing weekend schedules, and/or other requirements considered critical to serving specific circumstances may be imposed.

6.2 Storm Water Infiltration Systems

Municipalities have been increasing the requirement for onsite storm water infiltration, rather than allowing water to enter storm drain systems. From a geotechnical perspective, allowing storm water to infiltrate the onsite soil in concentrated areas increases the potential for settlement, liquefaction, and water-related damage to structures/improvements, such as wet slabs or pumping subgrade, and should be avoided where possible. If infiltration systems are required on this site, care should be taken in designing systems that control the storm water as much as possible.

Preliminary infiltration testing was conducted at the site as part of the previous investigation, and the methodology is discussed in Section 3.2. The resulting infiltration rates for P-1 and P-2 were calculated to be 0.4-inches per hour and 0.5-inches per hour, respectively, at approximately 5-feet below the existing ground surface (Alta, 2017). The results do not include a factor of safety. Groundwater was not encountered during our subsurface investigation.

The Project Geotechnical Consultant should review the final WQMP design prior to construction.

6.3 Boundary Conditions

The site is bounded to the north by Floral Drive, to the east and south by private property, and to the west by a parking lot. Construction of retaining/screen walls along these boundaries may require additional geotechnical recommendations concerning unsuitable soil removals and foundation design parameters. Boundary conditions for the project should be reviewed by the Project Geotechnical Consultant as the design progresses.

7.0 DESIGN CONSIDERATIONS

7.1 Structural Design

It is anticipated that two-story single-family, wood-framed residential structures with slab on-grade and shallow foundations will be constructed. Upon the completion of rough grading, finish grade samples should be collected and tested in order to provide specific recommendations as they relate to the individual building pad. These test results and corresponding design recommendations should be presented in a final rough grading report. Final slab and foundation design recommendations should be made based upon specific structure sitings, loading conditions, and as-graded soil conditions.

It is anticipated that the majority of onsite soils will possess “low” to "medium" expansion potential when tested in general accordance with ASTM Test Method D: 4829. It is our understanding that post-tensioned slabs will be utilized for the proposed structures. If conventional slabs are being considered, additional design recommendations can be provided.

7.1.1 Foundations

Foundations may be preliminary designed based on the values presented in Table 7-1 below.

Table 7-1
Foundation Design Parameters*

Allowable Bearing	2000 lbs/ft^2(assuming a minimum width and embedment of 12-inches).
Lateral Bearing	250 lbs/ft^2 at a depth of 12 inches plus 250 lbs/ft^2 for each additional 12 inches of embedment to a maximum of 2000 lbs/ft^2
Sliding Coefficient	0.30
Differential Settlement	Dynamic: Differential = 0.75 inches in 40 feet Static: Differential = 0.75 inches in 40 feet

*These values may be increased as allowed by Code to resist transient loads such as wind or seismic. Building code and structural design considerations may govern depth and reinforcement requirements and should be evaluated.

7.1.2 Post-Tensioned Slabs/Foundation Design Recommendations

Post-tensioned slabs for the project may be preliminarily designed utilizing the parameters presented in Tables 7-1 and 7-2. The parameters presented herein are based on methodology provided in the Design of Post-Tensioned Slabs-On-Ground, Third Edition, by the Post-Tensioning Institute, in accordance with the 2019 CBC.

TABLE 7-2
POST-TENSION SLAB DESIGN PARAMETERS

Category	Expansion Potential	Minimum Embedment	Edge Lift		Center Lift	
			Em (ft)	Ym (inch)	Em (ft)	Ym (inch)
I	Low	12 inches*	5.4	0.61	9.0	0.26
II	Medium	18 inches*	5.2	1.10	9.0	0.46
Slab Subgrade Moisture						
Category I	Minimum 110% of optimum moisture to a depth of 12 inches prior to pouring concrete					
Category II	Minimum 120% of optimum moisture to a depth of 12 inches prior to pouring concrete					
Embedment*						
The minimum outer footing embedment presented herein are based on expansion indexes. The structural engineer should verify the minimum embedment based on the number of floors supported by the footings, the structural loading, and the requirements of the latest California Building Code. If mat slabs are utilized, alternate embedment depths can be provided.						
Moisture Barrier						
A moisture barrier should be provided in accordance with the recommendations presented in Section 7.2						
The parameters presented herein are based on procedures presented in the Design of Post-Tensioned Slabs-On-Ground, Third Edition. No corrections for vertical barriers at the edge of the slab, or for adjacent vegetation have been assumed. The design parameters are based on a Constant Suction Value of 3.9 pF.						

7.2 Moisture Barrier

A moisture and vapor retarding system should be placed below the slabs-on-grade in portions of the structure considered to be moisture sensitive and should be capable of effectively preventing the migration of water and reducing the transmission of water vapor to acceptable levels. Historically, a 10-mil plastic

membrane, such as Visqueen, placed between two to four inches of clean sand, has been used for this purpose. The use of this system or other systems can be considered, at the discretion of the designer, provided the system reduces the vapor transmission rates to acceptable levels.

7.3 Seismic Design

In accordance with the requirements in Section 11.4.8 of ASCE 7-16 for sites with Site Class D and S1 values greater than 0.2, Alta has performed a site-specific ground motion analysis for the subject project. The analysis was performed in accordance with Chapter 21 of ASCE 7-16, the 2019 CBC, and the 2014 USGS Ground Acceleration Maps. The USGS Unified Hazard Tool (https://earthquake.usgs.gov/hazards/interactive/index.php) and the USGS National Seismic Hazard Map source model was utilized to perform the analysis.

The site class was determined based on the referenced reports and published geologic maps in the area in general conformance with Chapter 20 of ASCE 7-16. Based on density of the underlying soil, a Site Class of D was selected (shear wave velocity of 259 m/s).

Probabilistic (MCER) ground motions were determined in accordance with Method 2 of Section 21.2.1 of ACE 7-16. The site specific MCER was taken as the lesser of the probabilistic and deterministic ground motions.

The design response spectrum was determined per Section 21.3 of ASCE 7-16. Design acceleration parameters were determined per Section 21.4 of ASCE 7-16 and the results are presented in Table 7-3. These parameters should be verified by the structural engineer. Additional parameters should be determined by the structural engineer based on the Occupancy Category of the proposed structures.

TABLE 7-3 Seismic Ground Motion Values 2019 CBC and ASCE 7-16	
Parameter	*Value*
Site Class	D
Site Latitude	33.9909
Site Longitude	-117.0518
Spectral Response Acceleration Parameter, S_S	1.887
Spectral Response Acceleration Parameter, S_1	0.673
Site Coefficient, F_a	1.0
Site Coefficient, F_v (Per Table 11.4-2 of ASCE 7-16. Site Specific Parameters Govern)	1.7
Site Specific Parameters Per Chapter 21 of ASCE 7-16	
MCE Spectral Response Acceleration Parameter, S_{MS}	1.887
MCE Spectral Response Acceleration Parameter, S_{M1}	1.187
Design Spectral Response Acceleration Parameter, S_{DS}	1.258
Design Spectral Response Acceleration Parameter, S_{D1}	0.791
Peak Ground Acceleration, PGA_M	0.84

7.4 Fence and Garden Walls

Block walls, if used, should be embedded a minimum of 2 feet below the lowest adjacent grade. Construction joints (not more than 20 feet apart) should be included in the block wall construction. Side yard walls should be structurally separated from the rear yard wall.

7.5 Footing Excavations

Soils from the footing excavations should not be placed in slab-on-grade areas unless properly compacted and tested. The excavations should be cleaned of all loose/sloughed materials and be neatly trimmed at the time of concrete placement. The Project Geotechnical Consultant should observe the footing

excavations prior to the placement of concrete to determine that the excavations are founded in suitably compacted material.

7.6 Retaining Walls

Retaining walls should be founded on engineered fill and should be backfilled with granular soils that allow for drainage behind the wall. Based on the fine-grained nature of the soils onsite, it is anticipated suitable free-draining backfill material may need to be imported to the site. Foundations may be designed in accordance with the recommendations presented in Table 7-1, above. Unrestrained walls, free to horizontally move 0.0005H (for dense cohesionless backfill), may be designed to resist lateral pressures imposed by a fluid with a unit weight determined in accordance with the Table 7-4 below. The table also presents design parameters for restrained (at-rest) retaining walls. These parameters may be used to design retaining walls that may be considered as restrained due to the method of construction or location (corner sections of unrestrained retaining walls).

TABLE 7-4
Equivalent Fluid Pressures for 90% Compacted Fill (Select Material)

Backfill	Active Pressure (psf/ft)	At-Rest Pressure (psf/ft)
Level	35	55

Per the requirements of the 2019 CBC, the seismic force acting on the retaining walls with backfill exceeding 6-feet in height may be resolved utilizing the formula $17H^2$ lb/lineal ft (H=height of the wall). This force acts at approximately 0.6H above the base of the wall. The seismic value can be converted as required by the retaining wall engineer. Retaining walls should be designed in general accordance with Section 1807A.2 of the 2019 CBC.

- Restrained retaining walls should be designed for “at-rest” conditions.

- The design loads presented in the above table are to be applied on the retaining wall in a horizontal fashion and as such friction between wall and retained soils should not be allowed in the retaining wall analyses.
- Additional allowances should be made in the retaining wall design to account for the influence of construction loads, temporary loads, and possible nearby structural footing loads.
- Select backfill should be granular, structural quality backfill with a Sand Equivalent of 20 or better and an ASCE Expansion Index of 20 or less. The backfill must encompass the full active wedge area. The upper one foot of backfill should be comprised of native on-site soils (see Plate A).
- The wall design should include waterproofing (where appropriate) and backdrains or weep holes for relieving possible hydrostatic pressures. The backdrain should be comprised of a 4-inch perforated PVC pipe in a 1 ft. by 1 ft., ¾-inch gravel matrix, wrapped with a geofabric. The backdrain should be installed with a minimum gradient of 2 percent and should be outletted to an appropriate location. For subterranean walls this may include drainage by sump pumps.
- No backfill should be placed against concrete until minimum design strengths are achieved.

It should be noted that the allowable bearing and lateral bearing values presented in Table 7-1 are based on level conditions at the toe. Modified design parameters can be presented for retaining walls with sloping condition at the toe. Other conditions should be evaluated on a case by case basis.

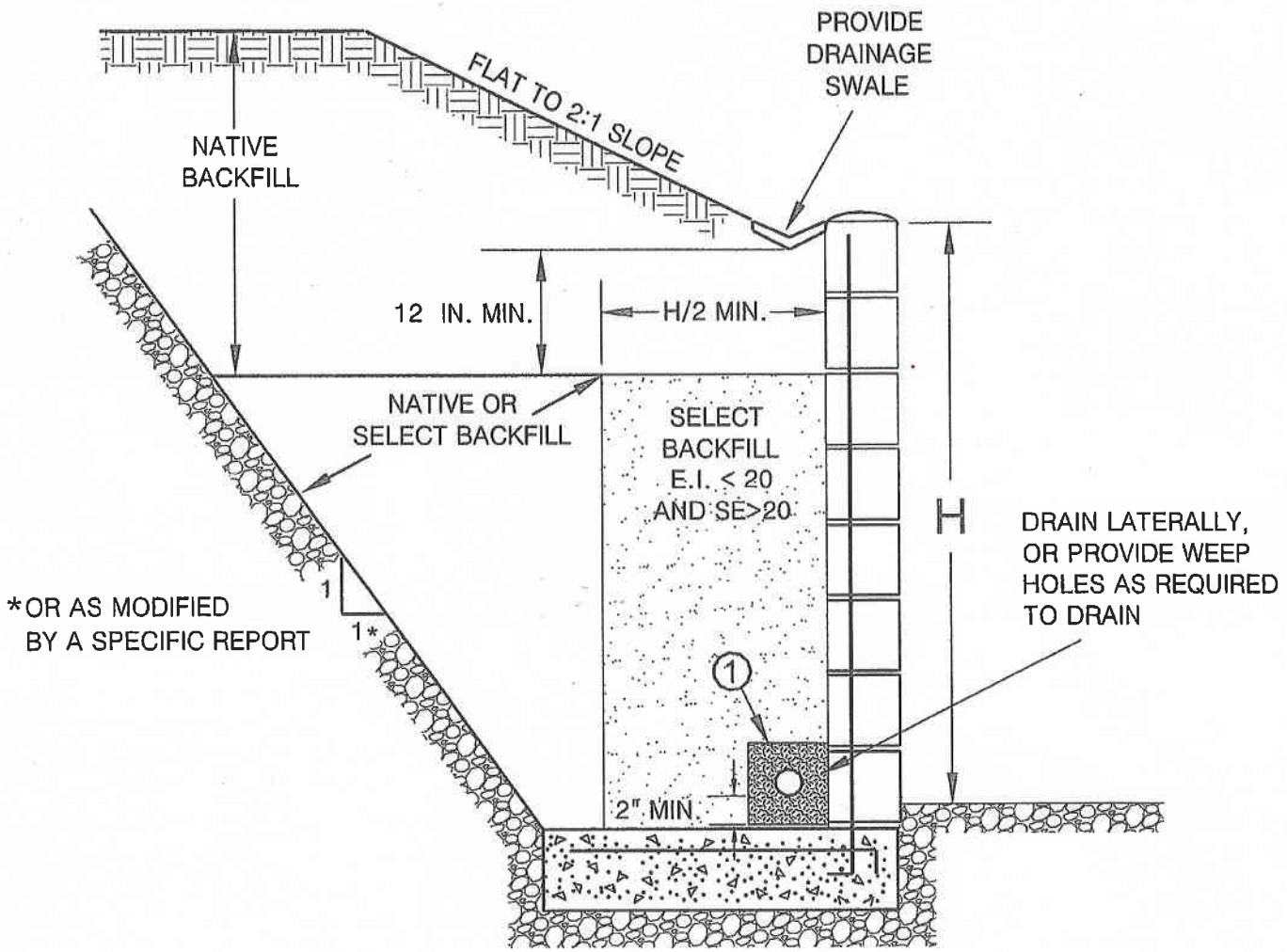
7.7 Exterior Slabs and Walkways

Exterior concrete slabs and walkways should be designed and constructed in consideration of the following recommendations.

7.7.1 Subgrade Compaction

The subgrade below exterior concrete slabs should be compacted to a minimum of 90 percent relative compaction as determined by ASTM Test Method: D 1557.

RETAINING WALL BACKFILL DETAIL



(1)

PIPE: 4-INCH PERFORATED PVC, SCHEDULE 40, SDR35 OR APPROVED ALTERNATE MINIMUM 8 PERFORATIONS (1/4-IN. DIA.) PER LINEAL FT. IN BOTTOM HALF OF PIPE

ROCK: MINIMUM VOLUME OF 1 CU. FT. OF 3/4-IN. MAX. ROCK PER. LINEAL FOOT OF PIPE, OR APPROVED ALTERNATE

FILTER FABRIC: MIRAFI 140 FILTER FABRIC OR APPROVED EQUIVALENT

7.7.2 Subgrade Moisture

The subgrade below concrete slabs should be moisture conditioned to a minimum of 110 percent of optimum moisture (low expansion) or 120 percent of optimum moisture (medium expansion) prior to concrete placement.

7.7.3 Concrete Slab Thickness

Concrete flatwork and driveways should be designed utilizing four-inch minimum thickness.

7.7.4 Concrete Slab Reinforcement

Utilization of reinforcement for flatwork and driveways is subject to a cost/benefit analysis. Reinforcement will decrease the amount of cracking that may occur in flatwork, however, planning for occasional repairs may be more cost effective. Utilizing closely spaced control joints is likely more cost-effective than utilizing reinforcement. The majority of the soils onsite are classified as low to medium in expansion potential. Consideration should be given to reinforcing flatwork with irregular (non-square/rectangular) shapes or flatwork underlain by medium expansive soils. Reinforcement may consist of 6x6 W.14/W1.4 welded wire mesh or an equivalent section of rebar.

7.7.5 Control Joints

Weakened plane joints should be installed on walkways at intervals of approximately eight feet (maximum) or less. Exterior slabs should be designed to withstand shrinkage of the concrete.

7.8 Concrete Design

As stated in Section 5.1.6, negligible concentrations of sulfates were detected in the onsite soils (Class S0). Therefore, the use of sulfate resistant concrete is not

required per ACI 318-14 at this time. Post-grading conditions should be evaluated and final recommendations made at that time.

7.9 Corrosion

Based on preliminary testing, the onsite soils are corrosive to buried metal objects. Buried ferrous metals should be protected against the effects of corrosive soils in accordance with the manufacture's recommendations. Typical measures may include using non-corrosive backfill, protective coatings, wrapping, plastic pipes, or a combination of these methods. A corrosion engineer should be consulted if specific design recommendations are required by the improvement designer.

Per ACI 318-14, an exposure class of C1 would be applicable to metals encased in concrete (rebar in footings) due to being exposed to moisture from surrounding soils. Per Table 19.3.2.1 of ACI 318-14, the requirements for concrete with an exposure class of C1 are a minimum compressive strength of 2500 psi and a maximum water-soluble chloride ion content in concrete of 0.30 (percent by weight of cement).

7.10 Pavement Design

Pavement sections for the proposed streets shall be designed based on laboratory testing conducted on samples taken from the soil subgrade. Preliminarily, based on an assumed R-Value of 20, the pavement may be designed utilizing the sections presented in Table 7-5. These sections should be verified upon the completion of grading, based on R-Value testing. The ultimate pavement section design for public streets is under the City of Whittier's purview.

Table 7-5 Preliminary Pavement Sections		
Traffic Index	Pavement Section Options OR	
5.0	3-inch AC on 7.5-inch AB	4-inch AC on 5-inch AB
5.5	3-inch AC on 9-inch AB	4-inch AC on 7-inch AB
6.0	3.5-inch AC on 9.5-inch AB	4-inch AC on 8.5-inch AB
AC-Asphalt Concrete AB-Caltrans Class II Base		

All pavement designs are subject to review and approval of the City of Whittier. Pavement subgrade soils should be at or near optimum moisture content and should be compacted to at least 95 percent of the maximum laboratory dry density as determined in accordance with ASTM Test Method: D 1557. After subgrade compaction, the exposed grade should then be "proof"- rolled with heavy equipment to ensure the grade does not "pump" and is verified as non-yielding. Aggregate base should consist of Class 2 (Caltrans) aggregate base and should be compacted to at least 95 percent of the maximum laboratory dry density as determined in accordance with ASTM Test Method: D 1557.

7.11 Site Drainage

Positive drainage away from the proposed structures should be provided and maintained. Roof, pad and lot drainage should be collected and directed away from the structures toward approved disposal areas through drainage terraces, gutters, down drains, and other devices. Design fine grade elevations should be maintained through the life of the structure or if design fine grade elevations are altered, adequate area drains should be installed in order to provide rapid discharge of water, away from structures.

8.0 LOT MAINTENANCE

Ongoing maintenance of the improvements is essential to the long-term performance of structures. As such, the owners must implement certain maintenance procedures. The attached "Maintenance and Improvement Considerations" presented in Appendix

D may be included as part of the sales packet to educate the owners in issues related to drainage, maintenance, backyard improvements, etc. The following recommendations should also be implemented.

8.1 Lot Drainage

Roof, pad and lot drainage should be collected and directed away from structures and slopes and toward approved disposal areas. Design fine grade elevations should be maintained through the life of the structure or if design fine grade elevations are altered, adequate area drains should be installed in order to provide rapid discharge of water, away from structures and slopes. Residents should be made aware that they are responsible for maintenance and cleaning of all drainage terraces, down drains, and other devices that have been installed to promote structure and slope stability.

8.2 Burrowing Animals

Residents or owners should undertake a program for the elimination of burrowing animals.

9.0 FUTURE PLAN REVIEWS

This report represents a geotechnical review of the site. As the project design for the project progresses, site specific geologic and geotechnical issues should be considered in the design and construction of the project. Consequently, future plan reviews may be necessary. These reviews may include reviews of:

- Grading Plans
- Foundation Plans
- Utility Plans

These plans should be forwarded to the project Geotechnical Consultant for review.

10.0 CLOSURE

10.1 Geotechnical Review

For the purposes of this report, multiple working hypotheses were established for the project, utilizing the available data and the most probable model is used for the analysis. Future information collected during the proposed grading operations is intended to evaluate the hypothesis and as such, some of the assumptions summarized in this report may need to be changed. Some modifications of the grading recommendations may become necessary, should the conditions encountered in the field differ from the conditions hypothesized in this report.

Plans and sections of the project specifications should be reviewed by Alta to evaluate conformance with the intent of the recommendations contained in this report. If the project description or final design varies from that described in herein, Alta must be consulted regarding the applicability of the recommendations contained herein and whether any changes are required. Alta accepts no liability for any use of its recommendations if the project description or final design varies and Alta is not consulted regarding the alterations.

10.2 Limitations

This report is based on the following: 1) the project as presented on the attached plan; 2) the information obtained from previous laboratory testing included herein; and 3) from the information presented in the referenced reports. The findings and recommendations are based on the results of the subsurface investigation, laboratory testing, and office analysis combined with an interpolation and extrapolation of conditions between and beyond the subsurface excavation locations. However, the materials adjacent to or beneath those observed may have different characteristics than those observed and no precise representations are made as to the quality or extent of the materials not

observed. The results reflect an interpretation of the direct evidence obtained. Work performed by Alta has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the geotechnical profession currently practicing in the same locality under similar conditions. No other representation, either expressed or implied, and no warranty or guarantee is included or intended.

The recommendations presented in this report are based on the assumption that an appropriate level of field review will be provided by a geotechnical consultant who is familiar with the design and site geologic conditions. That field review shall be sufficient to confirm that geotechnical and geologic conditions exposed during grading are consistent with the geologic representations and corresponding recommendations presented in this report.

The conclusions and recommendations included in this report are applicable to the specific design of this project as discussed in this report. They have no applicability to any other project or to any other location and any and all subsequent users accept any and all liability resulting from any use or reuse of the data, opinions, and recommendations without the prior written consent of Alta.

Alta has no responsibility for construction means, methods, techniques, sequences, procedures, safety precautions, programs in connection with the construction, acts or omissions of the CONTRACTOR or any other person performing any of the construction, or for the failure of any of them to carry out the construction in accordance with the final design drawings and specifications.

APPENDIX A

REFERENCES

APPENDIX A

Selected References

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APPENDIX B

Previous Subsurface Investigation
(Alta, 2017)

APPENDIX B

Subsurface Investigation

Alta's previous subsurface investigation consisted of excavating, logging, and sampling seven (7) hollow-stem auger borings. Details of the subsurface investigation are presented in Table B-1. The approximate location of the exploratory excavation is shown on the accompanying Site Plan (Plate 1) and the Geotechnical Logs are attached.

TABLE B-1
SURFACE INVESTIGATION DETAILS

Equipment	Range of Depths	Sampling Methods	Sample Locations
Hollow-stem auger	Up to 26 feet	1. Bulk 2. Ring Samples	1. Bulk-Select Depth 2. Every 5-feet

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		grf	ltr	Description
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravel and Gravelly Soils More than 50% of coarse fraction retained on No,. 4 sieve		GW	Well-graded gravels or gravel sand mixtures, little or no fines
			GP	Poorly-graded gravels or gravel sand mixture, little or no fines
			GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sand and Sandy Soils More than 50% of coarse fraction passes on No,. 4 sieve		SW	Well-graded sands or gravelly sands, little or no fines
			SP	Poorly-graded sands or gravelly sands, little or no fines
			SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, and-clay mixtures

Major Divisions		grf	ltr	
Fine Grained Soils More than 50% passes on No. 200 sieve	Silts And Clays LL,<50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silt-clays of low plasticity
	Silts And Clays LL,<50		MH	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
			VH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat and other highly organic soils

BOUNDARY CLASSIFICATION: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS

U.S. STANDARD SERIES SIEVE: 200 | 40 | 10 | 4

CLEAR SQUARE SIEVE OPENINGS: 3/4" | 3" | 12"

Silts and Clays	Sand			Gravel		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

RELATIVE DENSITY

Sands and Gravels	Blows/Foot (SPT)
Very Loose	<4
Loose	4-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

CONSISTENCY CLASSIFICATION

Silts and Clays	Criteria
Very Soft	Thumb penetrates soil >1 in.
Soft	Thumb penetrates soil 1 in.
Firm	Thumb penetrates soil 1/4 in.
Stiff	Readily indented with thumbnail
Very Stiff	Thumbnail will not indent soil

HARDNESS

Bedrock
Soft
Moderately Hard
Hard
Very Hard

LABORATORY TESTS

Symbol	Test
DS	Direct Shear
DSR	Direct Shear (Remolded)
CON	Consolidation
SA	Sieve Analysis
MAX	Maximum Density
RV	Resistance (R) Value
EI	Expansion Index
SE	Sand Equivalent
AL	Atterberg Limits
CHEM	Chemical Analysis
HY	Hydrometer Analysis

SOIL MOISTURE

Increasing Visual Moisture Content

Dry - Dry to touch

Moist - Damp, but no visible free water

wet - Visible free water

SIZE PROPORTIONS

Trace - <5%

Few - 5 to 10%

Some - 15 to 25%

KEY TO EXPLORATORY BORING LOGS

ALTA CALIFORNIA GEOTECHNICAL INC.

PLATE B

GEOTECHNICAL BORING LOG

PROJECT NO.	2-0124	PROJECT NAME	Floral Dr.		
DATE STARTED	8/3/17	GROUND ELEV.		BORING DESIG.	B-1
DATE FINISHED	8/3/17	GW DEPTH (FT)		LOGGED BY	MT
DRILLER	2R Drilling	DRIVE WT.	140 lbs	NOTE	
TYPE OF DRILL RIG	Hollow stem auger	DROP	30 inches		

DEPTH (Feet)	SAMPLE TYPE	BLOWS	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
			SM	4 inches of concrete consisting of two 2" layers. **UNDOCUMENTED ARTIFICIAL FILL** (afu): SILTY SAND, fine grained, dark brown, moist, moderately dense.				
5	R	6	ML	@5 ft. **YOUNG ALLUVIAL FAN DEPOSITS** (Qyf): SANDY SILT, fine grained, brown, moist, firm, some CLAY.	16.0	105	74	
10	R	9		@10 ft. Light brown, trace micro pores, some CLAY.	15.3	103	67	CON, HY
15	R	8		@15 ft. Brownish yellow, trace gravel, no clay.	15.2	94	53	
20	R	12		@20 ft. Very fine grained, trace sand in bottom ring.	17.0	99	67	
25	R	13	ML	@25 ft. SANDY SILT, fine grained, brown to reddish brown, moist, firm.	25.0	95	90	
				TOTAL DEPTH 26 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- [R] RING (DRIVE) SAMPLE
- [S] SPT (SPLIT SPOON) SAMPLE
- [B] BULK SAMPLE [T] TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0124 PLATE B-1

GEOTECHNICAL BORING LOG

PROJECT NO.	2-0124	PROJECT NAME	Floral Dr.		
DATE STARTED	8/3/17	GROUND ELEV.		BORING DESIG.	B-2
DATE FINISHED	8/3/17	GW DEPTH (FT)		LOGGED BY	MT
DRILLER	2R Drilling	DRIVE WT.	140 lbs	NOTE	
TYPE OF DRILL RIG	Hollow stem auger	DROP	30 inches		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	**YOUNG ALLUVIAL FAN DEPOSITS** (Qyf): SILTY SAND, very fine to fine grained, tannish brown, dry, moderately dense.				
5		R	15		ML	@5 ft. SANDY SILT, very fine grained, brown, dry to damp, firm, few rootlets, porous, some CLAY.	8.5	86	25	CON, HY
10		R	24			@10 ft. fine grained, moist.	14.6	80	36	
15		R	7			@15 ft. Brownish yellow, trace rootlets, trace pores.	13.9	91	45	
20		R	10			@20 ft. very fine to fine grained, brown.	18.7	96	68	
25		R	15		SM	@25 ft. SILTY SAND, fine grained, dark brown, moist, moderately dense, decomposed rootlets.	15.8	108	80	
						TOTAL DEPTH 26 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0124 PLATE B-2

GEOTECHNICAL BORING LOG

PROJECT NO.	2-0124	PROJECT NAME	Floral Dr.	BORING DESIG.	B-3
DATE STARTED	8/3/17	GROUND ELEV.		LOGGED BY	MT
DATE FINISHED	8/3/17	GW DEPTH (FT)		NOTE	
DRILLER	2R Drilling	DRIVE WT.	140 lbs		
TYPE OF DRILL RIG	Hollow stem auger	DROP	30 inches		

DEPTH (Feet)	SAMPLE TYPE	BLOWS	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
			SM	**UNDOCUMENTED ARTIFICIAL FILL** (afu): SILTY SAND, fine grained, dark yellowish brown, dry, moderately dense.				
	R	8		@2 ft. Dark tannish brown, some roots.	6.8	96	25	
5	R	13	SM	@5 ft. **YOUNG ALLUVIAL FAN DEPOSITS** (Qyf): SILTY SAND, very fine to fine grained, dark yellowish brown to dark tannish brown, loose, trace roots and gravel.	7.2	92	24	
10	R	17		@10 ft. Dark tannish brown, few gravels.	11.1	109	57	
15	R	10	SM	@15 ft. SILTY SAND to SANDY SILT, fine grained, dark yellowish brown, moist, moderately dense/firm, few gravels.	12.6	99	49	
20	R	12	ML	@20 ft. SANDY SILT, fine grained, brown, moist, firm.	16.7	99	66	
25	R	15	ML	@25 ft. SILT, brown to dark tannish brown, moist, firm.	18.1	102	76	
				TOTAL DEPTH 26 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0124 PLATE B-3

GEOTECHNICAL BORING LOG

PROJECT NO.	2-0124	PROJECT NAME	Floral Dr.		
DATE STARTED	8/3/17	GROUND ELEV.		BORING DESIG.	B-4
DATE FINISHED	8/3/17	GW DEPTH (FT)		LOGGED BY	MT
DRILLER	2R Drilling	DRIVE WT.	140 lbs	NOTE	
TYPE OF DRILL RIG	Hollow stem auger	DROP	30 inches		

DEPTH (Feet)	SAMPLE TYPE	BLOWS	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
			ML	5 inches of concrete.				
	B			**UNDOCUMENTED ARTIFICIAL FILL** (afu): SANDY SILT, fine grained, dark brown, moist, firm, some CLAY.				
5	R	7	SM	@5 ft. **YOUNG ALLUVIAL FAN DEPOSITS** (Qyf): SILTY SAND, fine grained, light brown to dark yellowish brown, moist, loose.	11.0	108	55	
10	R	5		@10 ft. Yellowish brown, trace SAND.	8.4	96	31	
15	R	13		@15 ft. Tannish brown to yellowish brown.	8.9	104	40	
20	R	9		@20 ft. Dark yellowish brown, porous.	18.2	91	59	
25	R	15	ML	@25 ft. SANDY SILT, fine grained, dark reddish brown, moist, firm, decomposed rootlets.	15.2	109	78	
				TOTAL DEPTH 26 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0124 PLATE B-4

GEOTECHNICAL BORING LOG

PROJECT NO.	2-0124	PROJECT NAME	Floral Dr.		
DATE STARTED	8/3/17	GROUND ELEV.		BORING DESIG.	B-5
DATE FINISHED	8/3/17	GW DEPTH (FT)		LOGGED BY	MT
DRILLER	2R Drilling	DRIVE WT.	140 lbs	NOTE	
TYPE OF DRILL RIG	Hollow stem auger	DROP	30 inches		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SC	**UNDOCUMENTED ARTIFICIAL FILL** (afu): CLAYEY SAND, fine grained, dark brown, moist.				
5		R	6		SM	@4 ft. **YOUNG ALLUVIAL FAN DEPOSITS** (Qyf): SILTY SAND, fine grained, brown, moist. @5 ft. Loose, trace roots and pores, micro micaceous.	14.9	99	59	
10		R	10		ML	@10 ft. SANDY SILT, fine grained, brown, moist, firm. trace rootlets and gravels.	18.8	100	77	
15		R	11		SM	@15 ft. SILTY SAND with CLAY and CLAYEY SILT, fine grained, yellowish brown and brown, moist, moderately dense/firm.	16.9	107	82	
20		R	9		SM	@20 ft. SILTY SAND, very fine to fine grained, dark tannish brown to dark yellowish brown, moist, moderately firm.	20.8	97	78	
25		R	11		ML	@25 ft. SILT, reddish brown moisty, soft to firm.	19.4	101	80	
						TOTAL DEPTH 26 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
[R] RING (DRIVE) SAMPLE
[S] SPT (SPLIT SPOON) SAMPLE
[B] BULK SAMPLE [T] TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0124 PLATE B-5

GEOTECHNICAL BORING LOG

PROJECT NO.	2-0124	PROJECT NAME	Floral Dr.		
DATE STARTED	8/3/17	GROUND ELEV.		BORING DESIG.	P-1
DATE FINISHED	8/3/17	GW DEPTH (FT)		LOGGED BY	MT
DRILLER	2R Drilling	DRIVE WT.		NOTE	
TYPE OF DRILL RIG	Hollow stem auger	DROP			

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					CL	4 inches of concrete. **UNDOCUMENTED ARTIFICIAL FILL** (afu): SANDY CLAY, fine grained, dark brown, moist, firm.				
5						TOTAL DEPTH 5 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
▶ SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0124 PLATE B-6

GEOTECHNICAL BORING LOG

PROJECT NO.	2-0124	PROJECT NAME	Floral Dr.		
DATE STARTED	8/3/17	GROUND ELEV.		BORING DESIG.	P-2
DATE FINISHED	8/3/17	GW DEPTH (FT)		LOGGED BY	MT
DRILLER	2R Drilling	DRIVE WT.		NOTE	
TYPE OF DRILL RIG	Hollow stem auger	DROP			

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	4 inches of concrete.				
						UNDOCUMENTED ARTIFICIAL FILL (afu): SILTY SAND, fine grained, brown, moist, moderately dense, few CLAY.				
5						TOTAL DEPTH 5 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- [R] RING (DRIVE) SAMPLE
- [S] SPT (SPLIT SPOON) SAMPLE
- [B] BULK SAMPLE [T] TUBE SAMPLE

▼ GROUNDWATER
▶ SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0124 PLATE B-7

APPENDIX C

Previous Laboratory Testing
(Alta, 2017)

PREVIOUS LABORATORY TESTING

The following laboratory tests were performed on a representative sample in accordance with the applicable latest standards or methods from the ASTM, California Building Code (CBC) and California Department of Transportation.

Classification

Soils were classified with respect to the Unified Soil Classification System (USCS) in accordance with ASTM D-2487 and D-2488.

Particle Size Analysis

Modified hydrometer testing was conducted to aid in classification of the soil. The results of the particle size analysis are presented in Table C.

Maximum Density/Optimum Moisture

The maximum dry density and optimum moisture content of one representative bulk sample was evaluated in accordance with ASTM D-1557. The results are summarized in Table C.

Expansion Index Tests

One (1) expansion index test was performed to evaluate the expansion potential of typical on-site soil. Testing was carried out in general conformance with ASTM Test Method D-4829. The results are presented in Table C.

Consolidation Tests

Consolidation testing was performed on two (2) relatively “undisturbed” soil samples at their natural moisture content in accordance with procedures outlined in ASTM D-2435. The samples were placed in a consolidometer and loads were applied incrementally in geometric progression. The samples (2.42-inches in diameter and 1-inch in height) were permitted to consolidate under each load increment until the slope of the characteristic linear secondary compression portion of the thickness versus log of time plot was apparent. The percent

consolidation for each load cycle was recorded as the ratio of the amount of vertical compression to the original 1-inch height. The consolidation test results are shown on Plates C-1, and C-2.

Chemical Analyses

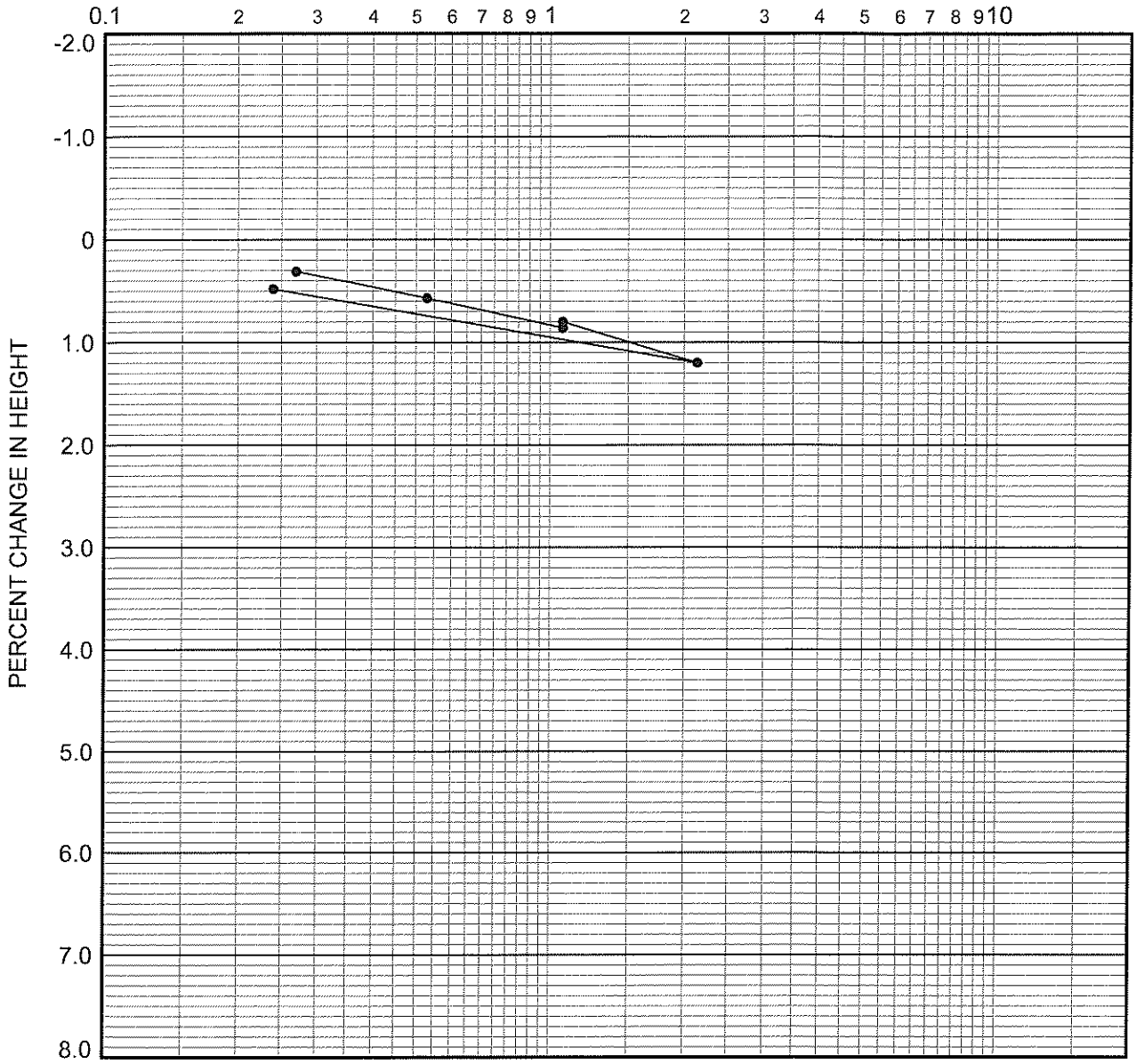
Chemical testing of selected sample was performed by Group Delta. The results of these tests are presented on Plate C-3.

TABLE C
SUMMARY OF LABORATORY TEST DATA
P.N. 2-0124

Boring/Pit No.	Depth	Soil Description	Group Symbol - Unified Soil Classification System	Maximum Dry Density		Direct Shear	Grain Size Analysis				Expansion Index	Sulfate Content	Consolidation	Other Tests Remarks
				Maximum Density (pcf)	Optimum Moisture (%)		Gravel (% + No. 4 Screen)	% Sand	%Silt (0.074 to 0.005mm)	% Clay (-0.005 mm)				
B-1	10	Sandy Silt (Qyf)	ML				1	38	38	23			See Plate C-1	
B-2	5	Sandy Silt (Qyf)	ML				2	36	38	24			See Plate C-2	
B-4	1-4	Sandy Silt (afu)	ML	128.3	10.2		5	39	34	22	41			Chem: Plate C-3

Alta California Geotechnical, Inc.

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-1	10.0	103	15.3	67	61	ML	Sandy silt (Qyf)

REMARKS: WATER ADDED AT 1.07 TSF

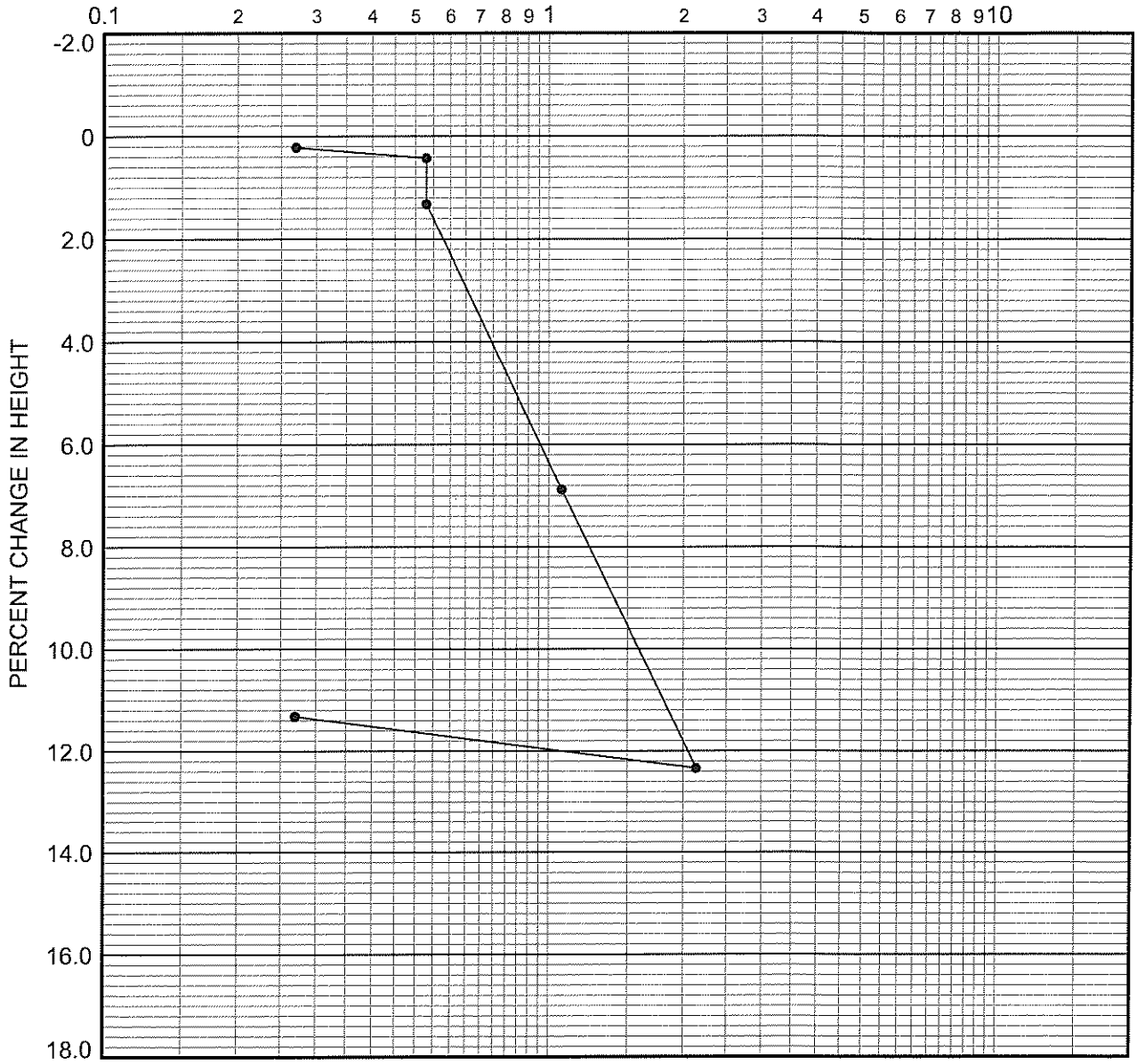
CONSOLIDATION CURVE

Alta California Geotechnical, Inc.

P.N. 2-0124

PLATE C-1

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-2	5.0	86	8.5	25	62	ML	Sandy silt (Qyf)

REMARKS: WATER ADDED AT 0.53 TSF

CONSOLIDATION CURVE

Alta California Geotechnical, Inc.

P.N. 2-0124

PLATE C-2

CORROSIVITY TEST RESULTS
(ASTM D516, CTM 643)

SAMPLE	pH	RESISTIVITY (OHM-CM)	SULFATE CONTENT (%)	CHLORIDE CONTENT (%)
WO #2-0124 / B-4 @ 1-4'	*7.50*	*1,004*	*< 0.01*	*< 0.01*

CORROSIVITY PERAMETERS

SULFATE CONTENT (%)	SULFATE EXPOSURE	CEMENT TYPE
0.00 to 0.10	Negligible	--
0.10 to 0.20	Moderate	II, IP(MS), IS(MS)
0.20 to 2.00	Severe	V
Above 2.00	Very Severe	V plus pozzolan

SOIL RESISTIVITY (OHM-CM)	GENERAL DEGREE OF CORROSIVITY TO FERROUS METALS
0 to 1,000	Very Corrosive
1,000 to 2,000	Corrosive
2,000 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
Above 10,000	Slightly Corrosive

CHLORIDE (CI) CONTENT (%)	GENERAL DEGREE OF CORROSIVITY TO METALS
0.00 to 0.03	Negligible
0.03 to 0.15	Corrosive
Above 0.15	Severely Corrosive

PLATE C-3

GROUP DELTA CONSULTANTS
1320 South Simpson Circle
Anaheim, CA 92806
(714) 660-7500 office
(714) 660-7550 fax

Project Name: *ALTA Geotechnical*
Project Number: *AL-153A*
Laboratory Number: *SO.4711*
Sample Number: *WO #2-0124 / B-4 @ 1-4'*
Report Date: *8/15/2017*

APPENDIX D

Maintenance and Improvement Considerations

MAINTENANCE AND IMPROVEMENT CONSIDERATIONS

General

Owners purchasing property must assume a certain degree of responsibility for improvements and for maintaining conditions around their home. Of primary importance from a geotechnical standpoint are maintaining drainage patterns and minimizing the soil moisture variation below all improvements. Such design, construction and owner maintenance provisions may include:

- Employing contractors for improvements who design and build in recognition of local building codes and specific site soils conditions.
- Establishing and maintaining positive drainage away from all foundations, walkways, driveways, patios, and other improvements.
- Avoiding the construction of planters adjacent to structural improvements. Alternatively, planter sides/bottoms can be sealed with an impermeable membrane and drained away from the improvements via subdrains into approved disposal areas.
- Sealing and maintaining construction/control joints within concrete slabs and walkways to reduce the potential for moisture infiltration into the subgrade soils.
- Utilizing landscaping schemes with vegetation that requires minimal watering. Watering should be done in a uniform manner, as equally as possible on all sides of the foundation, keeping the soil "moist" but not allowing the soil to become saturated.
- Maintaining positive drainage away from structures and providing roof gutters on all structures with downspouts that are designed to carry roof runoff directly into area drains or discharged well away from the foundation areas.
- Avoiding the placement of trees closer to the proposed structures than a distance of one-half the mature height of the tree.
- Observation of the soil conditions around the perimeter of the structure during extremely hot/dry or unusually wet weather conditions so that modifications can be made in irrigation programs to maintain relatively uniform moisture conditions.

Sulfates

Owners should be cautioned against the import and use of certain inorganic fertilizers, soil amendments, and/or other soils from offsite sources in the absence of specific information relating to their chemical composition. Some fertilizers have been known to leach sulfate compounds into soils and increase the sulfate concentrations to potentially detrimental levels.

Site Drainage

- The owners should be made aware of the potential problems that may develop when drainage is altered through construction of hardscape improvements. Ponded water, drainage over the slope face, leaking irrigation systems, overwatering, or other conditions which could lead to ground saturation must be avoided.
- No water should be allowed to flow over the slopes. No alteration of pad gradients should be allowed that would prevent pad and roof runoff from being directed to approved disposal areas.
- Drainage patterns have been established at the time of the fine grading should be maintained throughout the life of the structure. No alterations to these drainage patterns should be made unless designed by qualified professionals in compliance with local code requirements and site-specific soils conditions.

Slope Drainage

- Residents should be made aware of the importance of maintaining and cleaning all interceptor ditches, drainage terraces, down drains, and any other drainage devices, which have been installed to promote slope stability.
- Subsurface drainage pipe outlets may protrude through slope surfaces and/or wall faces. These pipes, in conjunction with the graded features, are essential to slope and wall stability and must be protected in-place. They should not be altered or damaged in any way.

Planting and Irrigation of Slopes

- Seeding and planting of the slopes should be planned to achieve, as rapidly as possible, a well-established and deep-rooted vegetal cover requiring minimal watering.
- It is the responsibility of the landscape architect to provide such plants initially and of the residents to maintain such planting. Alteration of such a planting scheme is at the resident's risk.
- The resident is responsible for proper irrigation and for maintenance and repair of properly installed irrigation systems. Leaks should be fixed immediately.
- Sprinklers should be adjusted to provide maximum uniform coverage with a minimum of water usage and overlap. Overwatering with consequent wasteful runoff and serious ground saturation must be avoided.
- If automatic sprinkler systems are installed, their use must be adjusted to account for seasonal and natural rainfall conditions.

Burrowing Animals

- Residents must undertake a program to eliminate burrowing animals. This must be an ongoing program in order to promote slope stability.

Owner Improvement

Owner improvements (pools, spas, patio slabs, retaining walls, planters, etc.) should be designed to account for the terrain of the project, as well as expansive soil conditions and chemical characteristics. Design considerations on any given lot may need to include provisions for differential bearing materials, ascending/descending slope conditions, bedrock structure, perched (irrigation) water, special geologic surcharge loading conditions, expansive soil stresses, and long-term creep/settlement.

All owner improvements should be designed and constructed by qualified professionals utilizing appropriate design methodologies, which account for the on-site soils and geologic conditions. Each lot and proposed improvement should be evaluated on an individual basis.

Setback Zones

Manufactured slopes maybe subject to long-term settlement and creep that can manifest itself in the form of both horizontal and vertical movement. These movements typically are produced as a result of weathering, erosion, gravity forces, and other natural phenomenon. A setback adjacent to slopes is required by most building codes, including the California Building Code. This zone is intended to locate and support the residential structures away from these slopes and onto soils that are not subject to the potential adverse effects of these natural phenomena.

The owner may wish to construct patios, walls, walkways, planters, swimming pools, spas, etc. within this zone. Such facilities may be sensitive to settlement and creep and should not be constructed within the setback zone unless properly engineered. It is suggested that plans for such improvements be designed by a professional engineer who is familiar with grading ordinances and design and construction requirements. In addition, we recommend that the

designer and contractor familiarize themselves with the site specific geologic and geotechnical conditions on the specific lot.

APPENDIX E

Earthwork Specifications

ALTA CALIFORNIA GEOTECHNICAL, INC.
EARTHWORK SPECIFICATIONS

These specifications present the generally accepted standards and minimum earthwork requirements for the development of the project. These specifications shall be the project guidelines for earthwork except where specifically superseded in preliminary geology and soils reports, grading plan review reports or by the prevailing grading codes or ordinances of the controlling agency.

A. GENERAL

1. The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications.

2. The project Geotechnical Engineer and Engineering Geologist, or their representatives, shall provide observation and testing services, and Geotechnical consultation for the duration of the project.

3. All clearing, grubbing, stripping and site preparation for the project shall be accomplished by the Contractor to the satisfaction of the Geotechnical Engineer/Engineering Geologist.

4. It is the Contractor's responsibility to prepare the ground surface to receive fill to the satisfaction of the Geotechnical Engineer and to place, spread, mix, moisture condition, and compact the fill in accordance with the job specifications and as required by the Geotechnical Engineer. The Contractor shall also remove all material considered by the Geotechnical Engineer to be unsuitable for use in the construction of engineered fills.

5. The Contractor shall have suitable and sufficient equipment in operation to handle the amount of fill being placed. When necessary, equipment will be shut down temporarily in order to permit the proper preparation of fills.

B. PREPARATION OF FILL AREAS

1. Excessive vegetation and all deleterious material should be disposed of offsite as required by the Geotechnical Engineer.

   Existing fill, soil, alluvium or rock materials determined by the Geotechnical Engineer as being unsuitable for placement in compacted fills shall be removed and hauled from the site. Where applicable, the Contractor may obtain the

approval of the Soils Engineer and the controlling authorities for the project to dispose of the above described materials, or a portion thereof, in designated areas onsite.

After removal of the deleterious materials have been accomplished, earth materials deemed unsuitable in their natural, in-place condition, shall be removed as recommended by the Geotechnical Engineer/Engineering Geologist.

2. Upon achieving a suitable bottom for fill placement, the exposed removal bottom shall be disced or bladed by the Contractor to the satisfaction of the Geotechnical Engineer. The prepared ground surfaces shall then be brought to the specified moisture content mixed as required, and compacted and tested as specified. In localities where it is necessary to obtain the approval of the controlling agency prior to placing fill, it will be the Contractor's responsibility to contact the proper authorities to visit the site.

3. Any underground structure such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipelines or other structures not located prior to grading are to be removed or treated in a manner prescribed by the Geotechnical Engineer and/or the controlling agency for the project.

C. ENGINEERED FILLS

1. Any material imported or excavated on the property may be utilized as fill, provided the material has been determined to be suitable by the Geotechnical Engineer. Deleterious materials shall be removed from the fill as directed by the Geotechnical Engineer.

2. Rock or rock fragments less than twelve inches in the largest dimension may be utilized in the fill, provided they are not placed in concentrated pockets and the distribution of the rocks is approved by the Geotechnical Engineer.

3. Rocks greater than twelve inches in the largest dimension shall be taken offsite, or placed in accordance with the recommendations of the Geotechnical Engineer in areas designated as suitable for rock disposal.

4. All materials to be used as fill, shall be tested in the laboratory by the Geotechnical Engineer. Proposed import materials shall be approved by the Geotechnical Engineer 48 hours prior to importation.

5. The fill materials shall be placed by the Contractor in lifts, that when compacted, shall not exceed six inches. Each lift shall be spread evenly and shall be

thoroughly mixed to achieve a near uniform moisture condition and a uniform blend of materials.

All compaction shall be achieved at or above the optimum moisture content, as determined by the applicable laboratory standard. The Contractor will be notified if the fill materials are too wet or too dry to achieve the required compaction standard.

6. When the moisture content of the fill material is below the limit specified by the Geotechnical Engineer, water shall be added and the materials shall be blended until a uniform moisture content, within specified limits, is achieved. When the moisture content of the fill material is above the limits specified by the Geotechnical Engineer, the fill materials shall be aerated by discing, blading, mixed with dryer fill materials, or other satisfactory methods until the moisture content is within the specified limits.

7. Each fill lift shall be compacted to the minimum project standards, in compliance with the testing methods specified by the controlling governmental agency, and in accordance with recommendations of the Geotechnical Engineer.

   In the absence of specific recommendations by the Geotechnical Engineer to the contrary, the compaction standard shall be the most recent version of ASTM:D 1557.

8. Where a slope receiving fill exceeds a ratio of five-horizontal to one-vertical, the fill shall be keyed and benched through all unsuitable materials into sound bedrock or firm material, in accordance with the recommendations and approval of the Geotechnical Engineer.

9. Side hill fills shall have a minimum key width of 15 feet into bedrock or firm materials, unless otherwise specified in the soil report and approved by the Geotechnical Engineer in the field.

10. Drainage terraces and subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency and/or with the recommendations of the Geotechnical Engineer and Engineering Geologist.

11. The Contractor shall be required to maintain the specified minimum relative compaction out to the finish slope face of fill slopes, buttresses, and stabilization fills as directed by the Geotechnical Engineer and/or the governing agency for the project. This may be achieved by either overbuilding the slope and cutting

back to the compacted core; by direct compaction of the slope face with suitable equipment; or by any other procedure which produces the required result.

12. The fill portion of fill-over-cut slopes shall be properly keyed into rock or firm material; and the fill area shall be stripped of all soil or unsuitable materials prior to placing fill.

    The design cut portion of the slope should be made first and evaluated for suitability by the Engineering Geologist prior to placement of fill in the keyway above the cut slope.

13. Pad areas in cut or natural ground shall be approved by the Geotechnical Engineer. Finished surfaces of these pads may require scarification and recompaction, or over excavation as determined by the Geotechnical Engineer.

D. CUT SLOPES

1. The Engineering Geologist shall observe all cut slopes and shall be notified by the Contractor when cut slopes are to be started.

2. If, during the course of grading, unforeseen adverse or potentially adverse geologic conditions are encountered, the Engineering Geologist and Soil Engineer shall investigate, analyze and make recommendations to remediate these problems.

3. Non-erodible interceptor swales shall be placed at the top of cut slopes that face the same direction as the superjacent, prevailing drainage.

4. Unless otherwise specified in specific geotechnical reports, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies.

5. Drainage terraces shall be constructed in compliance with the ordinances of the controlling governmental agencies, and/or in accordance with the recommendations of the Geotechnical Engineer or Engineering Geologist.

E. GRADING CONTROL

1. Fill placement shall be observed and tested by the Geotechnical Engineer and/or his representative during grading.

   Field density tests shall be made by the Geotechnical Engineer and/or his representative to evaluate the compaction and moisture compliance of each fill lift. Density tests shall be conducted at intervals not to exceed two feet of fill

height. Where sheepsfoot rollers are used, the fill may be disturbed to a depth of several inches. Density determinations shall be taken in the compacted material below the disturbed surface at a depth determined by the Geotechnical Engineer or his representative.

2. Where tests indicate that the density of any layer of fill, or portion thereof, is below the required relative compaction, or improper moisture content is in evidence, that particular layer or portion thereof shall be reworked until the required density and/or moisture content has been attained. Additional fills shall not be placed over an area until the previous lift of fill has been tested and found to meet the density and moisture requirements for the project and the previous lift is approved by the Geotechnical Engineer.

3. When grading activities are interrupted by heavy rains, fill operations shall not be resumed until field observations and tests by the Geotechnical Engineer indicate the moisture content and density of the fill are within the specified limits.

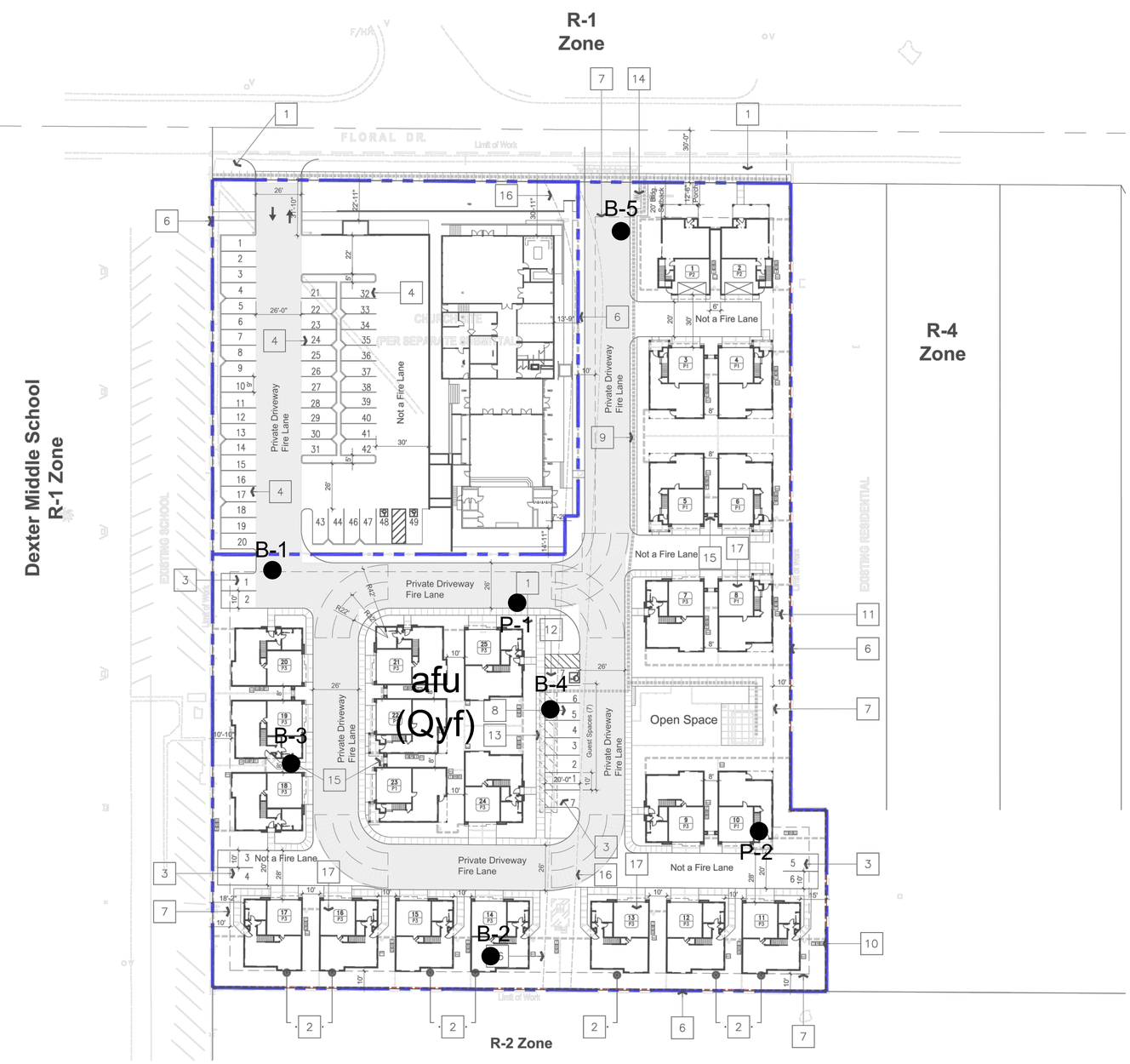
4. During construction, the Contractor shall properly grade all surfaces to maintain good drainage and prevent the ponding of water. The Contractor shall take remedial action to control surface water and to prevent erosion of graded areas until such time as a permanent drainage and erosion devices have been installed.

5. Observation and testing by the Geotechnical Engineer and/or his representative shall be conducted during filling and compacting operations in order that he will be able to state in his opinion that all cut and filled areas are graded in accordance with the approved specifications.

6. Upon the completion of grading activities and after the Geotechnical Engineer and Engineering Geologist have finished their observations of the work, final reports shall be submitted. No further excavation or fill placement shall be undertaken without prior notification of the Geotechnical Engineer and/or Engineering Geologist.

F. FINISHED SLOPES

All finished cut and fill slopes shall be planted and irrigated and/or protected from erosion in accordance with the project specifications, governing agencies, and/or as recommended by a landscape architect.



Project Summary

Total Site Area:	3.59 Acres	Building Code Designations:	R-3
Church Site Area:	1.03 Acres	Construction Type:	V-B
Residential Site Area:	2.56 Acres	Fire Sprinkler Req:	13D
Residential Dwelling Units:	25 DU		
Residential Density:	9.8 DU/AC		

Plan Summary

Plan	Type	No.Units	Area
P 1	3 BD / 2.5 BA	8	1,954 SF
P 2 (Alley Loaded)	3 BD / 2.5 BA	2	1,969 SF
P 3	4 BD / 3 BA	15	2,132 SF

Residential Parking Required	Resident Parking	Guest Parking
Resident Parking: 25 x 2.25 spaces/Unit	57	
Guest Parking: 25 x 0.25 Spaces/Unit		7

Residential Parking Provided	Resident Parking	Guest Parking
Resident Garages:	50	
Resident Open Parking:	7	
Guest Open Parking w/ Trellis		7
Total Onsite Parking Provided	57 Resident Spaces	7 Guest Spaces

Development Standards - Per R2 Standards

Standard	Required	Provided
Front Yard	20'	20'
Interior Side Yard	5' Min.	4'Min, 3' Min. at Plan 2
Rear Yard Setback	5' Min.	10' Min.
Height Limit	35'	<35'
Private Open Space	250 sf per unit, 10' Min.	580 sf/unit
Total Open Space	350 sf per unit =8,750 sf	18,920 sf = 750 sf/unit
Building Coverage	60% Max.	±31,500 sf - 29%

Church Summary

Lot Coverage	
Building Footprint:	9,082 sf
Lot Area:	45,088 sf
Lot Coverage:	20.1%
Building Coverage	
Church:	5,219 sf
Narthex:	738 sf
Parish Hall:	5,131 sf
Net New Construction:	2,212 sf
Total Building Area:	9,082 sf
Church Parking Required	
Seating in Sanctuary: 144 / 3 seats/space	48
Church Parking Provided	
Open Parking:	49

Notes:

1. Fire Hydrant
2. Alternate Elevation: privacy windows at Second story bedrooms
3. Resident Covered Parking - 10'x20'
4. Shared Guest Parking
5. Mail Kiosk
6. Property Line
7. Setback
8. Guest Parking - 10'x2
9. Path of Travel
10. Trash Enclosures
11. A/C Condenser
12. Accessible Parking
13. Shade Trellis at Parking
14. Entry Monument
15. Portico Wall
16. Waterline Easement
17. Private Garage - 20'x20' Clear

LEGEND

B-5 ●	Approximate Location of Boring
P-2 ●	Approximate Location of Infiltration Testing
afu	Undocumented Artificial Fill
Qyf	Young Alluvial Fan Deposits (Buried)

Fire Radius

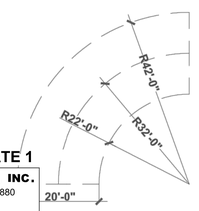


PLATE 1

ALTA CALIFORNIA GEOTECHNICAL, INC.
170 N. MAPLE STREET, STE 108, CORONA, CA 92880
TELEPHONE: (951) 509-7090
PROJECT NUMBER: 2-0124 DATE: Nov. 24, 2020

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BRANDYWINE HOMES

WHITTIER FLORAL
WHITTIER, CA # 2019-0500

CONCEPT DESIGN
November 19, 2020

0 15 30 60

SITE PLAN

A1.0

Appendix E Phase I and Phase II Environmental Site Assessment

Phase I and II Environmental Site Assessment

11716 Floral Drive
Whittier, California 90601

Stantec

Prepared for:
Brandywine Homes
16580 Aston
Irvine, California 92606

Prepared by:
Stantec Consulting Services Inc.
25864-F Business Center Drive
Redlands, California 92374

Project No.: 185803981

August 31, 2017

Sign-off Sheet and Signatures of Environmental Professionals

This Phase I and II Environmental Site Assessment was prepared by Stantec Consulting Services Inc. (Stantec) for the account of Brandywine Homes. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

All information, conclusions, and recommendations provided by Stantec in this document regarding the Phase I ESA have been prepared under the supervision of and reviewed by the professionals whose signatures appear below.

Author _____
(signature)

Joshua Sargent, MS
Geologic Project Specialist

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Property. I have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Reviewer _____
(signature)

Alicia Jansen,
Associate Scientist

Reviewer _____
(signature)

Kyle Emerson, California C.E.G. 1271
Managing Principal Geologist

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Abbreviations

AAI	All Appropriate Inquiry
ACM	Asbestos containing material
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
BER	Business Environmental Risk
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
CREC	Controlled Recognized Environmental Conditions
CWA	Clean Water Act
ELUC	Environmental Land Use Control
EP	Environmental Professional
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
ft msl	Feet above mean sea level
HREC	Historical Recognized Environmental Conditions
HWMU	Hazardous Waste Management Unit
LBP	Lead-based Paint
LUST	Leaking Underground Storage Tank
NESHAP	National Emissions Standard for Hazardous Air Pollutants
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
pVEC	Potential Vapor Encroachment Condition
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Conditions
SWMU	Solid Waste Management Unit
TSCA	Toxic Substance Control Act
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

1.0 SUMMARY

Stantec has completed a Phase I Environmental Site Assessment (ESA) report for the property located at 11716 Floral Drive in the City of Whittier, County of Los Angeles, California 90601 (the "Property"), on behalf of Brandywine Homes (the "Client"). Brandywine Homes has been designated as the User of this report.

The Phase I ESA was conducted in conformance with the requirements of American Society for Testing and Materials (ASTM) Designation E 1527-13 and All Appropriate Inquiries (AAI) Final Rule 40 CFR Part 312, except as may have been modified by the scope of work, and terms and conditions, requested by the Client. Any exceptions to, or deletions from, the ASTM practice are described in Section 2.3.

The Property consists of approximately 2.55 acres of a larger 3.6-acre parcel of land developed with buildings associated with the Trinity Lutheran Church of Whittier. The Property portion of the parcel consists of classroom buildings, office/fellowship building, playgrounds, and vacant field. The church and parking lot located in the northeastern corner are not included in the Property assessment. The surrounding area consist of residential structures. A Property location map is illustrated on Figure 1. A Property map illustrating the main features of the Property is provided as Figure 2. Photographs taken during the site reconnaissance visit are provided in Appendix A.

Stantec's interpretation of historical aerial photos indicate the Property was historically used for agricultural land (orchards) before it was developed with the existing structures in circa 1960.

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM E-1527-13 (and Final Rule 40 CFR Part 312 et seq.) with respect to the Property. Any exceptions to, or deletions from, this practice are described in Section 1.2 of this report. Any exceptions to, or deletions from, this practice are described in the Data Gaps section of this report. This assessment has revealed no evidence of recognized environmental conditions (RECs) in connection with the property except for the following:

- **Historical Agricultural Use.** Stantec's interpretation of historical aerial photos indicate the Property was used for agricultural land (orchards) before it was developed with the existing structures in circa 1960. Stantec recommended performing a shallow soil assessment at the Property to evaluate whether residual pesticides or heavy metals associated with herbicide applications are present above regulatory screening levels, human health risk criteria or California hazardous waste levels.

To assess this REC, Stantec advanced four shallow soil borings (SB-01 through SB-04) to approximately 3 feet below ground surface (bgs) across the property. The locations are presented on figure 2, attached. Soil samples were collected from each boring from one-foot and three-feet below ground surface (bgs). Soil samples from the one foot depth were submitted to the laboratory for analysis of organochlorine pesticides by EPA Method 8081A and

lead/arsenic by EPA Method 6010B. Given the potential impact was from a surface application, the deeper soil samples were held in the laboratory pending receipt of the analysis from the shallow samples if impact of concern was present.

There were no detections of organochlorine pesticides above the laboratory reporting limits in any of the samples analyzed. The lead concentrations were below the US EPA Regional Screening Level (RSL) of 80 milligrams per kilogram (mg/kg) and within naturally-occurring background concentrations of 12.4 to 97.1 mg/kg. Therefore, no additional assessment was recommended for the lead and organochlorine pesticides.

At soil boring locations SB-01, SB-02, and SB-03 arsenic was detected between 5,30 mg/kg and 9.42 mg/kg. These detected concentrations are above the U.S. EPA residential RSL of 0.067 mg/kg, but within the expected background concentrations for arsenic of 0.6 mg/kg to 12.0 mg/kg. The regulatory agencies use the background concentration as a guideline for action and therefore these detected levels are suitable for residential uses. Soil sample SB-04-01, had an elevated detection of arsenic at 65.1 mg/kg which is above maximum naturally-occurring regional background level of 12.0 mg/kg. To evaluate the vertical limits of impact at soil boring SB-04 the deeper sample from three feet bgs was analyzed. The deeper soil sample reported arsenic at 29.8 mg/kg, which is also above the maximum naturally-occurring regional background level of 12.0 mg/kg. Therefore, the vertical limits of impact were not defined.

On August 23, 2017, a deeper soil boring (SB-04A) was advanced to approximately six feet bgs adjacent to soil boring SB-04 to further vertically define the arsenic limit. The soil sample collected at 4-feet bgs from SB-04A reported arsenic at 4.19 mg/kg which is below the maximum naturally-occurring regional background level of 12.0 mg/kg. Additional step-out borings (SB-05, SB-06, and SB-07) were advanced to the east, west, and southwest of SB-04. Soil borings SB-06 and SB-07 had concentrations below the naturally-occurring regional background level; however, SB-05 located approximately 40 feet to the west reported arsenic at 88.0 mg/kg at the 1-foot sample interval. The deeper soil sample from SB-05 collected from 3-feet reported arsenic at 3.85 mg/kg which is below the maximum naturally-occurring regional background level.

Laboratory analytical results are summarized in Table 1. Complete laboratory analytical reports are provided in Appendix G.

Based on the assessment completed to date, Stantec estimates that approximately 415 cubic yards (or approximately 623 tons) of soil impacted with arsenic above the residential screening level is present at the Property in the vicinity of borings SB-04 and SB-5. The impacted soil does not appear to extent to deeper than four (4) feet. It is recommended that this soil be excavated and disposed of from the Property, until the residual levels in the excavation base and sidewalls are below the screening levels.

The preceding summary is intended for informational purposes only. Reading of the full body of this report is recommended.

2.0 INTRODUCTION

The objective of this Phase I ESA was to perform appropriate inquiry into the past ownership and uses of the Property consistent with good commercial or customary practice as outlined by the ASTM in "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process", Designation E1527-13. The purpose of this Phase I ESA was to identify adverse environmental conditions including recognized environmental conditions ("RECs") associated with the Property.

The ASTM E1527-13 standard indicates that the purpose of the Phase I ESA is to identify RECs, including historical recognized environmental conditions ("HRECs"), and controlled recognized environmental conditions ("CRECs") that may exist at a property. The term "recognized environmental conditions" means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property:

(1) Due to any release to the environment;

(2) Under conditions indicative of a release to the environment; or

(3) Under conditions that pose a material threat of a future release to the environment.

ASTM defines a "HREC" as a REC that has occurred in connection with the property, but has been addressed to the satisfaction of the applicable regulatory authority and meets unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). Before calling the past release a HREC, the environmental professional must determine whether the past release is a REC when the current Phase I ESA is conducted (for example, if there has been a change in the regulations). If the EP considers the past release to be a REC at the time the Phase I ESA is conducted, the condition shall be included in the conclusions section of the report as a REC.

ASTM defines a "CREC" as a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), but with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).

De minimis conditions are not RECs. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. As indicated, the term REC does not include de minimis conditions, which generally do not present a material risk to human health

and would not likely be subject to enforcement action if brought to the attention of governmental agencies.

This ESA was conducted in accordance with ASTM E 1527-13. The scope of work conducted during this Phase I ESA consisted of a visual reconnaissance of the Property, interviews with key individuals, and review of reasonably ascertainable documents. The scope of work did not include an assessment for environmental regulatory compliance of any facility ever operated at the Property (past or present), or sampling and analyzing of environmental media. Stantec was not contracted to perform any independent evaluation of the purchase or lease price of the Property and its relationship to current fair market value. The conclusions presented in this ESA Report are professional opinions based on data described herein. The opinions are subject to the limitations described in Section 2.3.

ASTM E1527-13 notes that the availability of record information varies from source to source. The User or Environmental Professional is not obligated to identify, obtain, or review every possible source that might exist with respect to a property. Instead, ASTM identifies record information that is reasonably ascertainable from standard sources. "Reasonably ascertainable" means:

(1) Information that is publicly available;

(2) Information that is obtainable from its source within reasonable time and cost constraints; and

(3) Information that is practicably reviewable.

2.1 PROPERTY DESCRIPTION

The Property consists of approximately 2.55 acres of a larger 3.6-acre parcel of land developed with buildings associated with the Trinity Lutheran Church of Whittier. The Property portion of the parcel consists of classroom buildings, office/fellowship building, playgrounds, and vacant field. The church and parking lot located in the northeastern corner are not included in the Property assessment. The surrounding area consist of residential structures. A Property location map is illustrated on Figure 1. A Property map illustrating the main features of the Property is provided as Figure 2. Photographs taken during the site reconnaissance visit are provided in Appendix A.

The Assessor Parcel Number (APN) for the Property are 8132-022-007.

2.2 SPECIAL TERMS, CONDITIONS, AND SIGNIFICANT ASSUMPTIONS

There were no special terms, conditions, or significant assumptions associated with the Phase I ESA.

2.3 DATA GAPS

The federal AAI rule [40 CFR 312.10(a)] and ASTM E1527-13 identify a "data gap" as the lack or inability to obtain information required by the standards and practices of the rule despite good faith efforts by the Environmental Professional or the User.

Any data gaps resulting from the Phase I ESA described in this report are listed and discussed below.

2.4 EXCEPTIONS AND LIMITING CONDITIONS

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. In addition, the work was completed in accordance with the terms and limitations present in the Master Consulting Services Agreement (MCSA) between Brandywine Homes and Stantec. Where conflicts exist, the MCSA governs. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential and actual liabilities and conditions associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. (40 CFR 312.20(f)(2) requires that the Environmental Professional evaluate the thoroughness and reliability of provided information.) Stantec can neither warrant nor guarantee the thoroughness or reliability of information received from others.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition.

This report relates solely to the specific project for which Stantec was retained and the stated purpose for which this report was prepared and shall not be used or relied upon by the client identified herein for any variation or extension of this project, any other project or any other purpose.

This report has been prepared for the exclusive use of the client identified herein and any use of or reliance on this report by any third party is prohibited, except as may be consented to in writing by Stantec or as required by law. The provision of any such consent is at Stantec's sole and unfettered discretion and will only be authorized pursuant to the conditions of Stantec's standard form reliance letter. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

Project- specific limiting conditions are provided in Section 2.2.

The conclusions are based on the site conditions encountered by Stantec at the time the work. Accordingly, additional studies and actions may be required. As the purpose of this report is to identify selected site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment. The findings, observations, and conclusions expressed by Stantec in this report are not an opinion concerning the compliance of any past or present owner or operator of the site which is the subject of this report with any Federal, state, provincial or local law or regulation.

This report presents professional opinions and findings of a scientific and technical nature. It does not and shall not be construed to offer a legal opinion or representations as to the requirements of, nor compliance with, environmental laws, rules, regulations or policies of Federal, state, provincial or local governmental agencies. Issues raised by the report should be reviewed by client legal counsel.

Stantec specifically disclaims any responsibility to update the conclusions in this report if new or different information later becomes available or if the conditions or activities on the property subsequently change.

2.5 PERSONNEL QUALIFICATIONS

This Phase I ESA was conducted by, or under the supervision of, an individual that meets the ASTM definition of an Environmental Professional (EP). The credentials of the EP and other key Stantec personnel involved in conducting this Phase I ESA are provided in Appendix B.

3.0 USER-PROVIDED INFORMATION

ASTM E1527-13 describes responsibilities of the User to complete certain tasks in connection with the performance of "All Appropriate Inquiries" into the Property. The ASTM standard requires that the Environmental Professional request information from the User on the results of those tasks because that information can assist in the identification of RECs, CRECs, HRECs, or *de minimis* conditions in connection with the Property. Towards that end, Stantec requested that the User provide the following documents and information:

Description of Information	Provided (Yes / No)	Description and/or Key Findings
User Questionnaire	Yes	The Property was formerly used as a church and school. There are no known chemicals, hazardous substance, or petroleum products present or historically used on the Property.
Environmental Liens or Activity Use Limitations	Yes	A preliminary title report dated May 10, 2017 did not indicate environmental liens or use limitations at the Property. A copy of the preliminary title report is included in Appendix C.
Previous Environmental Permits or Reports Provided by User	No	There were no former reports or permit for the Property provided by the User.

The significant information provided by Mr. Matt Ashton, Land Acquisition Manager of Brandywine Home is summarized below. The completed user questionnaire is provided in Appendix C.

1. Information on Environmental Cleanup Liens on Site? **No**
2. Information on Property Activity or Use Limitations (including Institutional and Engineering Controls)? **No**
3. Specialized knowledge or experience of the User: **No**
4. Does the purchase price being paid for this property reasonably reflect the fair market value of the property? **Yes**
5. Commonly known or reasonably ascertainable information about the Property? **Church and School.**
6. The degree of obviousness or the presence or likely presence of contamination at the Property, and the ability to detect the contamination by appropriate investigation? **No**

4.0 RECORDS REVIEW

The objective of consulting historical sources of information is to develop the history of the Property and surrounding area, in order to evaluate if past uses may have resulted in RECs. Physical setting records are evaluated to determine if the physical setting may have contributed to adverse environmental conditions in connection with the Property. During the review of historical records, Stantec attempted to identify uses of the Property from the present to the Property's first developed use. Stantec's research included the reasonably ascertainable and useful records described in this section.

4.1 PHYSICAL SETTING

A summary of the physical setting of the Property is provided in the table below with additional details in the following subsections.

Topography:	The Property is located at an elevation of approximately 269 feet above mean sea level (amsl). The regional topographic gradient is to the general west/southwest (EDR, 2017).
Soil/Bedrock Data:	The vicinity of the Property is underlain by brown, fine-grained silt and clay. Underlying native sediments are consistent with historic alluvial (flood plain) deposition (PIC, 2015).
Estimated Depth to Groundwater/ Estimated Direction of Gradient:	According to data presented in Report for the *Installation of Five Off-Site Groundwater Monitoring Wells* for the nearby former Mobile Station located at 10737 Beverly Boulevard, groundwater has been observed in the Property vicinity at depths ranging between 84 and 107 feet below ground surface (bgs). During the third quarter 2012, depth to groundwater ranged between 79.42 and 108.55 feet bgs with a groundwater flow direction to the west-northwest.

4.1.1 Property Topography and Surface Water Flow

The Property is located at an elevation of approximately 269 feet above mean sea level (amsl). The regional topographic gradient is to the general west/southwest (EDR, 2017). Surface runoff is expected to accumulate in lower lying areas of the Property or flow southwest during a significant rain event.

4.1.2 Regional and Property Geology

The Property is located in the eastern portion of the Los Angeles Coastal Plain, at the base of the Puente Hills (California Geological Survey [CGS], 2002). The stratigraphy underlying the Property consists of the upper Pleistocene Lakewood Formation to 50 feet bgs, the lower Pleistocene San Pedro Formation to 500 feet bgs, and by Pleistocene sedimentary rocks. The Lakewood and San Pedro Formation consist of marine and alluvial sand, gravel, silt, and clay (CDMG, 1965).

The vicinity of the Property is underlain by brown, fine-grained silt and clay. Underlying native sediments are consistent with historic alluvial (flood plain) deposition (PIC, 2015).

4.1.3 Regional and Property Hydrogeology

The Property is located within the Central Groundwater Basin of Los Angeles County Coastal Plain. The basin is bounded on the north by the La Brea high surface divide; on the northeast and east by emergent less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills. The southeast boundary between Central Basin and Orange County Groundwater Basin roughly follows Coyote Creek. The southwester boundary is formed by the Newport Inglewood fault system and associated with folded rocks of the Newport Inglewood uplift. The Los Angeles and San Gabriel Rivers pass across the surface of the basin and drain inland basins into the Pacific Ocean (Department of Water Resources [DWR], 2004).

According to data presented in Report for the *Installation of Five Off-Site Groundwater Monitoring Wells* for the nearby former Mobile Station located at 10737 Beverly Boulevard, groundwater has been observed in the Property vicinity at depths ranging between 84 and 107 feet below ground surface (bgs). During the third quarter 2012, depth to groundwater ranged between 79.42 and 108.55 feet bgs with a groundwater flow direction to the west-northwest.

4.2 FEDERAL, STATE AND TRIBAL ENVIRONMENTAL RECORDS

A regulatory agency database search report was obtained from Environmental Data Resources, Inc. (EDR), a third-party environmental database search firm. A complete copy of the database search report, including the date the report was prepared, the date the information was last updated, and the definition of databases searched, is provided in Appendix D.

Stantec evaluated the information listed within the database relative to potential impact to the Property, assessing the potential for impacts based in part on the physical setting. As part of this process, inferences have been made regarding the likely groundwater flow direction at or near the Property. As described in 4.1.3, the groundwater flow direction is to the west-northwest. Observations about the Property and surrounding properties made during the Property reconnaissance are provided in more detail in Section 5.

4.2.1 Listings for Property

The Property was not listed in any of the environmental databases searched by EDR.

4.2.2 Listings for Nearby Sites with Potential to Impact Property

Stantec assessed data presented in the environmental agency database search report to evaluate the potential for conditions to pose a REC, CREC, or HREC for the Property.

Based on this evaluation, the following individual facilities were identified as the most likely potential sources of impact to the Property. The basis for why each of the following listed databases does or does not create a REC for the property is also provided.

Listed Facility Name/Address	Database Listing	Distance/Direction from Property	REC? (YES / NO)
CCS Boring 11721 Orange Drive Whittier, CA	EDR Hist Auto	106 feet south	No
This facility is listed as a general auto repair shop between 1992 and 1994. According to a review of aerial photographs this area appears to be residential with no history of commercial development. Therefore, this listing appears to be an error and is unlikely to represent an environmental concern to the Property.			
Mobil #18-E6W (Former #11) 11253 Whittier Whittier, CA	LUST; HIST CORTESE	2,240 feet southwest	No
This facility is listed as receiving case closure on January 7, 2003 from the Los Angeles Regional Water Quality Control Board for a gasoline release to soil and groundwater. Given the distance to the Property and regulatory status, the Mobil station is considered unlikely to represent an environmental concern to the Property.			

The remaining listings in the database search report provided in Appendix D do not constitute a REC for the Property.

4.3 LOCAL/REGIONAL ENVIRONMENTAL RECORDS

Stantec checked the following sources to obtain information pertaining to Property use and/or indications of RECs in connection with the Property:

4.3.1 Local Health Department

Agency Name Contact Information	Finding
County of Los Angeles Department of Public Works 900 South Fremont Street Alhambra, CA, 91803 Phone: (626) 458-3517	The County of Los Angeles Department of Public Works (DPW) does not have any records available for the Property. Stantec also research the Solid Waste Management System database managed by this agency (https://dpw.lacounty.gov/epd/swims/OnlineServices/search-methane-hazards-esri.aspx) to determine if methane mitigation is required for the Property. According to this database, the Property is not within 300 feet of an oil or gas well or within 1,000 feet of a methane producing site. Therefore, this agency does not require a methane mitigation system for future Property structures.

4.3.2 Fire Department

Agency Name Contact Information	Finding
County of Los Angeles Fire Department – Health Hazardous Materials Division 5555 Ferguson Drive, Suite 120-04 Commerce, CA 90022 Phone: (323) 890-7806	Stantec submitted a request to the County of Los Angeles Fire Department – Health Hazardous Materials Division on March 30, 2016 to request any available records for the Property. As of the writing of this report, no response has been received by Stantec. The lack of response is considered a data gap. However, based on its review of other sources, Stantec considers it unlikely that any records from this agency would alter the conclusions or recommendations of this report.

4.3.3 State Departments

Agency Name Contact Information	Finding
Regional Water Quality Control Board (RWQCB) – Los Angeles Region http://geotracker.waterboards.ca.gov	Stantec submitted a request to the RWQCB to request any available records for the Property. According to the office assistant at the RWQCB, no records are on file for the Property. Additionally, no records were available for the Property address in the Geotracker database. The correspondence is included in Appendix F.
Department of Toxic Substances Control – Envirostor database http://www.envirostor.dtsc.ca.gov	According to a letter dated July 26, 2017, the DTSC does not have any records for the Property address. Additionally, the Property and nearby properties were searched in the Envirostor database. No records were available for the Property and no environmental concerns were found for surrounding properties. The correspondence is included in Appendix F.
Division of Oil, Gas, and Geothermal Resources (DOGGR), District 1 5816 Corporate Ave, Suite 100 Cypress, CA 90630 Phone: (714) 816-6847 Website: http://www.conservation.ca.gov	Stantec reviewed the DOGGR online well search database (Well Finder) on August 4, 2017. The online database shows two oil wells located within ¼ mile of the Property. There are no oil wells located on the Property parcel. The closest oil well is an American Petrofina Exploration Company plugged well and located approximately 821 feet to the west. The second oil well is an Atlantic Richfield Company plugged well and is located approximately 1,274 feet to the north-northeast. Given the status and distance, neither well appears to represent an environmental concern to the Property.

4.3.4 Local Building and/or Planning Department Records

Agency Name, Contact Information	Findings
City of Whittier Community Development Department 13230 Penn Street Whittier, CA 90602 Phone: (562) 567-9342	On August 1, 2017, Stantec reviewed available records for the Property at the City of Whittier Community Development Department. Available records were various tenant improvement permits and building permits. No records of environmental significance were observed. Records review are included in Appendix F.

4.4 HISTORICAL RECORDS REVIEW

4.4.1 Land Title Records/Deeds

According to the Preliminary Title Report dated May 10, 2017, no environmental liens or activity use limitations were listed for the Property. A copy of the Preliminary Title Report is provided in Appendix C.

4.4.2 Aerial Photographs

Stantec reviewed historical aerial photographs provided by EDR. The general type of activity on a property and land use changes can often be discerned from the type and layout of structures visible in the photographs. However, specific elements of a facility's operation usually cannot be discerned from aerial photographs alone. Copies of the Historical Aerial Photographs are provided in Appendix E. The following table summarizes Stantec's observations of the reviewed historical aerial photographs.

Year	Scale	Observations, Property and Adjoining Properties
1928 1938 1948	1:500	The Property and surrounding area appears to be utilized for agricultural purposes (i.e. orchards). The Property is not depicted in the 1948 aerial photograph but the adjacent property to the northwest appears to remain used for agricultural purposes.
1953	1:500	The classroom buildings appear on the western portion of the Property. The eastern portion of the Property appears to be vacant land. Another school appears adjacent to the west. Residential structures appear to the north and east and south beyond a field of trees. Beverly Boulevard appears to the east.
1952	1:500	Orchards no longer appear on the Property or surrounding area. The circular tanks on the southeastern corner of the Property appear to be replaced with square shaped features indicative of oil wells. Additional structures appear to the south beyond Davidson Drive. An additional structure in the configuration of a gasoline station is located to the west.
1964 1972 1979	1:500	The church building and administration/fellowship hall building appear on the northeastern portion of the Property. An increase in residential properties appears in the surrounding area.
1981 1989 1994	1:500	The Property and adjacent properties appear to remain relatively unchanged since the 1979 photograph.
2002 2005 2009 2010 2012	1:500	The Property and adjacent properties appear to remain relatively unchanged since the 1994 photograph. The southeastern portion of the Property was covered with a concrete basketball court.

EDR, 2017

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Stantec's interpretation of historical aerial photos indicate the Property was used for agricultural land (orchards) before it was developed with the existing structures in circa 1960. Stantec recommended performing a shallow soil assessment at the Property to evaluate whether residual pesticides or heavy metals associated with herbicide applications are present above regulatory screening levels, human health risk criteria or California hazardous waste levels.

To assess this REC, Stantec advanced four shallow soil borings (SB-01 through SB-04) to approximately 3 feet below ground surface (bgs) across the property. The locations are presented on figure 2, attached. Soil samples were collected from each boring from one-foot and three-feet below ground surface (bgs). Soil samples from the one foot depth were submitted to the laboratory for analysis of organochlorine pesticides by EPA Method 8081A and lead/arsenic by EPA Method 6010B. Given the potential impact was from a surface application, the deeper soil samples were held in the laboratory pending receipt of the analysis from the shallow samples if impact of concern was present.

There were no detections of organochlorine pesticides above the laboratory reporting limits in any of the samples analyzed. The lead concentrations were below the US EPA Regional Screening Level (RSL) of 80 milligrams per kilogram (mg/kg) and within naturally-occurring background concentrations of 12.4 to 97.1 mg/kg. Therefore, no additional assessment was recommended for the lead and organochlorine pesticides.

At soil boring locations SB-01, SB-02, and SB-03 arsenic was detected between 5,30 mg/kg and 9.42 mg/kg. These detected concentrations are above the U.S. EPA residential RSL of 0.067 mg/kg, but within the expected background concentrations for arsenic of 0.6 mg/kg to 12.0 mg/kg. The regulatory agencies use the background concentration as a guideline for action and therefore these detected levels are suitable for residential uses. Soil sample SB-04-01, had an elevated detection of arsenic at 65.1 mg/kg which is above maximum naturally-occurring regional background level of 12.0 mg/kg. To evaluate the vertical limits of impact at soil boring SB-04 the deeper sample from three feet bgs was analyzed. The deeper soil sample reported arsenic at 29.8 mg/kg, which is also above the maximum naturally-occurring regional background level of 12.0 mg/kg. Therefore, the vertical limits of impact were not defined.

On August 23, 2017, a deeper soil boring (SB-04A) was advanced to approximately six feet bgs adjacent to soil boring SB-04 to further vertically define the arsenic limit. The soil sample collected at 4-feet bgs from SB-04A reported arsenic at 4.19 mg/kg which is below the maximum naturally-occurring regional background level of 12.0 mg/kg. Additional step-out borings (SB-05, SB-06, and SB-07) were advanced to the east, west, and southwest of SB-04. Soil borings SB-06 and SB-07 had concentrations below the naturally-occurring regional background level; however, SB-05 located approximately 40 feet to the west reported arsenic at 88.0 mg/kg at the 1-foot sample interval. The deeper soil sample from SB-05 collected from 3-feet reported arsenic at 3.85 mg/kg which is below the maximum naturally-occurring regional background level.

Laboratory analytical results are summarized in Table 1. Complete laboratory analytical reports are provided in Appendix G.

Based on the assessment completed to date, Stantec estimates that approximately 415 cubic yards (or approximately 623 tons) of soil impacted with arsenic above the residential screening level is present at the Property in the vicinity of borings SB-04 and SB-5. The impacted soil does not appear to extent to deeper than four (4) feet. It is recommended that this soil be excavated and disposed of from the Property, until the residual levels in the excavation base and sidewalls are below the screening levels.

4.4.3 City Directories

Stantec reviewed the historical city directory abstract provided by EDR. The Property address of 11716 Flora Drive was listed as Trinity Lutheran Church & School from 1992 to 2013. The surrounding property addresses were primarily residential and school listings.

No RECs were identified for the Property based on City Directory listings. A copy of the complete City Directory Abstract is provided in Appendix E.

4.4.4 Historical Fire Insurance Maps

Fire insurance maps were developed for use by insurance companies to depict facilities, properties, and their uses for many locations throughout the United States. These maps provide information on the history of prior land use and are useful in assessing whether there may be potential environmental contamination on or near the Property. These maps, which have been periodically updated since the late 19th century, often provide valuable insight into historical Property uses.

Available fire insurance maps were requested from Environmental Data Resources. The following table summarizes the maps reviewed and our observations.

Year	Observations, Property and Adjoining Properties
1961 and 1962	The Property is depicted as the Trinity Lutheran Church and School. Dexter Intermediate School appears adjacent to the west. Flora Drive appears adjacent to the north. No RECs or environmental concerns were depicted on the maps.

A copies of the available Sanborn maps are included in Appendix E.

4.4.5 Historical Topographic Maps

Stantec reviewed historical USGS 7.5-Minute Topographic Maps of the Property vicinity to help identify past Property usage and areas of potential environmental concern. Copies of the historical maps are provided in Appendix E. The following table summarizes the maps reviewed and our observations.

Year	Scale	Observations, Property and Adjoining Properties
1896, 1899,	1:62,500	Based on the scale of the maps, no details regarding specific

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Year	Scale	Observations, Property and Adjoining Properties
1900, and 1902		development of the Property were observed. Sycamore Canyon appears to the east of the Property.
1923, 1925, and 1926	1=24,000	No site details on the Property are visible. The City of Whittier appears to the south.
1942, 1943, and 1947	1=62,500 1=24,000	The Property remains relatively unchanged from the 1926 map. Small structures and Beverly Boulevard appear to the east.
1948, 1949, 1951, and 1953	1=24,000	The Property is depicted as an urban area of the City of Whittier. No site details are provided.
1965, 1966, 1972, and 1981	1=24000	The Property is depicted as Trinity School with another school adjacent to the west.
2012	1=24000	No site details were depicted on the Property or adjacent land.

USGS via EDR, 2017

Copies of the historical topographic maps available are provided in Appendix E.

4.4.6 Other Historical Sources

No other historical sources were researched.

5.0 PROPERTY RECONNAISSANCE

A visit to the Property and its vicinity was conducted by Ms. Alicia Jansen, Associate Scientist with Stantec, on August 3, 2017. Authorization for access to the Property was coordinated through the Property owners representative, Ms. Pauline Chiles. Ms. Chiles was present during of the field visit and was interviewed by Stantec, as discussed in section 6.0. Photographs collected during the Property visit are included in Appendix A.

5.1 PROPERTY RECONNAISSANCE METHODOLOGY

The Property reconnaissance focused on observation of current conditions and observable indications of past uses and conditions that may indicate the presence of RECs. The Property reconnaissance was conducted on foot and Stantec utilized the following methodology to observe the Property:

- Traverse the perimeter of the Property.
- Traverse transects across the Property.
- Observe adjacent property uses.

Weather conditions during the visit to the Property were clear and sunny. There were no weather related property access restrictions encountered during the reconnaissance visit.

5.2 GENERAL DESCRIPTION

Property and Area Description:	The Property is located west of the intersection of Beverly Boulevard and Floral Drive in the City of Whittier, County of Los Angeles, California. The surrounding area consist of residential structures.
Property Operations.	The Trinity Lutheran Church of Whittier and school.
Structures, Roads, Other Improvements:	The Property portion of the parcel consists of classroom buildings, office/fellowship building, playgrounds, and vacant field. The church and parking lot located in the northeastern corner are not included in the Property assessment.
Property Size (acres):	Approximately 2.55 acres
Estimated % of Property Covered by Buildings and/or Pavement:	75%
Observed Current Property Use/Operations:	Inventory from the school buildings is currently being sold and removed. The church will remain in-use.
Observed Evidence of Past Property Use(s):	None observed.
Sewage Disposal Method (and	City of Whittier.

age):	
Potable Water Source:	Whittier Water Department
Electric Utility:	Southern California Edison

5.3 HAZARDOUS SUBSTANCES AND PETROLEUM PRODUCTS

The following table summarizes Stantec's observations during the Property reconnaissance.

Observations	Description/Location
Hazardous Substances and Petroleum Products as Defined by CERCLA 42 U.S.C. § 9601(14):	Small amounts of household cleaners were observed in janitors closest in the classroom buildings and fellowship hall/administration building.
Drums (≥ 5 gallons):	None observed.
Strong, Pungent, or Noxious Odors:	None detected.
Pools of Liquid:	None observed.
Unidentified Substance Containers:	See hazardous substances discussion above.
PCB-Containing Equipment:	A pad-mounted transformer was located on the sidewalk in the northeastern corner. No signs of a release were noted from the transformer.
Other Observed Evidence of Hazardous Substances or Petroleum Products:	The concrete basketball courts in the southeastern portion of the Property were being used by the City of Whittier road construction crew for a staging area and parking. The area was surrounded by a fence and no evidence of petroleum products or hazardous materials were observed in the staging area.

5.4 INTERIOR OBSERVATIONS

Stantec observed the interior portions of the buildings. The fellowship hall/administration building on the northeastern portion consists of a main floor with office space, a conference/prayer room, a kitchen, gymnasium, preschool, and stage. The partial second story included a lounge area and roof access. The buildings on the eastern portion consist of classrooms, restrooms, a library, office space, and teachers' lounge. No RECs were identified in interior portions of the building. Photographs of interior portions of the building are provided in Appendix A.

5.5 EXTERIOR OBSERVATIONS

Stantec made the following observations during the site reconnaissance of exterior areas of the Property and/or identified the following information during the interview or records review portions of the assessment:

Observations	Description
On-site Pits, Ponds, or Lagoons:	None observed.
Stained Soil or Pavement:	None observed.

Observations	Description
Stressed Vegetation:	None observed.
Waste Streams and Waste Collection Areas:	None observed.
Solid Waste Disposal:	No areas indicative of solid waste disposal was observed.
Potential Areas of Fill Placement:	No mounds, piles or depressions suggesting the placement of fill material were observed on the Property
Wastewater:	No exterior wastewater discharge was observed.
Stormwater:	None observed.
Wells:	None observed or reported.
Septic Systems:	No visible evidence of the existence of a septic system was observed.
Other Exterior Observations:	Playground and picnic areas were located in the southeastern portion of the Property. A large open field is located in the southwestern corner of the Property.

5.6 UNDERGROUND STORAGE TANKS/STRUCTURES

Existing USTs:	No visible evidence (fill pipes, vent pipes, dispensers, surface patches), which would indicate the presence of USTs, was discovered during the site reconnaissance.
Former USTs:	No visible evidence (fill pipes, vent pipes, dispensers, surface patches), reports, or other evidence of the former presence of USTs was discovered during this Phase I ESA.
Other Underground Structures:	None observed.

5.7 ABOVEGROUND STORAGE TANKS

Existing ASTs:	No visible evidence (fill pipes, vent pipes, dispensers, surface stains), which would indicate the presence of ASTs, was discovered during the site reconnaissance.
Former ASTs:	No visible evidence (fill pipes, vent pipes, dispensers, surface stains), reports, or other evidence of the former presence of USTs was discovered during this Phase I ESA.

5.8 ADJOINING PROPERTIES

5.8.1 Current Uses of Adjoining Properties

As viewed from the Property and/or from public rights-of-way, Stantec made the following observations about use and activities on adjoining properties:

NORTH	Floral Drive beyond which is residential.
SOUTH	Residential
EAST	Residential
WEST	Dexter Middle School

5.8.2 Observed Evidence of Past Uses of Adjoining Properties

Observations of adjoining properties providing indications of past use and activities, if any, are described below.

NORTH	None observed.
SOUTH	None observed.
EAST	None observed.
WEST	None observed.

5.8.3 Pits, Ponds or Lagoons on Adjoining Properties

As viewed from the Property and/or from public rights-of-way, Stantec made the following observations about the presence of pits, ponds and lagoons on adjoining properties:

NORTH	None observed.
SOUTH	None observed.
EAST	None observed.
WEST	None observed.

5.9 OBSERVED PHYSICAL SETTING

Topography of the Property and Surrounding Area:	The Property and surrounding area are relatively flat. The southern open field is at a slightly lower elevation.

6.0 POTENTIAL FOR VAPOR ENCROACHMENT

Additionally, consideration of the migration of hazardous substances and petroleum products in all phases including solid, liquid, or vapor is required by the ASTM E1527-13 standard. As stated in Section 2.1 of ASTM E1527-13:

Vapor migration must be considered no differently than contaminated groundwater migration in the Phase I investigation. While E2600-10 provides and industry consensus methodology to assess vapor migration, use of E2600-10 methodology is not required to achieve compliance with AAI – an EP may use alternative methodology as deemed appropriate, but this must be documented in the Phase I report (i.e., it must be "capable of being reconstructed by an EP other than the EP responsible for the Phase I").

As presented below, analysis of the potential for onsite or offsite releases to have affected the Site via migration through soil, groundwater or soil vapor was performed with consideration given to media affected, distance from the Site, remedial actions taken, type of contaminants, subsurface conditions, and location of the source relative to groundwater gradient.

Based on the site inspection, review of adjacent properties, and available environmental records, the likelihood for vapor intrusion at the Property is considered low based on the following:

- No releases are reported for adjacent sites or sites within a quarter mile up-gradient relative to groundwater flow;
- No indication of manufacturing operations or use of hazardous materials was identified for neighboring properties;
- No evidence of potential operations that would impact soil vapor was identified for the Property; and
- Although evidence of agricultural use was identified, pesticides and associated chemicals do not pose a vapor intrusion risk.

Therefore, Stantec recommends no investigation of soil vapor at the Property.

7.0 INTERVIEWS

President of Congregation, Ms. Pauline Hiles

On August 4, 2017, Stantec interviewed Ms. Hiles during the visit to the Property. Ms. Hiles has been familiar with the Property since 1951. She is not aware of any USTs, sumps, clarifiers, or outstanding environmental issues related to the Property. The church allowed the City of Whittier to use the southwestern portion of the Property as a staging and parking area during the road work activities that are being conducted along Beverly Boulevard for the next couple of months. No petroleum products or hazardous materials are being stored on the Property. Geotechnical investigations were being conducted at the same time of the site reconnaissance. Ms. Hiles is not aware of any environmental issues or concerns with the Property or any adjacent properties. No RECs were identified during Stantec interview with the Property owner's representative.

8.0 EVALUATION

This section provides a summary overview of or Findings, Opinions, and Conclusions.

8.1 FINDINGS AND OPINIONS

Information gathered from interviews, reviews of existing data review, and a property inspection was evaluated to determine if RECs are present in connection with the Property. Based on this information, Stantec made the following findings and developed the following opinions.

Finding 1: Stantec's interpretation of historical aerial photos indicate the Property was used for agricultural land (orchards) before it was developed with the existing structures in circa 1960. Stantec recommended performing a shallow soil assessment at the Property to evaluate whether residual pesticides or heavy metals associated with herbicide applications are present above regulatory screening levels, human health risk criteria or California hazardous waste levels.

To assess this REC, Stantec advanced four shallow soil borings (SB-01 through SB-04) to approximately 3 feet below ground surface (bgs) across the property. The locations are presented on figure 2, attached. Soil samples were collected from each boring from one-foot and three-feet below ground surface (bgs). Soil samples from the one foot depth were submitted to the laboratory for analysis of organochlorine pesticides by EPA Method 8081A and lead/arsenic by EPA Method 6010B. Given the potential impact was from a surface application, the deeper soil samples were held in the laboratory pending receipt of the analysis from the shallow samples if impact of concern was present.

There were no detections of organochlorine pesticides above the laboratory reporting limits in any of the samples analyzed. The lead concentrations were below the US EPA Regional Screening Level (RSL) of 80 milligrams per kilogram (mg/kg) and within naturally-occurring background concentrations of 12.4 to 97.1 mg/kg. Therefore, no additional assessment was recommended for the lead and organochlorine pesticides.

At soil boring locations SB-01, SB-02, and SB-03 arsenic was detected between 5,30 mg/kg and 9.42 mg/kg. These detected concentrations are above the U.S. EPA residential RSL of 0.067 mg/kg, but within the expected background concentrations for arsenic of 0.6 mg/kg to 12.0 mg/kg. The regulatory agencies use the background concentration as a guideline for action and therefore these detected levels are suitable for residential uses. Soil sample SB-04-01, had an elevated detection of arsenic at 65.1 mg/kg which is above maximum naturally-occurring regional background level of 12.0 mg/kg. To evaluate the vertical limits of impact at soil boring SB-04 the deeper sample from three feet bgs was

analyzed. The deeper soil sample reported arsenic at 29.8 mg/kg, which is also above the maximum naturally-occurring regional background level of 12.0 mg/kg. Therefore, the vertical limits of impact were not defined.

On August 23, 2017, a deeper soil boring (SB-04A) was advanced to approximately six feet bgs adjacent to soil boring SB-04 to further vertically define the arsenic limit. The soil sample collected at 4-feet bgs from SB-04A reported arsenic at 4.19 mg/kg which is below the maximum naturally-occurring regional background level of 12.0 mg/kg. Additional step-out borings (SB-05, SB-06, and SB-07) were advanced to the east, west, and southwest of SB-04. Soil borings SB-06 and SB-07 had concentrations below the naturally-occurring regional background level; however, SB-05 located approximately 40 feet to the west reported arsenic at 88.0 mg/kg at the 1-foot sample interval. The deeper soil sample from SB-05 collected from 3-feet reported arsenic at 3.85 mg/kg which is below the maximum naturally-occurring regional background level.

Laboratory analytical results are summarized in Table 1. Complete laboratory analytical reports are provided in Appendix G.

Opinion 1: Based on the assessment completed to date, Stantec estimates that approximately 415 cubic yards (or approximately 623 tons) of soil impacted with arsenic above the residential screening level is present at the Property in the vicinity of borings SB-04 and SB-5. The impacted soil does not appear to extent to deeper than four (4) feet. It is recommended that this soil be excavated and disposed of from the Property, until the residual levels in the excavation base and sidewalls are below the screening levels.

Finding 2: An environmental records search was performed and identified sites within their respective ASTM E 1527-13 search radii of the Property that may represent RECs, HRECs, or de minimis conditions.

Opinion 2: Based on one or more of the following reasons: distance from the Property, position of sites with respect to assumed groundwater flow direction, the native soils, and regulatory status, none of the sites identified in the in the environmental records search report are expected to affect soil or groundwater quality at the Property. The environmental records search identified no RECs, HRECs or de minimis conditions at or near the Property.

Finding 3: According to historical documents including aerial photography, the Property was developed with the existing structures in circa 1960.

Opinion 3: Based on the dates of construction of the Property, Stantec recommends performing a comprehensive, pre-demolition asbestos and lead-based paint survey in accordance with the sampling criteria of the Asbestos Hazard

Emergency Response Act ("AHERA") prior to any activities with the potential to disturb building materials, and abated accordingly.

8.2 DATA GAPS

The federal AAI rule [40 CFR 312.10(a)] and ASTM E1527-13 identify a "data gap" as the lack or inability to obtain information required by the standards and practices of the rule despite good faith efforts by the Environmental Professional or the User.

Any data gaps resulting from the Phase I ESA described in this report are listed and discussed below.

Gap	Discussion
Deletions or Exceptions From Scope of Work Referenced in Section 1.4:	None
Weather-Related Restrictions To Site Reconnaissance:	None
Facility Access Restrictions to Property Reconnaissance:	None
Other Property Reconnaissance Restrictions:	None
Data Gaps From Environmental Records Review:	Stantec submitted a request to the County of Los Angeles Fire Department – Health Hazardous Materials Division to request any available records for the Property. As of the writing of this report, no response has been received by Stantec. The lack of response is considered a data gap. However, based on its review of other sources, Stantec considers it unlikely that any records from this agency would alter the conclusions or recommendations of this report.
Data Gaps From Historical Records Review:	None
Data Gaps From Interviews:	None
Other Data Gaps:	None

8.3 CONCLUSIONS

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM E-1527-13 (and Final Rule 40 CFR Part 312 et seq.) with respect to the Property. Any exceptions to, or deletions from, this practice are described in Section 1.2 of this report. Any exceptions to, or deletions from, this practice are described in the Data Gaps section of this report. This assessment has revealed no evidence of recognized environmental conditions (RECs) in connection with the property except for the following:

- **Historical Agricultural Use.** Stantec's interpretation of historical aerial photos indicate the Property was used for agricultural land (orchards) before it was developed with the existing structures in circa 1960. Stantec recommended performing a shallow soil assessment at the Property to evaluate whether residual pesticides or heavy metals associated with herbicide applications are present above regulatory screening levels, human health risk criteria or California hazardous waste levels.

To assess this REC, Stantec advanced four shallow soil borings (SB-01 through SB-04) to approximately 3 feet below ground surface (bgs) across the property. The locations are presented on figure 2, attached. Soil samples were collected from each boring from one-foot and three-feet below ground surface (bgs). Soil samples from the one foot depth were submitted to the laboratory for analysis of organochlorine pesticides by EPA Method 8081A and lead/arsenic by EPA Method 6010B. Given the potential impact was from a surface application, the deeper soil samples were held in the laboratory pending receipt of the analysis from the shallow samples if impact of concern was present.

There were no detections of organochlorine pesticides above the laboratory reporting limits in any of the samples analyzed. The lead concentrations were below the US EPA Regional Screening Level (RSL) of 80 milligrams per kilogram (mg/kg) and within naturally-occurring background concentrations of 12.4 to 97.1 mg/kg. Therefore, no additional assessment was recommended for the lead and organochlorine pesticides.

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Based on the assessment completed to date, Stantec estimates that approximately 415 cubic yards (or approximately 623 tons) of soil impacted with arsenic above the residential screening level is present at the Property in the vicinity of borings SB-04 and SB-5. The impacted soil does not appear to extent to deeper than four (4) feet. It is recommended that this soil be excavated and disposed of from the Property, until the residual levels in the excavation base and sidewalls are below the screening levels.

9.0 NON-SCOPE CONSIDERATIONS

No ASTM E1527-13 non-scope services were performed as part of this Phase I ESA with the following exceptions:

9.1 LEAD-BASED PAINT

Concern for lead-based paint (LBP) is primarily related to residential structures. The EPA's Final Rule on Disclosure of Lead-Based Paint in Housing (40 CFR Part 745) defines LBP as paint or other surface coatings that contain lead equal to or in excess of 1.0 milligram per square centimeter or 0.5 percent by weight.

The risk of lead toxicity in LBP varies based upon the condition of the paint and the year of its application. The U.S. Department of Housing and Urban Development (HUD) has identified the following risk factors:

- The age of the dwelling as follows: maximum risk is from paint applied before 1950.
- There is severe risk from paint applied before 1960.
- There is moderate risk from deteriorated paint applied before 1970.
- There is slight risk from the paint that is intact but applied before 1977.
- The condition of the painted surfaces.
- The presence of children and certain types of households in the building.
- Previously reported cases of lead poisoning in the building or area.

Construction Date	Residential (Yes/No)	Observed Condition of Painted Surfaces
Variable	Yes.	Due to the age of the structures (constructed circa 1960s), LBP is likely to be present at the Property. If present, Stantec recommends that LBP be removed from the property in accordance with all applicable laws prior to any activities with the potential to disturb painted surfaces.

9.2 ASBESTOS

Asbestos can be found in many applications, including sprayed-on or blanket-type insulation, pipe wraps, mastics, floor and ceiling tiles, wallboard, mortar, roofing materials, and a variety of other materials commonly used in construction. The greatest asbestos-related human health risks are associated with friable asbestos, which is ACM that can be reduced to powder by hand

pressure. Friable asbestos can become airborne and be inhaled, and has been associated with specific types of respiratory disease. The manufacturing and use of asbestos in most building products was curtailed during the late 1970s.

Stantec makes no warranty as to the possible existence or absence of inaccessible materials or to their evaluation with respect to asbestos content. Samples of suspect ACM should be collected for laboratory analysis of asbestos prior to any renovation or building demolition, in order to determine the need for compliance with EPA National Emission Standard for Hazardous Air Pollutants (NESHAP) regulations.

Given the age of the existing building on the Property (circa 1960s), the presence of ACM is considered very probable. Stantec recommends conducting a comprehensive, pre-demolition ACM survey in accordance with the sampling protocol of the Asbestos Hazard Emergency Response Act (AHERA) prior to any activities with the potential to disturb building materials to determine whether ACM are present. Further, in the event ACM is detected, Stantec recommends proper removal and disposal of the materials identified prior to any activities with the potential to disturb them.

9.3 RADON

Radon is a colorless, tasteless radioactive gas with an EPA-specified action level of 4.0 PicoCuries per liter of air (pCi/L) for residential properties. Radon gas has a very short half-life of 3.8 days. The health risk potential of radon is primarily associated with its rate of accumulation within confined areas near or in the ground, such as basements, where vapors can readily transfer to indoor air from the ground through foundation cracks or other pathways. Large, adequately ventilated rooms generally present limited risk for radon exposure. The radon concentrations in buildings and homes depend on many factors, including soil types, temperature, barometric pressure, and building construction (EPA, 1993).

The Property is located in an area designated as Federal EPA Radon Zone Level 2 with a predicted average indoor screening level greater than or equal to 2 pCi/L but less than or equal to 4 pCi/L. According to the EDR report, none of the nine sites tested in the 90601 zip code (area of the Property) exhibited levels above 4 pCi/L. The average first floor radon concentration in the Property vicinity is 0.300 pCi/L. Based on this data, the Property lies within an area of low radon risk, radon is unlikely to represent an environmental concern to the Property, and Stantec recommends no further assessment regarding this issue.

9.4 FLOOD ZONES

According to the Physical Setting summary portion of the EDR report, the Property is not located within a 100-year or 500-year flood zone.

10.0 REFERENCES

American Society for Testing and Materials, Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process, Designation: E 1527-13, November 2013.

California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOG), 2017, website http://www.consrv.ca.gov/dog/maps

California Division of Mines and Geology (CDMG), 1965, Geologic Map of California, Santa Ana Sheet, scale 1:250,000.

California Geological Survey (CGS), 2002, California Geomorphic Provinces, Note 36.

_____, 2010a, Fault Activity Map of California, adjustable scale, http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html.

_____, 2010b, Alquist-Priolo Earthquake Fault Zones of California, http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

Environmental Data Resources, Inc. (EDR), EDR Radius Map with GeoCheck, Inquiry Number 5001824.2s, dated July 25, 2017.

_____, Certified Sanborn Map Report, Inquiry Number 5001824.3, dated July 24, 2017.

_____, Historical Topographic Map Report, Inquiry Number 5001824.4, dated July 24, 2017.

_____, Aerial Photo Decade Package, Inquiry Number 5001824.9, dated July 24, 2017.

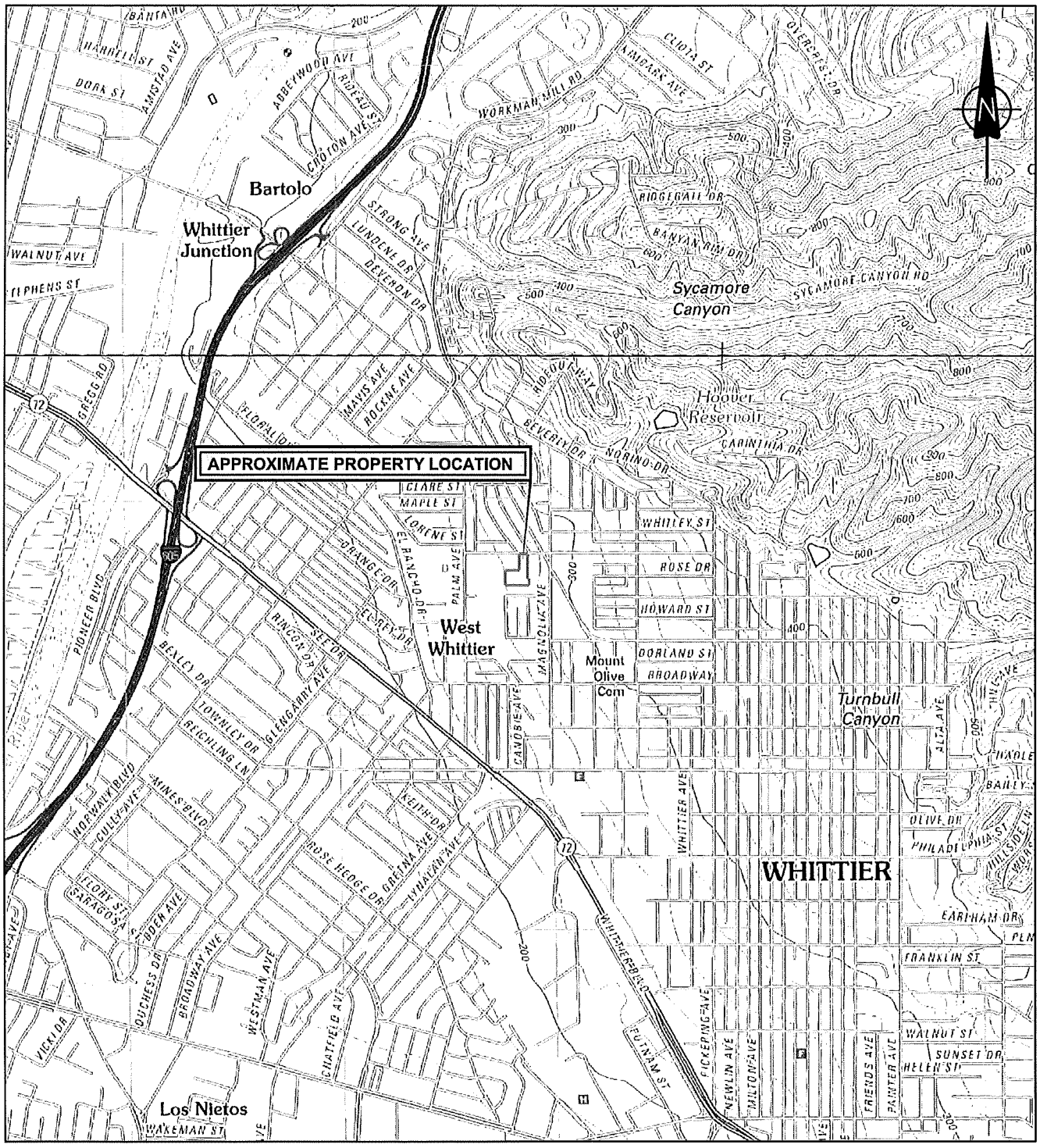
_____, City Directory Abstract, Inquiry Number 5001824.5, dated July 26, 2017.

PIC Environmental Services, 2015, Site Assessment Geologic Report, March 20.

State Water Resources Control Board (SWRCB), 2017, Geotracker website, http://geotracker.swrcb.ca.gov/

United States Geological Survey (USGS), 2012, Whittier Quadrangle, 7.5 Minute Topographic Map, Scale 1:24,000.

FIGURES

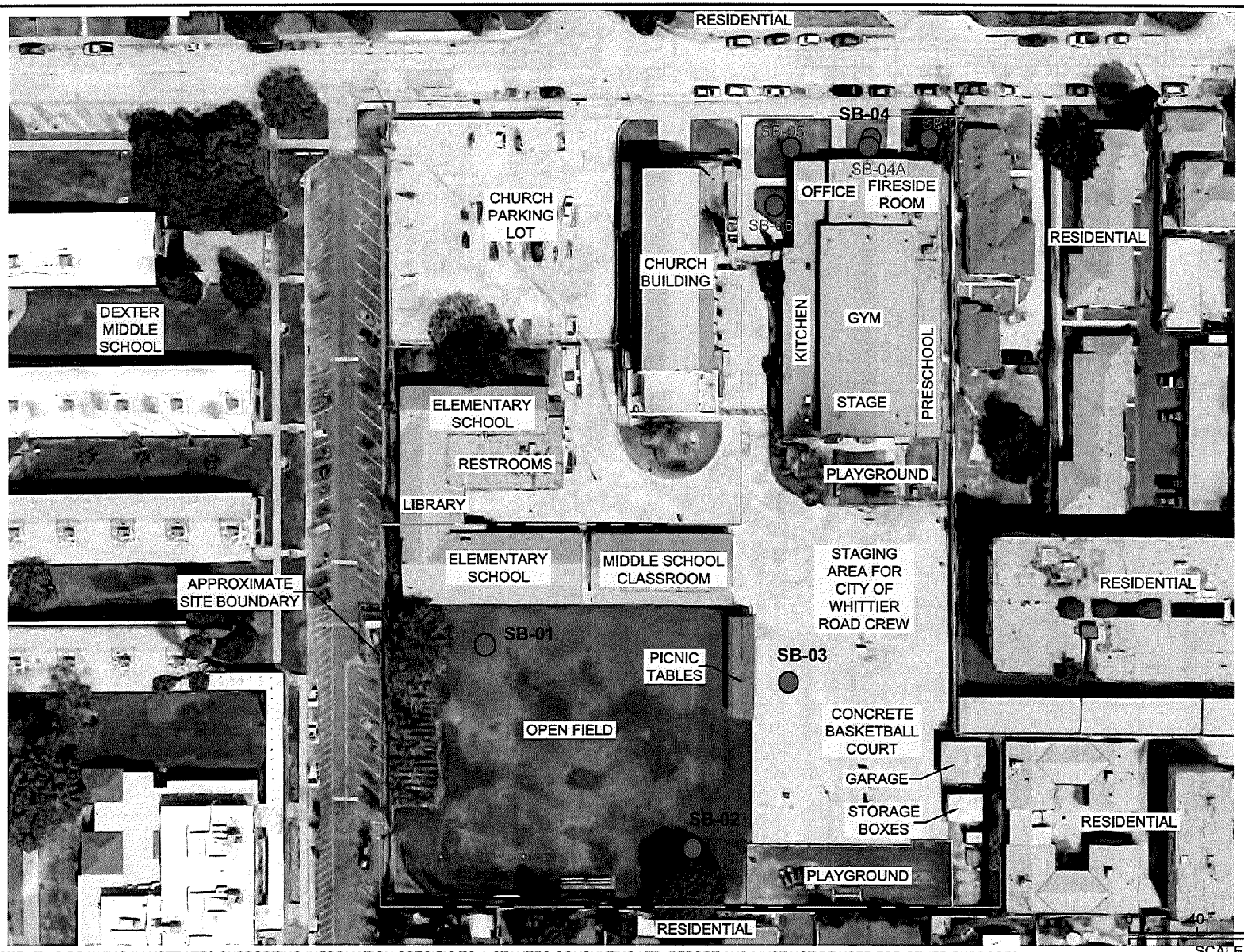


NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC SERVICES INC. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

PROPERTY LOCATION MAP PHASE I ESA 11716 FLORAL DRIVE, WHITTIER, CA	Project No.: 185803981 Scale: AS SHOWN Date: 17/08/05 Dwn. By: CD DM SC2017080108 App'd By: KE	Fig. No.: 1	Stantec
Client: BRANDYWINE HOMES			

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NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

SCALE : AS SHOWN

PROPERTY DETAILS

PHASE I ESA

11716 FLORAL DRIVE, WHITTIER, CA

Client: BRANDYWINE HOMES

Project No.:	185803981
Scale:	AS SHOWN
Date:	17/08/05
Dwn. By:	CD DM SC2017080109
App'd By:	KE

Fig. No.: 2

Stantec

PHASE I AND II ENVIRONMENTAL SITE ASSESSMENT

FIGURES
August 1, 2017

TABLE

Table 1
Summary of Soil Analytical Results - Pesticides, Arsenic, and Lead
11716 Floral Drive
Whittier, California
Stantec Project No.: 185803961

Location	Depth [1]	Date	Pesticides (EPA Test Method 8081A)				Metals (EPA Method 6010B)	
			4,4'-DDD	4,4'-DDE	4,4'-DDT	Other OCPs	Arsenic	Lead
DTSC HERO Note 3 or USEPA RSL for Residential Use [2]			2.3	2	1.9	varies	0.067	80
California Background Levels Range [3]			NE	NE	NE	NE	0.6-12.0	12.4-97.1
SB-01	1	8/3/2017	<0.005	<0.005	<0.005	<varies	**5.30**	**9.79**
SB-02	1	8/3/2017	<0.005	<0.005	<0.005	<varies	**5.55**	**7.59**
SB-03	1	8/3/2017	<0.0049	<0.0049	<0.0049	<varies	**9.42**	**7.55**
SB-04	1	8/3/2017	<0.0049	<0.0049	<0.0049	<varies	**65.1**	**11.0**
SB-04	3	8/3/2017	NA	NA	NA	NA	**29.8**	NA
SB-04A	4	8/23/2017	NA	NA	NA	NA	**4.19**	NA
SB-05	1	8/23/2017	NA	NA	NA	NA	**88.0**	NA
SB-05	3	8/23/2017	NA	NA	NA	NA	**3.85**	NA
SB-06	1	8/23/2017	NA	NA	NA	NA	**4.48**	NA
SB-07	1	8/23/2017	NA	NA	NA	NA	**4.73**	NA

NOTES:

(1) Sample depth is reported as feet below ground surface

(2) Site Cleanup Level is the most conservative value between DTSC HERO Note 3 (updated May 2016), or US EPA RSL (updated November 2016)

(3) Chernoff G., Bosan W., and Oudiz B., DTSC, Determination of a Southern California Regional Background Arsenic Concentration in Soil

All concentrations reported in milligrams of metal per kilogram of soil (mg/kg)

< - Indicates the concentration was not detected above the laboratory method reporting limit.

Indicates concentration is above screening level for residential use.

BOLD indicates the concentration was detected above the laboratory reporting limit.

Appendix A PHOTOGRAPHS OF THE PROPERTY AND VICINITY

Appendix F Hydrology & Hydraulics Study

HYDROLOGY & HYDRAULICS STUDY
TTM 82802
In the City of Whittier, California

Prepared For:

Trinity Lutheran Church
11716 Floral Drive
Irvine, CA 92606
Tel: (562)-699-7431

Prepared By:

KES Technologies Inc.
1 Venture Ste 130
Irvine, CA 92618
(949) 339-5331

Revised December, 2020

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IV. Conclusion……..3
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APPENDICIES

A. Supporting Hydrology Documents
B. Proposed and Existing Flows per Hydro Calculator
C. LID Calculations
D. Soils Report

List of Exhibits:

1. Preliminary Grading and Utility Plan
2. Hydrology Map

Hydrology Study and Hydraulic Analysis
For
TTM 82832
City of Whittier

ACKNOWLEDGEMENT AND SIGNATURE PAGE

This Hydrology Study prepared by KES Technologies, Inc. under the supervision of Ali Monshizadeh, P.E.

_____ _____

Ali Monshizadeh R.C.E 67674 Date
KES Technologies, Inc.

Introduction:

The project site is currently (1) fee parcel and is proposed to be developed as two fee parcels for condominium purposes and a proposed church site as TTM 82832.

The proposed church project will include one building and is located north and west of the proposed housing development. The project site includes the sanctuary, associated parking and open space landscape

The existing site currently resides as church site and school use. Post development and mapping the church will be within its own parcel. The exiting site surface flows to the west and north through the underwalk drain into the right of way. The proposed development will preserve this historical flow. The proposed development is proposed as 18% impervious and is the same as the predevelopment. The proposed development will outlet less flows as predevelopment.

The proposed site will capture and bio-filtrate the required LID flow by use of flow through filters. Any flow in addition to this flow will bypass the filters and flow to the north west through a parkway drain. Flow then collects within the right of way and flows to the west until it reaches a public maintained catch basin. Once in County maintained storm drain storm flows ultimately outlet into the San Gabriel River. No current water quality BMP are in place and utilized on the current site. The proposed main system will be sized for a 100-year storm event.

Prior to outletting into the public system, storm water flows will be encouraged to flow through landscape areas. These systems can be representative for a typical site treatment train.

Methodology:

The proposed drainage area was analyzed by utilizing the County of Los Angeles Hydrology Manual dated January 2006. Each drainage area was divided as demonstrated on the hydrology map (Exhibit 1&2). Each area was analyzed for acreage, impervious cover, and time of concentration according to the Rational Method. The flows, expressed in cubic feet per second (cfs), were totaled at outfall locations.

The proposed project only has one sub area as denoted on the proposed hydrology exhibit. The flows have been allocated to flow in the direction that closely matches the existing conditions.

Design Assumptions:

1. The onsite drainage area was analyzed for a 100-year existing storm event and a 100 proposed storm event using Rational Method Analysis per County of Los Angeles Standards
2. No additional infiltration was utilized for reducing the storm water flows.
3. Perimeter street right of way is considered to be un treated for water quality.
4. The impervious area has been calculated to be 88% for the subject project.
5. All flows are based on the complete future development of land.
6. The Final Hydrology Map will be included within the final engineering documents.
7. Tc and other calculation were obtained by utilizing the Los Angeles County Hydro calculator.
8. Existing impervious percentage is 88%
9. Project is not within a County adopted Floodway
10. Project is not within a FEMA Flood Zone A.
11. Project is a Designated Project
12. Infiltration is not feasible due to existing infiltration rates.
13. Runoff Harvest is not feasible.

Note: Additional Calculation Assumptions Have Been Noted Throughout Report

Conclusion:

The results from this hydrology and hydraulic analysis demonstrate the following:

- The site is designed to manage runoff from a 10 and 100-year storm.
- The subject site safely transfers storm water into the existing right of way to maintain the existing drainage patterns.

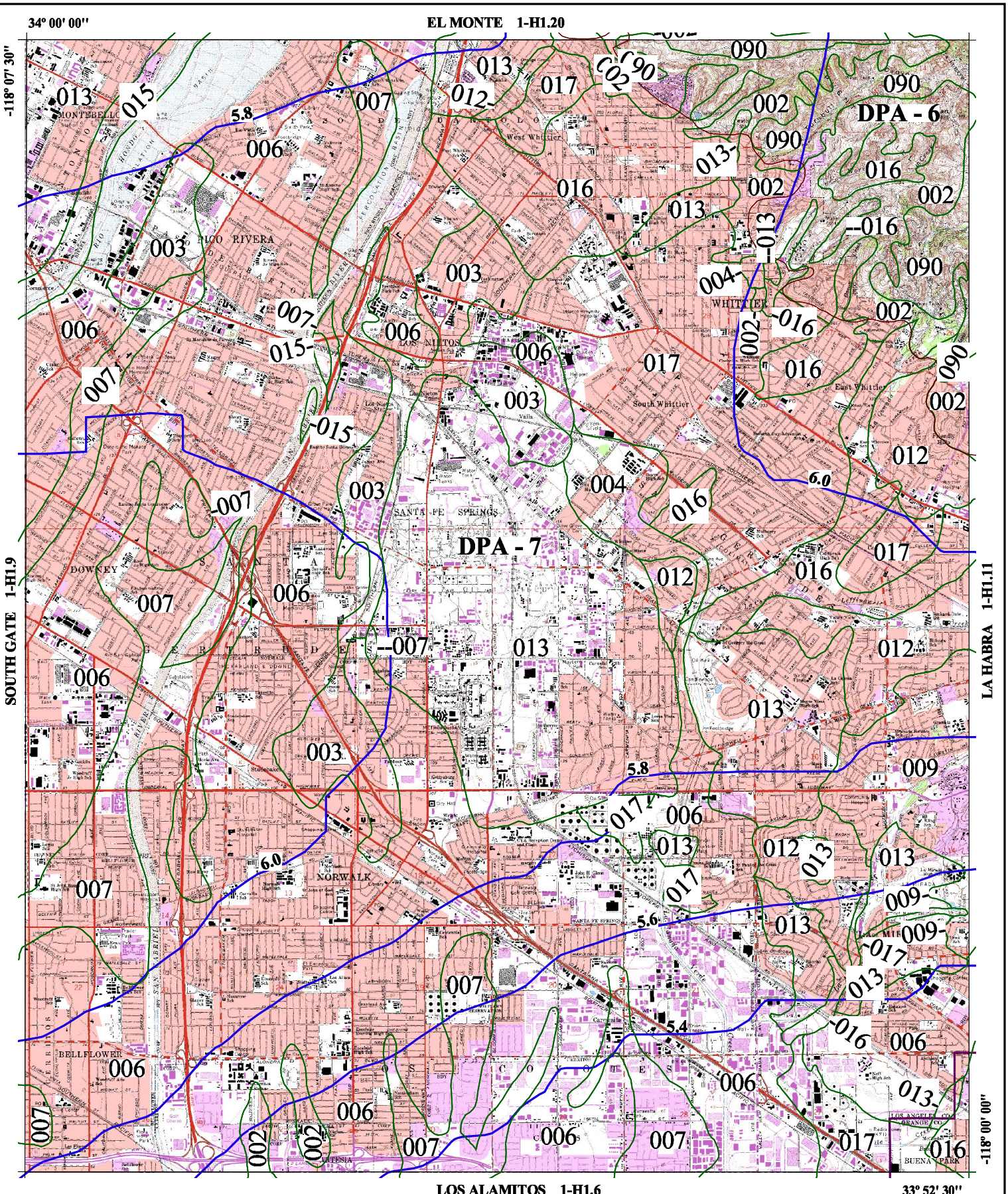
References

1. County of Los Angeles Hydrology Manual, dated January 2006.

2. Water Surface and Pressure Gradient (WSPG) Hydraulic Analysis System Software, Los Angeles County Department of Public Works Program No. F0515P, April 1979.

3. Advanced Engineering Software, HELE1 Hydraulic Elements I for Street Flooding and Catch Basin Design, 1996 version.

Supporting Hydrology Documents



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

WHITTIER
50-YEAR 24-HOUR ISOHYET

1-H1.10

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

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Proposed and Existing Flows

Peak Flow Hydrologic Analysis

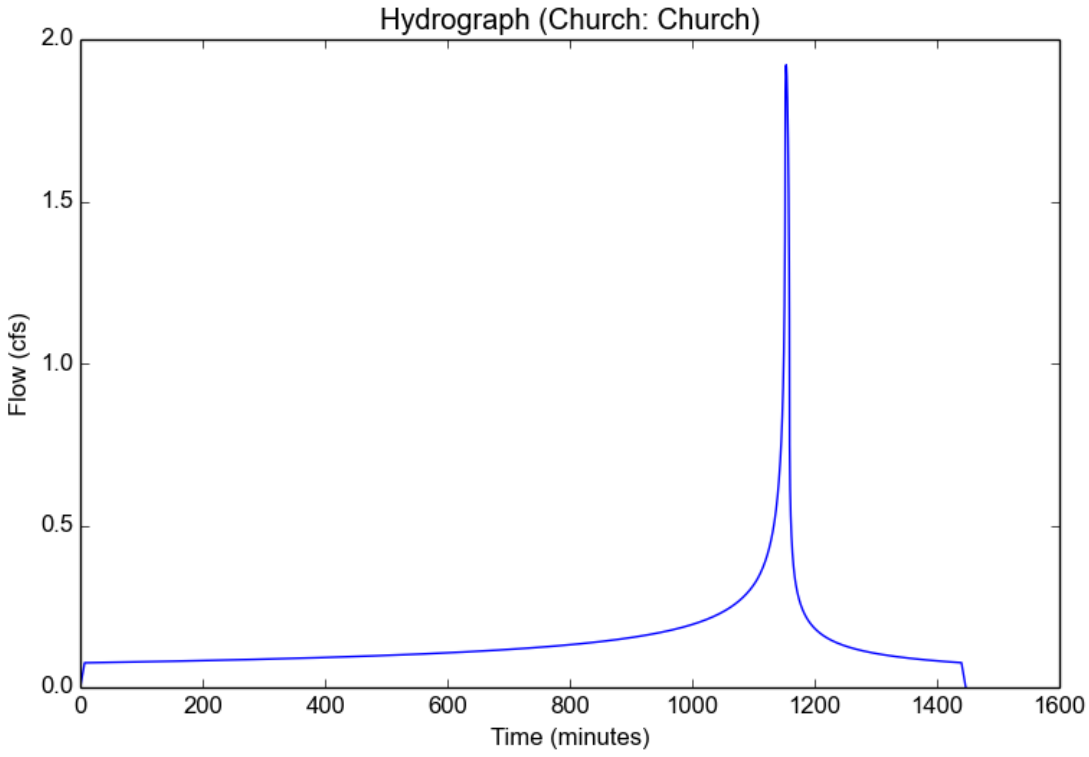
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Church
Subarea ID	Church
Area (ac)	1.03
Flow Path Length (ft)	330.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.88
Soil Type	16
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.1412
Peak Intensity (in/hr)	2.1094
Undeveloped Runoff Coefficient (Cu)	0.769
Developed Runoff Coefficient (Cd)	0.8843
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	1.9212
Burned Peak Flow Rate (cfs)	1.9212
24-Hr Clear Runoff Volume (ac-ft)	0.2861
24-Hr Clear Runoff Volume (cu-ft)	12464.2439



Peak Flow Hydrologic Analysis

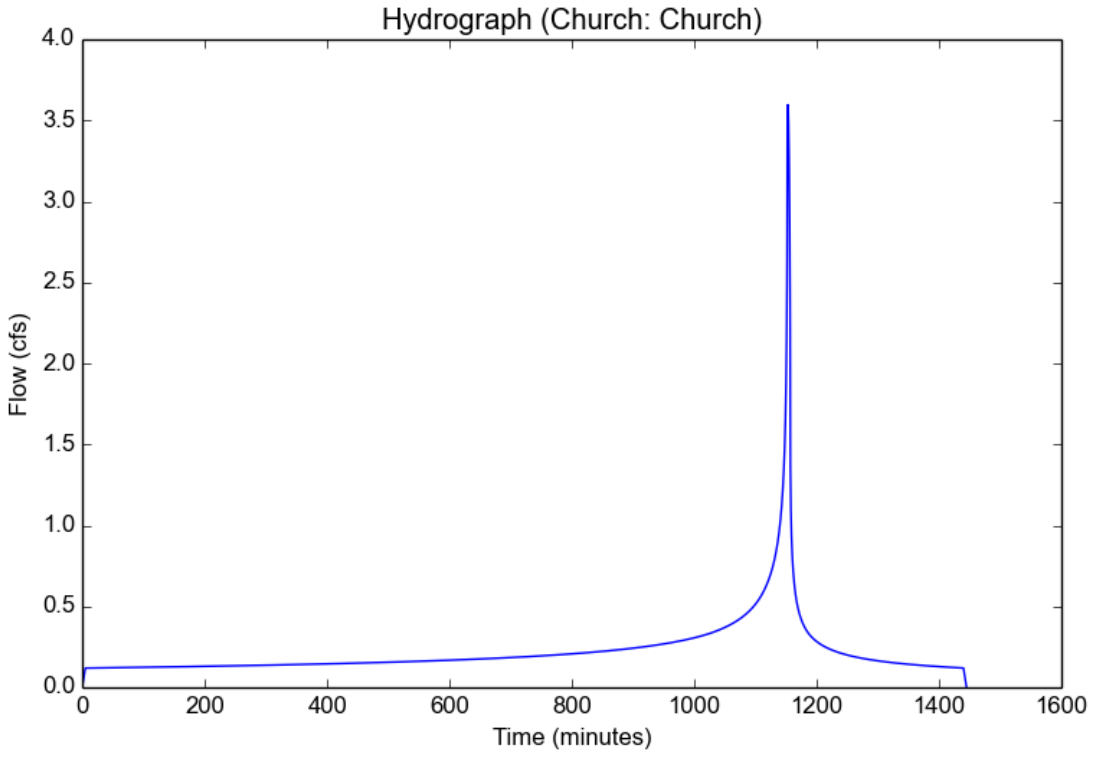
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Version: HydroCalc 1.0.3

Input Parameters

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Soil Type	16
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.5076
Peak Intensity (in/hr)	3.8826
Undeveloped Runoff Coefficient (Cu)	0.8946
Developed Runoff Coefficient (Cd)	0.8994
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.5966
Burned Peak Flow Rate (cfs)	3.5966
24-Hr Clear Runoff Volume (ac-ft)	0.4526
24-Hr Clear Runoff Volume (cu-ft)	19715.6224



LID Calculations

Peak Flow Hydrologic Analysis

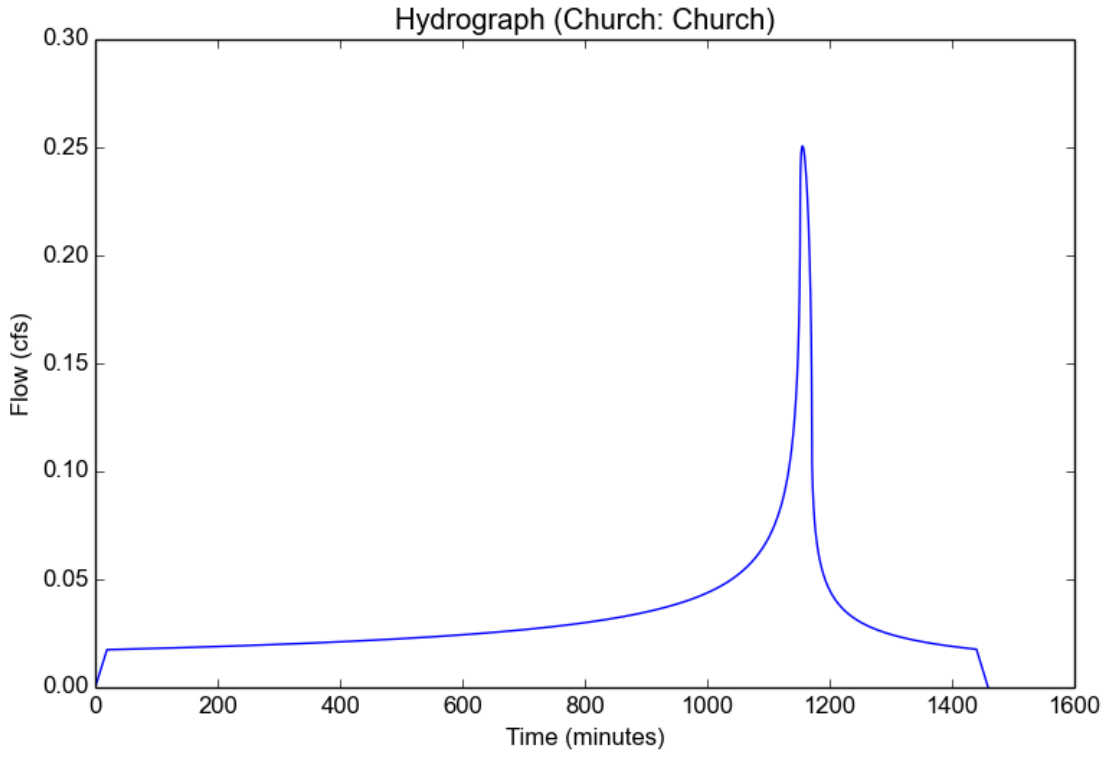
File location: C:/Users/dkessler/Desktop/Church - Church.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Church
Subarea ID	Church
Area (ac)	1.03
Flow Path Length (ft)	330.0
Flow Path Slope (vft/hft)	0.012
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.88
Soil Type	16
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

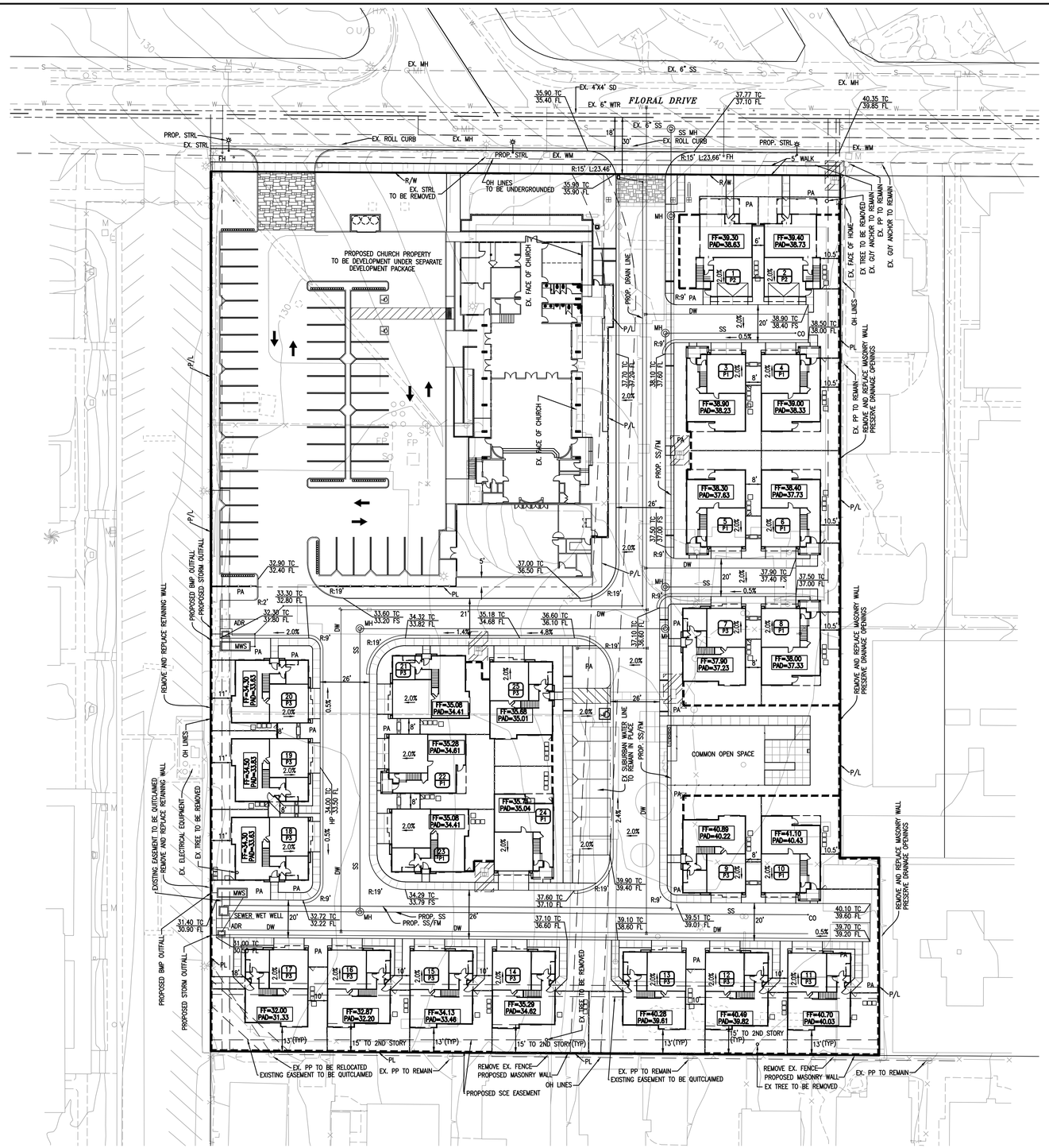
Output Results

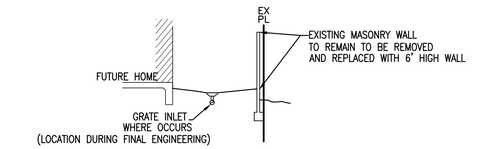
Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3026
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.804
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	0.2506
Burned Peak Flow Rate (cfs)	0.2506
24-Hr Clear Runoff Volume (ac-ft)	0.065
24-Hr Clear Runoff Volume (cu-ft)	2832.1833



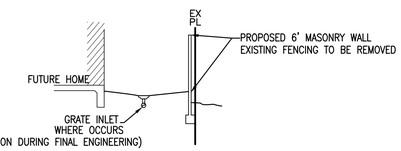
Exhibit

Grading and Utility Plan

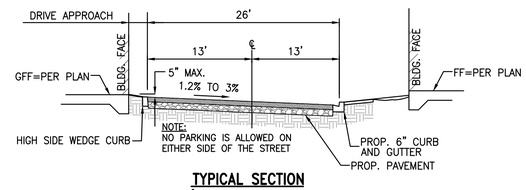




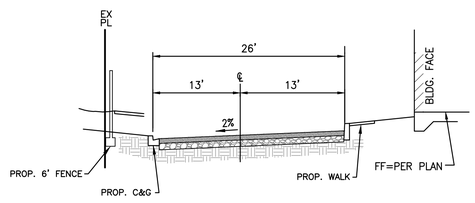
EAST PL SECTION
LOOKING NORTH N.T.S.



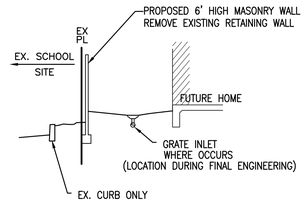
SOUTH PL SECTION
LOOKING EAST N.T.S.



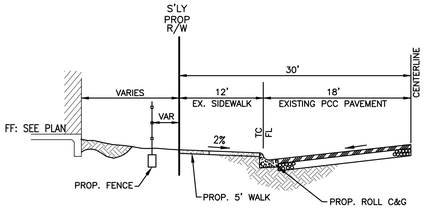
TYPICAL SECTION
26' MAIN DRIVE AISLE
NTS



26' MAIN ENTRY DRIVE AISLE
NTS



WEST PL SECTION
LOOKING NORTH N.T.S.

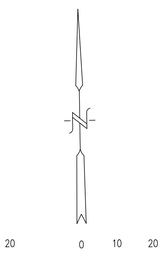


FLORAL DRIVE STREET SECTION
N.T.S.

PRELIMINARY EARTHWORK SUMMARY:
QUANTITIES FOR PLAN CHECKING PURPOSES ONLY
QUANTITIES NOT TO BE USED AS GRADING PAY QUANTITIES

RAW CUT	6453 CY
SPOILS	900 CY
RAW IMPORT	400 CY
OVER EXCAVATION	7744 CY
ADJUSTED IMPORT	8905 CY
EXPORT	5792 CY

ASSUMPTIONS:
1. SITE SUBSIDENCE IS ASSUMED NEGLIGIBLE.
2. ENTIRE SITE TO BE OVER-EXCAVATED.



STREET LIGHT NOTE:
PROJECT TO INSTALL NEW LS2 TYPE STREET LIGHTS ALONG FLORAL PER CITY OF WHITTIER STREET LIGHTING POLICY

STREET TREE NOTE:
PROJECT TO INSTALL STREET TREES ALONG FRONTAGE PER CITY OF WHITTIER STANDARDS

FIRE WATER NOTE:
PROPOSED PUBLIC FIRE HYDRANTS

WATER NOTE:
PROPOSED PUBLIC MAIN: 8" MAIN LATERAL PVC
PROPOSED HOUSE LATERALS: 1.5" PVC

SEWER NOTE:
PROPOSED SEWER/ALLEY MAIN: 6" MAIN LATERAL PVC
PROPOSED HOUSE LATERALS: 4" PVC
ALL PROPOSED MAIN LINE SEWER TO BE PRIVATE
ALL PROPOSED ALLEY SEWER LATERALS TO BE PRIVATE

PROPOSED EASEMENT
AN EASEMENT IS PROPOSED OVER ALL VEHICULAR PAVEMENT AREA FOR INGRESS/EGRESS AND UTILITY PURPOSES.

DIGALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

REVISIONS

NO	DATE	INITIAL	DESCRIPTION	APP	DATE

OWNER/DEVELOPER:
BRANDYWINE HOMES, INC.
16580 ASTON
IRVINE, CA 92606
(949) 296-2400

PREPARED BY :
KES TECHNOLOGIES INC
CIVIL ENGINEERING
LAND PLANNING AND SURVEYING
1 VENTURE STE 130
IRVINE, CALIFORNIA 92618
PHONE (949) 339-5331
FAX (866) 426-2201

REGISTERED PROFESSIONAL ENGINEER
ALI MONSHIZADEH
C67674
EXP. 06/30/2021
CIVIL
STATE OF CALIFORNIA

I hereby certify that:
1. These plans have been prepared under my supervision:
2. The grading shown hereon will not divert drainage from its natural downstream course or obstruct the drainage of adjacent properties:
3. All specimen trees located on this properly are shown:
4. Existing ground contours and elevations were obtained by field survey on/aerial topography flown on MAY, 2018

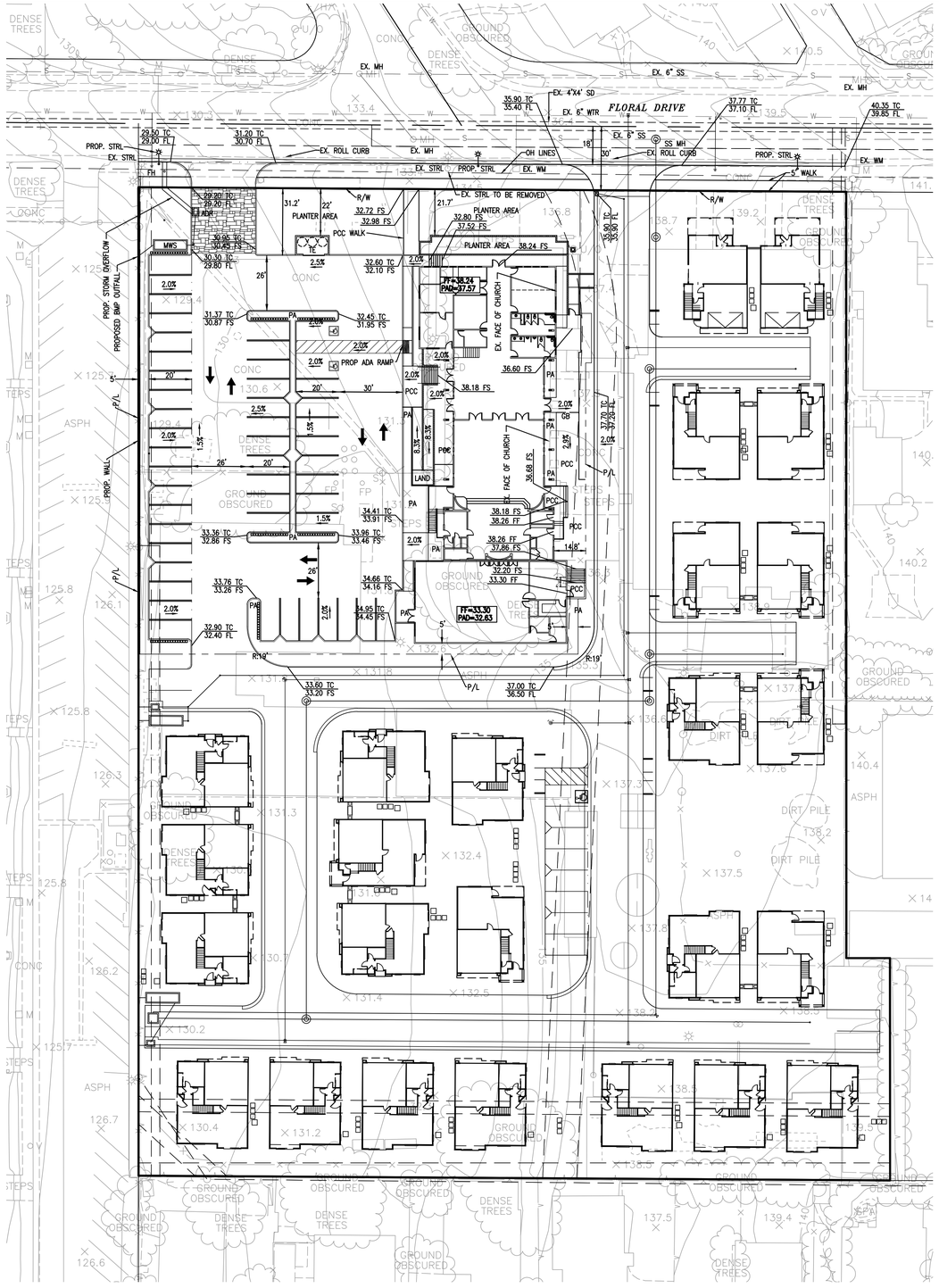
ENGINEER _____ DATE _____
RCE 67674 EXP. DATE 6-31-21

VESTING TENTATIVE TRACT NO. 82802 (FOR CONDOMINIUM PURPOSES)
GRADING AND UTILITY PLAN
LOCATED IN THE CITY OF WHITTIER THE COUNTY OF LOS ANGELES, STATE OF CA

SHEET 2 OF 3

SCALE: AS SHOWN | DRAWN BY: DSK | CHECKED BY: AM

CITY OF WHITTIER



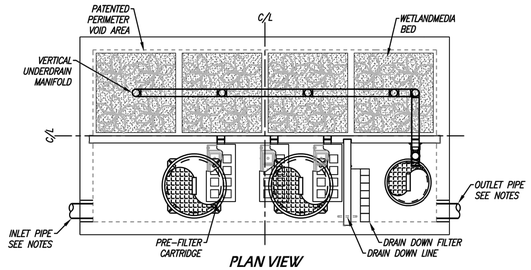
SITE SPECIFIC DATA			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			7.26
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø3.07"
MAXIMUM PICK WEIGHT (LBS)			TBD
NOTES:			

INSTALLATION NOTES

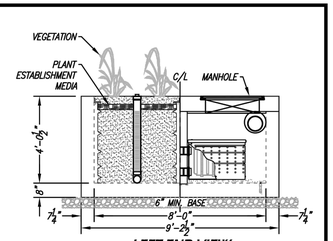
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SCALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

GENERAL NOTES

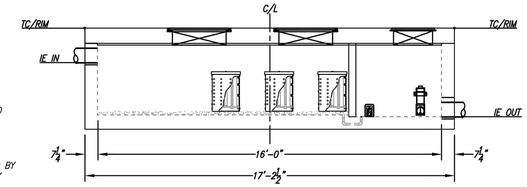
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.



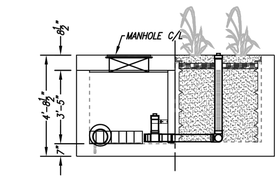
PLAN VIEW



LEFT END VIEW
BIOFILTRATION/PRETREATMENT



ELEVATION VIEW



RIGHT END VIEW
DISCHARGE/BIOFILTRATION

TREATMENT FLOW (CFS)	0.462
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MWS-L-8-16-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

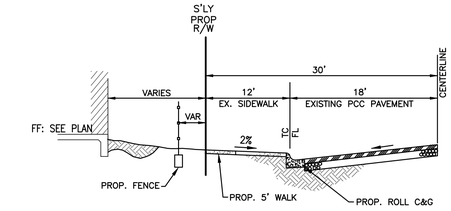
THE PRODUCT DESCRIBED MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,376; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MODULAR WETLANDS SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MODULAR WETLANDS SYSTEMS IS PROHIBITED.

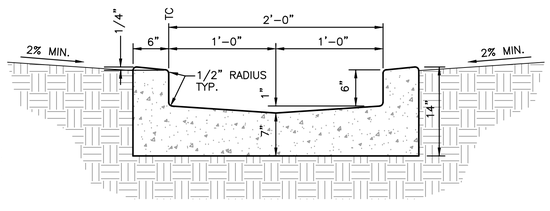
MODULAR WETLANDS
www.ModularWetlands.com | (855) DRAIN-WET



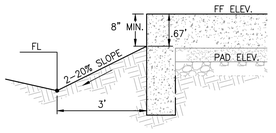
CATCH BASIN STENCILING DETAIL
NTS



FLORAL DRIVE STREET SECTION
N.T.S.



CONCRETE U-CHANNEL DETAIL



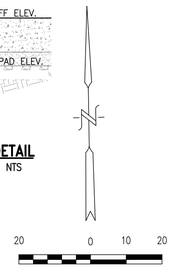
SIDE YARD GRADING DETAIL
NTS

PRELIMINARY EARTHWORK SUMMARY:

QUANTITIES FOR PLAN CHECKING PURPOSES ONLY
QUANTITIES NOT TO BE USED AS GRADING PAY QUANTITIES

RAW CUT	1984 CY
SPOILS	500 CY
RAW IMPORT	0 CY
OVER EXCAVATION	5904 CY
ADJUSTED IMPORT	8905 CY
IMPORT	517 CY

ASSUMPTIONS:
1. SITE SUBSIDENCE IS ASSUMED NEGLIGIBLE.
2. ENTIRE SITE TO BE OVER-EXCAVATED.



STREET LIGHT NOTE:
PROJECT TO INSTALL NEW LS2 TYPE STREET LIGHTS ALONG FLORAL PER CITY OF WHITTIER STREET LIGHTING POLICY

WATER NOTE:
EXISTING LATERAL: 2" PVC

SEWER NOTE:
EXISTING HOUSE LATERALS: 6" PVC

PROPOSED EASEMENT
AN EASEMENT IS PROPOSED OVER ALL VEHICULAR PAVEMENT AREA FOR INGRESS/EGRESS AND UTILITY PURPOSES.

DIGALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

REVISIONS

NO	DATE	INITIAL	DESCRIPTION	APP	DATE

OWNER/DEVELOPER:
TRINITY LUTHERAN CHURCH
11716 FLORAL DRIVE
WHITTIER, CA 90601

PREPARED BY :
KES TECHNOLOGIES INC
CIVIL ENGINEERING
LAND PLANNING AND SURVEYING
1 VENTURE STE 130
IRVINE, CALIFORNIA 92618
PHONE (949) 339-5331
FAX (866) 426-2201

REGISTERED PROFESSIONAL ENGINEER
ALI MONSHIZADEH
C67674
EXP. 06/30/2021
CIVIL
STATE OF CALIFORNIA

I hereby certify that:
1. These plans have been prepared under my supervision:
2. The grading shown hereon will not divert drainage from its natural downstream course or obstruct the drainage of adjacent properties:
3. All specimen trees located on this properly are shown:
4. Existing ground contours and elevations were obtained by field survey on/aerial topography flown on MAY, 2018

ENGINEER _____ DATE _____
RCE 67674 EXP. DATE 6-31-21

CONDITIONAL USE PERMIT

GRADING AND UTILITY PLAN

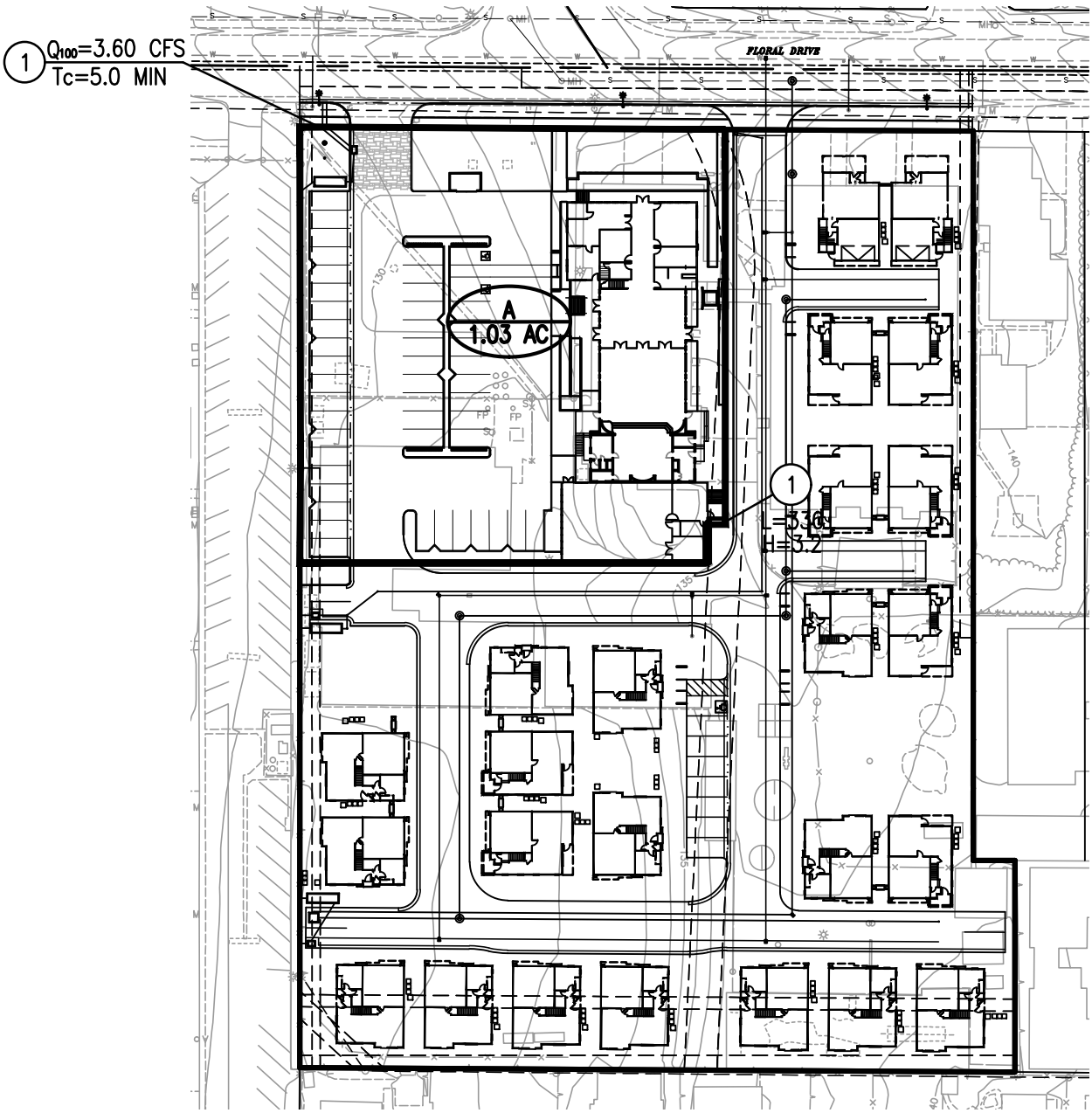
LOCATED IN THE CITY OF WHITTIER
THE COUNTY OF LOS ANGELES, STATE OF CA

SHEET 1 OF 1

SCALE: AS SHOWN | DRAWN BY: DSK | CHECKED BY: AM

CITY OF WHITTIER

Exhibit
Hydrology Map



LEGEND

X1
0.60 AC
DRAINAGE AREA NUMBER
DRAINAGE ARE IN ACRES

DRAINAGE AREA BOUNDARY

FLOW DIRECTION

1 Q100=X.XX CFS
Tc=X.X MIN
100-YR PEAK RUNOFF IN CUBIC FEET PER SECOND
TIME OF CONCENTRATION IN MINUTES

SHEET 1 OF 1	EXHIBIT	**KES TECHNOLOGIES** CIVIL ENGINEERING LAND PLANNING AND SURVEYING
JOB NO. 201-002		
BY: DSK	PROPOSED HYDROLOGY	1 VENTURE STE 130 IRVINE, CALIFORNIA 92618 PHONE (949) 339-5331
DATE: 07/28/2019		
SCALE: 1"=80'		

Appendix G Low Impact Development (LID) Mitigation Plan

Low Impact Development (LID) Mitigation Plan

Prepared for:

Brandywine Homes
16580 Aston
Irvine, CA 92606
Tel: (949)-296-2400

Property Address:
11716 Floral Drive
Whittier, CA

Prepared by:
KES Technologies Inc.
1 Venture Ste 130
Irvine, CA 92618
(949) 339-5331

LID Preparation Date:
Revised December, 2020

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SECTION 300 2

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C.Vicinity Map 4
D.Existing Site Drainage Condition 4
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F.Pollutant Source Identification and BMP Selection 5
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Appendix F: General Education Materials
Appendix G: BMP Maintenance, Inspection, and Repair Log and Checklist

Owner/Developer
Approval and Certification
Of the
Low Impact Development Mitigation Plan

Project Name: **11716 Floral Drive**

Project Number: APN: 8132-022-007

Project Address: 11716 Floral Drive
Whittier, CA 90201

Low Impact Development Mitigation Plan
City of Whittier
Project: 11716 Floral Drive

This Low Impact Development (LID) for the 11716 Floral Drive Project has been prepared for the Brandywine Homes by KES Technologies, Inc. This LID is intended to comply with the requirements of the City of Whittier, County of Los Angeles, requiring the preparing of a project specific LID.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Los Angeles County Stormwater Quality Management Plan (SQMP), and the intent of the stormwater and urban runoff NPDES Permit and Waste Discharge Requirements for the incorporated Cities of Los Angeles County under the jurisdiction of the Los Angeles Regional Water Quality Control Board.

I certify under penalty of lay that this document and all attachments were prepared under my jurisdiction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for the gathered information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

This LID will be reviewing with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party having responsibility for implementing portions of this LID. At least one copy of the approved and certified copy of this LID shall be available on the subject property in perpetuity. Once the

undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the LID.

_____ Date_____

Owner's Signature

_____

Printed Name/ Title

_____

Telephone

Section 200

A. Contact Information/List of Responsible Parties

The property contact information is:

Brandywine Homes
16580 Aston
Irvine, CA 92606
Tel: (949)-296-2400

The property owner shall have primary responsibility and significant authority for the implementation, maintenance, and inspection of the property BMPs. Duties of the Owner include but are not limited to:

- Implementing all elements of the LID, including but not limited to:
  - Implementation of prompt and effective erosion and sediment control measures
  - Implementing all non-storm water management, and materials and waste management activities, such as: monitoring, discharges, general site clean-up; vehicle and equipment cleaning, spill control; ensuring that no materials other than storm water are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems, etc.
- Pre-storm inspections
- Storm event inspections
- Post-storm inspections
- Routine inspections as described in the LID
- Ensuring elimination of all unauthorized discharges
- The Owner shall be assigned authority to mobilize crews in order to make immediate repairs to the control measures.
- Coordinate all of the necessary corrections/repairs are made immediately, and that the project complies with the LID at all times.
- Managing and report any Illicit Connections or Illegal Discharges.

Section 300

A. References

The following documents are made a part of this LID by reference:

- Project plans and specifications for Grading and Utilities, prepared by KES Technologies, Inc., 1 Venture Ste 130, Irvine CA 92618

- State Water Resources Control Board (SWRCB) Order No. 99-08-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction Activity, August 1999.

- State Water Resources Control Board Resolution No. 2001-046, Modifications of Water Quality Order 99-08-DWQ State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) to Include Small Construction Activity (One to Five Acres), adopted by the SWRCB on December 2, 2002

- California Stormwater BMP Handbook – Construction, January 2003

- California Stormwater BMP Handbook – New Development and Redevelopment, January 2003

Section 400 – Body of LID

A. Objectives

This Low Impact Development Plan (LID) has four main objectives:

1) Identify all pollutant sources, including sources of sediment that may affect the quality of storm water discharges associated with daily use / activity (storm water discharges) from the property site.
2) Identify non-storm water discharges.
3) Identify, construct, implement and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants in storm water discharges and authorized non-storm water discharges from the property site.
4) Develop a maintenance schedule for BMPs designed to reduce or eliminate pollutants.

B. Project Background and Description

The project site is currently (1) fee parcel and is proposed to be developed as two fee parcels for condominium purposes and a proposed church site as TTM 82802.

The proposed project will include several building sequences as detached condominiums. The subject site will include residential for sale units, vehicular drive aisles, open space and landscape throughout the development. Parcel two of the tentative parcel map includes a proposal church development not a part of this study.

The existing site currently resides as church site and school use. The exiting site surface flows to the west through the existing fence/wall into the western adjacent parcels as demonstrated by the existing contours. Currently the existing site is 38% pervious. The proposed development is proposed as 23% impervious (Appendix D, Mixed Multi-family). The proposed development will outlet less flows as predevelopment.

The proposed site will capture and bio-filtrate the required LID flow by use of flow through filters. Any flow in addition to this flow will bypass the filters and flow to the westerly school parcel through a parkway drain. Once in the school parcel the flow travels within the curb and gutter to the nearest catch basin. Once in County maintained storm drain storm flows ultimately outlet into the San Gabriel River. No current water quality BMP are in place and utilized on the current site. The proposed main system will be sized for a 100-year storm event.

Prior to outletting into the public system, storm water flows will be encouraged to flow through landscape areas. These systems can be representative for a typical site treatment train.

Per the project soils report the soils underlying the subject project have an existing infiltration rate of 0.1 in/hr, therefore infiltration is infeasible.

Abbreviation Note
The property is to be developed by Brandywine Homes. The property owner will be responsible for the maintenance of the project until sold to home owners and the HOA is established.

C. Vicinity Map

The subject project is located south of floral Drive and west and Beverly

The area surrounding the project would be considered residential.

Please refer to Figure 1 & 2 for Vicinity and Location maps.

D. Existing Site Drainage Condition & Site Characterization

The contours of the land are very gentle with slopes not greater than 3% flowing towards the west/existing school. The site is approximately 2.56 acres. The pre-development conditions yield approximately 62% pervious and 38% impervious and the post-development conditions yield approximately 23% pervious and 77% impervious, therefore the project is proposing to not mitigating post development flow seeing the proposed project will decrease flow from a water quality standpoint.

	Pervious		Impervious	
	Area (ac)	**Percent (%)**	**Area (ac)**	**Percent (%)**
Pre-Development	0.97	38%	1.58	62%
Post-Development	0.59	23%	1.97	77%

The proposed project will also require additional permits:

- Grading Permit by the City of Whittier, Community Development Department
- State Water Resources Control Board, NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, NPDES No. CAS000002 dated September 2, 2009

Groundwater was encountered during the project geotechnical investigation to a depth of 24.0 feet below the ground. Infiltration BMPs will not be utilized for required water quality treatment due to soils conditions and low infiltration rates of 0.1”/hr.

E. LID Project Types, Characteristics, & Activities

This proposed development is subject to City of Whittier's LID ordinance and requirements under the "Redevelopment" category. According to the City of Whittier's, "redevelopment" means land-disturbing activity that result in the creation, addition, or replacement of 5,000 square-feet or more of impervious surface area on an already developed site. Redevelopment includes, but not limited to: the expansion of a building footprint; addition or replacement of a structure; replacement of impervious surface area that is not part of a routine maintenance activity; and land disturbing activities related to structural impervious surfaces. It does not include the routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety (Order No. R4-2012-0175)

F. Pollutant Source Identification and BMP Selection

The following is a list of materials to be used in the daily construction activities at the project site, which will potentially contribute to pollutants, other than sediment, to storm water runoff. Control Practices for each activity are identified below:

- Vehicle fluids, including oil, grease, petroleum, and coolants from personal vehicles
- Landscaping materials and wastes (topsoil, plant materials, herbicides, fertilizers, mulch, pesticides)
- General trash debris and litter

The Best Management Practices (BMPs) that have been selected for implementation on this project are detailed in the following sections.

The project site is located within Upper Reach 2 of the Los Angeles River which is located on the 2010 303(d) Water Body List. The Los Angeles River is not impaired by sedimentation pollution, therefore is not an impacted receiving water body which refers to the Risk Level calculations, however the reach is impaired by other pollutants such as Nutrients, Pathogens, Metals/ Metalloids, Nuisance and Trash.

G. Source Control BMPs

Project proponents shall implement Site Design concepts that achieve each of the following:

- Minimize Urban Runoff
- Minimize Impervious Footprint
- Conserve Natural Areas
- Minimize Directly Connected Impervious Areas (DCIAs)

The following tables identify the source control and treatment BMPs and how each implemented to achieve each Site Design concept.

Table-1: Design BMPs

BMP	TECHNIQUE	INCLUDED?		BRIEF DESCRIPTION OF METHOD
		YES	NO	
SD-10	Minimize Impervious Area/Maximize Permeability (C-Factor Reduction)		X	
	Minimize Directly Connected Impervious Areas (DCIAs) (C-Factor Reduction)		X	
	Create Reduced or "Zero Discharge" Areas (Runoff Volume Reduction)		X	

Table-2: Treatment BMPs

BMP	NAME	INCLUDED?		IF NOT APPLICABLE, STATE BRIEF REASON
		YES	NO	
TC-31	Vegetated (Grass) Strips		X	Site Plan does not have vegetated strips designed into the development
TC-30	Vegetated (Grass) Swales		X	Site plan does not have extensive swales
MP-52	Drain Inserts	X		
TC-22	Dry Detention Basin (Extended Detention Basin)		X	The project site does not allow use of this BMP
TC-20	Wet Detention Basin		X	The project site does not allow use of this BMP

BMP	NAME	INCLUDED?		IF NOT APPLICABLE, STATE BRIEF REASON
		YES	NO	
TC-21	Constructed Wetland		X	This is not a wetland area/ development.
TC-10	Detention Basin/Sand Filter		X	The project site does not allow use of this BMP
TC-12	Porous Pavement Detention		X	The project site does not allow use of this BMP
TC-11	Infiltration Basin		X	The project site does not allow use of this BMP
TC-10	Infiltration Trench		X	The project site does not allow use of this BMP
TC-40	Bio-Filtration	X		

Table-3: Source Control BMPs

BMP	BMP DESCRIPTION	CHECK ONE		IF NOT APPLICABLE, STATE BRIEF REASON
		INCLUDED?	NOT APPLICABLE	
	Non-Structural Source Control BMPs:			
	Education for Leasers, Operators, Occupants, or Employees	X		
	Activity Restrictions (CC&Rs)		X	N/A
SD-12	Efficient Irrigation System and Landscape Maintenance	X		
SD-32	Common Area Litter Control		X	No Common Areas

BMP	BMP DESCRIPTION	CHECK ONE		IF NOT APPLICABLE, STATE BRIEF REASON
		INCLUDED?	NOT APPLICABLE	
SE-7	Street Sweeping Private Streets and Parking Lots	X		
	Drainage Facility Inspection and Maintenance	X		
	Structural Source Control BMPs:			
SD-13	MS4 Stenciling and Signage	X		
SD-12	Landscape and Irrigation System Design	X		
SD-10	Protect Slopes and Channels		X	
SD-30	Provide Community Car Wash Racks		X	Car Wash Racks are not permitted within the proposed development – Not Applicable.
	Proper Site Design:			
SD-12	Efficient Landscape Design & Irrigation System	X		
SD-30	Fueling Areas		X	Not Applicable
SD-33	Air/Water Supply Area Drainage		X	Not Applicable
SD-32	Trash Storage Areas	X		In Park Area
SD-31	Loading Docks		X	Not Applicable
SD-31	Maintenance Bays		X	Not Applicable

BMP	BMP DESCRIPTION	CHECK ONE		IF NOT APPLICABLE, STATE BRIEF REASON
		INCLUDED?	NOT APPLICABLE	
SD-33	Vehicle and Equipment Wash Areas		X	Not Applicable
SD-35	Outdoor Material Storage Areas		X	Not Applicable
SD-36	Outdoor Work Areas or Processing Areas		X	Not Applicable
	Provide Wash Water Controls for Food Preparation Areas		X	Not Applicable

Non-Structural Measures

Non-structural BMPs are generally managerial, educational, inspection and/ or maintenance oriented. These items consist of educating employees and occupants, developing and implementing Owner guidelines, implementing BMPs and enforcing Code requirements. Non-structural BMPs used for this project are summarized below:

Education for Employees and Occupants

Practical informational materials will be provided to owners, occupants and employees on general good housekeeping practices that contribute to protection of storm water quality. Among other things, these materials will describe the use of chemicals (including household type) that should be limited to the property, with no discharge of specified wastes via hosing or other direct discharge to gutters, catch basins and storm drains.

The property owner will provide these materials. Thereafter, such materials will be available through the property owner education program.

This program must be maintained, enforced, and updated periodically by the property owner. Educational materials including, but not limited to, the materials included in the Appendix section of this plan will be made available to the employees and contractors of the property owner.

Activity Restrictions

N/A.

Common Area Landscape Management
Management programs will be designed and established by the property owner, who will maintain the common areas within the project site. These programs will include how to mitigate the potential dangers of fertilizer and pesticide usage (refer to the Maintenance and Frequency Table).

Ongoing maintenance will be consistent with the State of California Model Water-Efficient Landscape Ordinance.

Fertilizer and pesticide usage shall be consistent with County Management Guidelines for use of Fertilizers and Pesticides.

BMP Maintenance
The property owner(s) will be responsible for implementing each of the BMPs detailed in this plan. The property owner will also be responsible for cleaning and maintaining the BMPs on a regular basis. Maintenance operations should be logged in Appendix G.

Uniform Fire Code Implementation
The property owner will comply with this Code.

Common Area Litter Control
There is no proposed Common Area

Employee Training
A training program will be established as it would apply to future employees, contractors, and leasers of the property owner to inform and train in maintenance activities regarding the impact of dumping oil, paints, solvents, or other potentially harmful chemicals into storm drains; the proper use of fertilizers and pesticides in landscaping maintenance practices; and the impacts of littering and improper water disposal.

Catch Basin Inspection
The property owner will maintain the drainage systems, including catch basins and culverts. The property owner is required to have catch basins inspected and, if necessary, cleaned prior to the storm season, no later than October 15th each year prior to the “first flush” storm. These duties may be contracted out to the landscape maintenance firm hired by the property owner. Please see Appendix E for maintenance program. Maintenance operations should be logged in Appendix G.

Street Sweeping Private Streets and Parking Lots
Truck and Vehicle parking areas to be swept once a week throughout the year.

H. Structural BMPs

Structural BMPs shall be installed by the developer/ owner, through the construction and development of the project, for instance; slope planting and irrigation systems shall be designed by licensed landscape architects and installed by qualified contractors to

specifications and standards of Los Angeles County. The structural BMPs used for this project are summarized below:

With this project we anticipate sediment runoff during construction, on-site trash, and the potential of on-site automobile oil. To mitigate these pollutants, we propose the structural best management practices listed.

Filtration
Storm runoff through the project site will drain directly into the proposed bio-filtration system. The water is first pretreated through a roof drain filter than is encouraged to flow into the bio-filtration landscape system

Efficient Irrigation
As part of the design of all common area landscape irrigation shall employ water conservation principals, including, but not limited to, such provisions as water sensors, programmable irrigation times (for short cycles), etc., will be used. Such common areas will be maintained by the property owner.

Runoff-Minimizing Landscape Design
As part of the design of all common area landscape areas, similar planting material with similar water requirements will be used in order to reduce excess irrigation runoff and promote surface filtration. Such common areas will be maintained by the property owner.

Car Wash Racks
No car wash rack or area will be provided, therefore, washing of vehicles by employees on the property will not be allowed.

Trash Container (Dumpster) Areas
Trash area are considered within this document for the park area only.

Self Contained Washing
Self-contained washing of vehicles by employees or clients on the property will not be allowed.

Outdoor Material Storage Areas
Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials. Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the storm water conveyance system. Outdoor Storage by employees on the property will not be allowed.

Catch Basin Stenciling
Phrase "No Dumping – Drains to Ocean" or equally effective phrase to be stenciled on catch basins to alert the public to the destination of pollutants discharged into storm

water. This stenciling will be inspected and re-stenciled on a periodic basis by the property owner. Refer to Appendix D.

Inlet trash Racks
No inlets are large enough for filters

I. BMP Maintenance, Inspection, and Repair

Inspections will be conducted as follows:

- Annually prior to the start of the rainy season
- Every (1) month during rainy season
- At any other time(s) or intervals of time specified in the contract documents

An inspection form shall be completed at least once per year prior to the start of the rainy season. This inspection check-sheet (see Appendix G) shall be included in this report and kept onsite at all times. The check-sheet should be filled out completely and clearly indicate any BMPs that are in need of repair or maintenance. These repairs and/ or maintenance procedures shall be carried out at the soonest possible time.

A legible log shall be kept on site to record the inspection of the stormwater pollution abatement control measures. The record must contain the following information: (i) type of maintenance activities or source-control practices; (ii) date the activities are completed; and (iii) the name of the operator performing the activities. During transfer of ownership/operation of the facility, the current owner must notify the new owner/operator of the BMPs and the associated maintenance activities that also transfer to the new owner/operator of the property. See Appendix G.

J. Inspection, Maintenance, and Responsibility for BMPs

The following tables show the lists of the post-construction BMPs (routine non-structural and structural), the required ongoing maintenance, the inspection and maintenance frequency, the inspection criteria, and the entity or party responsible for implementation, maintenance, and/or inspection.

Table-4: Non-Structural BMP Maintenance Responsibility/Frequency Matrix

BMP	RESPONSIBILITY	FREQUENCY
Leaser/ Occupant Education, Activity Restrictions	The property owner will provide educational materials.	Continuous. Maintenance/ Educational materials to be provided to leasers/ occupants at the time they lease the apartment and updates provided by the property owner as they occur.

BMP	RESPONSIBILITY	FREQUENCY
Common Area Landscape Management	The property owner through it's landscape maintenance contractor	Monthly during regular maintenance and use with management guidelines for use of fertilizers and pesticides.
Parking Areas and Drives Management	The property owner through it's landscape maintenance contractor	The Parking Areas and Drives are to be swept on a routine scheduled basis to facilitate the pickup of trash and debris (plant or otherwise) and to remove excessive oil, grease and build-up. During sweeping, debris is to be removed from the parking areas and drives and then scrubbed and rinsed. This sweeping schedule will be at a minimum occurrence of once a month and as necessary to rid / reduce active pollutants from the pavement areas. This maintenance requirement will be listed in the Maintenance Contract for this project.
Litter Control by Sweeping	The property owner through its landscape maintenance contractor.	Daily inspection of trash receptacles to ensure that lids are closed and pick up any excess trash on the ground, noting trash disposal violations to the property owner for remediation.
Employee Training	The property owner will train the landscape contractors after construction.	Monthly for maintenance personnel and employees to include the educational materials contained in the approved LID.
Common Area Catch Basin Inspection & Cleaning	The property owner through it's landscape maintenance contractor for common areas and storm drain facilities	Inspect basins once a month. Clean debris and silt in bottom of catch basins as needed. Intensified on or about October 1 of each year, prior to "first flush" storm. See Appendix "G"

Table-5: Structural BMP Maintenance Responsibility/Frequency Matrix

BMP	RESPONSIBILITY	FREQUENCY
Bio-Filtration	The property owner after construction	Bio Filtration system will need to be maintained once a year one month prior to the rainy season and every month during the rain season. Maintenance will require the flushing and cleaning of the perforated pipe and engineered soil system, per BIO-01 specifications and manufacturers recommendations.
Common Area Efficient Irrigation	The property owner through it's landscape contractors after construction	Once a week, in conjunction with maintenance activities. Verify that runoff minimizing landscape design continues to function by checking that water sensors are functioning properly, that irrigation heads are adjusted properly to eliminate overspray to hardscape areas, and to verify that irrigation timing and cycle lengths are adjusted in accordance with water demands, given time of year, weather and day or night time temperatures.
Common Area Runoff Efficient Landscape Design	The property owner through it's landscaping contractors	Once a week in conjunction with maintenance activities and prior to finalizing any replanting schemes. Verify that plants continue to be grouped according to similar water requirements in order to reduce excess irrigation runoff.
Catch Basin Stenciling	The property owner providing maintenance	A warning stencil will be painted on top and in view with the words: "No-Dumping – Drains to Ocean" At all catch basin, drain inlets draining to the street or storm drain system. See Appendix "F" (example). Once every 6 months, inspect for re-stenciling needs. Re-stencil as needed immediately.

K. Operation/Maintenance Funding after Project Completion

The post-construction BMPs as described above will be funded and maintained by:

Brandywine Homes
16580 Aston
Irvine, CA 92606
Tel: (949)-296-2400

- Maintenance requirements and responsibilities for the property will be listed in the Maintenance Contract for this project and will be the responsibility of the property owner at all times.

Figure -1: Project Vicinity Map

Figure -2: Project Location Map

Figure -3: Project BMPs Exhibit

Figure -4: Impaired Waters

Appendix A: Volume and Flow Rate Calculations

Appendix B: Site BMPs

Appendix C: Grading Plan

Appendix D:
"NO DUMPING – DRAINS TO OCEAN" Stencil Example

Appendix E: Treatment Control BMP Information

Appendix F: General Education Materials

Appendix G:
BMP Maintenance, Inspection, and Repair Log and Checklist

ATTACHMENT A

Volume and Flow Rate Calcs

Peak Flow Hydrologic Analysis

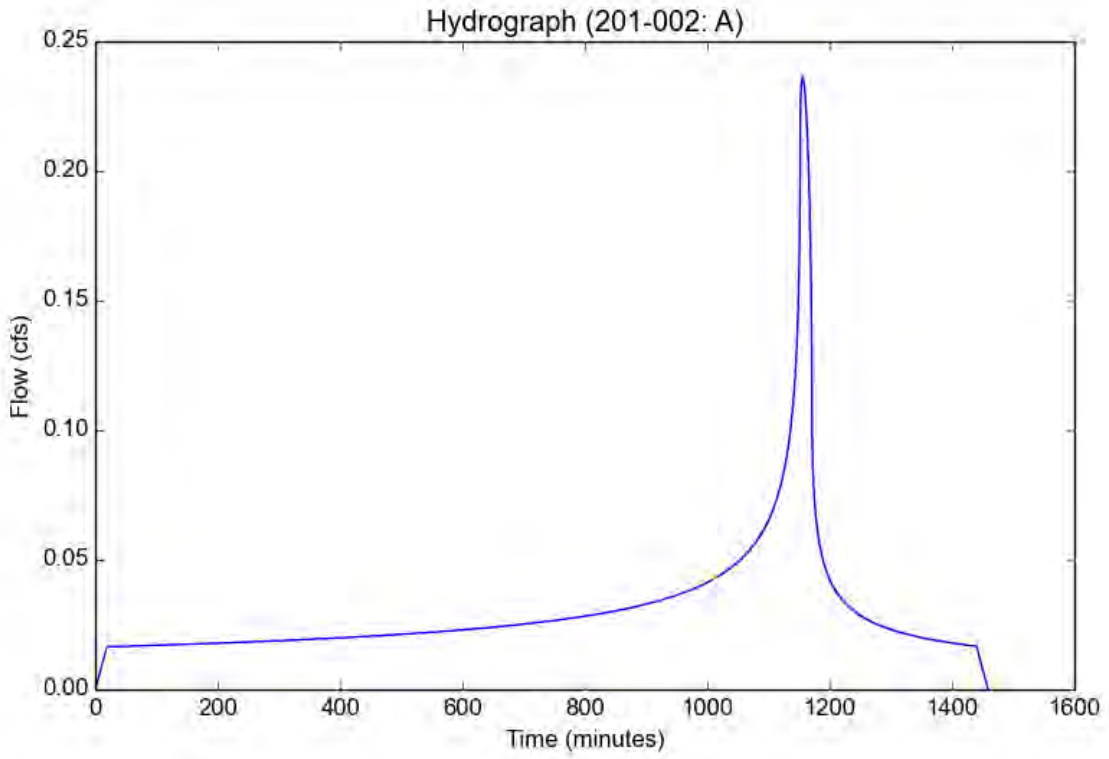
File location: C:/Users/dkessler/Desktop/BMP-A.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	201-002
Subarea ID	A
Area (ac)	1.09
Flow Path Length (ft)	337.0
Flow Path Slope (vft/hft)	0.024
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.77
Soil Type	16
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3026
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.716
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	0.2362
Burned Peak Flow Rate (cfs)	0.2362
24-Hr Clear Runoff Volume (ac-ft)	0.0613
24-Hr Clear Runoff Volume (cu-ft)	2669.117



Peak Flow Hydrologic Analysis

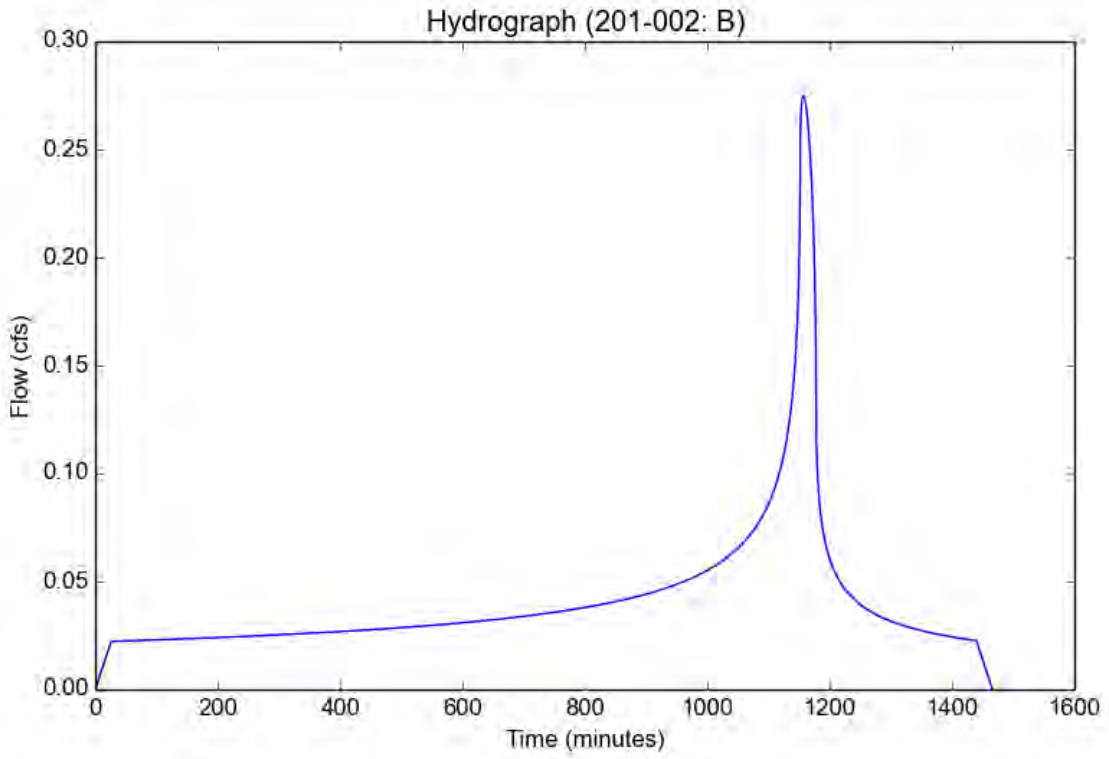
File location: C:/Users/dkessler/Desktop/BMP-B.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	201-002
Subarea ID	B
Area (ac)	1.47
Flow Path Length (ft)	510.0
Flow Path Slope (vft/hft)	0.016
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.77
Soil Type	16
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.2612
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.716
Time of Concentration (min)	26.0
Clear Peak Flow Rate (cfs)	0.2749
Burned Peak Flow Rate (cfs)	0.2749
24-Hr Clear Runoff Volume (ac-ft)	0.0826
24-Hr Clear Runoff Volume (cu-ft)	3599.6494



ATTACHMENT B

BMP’s

Drain Inserts MP-52

Description

Drain inserts are manufactured filters or fabric placed in a drop inlet to remove sediment and debris. There are a multitude of inserts of various shapes and configurations, typically falling into one of three different groups: socks, boxes, and trays. The sock consists of a fabric, usually constructed of polypropylene. The fabric may be attached to a frame or the grate of the inlet holds the sock. Socks are meant for vertical (drop) inlets. Boxes are constructed of plastic or wire mesh. Typically a polypropylene "bag" is placed in the wire mesh box. The bag takes the form of the box. Most box products are one box; that is, the setting area and filtration through media occur in the same box. Some products consist of one or more trays or mesh grates. The trays may hold different types of media. Filtration media vary by manufacturer. Types include polypropylene, porous polymer, treated cellulose, and activated carbon.

California Experience

The number of installations is unknown but likely exceeds a thousand. Some users have reported that these systems require considerable maintenance to prevent plugging and bypass.

Advantages

- Does not require additional space as inserts as the drain inlets are already a component of the standard drainage systems.
- Easy access for inspection and maintenance.
- As there is no standing water, there is little concern for mosquito breeding.
- A relatively inexpensive retrofit option.

Limitations

Performance is likely significantly less than treatment systems that are located at the end of the drainage system such as ponds and vaults. Usually not suitable for large areas or areas with trash or leaves than can plug the insert.

Design and Sizing Guidelines

Refer to manufacturer's guidelines. Drain inserts come any many configurations but can be placed into three general groups: socks, boxes, and trays. The sock consists of a fabric, usually constructed of polypropylene. The fabric may be attached to a frame or the grate of the inlet holds the sock. Socks are meant for vertical (drop) inlets. Boxes are constructed of plastic or wire mesh. Typically a polypropylene "bag" is placed in the wire mesh box. The bag takes the form of the box. Most box products are

Design Considerations

- Use with other BMPs
- Fit and Seal Capacity within Inlet

Targeted Constituents

✓	Sediment
✓	Nutrients
✓	Trash
✓	Metals
	Bacteria
✓	Oil and Grease
✓	Organics

Removal Effectiveness

See New Development and Redevelopment Handbook-Section 5.

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one box; that is, the setting area and filtration through media occurs in the same box. One manufacturer has a double-box. Stormwater enters the first box where setting occurs. The stormwater flows into the second box where the filter media is located. Some products consist of one or more trays or mesh grates. The trays can hold different types of media. Filtration media vary with the manufacturer: types include polypropylene, porous polymer, treated cellulose, and activated carbon.

Construction/Inspection Considerations

Be certain that installation is done in a manner that makes certain that the stormwater enters the unit and does not leak around the perimeter. Leakage between the frame of the insert and the frame of the drain inlet can easily occur with vertical (drop) inlets.

Performance

Few products have performance data collected under field conditions.

Siting Criteria

It is recommended that inserts be used only for retrofit situations or as pretreatment where other treatment BMPs presented in this section area used.

Additional Design Guidelines

Follow guidelines provided by individual manufacturers.

Maintenance

Likely require frequent maintenance, on the order of several times per year.

Cost

- The initial cost of individual inserts ranges from less than $100 to about $2,000. The cost of using multiple units in curb inlet drains varies with the size of the inlet.
- The low cost of inserts may tend to favor the use of these systems over other, more effective treatment BMPs. However, the low cost of each unit may be offset by the number of units that are required, more frequent maintenance, and the shorter structural life (and therefore replacement).

References and Sources of Additional Information

Hrachovec, R., and G. Minton, 2001, Field testing of a sock-type catch basin insert, Planet CPR, Seattle, Washington

Interagency Catch Basin Insert Committee, Evaluation of Commercially-Available Catch Basin Inserts for the Treatment of Stormwater Runoff from Developed Sites, 1995

Larry Walker Associates, June 1998, NDMP Inlet/In-Line Control Measure Study Report

Manufacturers literature

Santa Monica (City), Santa Monica Bay Municipal Stormwater/Urban Runoff Project - Evaluation of Potential Catch basin Retrofits, Woodward Clyde, September 24, 1998

Woodward Clyde, June 11, 1996, Parking Lot Monitoring Report, Santa Clara Valley Nonpoint Source Pollution Control Program.

Efficient Irrigation SD-12



Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Vegetated Swale TC-30



Design Considerations

- Tributary Area
- Area Required
- Slope
- Water Availability

Description

Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of stormwater runoff. Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems.

Targeted Constituents

☑	Sediment	▲
☑	Nutrients	●
☑	Trash	●
☑	Metals	▲
☑	Bacteria	●
☑	Oil and Grease	▲
☑	Organics	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

California Experience

Caltrans constructed and monitored six vegetated swales in southern California. These swales were generally effective in reducing the volume and mass of pollutants in runoff. Even in the areas where the annual rainfall was only about 10 inches/yr, the vegetation did not require additional irrigation. One factor that strongly affected performance was the presence of large numbers of gophers at most of the sites. The gophers created earthen mounds, destroyed vegetation, and generally reduced the effectiveness of the controls for TSS reduction.

Advantages

- If properly designed, vegetated, and operated, swales can serve as an aesthetic, potentially inexpensive urban development or roadway drainage conveyance measure with significant collateral water quality benefits.

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- Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible.

Limitations

- Can be difficult to avoid channelization.
- May not be appropriate for industrial sites or locations where spills may occur
- Grassed swales cannot treat a very large drainage area. Large areas may be divided and treated using multiple swales.
- A thick vegetative cover is needed for these practices to function properly.
- They are impractical in areas with steep topography.
- They are not effective and may even erode when flow velocities are high, if the grass cover is not properly maintained.
- In some places, their use is restricted by law: many local municipalities require curb and gutter systems in residential areas.
- Swales are mores susceptible to failure if not properly maintained than other treatment BMPs.

Design and Sizing Guidelines

- Flow rate based design determined by local requirements or sized so that 85% of the annual runoff volume is discharged at less than the design rainfall intensity.
- Swale should be designed so that the water level does not exceed 2/3rds the height of the grass or 4 inches, which ever is less, at the design treatment rate.
- Longitudinal slopes should not exceed 2.5%
- Trapezoidal channels are normally recommended but other configurations, such as parabolic, can also provide substantial water quality improvement and may be easier to mow than designs with sharp breaks in slope.
- Swales constructed in cut are preferred, or in fill areas that are far enough from an adjacent slope to minimize the potential for gopher damage. Do not use side slopes constructed of fill, which are prone to structural damage by gophers and other burrowing animals.
- A diverse selection of low growing, plants that thrive under the specific site, climatic, and watering conditions should be specified. Vegetation whose growing season corresponds to the wet season are preferred. Drought tolerant vegetation should be considered especially for swales that are not part of a regularly irrigated landscaped area.
- The width of the swale should be determined using Manning's Equation using a value of 0.25 for Manning's n.

Construction/Inspection Considerations

- Include directions in the specifications for use of appropriate fertilizer and soil amendments based on soil properties determined through testing and compared to the needs of the vegetation requirements.
- Install swales at the time of the year when there is a reasonable chance of successful establishment without irrigation; however, it is recognized that rainfall in a given year may not be sufficient and temporary irrigation may be used.
- If sod tiles must be used, they should be placed so that there are no gaps between the tiles; stagger the ends of the tiles to prevent the formation of channels along the swale or strip.
- Use a roller on the sod to ensure that no air pockets form between the sod and the soil.
- Where seeds are used, erosion controls will be necessary to protect seeds for at least 75 days after the first rainfall of the season.

Performance

The literature suggests that vegetated swales represent a practical and potentially effective technique for controlling urban runoff quality. While limited quantitative performance data exists for vegetated swales, it is known that check dams, slight slopes, permeable soils, dense grass cover, increased contact time, and small storm events all contribute to successful pollutant removal by the swale system. Factors decreasing the effectiveness of swales include compacted soils, short runoff contact time, large storm events, frozen ground, short grass heights, steep slopes, and high runoff velocities and discharge rates.

Conventional vegetated swale designs have achieved mixed results in removing particulate pollutants. A study performed by the Nationwide Urban Runoff Program (NURP) monitored three grass swales in the Washington, D.C., area and found no significant improvement in urban runoff quality for the pollutants analyzed. However, the weak performance of these swales was attributed to the high flow velocities in the swales, soil compaction, steep slopes, and short grass height.

Another project in Durham, NC, monitored the performance of a carefully designed artificial swale that received runoff from a commercial parking lot. The project tracked 11 storms and concluded that particulate concentrations of heavy metals (Cu, Pb, Zn, and Cd) were reduced by approximately 50 percent. However, the swale proved largely ineffective for removing soluble nutrients.

The effectiveness of vegetated swales can be enhanced by adding check dams at approximately 17 meter (50 foot) increments along their length (See Figure 1). These dams maximize the retention time within the swale, decrease flow velocities, and promote particulate settling. Finally, the incorporation of vegetated filter strips parallel to the top of the channel banks can help to treat sheet flows entering the swale.

Only 9 studies have been conducted on all grassed channels designed for water quality (Table 1). The data suggest relatively high removal rates for some pollutants, but negative removals for some bacteria, and fair performance for phosphorus.

Table 1 Grassed swale pollutant removal efficiency data							
	Removal Efficiencies (% Removal)						
Study	TSS	TP	TN	NO_3	Metals	Bacteria	Type
Caltrans 2002	77	8	67	66	83-90	-33	dry swales
Goldberg 1993	67.8	4.5	-	31.4	42–62	-100	grassed channel
Seattle Metro and Washington Department of Ecology 1992	60	45	-	-25	2–16	-25	grassed channel
Seattle Metro and Washington Department of Ecology, 1992	83	29	-	-25	46–73	-25	grassed channel
Wang et al., 1981	80	-	-	-	70–80	-	dry swale
Dorman et al., 1989	98	18	-	45	37–81	-	dry swale
Harper, 1988	87	83	84	80	88–90	-	dry swale
Kercher et al., 1983	99	99	99	99	99	-	dry swale
Harper, 1988.	81	17	40	52	37–69	-	wet swale
Koon, 1995	67	39	-	9	-35 to 6	-	wet swale

While it is difficult to distinguish between different designs based on the small amount of available data, grassed channels generally have poorer removal rates than wet and dry swales, although some swales appear to export soluble phosphorus (Harper, 1988; Koon, 1995). It is not clear why swales export bacteria. One explanation is that bacteria thrive in the warm swale soils.

Siting Criteria

The suitability of a swale at a site will depend on land use, size of the area serviced, soil type, slope, imperviousness of the contributing watershed, and dimensions and slope of the swale system (Schueler et al., 1992). In general, swales can be used to serve areas of less than 10 acres, with slopes no greater than 5 %. Use of natural topographic lows is encouraged and natural drainage courses should be regarded as significant local resources to be kept in use (Young et al., 1996).

Selection Criteria (NCTCOG, 1993)

- Comparable performance to wet basins
- Limited to treating a few acres
- Availability of water during dry periods to maintain vegetation
- Sufficient available land area

Research in the Austin area indicates that vegetated controls are effective at removing pollutants even when dormant. Therefore, irrigation is not required to maintain growth during dry periods, but may be necessary only to prevent the vegetation from dying.

The topography of the site should permit the design of a channel with appropriate slope and cross-sectional area. Site topography may also dictate a need for additional structural controls. Recommendations for longitudinal slopes range between 2 and 6 percent. Flatter slopes can be used, if sufficient to provide adequate conveyance. Steep slopes increase flow velocity, decrease detention time, and may require energy dissipating and grade check. Steep slopes also can be managed using a series of check dams to terrace the swale and reduce the slope to within acceptable limits. The use of check dams with swales also promotes infiltration.

Additional Design Guidelines

Most of the design guidelines adopted for swale design specify a minimum hydraulic residence time of 9 minutes. This criterion is based on the results of a single study conducted in Seattle, Washington (Seattle Metro and Washington Department of Ecology, 1992), and is not well supported. Analysis of the data collected in that study indicates that pollutant removal at a residence time of 5 minutes was not significantly different, although there is more variability in that data. Therefore, additional research in the design criteria for swales is needed. Substantial pollutant removal has also been observed for vegetated controls designed solely for conveyance (Barrett et al, 1998); consequently, some flexibility in the design is warranted.

Many design guidelines recommend that grass be frequently mowed to maintain dense coverage near the ground surface. Recent research (Colwell et al., 2000) has shown mowing frequency or grass height has little or no effect on pollutant removal.

Summary of Design Recommendations

1) The swale should have a length that provides a minimum hydraulic residence time of at least 10 minutes. The maximum bottom width should not exceed 10 feet unless a dividing berm is provided. The depth of flow should not exceed 2/3rds the height of the grass at the peak of the water quality design storm intensity. The channel slope should not exceed 2.5%.

2) A design grass height of 6 inches is recommended.

3) Regardless of the recommended detention time, the swale should be not less than 100 feet in length.

4) The width of the swale should be determined using Manning's Equation, at the peak of the design storm, using a Manning's n of 0.25.

5) The swale can be sized as both a treatment facility for the design storm and as a conveyance system to pass the peak hydraulic flows of the 100-year storm if it is located "on-line." The side slopes should be no steeper than 3:1 (H:V).

6) Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible. If flow is to be introduced through curb cuts, place pavement slightly above the elevation of the vegetated areas. Curb cuts should be at least 12 inches wide to prevent clogging.

7) Swales must be vegetated in order to provide adequate treatment of runoff. It is important to maximize water contact with vegetation and the soil surface. For general purposes, select fine, close-growing, water-resistant grasses. If possible, divert runoff (other than necessary irrigation) during the period of vegetation

establishment. Where runoff diversion is not possible, cover graded and seeded areas with suitable erosion control materials.

Maintenance

The useful life of a vegetated swale system is directly proportional to its maintenance frequency. If properly designed and regularly maintained, vegetated swales can last indefinitely. The maintenance objectives for vegetated swale systems include keeping up the hydraulic and removal efficiency of the channel and maintaining a dense, healthy grass cover.

Maintenance activities should include periodic mowing (with grass never cut shorter than the design flow depth), weed control, watering during drought conditions, reseeding of bare areas, and clearing of debris and blockages. Cuttings should be removed from the channel and disposed in a local composting facility. Accumulated sediment should also be removed manually to avoid concentrated flows in the swale. The application of fertilizers and pesticides should be minimal.

Another aspect of a good maintenance plan is repairing damaged areas within a channel. For example, if the channel develops ruts or holes, it should be repaired utilizing a suitable soil that is properly tamped and seeded. The grass cover should be thick; if it is not, reseed as necessary. Any standing water removed during the maintenance operation must be disposed to a sanitary sewer at an approved discharge location. Residuals (e.g., silt, grass cuttings) must be disposed in accordance with local or State requirements. Maintenance of grassed swales mostly involves maintenance of the grass or wetland plant cover. Typical maintenance activities are summarized below:

- Inspect swales at least twice annually for erosion, damage to vegetation, and sediment and debris accumulation preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the swale is ready for winter. However, additional inspection after periods of heavy runoff is desirable. The swale should be checked for debris and litter, and areas of sediment accumulation.
- Grass height and mowing frequency may not have a large impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.
- Trash tends to accumulate in swale areas, particularly along highways. The need for litter removal is determined through periodic inspection, but litter should always be removed prior to mowing.
- Sediment accumulating near culverts and in channels should be removed when it builds up to 75 mm (3 in.) at any spot, or covers vegetation.
- Regularly inspect swales for pools of standing water. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g. debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained.

Cost

Construction Cost

Little data is available to estimate the difference in cost between various swale designs. One study (SWRPC, 1991) estimated the construction cost of grassed channels at approximately $0.25 per ft². This price does not include design costs or contingencies. Brown and Schueler (1997) estimate these costs at approximately 32 percent of construction costs for most stormwater management practices. For swales, however, these costs would probably be significantly higher since the construction costs are so low compared with other practices. A more realistic estimate would be a total cost of approximately $0.50 per ft², which compares favorably with other stormwater management practices.

Table 2 Swale Cost Estimate (SEWRPC, 1991)

Component	Unit	Extent	Unit Cost			Total Cost		
			Low	Moderate	High	Low	Moderate	High
Mobilization / Demobilization-Light	Swale	1	$107	$274	$441	$107	$274	$441
Site Preparation								
Clearing[b]	Acre	0.5	$2,200	$3,800	$5,400	$1,100	$1,900	$2,700
Grubbing[c]	Acre	0.25	$3,800	$5,200	$6,600	$950	$1,300	$1,650
General Excavation[d]	Yd^3	372	$2.10	$3.70	$5.30	$781	$1,376	$1,972
Level and Till[e]	Yd^2	1,210	$0.20	$0.35	$0.50	$242	$424	$605
Sites Development								
Salvaged Topsoil Seed, and Mulch[f]	Yd^2	1,210	$0.40	$1.00	$1.60	$484	$1,210	$1,936
Sod[g]	Yd^2	1,210	$1.20	$2.40	$3.60	$1,452	$2,904	$4,356
Subtotal	--	–	--	–	--	$5,116	$9,388	$13,660
Contingencies	Swale	1	25%	25%	25%	$1,279	$2,347	$3,415
Total	--	–	--	–	--	$6,395	$11,735	$17,075

Source: (SEWRPC, 1991)

Note: Mobilization/demobilization refers to the organization and planning involved in establishing a vegetative swale.

[a] Swale has a bottom width of 1.0 foot, a top width of 10 feet with 1:3 side slopes, and a 1,000-foot length.

[b] Area cleared = (top width + 10 feet) x swale length.

[c] Area grubbed = (top width x swale length).

[d] Volume excavated = (0.67 x top width x swale depth) x swale length (parabolic cross-section).

[e] Area tilled = $\left(\text{top width} + \frac{8(\text{swale depth}^2)}{3(\text{top width})}\right) \times$ swale length (parabolic cross-section).

[f] Area seeded = area cleared x 0.5.

[g] Area sodded = area cleared x 0.5.

Table 3 Estimated Maintenance Costs (SEWRPC. 1991)

Component	Unit Cost	Swale Size (Depth and Top Width)		Comment
		1.5 Foot Depth, One-Foot Bottom Width, 10-Foot Top Width	3-Foot Depth, 3-Foot Bottom Width, 21-Foot Top Width	
Lawn Mowing	$0.85 / 1,000 ft^2/ mowing	$0.14 / linear foot	$0.21 / linear foot	Lawn maintenance area=(top width + 10 feet) x length. Mow eight times per year
General Lawn Care	$9.00 / 1,000 ft^2/ year	$0.18 / linear foot	$0.28 / linear foot	Lawn maintenance area = (top width + 10 feet) x length
Swale Debris and Litter Removal	$0.10 / linear foot / year	$0.10 / linear foot	$0.10 / linear foot	–
Grass Reseeding with Mulch and Fertilizer	$0.30 / yd^2	$0.01 / linear foot	$0.01 / linear foot	Area revegetated equals 1% of lawn maintenance area per year
Program Administration and Swale Inspection	$0.15 / linear foot / year, plus $25 / inspection	$0.15 / linear foot	$0.15 / linear foot	Inspect four times per year
Total	--	**$0.58 / linear foot**	**$ 0.75 / linear foot**	--

Maintenance Cost

Caltrans (2002) estimated the expected annual maintenance cost for a swale with a tributary area of approximately 2 ha at approximately $2,700. Since almost all maintenance consists of mowing, the cost is fundamentally a function of the mowing frequency. Unit costs developed by SEWRPC are shown in Table 3. In many cases vegetated channels would be used to convey runoff and would require periodic mowing as well, so there may be little additional cost for the water quality component. Since essentially all the activities are related to vegetation management, no special training is required for maintenance personnel.

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Information Resources

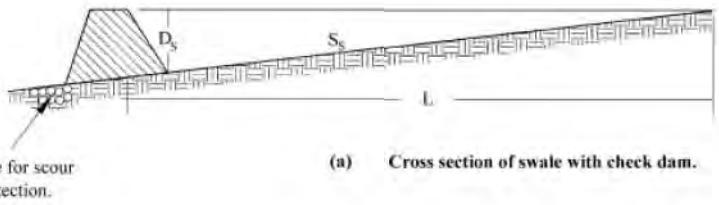
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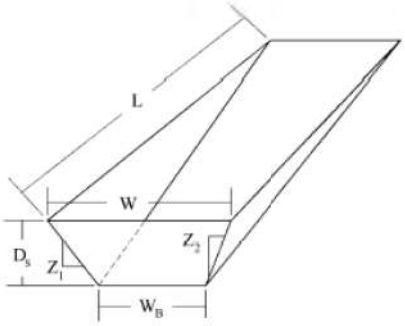
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(a) Cross section of swale with check dam.

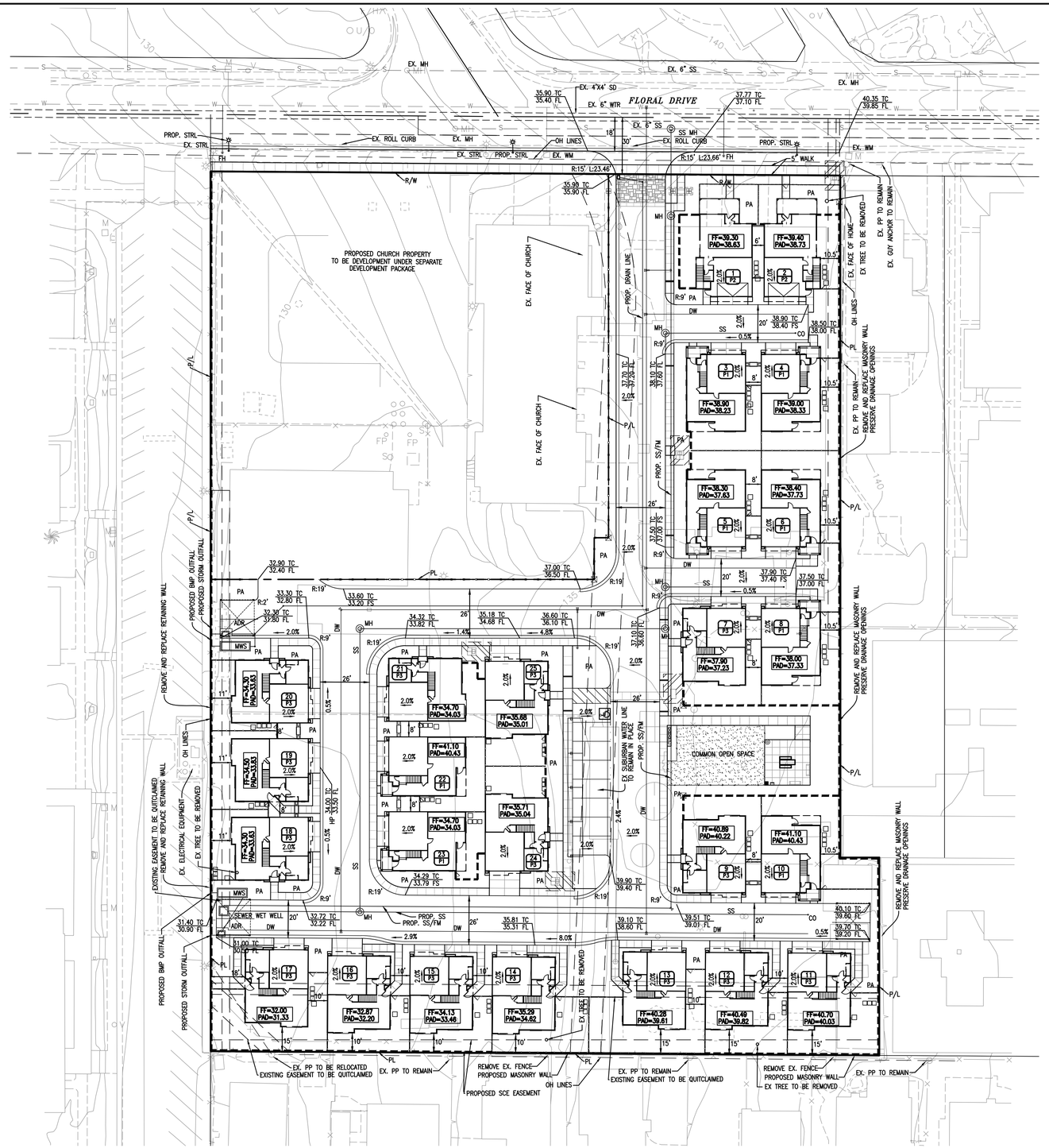


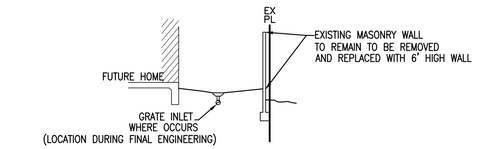
(b) Dimensional view of swale impoundment area.

Notation:
L = Length of swale impoundment area per check dam (ft)
D_S = Depth of check dam (ft)
S_S = Bottom slpe of swale (ft/ft)
W = Top width of check dam (ft)
W_B = Bottom width of check dam (ft)
$Z_{1\&2}$ = Ratio of horizontal to vertical change in swale side slope (ft/ft)

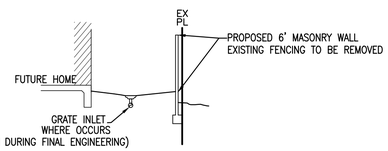
ATTACHMENT C

Grading Plan

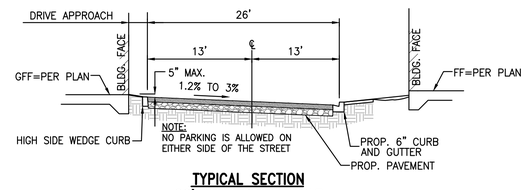




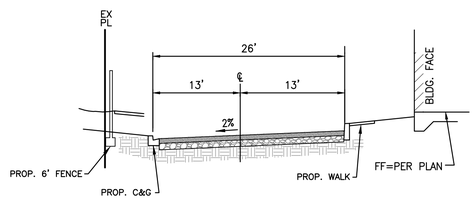
EAST PL SECTION
LOOKING NORTH N.T.S.



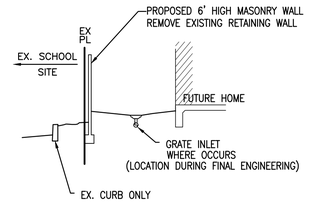
SOUTH PL SECTION
LOOKING EAST N.T.S.



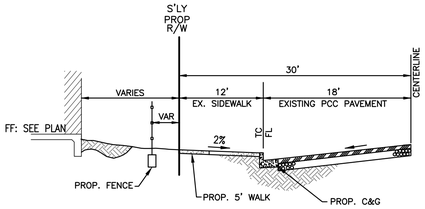
TYPICAL SECTION
26' MAIN DRIVE AISLE
NTS



26' MAIN ENTRY DRIVE AISLE
NTS



WEST PL SECTION
LOOKING NORTH N.T.S.

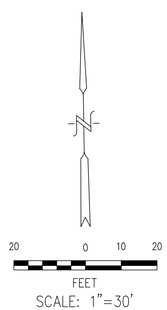


FLORAL DRIVE STREET SECTION
N.T.S.

PRELIMINARY EARTHWORK SUMMARY:
QUANTITIES FOR PLAN CHECKING PURPOSES ONLY
QUANTITIES NOT TO BE USED AS GRADING PAY QUANTITIES

RAW CUT	6453 CY
SPOILS	900 CY
RAW IMPORT	400 CY
OVER EXCAVATION	7744 CY
ADJUSTED IMPORT	8905 CY
EXPORT	5792 CY

ASSUMPTIONS:
1. SITE SUBSIDENCE IS ASSUMED NEGLIGIBLE.
2. ENTIRE SITE TO BE OVER-EXCAVATED.



STREET LIGHT NOTE:
PROJECT TO INSTALL NEW LS2 TYPE STREET LIGHTS ALONG FLORAL PER CITY OF WHITTIER STREET LIGHTING POLICY

STREET TREE NOTE:
PROJECT TO INSTALL STREET TREES ALONG FRONTAGE PER CITY OF WHITTIER STANDARDS

FIRE WATER NOTE:
PROPOSED PUBLIC FIRE HYDRANTS

WATER NOTE:
PROPOSED PUBLIC MAIN: 8" MAIN LATERAL PVC
PROPOSED HOUSE LATERALS: 1.5" PVC

SEWER NOTE:
PROPOSED SEWER/ALLEY MAIN: 6" MAIN LATERAL PVC
PROPOSED HOUSE LATERALS: 4" PVC
ALL PROPOSED MAIN LINE SEWER TO BE PRIVATE
ALL PROPOSED ALLEY SEWER LATERALS TO BE PRIVATE

PROPOSED EASEMENT
AN EASEMENT IS PROPOSED OVER ALL VEHICULAR PAVEMENT AREA FOR INGRESS/EGRESS AND UTILITY PURPOSES.

DIGALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

REVISIONS

NO	DATE	INITIAL	DESCRIPTION	APP	DATE

OWNER/DEVELOPER:
BRANDYWINE HOMES, INC.
16580 ASTON
IRVINE, CA 92606
(949) 296-2400

PREPARED BY :
KES TECHNOLOGIES INC
CIVIL ENGINEERING
LAND PLANNING AND SURVEYING
1 VENTURE STE 130
IRVINE, CALIFORNIA 92618
PHONE (949) 339-5331
FAX (866) 426-2201

REGISTERED PROFESSIONAL ENGINEER
ALI MONSHIZADEH
C67674
EXP. 06/30/2021
CIVIL
STATE OF CALIFORNIA

I hereby certify that:
1. These plans have been prepared under my supervision:
2. The grading shown hereon will not divert drainage from its natural downstream course or obstruct the drainage of adjacent properties:
3. All specimen trees located on this properly are shown:
4. Existing ground contours and elevations were obtained by field survey on/aerial topography flown on MAY, 2018

ENGINEER _____ DATE _____
RCE 67674 EXP. DATE 6-31-21

VESTING TENTATIVE TRACT NO. 82802 (FOR CONDOMINIUM PURPOSES)
GRADING AND UTILITY PLAN
LOCATED IN THE CITY OF WHITTIER THE COUNTY OF LOS ANGELES, STATE OF CA

SHEET 2 OF 3

SCALE: AS SHOWN | DRAWN BY: DSK | CHECKED BY: AM

CITY OF WHITTIER

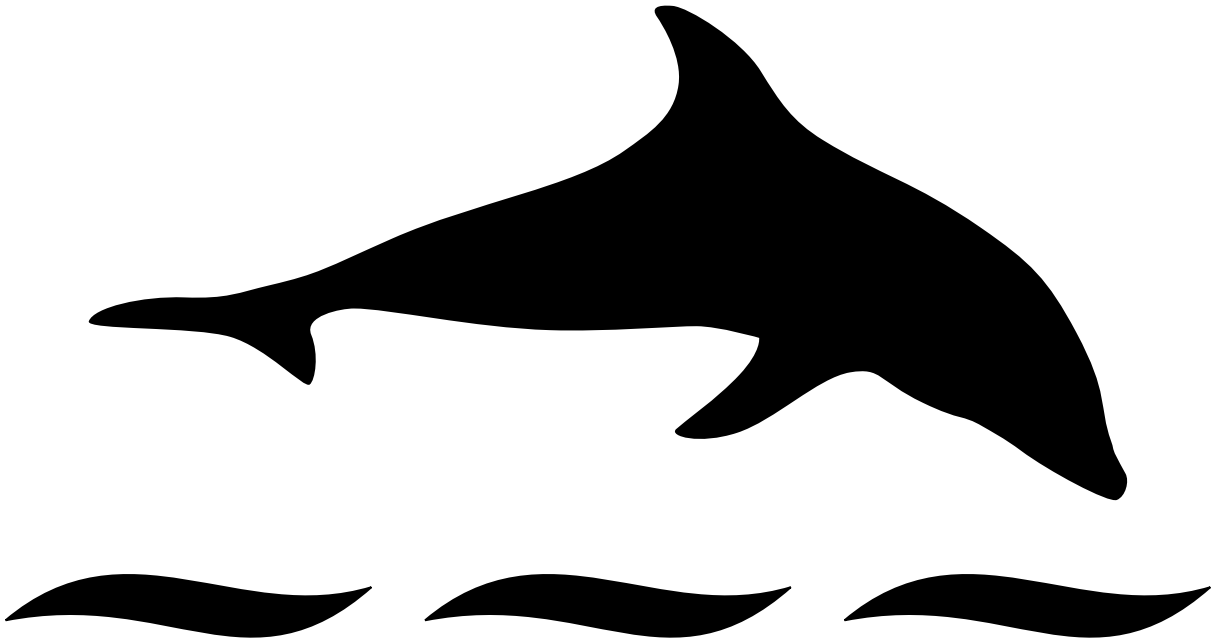
ATTACHMENT D

No Dumping



Sample Stencil 1

NO DUMPING



DRAINS TO OCEAN

Sample Stencil 2

ATTACHMENT E

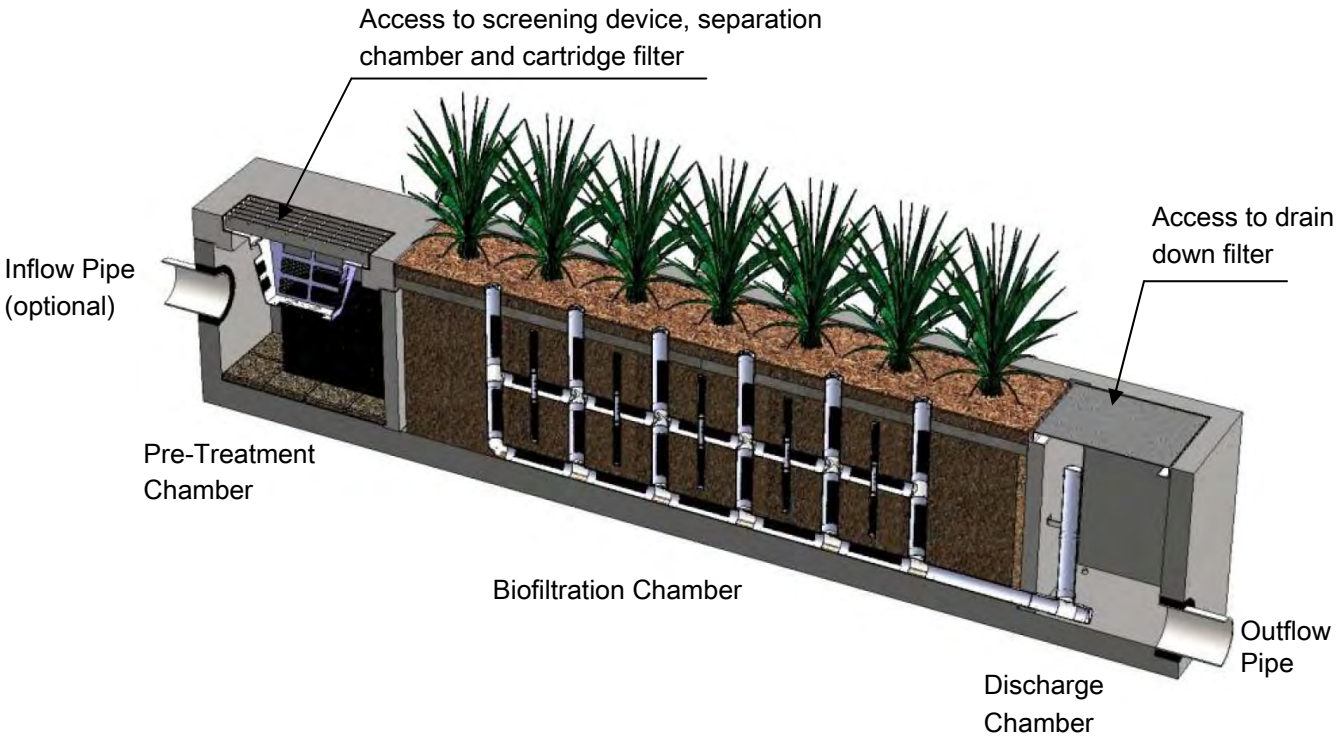
Treatment Control BMP Info

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.



Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.

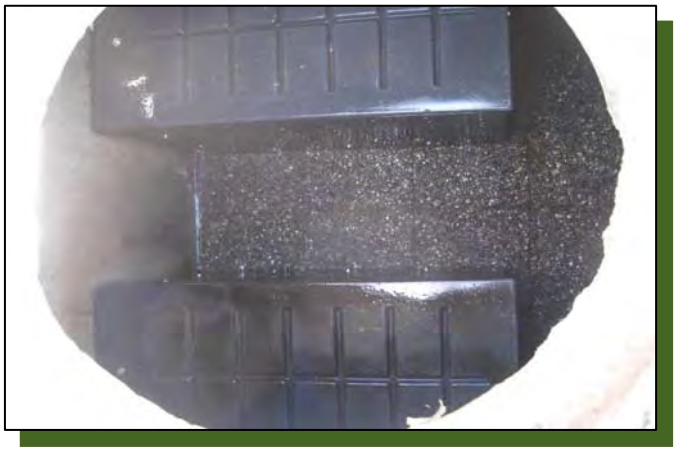






Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.







Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.



Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.









Inspection Form



Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ___/___/___ Time _____ AM / PM

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report



Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

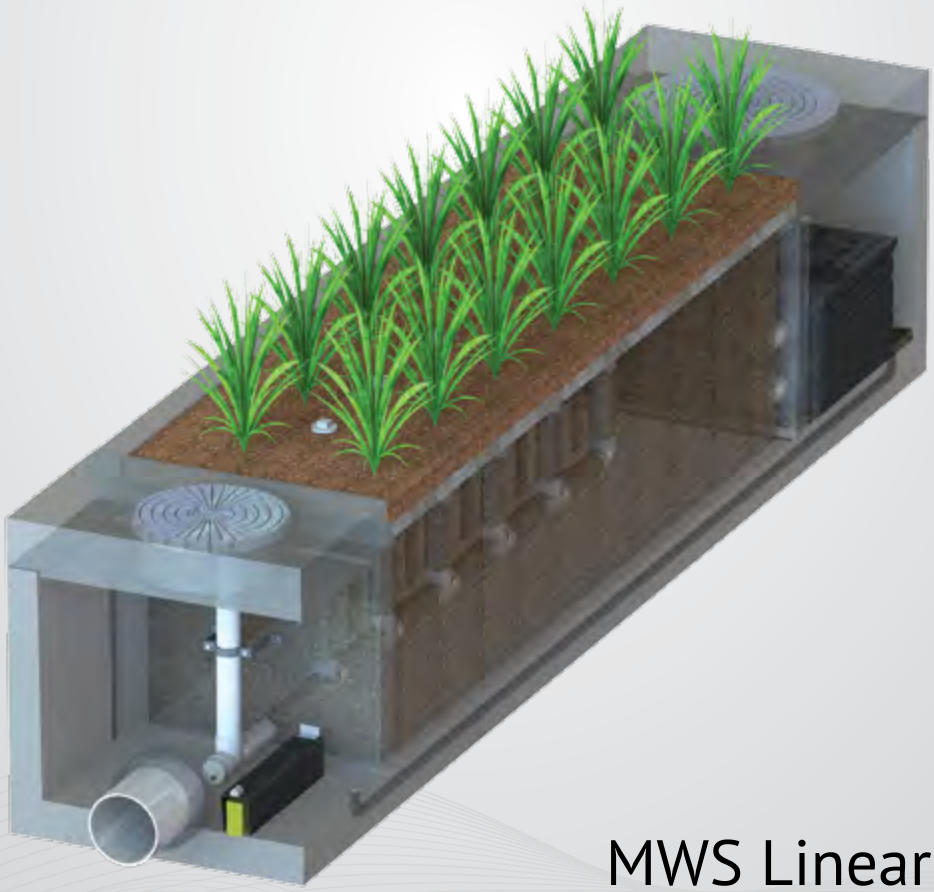
Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

MODULAR WETLANDS™

*Advanced **Stormwater** Biofiltration*



MWS Linear



Contents

1 Introduction

2 Applications

3 Configurations

4 Advantages

5 Operation

6 Orientations | Bypass

7 Performance | Approvals

8 Sizing

9 Installation | Maintenance | Plants

The Urban Impact

For hundreds of years natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as our cities grow and develop, these natural wetlands have perished under countless roads, rooftops, and parking lots.



Plant A Wetland

Without natural wetlands our cities are deprived of water purification, flood control, and land stability. Modular Wetlands and the MWS Linear re-establish nature's presence and rejuvenate water ways in urban areas.





MWS Linear

The Modular Wetland System Linear represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint and higher treatment capacity. While most biofilters use little or no pre-treatment, the MWS Linear incorporates an advanced pre-treatment chamber that includes separation and pre-filter cartridges. In this chamber sediment and hydrocarbons are removed from runoff before it enters the biofiltration chamber, in turn reducing maintenance costs and improving performance.

Applications

The MWS Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.



Industrial

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA mandated effluent limits for dissolved metals and other pollutants.



Residential

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.



Streets

Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.



Parking Lots

Parking lots are designed to maximize space and the MWS Linear's 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.



Commercial

Compared to bioretention systems, the MWS Linear can treat far more area in less space - meeting treatment and volume control requirements.



Mixed Use

The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications are available on our website: www.ModularWetlands.com/Applications

- Agriculture
- Reuse
- Low Impact Development
- Waste Water





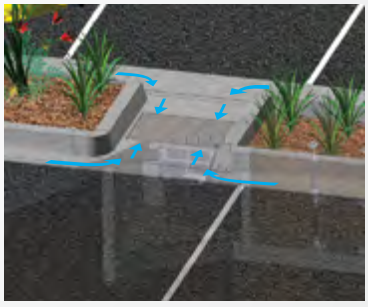
Configurations

The MWS Linear is the preferred biofiltration system of Civil Engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your stormdrain design.



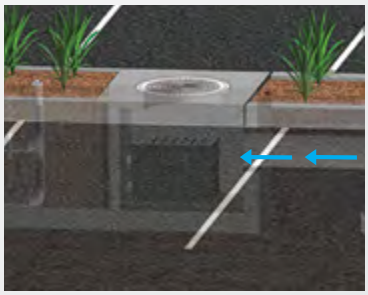
Curb Type

The *Curb Type* configuration accepts sheet flow through a curb opening and is commonly used along road ways and parking lots. It can be used in sump or flow by conditions. Length of curb opening varies based on model and size.



Grate Type

The *Grate Type* configuration offers the same features and benefits as the *Curb Type* but with a grated/drop inlet above the systems pre-treatment chamber. It has the added benefit of allowing for pedestrian access over the inlet. ADA compliant grates are available to assure easy and safe access. The *Grate Type* can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



Vault Type

The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pre-treatment chamber, meaning the MWS Linear can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/bioretention systems. Another benefit of the "pipe in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.



Downspout Type

The *Downspout Type* is a variation of the *Vault Type* and is designed to accept a vertical downspout pipe from roof top and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

Advantages & Operation

The MWS Linear is the most efficient and versatile biofiltration system on the market, and the only system with horizontal flow which improves performance, reduces footprint, and minimizes maintenance. Figure-1 and Figure-2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

Featured Advantages

- Horizontal Flow Biofiltration
- Greater Filter Surface Area
- Pre-Treatment Chamber
- Patented Perimeter Void Area
- Flow Control
- No Depressed Planter Area

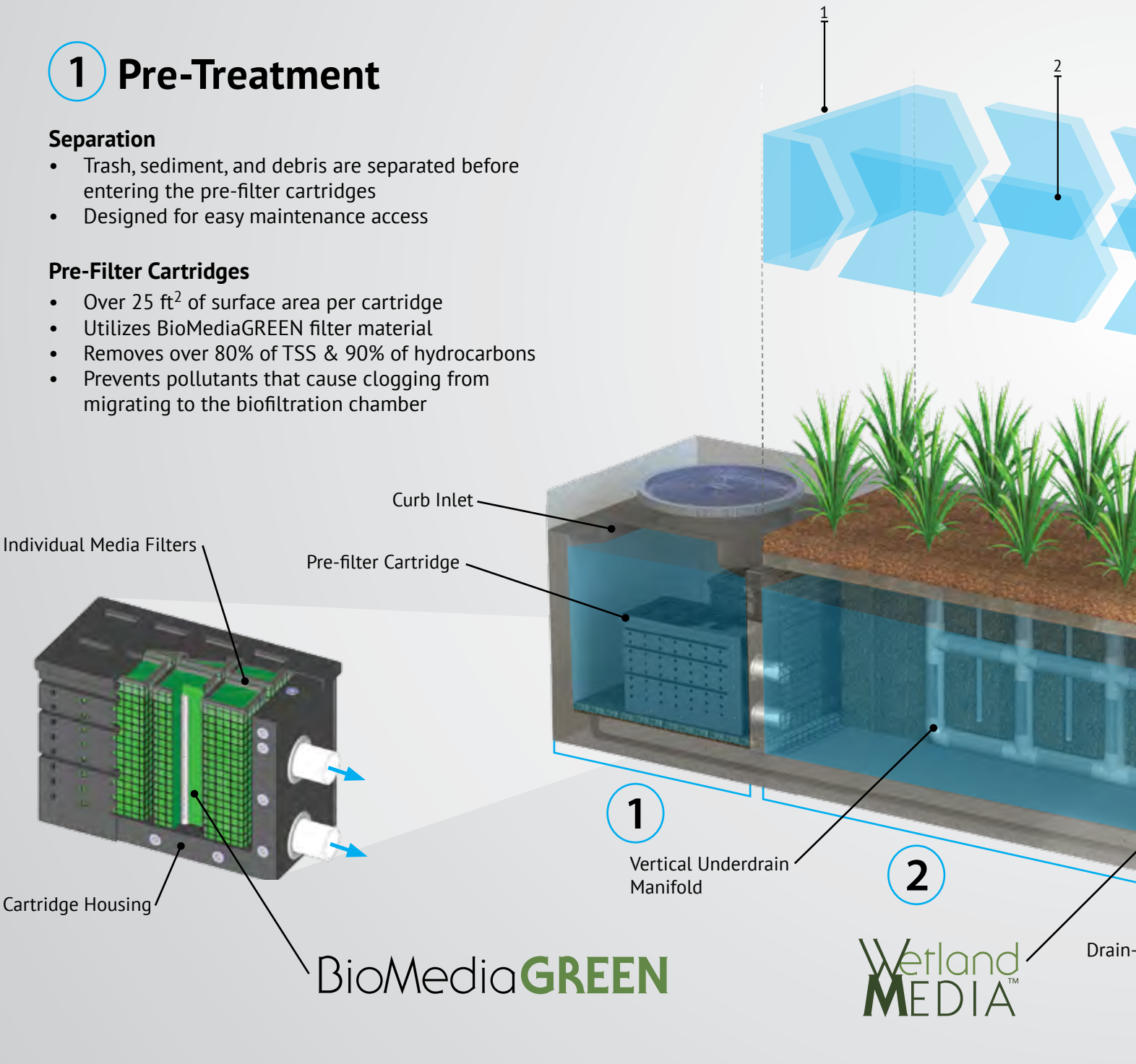
1 Pre-Treatment

Separation

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

Pre-Filter Cartridges

- Over 25 ft^2 of surface area per cartridge
- Utilizes BioMediaGREEN filter material
- Removes over 80% of TSS & 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber



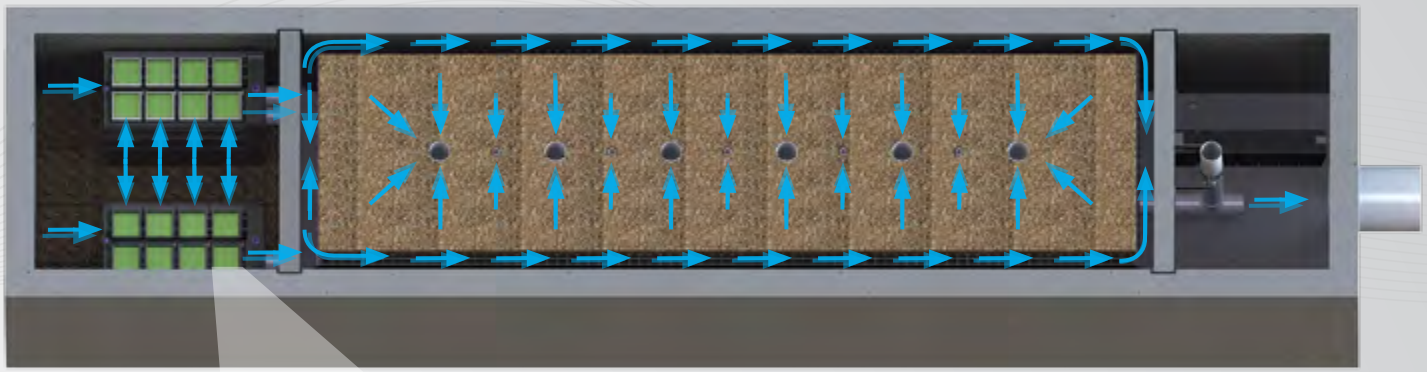


Fig. 2 - Top View

2x to 3x More Surface Area Than Traditional Downward Flow Bioretention Systems.



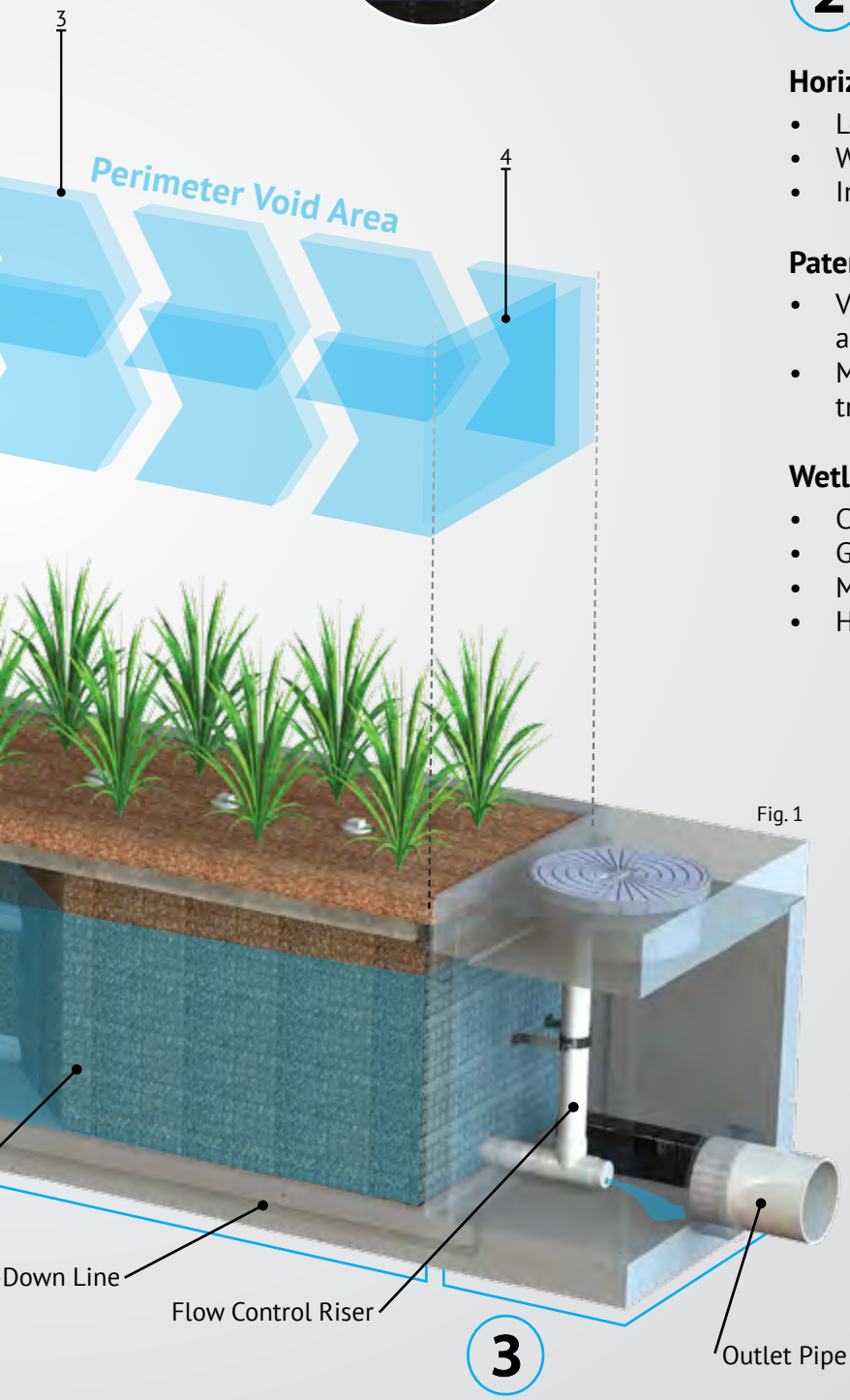


Fig. 1

2 Biofiltration

Horizontal Flow

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

Patented Perimeter Void Area

- Vertically extends void area between the walls and the WetlandMEDIA on all four sides.
- Maximizes surface area of the media for higher treatment capacity

WetlandMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and light weight

3 Discharge

Flow Control

- Orifice plate controls flow of water through WetlandMEDIA to a level lower than the media's capacity.
- Extends the life of the media and improves performance

Drain-Down Filter

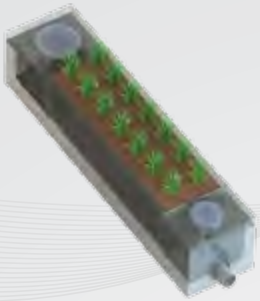
- The Drain-Down is an optional feature that completely drains the pre-treatment chamber
- Water that drains from the pre-treatment chamber between storm events will be treated

Orientations



Side-By-Side

The *Side-By-Side* orientation places the pre-treatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.



End-To-End

The *End-To-End* orientation places the pre-treatment and discharge chambers on opposite ends of the biofiltration chamber therefore minimizing the width of the system to 5 ft (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is bypass must be external.

Bypass

Internal Bypass Weir (Side-by-Side Only)

The *Side-By-Side* orientation places the pre-treatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pre-treatment chamber directly to the discharge chamber.

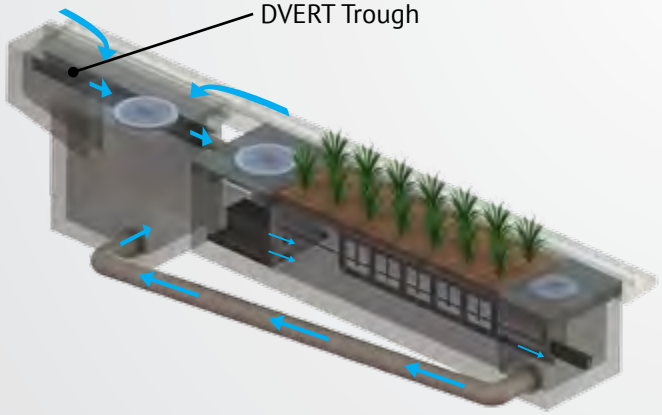
External Diversion Weir Structure

This traditional offline diversion method can be used with the MWS Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

Flow By Design

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT Low Flow Diversion



This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the MWS Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allows the MWS Linear to be installed anywhere space is available.





Performance

The MWS Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country. With it's advanced pre-treatment chamber and innovative horizontal flow biofilter, the system is able to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. With the same biological processes found in natural wetlands, the MWS Linear harnesses natures ability to process, transform, and remove even the most harmful pollutants.

Approvals

The MWS Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation, and perhaps the world.



Washington State DOE Approved

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft^2 loading rate. The highest performing BMP on the market for all main pollutant categories.

TSS	Total Phosphorus	Ortho Phosphorus	Nitrogen	Dissolved Zinc	Dissolved Copper	Total Zinc	Total Copper	Motor Oil
85%	64%	67%	45%	66%	38%	69%	50%	95%



DEQ Assignment

The Virginia Department of Environmental Quality assigned the MWS Linear, the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) Technical Criteria.



MASTEP Evaluation

The University of Massachusetts at Amherst – Water Resources Research Center, issued a technical evaluation report noting removal rates up to 84% TSS, 70% Total Phosphorus, 68.5% Total Zinc, and more.



Rhode Island DEM Approved

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% Pathogens, 30% Total Phosphorus for discharges to freshwater systems, and 30% Total Nitrogen for discharges to saltwater or tidal systems.

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

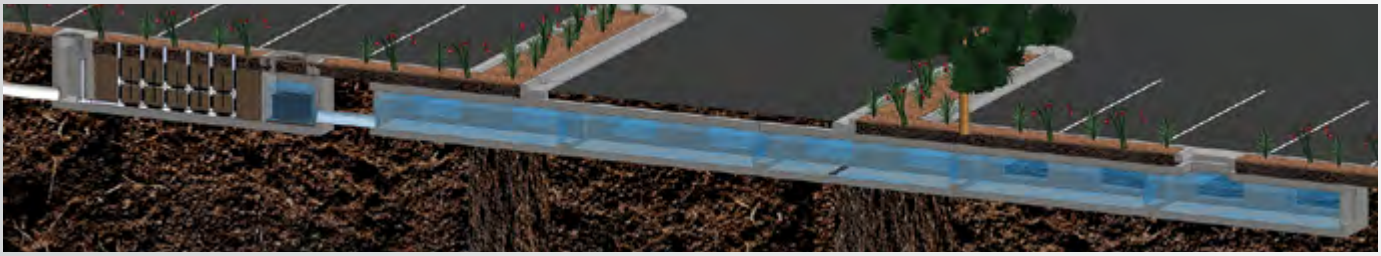


Treatment Flow Sizing Table

Model #	Dimensions	WetlandMedia Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 ft^2	0.052
MWS-L-4-6	4' x 6'	32 ft^2	0.073
MWS-L-4-8	4' x 8'	50 ft^2	0.115
MWS-L-4-13	4' x 13'	63 ft^2	0.144
MWS-L-4-15	4' x 15'	76 ft^2	0.175
MWS-L-4-17	4' x 17'	90 ft^2	0.206
MWS-L-4-19	4' x 19'	103 ft^2	0.237
MWS-L-4-21	4' x 21'	117 ft^2	0.268
MWS-L-8-8	8' x 8'	100 ft^2	0.230
MWS-L-8-12	8' x 12'	151 ft^2	0.346
MWS-L-8-16	8' x 16'	201 ft^2	0.462

Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.



Treatment Volume Sizing Table

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

Installation

The MWS Linear is simple, easy to install, and has a space efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles pre-cast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians are available to supervise installations and provide technical support.



Maintenance

Reduce your maintenance costs, man hours, and materials with the MWS Linear. Unlike other biofiltration systems that provide no pre-treatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pre-treatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pre-treatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pre-treatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long term operation and there is absolutely no need to replace expensive biofiltration media.



Plant Selection

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the MWS Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more "contact time" so that pollutants are more successfully decomposed, volatilized and incorporated into the biomass of The MWS Linear's micro/macro flora and fauna.

A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by selecting the list relative to your project location's hardy zone.

Please visit www.ModularWetlands.com/Plants for more information and various plant lists.



MWS-LINEAR 2.0 STORMWATER FILTRATION SYSTEM

NATURE AND TECHNOLOGY WORKING TOGETHER IN PERFECT HARMONY.

The need for a new stormwater treatment system is evident. Federal and state requirements on cities and industry to reduce stormwater runoff increase every year as our population explodes. The EPA is now reporting that stormwater runoff represents the nation's number one water quality problem, and is the reason why nearly half of our rivers and lakes are not even clean enough to support fishing or swimming. ***Nearly half.***

MODULAR WETLANDS™

To combat this catastrophe, we turned to the expert in this field: **Nature.** By developing technology that imitates the processes found in nature, we've created the most advanced stormwater filtration system available. Years ahead of current EPA requirements, our clients understand that when they invest in our new technology, they are investing in the future. For all of us.



GRATE TYPE



CURB TYPE

MWS-LINEAR TESTED REMOVAL EFFICIENCIES

TSS	Nitrate	Copper	Zinc	Oils & Grease	Bacteria	Turbidity
82% - 98%	74%	>53% - 93%	79% - 81%	84% - 99%	60% - 89%	>90%

Washington State DOE Approved

SIZING

Model #	Dimensions (ft)	WetlandMedia Surface Area (sq ft)	Treatment Flow Rate (cfs)
MWS-L-3-6	3 x 6	34	0.076
MWS-L-4-8	4 x 8	50	0.116
MWS-L-4-13	4 x 13	63	0.144
MWS-L-4-15	4 x 15	76	0.175
MWS-L-4-17	4 x 17	90	0.206
MWS-L-4-19	4 x 19	103	0.236
MWS-L-4-21	4 x 21	117	0.267

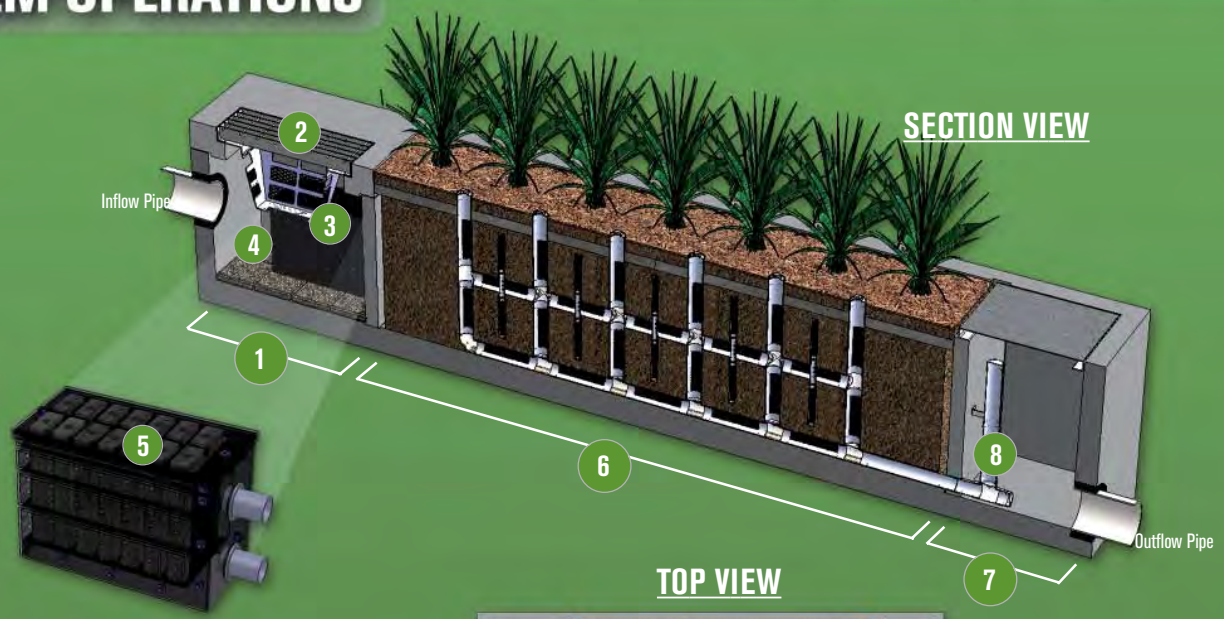
VOLUME SIZING



The Modular Wetland System is the only biofilter that can be installed downstream of detention systems.

T 760.433.7640 E info@modularwetlands.com www.modularwetlands.com

SYSTEM OPERATIONS

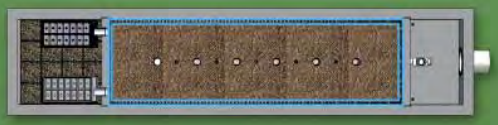


Pre-Filter Cartridge

35 sq ft surface area per cartridge ensures higher effectiveness and lower maintenance requirements.

This pre-filter eliminates maintenance in the Wetland Chamber.

TOP VIEW



Perimeter Wetland Chamber

Pre-filtered runoff entering the wetland chamber flows into a peripheral void area, maximizing the media surface area.

Over 2x to 3x more surface area than traditional downward flow bioretention systems.

INTERNAL HIGH FLOW BYPASS CONFIGURATION AVAILABLE

FEATURES

1. **PRE-TREATMENT CHAMBER**
   Captures incoming runoff and contains the first three stages of treatment.
2. **GRATE TYPE CATCH BASIN INLET**
   A standard 41" x 24" grate type traffic rated catch basin opening directs stormwater into the system.
3. **CATCH BASIN INSERT FILTER**
   Provides the first stage of treatment by capturing trash & litter, gross solids, and sediment.
4. **SETTLING CHAMBER**
   Provides the second stage of treatment by separating out larger suspended solids.
5. **PRE-FILTER CARTRIDGE**
   Provides the third stage of treatment by physically and chemically capturing fine TSS, metals, nutrients, and bacteria.
6. **WETLAND CHAMBER**
   Provides the final stage of treatment through a combination of physical, chemical and biological processes.
7. **DISCHARGE CHAMBER**
   Contains flow control, high flow bypass and optional drain down filter.
8. **MULTI-LEVEL FLOW CONTROL**
   Orifice plates and/or valves are used to control the flow through the treatment stages.

MODULAR WETLANDS

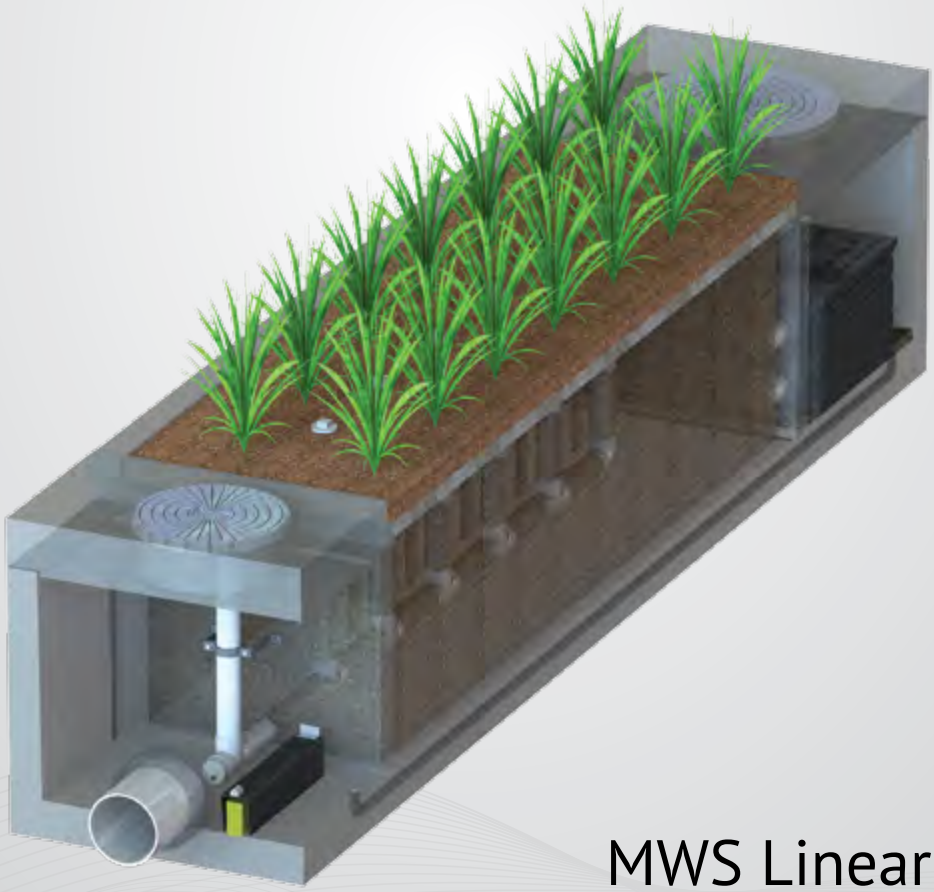
RAINFOREST ALLIANCE CERTIFIED

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MODULAR WETLANDS™

*Advanced **Stormwater** Biofiltration*



MWS Linear



Contents

1 Introduction

2 Applications

3 Configurations

4 Advantages

5 Operation

6 Orientations | Bypass

7 Performance | Approvals

8 Sizing

9 Installation | Maintenance | Plants

The Urban Impact

For hundreds of years natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as our cities grow and develop, these natural wetlands have perished under countless roads, rooftops, and parking lots.



Plant A Wetland

Without natural wetlands our cities are deprived of water purification, flood control, and land stability. Modular Wetlands and the MWS Linear re-establish nature's presence and rejuvenate water ways in urban areas.





MWS Linear

The Modular Wetland System Linear represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint and higher treatment capacity. While most biofilters use little or no pre-treatment, the MWS Linear incorporates an advanced pre-treatment chamber that includes separation and pre-filter cartridges. In this chamber sediment and hydrocarbons are removed from runoff before it enters the biofiltration chamber, in turn reducing maintenance costs and improving performance.

Applications

The MWS Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.



Industrial

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA mandated effluent limits for dissolved metals and other pollutants.



Residential

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.



Streets

Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.



Parking Lots

Parking lots are designed to maximize space and the MWS Linear's 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.



Commercial

Compared to bioretention systems, the MWS Linear can treat far more area in less space - meeting treatment and volume control requirements.



Mixed Use

The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications are available on our website: www.ModularWetlands.com/Applications

- Agriculture
- Reuse
- Low Impact Development
- Waste Water





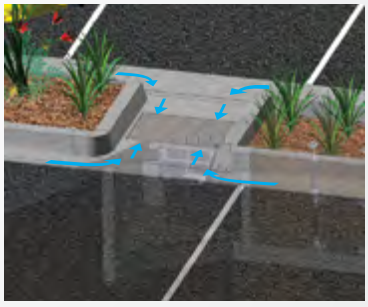
Configurations

The MWS Linear is the preferred biofiltration system of Civil Engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your stormdrain design.



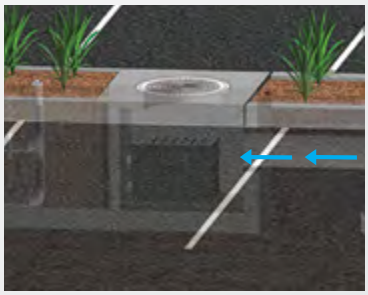
Curb Type

The *Curb Type* configuration accepts sheet flow through a curb opening and is commonly used along road ways and parking lots. It can be used in sump or flow by conditions. Length of curb opening varies based on model and size.



Grate Type

The *Grate Type* configuration offers the same features and benefits as the *Curb Type* but with a grated/drop inlet above the systems pre-treatment chamber. It has the added benefit of allowing for pedestrian access over the inlet. ADA compliant grates are available to assure easy and safe access. The *Grate Type* can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



Vault Type

The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pre-treatment chamber, meaning the MWS Linear can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/bioretention systems. Another benefit of the "pipe in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.



Downspout Type

The *Downspout Type* is a variation of the *Vault Type* and is designed to accept a vertical downspout pipe from roof top and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

Advantages & Operation

The MWS Linear is the most efficient and versatile biofiltration system on the market, and the only system with horizontal flow which improves performance, reduces footprint, and minimizes maintenance. Figure-1 and Figure-2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

Featured Advantages

- Horizontal Flow Biofiltration
- Greater Filter Surface Area
- Pre-Treatment Chamber
- Patented Perimeter Void Area
- Flow Control
- No Depressed Planter Area

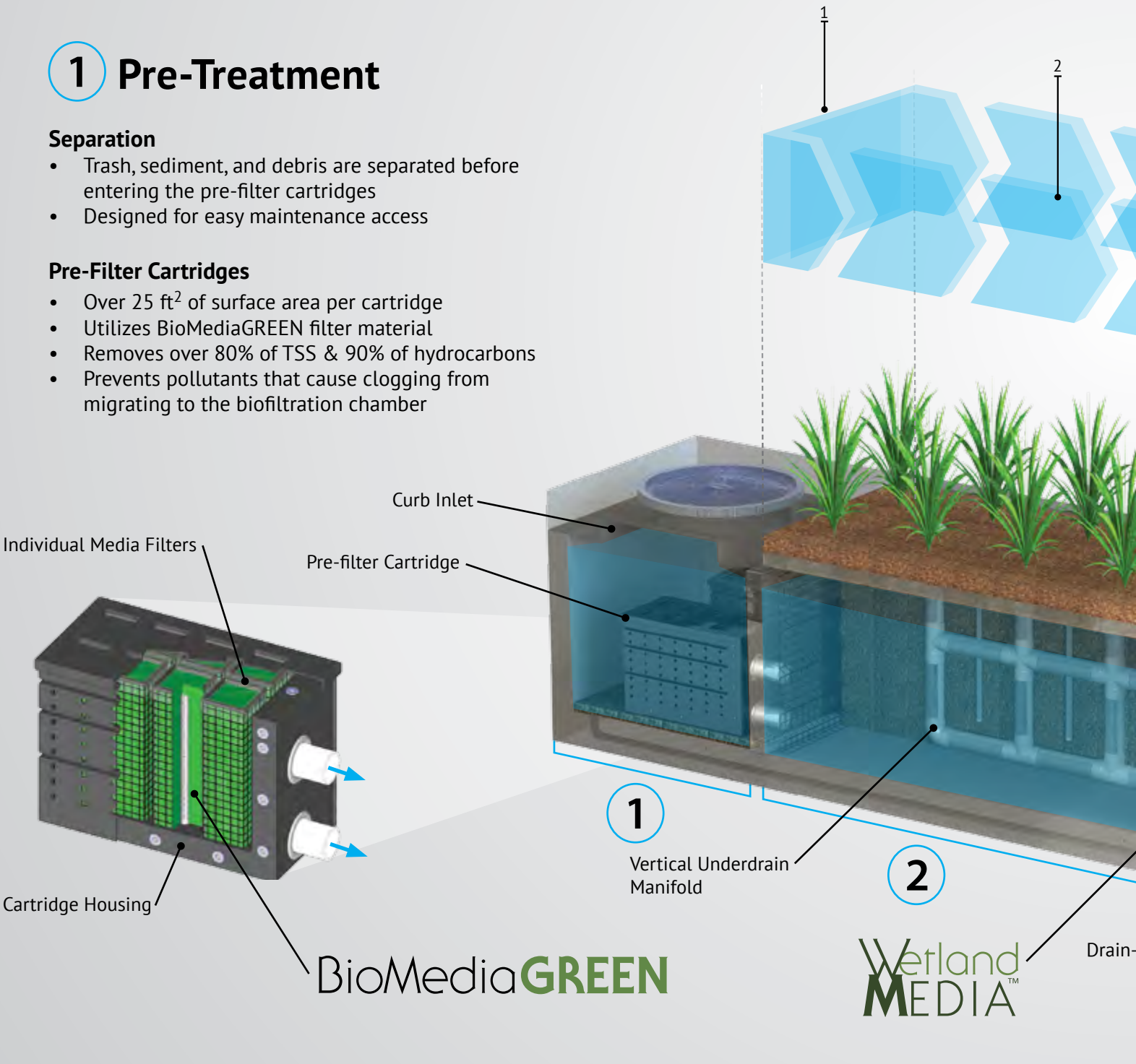
1 Pre-Treatment

Separation

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

Pre-Filter Cartridges

- Over 25 ft^2 of surface area per cartridge
- Utilizes BioMediaGREEN filter material
- Removes over 80% of TSS & 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber



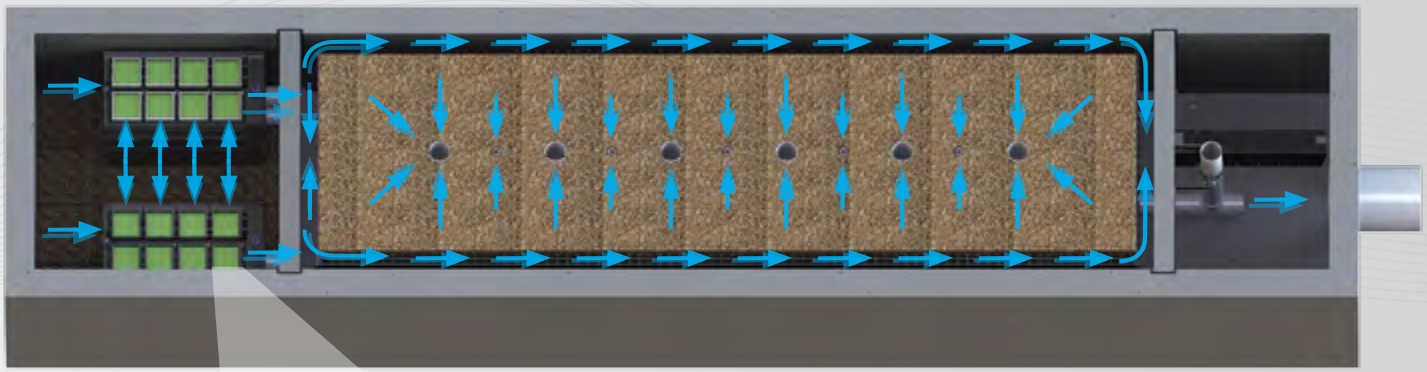


Fig. 2 - Top View

2x to 3x More Surface Area Than Traditional Downward Flow Bioretention Systems.



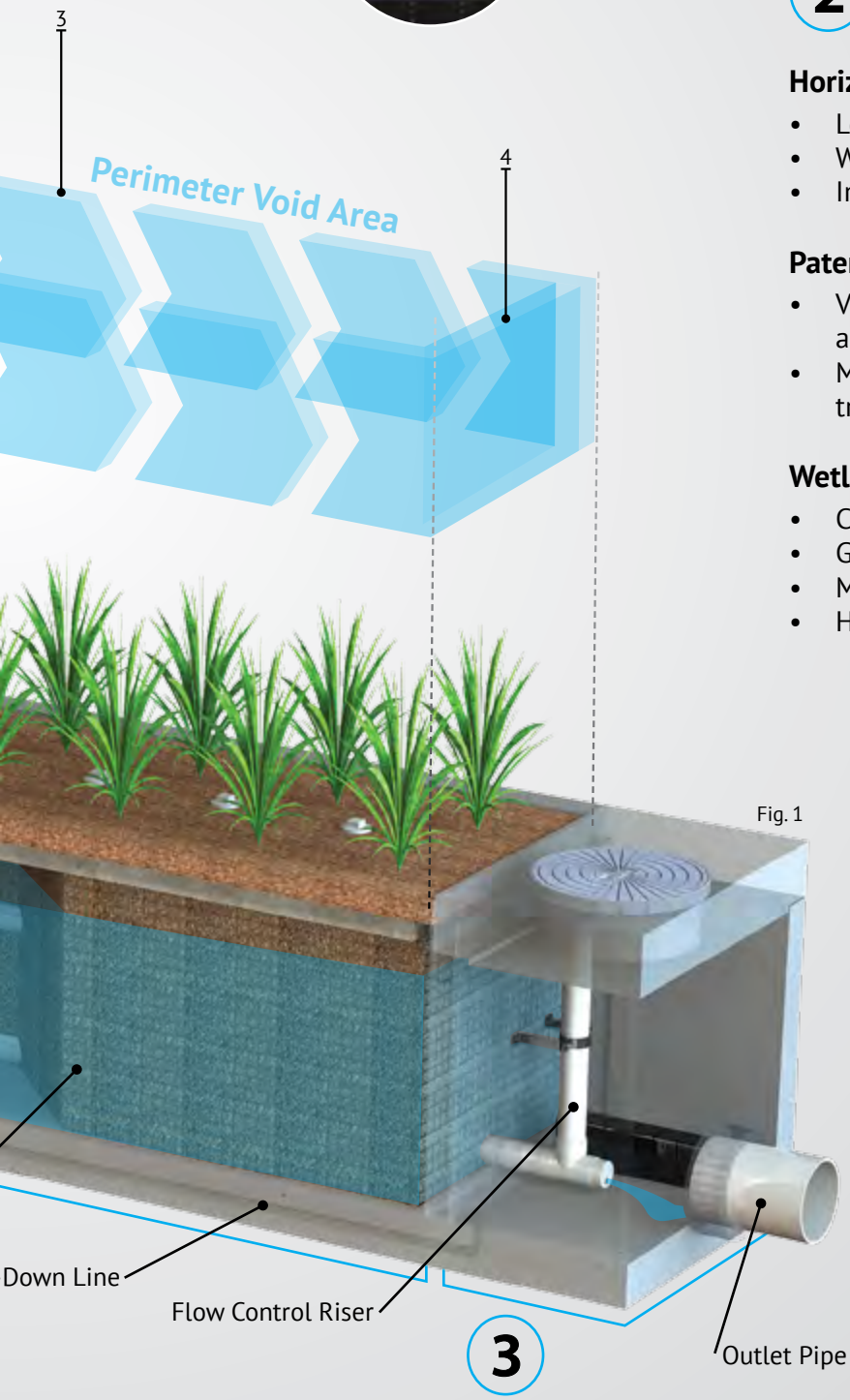


Fig. 1

2 Biofiltration

Horizontal Flow

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

Patented Perimeter Void Area

- Vertically extends void area between the walls and the WetlandMEDIA on all four sides.
- Maximizes surface area of the media for higher treatment capacity

WetlandMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and light weight

3 Discharge

Flow Control

- Orifice plate controls flow of water through WetlandMEDIA to a level lower than the media's capacity.
- Extends the life of the media and improves performance

Drain-Down Filter

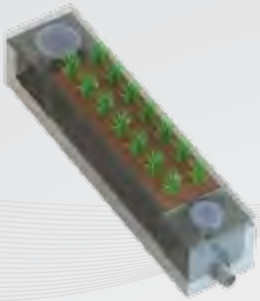
- The Drain-Down is an optional feature that completely drains the pre-treatment chamber
- Water that drains from the pre-treatment chamber between storm events will be treated

Orientations



Side-By-Side

The *Side-By-Side* orientation places the pre-treatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.



End-To-End

The *End-To-End* orientation places the pre-treatment and discharge chambers on opposite ends of the biofiltration chamber therefore minimizing the width of the system to 5 ft (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is bypass must be external.

Bypass

Internal Bypass Weir (Side-by-Side Only)

The *Side-By-Side* orientation places the pre-treatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pre-treatment chamber directly to the discharge chamber.

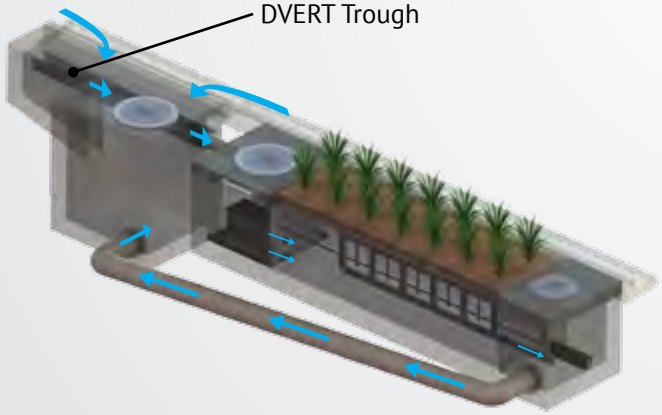
External Diversion Weir Structure

This traditional offline diversion method can be used with the MWS Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

Flow By Design

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT Low Flow Diversion



This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the MWS Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allows the MWS Linear to be installed anywhere space is available.





Performance

The MWS Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country. With it's advanced pre-treatment chamber and innovative horizontal flow biofilter, the system is able to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. With the same biological processes found in natural wetlands, the MWS Linear harnesses natures ability to process, transform, and remove even the most harmful pollutants.

Approvals

The MWS Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation, and perhaps the world.



Washington State DOE Approved

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft^2 loading rate. The highest performing BMP on the market for all main pollutant categories.

TSS	Total Phosphorus	Ortho Phosphorus	Nitrogen	Dissolved Zinc	Dissolved Copper	Total Zinc	Total Copper	Motor Oil
85%	64%	67%	45%	66%	38%	69%	50%	95%



DEQ Assignment

The Virginia Department of Environmental Quality assigned the MWS Linear, the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) Technical Criteria.



MASTEP Evaluation

The University of Massachusetts at Amherst – Water Resources Research Center, issued a technical evaluation report noting removal rates up to 84% TSS, 70% Total Phosphorus, 68.5% Total Zinc, and more.



Rhode Island DEM Approved

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% Pathogens, 30% Total Phosphorus for discharges to freshwater systems, and 30% Total Nitrogen for discharges to saltwater or tidal systems.

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

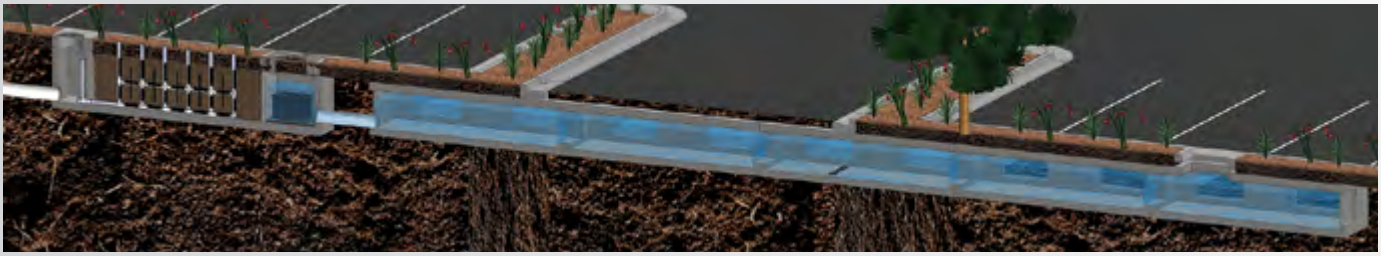


Treatment Flow Sizing Table

Model #	Dimensions	WetlandMedia Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 ft^2	0.052
MWS-L-4-6	4' x 6'	32 ft^2	0.073
MWS-L-4-8	4' x 8'	50 ft^2	0.115
MWS-L-4-13	4' x 13'	63 ft^2	0.144
MWS-L-4-15	4' x 15'	76 ft^2	0.175
MWS-L-4-17	4' x 17'	90 ft^2	0.206
MWS-L-4-19	4' x 19'	103 ft^2	0.237
MWS-L-4-21	4' x 21'	117 ft^2	0.268
MWS-L-8-8	8' x 8'	100 ft^2	0.230
MWS-L-8-12	8' x 12'	151 ft^2	0.346
MWS-L-8-16	8' x 16'	201 ft^2	0.462

Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.



Treatment Volume Sizing Table

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

Installation

The MWS Linear is simple, easy to install, and has a space efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles pre-cast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians are available to supervise installations and provide technical support.



Maintenance

Reduce your maintenance costs, man hours, and materials with the MWS Linear. Unlike other biofiltration systems that provide no pre-treatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pre-treatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pre-treatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pre-treatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long term operation and there is absolutely no need to replace expensive biofiltration media.



Plant Selection

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the MWS Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more "contact time" so that pollutants are more successfully decomposed, volatilized and incorporated into the biomass of The MWS Linear's micro/macro flora and fauna.

A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by selecting the list relative to your project location's hardy zone.

Please visit www.ModularWetlands.com/Plants for more information and various plant lists.



ATTACHMENT F

Education Materials

The Ocean Begins at Your Front Door



Never allow pollutants to enter the

street, gutter or storm drain!

Follow these simple steps to help reduce water pollution:

Household Activities

- Do not rinse spills with water. Use dry cleanup methods such as applying cat litter or another absorbent material, sweep and dispose of in the trash. Take items such as used or excess batteries, oven cleaners, automotive fluids, painting products and cathode ray tubes, like TVs and computer monitors, to a Household Hazardous Waste Collection Center (HHWCC).
- For a HHWCC near you call (714) 834-6752 or visit www.oclandfills.com.
- Do not hose down your driveway, sidewalk or patio to the street, gutter or storm drain. Sweep up debris and dispose of it in the trash.

Automotive

- Take your vehicle to a commercial car wash whenever possible. If you wash your vehicle at home, choose soaps, cleaners, or detergents labeled non-toxic, phosphate- free or biodegradable. Vegetable and citrus-based products are typically safest for the environment.
- Do not allow washwater from vehicle washing to drain into the street, gutter or storm drain. Excess washwater should be disposed of in the sanitary sewer (through a sink or toilet) or onto an absorbent surface like your lawn.
- Monitor your vehicles for leaks and place a pan under leaks. Keep your vehicles well maintained to stop and prevent leaks.
- Never pour oil or antifreeze in the street, gutter or storm drain. Recycle these substances at a service station, a waste oil collection center or used oil recycling center. For the nearest Used Oil Collection Center call 1-800-CLEANUP or visit www.1800cleanup.org.

Pool Maintenance

- Pool and spa water must be dechlorinated and free of excess acid, alkali or color to be allowed in the street, gutter or storm drain.
- When it is not raining, drain dechlorinated pool and spa water directly into the sanitary sewer.
- Some cities may have ordinances that do not allow pool water to be disposed of in the storm drain. Check with your city.

Landscape and Gardening

- Do not over-water. Water your lawn and garden by hand to control the amount of water you use or set irrigation systems to reflect seasonal water needs. If water flows off your yard onto your driveway or sidewalk, your system is over-watering. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of waste by composting, hauling it to a permitted landfill, or as green waste through your city's recycling program.
- Follow directions on pesticides and fertilizer, (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Take unwanted pesticides to a HHWCC to be recycled. For locations and hours of HHWCC, call (714) 834-6752 or visit www.oclandfills.com.

Trash

- Place trash and litter that cannot be recycled in securely covered trash cans.
- Whenever possible, buy recycled products.
- Remember: Reduce, Reuse, Recycle.

Pet Care

- Always pick up after your pet. Flush waste down the toilet or dispose of it in the trash. Pet waste, if left outdoors, can wash into the street, gutter or storm drain.
- If possible, bathe your pets indoors. If you must bathe your pet outside, wash it on your lawn or another absorbent/permeable surface to keep the washwater from entering the street, gutter or storm drain.
- Follow directions for use of pet care products and dispose of any unused products at a HHWCC.

Common Pollutants

Home Maintenance

- Detergents, cleaners and solvents
- Oil and latex paint
- Swimming pool chemicals
- Outdoor trash and litter

Lawn and Garden

- Pet and animal waste
- Pesticides
- Clippings, leaves and soil
- Fertilizer

Automobile

- Oil and grease
- Radiator fluids and antifreeze
- Cleaning chemicals
- Brake pad dust

Even if you live miles from the Pacific Ocean, you may be unknowingly polluting it.

Dumping one quart of motor oil into a storm drain can contaminate 250,000 gallons of water.

Did You Know?

- Most people believe that the largest source of water pollution in urban areas comes from specific sources such as factories and sewage treatment plants. In fact, the largest source of water pollution comes from city streets, neighborhoods, construction sites and parking lots. This type of pollution is sometimes called “non-point source” pollution.
- There are two types of non-point source pollution: stormwater and urban runoff pollution.
- Stormwater runoff results from rainfall. When rainstorms cause large volumes of water to rinse the urban landscape, picking up pollutants along the way.
- Urban runoff can happen any time of the year when excessive water use from irrigation, vehicle washing and other sources carries trash, lawn clippings and other urban pollutants into storm drains.

Where Does It Go?

- Anything we use outside homes, vehicles and businesses – like motor oil, paint, pesticides, fertilizers and cleaners – can be blown or washed into storm drains.
- A little water from a garden hose or rain can also send materials into storm drains.
- Storm drains are separate from our sanitary sewer systems; unlike water in sanitary sewers (from sinks or toilets), water in storm drains is not treated before entering our waterways.

Sources of Non-Point Source Pollution

- Automotive leaks and spills.
- Improper disposal of used oil and other engine fluids.
- Metals found in vehicle exhaust, weathered paint, rust, metal plating and tires.
- Pesticides and fertilizers from lawns, gardens and farms.
- Improper disposal of cleaners, paint and paint removers.
- Soil erosion and dust debris from landscape and construction activities.
- Litter, lawn clippings, animal waste, and other organic matter.
- Oil stains on parking lots and paved surfaces.



The Effect on the Ocean



Non-point source pollution can have a serious impact on water quality in Orange County. Pollutants from the storm drain system can harm marine life as well as coastal and wetland habitats. They can also degrade recreation areas such as beaches, harbors and bays.

Stormwater quality management programs have been developed throughout Orange County to educate and encourage the public to protect water quality, monitor runoff in the storm drain system, investigate illegal dumping and maintain storm drains.

Support from Orange County residents and businesses is needed to improve water quality and reduce urban runoff pollution. Proper use and disposal of materials will help stop pollution before it reaches the storm drain and the ocean.



For More Information

California Environmental Protection Agency
www.calepa.ca.gov

- **Air Resources Board**
  www.arb.ca.gov
- **Department of Pesticide Regulation**
  www.cdpr.ca.gov
- **Department of Toxic Substances Control**
  www.dtsc.ca.gov
- **Integrated Waste Management Board**
  www.ciwmb.ca.gov
- **Office of Environmental Health Hazard Assessment**
  www.oehha.ca.gov
- **State Water Resources Control Board**
  www.waterboards.ca.gov

Earth 911 - Community-Specific Environmental Information 1-800-cleanup or visit www.1800cleanup.org

Health Care Agency's Ocean and Bay Water Closure and Posting Hotline
(714) 433-6400 or visit www.ocbeachinfo.com

Integrated Waste Management Dept. of Orange County (714) 834-6752 or visit www.oclandfills.com for information on household hazardous waste collection centers, recycling centers and solid waste collection

O.C. Agriculture Commissioner
(714) 447-7100 or visit www.ocagcomm.com

Stormwater Best Management Practice Handbook
Visit www.cabmphandbooks.com

UC Master Gardener Hotline
(714) 708-1646 or visit www.uccemg.com

The Orange County Stormwater Program has created and moderates an electronic mailing list to facilitate communications, take questions and exchange ideas among its users about issues and topics related to stormwater and urban runoff and the implementation of program elements. To join the list, please send an email to ocstormwaterinfo-join@list.ocwatersheds.com

Orange County Stormwater Program

Aliso Viejo	(949)	425-2535
Anaheim Public Works Operations	(714)	765-6860
Brea Engineering	(714)	990-7666
Buena Park Public Works	(714)	562-3655
Costa Mesa Public Services	(714)	754-5323
Cypress Public Works	(714)	229-6740
Dana Point Public Works	(949)	248-3584
Fountain Valley Public Works	(714)	593-4441
Fullerton Engineering Dept.	(714)	738-6853
Garden Grove Public Works	(714)	741-5956
Huntington Beach Public Works	(714)	536-5431
Irvine Public Works	(949)	724-6315
La Habra Public Services	(562)	905-9792
La Palma Public Works	(714)	690-3310
Laguna Beach Water Quality	(949)	497-0378
Laguna Hills Public Services	(949)	707-2650
Laguna Niguel Public Works	(949)	362-4337
Laguna Woods Public Works	(949)	639-0500
Lake Forest Public Works	(949)	461-3480
Los Alamitos Community Dev.	(562)	431-3538
Mission Viejo Public Works	(949)	470-3056
Newport Beach, Code & Water Quality Enforcement	(949)	644-3215
Orange Public Works	(714)	532-6480
Placentia Public Works	(714)	993-8245
Rancho Santa Margarita	(949)	635-1800
San Clemente Environmental Programs	(949)	361-6143
San Juan Capistrano Engineering	(949)	234-4413
Santa Ana Public Works	(714)	647-3380
Seal Beach Engineering	(562)	431-2527 x317
Stanton Public Works	(714)	379-9222 x204
Tustin Public Works/Engineering	(714)	573-3150
Villa Park Engineering	(714)	998-1500
Westminster Public Works/Engineering	(714)	898-3311 x446
Yorba Linda Engineering	(714)	961-7138
Orange County Stormwater Program	(877)	897-7455

Orange County 24-Hour
Water Pollution Problem Reporting Hotline
1-877-89-SPILL (1-877-897-7455)

On-line Water Pollution Problem Reporting Form
www.ocwatersheds.com

Printed on Recycled Paper

The Ocean Begins at Your Front Door



The Pollution Solution

Several residential activities can result in water pollution. Among these activities are car washing and hosing off driveways and sidewalks. Both activities can waste water and result in excess runoff. Water conservation methods described in this pamphlet can prevent considerable amounts of runoff and conserve water. By taking your car to a commercial car wash and by sweeping driveways and sidewalks, you can further prevent the transport of pollutants to Orange County waterways. Here are some of the common pollutants for which you can be part of the solution:

1 Pesticides and Fertilizer



- **Pollution:** The same pesticides that are designed to be toxic to pests can have an equally lethal impact on our marine life. The same fertilizer that promotes plant growth in lawns and gardens can also create nuisance algae blooms, which remove oxygen from the water and clog waterways when it decomposes.
- **Solution:** Never use pesticides or fertilizer within 48 hours of an anticipated rainstorm. Use only as much as is directed on the label and keep it off driveways and sidewalks.

2 Dirt and Sediment

- **Pollution:** Dirt or sediment can impede the of the stormwater and negatively impact stream habitat as it travels through waterways and deposits downstream. Pollutants can attach to sediment, which can then be transported through our waterways.
- **Solution:** Protect dirt stockpiles by covering them with tarps or secure plastic sheets to prevent wind or rain from allowing dirt or sediment to enter the storm drain system.

3 Metals

- **Pollution:** Metals and other toxins present in car wash water can harm important plankton, which forms the base of the aquatic food chain.
- **Solution:** Take your car to a commercial car wash where the wash water is captured and treated at a local wastewater treatment plant.

DID YOU KNOW?

Did you know that most of the pollution found in our waterways is not from a single source, but from a "non-point" source meaning the accumulation of pollution from residents and businesses throughout the community

4 Pet Waste

- **Pollution:** Pet waste carries bacteria through our watersheds and eventually will be washed out to the ocean. This can pose a health risk to swimmers and surfers.
- **Solution:** Pick up after your pets!

5 Trash and Debris



- **Pollution:** Trash and debris can enter waterways by wind, littering and careless maintenance of trash receptacles. Street sweeping collects some of this trash; however, much of what isn't captured ends up in our storm drain system where it untreated out to the ocean.
- **Solution:** Don't litter and make sure trash containers are properly covered. It is far more expensive to clean up the litter and trash that ends up in our waterways than it is to prevent it in the place. Come out to one of Orange County's many locations for Coastal and Inner-Coastal Cleanup Day, which is held in September.

6 Motor Oil / Vehicle Fluids

- **Pollution:** Oil and petroleum products from our vehicles are toxic to people, wildlife and plants.
- **Solution:** Fix any leaks from your vehicle and keep the maintenance up on your car. Use absorbent material such as cat litter on oil spills, then sweep it up and dispose of it in the trash. Recycle used motor oil at a local Household Hazardous Waste Collection Center.





A TEAM EFFORT

The Orange County Stormwater Program has teamed with the Municipal Water District of Orange County (MWDOC) and the University of California Cooperative Extension Program (UCCE) to develop this pamphlet.

Low Impact Development (LID) and sustainable water use prevents water pollution and conserves water for drinking and reuse. Reducing your water use and the amount of water flowing from your home protects the environment and saves you money.

Thank you for making water protection a priority!

For more information, please visit
www.ocwatersheds.com/publiced/

www.mwdoc.com

www.uccemg.com



To report a spill, call the Orange County 24-Hour Water Pollution Prevention Reporting Hotline at 1-877-89-SPILL \(1-877-897-7455)

Special Thanks to
The City of Los Angeles Stormwater Program for the use of its artwork

The Metropolitan Water District of Southern California for the use of the California-Friendly Plant and Native Habitat photos







Homeowners Guide for Sustainable Water Use

Low Impact Development, Water Conservation & Pollution Prevention





The Ocean Begins at Your Front Door



RUNOFF, RAINWATER AND REUSE

Where Does Water Runoff Go?

Stormwater, or water from rainfall events, and runoff from outdoor water use such as sprinklers and hoses from homes directly into catch basins and the storm drain system. After entering the storm drain, the water untreated into streams, rivers, bays and ultimately the Ocean. Runoff can come from lawns, gardens, driveways, sidewalks and roofs. As it over hard, impervious surfaces, it picks up pollutants. Some pollutants carried by the water runoff include trash, pet waste, pesticides, fertilizer, motor oil and more.







Water Conservation

Pollution not only impairs the water quality for habitat and recreation, it can also reduce the water available for reuse. Runoff allowed to soak into the ground is cleaned as it percolates through the soil, replenishing depleted groundwater supplies. Groundwater provides approximately 50% of the total water for drinking and other indoor household activities in north and central Orange County. When land is covered with roads, parking lots, homes, etc., there is less land to take in the water and more hard surfaces over which the water can .

In Orange County, 60-70% of water used by residents and businesses goes to irrigation and other outdoor uses. Reusing rainwater to irrigate our lawn not only reduces the impact of water pollution from runoff, but it also is a great way to conserve our precious water resources and replenish our groundwater basin.

What is Low Impact Development (LID)?

Low Impact Development (LID) is a method of development that seeks to maintain the natural hydrologic character of an area. LID provides a more sustainable and pollution-preventative approach to water management.

New water quality regulations require implementation of LID in larger new developments and encourage implementation of LID and other sustainable practices in existing residential areas. Implementing to your lawn or garden can reduce pollution in our environment, conserve water and reduce your water bill.



Permeable pavement allows water runoff to through the soil and prevents most pollutants from reaching the storm drain system.

OPTIONS FOR RAINWATER HARVESTING AND REUSE

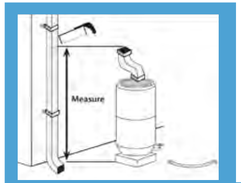
Rainwater harvesting is a great way to save money, prevent pollution and reduce potable water use. To harvest your rainwater, simply redirect the runoff from roofs and downspouts to rain barrels. Rain gardens are another option; these reduce runoff as well as encourage

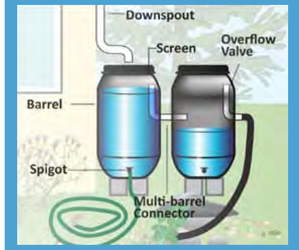
Downspout Disconnection/Redirection

Disconnecting downspouts from pipes running to the gutter prevents runoff from transporting pollutants to the storm drain. Once disconnected, downspouts can be redirected to rain gardens or other vegetated areas, or be connected to a rain barrel.

Rain Barrels

Rain barrels capture rainwater from roofs for reuse in landscape irrigation. Capacity of rain barrels needed for your home will depend on the amount of roof area and rainfall received. When purchasing your rain barrel, make sure it includes a screen, a spigot to siphon water for use, an tube to allow for excess water to run out and a connector if you wish to connect multiple barrels to add capacity of water storage.





Mosquito growth prevention is very important when installing a rain barrel. The best way to prevent mosquito breeding is to eliminate entry points by ensuring all openings are sealed tightly. If these methods are unsuccessful, products are available to kill mosquito larvae, but that are harmless to animals and humans. Regular application of these products is essential. Please visit the Orange County Vector Control website for more information at www.ocvcd.org/mosquitoes3.php.

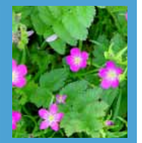
Rain Gardens

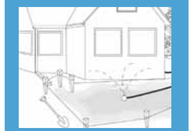
Rain gardens allow runoff to be directed from your roof downspout into a landscaped area. Vegetation and rocks in the garden will slow the of water to allow for into the soil. Plants and soil particles will absorb pollutants from the roof runoff. By utilizing a native plant palate, rain gardens can be maintained all year with minimal additional irrigation. These plants are adapted to the semi-arid climate of Southern California, require less water and can reduce your water bill.

Before modifying your yard to install a rain garden, please consult your local building and/or planning departments to ensure your garden plan follows pertinent building codes and ordinances. Besides codes and ordinances, some home owner associations also have guidelines for yard If your property is in hill areas or includes engineered slopes, please seek professional advice before proceeding with changes.



For information on how to disconnect a downspout or to install and maintain a rain barrel or rain garden at your home, please see the Los Angeles Rainwater Harvesting Program, A Homeowner's "How-To" Guide, November 2009 at www.larainwaterharvesting.org/





OTHER WATER CONSERVATION AND POLLUTION PREVENTION TECHNIQUES

Native Vegetation and Maintenance

"California Friendly" plants or native vegetation can reduce water use. These plants often require far less fertilizers and pesticides, which are two pollutants found in Orange County waterways. Replacing water "thirsty" plants and grass types with water natives is a great way to save water and reduce the need for potentially harmful pesticides and fertilizer.

Please see the California Friendly Garden Guide produced by the Metropolitan Water District of Southern California and associated Southern California Water Agencies for a catalog of California friendly plants and other garden resources at www.bewaterwise.com/Gardensoft.

Weed Free Yards

Weeds are water thieves. They often reproduce quickly and rob your yard of both water and nutrients. Weed your yard by hand if possible. If you use herbicides to control the weeds, use only the amount recommended on the label and never use it if rain is forecast within the next 48 hours.



Soil Amendments

Soil amendments such as green waste (e.g. grass clippings, compost, etc.) can be a source of nutrients and can help keep the soil near the roots of plants moist. However, they can cause algal booms if they get into our waterways, which reduces the amount of oxygen in the water and impacts most aquatic organisms. It is important to apply soil amendments more than 48 hours prior to predicted rainfall.

IRRIGATE EFFICIENTLY

Smart Irrigation Controllers



Water runoff from sprinklers left on too long will carry pollutants into our waterways.

Smart Irrigation Controllers have internal clocks as well as sensors that will turn off the sprinklers in response to environmental changes. If it is raining, too windy or too cold, the smart irrigation control sprinklers will automatically shut off.

Check with your local water agency for available rebates on irrigation controllers and smart timers.

- Aim your sprinklers at your lawn, not the sidewalk – By simply adjusting the direction of your sprinklers you can save water, prevent water pollution from runoff, keep your lawn healthy and save money.
- **Set a timer for your sprinklers** – lawns absorb the water they need to stay healthy within a few minutes of turning on the sprinklers. Time your sprinklers; when water begins running off your lawn, you can turn them off. Your timer can be set to water your lawn for this duration every time.
- **Water at Sunrise** – Watering early in the morning will reduce water loss due to evaporation. Additionally, winds tend to die down in the early morning so the water will get to the lawn as intended.
- **Water by hand** – Instead of using sprinklers, consider watering your yard by hand. Hand-watering ensures that all plants get the proper amount of water and you will prevent any water runoff, which wastes water and carries pollutants into our waterways.
- **Fix leaks** - Nationwide, households waste one trillion gallons of water a year to leaks – that is enough water to serve the entire state of Texas for a year. If your garden hose is leaking, replace the nylon or rubber hose washer and ensure a tight connection. Fix broken sprinklers immediately.



Do your part to prevent water pollution in our creeks, rivers, bays and ocean.

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, not properly disposing of household hazardous waste can lead to water pollution. Batteries, electronics, paint, oil, gardening chemicals, cleaners and other hazardous materials cannot be thrown in the trash. They also must never be poured or thrown into yards, sidewalks, driveways, gutters or streets. Rain or other water could wash the materials into the storm drain and eventually into our waterways and the ocean. In addition, hazardous waste must not be poured in the sanitary sewers (sinks and toilets).

NEVER DISPOSE OF HOUSEHOLD HAZARDOUS WASTE IN THE TRASH, STREET, GUTTER, STORM DRAIN OR SEWER.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To Report Illegal Dumping of Household Hazardous Waste call 1-800-69-TOXIC

To report a spill,
call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline
1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

RECYCLE USED OIL

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Proper Disposal of Household Hazardous Waste



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

ORANGE COUNTY

Pollution Prevention

Leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients are considered to be "household hazardous waste" or "HHW." HHW can be found throughout your home, including the bathroom, kitchen, laundry room and garage.

WHEN POSSIBLE, USE NON-HAZARDOUS OR LESS-HAZARDOUS PRODUCTS.

Disposal of HHW down the drain, on the ground, into storm drains, or in the trash is illegal and unsafe.

Proper disposal of HHW is actually easy. Simply drop them off at a Household Hazardous Waste Collection Center (HHWCC) for free disposal and recycling. Many materials including anti-freeze, latex-based paint, motor oil and batteries can be recycled. Some centers have a "Stop & Swap" program that lets you take partially used home, garden, and automobile products free of charge. There are four HHWCCs in Orange County:

Anaheim:.....1071 N. Blue Gum St
Huntington Beach:.....17121 Nichols St
Irvine:..... 6411 Oak Canyon
San Juan Capistrano:... 32250 La Pata Ave

Centers are open Tuesday-Saturday, 9 a.m.-3 p.m. Centers are closed on rainy days and major holidays. For more information, call **(714) 834-6752** or visit **www.oclandfills.com.**

Common household hazardous wastes

- Batteries
- Paint and paint products
- Adhesives
- Drain openers
- Household cleaning products
- Wood and metal cleaners and polishes
- Pesticides
- Fungicides/wood preservatives
- Automotive products (antifreeze, motor oil, fluids)
- Grease and rust solvents
- Fluorescent lamps
- Mercury (thermometers & thermostats)
- All forms of electronic waste including computers and microwaves
- Pool & spa chemicals
- Cleaners
- Medications
- Propane (camping & BBQ)
- Mercury-containing lamps
- Television & monitors (CRTs, flatscreens)

Tips for household hazardous waste

- Never dispose of HHW in the trash, street, gutter, storm drain or sewer.
- Keep these materials in closed, labeled containers and store materials indoors or under a cover.
- When possible, use non-hazardous products.
- Reuse products whenever possible or share with family and friends.
- Purchase only as much of a product as you'll need. Empty containers may be disposed of in the trash.
- HHW can be harmful to humans, pets and the environment. Report emergencies to 911.



HOMEOWNER TIPS
PROTECTING WATER

Before Buying Pest Control Products

- Identify the pest.
- Decide if pest control products are the best control measure or if there are alternatives available.
- Are integrated pest management guidelines available for this pest?
- Read the product label:
  Is the pest listed on the label?
  Is it the best product for the pest?

Before Mixing Your Sprayer



- Read the label carefully.
- Buy only enough pesticide to treat the area affected by the pest.
- Check the weather and don't apply if it's windy or about to rain
- Measure the area you're treating.
- Calculate how much spray to mix.
- Wear long sleeve shirt, long pants, shoes and any other protective equipment listed on the label and follow all the label precautions.
- Be prepared for spills and know how to clean them up.

When You're Ready To Spray

- Mix and load spray in an area where any spilled pesticide will not be able to drain or be washed away into storm drains, ditches, streams, ponds or other bodies of water.
- Mix sprayer on grass, not the sidewalk or driveway.
- Mix only as much as needed.

When You're Spraying

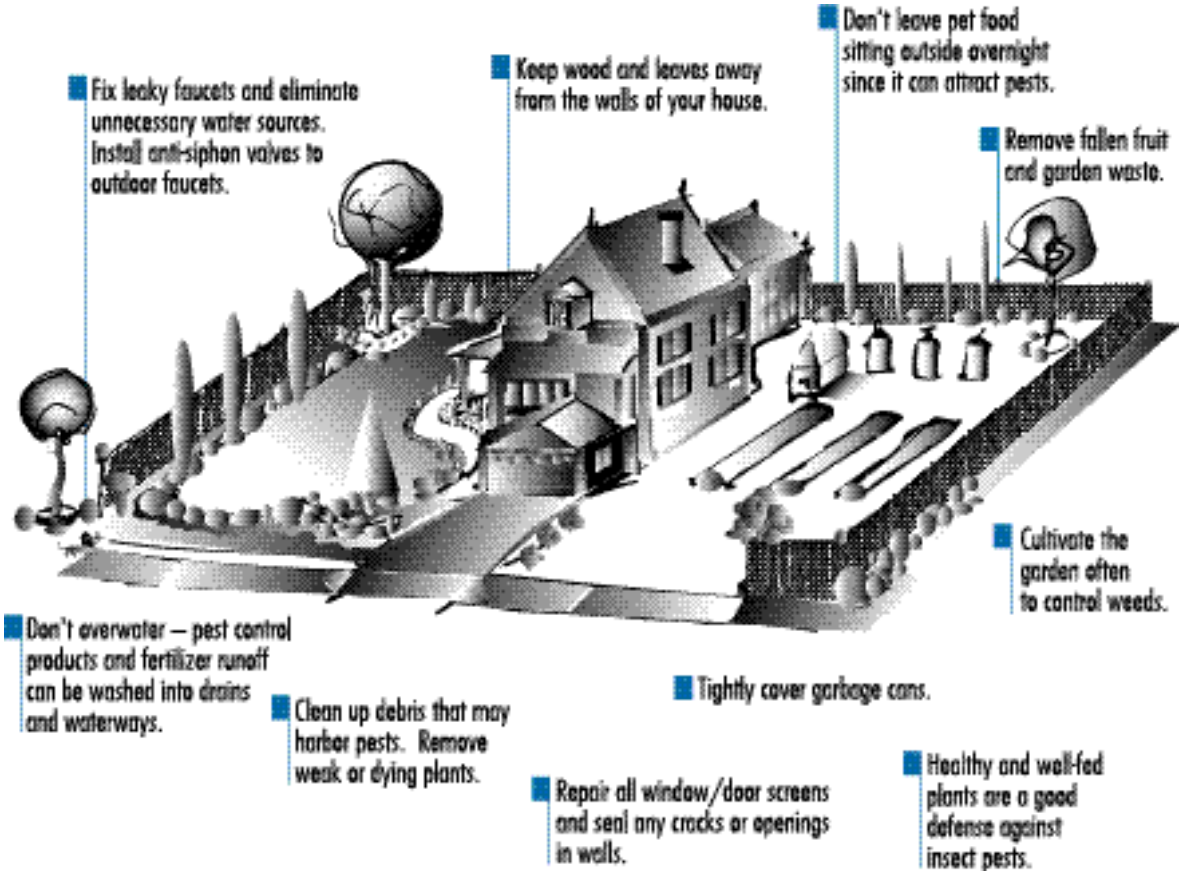
- AVOID spraying in or near storm drains, ditches, streams, and ponds!
- Leave an untreated strip around these areas to protect the water.

When You're done

- Never dump leftovers down any drain; Save for a future application.
- Triple-rinse sprayer and apply rinsewater to treated area.
- Take any old or unwanted pesticides to a Household Hazardous Waste Collection Center (714) 834-6752.

Using Pest Control Products. It's Your Responsibility To Do It Right!





IPM... Outsmarting Pests While Protecting Water

With Integrated Pest Management (IPM), homeowners use common sense and nature to make it difficult for pests to survive. IPM techniques include cultural practices (such as mulching to prevent weeds), encouraging natural enemies (good bugs), and judicious use of pest control products.

- First, identify your pest problem. To find the best solution, you need to pin down the problem. Consult gardening books, your county cooperative extension office or your local nursery.
- Decide how much pest control is necessary. If you can live with some pest damage, you can avoid intensive pest control product treatments.
- Choose an effective option. Try various types of controls first: washing bugs off plants, pruning diseased parts of plants. If you need to use pest control products, choose one that targets the problem and poses the least hazard.
- Finally, it's easier to prevent pests than to control them.

Think ahead.



This brochure is being distributed in order to reduce the impacts of pesticides on water quality. It was produced with support from the Orange County Storm Water Program, the Coalition for Urban/Rural Environmental Stewardship (CURES) and a 319(h) grant from the State Water Resources Control Board.

Orange County Storm Water Program Participants:

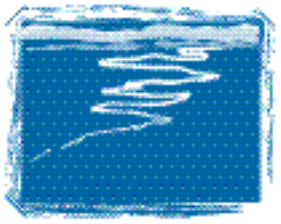
Anaheim Public Works/Engineering	(714) 765-5176
Brea Engineering	(714) 990-7666
Buena Park Public Works	(714) 562-3655
Costa Mesa Public Services	(714) 754-5248
Cypress Engineering	(714) 229-6752
Dana Point Public Works	(949) 248-3562
Fountain Valley Public Works	(714) 593-4400 x347
Fullerton Engineering Dept	(714) 738-6853
Garden Grove Development Services	(714) 741-5554
Huntington Beach Public Works	(714) 536-5432
Irvine Public Works	(949)724-6515
La Habra Public Services	(562) 905-9792
La Palma Public Works	(714) 523-1140 x102
Laguna Beach Municipal Services	(949) 497-0711
Laguna Hills Engineering	(949) 707-2600
Laguna Niguel Public Works	(949) 362-4337
Lake Forest Public Works	(949) 461-3480
Los Alamitos Community Dev	(562) 431-3538 x301
Mission Viejo Public Works	(949) 470-3095
Newport Beach Public works	(949) 644-3311
Orange Public Works	(714) 744-5551
Placentia Engineering	(714) 993-8131
San Clemente Engineering	(949) 361-6100
San Juan Capistrano Engineering	(949) 493-1171
Santa Ana Public Works	(714) 647-3380
Seal Beach Engineering	(562) 431-2527 x318
Stanton Public Works	(714) 379-9222 x204
Tustin Public Works Engineering	(714) 573-3150
Villa Park Engineering	(714) 998-1500
Westminster Public Works Eng.	(714) 898-3311 x215
Yorba Linda Engineering	(714) 961-7170 x174
O.C. Storm Water Program	1-877-89-SPILL (1-877-897-7455)
24 Hour Water Pollution Hotline	(714) 567-6363 or ashbyk@pfrd.co.orange.ca.us
Chemical and Hazardous Material Spill Emergencies	911

Other Important Phone Numbers:

For Additional Brochures	1-877-89-SPILL (1-877-897-7455)
UC Masters & Coop Extension	(714) 708-1646 ucmastergardeners@yahoo.com
O.C. Household Hazardous Waste Information	(714) 834-6752 or www.oc.ca.gov/IWMD
Information on agriculture chemicals, pesticides and possible alternatives, O.C. Agriculture Commissioner	(714) 447-7115

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Coalition For Urban/Rural Environmental Stewardship (CURES)
Western Crop Protection Association (WCPA)
Responsible Industry for a Sound Environment (RISE)

Keeping Pest Control Products Out of Creeks, Rivers and The Ocean



HOMEOWNER TIPS

PROTECTING WATER



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as pest control can lead to water pollution if you're not careful. Pesticide treatments must be planned and applied properly to ensure that pesticides do not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump pesticides into the ocean, so don't let it enter the storm drains. Pesticides can cause significant damage to our environment if used improperly. If you are thinking of using a pesticide to control a pest, there are some important things to consider.

For more information,
please call
University of California Cooperative
Extension Master Gardeners at
(714) 708-1646
or visit these Web sites:
www.uccemg.org
www.ipm.ucdavis.edu

For instructions on collecting a specimen sample visit the Orange County Agriculture Commissioner's website at:
http://www.ocagcomm.com/ser_lab.asp

To report a spill, call the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
at 1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

Information From:
Cheryl Wilen, Area IPM Advisor; Darren Haver, Watershed Management Advisor; Mary Louise Flint, IPM Education and Publication Director; Pamela M. Geisel, Environmental Horticulture Advisor; Carolyn L. Unruh, University of California Cooperative Extension staff writer. Photos courtesy of the UC Statewide IPM Program and Darren Haver.

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Printed on Recycled Paper

Help Prevent Ocean Pollution:

Responsible Pest Control



Tips for Pest Control

Key Steps to Follow:

Step 1: **Correctly identify the pest (insect, weed, rodent, or disease) and verify that it is actually causing the problem.**



Three life stages of the common lady beetle, a beneficial insect.

This is important because beneficial insects are often mistaken for pests and sprayed with pesticides needlessly.

Consult with a Certified Nursery Professional at a local nursery or garden center or send a sample of the pest to the Orange County Agricultural Commissioner's Office.

Determine if the pest is still present – even though you see damage, the pest may have left.

Step 2: **Determine how many pests are present and causing damage.**



Small pest populations may be controlled more safely using non-pesticide techniques. These include removing food sources, washing off leaves with a strong stream of water, blocking entry into the home using caulking and replacing problem plants with ones less susceptible to pests.

Integrated Pest Management (IPM) usually combines several least toxic pest control methods for long-term prevention and management of pest problems without harming you, your family, or the environment.

UC CE University of California Cooperative Extension

Step 3: **If a pesticide must be used, choose the least toxic chemical.**

Obtain information on the least toxic pesticides that are effective at controlling the target pest from the UC Statewide Integrated Pest Management (IPM) Program's Web site at www.ipm.ucdavis.edu.

Seek out the assistance of a Certified Nursery Professional at a local nursery or garden center when selecting a pesticide. Purchase the smallest amount of pesticide available.

Apply the pesticide to the pest during its most vulnerable life stage. This information can be found on the pesticide label.

Step 4: **Wear appropriate protective clothing.**

Follow pesticide labels regarding specific types of protective equipment you should wear. Protective clothing should always be washed separately from other clothing.

Step 5: **Continuously monitor external conditions when applying pesticides such as weather, irrigation, and the presence of children and animals.**

Never apply pesticides when rain is predicted within the next 48 hours. Also, do not water after applying pesticides unless the directions say it is necessary.

Apply pesticides when the air is still; breezy conditions may cause the spray or dust to drift away from your targeted area.

In case of an emergency call 911 and/or the regional poison control number at (714) 634-5988 or (800) 544-4404 (CA only).

For general questions you may also visit www.calpoison.org.

Step 6: **In the event of accidental spills, sweep up or use an absorbent agent to remove any excess pesticides. Avoid the use of water.**

Be prepared. Have a broom, dust pan, or dry absorbent material, such as cat litter, newspapers or paper towels, ready to assist in cleaning up spills.

Contain and clean up the spill right away. Place contaminated materials in a doubled plastic bag. All materials used to clean up the spill should be properly disposed of according to your local Household Hazardous Waste Disposal site.

Step 7: **Properly store and dispose of unused pesticides.**



Purchase Ready-To-Use (RTU) products to avoid storing large concentrated quantities of pesticides.

Store unused chemicals in a locked cabinet.

Unused pesticide chemicals may be disposed of at a Household Hazardous Waste Collection Center.

Empty pesticide containers should be triple rinsed prior to disposing of them in the trash.

Household Hazardous Waste Collection Center
(714) 834-6752
www.oclandfills.com

PROJECT Pollution PREVENTION



Did you know that just one quart of oil can pollute 250,000 gallons of water?

A clean ocean and healthy creeks, rivers, bays and beaches are important to Orange County. However, not properly disposing of used oil can lead to water pollution. If you pour or drain oil onto driveways, sidewalks or streets, it can be washed into the storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering the ocean. Help prevent water pollution by taking your used oil to a used oil collection center.

Included in this brochure is a list of locations that will accept up to five gallons of used motor oil at no cost. Many also accept used oil filters. Please contact the facility before delivering your used oil. This listing of companies is for your reference and does not constitute a recommendation or endorsement of the company.

Please note that used oil filters may not be disposed of with regular household trash. They must be taken to a household hazardous waste collection or recycling center in Anaheim, Huntington Beach, Irvine or San Juan Capistrano. For information about these centers, visit www.oclandfills.com.

Please do not mix your oil with other substances!

For more information, please call the Orange County Stormwater Program at 1-877-89-SPILL (1-877-897-7455) or visit www.watersheds.com.

For information about the proper disposal of household hazardous waste, call the Household Waste Hotline at (714) 834-6752 or visit www.oclandfills.com.

RECYCLE USED OIL

For additional information about the nearest oil recycling center, call the Used Oil Program at 1-800-CLEANUP or visit www.cleanup.org.

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printed on recycled paper

Help Prevent Ocean Pollution:

Recycle at Your Local Used Oil Collection Center



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

NORTH COUNTY

Used Oil Collection Centers

Anaheim

All Seasons Tire and Auto Center, Inc.
817 S Brookhurst St., Anaheim, CA 92804
(714)772-6090( )
CIWMB#: 30-C-03177

AutoZone #3317
423 N Anaheim Blvd., Anaheim, CA 92805
(714)776-0787( )
CIWMB#: 30-C-05263

AutoZone #5226
2145 W Lincoln Ave., Anaheim, CA 92801
(714)533-6599( )
CIWMB#: 30-C-04604

Bedard Automotive
3601 E Miraloma Ave., Anaheim, CA 92806
(714)528-1380( )
CIWMB#: 30-C-02205

Classic Chevrolet
1001 Weir Canyon Rd., Anaheim, CA 92807
(714)283-5400( )
CIWMB#: 30-C-05223

Econo Lube N' Tune #4
3201 W Lincoln Ave., Anaheim, CA 92801
(714)821-0128( )
CIWMB#: 30-C-01485

EZ Lube Inc - Savi Ranch #43
985 N Weir Canyon Rd., Anaheim, CA 92807
(714)556-1312( )
CIWMB#: 30-C-06011

Firestone Store #71C7
1200 S Magnolia Ave., Anaheim, CA 92804
(949)598-5520( )
CIWMB#: 30-C-05743

Great Western Lube Express
125 N Brookhurst St., Anaheim, CA 92801
(714)254-1300( )
CIWMB#: 30-C-05542

HR Pro Auto Service Center
3180 W Lincoln Ave., Anaheim, CA 92801
(714)761-4343( )
CIWMB#: 30-C-05927

Ira Newman Automotive Services
1507 N State College Blvd., Anaheim, CA 92806
(714)635-2392( )
CIWMB#: 30-C-01482

Jiffy Lube #1028
2400 W Ball Rd., Anaheim, CA 92804
(714)761-5211( )
CIWMB#: 30-C-00870

Jiffy Lube #1903
2505 E Lincoln Ave., Anaheim, CA 92806
(714)772-4000( )
CIWMB#: 30-C-05511

Jiffy Lube #2340
2181 W Lincoln Ave., Anaheim, CA 92801
(714)533-1000( )
CIWMB#: 30-C-04647

Kragen Auto Parts #1303
1088 N State College Blvd., Anaheim, CA 92806
(714)956-7351( )
CIWMB#: 30-C-03438

Kragen Auto Parts #1399
2245 W Ball Rd., Anaheim, CA 92804
(714)490-1274( )
CIWMB#: 30-C-04094

Kragen Auto Parts #1565
2072 Lincoln Ave., Anaheim, CA 92806
(714)502-6992( )
CIWMB#: 30-C-04078

Kragen Auto Parts #1582
3420 W Lincoln Ave., Anaheim, CA 92801
(714)828-7977( )
CIWMB#: 30-C-04103

Pep Boys #613
10912 Katella Ave., Anaheim, CA 92804
(714)638-0863( )
CIWMB#: 30-C-01756

Pep Boys #663
3030 W Lincoln Anaheim, CA 92801
(714)826-4810( )
CIWMB#: 30-C-03417

Pep Boys #809
8205 E Santa Ana Cyn Rd., Anaheim, CA 92808
(714)974-0105( )
CIWMB#: 30-C-03443

Pick Your Part
1235 S Beach Blvd., Anaheim, CA 92804
(714)527-1645( )
CIWMB#: 30-C-03744

PK Auto Performance
3106 W. Lincoln Ave., Anaheim, CA 92801
(714)826-2141( )
CIWMB#: 30-C-05628

Quick Change Lube and Oil
2731 W Lincoln Ave., Anaheim, CA 92801
(714)821-4464( )
CIWMB#: 30-C-04363

Saturn of Anaheim
1380 S Auto Center Dr., Anaheim, CA 92806
(714)648-2444( )
CIWMB#: 30-C-06332

Sun Tech Auto Service
105 S State College Blvd., Anaheim, CA 92806
(714)956-1389( )
CIWMB#: 30-C-06455

Vonic Truck Services
515 S Rose St., Anaheim, CA 92805
(714)533-3333( )
CIWMB#: 30-C-01142

Anaheim Hills

Anaheim Hills Car Wash & Lube
5810 E La Palma Ave., Anaheim Hills, CA 92807
(714)777-6605( )
CIWMB#: 30-C-01387

Brea

Firestone Store #27A9
891 E Imperial Hwy., Brea, CA 92821
(714)529-8404( )
CIWMB#: 30-C-01221

Oil Can Henry's
230 N Brea Blvd., Brea, CA 92821
(714)990-1900( )
CIWMB#: 30-C-04273

Buena Park

Firestone Store #71F7
6011 Orangethorpe Buena Park, CA 90620
(714)670-7912( )
CIWMB#: 30-C-01218

Firestone Store #71T8
8600 Beach Blvd., Buena Park, CA 90620
(714)827-5300( )
CIWMB#: 30-C-02121

Kragen Auto Parts #1204
5303 Beach Blvd., Buena Park, CA 90621
(714)994-1320( )
CIWMB#: 30-C-02623

Cypress

AutoZone #5521
5471 Lincoln Ave., Cypress, CA 90630
(714)995-4644( )
CIWMB#: 30-C-00836

Big O Tires
6052 Cerritos Ave., Cypress, CA 90630
(714)826-6334( )
CIWMB#: 30-C-04245

Econo Lube N' Tune #213
5497 Cerritos Ave., Cypress, CA 90630
(714)761-0456( )
CIWMB#: 30-C-06240

Jiffy Lube #851
4942 Lincoln Ave., Cypress, CA 90630
(626)965-9689( )
CIWMB#: 30-C-06182

M & N Coastline Auto & Tire Service
4005 Ball Rd., Cypress, CA 90630
(714)826-1001( )
CIWMB#: 30-C-04387

Masterlube #103
5904 Lincoln Cypress, CA 90630
(714)826-2323( )
CIWMB#: 30-C-01071

Masterlube #104
5971 Ball Rd., Cypress, CA 90630
(714)220-1555( )
CIWMB#: 30-C-04682

Metric Motors of Cypress
6042 Cerritos Ave., Cypress, CA 90630
(714)821-4702( )
CIWMB#: 30-C-05157

Fullerton

AutoZone #2898
146 N. Raymond Ave., Fullerton, CA 92831
(714)870-9772( )
CIWMB#: 30-C-04488

AutoZone #5522
1801 Orangethorpe W. Fullerton, CA 92833
(714)870-8286( )
CIWMB#: 30-C-06062

AutoZone #5523
102 N Euclid Fullerton, CA 92832
(714)870-8286( )
CIWMB#: 30-C-04755

EZ Lube #17
4002 N Harbor Blvd., Fullerton, CA 92835
(714)871-9980( )
CIWMB#: 30-C-03741

Firestone Store #27EH
1933 N Placentia Ave., Fullerton, CA 92831
(714)993-7100( )
CIWMB#: 30-C-02122

Fox Service Center
1018 W Orangethorpe Fullerton, CA 92833
(714)879-1430( )
CIWMB#: 30-C-02318

Fullerton College Automotive Technology
321 E Chapman Ave., Fullerton, CA 92832
(714)992-7275( )
CIWMB#: 30-C-03165

Kragen Auto Parts #0731
2978 Yorba Linda Fullerton, CA 92831
(714)996-4780( )
CIWMB#: 30-C-02628

Kragen Auto Parts #4133
904 W Orangethorpe Ave., Fullerton, CA 92832
(714)526-3570( )
CIWMB#: 30-C-06256

Pep Boys #642
1530 S Harbor Blvd., Fullerton, CA 92832
(714)870-0700( )
CIWMB#: 30-C-01755

Sunnyside 76 Car Care Center
2701 N Brea Blvd., Fullerton, CA 92835
(714)256-0773( )
CIWMB#: 30-C-01381

Garden Grove

76 Pro Lube Plus
9001 Trask Ave., Garden Grove, CA 92844
(714)393-0590( )
CIWMB#: 30-C-05276

AutoZone #5527
13190 Harbor Blvd., Garden Grove, CA 92843
(714)636-5665( )
CIWMB#: 30-C-04760

David Murray Shell
12571 Vly View St., Garden Grove, CA 92845
(714)898-0170( )
CIWMB#: 30-C-00547

Express Lube & Wash
8100 Lampson Ave., Garden Grove, CA 92841
(909)316-8261( )
CIWMB#: 30-C-06544

Firestone Store #7180
10081 Chapman Ave., Garden Grove, CA 92840
(714)530-4630( )
CIWMB#: 30-C-01224

Firestone Store #71W3
13961 Brookhurst St., Garden Grove, CA 92843
(714)590-2741( )
CIWMB#: 30-C-03690

Jiffy Lube #1991
13970 Harbor Blvd., Garden Grove, CA 92843
(714)554-0610( )
CIWMB#: 30-C-05400

Kragen Auto Parts #1251
13933 N Harbor Blvd., Garden Grove, CA 92843
(714)554-3780( )
CIWMB#: 30-C-02663

Kragen Auto Parts #1555
9851 Chapman Ave., Garden Grove, CA 92841
(714)741-8030( )
CIWMB#: 30-C-04079

Nissan of Grarden Grove
9670 Trask Ave., Garden Grove, CA 92884
(714)537-0900( )
CIWMB#: 30-C-06553

Toyota of Garden Grove
9444 Trask Ave., Garden Grove, CA 92844
(714)895-5595( )
CIWMB#: 30-C-06555

La Habra

AutoZone #5532
1200 W Imperial Hwy., La Habra, CA 90631
(562)694-5337( )
CIWMB#: 30-C-04784

Burch Ford
201 N Harbor Blvd., La Habra, CA 90631
(562)691-3225( )
CIWMB#: 30-C-05179

Firestone Store #2736
1071 S Beach Blvd., La Habra, CA 90631
(562)691-1731( )
CIWMB#: 30-C-01169

Kragen Auto Parts #1569
1621 W Whittier Blvd., La Habra, CA 90631
(562)905-2538( )
CIWMB#: 30-C-04076

Pep Boys #997
125 W Imperial Hwy., La Habra, CA 90631
(714)447-0601( )
CIWMB#: 30-C-04026

SpeeDee Oil Change & Tune-Up
1580 W Imperial Hwy., La Habra, CA 90631
(562)697-3513( )

Los Alamitos

Jiffy Lube #1740
3311 Katella Ave., Los Alamitos, CA 90720
(562)596-1827( )
CIWMB#: 30-C-03529

Midway City

Bolsa Transmission
8331 Bolsa Ave., Midway City, CA 92655
(714)799-6158( )
CIWMB#: 30-C-05768

Placentia

Advanced Auto & Diesel
144 S Bradford Placentia, CA 92870
(714)996-8222( )
CIWMB#: 30-C-06242

Castner's Auto Service
214 S. Bradford Ave., Placentia, CA 92870
(714)528-1311( )
CIWMB#: 30-C-06452

Econo Lube N' Tune
100 W Chapman Ave., Placentia, CA 92870
(714)524-0424( )
CIWMB#: 30-C-06454

Fairway Ford
1350 E Yorba Linda Blvd., Placentia, CA 92870
(714)524-1200( )
CIWMB#: 30-C-01863

Seal Beach

M & N Coastline Auto & Tire Service
12239 Seal Beach Blvd., Seal Beach, CA 90740
(714)826-1001( )
CIWMB#: 30-C-04433

Seal Beach Chevron
12541 Seal Beach Blvd., Seal Beach, CA 90740
(949)495-0774(14)
CIWMB#: 30-C-06425

Stanton

AutoZone #2806
11320 Beach Blvd., Stanton, CA 90680
(714)895-7665( )
CIWMB#: 30-C-04563

Joe's Auto Clinic
11763 Beach Blvd., Stanton, CA 90680
(714)891-7715( )
CIWMB#: 30-C-03253

Kragen Auto Parts #1742
11951 Beach Blvd., Stanton, CA 90680
(714)799-7574( )
CIWMB#: 30-C-05231

Scher Tire #20
7000 Katella Ave., Stanton, CA 90680
(714)892-9924( )
CIWMB#: 30-C-05907

USA 10 Minute Oil Change
8100 Lampson Ave., Stanton, CA 92841
(714)373-4432( )
CIWMB#: 30-C-05909

Westminster

AutoZone #5543
6611 Westminster Blvd., Westminster, CA 92683
(714)898-2898( )
CIWMB#: 30-C-04964

AutoZone #5544
8481 Westminster Blvd., Westminster, CA 92683
(714)891-3511( )
CIWMB#: 30-C-04966

City of Westminster Corporate Yard
14381 Olive St., Westminster, CA 92683
(714)895-2876(292)
CIWMB#: 30-C-02008

Honda World
13600 Beach Blvd., Westminster, CA 92683
(714)890-8900( )
CIWMB#: 30-C-03639

Jiffy Lube #1579
6011 Westminster Blvd., Westminster, CA 92683
(714)899-2727( )
CIWMB#: 30-C-02745

John's Brake & Auto Repair
13050 Hoover St., Westminster, CA 92683
(714)379-2088( )
CIWMB#: 30-C-05617

Kragen Auto Parts #0762
6562 Westminster Blvd., Westminster, CA 92683
(714)898-0810( )
CIWMB#: 30-C-02590

Midway City Sanitary District
14451 Cedarwood St., Westminster, CA 92683
(714)893-3553( )
CIWMB#: 30-C-01626

Pep Boys #653
15221 Beach Blvd., Westminster, CA 92683
(714)893-8544( )
CIWMB#: 30-C-03415

Yorba Linda

AutoZone #5545
18528 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)970-8933( )
CIWMB#: 30-C-04971

Econo Lube N' Tune
22270 La Palma Ave., Yorba Linda, CA 92887
(714)692-8394( )
CIWMB#: 30-C-06513

EZ Lube Inc. #41
17511 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)556-1312( )
CIWMB#: 30-C-05739

Firestone Store #27T3
18500 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)779-1966( )
CIWMB#: 30-C-01222

Jiffy Lube #1532
16751 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)528-2800( )
CIWMB#: 30-C-03777

Mike Schultz Import Service
4832 Eureka Ave., Yorba Linda, CA 92886
(714)528-4411( )
CIWMB#: 30-C-04313

This information was provided by the County of Orange Integrated Waste Management Department and the California Integrated Waste Management Board (CIWMB).

Sewage Spill Regulatory Requirements

Allowing sewage to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up efforts.

Here are the pertinent codes, fines, and agency contact information that apply.

Orange County Stormwater Program
24 Hour Water Pollution Reporting Hotline
1-877-89-SPILL (1-877-897-7455)

- County and city water quality ordinances prohibit discharges containing pollutants.

Orange County Health Care Agency Environmental Health
(714) 433-6419

California Health and Safety Code, Sections 5410-5416

- No person shall discharge raw or treated sewage or other waste in a manner that results in contamination, pollution or a nuisance.
- Any person who causes or permits a sewage discharge to any state waters:
  - must immediately notify the local health agency of the discharge.
  - shall reimburse the local health agency for services that protect the public's health and safety (water-contact receiving waters).
  - who fails to provide the required notice to the local health agency is guilty of a misdemeanor and shall be punished by a fine (between $500–$1,000) and/or imprisonment for less than one year.

Regional Water Quality Control Board
Santa Ana Region (951) 782-4130
San Diego Region (858) 467-2952

- Requires the prevention, mitigation, response to and reporting of sewage spills.

California Office of Emergency Services
(800) 852-7550

California Water Code, Article 4, Chapter 4, Sections 13268-13271
California Code of Regulations, Title 23, Division 3, Chapter 9.2, Article 2, Sections 2250-2260

- Any person who causes or permits sewage in excess of 1,000 gallons to be discharged to state waters **shall immediately notify the Office of Emergency Services.**
- Any person who fails to provide the notice required by this section is **guilty of a misdemeanor** and shall be punished by a fine (less than $20,000) and/or imprisonment for not more than one year.

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Sewage Spill
Reference Guide

Your Responsibilities as a Private Property Owner

Residences
Businesses
Homeowner/Condominium Associations
Federal and State Complexes
Military Facilities



Orange County Sanitation District

Health Care Agency
Environmental Health

PROJECT Pollution PREVENTION
www.ocwatersheds.com

This brochure was designed courtesy of the Orange County Sanitation District (OCSD). For additional information, call (714) 962-2411, or visit their website at www.ocsd.com

What is a Sewage Spill?

Sewage spills occur when the wastewater being transported via underground pipes overflows through a manhole, cleanout or broken pipe. Sewage spills can cause health hazards, damage to homes and businesses, and threaten the environment, local waterways and beaches.

Common Causes of Sewage Spills

Grease builds up inside and eventually blocks sewer pipes. Grease gets into the sewer from food establishments, household drains, as well as from poorly maintained commercial grease traps and interceptors.

Structure problems caused by tree roots in the lines, broken/cracked pipes, missing or broken cleanout caps or undersized sewers can cause blockages.

Infiltration and inflow (I/I) impacts pipe capacity and is caused when groundwater or rainwater enters the sewer system through pipe defects and illegal connections.

You Are Responsible for a Sewage Spill Caused by a Blockage or Break in Your Sewer Lines!

Time is of the essence in dealing with sewage spills. You are required to **immediately**:

Control and minimize the spill. Keep spills contained on private property and out of gutters, storm drains and public waterways by shutting off or not using the water.

Use sandbags, dirt and/or plastic sheeting to prevent sewage from entering the storm drain system.

Clear the sewer blockage. Always wear gloves and wash your hands. It is recommended that a plumbing professional be called for clearing blockages and making necessary repairs.

Always notify your city sewer/public works department or public sewer district of sewage spills. If the spill enters the storm drains also notify the Health Care Agency. In addition, if it exceeds 1,000 gallons notify the Office of Emergency Services. Refer to the numbers listed in this brochure.



Overflowing cleanout pipe located on private property

You Could Be Liable

Allowing sewage from your home, business or property to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up and enforcement efforts. See Regulatory Codes & Fines section for pertinent codes and fines that apply.

What to Look For

Sewage spills can be a very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed. Don't dismiss unaccounted-for wet areas.

Look for:

- Drain backups inside the building.
- Wet ground and water leaking around manhole lids onto your street.
- Leaking water from cleanouts or outside drains.
- Unusual odorous wet areas: sidewalks, external walls or ground/landscape around a building.

Caution

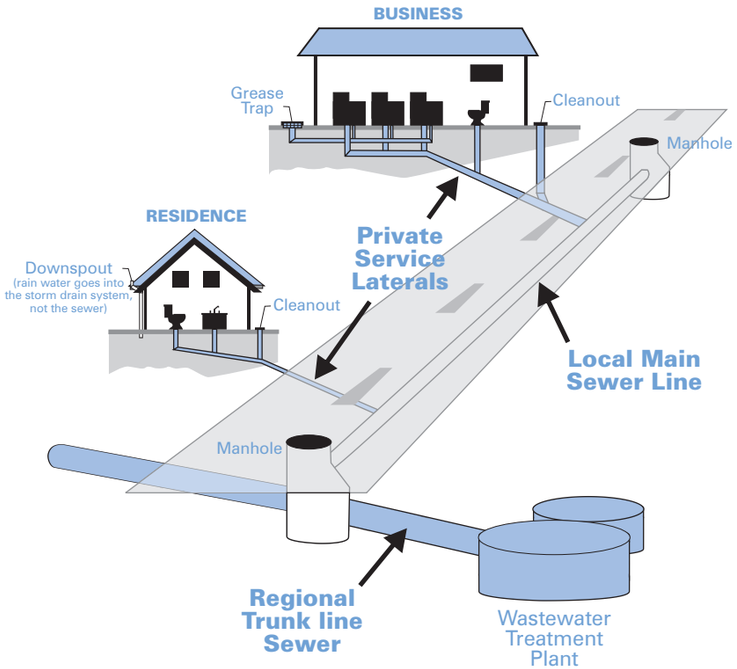
Keep people and pets away from the affected area. Untreated sewage has high levels of disease-causing viruses and bacteria. Call your local health care agency listed on the back for more information.

If You See a Sewage Spill Occurring, Notify Your City Sewer/Public Works Department or Public Sewer District IMMEDIATELY!

How a Sewer System Works

A property owner's sewer pipes are called service laterals and are connected to larger local main and regional trunk lines. Service laterals run from the connection at the home to the connection with the public sewer (including the area under the street). These laterals are the responsibility of the property owner and must be maintained by the property owner. Many city agencies have adopted ordinances requiring maintenance of service laterals. Check with your city sewer/local public works department for more information.

Operation and maintenance of **local and regional sewer lines** are the responsibility of the city sewer/public works departments and public sewer districts.



How You Can Prevent Sewage Spills

1. **Never put grease down garbage disposals, drains or toilets.**
2. **Perform periodic cleaning to eliminate grease, debris and roots in your service laterals.**
3. **Repair any structural problems in your sewer system and eliminate any rainwater infiltration/inflow leaks into your service laterals.**



Preventing Grease Blockages

The drain is not a dump! Recycle or dispose of grease properly and never pour grease down the drain.

Homeowners should mix fats, oils and grease with absorbent waste materials such as paper, coffee grounds, or kitty litter and place it in the trash. Wipe food scraps from plates and pans and dump them in the trash.

Restaurants and commercial food service establishments should always use "Kitchen Best Management Practices." These include:

- Collecting all cooking grease and liquid oil from pots, pans and fryers in covered grease containers for recycling.
- Scraping or dry-wiping excess food and grease from dishes, pots, pans and fryers into the trash.
- Installing drain screens on all kitchen drains.
- Having spill kits readily available for cleaning up spills.
- Properly maintaining grease traps or interceptors by having them serviced regularly. Check your local city codes.

Orange County Agency Responsibilites

- **City Sewer/Public Works Departments—** Responsible for protecting city property and streets, the local storm drain system, sewage collection system and other public areas.
- **Public Sewer/Sanitation District—** Responsible for collecting, treating and disposing of wastewater.
- **County of Orange Health Care Agency—** Responsible for protecting public health by closing ocean/bay waters and may close food-service businesses if a spill poses a threat to public health.
- **Regional Water Quality Control Boards—** Responsible for protecting State waters.
- **Orange County Stormwater Program—** Responsible for preventing harmful pollutants from being discharged or washed by stormwater runoff into the municipal storm drain system, creeks, bays and the ocean.

You Could Be Liable for Not Protecting the Environment

Local and state agencies have legal jurisdiction and enforcement authority to ensure that sewage spills are remedied.

They may respond and assist with containment, relieving pipe blockages, and/or clean-up of the sewage spill, especially if the spill is flowing into storm drains or onto public property.

A property owner may be charged for costs incurred by these agencies responding to spills from private properties.



Report Sewage Spills!

City Sewer/Public Works Departments

Aliso Viejo	(949) 425-2500
Anaheim	(714) 765-6860
Brea	(714) 990-7691
Buena Park	(714) 562-3655
Costa Mesa	(949) 645-8400
Cypress	(714) 229-6760
Dana Point	(949) 248-3562
Fountain Valley	(714) 593-4600
Fullerton	(714) 738-6897
Garden Grove	(714) 741-5375
Huntington Beach	(714) 536-5921
Irvine	(949) 453-5300
Laguna Beach	(949) 497-0765
Laguna Hills	(949) 707-2650
Laguna Niguel	(949) 362-4337
Laguna Woods	(949) 639-0500
La Habra	(562) 905-9792
Lake Forest	(949) 461-3480
La Palma	(714) 690-3310
Los Alamitos	(562) 431-3538
Mission Viejo	(949) 831-2500
Newport Beach	(949) 644-3011
Orange	(714) 532-6480
Orange County	(714) 567-6363
Placentia	(714) 993-8245
Rancho Santa Margarita	(949) 635-1800
San Clemente	(949) 366-1553
San Juan Capistrano	(949) 443-6363
Santa Ana	(714) 647-3380
Seal Beach	(562) 431-2527
Stanton	(714) 379-9222
Tustin	(714) 962-2411
Villa Park	(714) 998-1500
Westminster	(714) 893-3553
Yorba Linda	(714) 961-7170

Public Sewer/Water Districts

Costa Mesa Sanitary District	(714) 393-4433/ (949) 645-8400
El Toro Water District	(949) 837-0660
Emerald Bay Service District	(949) 494-8571
Garden Grove Sanitary District	(714) 741-5375
Irvine Ranch Water District	(949) 453-5300
Los Alamitos/Rossmoor Sewer District	(562) 431-2223
Midway City Sanitary District (Westminster)	(714) 893-3553
Moulton Niguel Water District	(949) 831-2500
Orange County Sanitation District	(714) 962-2411
Santa Margarita Water District	(949) 459-6420
South Coast Water District	(949) 499-4555
South Orange County Wastewater Authority	(949) 234-5400
Sunset Beach Sanitary District	(562) 493-9932
Trabuco Canyon Sanitary District	(949) 858-0277
Yorba Linda Water District	(714) 777-3018

Other Agencies

Orange County Health Care Agency	(714) 433-6419
Office of Emergency Services	(800) 852-7550



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Home improvement projects and work sites must be maintained to ensure that building materials do not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump building materials into the ocean, so don't let them enter the storm drains. Follow these tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while performing home improvement projects. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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Help Prevent Ocean Pollution:

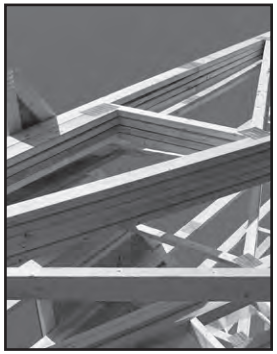
Tips for Home Improvement Projects



Tips for Home Improvement Projects

Home improvement projects can cause significant damage to the environment. Whether you hire a contractor or work on the house yourself, it is important to follow these simple tips while renovating, remodeling or improving your home:

General Construction



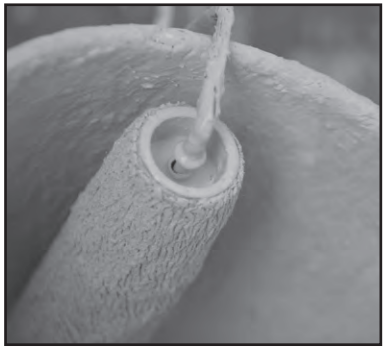
- Schedule projects for dry weather.
- Keep all construction debris away from the street, gutter and storm drain.
- Store materials under cover with temporary roofs or plastic sheets to eliminate or reduce the possibility that rainfall, runoff or wind will carry materials from the project site to the street, storm drain or adjacent properties.

Building Materials

- Never hose materials into a street, gutter or storm drain.
- Exposed piles of construction material should not be stored on the street or sidewalk.
- Minimize waste by ordering only the amount of materials needed to complete the job.
- Do not mix more fresh concrete than is needed for each project.
- Wash concrete mixers and equipment in a designated washout area where the water can flow into a containment area or onto dirt.
- Dispose of small amounts of dry excess materials in the trash. Powdery waste, such as dry concrete, must be properly contained within a box or bag prior to disposal. Call your local trash hauler for weight and size limits.

Paint

- Measure the room or object to be painted, then buy only the amount needed.
- Place the lid on firmly and store the paint can upside-down in a dry location away from the elements.
- Tools such as brushes, buckets and rags should never be washed where excess water can drain into the street, gutter or storm drain. All tools should be rinsed in a sink connected to the sanitary sewer.
- When disposing of paint, never put wet paint in the trash.
- Dispose of water-based paint by removing the lid and letting it dry in the can. Large amounts must be taken to a Household Hazardous Waste Collection Center (HHWCC).



- Oil-based paint is a household hazardous waste. All leftover paint should be taken to a HHWCC.
- For HHWCC locations and hours, call **(714) 834-6752** or visit **www.oclandfills.com**.

Erosion Control

- Schedule grading and excavation projects for dry weather.
- When temporarily removing soil, pile it in a contained, covered area where it cannot spill into the street, or obtain the required temporary encroachment or street closure permit and follow the conditions instructed by the permit.
- When permanently removing large quantities of soil, a disposal location must be found prior to excavation. Numerous businesses are available to handle disposal needs. For disposal options, visit **www.ciwmb.ca.gov/SWIS**.
- Prevent erosion by planting fast-growing annual and perennial grasses. They will shield and bind the soil.

Recycle

- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry (bricks, concrete, etc.), carpet, plastic, pipes (plastic, metal and clay), drywall, rocks, dirt and green waste.



- For a listing of construction and demolition recycling locations in your area, visit **www.ciwmb.ca.gov/recycle.**

Spills

- Clean up spills immediately by using an absorbent material such as cat litter, then sweep it up and dispose of it in the trash.
- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at **(714) 567-6363** or visit **www.ocwatersheds.com** to fill out an incident reporting form.

PROJECT Pollution PREVENTION



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour gardening products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

UCCE Master Gardener Hotline:
(714) 708-1646

To report a spill,
call the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
1-877-89-SPILL (1-877-897-7455)**.**

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while landscaping or gardening. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Tips for Landscape & Gardening



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Tips for Landscape & Gardening

Never allow gardening products or polluted water to enter the street, gutter or storm drain.

General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.
- Plant native vegetation to reduce the amount of water, fertilizers, and pesticide applied to the landscape.



- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.

Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro spray systems. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.



- Use slow-release fertilizers to minimize leaching, and use organic fertilizers.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.



- Rinse empty pesticide containers and re-use rinse water as you would use the product. Do not dump rinse water down storm drains. Dispose of empty containers in the trash.
- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting. For more information, visit **www.ipm.ucdavis.edu**.
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Hazardous Waste Collection Center to be recycled. Locations are provided below.

Household Hazardous Waste Collection Centers

Anaheim:	1071 N. Blue Gum St.
Huntington Beach:	17121 Nichols St.
Irvine:	6411 Oak Canyon
San Juan Capistrano:	32250 La Pata Ave.

For more information, call (714) 834-6752 or visit www.oclandfills.com



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Pet waste and pet care products can be washed into the storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never put pet waste or pet care products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline
1-877-89-SPILL (1-877-897-7455).

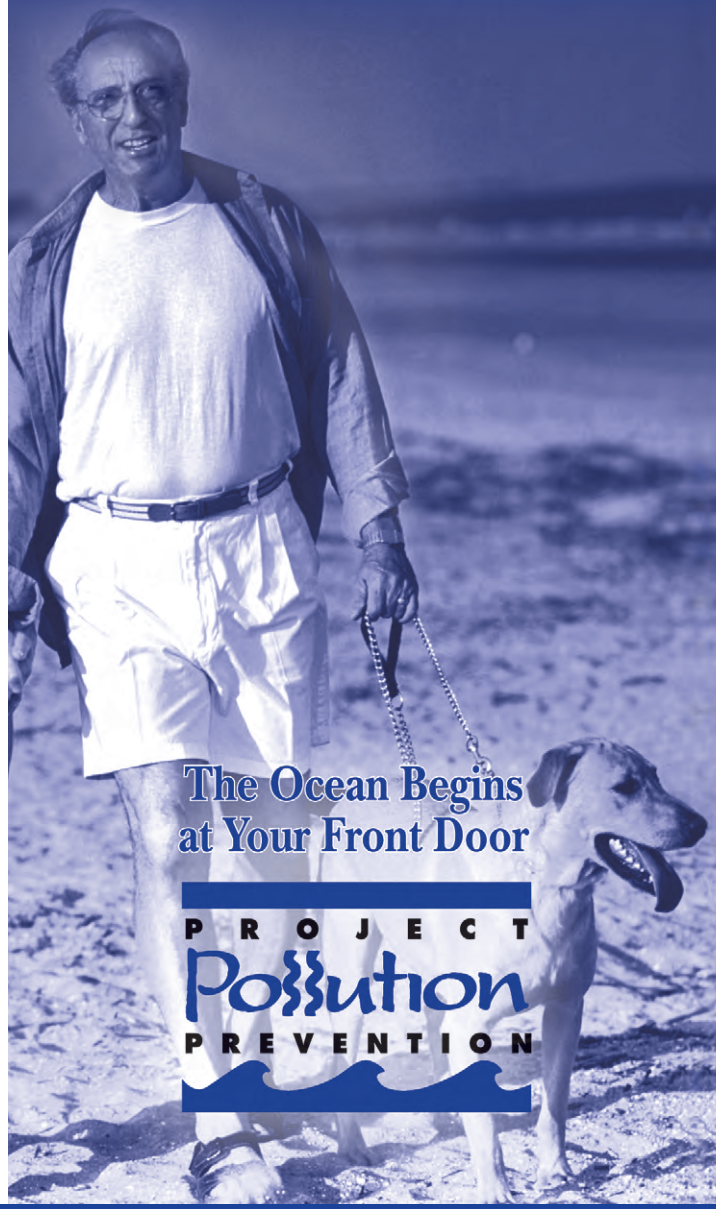
For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while caring for your pet. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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Help Prevent Ocean Pollution:

Tips for Pet Care



Tips for Pet Care

Never let any pet care products or washwater run off your yard and into the street, gutter or storm drain.

Washing Your Pets

Even biodegradable soaps and shampoos can be harmful to marine life and the environment.

- If possible, bathe your pets indoors using less-toxic shampoos or have your pet professionally groomed. Follow instructions on the products and clean up spills.

- If you bathe your pet outside, wash it on your lawn or another absorbent/ permeable surface to keep the washwater from running into the street, gutter or storm drain.



Flea Control

- Consider using oral or topical flea control products.

- If you use flea control products such as shampoos, sprays or collars, make sure to dispose of any unused products at a Household Hazardous Waste Collection Center. For location information, call **(714) 834-6752**.



Why You Should Pick Up After Your Pet

It's the law! Every city has an ordinance requiring you to pick up after your pet. Besides being a nuisance, pet waste can lead to water pollution, even if you live inland. During rainfall, pet waste left outdoors can wash into storm drains. This waste flows directly into our waterways and the ocean where it can harm human health, marine life and the environment.



As it decomposes, pet waste demands a high level of oxygen from water. This decomposition can contribute to killing marine life by reducing the amount of dissolved oxygen available to them.



Have fun with your pets, but please be a responsible pet owner by taking care of them and the environment.

- Take a bag with you on walks to pick up after your pet.

- Dispose of the waste in the trash or in a toilet.

PROJECT Pollution PREVENTION



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as painting can lead to water pollution if you're not careful. Paint must be used, stored and disposed of properly to ensure that it does not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump paint into the ocean, so don't let it enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while using, storing and disposing of paint. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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Help Prevent Ocean Pollution:

Tips for Projects Using Paint



Tips for Projects Using Paint

Paint can cause significant damage to our environment. Whether you hire a contractor or do it yourself, it is important to follow these simple tips when purchasing, using, cleaning, storing and disposing of paint.

Purchasing Paint

- Measure the room or object to be painted, then buy only the amount needed.
- Whenever possible, use water-based paint since it usually does not require hazardous solvents such as paint thinner for cleanup.

Painting

- Use only one brush or roller per color of paint to reduce the amount of water needed for cleaning.
- Place open paint containers or trays on a stable surface and in a position that is unlikely to spill.
- Always use a tarp under the area or object being painted to collect paint drips and contain spills.

Cleaning

- Never clean brushes or rinse paint containers in the street, gutter or storm drain.
- For oil-based products, use as much of the paint on the brushes as possible. Clean brushes with thinner. To reuse thinner, pour it through a fine filter (e.g. nylon, metal gauze or filter paper) to remove solids such as leftover traces of paint.
- For water-based products, use as much of the paint on the brushes as possible, then rinse in the sink.
- Collect all paint chips and dust. Chips and dust from marine paints or paints containing lead, mercury or tributyl tin are hazardous waste. Sweep up and dispose of at a Household Hazardous Waste Collection Center (HHWCC).

Storing Paint

- Store paint in a dry location away from the elements.
- Store leftover water-based paint, oil-based paint and solvents separately in original or clearly marked containers.
- Avoid storing paint cans directly on cement floors. The bottom of the can will rust much faster on cement.
- Place the lid on firmly and store the paint can upside-down to prevent air from entering. This will keep the paint usable longer. Oil-based paint is usable for up to 15 years. Water-based paint remains usable for up to 10 years.

Alternatives to Disposal

- Use excess paint to apply another coat, for touch-ups, or to paint a closet, garage, basement or attic.
- Give extra paint to friends or family. Extra paint can also be donated to a local theatre group, low-income housing program or school.
- Take extra paint to an exchange program such as the **"Stop & Swap"** that allows you to drop off or pick up partially used home care products free of charge. **"Stop & Swap"** programs are available at most HHWCCs.
- For HHWCC locations and hours, call **(714) 834-6752** or visit **www.oclandfills.com**.



Disposing of Paint

- Never put wet paint in the trash.

For water-based paint:

- If possible, brush the leftover paint on cardboard or newspaper. Otherwise, allow the paint to dry in the can with the lid off in a well-ventilated area protected from the elements, children and pets. Stirring the paint every few days will speed up the drying.
- Large quantities of extra paint should be taken to a HHWCC.
- Once dried, paint and painted surfaces may be disposed of in the trash. When setting a dried paint can out for trash collection, leave the lid off so the collector will see that the paint has dried.

For oil-based paint:

- Oil-based paint is a household hazardous waste. All leftover paint should be taken to a HHWCC.

Aerosol paint:

- Dispose of aerosol paint cans at a HHWCC.

Spills

- Never hose down pavement or other impermeable surfaces where paint has spilled.
- Clean up spills immediately by using an absorbent material such as cat litter. Cat litter used to clean water-based paint spills can be disposed of in the trash. When cleaning oil-based paint spills with cat litter, it must be taken to a HHWCC.
- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at **(714) 567-6363** or visit **www.ocwatersheds.com** to fill out an incident reporting form.

PROJECT Pollution PREVENTION

ATTACHMENT G

Maintenance, Inspection & Repair

CATCH BASIN MAINTENANCE RECORD

SITE INFORMATION	
Contact:	Phone: ( )
Project Name:	
Address:	
Filter No. & Model:	

SERVICE INFORMATION		
Date of Service:	By:	
Inspection	Clean Debris	Clean Silt/Sediment
Replace Pouch	Replace Rock	Repair/Replace Parts
Comments:		
Approval Signature:		

SITE INFORMATION	
Contact:	Phone: ( )
Project Name:	
Address:	
Filter No. & Model:	

SERVICE INFORMATION		
Date of Service:	By:	
Inspection	Clean Debris	Clean Silt/Sediment
Replace Pouch	Replace Rock	Repair/Replace Parts
Comments:		
Approval Signature:		

FIGURE 1

Project Vicinity Map



Project Vicinity Map

FIGURE 2

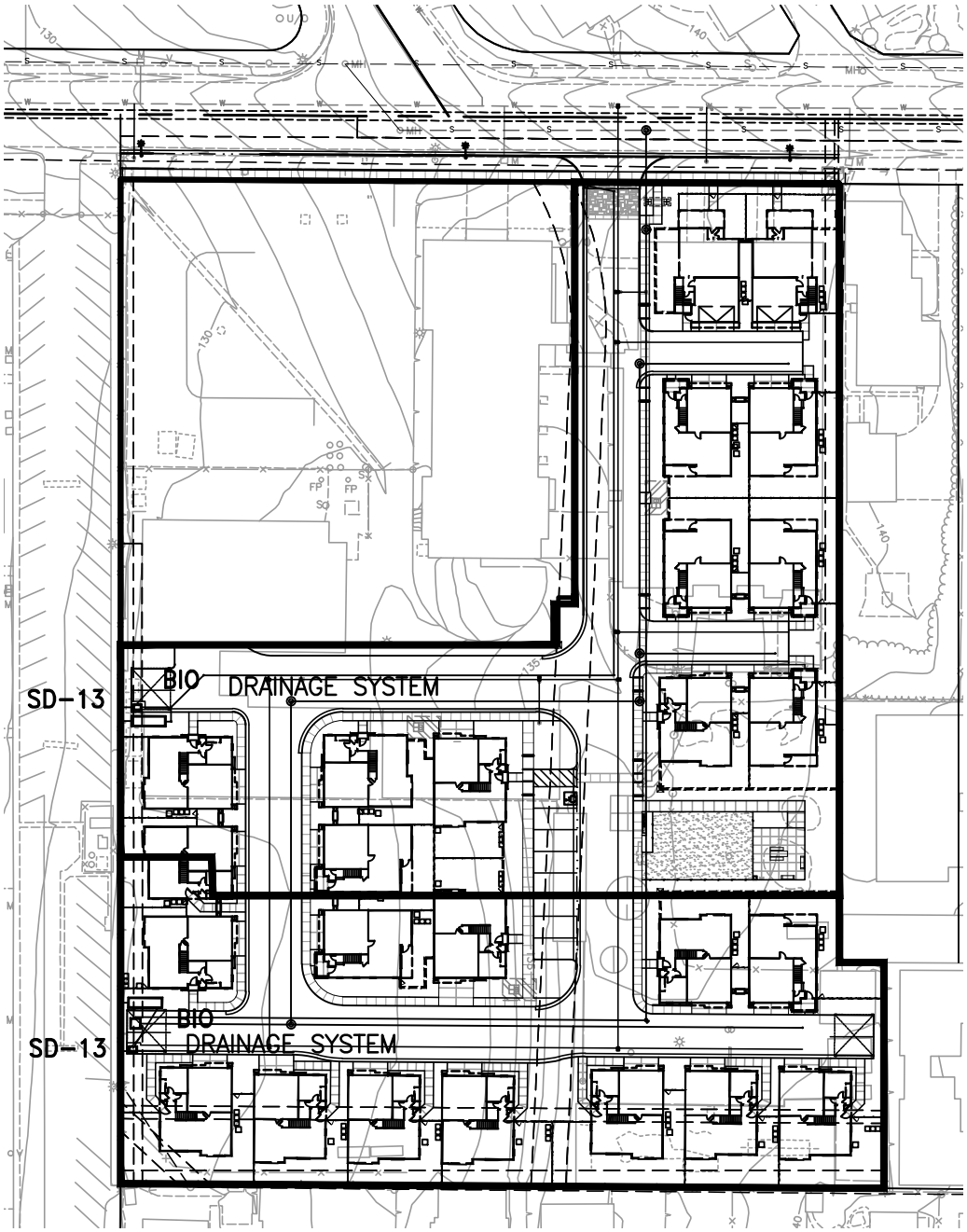
Project Location Map



Project Location Map

FIGURE 3

BMP’s Exhibit



LID SITE NOTES:

DF-1	DRAINAGE SYSTEM
SE-7	STREET SWEEPING AND VACUUMMING (ALL PVMT)
SD-13	STORM DRAIN SIGNAGE
BIO	BIO-FILTRATION MWS FILTER

SHEET 1 OF 1	EXHIBIT	KES TECHNOLOGIES CIVIL ENGINEERING LAND PLANNING AND SURVEYING
JOB NO. 201-002		
BY: DSK	LID EXHIBIT	1 VENTURE STE 130 IRVINE, CALIFORNIA 92618 PHONE (949) 339-5331
DATE: 07/28/2019		
SCALE: 1"=80'		

FIGURE 4

Impaired Water

2.1 LOS ANGELES RIVER WATERSHED

This watershed will be targeted in FY2004/05.

Overview of Watershed



Size of watershed: 824 square miles

Length of river: 55 miles

The Los Angeles (LA) River watershed is one of the largest in the Region. It is also one of the most diverse in terms of land use patterns. Approximately 324 square miles of the watershed are covered by forest or open space land including the area near the headwaters which originate in the Santa Monica, Santa Susana, and San Gabriel Mountains. The rest of the watershed is highly developed. The river flows through the San Fernando Valley past heavily developed residential and commercial areas. From the Arroyo Seco, north of downtown Los Angeles, to the confluence with the Rio Hondo, the river flows through industrial and commercial areas and is bordered by railyards, freeways, and major commercial and government buildings. From the Rio Hondo to the Pacific Ocean, the river flows through industrial, residential, and commercial areas, including major refineries and petroleum products storage facilities, major freeways, rail lines, and rail yards serving the Ports of Los Angeles and Long Beach.

Major tributaries to the river in the San Fernando Valley are the Pacoima Wash, Tujunga Wash (both drain portions of the Angeles National Forest in the San Gabriel Mountains), Burbank Western Channel and Verdugo Wash (both drain the Verdugo Mountains). Due to major flood events at the beginning of the century, by the 1950's most of the river was lined with concrete. In the San Fernando Valley, there is a section of the river with a soft bottom at the Sepulveda Flood Control Basin. The Basin is a 2,150-acre open space upstream of the Sepulveda Dam designed to collect flood waters during major storms. Because the area is periodically inundated, it remains in a semi-natural condition and supports a variety of low-intensity uses as well as supplying habitat. At the eastern end of the San Fernando Valley, the river bends around the Hollywood Hills and flows through Griffith and Elysian Parks, in an area known as the Glendale Narrows. Since the water table was too high to allow laying of concrete, the river in this area has a rocky, unlined bottom with concrete-lined or rip-rap sides. This stretch of the river is fed by natural springs and supports stands of willows, sycamores, and cottonwoods. The many trails and paths along the river in this area are heavily used by the public for hiking, horseback riding, and bird watching.

South of the Glendale Narrows, the river is contained in a concrete-lined channel down to Willow Street in Long Beach. The main tributaries to the river in this stretch are the Arroyo Seco (which drains areas of Pasadena and portions of the Angeles National Forest in the San Gabriel Mountains), the Rio Hondo, and Compton Creek. Compton Creek supports a wetland habitat just before its confluence with the Los Angeles River. The river is hydraulically connected to the San Gabriel River Watershed by the Rio Hondo through the Whittier Narrows Reservoir. Flows from

the San Gabriel River and Rio Hondo merge at this reservoir during larger flood events, thus flows from the San Gabriel River Watershed may
impact the LA River. Most of the water in the Rio Hondo is used for groundwater recharge during dry weather seasons. The San Gabriel River drains approximately 689 square miles, which includes the eastern San Gabriel Mountains and portions of the Chino, San Jose, and Puente Hills.

Beneficial Uses in watershed:

Estuary	*Above estuary*
Industrial service supply	Groundwater recharge
Contact & noncontact water recreation	Contact & noncontact water recreation
Navigation	Warmwater habitat
Commercial & sportfishing	Wetlands Habitat
Protection of rare & endangered species	Protection of rare & endangered species
Wildlife habitat	Wildlife habitat
Marine habitat	
Migration of aquatic organisms	
Spawning	
Estuarine habitat	

The LA River tidal prism/estuary begins in Long Beach at Willow Street and runs approximately three miles before joining with Queensway Bay located between the Port of Long Beach and the city of Long Beach. The channel has a soft bottom in this reach with concrete-lined sides. Queensway Bay is heavily water recreation-oriented; however, major pollutant inputs are likely more related to flows from the LA River which carries the largest storm flow of any river in southern California.

Also part of the watershed are a number of lakes including Peck Road Park, Belvedere Park, Hollenbeck Park, Lincoln Park, and Echo Park Lakes as well as Lake Calabasas. These lakes are heavily used for recreational purposes.

Four basins in the San Fernando Valley area contain substantial deep groundwater reserves and are recharged mainly through runoff and infiltration although the increase in impermeable surfaces has decreased infiltration. Groundwater basins in the San Gabriel Valley are not separated into distinct aquifers other than near the Whittier Narrows. Active recharge occurs in some of these areas through facilities operated by Los Angeles County. Spreading grounds recharge two basins in the coastal plain of Los Angeles west of the downtown area.

Permitted discharges:

- 144 NPDES discharges including: seven major NPDES dischargers (four POTWs); 23 minor individual permits; 114 dischargers covered by general permits
- Minor permits cover miscellaneous wastes such as ground water dewatering, recreational lake overflow, swimming pool wastes, and ground water seepage. Other permits are for discharge of treated contaminated ground water, noncontact cooling water, and storm water
- Two municipal storm water permits
- 1,336 dischargers covered under an industrial storm water permit
- 456 dischargers covered under a construction storm water permit

Water Quality Problems and Issues

Pollutants from dense clusters of residential, industrial, and other urban activities have impaired water quality in the middle and lower watershed. Added to this complex mixture of pollutant sources (in particular, pollutants associated with urban and stormwater runoff), is the high number of point source permits.

Types of permitted wastes discharged into the Los Angeles River Watershed:

Nature of Waste *Prior* to Treatment or Disposal	# of Permits	Types of Permits
Nonhazardous (designated) contaminated groundwater DCNWTRS	2 14	Minor General
Nonhazardous (designated) domestic sewage & industrial waste DDOMIND	4	Major
Nonhazardous (designated) wastes from dewatering, rec. lake overflow, swimming pool wastes, water ride wastewater, or groundwater seepage DMISCEL	1 6 43	Major Minor General
Nonhazardous (designated) noncontact cooling water DNONCON	2 8	Minor General
Nonhazardous (designated) process waste (produced as part of industrial/manufacturing process) DPROCES	3	Minor
Nonhazardous (designated) stormwater runoff DSTORMS	1 6	Major Minor
Hazardous contaminated groundwater HCNWTRS	2 7	Minor General
Nonhazardous (designated) domestic sewage DDOMEST	1 1	Major Minor
Nonhazardous (designated) filter backwash brine waters DFILBRI	1	Minor
Hazardous wastes from dewatering, rec. lake overflow, swimming pool wastes, water ride wastewater, or groundwater seepage HMISCEL	4	General
Nonhazardous drilling muds NDRILLS	1	General
Nonhazardous wastes from dewatering, rec. lake overflow, swimming pool wastes, water ride wastewater, or groundwater seepage NMISCEL	16	General
Nonhazardous contaminated groundwater NCNWTRS	1	General
Inert filter backwash brine waters IFILBRI	1	General
Inert wastes from dewatering, rec. lake overflow, swimming pool wastes, water ride wastewater, or groundwater seepage IMISCEL	12	General

Hazardous wastes are those influent or solid wastes that contain toxic, corrosive, ignitable, or reactive substances (prior to treatment or disposal) managed according to applicable Department of Health Services standards
Designated wastes are those influent or solid wastes that contain **nonhazardous** wastes (prior to treatment or disposal) that pose a significant threat to water quality because of their high concentrations
Nonhazardous wastes are those influent or solid wastes that contain putrescible and nonputrescible solid, semisolid, and liquid wastes (prior to treatment or disposal) and have little adverse impact on water quality
Inert wastes are those influent or solid wastes that do not contain soluble pollutants or organic wastes (prior to treatment or disposal) and have little adverse impact on water quality

Major discharges are POTWs with a yearly average flow of over 0.5 MGD or an industrial source with a yearly average flow of over 0.1 MGD and those with lesser flows but with acute or potential adverse environmental impacts.

Minor discharges are all other discharges that are not categorized as a Major. Minor discharges may be covered by a general permit, which are issued administratively, for those that meet the conditions specified by the particular general permit.

A majority of the 144 NPDES discharges go directly to the Los Angeles River. Burbank Western Channel receives three discharges, Compton Creek receives seven, and Rio Hondo receives sixteen.

Of the 1,336 dischargers enrolled under the general industrial storm water permit in the watershed, the largest numbers occur in the cities of Los Angeles (many within the community of Sun Valley), Vernon, South Gate, Long Beach, Compton, and Commerce. Metal plating, transit, trucking & warehousing, and wholesale trade are a large component of these businesses. This watershed has about twice the number of industrial stormwater dischargers as does the San Gabriel River Watershed and the most in this region.

There are a total of 456 construction sites enrolled under the construction storm water permit. The larger sites are in the upper watershed (which includes the San Fernando Valley) and the construction in this watershed is fairly evenly divided between commercial and residential. About

one-half of them occur on sites that are larger than five acres with the largest sites being up to 700 acres.

IMPAIRMENTS: The majority of the LA River Watershed is considered impaired due to a variety of point and nonpoint sources. The 2002 303(d) list implicates pH, ammonia, a number of metals, coliform, trash, scum, algae, oil, chlorpyrifos as well as other pesticides, and volatile organics for a total of 107 individual impairments (reach/constituent combinations). Some of these constituents are of concern throughout the length of the river while others are of concern only in certain reaches (see chart below). Impairment may be due to water column exceedances, excessive sediment levels of pollutants, or bioaccumulation of pollutants. The beneficial uses threatened or impaired by degraded water quality are aquatic life, recreation, groundwater recharge, and municipal water supply.

The table below gives examples of typical data ranges which led to the listings.

Impairments	Applicable Objective/Criteria	Typical Data Ranges Resulting in Impairment	303(d) Listed Waters/Reaches
ammonia	Basin Plan narrative objective		Tujunga Wash (d/s Hansen Dam to Los Angeles River) Los Angeles River Reach 5 (within Sepulveda Basin)
	Basin Plan numeric objective: varies depending on pH and temperature but the general range is 0.53 - 2.7 mg/l of total ammonia (at average pH and temp.) in waters designated as WARM to protect against chronic toxicity and 2.3 - 28.0 mg/l to protect against acute toxicity	ND - 34.9 mg/l (mean of 10.7 ± 4.8)	Los Angeles River Reach 4 (Sepulveda Dam to Riverside Dr.) Los Angeles River Reach 3 (Riverside Dr. to Figueroa St.) Los Angeles River Reach 2 (Figueroa St. to u/s Carson St.) Los Angeles River Reach 1(u/s Carson St. to estuary) Burbank Western Channel Lincoln Park Lake Echo Park Lake Lake Calabasas
nutrients (algae)	Basin Plan narrative objective		Los Angeles River Reach 5 (within Sepulveda Basin) Los Angeles River Reach 4 (Sepulveda Dam to Riverside Dr.)
	Basin Plan numeric objective: nitrates-N + nitrites-N not greater than 10 mg/l	0.2 - 14.5 mg/l (mean of 2.7 ± 3.2)	Los Angeles River Reach 3 (Riverside Dr. to Figueroa St.) Los Angeles River Reach 2 (Figueroa St. to u/s Carson St.) Los Angeles River Reach 1(u/s Carson St. to estuary) Burbank Western Channel Verdugo Wash (Reaches 1 & 2) Arroyo Seco Rch 1 (d/s Devil's Gate Dam) & Rch 2 (W. Holly Ave. to Devil's Gate) Echo Park Lake
Scum, odors	Basin Plan narrative objective		Tujunga Wash (d/s Hansen Dam to Los Angeles River) Los Angeles River Reach 5 (within Sepulveda Basin) Los Angeles River Reach 4 (Sepulveda Dam to Riverside Dr.) Los Angeles River Reach 3 (Riverside Dr. to Figueroa St.) Los Angeles River Reach 2 (Figueroa St. to u/s Carson St.) Los Angeles River Reach 1(u/s Carson St. to estuary) Burbank Western Channel Peck Rd Lake Lincoln Park Lake Echo Park Lake Lake Calabasas
pH	Basin Plan numeric objective: 6.5 - 8.5 pH units	7.0 - 10.6 pH units (mean of 9.2 ± 0.9)	Los Angeles River Reach 1(u/s Carson St. to estuary) Rio Hondo Reach 1 (Santa Ana Fwy to Los Angeles River) Compton Creek Echo Park Lake Lake Calabasas

Impairments	Applicable Objective/Criteria	Typical Data Ranges Resulting in Impairment	303(d) Listed Waters/Reaches
Low DO/organic Enrichment	Basin Plan narrative objective		Lincoln Park Lake Peck Rd Lake
	Basin Plan numeric objective: annual mean greater than 7.0 mg/l no single sample less than 5.0 mg/l	0.2 - 15.2 mg/l (mean of 6.0 ± 4.0)	Lake Calabasas
Trash	Basin Plan narrative objective		Tujunga Wash (d/s Hansen Dam to Los Angeles River) Burbank Western Channel Verdugo Wash (Reaches 1 & 2) Arroyo Seco Reach 1 (d/s Devil's Gate Dam) & Reach 2 (W. Holly Ave. to Devil's Gate) Rio Hondo Reach 1 (Santa Ana Fwy to Los Angeles River) Peck Rd Lake Echo Park Lake Lincoln Park Lake
Copper	USEPA water quality criteria: varies based on hardness but typically 12 - 47 ug/l	63 ug/l (maximum)	Tujunga Wash (d/s Hansen Dam to Los Angeles River) Compton Creek Rio Hondo Reach 1 (Santa Ana Fwy to Los Angeles River) Echo Park Lake
Lead (sediment and/or water)	USEPA water quality criteria: varies based on hardness but typically 3.2 - 25 ug/l Sediment quality guidelines: 112 – 218 ug/g	140 ug/l (maximum) in water 35 – 213 ug/g (sediment)	Los Angeles River Reach 4 (Sepulveda Dam to Riverside Dr.) Los Angeles River Reach 2 (Figueroa St. to u/s Carson St.) Los Angeles River Reach 1(u/s Carson St. to estuary) Los Angeles River Estuary (Queesway Bay) (sediment) Monrovia Cyn Creek Rio Hondo Reach 1 (Santa Ana Fwy to Los Angeles River) Compton Creek Peck Rd Lake Lincoln Park Lake Echo Park Lake
Cadmium	USEPA water quality criteria: varies based on hardness but typically 1.1 - 4.0 ug/l	3 ug/l (maximum)	Burbank Western Channel Los Angeles River Reach 1(u/s Carson St. to estuary)
Zinc (sediment and/or water)	USEPA water quality criteria: varies based on hardness but typically 106 - 414 ug/l Sediment quality guidelines: 271 - 410 ug/g	1,340 ug/l (maximum) in water 37 – 510 ug/g (sediment)	Los Angeles River Estuary (Queensway Bay) (sediment) Rio Hondo Reach 1 (Santa Ana Fwy to Los Angeles River)
Selenium	USEPA water quality criteria: 5.0 ug/l	9.3 ug/l (maximum)	Aliso Canyon Wash McCoy Canyon Creek Dry Canyon Creek
coliform	Basin Plan numeric objective: Inland: fecal coliform not to exceed log mean of 200 mpn/100ml in 30-day period and not more than 10% of samples exceed 400 MPN/100ml Beaches: total coliform not to exceed 1,000 MPN/100ml in more than 20% of samples in 30 days and not more than 10,000 MPN/100ml at any time	ND - 93,000 MPN/100ml	Tujunga Wash (d/s Hansen Dam to Los Angeles River) Los Angeles River Reach 6 (u/s of Sepulveda Basin) Los Angeles River Reach 4 (Sepulveda Dam to Riverside Dr.) Los Angeles River Reach 2 (Figueroa St. to u/s Carson St.) Los Angeles River Reach 1(u/s Carson St. to estuary) Verdugo Wash (Reaches 1 & 2) Arroyo Seco Rch 1 (d/s Devil's Gate Dam) & Rch 2 (W. Holly Ave. to Devil's Gate) Rio Hondo Reach 1 (Santa Ana Fwy to Los Angeles River) Rio Hondo Reach 2 (Whittier Narrows Flood Control Basin to Spreading Grounds) Compton Creek Dry Canyon Creek McCoy Canyon Creek Bell Creek
PCBs (tissue or sediment)	State Board numeric objective (tissue): Max. Tissue Residue Level 5.3 ng/g	50 – 84 ng/g (tissue)	Echo Park Lake (tissue)
	Sediment quality guidelines: 180 – 188 ng/g	29 – 397 ng/g (sediment)	Los Angeles River Estuary (Queensway Bay) (sediment)
DDT (tissue or sediment)	State Board numeric objective (tissue): Max. Tissue Residue Level 32.0 ng/g	14 – 49 ng/g (tissue)	Los Angeles River Estuary (Queensway Bay) (sediment)
	Sediment quality guidelines: 45 – 52 ng/g	16 – 75 ng/g (sediment)	Lake Calabasas (tissue) Peck Rd Lake (tissue)
Chlordane (tissue or sediment)	State Board numeric objective (tissue): Max. Tissue Residue Level 8.0 ng/g	7 – 42 ng/g (tissue)	Peck Rd Lake (tissue)
	Sediment quality guidelines: 4 – 6 ng/g	12 – 25 ng/g (sediment)	Los Angeles River Estuary (Queensway Bay) (sediment)

Potential sources of pollution:

- POTWs
- Industrial discharges
- septic systems
- landfills
- Nonpoint sources (horse stables, golf courses)
- Illegal trash dumping
- Cross-contamination between surface and groundwater

Ground water resources in the watershed are also impacted. Impacts, both real and threatened, include those from hundreds of cases of known leaking underground storage tanks that have contaminated soil and/or ground water with petroleum hydrocarbons and volatile organic compounds. There are also a number of cases of refineries/tank farms that have contaminated soil and/or ground water. Seawater intrusion (chloride) is of concern in other areas of the watershed which has necessitated wellhead treatment, shutdown, or blending. Finally, a number of wells have been shut down due to nitrate contamination with septic systems as a likely source.

ISSUES: The major issues of concern in the watershed include: 1) protection and enhancement of fish and wildlife habitat, 2) removal of exotic vegetation, 3) enhancement of recreational areas, 4) attaining a balance between water reclamation and minimum flows to support habitat, 5) management of storm water quality, 6) assessment of other nonpoint sources including horse stables, golf courses, and septic systems, 7) pollution from contaminated ground water, 8) groundwater recharge with reclaimed water, 9) contamination of ground water by volatile organic compounds, 10) leakage of MTBE from underground storage tanks, 11) groundwater contamination with heavy metals, particularly hexavalent chromium, and 12) contaminated sediments within the LA River estuary.. Some of these issues are only indirectly related to water quality but are those identified by stakeholder groups.

COMPLETED TMDLS

- Trash (2001)
- Nutrients (2004)

CURRENTLY SCHEDULED TMDLS:

- metals-FY04/05
- historic pesticides-FY07/08
- coliform-FY07/08

Stakeholder Groups

Los Angeles & San Gabriel Rivers Watershed Council The group was formed in 1995 following a large watershed conference held in the area which served as a springboard. The Council has a board of directors and became incorporated as a nonprofit organization in 1996. The group is tracking watershed activities, but has primarily focused on flood control issues in the Los Angeles River as well as opportunities to create greenbelts and restore habitat. The Council's goal is to help facilitate a process to preserve, restore, and enhance all aspects of the two watersheds. The Council recently published a document entitled "Beneficial Uses of the Los Angeles and San Gabriel Rivers" which summarizes a great deal of information about the joint watershed. Generally one staff person attends these monthly council as well as monthly board of directors meetings. More information about this group may be found at their website http://www.lasgrwc.org/.

Friends of the Los Angeles River The Friends of the LA River is a nonprofit organization formed in 1986 in support of Los Angeles River restoration activities. More information about the organization may be found at http://www.folar.org/.

Past Significant Activities

WATERSHED MANAGEMENT

Key regulatory staff were part of a LA River Watershed "team" for purposes of preparing a State of the Watershed Report/Water Quality Characterization Report (a draft of which was released April 18, 1998) and for coordinating permit renewals and regional monitoring program development.

NONPOINT SOURCE PROGRAM

A 319(h) project by the Friends of the Los Angeles River terminated in 2002. The project involved volunteer monitoring of the river for physical and chemical parameters and surveys of the natural bottom portions of the river.

The City of Los Angeles Department of Public Works and Stormwater Management Division received a Proposition 13 grant (Nonpoint Source Subaccount) in 2001 to install a low-flow diversion and treatment system for the 8th Street drainage area leading into the river. The most severe bacterial pollution along the entire river has been found at this storm drain. All dry weather flow will be diverted to the sewer system. Trash and other solid pollutants will be captured both during diversion and non-diversion periods.

Current Activities

The following is a summary of current Regional Board activities in the Los Angeles River Watershed which are expected to continue as part of the Watershed Management Initiative on a watershed basis. Activities which address the aforementioned pollutants or issues of concern are highlighted.

CORE REGULATORY

Continuing core regulatory activities that have been integrated into the watershed management approach include (but are not limited to) renewal/revision of NPDES permits including those covered under Regional Board general permits. Compliance inspections, review of monitoring reports, response to complaints, and enforcement actions relative to the watershed's NPDES permits will continue. Because of the large number of permits, renewal of permits in this watershed during its first cycle was spread over two years. Due to limited resources, only the basic regulatory activities are performed: review of dischargers' monitoring reports, minimum necessary inspections and sampling, issuance/renewal of permits, levels 1 and 2 enforcement actions (noncompliance and violation notification), case handling, and answering inquiries from the public.

The Los Angeles River Watershed falls within Los Angeles County which has been covered by a municipal storm water permit since 1990. The third five-year permit was and adopted on December 13, 2001. This permit covers Los Angeles County and all the incorporated cities, except the City of Long Beach, which was issued a separate municipal storm water permit in

1999. The Los Angeles County Flood Control District is the Principal Permittee. Under the requirements of the permit, the Permittees will implement the Storm Water Quality Management Plan which includes the following components: (a) Program Management; (b) Public Information and Participation Program; (c) Industrial/Commercial Facilities Program; (d) Development Planning Program; (e) Programs for Construction Sites; (f) Public Agency Activities; and (e) Illicit Connection/Illicit Discharge Elimination Program. These programs collectively are expected to reduce pollutants in storm water discharges to the maximum extent practicable. In addition, the County will conduct a storm water monitoring program to estimate mass emissions and toxicity of pollutants in its waters, evaluate causes of toxicity, and several other components to characterize storm water discharges and measure the effectiveness of the Storm Water Quality Management Program. The permit can be downloaded from the Regional Board Storm Water website at
http://www.waterboards.ca.gov/losangeles/html/programs/Stormwater/stormwater.html.

An important requirement of both the Los Angeles County and the City of Long Beach municipal storm water permits is implementation of the Standard Urban Storm Water Mitigation Plans (SUSMPs) and numerical design standards for Best Management Practices (BMPs), which municipalities began implementing in February 2001. The final SUSMP was issued on March 8, 2000, and amended in the permit, adopted on December 13, 2001. The SUSMP is designed to ensure that storm water pollution is addressed in one of the most effective ways possible, i.e., by incorporating BMPs in the design phase of
new development and redevelopment. It provides for numerical design standards to ensure that storm water runoff is managed for water quality and quantity concerns. The purpose of the SUSMP requirements is to minimize, to the maximum extent practicable, the discharge of pollutants of concern from new and redevelopment. The requirements are very similar to the Ventura County SQUIMP.
The numerical design standard is that post-construction treatment BMPs be designed to mitigate (infiltrate or treat) storm water runoff from the first ¾ inch of rainfall, prior to its discharge to a storm water conveyance system. Other standards also apply; additional information on the SUSMP may be found on the Regional Board Storm Water website at
http://www.waterboards.ca.gov/losangeles/html/programs/stormwater/susmp/susmp_details.html.

Regulation of groundwater protection activities is intended to eventually become integrated into the watershed management approach while land disposal activities will likely remain separate. Accomplishment of core regulatory activities are a high priority that is currently funded; however, funds do not tend to go far enough to encompass extensive enforcement and response to complaints; however, enforcement is a high priority.

MONITORING AND ASSESSMENT

Work on a TMDL for nitrogen in the watershed is currently underway. Intensive monitoring has been conducted and a watershed model has been developed by SCCWRP.

This watershed was one of those focused on for SWAMP monitoring in FY03/04.

As part of a long-term integrated resource planning process, the City of Los Angeles has been conducting enhanced monitoring with the river. Additional information on flow requirements for sensitive habitats, including the area in the concreted lower river utilized by shorebirds, was collected in collaboration with the US Bureau of Reclamation and the City's Department of Water and Power.

NONPOINT SOURCE PROGRAM

The major nonpoint source-generated pollutants found throughout the watershed that have contributed to its impairments are lead, coliform, and oil, while chlorpyrifos is implicated in the upper watershed. These pollutants are common components of dry weather urban runoff and wet weather storm runoff. In many ways, the "point source" municipal stormwater permit for LA County will be a major tool in nonpoint source pollution elimination. Permitees are responsible for development and implementation of storm water management plans, for plans to eliminate non-storm water discharges (dry weather urban runoff), and must apply best management practices to prevent storm water pollution.

Proposition 13 funds (Watershed Protection Subaccount) were awarded to the nonprofit organization the Los Angeles and San Gabriel Rivers Watershed Council to evaluate the effectiveness of infiltration BMPs on water quality at various depths as urban runoff infiltrates into the groundwater supply. Sampling under this contract is ongoing.

Staff will also be involved in stakeholder meetings and will assist in the development of watershed management plans which will be expected to address strategies to reduce point and nonpoint source pollutants as well as other issues other than strictly water quality concerns.

BASIN PLANNING

The 2001 Triennial Review identified adoption of TMDLs as Basin Plan amendments the highest priority issue that can be accomplished given existing resource levels. Approximately 0.5 PYs/TMDL is utilized for this task. Determination of appropriate nutrient (nitrate and phosphate) objectives for protection of aquatic life is also a high priority that is currently unfunded. 2 PYs are needed for this task.

Basin Planning activities will include continued participation in both internal and external watershed planning efforts and further incorporation of watershed management and principles and watershed-specific priorities into future updates of the Basin Plan, where appropriate.

Review and comment on EIRs for the highest priority projects within the watershed will continue; however, there is currently no funding for this program.

WETLANDS PROTECTION AND MANAGEMENT

The Southern California Wetlands Recovery Project considers of various parcels along the lower Los Angeles River in the city of Long Beach a high priority in the current year's workplan. A combined Lower Los Angeles and San Gabriel Rivers Habitat Needs Assessment is another high priority project.
Big Tujunga Wash Revegetation and Restoration is also in the current year's workplan. Funds have also bee allocated toward wetlands restoration feasibility work in the Dominguez Gap area and at two other sites adjacent to the lower river. More information on Wetland Recovery Project's workplan may be found at http://www.coastalconservancy.ca.gov/scwrp/index.html.

The San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC) is an independent State agency within the Resources Agency. State law established the Conservancy in 1999. Its jurisdiction includes the San Gabriel River and its tributaries, the Lower Los Angeles River and its tributaries, and the San Gabriel Mountains. Puente Hills, and San Jose Hills. It was established to preserve open space and habitats in order to provide for low-impact recreation and

educational uses, wildlife and habitat restoration and protection, and watershed improvements within its jurisdiction. It is currently involved with beginning work on an open space plan for the area. Propositions 12 and 40 have directed funds to the Conservancy. More information about the RMC's workplan may be found at http://www.rmc.ca.gov/.

The Santa Monica Mountains Conservancy (SMMC) is a state agency created by the Legislature in 1979 charged with primary responsibility for acquiring property with statewide and regional significance, and making those properties accessible to the general public. The Conservancy manages parkland in the Santa Monica Mountains, Santa Susana Mountains, the Simi Hills, the Santa Clarita Woodlands, the Whittier-Puente Hills, the Sierra Pelona, the Los Angeles River Greenway, the Rio Hondo, the Verdugo Mountains, the San Gabriel Mountains, and the San Rafael Hills. The agency's goals are to: 1) implement the Santa Monica Mountains Comprehensive Plan, 2) implement the Rim of the Valley Trails Corridor Master Plan, 3) implement the Los Angeles County River Master Plan, 4) further cooperation with local governments in the region to secure open space and parkland, and 5) expand education, public access, and resource stewardship components in a manner that best serves the public, protects habitat, and provides recreational opportunities. More information about SMMC activities may be found at http://smmc.ca.gov/.

WATERSHED MANAGEMENT

The Watershed Council was awarded Proposition 13 grant funds from the State Water Resources Control Board to prepare a **Compton Creek Watershed Management Plan**. Compton Creek is a tributary to the lower Los Angeles River. A steering committee has been meeting in 2004 to develop the Plan with input from the community.

The San Gabriel Valley Council of Governments (SGVCOG), in partnership with the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC), was awarded Proposition 13 grant funds from the State Water Resources Control Board to prepare a **Rio Hondo Watershed Management Plan**. The Rio Hondo is a major subwatershed draining to the Los Angeles River. Once the Plan is completed in late 2004, it is anticipated that the RMC will adopt it as part of their Rivers and Tributaries Greenway Plan. A webpage for the watershed management planning process is at http://www.rmc.ca.gov/rio_hondo/rh_index.html. The public review draft of the Watershed Plan can also be obtained at the website.

Information about the Arroyo Seco, a major tributary to the Los Angeles River, may be found at the Arroyo Seco Foundation's website http://www.arroyoseco.org/. The nonprofit group Northeast Trees has been directing development of a Proposition 13-funded watershed plan for the Arroyo Seco Subwatershed.

Near-term Activities

Specific resource needs are described in the Region-wide Section of this document.

Following renewal of the watershed's permits, core regulatory activities will focus on permit compliance, monitoring report review, and enforcement as needed. Members of the watershed team will be involved with periodic updates of the State of the Watershed Report. Additionally, there will be on-going interaction with stakeholders and followup on goals established during the permit renewal phase. Pending completion of a final TMDL we will pursue agreement on pollutant loadings that can be implemented through future NPDES permits, the municipal stormwater permit, and through other nonpoint source control measures.

A preliminary review of resources for core regulatory activities against cost factors has determined that our region is seriously underfunded for our baseline program. We will be seeking more funding for our core program activities.

Our efforts to involve stakeholders also shall include exploration of funding options (especially for implementation of nonpoint source measures) and continuation of other outreach activities, such as presentations, meetings, and participation in environmental events.

Also, efforts are underway to address problems with urban runoff (through the storm water municipal and industrial NPDES permits) and septic systems. Future activities should focus on horse corrals and golf courses, parks or other green areas. Activities proposed include outreach to implement BMPs. Tier I activities also should include monitoring and assessment to determine if Tier 2 or Tier 3 activities are needed to ensure successful implementation of BMPs and reduction of nitrogen and coliform loadings.

We will maintain involvement with stakeholder activities and pursue funding options, especially those involving implementation of nonpoint source measures (coordinate 205(j) and 319(h) activities) as well as other outreach activities such as speeches, meetings, and participation in environmental events. As resources permit, we will also work with stakeholders to implement provisions of the Coastal Zone Act Reauthorization Amendments.

Potential Long-term Activities

In the long-term, Basin Planning activities will include continued participation in both internal and external watershed planning efforts and further incorporation of watershed management and principles and watershed-specific priorities (such as more refined regional procedures for conducting use attainability analyses and site-specific objective development) into the next update of the Basin Plan. More detailed analysis regarding certain beneficial uses needs to be done (species inhabiting/using the river, potential for aquatic life in the river, future water supply needs/diversions, ground water recharge areas). We will continue to pursue funding for Basin Planning programs. Comments on watershed issues in CEQA documents (for the highest priority projects) will continue to be prepared; however, there is currently no funding for this program.

Other issues include:

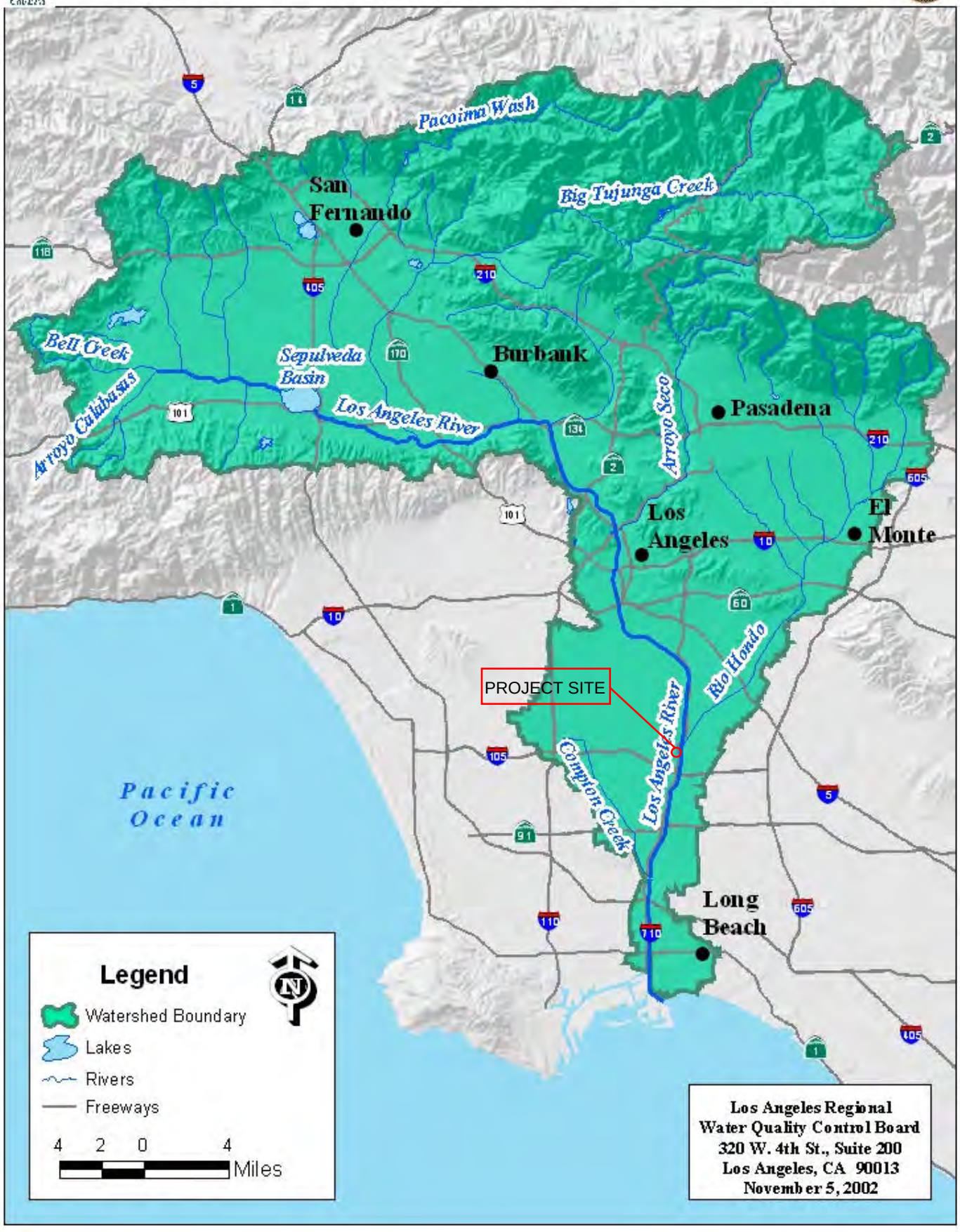
- Balancing maintenance of habitat in the river with flood control needs
- Evaluation of areas in the river for restoration purposes
- Evaluating critical habitat areas
- Evaluating the most protective (while providing flood control) long-term plans for vegetation/sediment removal under the 401certification program
- Evaluate and implement low flow diversions where appropriate
- Assist in greenway developments along the river
- Evaluate estuarine habitats and water quality
- Implementing biological monitoring

Los Angeles River Watershed 303(d)-listed Waters

303(d) Listed Waters/Reaches	Impairments
Aliso Canyon Wash	Selenium
Arroyo Seco Rch 1 (d/s Devil's Gate Dam)	coliform nutrients (algae) trash
Arroyo Seco Rch 2 (W. Holly Ave. to Devil's Gate)	coliform nutrients (algae) trash
Bell Creek	coliform
Burbank Western Channel	algae ammonia Cadmium odors scum/foam-unnatural trash
Compton Creek	coliform Copper Lead PH
Dry Canyon Creek	coliform Selenium, total
Echo Park Lake	algae ammonia Copper eutrophic Lead odors PCBs (tissue) PH
Lake Calabasas	ammonia DDT (tissue) eutrophic low DO/organic enrichment odors pH
Lincoln Park Lake	ammonia eutrophic Lead low DO/organic enrichment odors
Los Angeles River Estuary (Queensway Bay)	chlordane (sediment) DDT (sediment) Lead (sediment) PCBs (sediment) Zinc (sediment)
Los Angeles River Reach 1(u/s Carson St. to estuary)	Aluminum, total ammonia cadmium, dissolved coliform copper, dissolved Lead nutrients (algae) pH scum/foam-unnatural zinc, dissolved

303(d) Listed Waters/Reaches	Impairments
Los Angeles River Reach 2 (Figueroa St. to u/s Carson St.)	ammonia coliform Lead nutrients (algae) odors oil scum/foam-unnatural
Los Angeles River Reach 3 (Riverside Dr. to Figueroa St.)	ammonia nutrients (algae) odors scum/foam-unnatural
Los Angeles River Reach 4 (Sepulveda Dam to Riverside Dr.)	ammonia coliform Lead nutrients (algae) odors scum/foam-unnatural
Los Angeles River Reach 5 (within Sepulveda Basin)	ammonia nutrients (algae) odors oil scum/foam-unnatural
Los Angeles River Reach 6 (u/s of Sepulveda Basin)	coliform Dichloroethylene/1,1-DCE Tetrachloroethylene/PCE Trichloroethylene/TCE
McCoy Canyon Creek	coliform nitrate (NO3) nitrate as nitrogen Selenium, total
Monrovia Cyn Creek	Lead
Peck Rd Lake	chlordane (tissue) DDT (tissue) Lead low DO/organic enrichment odors
Rio Hondo Reach 1 (Santa Ana Fwy to Los Angeles River)	coliform Copper Lead pH Trash Zinc
Rio Hondo Reach 2 (Whittier Narrows Flood Control Basin to Spreading Grounds)	coliform
Tujunga Wash (d/s Hansen Dam to Los Angeles River)	ammonia coliform Copper odors scum/foam-unnatural Trash
Verdugo Wash Reach 1 (LA River to Verdugo Rd)	algae coliform Trash
Verdugo Wash Reach 2 (above Verdugo Road)	algae coliform Trash

Los Angeles River Watershed



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Appendix H Noise Impact Study

WHITTIER FLORAL RESIDENTIAL PROJECT
NOISE IMPACT STUDY
City of Whittier, California



WHITTIER FLORAL RESIDENTIAL PROJECT
NOISE IMPACT STUDY
City of Whittier, California

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1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

The purpose of this report is to evaluate the potential noise impacts from the proposed Whittier Floral Residential Project (project) and provide recommendations, if necessary, to minimize any project noise impacts. The assessment was conducted within the context of the California Environmental Quality Act (CEQA) and utilizes the noise standards set forth by the applicable Federal, State, and local agencies.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- Identification of the regulatory setting and applicable noise standards
- Analysis of the existing noise environment
- Analysis of the project's construction and operational noise impact to adjacent receptors
- Summary of recommended mitigation measures and project design features to reduce noise level impacts.

1.2 Site Location

The proposed Whittier Floral Residential Developmental project site is located at 11716 Floral Drive, in the City of Whittier, California. The project site is located approximately 273 feet above sea level and is relatively flat.

Existing land uses surrounding the proposed project site include; residential uses to the north, south and east and Dexter Middle School to the west.

The nearest existing noise-sensitive land uses are considered the residential properties and school located adjacent of the project site.

The project site location map is provided in Exhibit A.

1.3 Project Description

The project proposes to construct and operate 25 single family detached dwelling units. The project site is currently occupied by the Trinity Lutheran Church upon a 3.59-acre lot

for religious gathering and assembly. The Church plans to subdivide the property into two parcels; one (1) 2.56-acre lot for the residential development project and one (1) 1.03-acre lot for the Church, which will remain in operation.

The residential project will displace the former church school buildings on-site which are currently vacant. The Church also proposes to expand the sanctuary building by an additional 2,809 sqaure feet. The site plan used for this analysis, provided by KTGY Architecture, is illustrated in Exhibit B. Table 1 summarizes the proposed project land uses.

The project consist of demolition of 13,334 square feet of school buildings and 14,545 square feet of the gymnasium building as part of the construction process. The site requires grading and import of approximately 8,905 cubic yards of fill material during grading phase.

The project requires a General Plan amendment to change the land use from Private School to Medium Density Residential land use and requires a zone change from Low Density Residential (R-1) to Medium Density Residential (R-2).

Construction of the project is estimated to begin in the year 2021 and last approximately 17 months. Construction activities are expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. The project is expected to be operational in the year 2022.

It should be noted that the project site plan has been slightly modified compared to what was originally used in this noise analysis. The changes to the site plan do not substantially change the distance of noise sources to adjacent property lines or increase the severity of noise from the project. Therefore, the analysis shown in this report, which is based on the original site plan, still provides an adequate and reasonable assessment of potential project impacts. Any minor changes to the analysis as a result of the new site plan would not affect the overall findings of this study.

1.4 Summary of Analysis Results

Table 1 provides a summary of the noise analysis results, per the CEQA impact criteria checklist. With the implementation of the recommended project design features, the project is not expected to result in 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.

Table 1
CEQA Noise Impact Criteria

Noise Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
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

1.5 Recommended Mitigation Measures

The following recommended mitigation measures are provided to help ensure the project's construction noise levels do not adversely impact the adjacent noise sensitive land uses:

MM-1 The project shall prepare a construction management plan to be approved by the City of Whittier Community Development Department prior to initiating construction. The construction management plan shall include best management practices to reduce construction noise levels. Best management practices may include the following:

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).
- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.
- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.

- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.

- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.

- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

- Post a sign in a readily visible location at the project site that indicates the dates and duration of construction activities, as well as provide a telephone number where residents can enquire about the construction process and register complaints to an assigned construction noise disturbance coordinator.

MM-2 The project shall construct the six (6) foot high concrete masonry unit (CMU) block perimeter wall at the first phase of the construction and prior to performing the major demolition or grading activities. The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the project site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking.

MM-3 No impact pile driving activities shall be permitted on the project site during construction. If impact pile driving is required, a follow-up noise and vibration impact assessment shall be conducted prior to start of any pile driving activity.

1.6 Recommended Project Design Features

The following design features, while not generally considered mitigation under CEQA, are provided to help ensure the project meets the City/State standards for interior noise exposure within a residential dwelling.

Design features included standard rules and requirements and best practices that are provided for consideration as part of the conditions of approval for the project.

DF-1 Construction-related noise activities shall comply with the requirements set forth in the City of Whittier Municipal Code Chapter 8.32 Noise Control and Chapter 15.06 Construction Hours.

- Work authorized under or requiring a building or other permit shall take place only between the hours of 7:00 a.m. and 8:00 p.m. Monday through Saturday, unless authorized in writing by the City Manager or necessitated to protect life and/or property.

- Use of heavy equipment (dump trucks, graders, jack hammers, etc. are only permitted Monday through Friday from 7:00 a.m. to 6:00 p.m. and Saturday from 8:00 a.m. to 5:00 p.m.

- No work is permitted on Sundays or federal holidays

- Work, as used in the section, includes all preparation, cleanup and material deliveries.

DF-2 The project shall incorporate building construction techniques that achieve the minimum interior noise standard of 45 dBA CNEL for all residential units.

DF-3 A "windows closed" condition is expected to be required for most residential units within the project site to meet the interior noise standard. To accommodate a windows closed conditions, all units shall be equipped with adequate fresh air ventilation, per the requirements of the California Uniform Building Code (UBC).

DF-4 The project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls).

- Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

DF-5 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-6 All HVAC units should be partially enclosed behind a noise screening wall and shielded from line of sight of any adjacent property line.

DF-7 Delivery, loading/unloading activity, and trash pick-up hours should be limited to daytime (7 a.m. – 9 p.m.) hours only.

DF-8 Limit engine idling time for all delivery vehicles and moving trucks to 5 minutes or less.

2.0 Fundamentals of Noise

This section of the report provides basic information about noise and presents some of the terms used within the report.

2.1 Sound, Noise and Acoustics

Sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. Sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic, or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines it loudness. The loudness of sound increases or decreases, as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels and abbreviated dB.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two (2) sounds of equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3 dB increase.

If two (2) sounds differ by approximately 10 dB the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud[1]. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway), would result in a barely perceptible change in sound level.

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant, while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels. Following are the most commonly used noise descriptors along with brief definitions.

A-Weighted Sound Level

The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level

The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

[1] Source: U.S. DOT Federal Highway Administration. Dec. 2011. Highway Traffic Noise: Analysis and Abatement Guidance.

Community Noise Equivalent Level (CNEL)

The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and addition of ten (10) decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

Decibel (dB)

A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A)

A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ)

The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level. The energy average noise level during the sample period.

Habitable Room

Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n)

The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 is the sound level exceeded 10 percent of the sample time. Similarly L50, L90 and L99, etc.

Noise

Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Outdoor Living Area

Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Percent Noise Levels

See L(n).

Sound Level (Noise Level)

The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter

An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL)

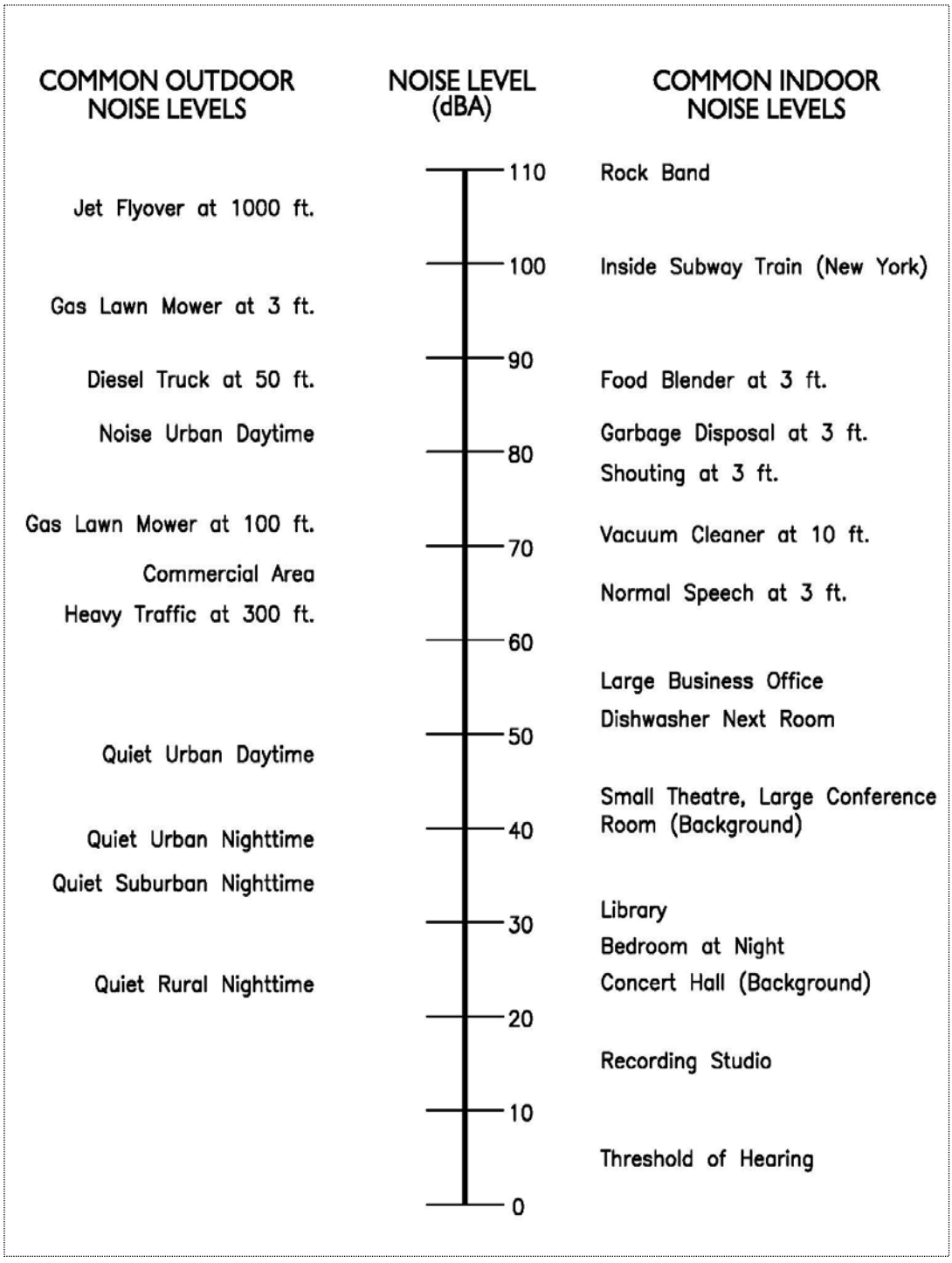
The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

2.7 Sound Propagation

As sound propagates from a source it spreads geometrically. Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at an additional rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 3 dB per doubling of distance for a line source and 6.0 dB per doubling of distance for a point source.

Figure 1
Typical Sound Levels from Indoor and Outdoor Noise Sources[2]



[2] Source: AAHSTO. 1993. Guide on Evaluation and Abatement of Traffic Noise

2.8 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV

Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS

Known as the root mean squared (RMS) can be used to denote vibration amplitude.

VdB

A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

2.9 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, fragile buildings can be exposed to ground-borne vibration levels of 0.3 inches per second without experiencing structural damage.

2.10 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wavefront, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wavefront. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wavefront. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

2.11 Construction Related Vibration Level Prediction

Operational activities are separated into two different categories. The vibration can be transient or continuous in nature. Each category can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the project area site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. The thresholds from Caltrans Transportation and Construction Induced Vibration Guidance Manual in the table below provide general guidelines as to the maximum vibration limits for when vibration becomes potentially annoying.

Table 2
Vibration Annoyance Potential Criteria

Human Response	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

The Caltrans Transportation and Construction Induced Vibration Guidance Manual provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts. The table below provides general vibration damage potential thresholds:

Table 3
Vibration Damage Potential Threshold Criteria

Structure and Condition	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings ruin ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Soil conditions have an impact on how vibration propagates through the ground. The Caltrans Transportation and Construction Induced Vibration Guidance Manual provides suggested "n" values based on soil class. The table below outlines the manual's suggested values and description.

Table 4
Suggested "n" Values Based on Soil Classes

Soil Class	Description of Soil Material	Suggested Value of "n"
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, weathered rock.	1.3
III	Hard soils: densely compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

3.0 Regulatory Setting

The proposed project is located in the City of Whittier and noise regulations are addressed through the various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

3.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three (3) purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was originally tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The Federal government and the State advocate that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government and the State have preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

3.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix." The matrix allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

Noise insulation design standards for residential dwellings have been established by the State of California Uniform Building Code (UBC) Chapter 12, Division II and by the Title 24 noise insulation standards of the California Administrative Code. The City is required by the State Housing Law to adopt these State codes as minimum performance standards. The City may enact stricter noise standards throughout the city or on a case-by-case basis if deemed necessary. In brief, the Title 24 noise standards require the following noise insulation standards:

1. Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

Thus, the interior limit is 45 dBA CNEL between dwelling units and from exterior noise sources to interior living spaces.

3.3 City of Whittier Noise Regulations

The City of Whittier outlines their noise regulations and standards within the Section 8 Noise Element of the General Plan, Chapter 8.32 - Noise Control of the Municipal Code and Chapter 15.06.010 – Construction Hours. The noise standards from the General Plan and Municipal Code are provided in Appendix A.

3.3.1 City of Whittier General Plan

The City of Whittier General Plan Noise Element addresses noise goals and policies, implementation programs, compatibility guidelines and roadway noise levels. Goals and policies that apply to the Proposed Project include:

- Policy 2.1: Control, at their source, any sounds which exceed accepted community noise levels.
- Policy 2.2: Evaluate and control the noise impacts of major developments and construction through the environmental review process.
- Policy 2.3: Encourage attenuation devices and limited hours of operation for new recreational developments so that neighborhood noise, especially during evening and nighttime hours, can be reduced.
- Policy 2.5: Recognize and follow acceptable noise level standards from schools, parks and other land uses in future planning.

The General Plan Noise Element also contains noise compatibility guidelines that indicate the acceptability of noise exposure levels for different land uses. The Noise Element indicates that projects should incorporate noise mitigation measures if they will exceed normally acceptable levels as defined by the guidelines.

3.3.2 City of Whittier Municipal Code

Chapter 8.32 of the City of Whittier Municipal Code regulates control of noise and vibration. The current City Municipal Code is more general in nature and does not prescribe specific noise limits.

The City of Whittier Municipal Code regulated the loud, annoying and unnecessary noises in the Chapter 8.32, section 8.32.030 as follows;

It shall be unlawful for any person to willfully make or continue, or cause to be made or continued, any excessive or unreasonable noise, which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

The City of Whittier Municipal Code does not prescribe specific noises such as loud, annoying and unnecessary noises in the Chapter 8.32. However, section 8.32.040 specifies as follows;

"Where no specific distance is set for the determination of audibility, reference to noise disturbance shall be deemed to mean plainly audible at a distance of one hundred feet from the real property boundary of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on the public right-of-way, public property, or private property open to the public. References to "adjacent" or "neighboring" residences or units in this section shall mean those residences or units located next to or in close proximity to the source of the noise, and no specific distance standard shall be required for such locations."

The City of Whittier does not specify the noise level for plainly audible at a distance of one hundred feet at the noise sensitive receptors. Hence, the CEQA threshold of significance discussed in the Section 3.5 of this report has been applied to this project.

Therefore, in order to comply with the City of Whittier Municipal Code noise regulation and CEQA threshold of significance the project shall not result in the exposure of persons to or generation of noise levels in excess of the ambient noise level significantly at the property line of the noise sensitive land uses surrounding the project.

Construction Noise Regulation

Section 8.32.040 of the City's Municipal Code states that the noise from the following activities noises would be in violation of the Municipal Code except on weekdays between the hours of 7 a.m. and 6 p.m. and on Saturdays 8 a.m. to 5 p.m. shall be exempted from the provisions of the noise code;

"Erection or demolition of buildings, excluding owner resident additions or remodeling, and the grading and excavation of land including the use of blasting, the startup and use of heavy equipment such as dump trucks and graders and the use of jack hammers."

3.4 County of Los Angeles Noise Regulations

Since City of Whittier does not provide numerical noise limit thresholds in the General Plan or Municipal Code for stationary operational noise impacts, this report has reviewed the County of Los Angeles noise regulations as a secondary source of noise standards.

The County of Los Angeles outlines their noise regulations and standards within the Chapter 11 Noise Element of the General Plan and Chapter 12.08- Noise Control of the Municipal Code. The noise standards from the General Plan and Municipal code are provided in Appendix A.

3.4.1 LA County Municipal Code Noise Standards

Chapter 12.08, Noise Control, of the County of Los Angeles Municipal Code serves as the Noise Ordinance for the County and establishes noise standards to control unnecessary, excessive, and annoying noise and vibration in the County. The project must not exceed the residential noise limit at the nearest adjacent residential property line.

Table 5 shows the Los Angeles County exterior noise standards for the surrounding properties.

Table 5
County of Los Angeles Exterior Noise Standards

Location	Time Period	Leq	L_{50} (30-min)	L_{25} (15-min)	L_8 (5-min)	L_2 (1-min)	L_{MAX} (any time)
Residential	Daytime (7am - 10pm)	50 dBA	50 dBA	55 dBA	70 dBA	65 dBA	70 dBA
	Nighttime (10pm – 7am)	45 dBA	45 dBA	50 dBA	65 dBA	60 dBA	65 dBA
Noise Sensitive Area	Anytime	45 dBA	45 dBA	50 dBA	65 dBA	60 dBA	65 dBA

3.5 Thresholds of Significance

The CEQA Guidelines do not define the levels at which temporary and permanent increases in ambient noise are considered "substantial", and therefore for the purposes of this analysis, noise impacts would be considered to be potentially significant if the proposed project in the following:

- Construction activities that exceed the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria - 8 hour Leq threshold of 80 decibels.

- A permanent (i.e., long term operational) increase of 5 dBA CNEL over ambient noise levels at any existing noise-sensitive land use

- A permanent (i.e., long term operational) increase of 3 dBA CNEL over ambient noise levels at any existing noise-sensitive land use location where the future resulting noise level would exceed 65 dBA CNEL (i.e., the noise levels would be considered unacceptable for noise-sensitive uses)

4.0 Study Method and Procedures

The following section describes the measurement procedures, measurement locations, and noise modeling procedures and assumptions used in the noise analysis.

4.1 Measurement Procedures and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

RK conducted the sound level measurements in accordance with Caltrans technical noise specifications. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

A Larson Davis 712 Type 2 sound level meter was used to conduct short-term (10-minute) noise measurements and a Piccolo-II Type 2 integrating-averaging sound level meter was used to conduct long-term (24-hour) noise measurements at the project site and property boundaries.

The Leq, Lmin, Lmax, L2, L8, L25, and L50 statistical data were recorded over the measurement time period intervals and the information was utilized to define the noise characteristics for the project. The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed five (5) feet above the ground for all short-term noise measurements and ten (10) feet above ground for long-term noise measurements
- Sound level meters were calibrated before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone

- Frequency weighting was set on "A" and slow response
- Results of the short-term noise measurements were recorded on field data sheets
- During any short-term noise measurements, any noise contaminations such as barking dogs, local traffic, lawn mowers, or aircraft fly-overs were noted
- Temperature and sky conditions were observed and documented

Appendix B includes photos, field sheets, and measured noise data.

4.2 Stationary Noise Modeling

On-site stationary noise sources were analyzed using SoundPLAN™ noise modeling software. SoundPLAN™ is a standards-based program that incorporates more than twenty national and international noise modeling guidelines. This project consists of parking lot noise and stationary noise sources which are classified under industrial sources.

Projected noise levels from SoundPLAN™ are based on the following key parameters:

- Developing three-dimensional noise models of the project,
- Predicting the project noise levels at the selected community locations and
- Comparing the predicted noise with the existing community ambient noise levels at the receptor locations.

The sides of the buildings, walls, etc. were modeled as reflective surfaces and also as diffractive bodies. The noise sources are shown as red spheres (point sources) and red surfaces (area sources). A light blue line outlines the perimeter of each operation. The surrounding roads are displayed as grey surfaces.

Most of the ground within the project site and adjacent areas are covered with paved surfaces and field grass and will be run as a hard site to be conservative (Ground Factor=0). The Effective Flow Resistivity for field grass is SoundPLAN default. The elevation profile for the project site is derived from Google Earth and all the receptors are placed at 5 foot above the ground level.

Reference Spectrum

SoundPLAN provides over 500 sound source spectra in third octaves and octaves from an open source library. These spectra were compiled from various sources (handbooks, literature, etc.).

The referenced spectrum is input into the project library and used as a reference spectrum normed to produce 76 dBA. The referenced noise level decibel value (described in Table 6) is used in conjunction with the reference spectrum to produce a valid emission.

Sound Power and Sound Pressure Level

Sound power level is the acoustic energy emitted by a source which produces a sound pressure level at some distance. While the sound power level of a source is fixed, the sound pressure level depends upon the distance from the source and the acoustic characteristics of the area in which it is located.

SoundPLAN requires that the source noise level be input using sound power level. The sound power level is calculated using SoundPLAN software by calibrating the source noise level to equal the sound pressure level at an equal distance from the source in which the referenced measurement was taken.

4.2.1 HVAC Equipment Noise

The project is proposing to use LENNOX ML14XC1 Air Conditioner units. In order to determine the future noise levels from a/c units, RK requested the specification sheet from the applicant and obtained the referenced noise level of the proposed a/c units. Table 6 indicates the referenced noise levels for on-site stationary noise sources. The manufacture spec sheet is shown in Appendix B.

Table 6
HVAC Referenced Noise Levels[1]

Source[1]	Noise Levels (dBA)
	L_{eq}
HVAC Equipment	76

To estimate the future noise levels during typical operational conditions, referenced noise levels are input into SoundPLAN and projected to the nearest sensitive receptor locations. Adjusted noise levels are based on the distance of the receptor location relative to the noise source, local topography and physical barriers including buildings and sound walls. The noise levels assume that the stationary sources are operating continuously during both daytime and nighttime hours, when in reality will likely operate only intermittently throughout daily operations.

5.0 Existing Noise Environment

The existing noise environment for the project site and surrounding areas has been established based on noise measurement data collected by RK. Noise measurement data indicates that traffic noise propagating from the adjacent roadways, as well as activities from the surrounding properties are the main sources of ambient noise at the project site and surrounding area.

5.1 Long-Term (24-Hour) Noise Measurement Results

To determine the existing noise level environment, RK conducted four (4) 24-hour noise measurements at the project study area. Noise levels were measured on February 20 and February 21, 2020 using a Piccolo-II Type 2 integrating-averaging sound level meter. The information was utilized to establish the noise characteristics of the existing ambient environment.

The noise monitoring locations were selected based on the proximity and location to adjacent sensitive receptors. Exhibit C graphically illustrates the location of the long-term measurements.

- Long-term noise monitoring location one (LT-1) was taken along the western property line at approximately 25 feet to the southern property line of the project site.

- Long-term noise monitoring location two (LT-2) was taken along the northern property line of the project and approximately 160 feet from the centerline of Floral Drive and 15 feet from the western property line of the project.

- Long-term noise monitoring location one (LT-3) was taken at approximately 15 feet to the eastern property line and 42 feet from the southern property line of the project.

- Long-term noise monitoring location two (LT-4) was taken along the northern property line of the project and approximately 60 feet from the centerline of Floral Drive.

Long term noise monitoring locations represent the existing noise levels near the adjacent noise sensitive land uses. Long-term noise measurement results are summarized in Tables 7, 8, 9, and 10. Appendix C includes photographs, field sheets and measured noise data.

Table 7
24-Hour Noise Measurement Results LT-1[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	50.1	12:00 PM	56.7
1:00 AM	50.9	1:00 PM	55.2
2:00 AM	53.4	2:00 PM	56.1
3:00 AM	49.0	3:00 PM	53.0
4:00 AM	49.8	4:00 PM	53.4
5:00 AM	55.6	5:00 PM	53.8
6:00 AM	57.2	6:00 PM	53.7
7:00 AM	63.7	7:00 PM	54.1
8:00 AM	65.4	8:00 PM	54.0
9:00 AM	55.3	9:00 PM	55.0
10:00 AM	53.9	10:00 PM	54.9
11:00 AM	55.5	11:00 PM	53.3
24-Hour CNEL			**61.2**

[1] LT-1 was taken along the western property line, approximately 25 feet from the southern property line of the project site. LT-1 was recorded on 02/20/2020.

Table 8
24-Hour Noise Measurement Results, LT-2[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	50.5	12:00 PM	53.9
1:00 AM	49.5	1:00 PM	52.9
2:00 AM	49.6	2:00 PM	54.7
3:00 AM	49.7	3:00 PM	53.2
4:00 AM	50.8	4:00 PM	55.2
5:00 AM	54.7	5:00 PM	58.8
6:00 AM	57.9	6:00 PM	55.3
7:00 AM	59.4	7:00 PM	53.8
8:00 AM	56.3	8:00 PM	53.9
9:00 AM	56.4	9:00 PM	53.8
10:00 AM	51.9	10:00 PM	54.8
11:00 AM	52.3	11:00 PM	52.6
24-Hour CNEL			**58.0**

[1] LT-2 was taken along the northern property line of the project site, approximately 160 feet from the centerline of Floral Drive and 15 feet from the western property line. LT-2 was recorded on 02/20/2020.

Table 9
24-Hour Noise Measurement Results LT-3[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	44.9	12:00 PM	54.6
1:00 AM	43.6	1:00 PM	55.7
2:00 AM	42.3	2:00 PM	52.9
3:00 AM	41.7	3:00 PM	55.2
4:00 AM	41.5	4:00 PM	53.4
5:00 AM	43.0	5:00 PM	53.8
6:00 AM	47.3	6:00 PM	53.8
7:00 AM	52.5	7:00 PM	53.0
8:00 AM	54.4	8:00 PM	56.1
9:00 AM	55.2	9:00 PM	52.3
10:00 AM	55.6	10:00 PM	51.1
11:00 AM	54.5	11:00 PM	50.5
24-Hour CNEL			**56.2**

[1] LT-3 was taken at approximately 15 feet from the eastern property line of the site and 42 feet from the southern property line of the project. LT-3 was recorded on 02/21/2020.

Table 10
24-Hour Noise Measurement Results, LT-4[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	50.5	12:00 PM	53.9
1:00 AM	49.5	1:00 PM	52.9
2:00 AM	49.6	2:00 PM	54.7
3:00 AM	49.7	3:00 PM	53.2
4:00 AM	50.8	4:00 PM	55.2
5:00 AM	54.7	5:00 PM	58.8
6:00 AM	57.9	6:00 PM	55.3
7:00 AM	59.4	7:00 PM	53.8
8:00 AM	56.3	8:00 PM	53.9
9:00 AM	56.4	9:00 PM	53.8
10:00 AM	51.9	10:00 PM	54.8
11:00 AM	52.3	11:00 PM	52.6
24-Hour CNEL			**60.3**

[1] LT-4 was taken along the northern property line of the project site, approximately 60 feet from the centerline of Floral Drive. LT-4 was recorded on 02/21/2020.

6.0 Operational Noise Impacts

This assessment analyzes the anticipated noise levels generated by the project and impacts caused by changes to the ambient environment as a result of operational activities. The main sources of operational noise generated by the project would include on-site activities from HVAC equipment. Noise level impacts are compared to the City of Whittier noise standards.

The project must demonstrate that noise levels generated by the project site would not be in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

6.1 Stationary Source Noise Impacts

On-site stationary noise impacts are assessed at all adjacent property lines surrounding the project site. Existing land uses surrounding the proposed project site include; existing residential uses to the north, south and east, school/institutional use to the west.

Project operational activities are analyzed for long-term noise impacts associated with the day to day operation of the project; including mechanical HVAC equipment to the nearest adjacent property lines.

HVAC equipment will be generally located on the exterior ground floor area of each unit. The closest HVAC units are expected to be located approximately 62 feet from the northern property line, approximately 30 feet from the southern property line, approximately 6 feet from the eastern property line and approximately 100 feet from the western property line.

- All HVAC units should partially enclosed behind a noise screening wall and shielded from line of sight of any adjacent property line.

SoundPLAN calculation worksheets are shown in Appendix D.

It should be noted that the project site plan has been slightly modified compared to what was originally used in this noise analysis. The changes to the site plan do not substantially change the distance of noise sources to adjacent property lines or increase the severity of noise from the project. Therefore, the analysis shown in this report, which is based on the original site plan, still provides an adequate and reasonable assessment of potential project impacts. Any minor changes to the analysis as a result of the new site plan would not affect the overall findings of this study.

Daytime Stationary Source Noise Impacts

The results of the daytime noise impact analysis are shown in the Tables 11 and are graphically illustrated on Exhibit E.

The noise analysis considers all project noise sources operating simultaneously during daytime (7 a.m. to 9 p.m.) hours at the nearest adjacent property lines. In the absence of quantified noise limit thresholds in the City of Whittier, the County of Los Angeles daytime noise standard from 7 a.m. to 9 p.m. of 50 dBA for residential uses and 45 dBA for the school/institutional use to the west is referenced for informational purposes.

Based on the results of this analysis, noise levels generated by the project are not expected to exceed the County's daytime noise standards at the adjacent property lines.

The change in existing daytime ambient noise levels as a result of the project would be approximately 0.2 dBA Leq during the daytime hours (7 a.m. to 9 p.m.). Typically, the human ear can barely perceive the change in the noise level of 3 dB, and therefore the impact is considered imperceptible and less than significant.

Nighttime Stationary Source Noise Impacts

The results of the nighttime noise impact analysis are shown in the Tables 12 and are graphically illustrated on Exhibit F.

The nighttime noise analysis considers all project noise sources operating simultaneously during nighttime (9 p.m. to 7 a.m.) hours.

The noise standard for all noise sensitive residential uses surrounding the project site is established to be 45 dBA from 9 p.m. to 7 a.m.

Noise levels generated by the project are not expected to exceed the County's nighttime noise standards at the adjacent property lines.

The change in existing daytime ambient noise levels as a result of the project would be approximately 0.2 dBA to 1.6 dBA Leq during the nighttime hours (9 p.m. to 7 a.m.). Typically, the human ear can barely perceive the change in the noise level of 3 dB, and therefore the impact is considered imperceptible and less than significant.

TABLE 11
Whittier Floral Residential Project
Daytime Noise Impact Analysis (dBA)

Receptor	Land Use	Location	Daytime Exterior Noise Level dBA[1]						
			Project Noise Contribution (Leq)	City of Whittier Noise Level Criteria (Leq)	Noise Level Exceeds Standard (?)	Existing Ambient Measurement (Leq)[1]	Combined Noise Level Existing Plus Project (Leq)	Change in Noise Level as a Result of Project (dBA)	Significant Imapact (?)
Receiver at PL-1	Residential	North	29.3	50.0	No	52.8	52.8	0.0	No
Receiver at PL-2	Residential	South	36.6		No	51.1	51.3	0.2	No
Receiver at PL-3	Residential	East	35.3		No	52.8	52.9	0.1	No
Receiver at PL-4	Residential	East	37.9		No	51.1	51.3	0.2	No
Receiver at PL-5	School	West	28.3	45.0	No	53.0	53.0	0.0	No

[1] Lowest Daytime Measured Leq

TABLE 12
Whittier Floral Residential Project
Nighttime Noise Impact Analysis (dBA)

Receptor	Land Use	Location	Nighttime Exterior Noise Level dBA[1]						
			Project Noise Contribution (Leq)	City of Whittier Noise Level Criteria (Leq)	Noise Level Exceeds Standard (?)	Existing Ambient Measurement (Leq)[1]	Combined Noise Level Existing Plus Project (Leq)	Change in Noise Level as a Result of Project (dBA)	Significant Imapact (?)
Receiver at PL-1	Residential	North	29.3	45.0	No	43.7	43.9	0.2	No
Receiver at PL-2	Residential	South	36.6		No	41.5	42.7	1.2	No
Receiver at PL-3	Residential	East	35.3		No	43.7	44.3	0.6	No
Receiver at PL-4	Residential	East	37.9		No	41.5	43.1	1.6	No
Receiver at PL-5	School	West	28.3	45.0	No	41.5	41.7	0.2	No

[1] Lowest Nighttime Measured Leq

6.2 Recommended Project Design Features

The following design features, while not generally considered mitigation under CEQA, are provided to help ensure the project meets the City/State standards for interior noise exposure within a residential dwelling. Design features included standard rules and requirements and best practices that are provided for consideration as part of the conditions of approval for the project.

DF-2 The project shall incorporate building construction techniques that achieve the minimum interior noise standard of 45 dBA CNEL for all residential units.

DF-3 A "windows closed" condition is expected to be required for all residential units within the project site to meet the interior noise standard. To accommodate a windows closed conditions, all units shall be equipped with adequate fresh air ventilation, per the requirements of the California Uniform Building Code (UBC).

DF-4 The project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls).

- Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

DF-5 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-6 All HVAC units should partially enclosed behind a noise screening wall and shielded from line of sight of any adjacent property line.

DF-7 Delivery, loading/unloading activity, and trash pick-up hours should be limited to daytime (7 a.m. – 9 p.m.) hours only.

DF-8 Limit engine idling time for all delivery vehicles and moving trucks to 5 minutes or less.

7.0 Construction Noise and Vibration Impacts

Temporary construction noise and vibration impacts have been assessed from the project site to the surrounding existing noise sensitive land uses. The degree of construction noise will vary depending on the type of construction activity taking place and the location of the activity relative to the surrounding properties.

Section 8.32.040 of the City's Municipal Code states that the noise from the following activities noises would be in violation of the Municipal Code except on weekdays between the hours of 7 a.m. and 6 p.m. and on Saturdays 8 a.m. to 5 p.m. shall be exempted from the provisions of the noise code;

"Erection or demolition of buildings, excluding owner resident additions or remodeling, and the grading and excavation of land including the use of blasting, the startup and use of heavy equipment such as dump trucks and graders and the use of jack hammers."

Although construction activity is exempt from the noise standards in the City's Municipal Code, CEQA requires that potential noise impacts still be evaluated for significance. For purposes of this analysis, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria will be used. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA Leq for an 8-hour period. In compliance with the City's Municipal Code, it is assumed construction would not occur during the noise-sensitive nighttime hours.

Construction phasing and equipment usage assumptions are based on the equipment list provided by applicant.

7.1 Typical Construction Noise Levels

Table 13 shows typical construction noise levels compiled by the Environmental Protection Agency (EPA) for common type construction equipment. Typical construction noise levels are used to estimate potential project construction noise levels at the adjacent sensitive receptors.

Table 13
Typical Construction Noise Levels[1]

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86
Impact Equipment	
Pneumatic Wrenches	82 - 87
Jack Hammers, Rock Drills	80 - 99
Pile Drivers (Peak)	95-105
Other	
Vibrators	68 - 82
Saws	71 - 82

[1] Referenced Noise Levels from the Environmental Protection Agency (EPA)

7.2 Construction Noise Impact Analysis

This assessment analyzes potential noise impacts during all expected phases of construction, including; demolition, site preparation, grading, building construction, paving, and architectural coating. Noise levels are calculated based on an average distance of equipment over an 8-hour period to the nearest adjacent property.

The project's estimated construction noise levels have been calculated using the Federal Highway Administration Roadway Construction Noise Model Version 1.1. Tables 14 show the noise level impacts to the nearest existing residential property lines. Construction noise calculation worksheets are provided in Appendix E.

Table 14
Project Construction Noise Levels

Phase	Equipment	Quantity	Equipment Noise Level at 50ft (dBA Leq)	Combined Noise Level (dBA Leq)
Demolition	Concrete/Industrial Saws	1	82.6	79.5
	Rubber Tired Dozers	1	77.7	
Site Preparation	Graders	1	81.0	83.6
	Tractors/Loaders/Backhoes	1	80.0	
Grading	Graders	1	81.0	82.7
	Rubber Tired Dozers	1	77.7	
Building Construction	Cranes	1	72.6	82.5
	Generator Sets	1	77.6	
	Tractors/Loaders/Backhoes	1	80.0	
Paving	Cement and Mortar Mixers	1	74.8	82.5
	Pavers	1	74.2	
	Paving Equipment	1	73.0	
	Tractors/Loaders/Backhoes	1	80.0	
Architectural Coating	Air Compressors	1	73.7	73.7
Worst Case Construction Phase Noise Level - Leq (dBA) - **Unmitigated**				82.7
FTA Construction Noise Criteria (Detailed Assessment: 8-Hour Leq)				80.0
Worst Case Construction Phase Noise Level - Leq (dBA) - **Mitigated**				77.7
Noise level exceeds FTA criteria?				No

As shown in Table 15, project construction noise levels are expected to be below the recommended 8-hour construction noise threshold provided by the FTA for adverse community reaction at the adjacent residential, taking into account the mitigation measures mentioned below. However, the project construction would still generate noise levels in exceedance of ambient conditions at the adjacent residential land uses.

As a result, several mitigation measures are recommended to reduce construction noise impacts to the surrounding sensitive land uses:

MM-1 The project shall prepare a construction management plan to be approved by the City of Whittier Community Development Department prior to initiating construction. The construction management plan shall include best management practices to reduce construction noise levels. Best management practices may include the following:

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).
- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.
- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.
- Post a sign in a readily visible location at the project site that indicates the dates and duration of construction activities, as well as provide a telephone number where residents can enquire about the construction process and register complaints to an assigned construction noise disturbance coordinator.

MM-2 The project shall construct the six (6) foot high concrete masonry unit (CMU) block perimeter wall at the first phase of the construction and prior to performing the major demolition or grading activities. The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the project site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking.

7.3 Construction Vibration Impact Analysis

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structures. The nearest sensitive receptors are the residential structures located adjacent to the project site to the east and south of the property line. All structures surrounding the project site are considered "new residential structures". No historical or fragile buildings are known to be located within the vicinity of the site.

The construction of the proposed project is not expected to require the use of substantial vibration inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during construction of the project would be the operation of equipment such as bulldozer activity during site preparation, loading trucks during grading and excavation, and vibratory rollers during paving.

The construction vibration assessment utilizes the referenced vibration levels and methodology set-forth within the Caltrans Transportation and Construction Induced Vibration Guidance Manual.

Table 15 shows the referenced vibration levels.

Table 15
Typical Construction Vibration Levels[1]

Equipment	Peak Particle Velocity (PPV) (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Piledriver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Piledriver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

Table 16 shows the project's construction-related vibration analysis at the nearest structures to the project construction area. Construction impacts are assessed from the closest area on the project site to the nearest adjacent structure.

Table 16
Construction Vibration Impact Analysis

Construction Activity	Distance to Nearest Structure (ft)	Duration	Calculated Vibration Level - PPV (in/sec)	Damage Potential Level	Annoyance Criteria Level
Large Bulldozer	25	Continuous/Frequent	0.089	Extremely fragile historic buildings	Distinctly Perceptible
Vibratory Roller	25	Continuous/Frequent	0.210	Historic and old buildings	Strongly Perceptible
Loaded Trucks	25	Continuous/Frequent	0.076	Extremely fragile historic buildings	Distinctly Perceptible

As shown in Table 16, project related construction activity is not expected to cause any damage potential to the nearest structures. The annoyance potential of vibration from construction activities would range from "distinctly perceptible" to "strongly perceptible".

MM-3 No impact pile driving activities shall be permitted on the project site during construction. If impact pile driving is required, a follow-up noise and vibration impact assessment shall be conducted prior to start of any pile driving activity.

Construction vibration calculation worksheets are shown in Appendix E.

7.4 Construction Project Design Features

In order to help ensure the project complies with the applicable City of Whittier noise standards during construction, the following project design features are recommended.

DF-1 Construction-related noise activities shall comply with the requirements set forth in the City of Whittier Municipal Code Chapter 8.32 Noise Control and Chapter 15.06 Construction Hours.

- Work authorized under or requiring a building or other permit shall take place only between the hours of 7:00 a.m. and 8:00 p.m. Monday through Saturday, unless authorized in writing by the City Manager or necessitated to protect life and/or property.

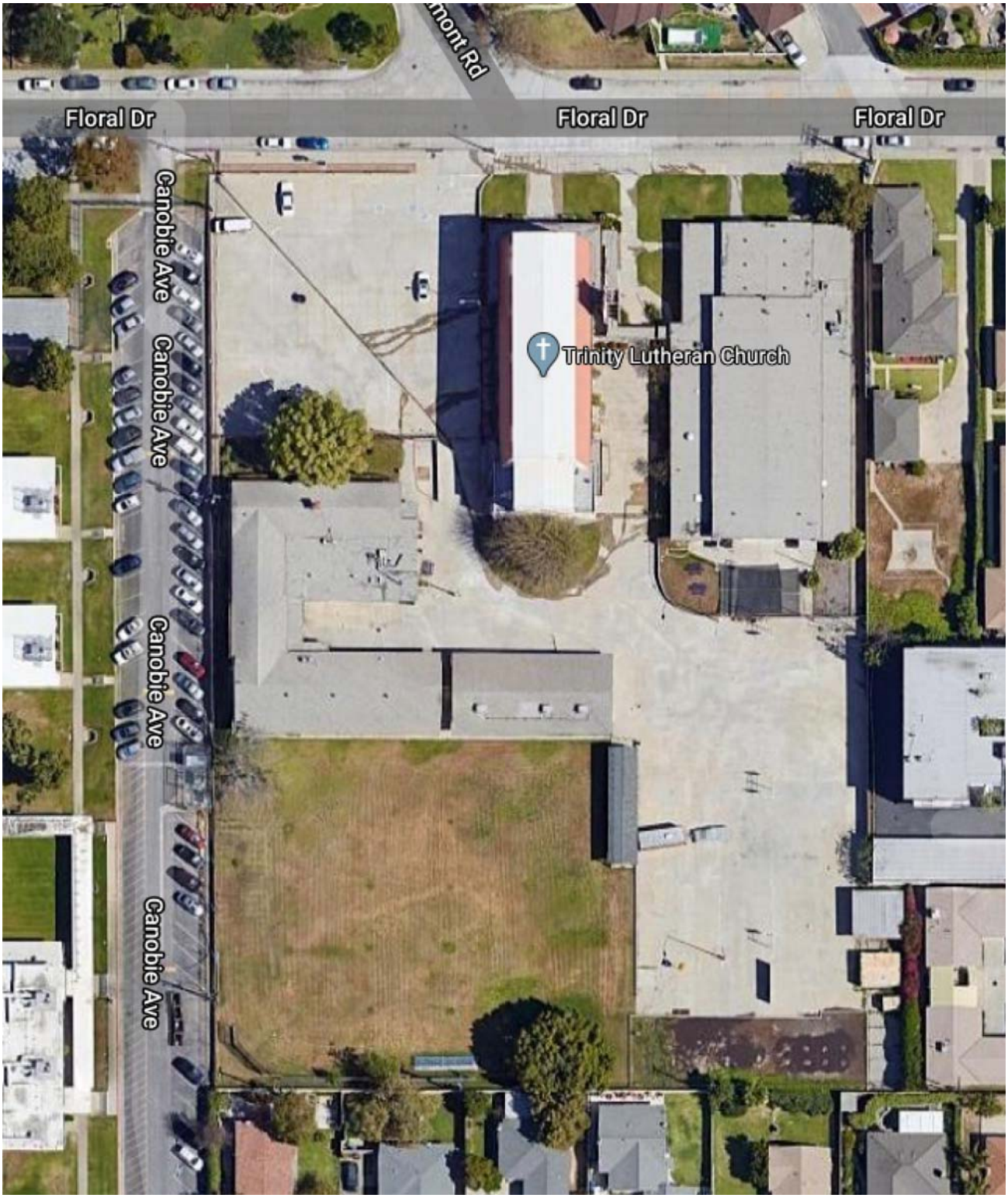
- Use of heavy equipment (dump trucks, graders, jack hammers, etc. are only permitted Monday through Friday from 7:00 a.m. to 6:00 p.m. and Saturday from 8:00 a.m. to 5:00 p.m.

- No work is permitted on Sundays or federal holidays

- Work, as used in the section, includes all preparation, cleanup and material deliveries.

Exhibits

Location Map



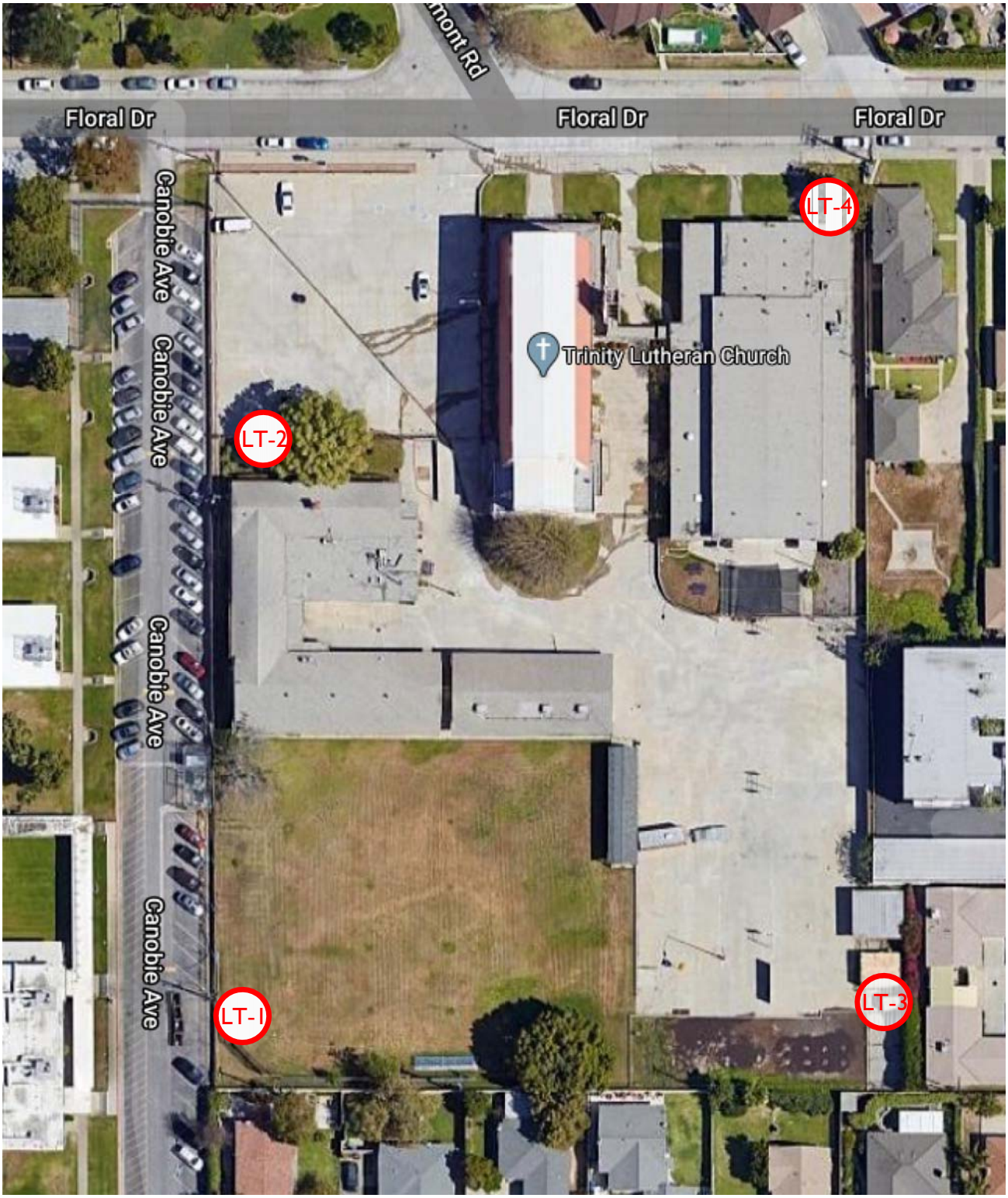
N

Exhibit B
Site Plan



N

Monitoring Locations



Legend:

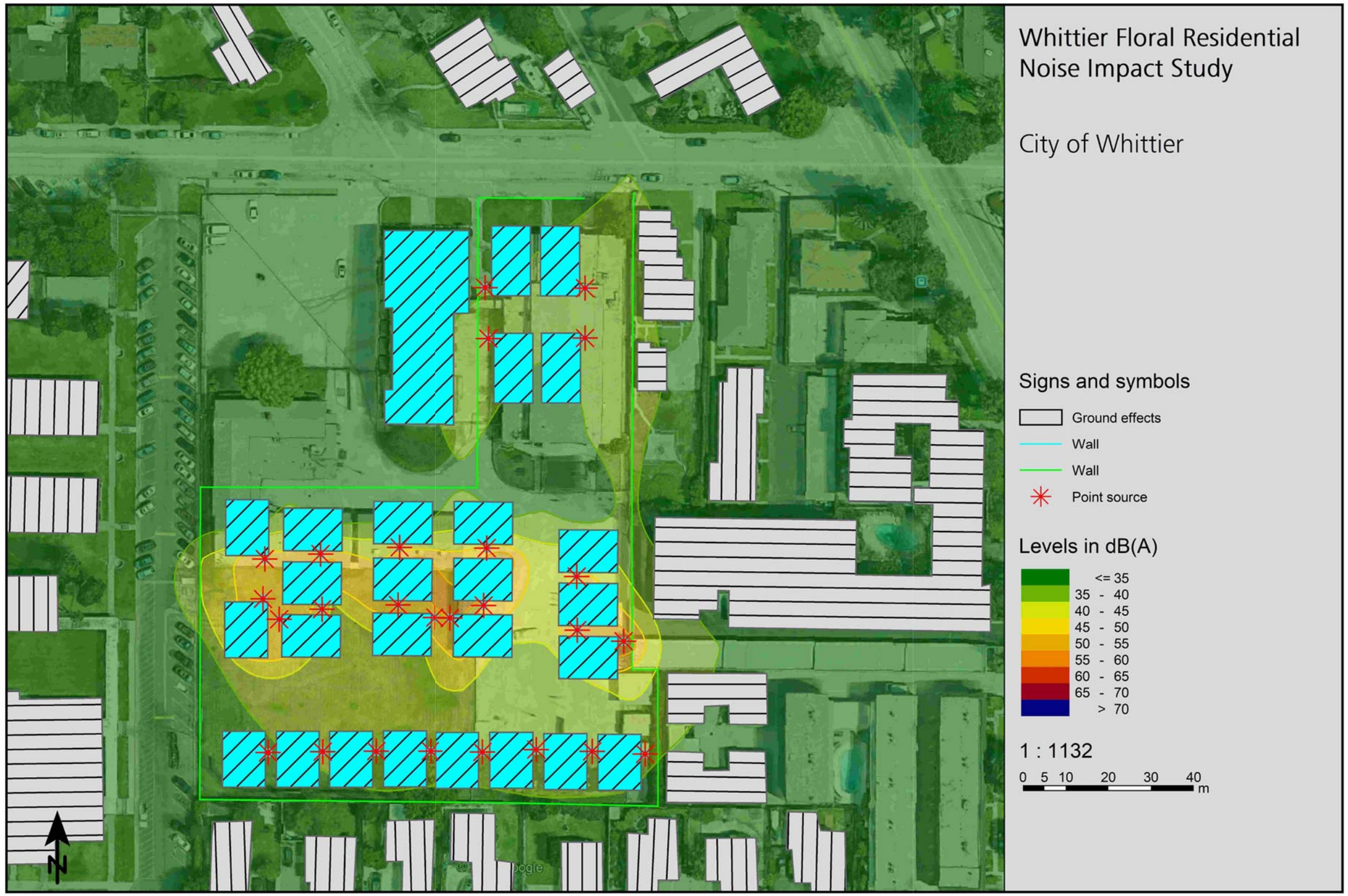
LT-1 = Long Term (24-Hr) Noise Monitoring Location

N

SoundPLAN Project Noise Level Results



Project Noise Level Contours - Daytime



Project Noise Level Contours - Nighttime



Appendices

Appendix A

City of Whittier
General Plan and Municipal Code Noise Standards
&
County of Los Angeles Municipal Code Noise Standards

SECTION 8: NOISE ELEMENT

INTRODUCTION

Excessive noise levels disturb and disrupt human activities and affect the health of individuals. The Noise Element of the *Whittier General Plan* establishes guidelines for controlling and minimizing the impacts of noise in the City. The Noise Element contains a discussion of the characteristics and effects of noise, state and federal guidelines related to noise control, an evaluation of the existing noise environment in the City, and projections of the future noise environment likely to occur in the future. The Element also identifies noise-sensitive land uses and major noise sources in the City.

Government Code Section 65302 (F) requires the adoption of a Noise Element to identify existing and projected noise problems of the City and to outline possible solutions to address these problems. Noise contours illustrating existing and future traffic noise levels will serve as a guide for future development in the City.

The goals, policies, and programs contained within the Noise Element are designed to minimize noise problems in the City and to protect public health. With the majority of the planning area devoted to residential uses, it is important that noise sources are controlled at the source, located away from the residential communities, or that buffers are provided between the main sources of noise and residences. The noise mitigation program in the Element explores these options along with noise insulation standards and land use compatibility along major roadways.

Noise sources and the existing noise environment within Whittier are described in the Noise Element Background Report. Concerns that were identified in the report are summarized below.

- Noise affects the physical and psychological well-being of humans and levels of regulations that will be effective in controlling noise sources and protecting people from its harmful effects should be established.

- In Whittier, traffic is a primary source of noise. Traffic noise is directly related to the traffic volume, vehicle speed, roadway grade, motor idling, and acceleration. Land uses along major roadways are exposed to the highest vehicle noise levels and often require insulation and noise reduction measures. Other noise sources in the City include aircraft, occasional trains, commercial and industrial uses, crowds and events attracting large groups of people, trucks and sweepers, residential noise, recreational events, and garden equipment.

- Uses that are particularly sensitive to noise include schools, libraries, hospitals, residences, nursing homes, and churches. These activities are exposed to increasing levels of noise.

- Noise control in Whittier in the past has been prompted by individual complaints, rather than through a regular enforcement program. The development of a noise

ordinance is expected to better address ways to reduce noise levels throughout the community.

NOISE GOALS AND POLICIES

The goals and polices of the Noise Element focus on land use compatibility as it relates to the noise environment. For example, the Noise Element acknowledges the need to provide buffering between noise sensitive land uses and busy roadways. Other policies focus on ways to control those activities that increase excessive noise levels.

Issue: Noise Sensitive Uses

The following goal and supporting policies focus on the impacts of traffic noise on noise sensitive land uses.

Goal 1 Minimize noise levels throughout the community.

Policy 1.1 Work toward the separation or buffering of freeways and highways from noise-sensitive land uses such as residences, schools, and hospitals.

Policy 1.2 Consider steps to correct existing noise problems and avoid future problems through design measures such as buffers and barriers or through abatement procedures.

Issue: Noise Sources

Certain land uses typically generate high levels of noise. For example, manufacturing activities often generate excessive levels of noise which could create a problem for any noise sensitive land use located nearby. The following goal and supporting programs promote the consideration of noise impacts and exposure in land use compatibility.

Goal 2 Discourage noises which are detrimental to the public health and welfare and contrary to the public interest.

Policy 2.1 Control, at their sources, any sounds which exceed accepted community noise levels.

Policy 2.2 Evaluate and control the noise impacts of major developments and construction through the environmental review process.

Policy 2.3 Encourage attenuation devices and limited hours of operation for new private recreational developments so that neighborhood noise, especially during evening and nighttime hours, can be reduced.

Policy 2.4 Support the enforcement of existing laws pertaining to the noise of off-road vehicles, trucks, and equipment.

Policy 2.5 Recognize and follow acceptable noise level standards from schools, parks, and other land uses in future planning.

IMPLEMENTATION PROGRAMS

Individual actions to achieve noise reduction in the City of Whittier have been developed. The noise goals and policies and their corresponding implementation are provided in Table 8-1. A discussion of these measures is provided in Section 10.

TABLE 8-1
NOISE IMPLEMENTATION

Goal	Policy	Implementation Measure
1. Minimize Noise Levels	1.1 Work for separation of freeways and highways from noise-sensitive land uses.	Landscaping and Land Use Buffers Acoustical Analysis Reports
	1.2 Correct existing noise problems and avoid future noise problems.	Noise Ordinance
2. Discourage Noise	2.1 Control noise at their sources.	Noise Ordinance OSHA Requirements Noise Complaints
	2.2 Evaluate and control noise impacts during review process.	Environmental Review Acoustical Analysis Reports Noise Ordinance
	2.3 Encourage noise attenuation devices and limited hours of operation.	Noise Ordinance Acoustical Analysis Reports
	2.4 Support the enforcement of noise control regulations.	Noise Control Coordination Noise Ordinance OSHA Requirements
	2.5 Establish acceptable noise standards.	Noise Ordinance

NOISE COMPATIBILITY GUIDELINES

Developments in certain areas of the City of Whittier are currently exposed to high noise levels created by roadway traffic and industrial and commercial activities. Federal, state and county

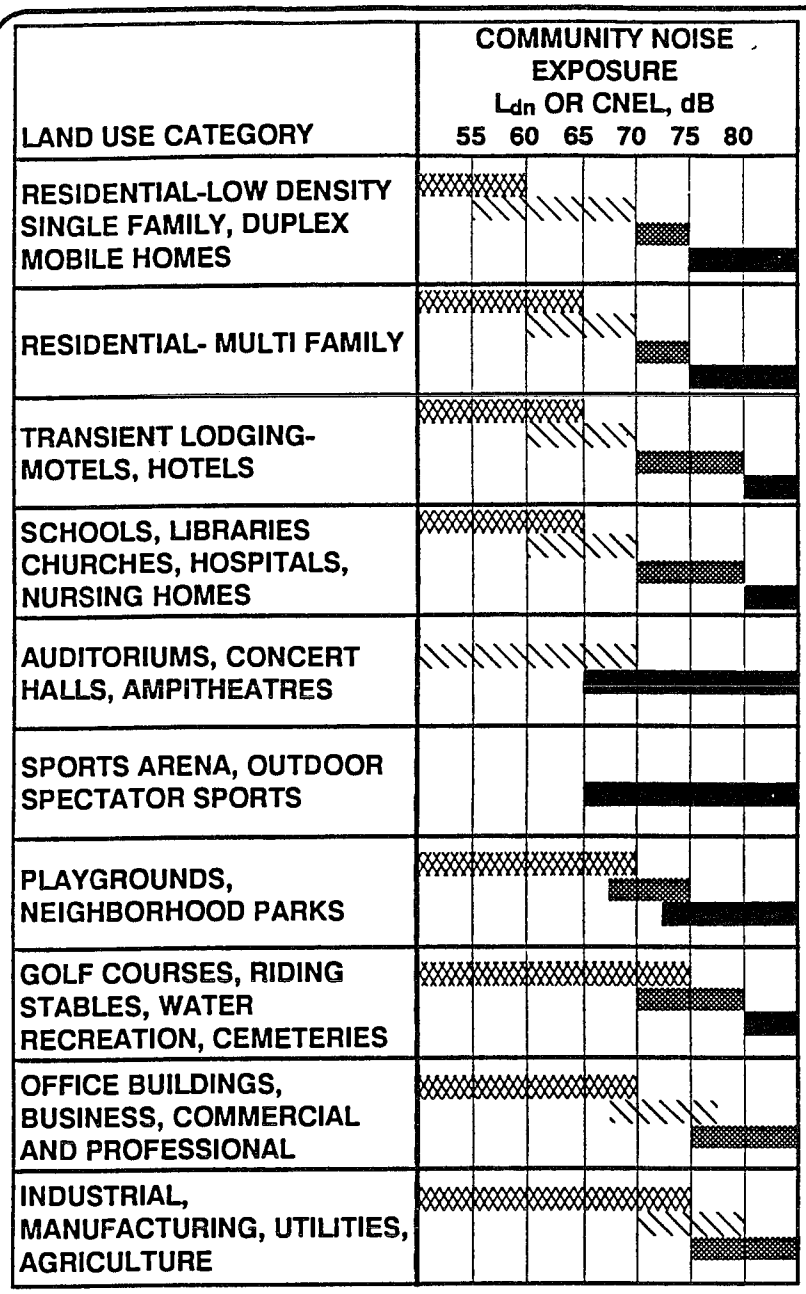
agencies are involved in noise control. The City will acknowledge these regulations and will work with responsible agencies in addressing the noise problems of Whittier. In order to minimize noise impacts on future development, the City has developed a Noise Mitigation Program. The program addresses ways for correcting existing noise problems, as well as ways to control future increases in ambient noise levels in the City.

The implementation of the Noise Mitigation Program is dependent on the level of noise that residents are willing to live with and the health effects of noise on people and the importance of a quiet environment to the City.

Noise compatibility guidelines for the City are illustrated in Exhibit 8-1. These guidelines indicate the acceptability of noise exposure levels for different land uses. Future projects should incorporate noise mitigation measures if they will exceed normally acceptable levels as defined by the Guidelines. Noise reduction measures may include any of the following:

- The control of noise at the source, including muffling devices on noise generating equipment;
- The provision of buffers, berms, or setbacks between the noise source and adjacent developments;
- The mitigation of noise impacts, thus reducing the level of exposure, for development adjacent to a noise source (freeways, railroads, etc.);
- Noise reduction at the receiver through the use of sound insulation, blank walls, double paned windows, and other design techniques to reduce interior noise;
- Restriction of noise sensitive land uses adjacent to known noise sources or prohibiting the placement of noise generators near noise sensitive areas;
- Limiting the development of noise sensitive land uses in areas where noise levels exceed acceptable standards pursuant to the noise compatibility guidelines; and
- Use of masking effects, where more pleasant sounds (water, leaves, music, etc.) disguise less desirable noises.

Noise control efforts should be focused on areas where the most number of people are exposed and the highest noise levels are experienced. Noise from transportation sources are regulated by state laws. The State of California Department of Health Services and the Department of Motor Vehicles have noise standards which are enforced by the California Highway Patrol. The City may choose to be involved in this control process through coordination with the highway patrol.



LEGEND

NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features inclued in the design.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

CONSIDERATIONS IN DETERMINATION OF NOISE-COMPATIBLE LAND USE

A. NORMALIZED NOISE EXPOSURE DESIRED

Where sufficient data exists, evaluate land use suitability with respect to a "normalized" value of CNEL or Ldn . Normalized values are obtained by adding or subtracting the constants described in Table 1 to the measured or calculated value of CNEL or Ldn.

B. NOISE SOURCE CHARACTERISTICS

The land use-noise compatibility recommendations should be viewed in relation to the specific source of the noise. For example, aircraft and railroad noise is normally made up of higher single noise events than auto traffic but occurs less frequently. Therefore, different sources yielding the same composite noise exposure do not necessarily create the same noise environment. The State Aeronautics Act uses 65dB CNEL as the criterion which airports must eventually meet to protect existing residential communities from unacceptable exposure to aircraft noise. In order to facilitate the purposes of the Act, one of which is to encourage land uses compatible with the 65dB CNEL criterion wherever possible and in order to facilitate the ability of airports to comply with the Act, residential uses located in Community Noise Exposure Areas greater than 65dB should be discouraged and considered located within normally unacceptable areas.

C. SUITABLE INTERIOR ENVIRONMENTS

One objective of locating residential units relative to a known noise source is to maintain a suitable interior noise environment at no greater then 45 dB CNEL of Ldn. This requirement, coupled with the measured or calculated noise reduction performance of the type of structure under consideration, should govern the minimum acceptable distance to a noise source.

D. ACCEPTABLE OUTDOOR ENVIRONMENTS

Another consideration, which in some communites is an overriding factor, is the desire for an acceptable outdoor noise environment. When this is the case, more restrictive standards for land use compatibility, typically below the maximum considered "normally acceptable" for that land use category, may be appropriate.

State law requires multi-family development to be located within areas with noise levels of 65 dB or less unless mitigation measures are provided that would reduce the interior noise levels to 45 dB or less. Sound transmission control standards (Title 24 of the California Administrative Code) outline noise insulation performance standards for habitable structures. Future noise regulations contained in a noise ordinance (as provided for in this General Plan) may include standards for land use compatibility, restriction on the hours of operation for noise sources, periodic investigation of noise sources, noise reduction measures for new and existing developments, time limits for car alarms, and acoustical design in new construction.

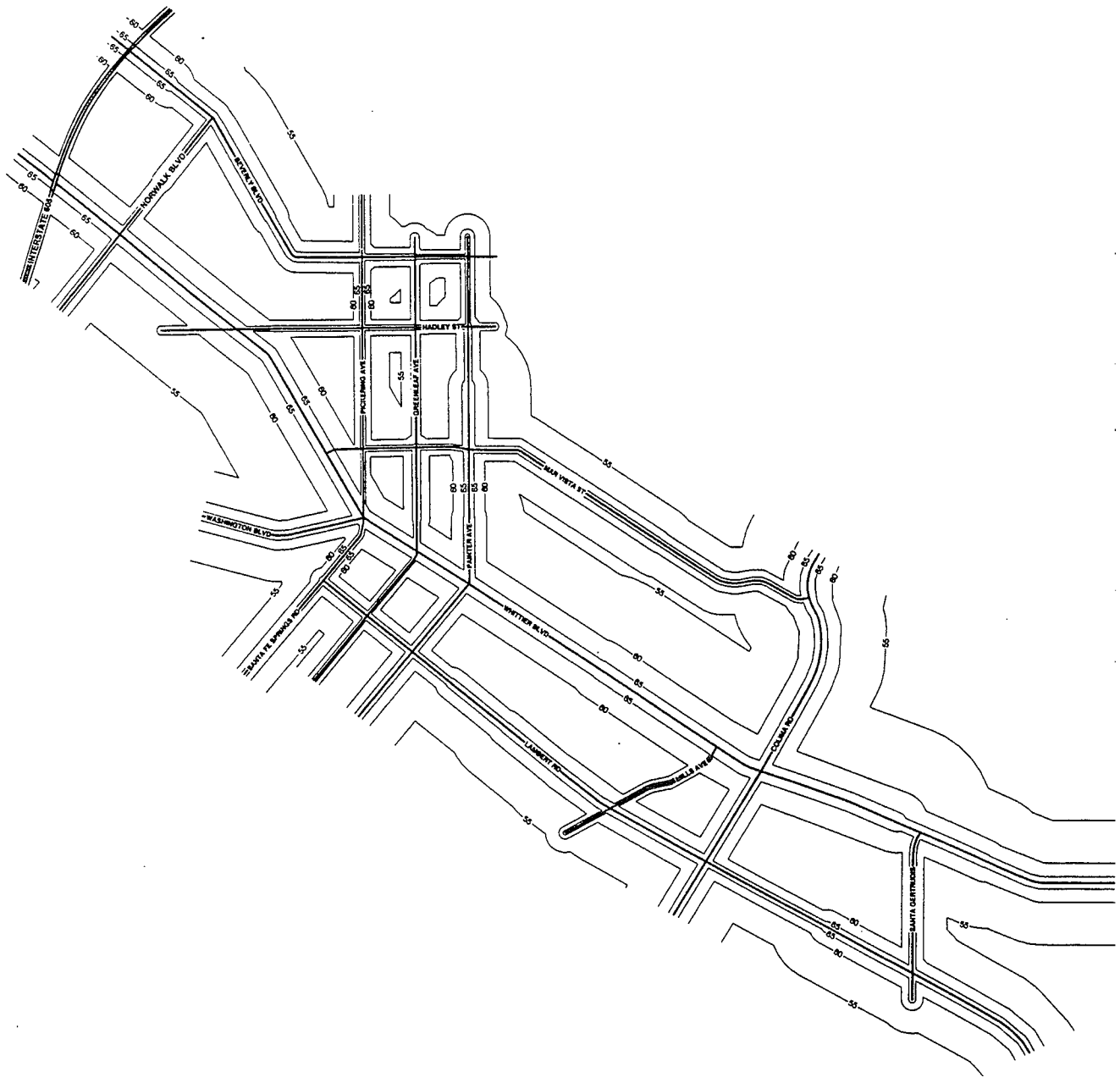
At buildout of the Land Use Plan, noise levels are expected to be higher than today. Using the Federal Highway Administration Noise Prediction Model, the future noise environment is estimated from projected traffic volumes. Table 8-2 shows noise levels along major streets at buildout of the plan and Exhibit 8-2 shows the areas that will be impacted by traffic noise.

TABLE 8-2
FUTURE ROADWAY NOISE LEVELS

Road Segment	Distance from Roadway Centerline to CNEL (feet)				
	70 CNEL	65 CNEL	60 CNEL	55 CNEL	CNEL at 50' from CL
Beverly Blvd.					
SR-605/Carley	70.0	212.0	667.0	2108.0	70.0
Carley/Palm	0.0	158.0	497.0	1570.0	69.0
Palm/Magnolia	55.0	163.0	512.0	1618.0	69.0
Magnolia/Pickering	0.0	139.0	435.0	1373.0	68.0
Pickering/Greenleaf	0.0	86.0	265.0	834.0	66.0
Greenleaf/Painter	0.0	60.0	187.0	590.0	65.0
Painter/Turnbull Canyon	0.0	0.0	0.0	0.0	54.0
Whittier Blvd.					
West of SR-605	67.0	202.0	636.0	2011.0	70.0
SR-605/Painter	79.0	241.0	760.0	2403.0	71.0
Painter/Calmada	82.0	251.0	791.0	2501.0	71.0
Calmada/Santa Gertrudes	88.0	271.0	853.0	2697.0	71.0
Santa Gertrudes/First	63.0	188.0	590.0	1864.0	69.0
East of First Street	58.0	173.0	543.0	1717.0	69.0
Hadley Avenue					
Glengarry/Whittier Blvd.	0.0	0.0	126.0	393.0	63.0
Whittier Blvd./Hoover	0.0	67.0	203.0	638.0	65.0
Hoover/Pickering	0.0	76.0	234.0	736.0	65.0
Pickering/Greenleaf	0.0	72.0	218.0	687.0	65.0
Greenleaf/Painter	0.0	62.0	187.0	589.0	64.0
East of Painter Avenue	0.0	0.0	111.0	344.0	62.0

TABLE 8-2
FUTURE ROADWAY NOISE LEVELS (continued)

Road Segment	Distance from Roadway Centerline to CNEL (feet)				
	70 CNEL	65 CNEL	60 CNEL	55 CNEL	CNEL at 50' from CL
Washington					
West of Whittier Blvd.	0.0	129.0	404.0	1275.0	68.0
Lambert Avenue					
Santa Fe Springs/Laurel	0.0	115.0	357.0	1128.0	67.0
Laurel/Calmada	0.0	144.0	450.0	1422.0	68.0
Calmada/Gunn	0.0	158.0	497.0	1570.0	69.0
Gunn/Colima	55.0	163.0	512.0	1618.0	69.0
Colima/Scott	0.0	115.0	357.0	1128.0	67.0
Scott/Santa Gertrudes	0.0	153.0	481.0	1521.0	69.0
Santa Gertrudes/Beach Blvd.	0.0	139.0	435.0	1373.0	68.0
Colima					
South of Whittier Blvd.	0.0	153.0	482.0	1523.0	69.0
Whittier Blvd./Mar Vista	61.0	183.0	574.0	1815.0	69.0
North of Mar Vista	63.0	207.0	652.0	2060.0	70.0
Santa Fe					
South of Lambert Rd.	0.0	81.0	249.0	785.0	66.0
Lambert/Whittier Blvd.	0.0	86.0	265.0	843.0	66.0
Norwalk					
South of Whittier Blvd.	0.0	95.0	295.0	932.0	66.0
Whittier Blvd/El Rancho	0.0	81.0	249.0	785.0	66.0
El Rancho/Beverly Blvd.	0.0	95.0	295.0	932.0	66.0
Pickering					
Whittier Blvd/Penn	0.0	65.0	202.0	639.0	65.0
Penn/Hadley	0.0	74.0	233.0	737.0	66.0
Hadley/Beverly Blvd	0.0	77.0	241.0	762.0	66.0
Greenleaf					
South of Whittier Blvd.	0.0	62.0	187.0	589.0	64.0
Whittier Blvd/La Cuarta	0.0	91.0	280.0	883.0	66.0
La Cuarta/Franklin	0.0	115.0	357.0	1128.0	67.0
Franklin/Beverly Blvd.	0.0	0.0	126.0	393.0	63.0



DAVID EVANS AND ASSOCIATES, INC.

City of Whittier

GENERAL PLAN

EXHIBIT 8-2
FUTURE NOISE CONTOURS

TABLE 8-2
FUTURE ROADWAY NOISE LEVELS (continued)

Road Segment	Distance from Roadway Centerline to CNEL (feet)				
	70 CNEL	65 CNEL	60 CNEL	55 CNEL	CNEL at 50' from CL
Mills Avenue	0.0	58.0	172.0	540.0	64.0
Santa Gertrudes Avenue	0.0	95.0	295.0	932.0	66.0

Source: FHWA Traffic Noise Prediction Model, David Evans & Associates, Inc., 1992.

The City of Whittier should focus it noise reduction programs in areas within the future 70 dB noise contour and on noise sensitive future uses within the future 65 dB noise contour. The area along Whittier Boulevard and the northern segment of Colima Road are within 70 dB CNEL. At buildout, noise levels will impact commercial, industrial, and high density residential uses along Whittier Boulevard and residential uses along Colima Road, absent any noise control measures. The 65 dB CNEL is found along most major streets in the City. Noise sensitive uses along these corridors include schools, hospitals, libraries, nursing homes, and residential developments. Specific programs to help reduce the adverse impacts of traffic noise are identified in Table 8-1 discussed in Section 10.

Chapter 8.32 - NOISE CONTROL

Sections:

Footnotes:
*--- (**2**) ---*
***Editor's note—** Ord. No. 2943, § 1, adopted Jan. 12, 2010, repealed the former Chapter 8.32, §§ 8.32.010—8.32.120, and enacted a new Chapter 8.32 as set out herein. The former Chapter 8.32 pertained to similar subject matter and derived from Ord. 2747, § 2(part), adopted in 1999; and Ord. 2869, § 29, adopted in 2006.*

8.32.010 - Purpose.

A. The making and creation of loud, unnecessary or unusual noises within the limits of the city is a condition which has existed for some time and the extent and volume of such noises is increasing.

B. The making, creation or maintenance of such loud, unnecessary, unnatural or unusual noises which are prolonged, unusual and unnatural in their time, place and use affect and are a detriment to public health, comfort, convenience, safety, welfare and prosperity of the residents of the city; and

C. The necessity in the public interest for the provisions of this chapter is declared as a matter of legislative determination and public policy, and it is further declared that the provisions of this chapter are for the purpose of securing and promoting the public health, comfort, convenience, safety, welfare, prosperity and peace and quiet of the city and its inhabitants.

(Ord. No. 2943, § 1, 1-12-10)

8.32.020 - Definitions.

A. "City" means the city of Whittier.

B. "City manager" means the city manager of the city of Whittier, or his/her designee.

C. "Chief of police" means the chief of the Whittier Police Department.

D. "Construction" means any site preparation, assembly, erection, substantial repair, alteration, demolition, or similar action.

E. "Continuous sound" means and denotes a sound the intensity of which remains essentially constant during a given period of time.

F. "Director" means the director of community development of the city of Whittier, or his/her designee.

G. "Daytime" denotes the local time of day between the hours of seven a.m. and nine p.m. on weekdays and between the hours of nine a.m. and nine p.m. on Saturdays, Sundays and local legal holidays.

H. "Emergency" means any occurrence or set of circumstances involving actual or imminent physical trauma or property damage, which demands immediate action.

I. "Emergency signal device" means any audible warning device, such as a gong, whistle or siren or any air horn or any similar device, used for emergency purposes or alert the public or emergency personnel to the existence of an emergency.

J. "Emergency work" means any work performed for the purpose of preventing or alleviating the physical trauma or property damage threatened or caused by an emergency.

K. "Mobile source" means any moving sound source on a public right-of-way.

L. "Motor vehicle" means a vehicle that is self-propelled. "Motor vehicle" includes, but is not limited to, passenger

cars, trucks, truck-trailers, semi-trailers, campers, motorcycles, minibikes, go-carts, snowmobiles, mopeds, amphibious craft on land, dune buggies, all-terrain vehicles or racing vehicles. "Motor vehicle" does not include a self-propelled wheelchair, motorized tricycle, or motorized quadricycle, if operated by a person who, by reason of physical disability, is otherwise unable to move about as a pedestrian.

1. "Motorcycle" means (1) a motor vehicle having a seat or saddle for the use of the rider, designed to travel on not more than three wheels in contact with the ground; (2) a motor vehicle that has four wheels in contact with the ground, two of which are a functional part of a sidecar, is a motorcycle if the vehicle otherwise comes within the definition of subdivision (1); (3) a farm tractor is not a motorcycle; (4) a three-wheeled motor vehicle that otherwise meets the requirements of subdivision (1), has a partially or completely enclosed seating area for the driver and passenger, is used by local public agencies for the enforcement of parking control provisions, and is operated at slow speeds on public streets, is not a motorcycle. However, a motor vehicle described in this subdivision shall comply with the applicable sections of this code imposing equipment installation requirements on motorcycles.
2. "All-terrain vehicle (ATV)" means a motor vehicle that is all of the following: (1) designed for operation off of the highway by an operator with no more than one passenger; (2) fifty inches or less in width; (3) nine hundred pounds or less unladen weight; (4) suspended on three or more low-pressure tires; (5) has a single seat designed to be straddled by the operator, or a single seat designed to be straddled by the operator and a seat for no more than one passenger; (6) has handlebars for steering control.

M. "Nighttime" means those hours excluded from the definition of "daytime."

N. "Person" means any individual, corporation, partnership firm or any legal successor, representative or agent of the foregoing.

O. "Public right-of-way" means any street, avenue, boulevard, highway, alley, sidewalk or public space which has been dedicated for use by the general public and the dedication of which has been accepted by the appropriate governmental entity.

P. "Real property boundary" means an imaginary line along the ground surface, and its vertical extension, which separates the real property owned by one person from that owned by another person, but it does not include intra-building real property division.

Q. "Small power equipment" means any motorized or engine powered device, including but not limited to lawn mowers, lawn and garden tools, leaf blowers, riding lawn mowers and power saws, but excluding motor vehicles.

R. "Sound amplifying equipment" means any machine or device for the amplification of the human voice, music or any other sound. Sound amplifying equipment as used herein shall not be construed as including standard automobile radio when used and primarily audible only by the occupants of the vehicle in which installed or warning devices on authorized emergency vehicles or horns or other warning devices on other vehicles used only for traffic safety purposes.

S. "Special event" means assemblages, public meetings, and other special events including festivals, ceremonies, addresses, speeches, exhibits, performances, plays, circuses, musical events, athletic events that occur at a particular place and for a limited duration of time.

T. "Stadium event" means events held at a facility with permanent seating and accommodations for more than one thousand spectators.

U. "Stationary source" means any sound source operating or occurring on any public or private property.

V. "Weekday" means any day Monday through Friday, which is not a legal holiday.

(Ord. No. 2943, § 1, 1-12-10)

8.32.030 - Loud, annoying and unnecessary noises prohibited.

A. It shall be unlawful for any person to willfully make or continue, or cause to be made or continued, any excessive or unreasonable noise, which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

B. The standard that may be considered in determining whether a violation of the provisions of this section exists may include, but not be limited to, the following:

1. The level of the noise;
2. Whether the nature of the noise is usual or unusual;
3. Whether the origin of the noise is natural or unnatural;
4. The level and intensity of the background noise, if any;
5. The proximity of the noise to residential sleeping facilities;
6. The nature and zoning of the area within which the noise emanates;
7. The density of the inhabitation of the area within which the noise emanates;
8. The time of the day and night the noise occurs;
9. The duration of the noise, including whether it is of a temporary or short-term nature;
10. Whether the noise is recurrent, intermittent, or constant; and
11. Whether the noise is produced by a commercial or noncommercial activity.

(Ord. No. 2943, § 1, 1-12-10)

8.32.040 - Loud, annoying and unnecessary noises—Enumerated.

The city council finds the following to be loud, annoying and unnecessary noises, which are hereby declared to be in violation of this chapter; this list is deemed illustrative and shall not be construed in any way to be an exclusive or all-inclusive list of the noises prohibited by this chapter, it being the intent and purpose of this chapter to include and prohibit all noises of the character described in this section. Where no specific distance is set for the determination of audibility, reference to noise disturbance shall be deemed to mean plainly audible at a distance of one hundred feet from the real property boundary of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on the public right-of-way, public property, or private property open to the public. References to "adjacent" or "neighboring" residences or units in this section shall mean those residences or units located next to or in close proximity to the source of the noise, and no specific distance standard shall be required for such locations.

A. Animals and Birds. The keeping of any animal or bird that causes frequent or long continued noise plainly audible by inhabitants or occupants of any adjacent or neighboring residential properties or units, or plainly audible at a distance of fifty feet from any nonresidential building or structure, shall be presumed to disturb the comfort and repose of any person in the vicinity and shall be prima facie evidence of a violation of this chapter; however, nothing in this subsection shall be construed to apply to occasional noises emanating from a legally operated kennel, animal hospital or veterinary clinic, humane society or pound.

B. Defect in Vehicle or Load. The use of any automobile, motorcycle or other vehicle so out of repair, so loaded or in such manner as to create loud and unnecessary grating, grinding, rattling or other noise.

C. Motor Vehicle Noises. Any loud or annoying noise made by any motor vehicle and not reasonably necessary to the operation thereof under the circumstances, including, but not limited to, noise caused

by screeching of tires; racing or accelerating the engine, except in the course of repair or adjustment thereof during nighttime hours; backfiring the engine; or the emission of exhaust from the engine tail pipe or muffler.

D. Domestic Power Tools. Operating or permitting the operation of any mechanically powered saw, sander, drill, grinder, lawn or garden tool, snow blower, small power equipment, or similar device used outdoors in residential areas during nighttime hours so as to cause a noise disturbance across a residential real property boundary.

E. Engine-Repair and Testing. It shall be unlawful for any person to repair, rebuild or test any engine so as to create a noise disturbance, during nighttime hours.

F. Horns and Signaling Devices. The sounding of any horn or signaling device on any automobile, motor vehicle or any other vehicle on any street or public street except as a danger warning; the creation by means of any such signaling device of any unreasonably and unnecessarily loud or harsh sounds; the sounding of any such signaling device for an unnecessarily or unreasonably long period of time; or the use of any horn, whistle or other device operated by engine exhaust

G. Loudspeakers/Public Address System. The using, operating or playing, or permitting to be played, used or operated, of any radio receiving set, musical instrument, audio system, loudspeaker, sound amplifying equipment or other machine or device for the producing or reproducing of sound, which casts sound upon the streets for the purpose of commercial or noncommercial advertising, or attracting the attention of the public to any building, structure or attraction (1) such that the sound there from creates a loud, annoying or unnecessary noise across a residential area; or (2) on a public right-of-way or public space, except as provided in Section 8.32.080.

H. Radios, Musical Instruments and Similar Devices. The using, operating or playing, or the permitting to be played, used or operated, any stereo, radio receiving set, musical instrument, audio system, television set or any like machine or device that produces or reproduces sound, in such manner as to disturb at any time, the peace, quiet and comfort of the neighboring inhabitants, with louder volume than is necessary for convenient hearing for the person or persons who are in the room, vehicle, chamber or place in which the machine or device is operated and who are voluntarily listening thereto. The operation of any such machine or device during nighttime hours in such a manner as to be plainly audible by inhabitants or occupants of any adjacent or neighboring residential properties or units, or plainly audible at a distance of fifty feet from any nonresidential building, structure, vehicle or place in which it is located, shall be prima facie evidence of a violation of this subsection.

I. Yelling and Shouting. Loud or raucous yelling, shouting, hooting, whistling or singing in the public streets or in public places, or any other place, so as to annoy or disturb the quiet, comfort or repose of persons in any office or inhabitants or occupants of any neighboring or adjacent dwelling, hotel, apartment building or other kind of residence. The occurrence of such conduct during nighttime hours shall be prima facie evidence of a violation of this subsection.

J. Noise in Proximity to Schools, Courts, Churches or Hospitals. The creation of any excessive noise on any street adjacent to a school, institution of learning, church or court while such facilities are in use, or adjacent to any hospital which unreasonably interferes with the work of the institution or which disturbs or unduly annoys patients of the hospital; however, this subsection shall not apply unless conspicuous signs are displayed in such streets indicating that there is located in the vicinity a school, hospital, court or church.

K. Hawkers and Peddlers. The shouting or crying of peddlers, hawkers or vendors, so as to disturb the

peace and quiet of the neighborhood.

L. Erection or demolition of buildings, excluding owner resident additions or remodeling, and the grading and excavation of land including the use of blasting, the start up and use of heavy equipment such as dump trucks and graders and the use of jack hammers except on weekdays between the hours of seven a.m. and six p.m. and on Saturdays eight a.m. to five p.m. The city manager may waive any or all of the provisions of this subsection in cases of urgent necessity, or in the interest of public health and safety. The provisions of this subsection may also be waived or modified pursuant to a conditional use permit or other development entitlement processed and issued in accordance with the applicable city requirements and procedures.

M. Late night disturbances of any kind that are plainly audible by inhabitants or occupants of any adjacent or neighboring residential properties or units, or are plainly audible at a distance of fifty feet from a real property boundary, that occur during nighttime hours, shall be prima facie evidence of violation of this subsection.

(Ord. No. 2943, § 1, 1-12-10)

8.32.050 - Mixed use developments.

Due to the unique nature of mixed use developments, as are designated as such in a specific plan, violations of this chapter shall be determined pursuant to Section 8.32.030. The distance requirements of Section 8.32.040 shall not apply to mixed use neighborhoods.

(Ord. No. 2943, § 1, 1-12-10)

8.32.060 - Assessment of noise disturbance.

Any law enforcement officer, code enforcement officer, or other employee or official designated by the city manager or designee who hears a noise or sound that is plainly audible, as defined in Sections 8.32.030 and 8.32.040, in violation of this chapter, may enforce this chapter and shall assess the noise or sound according to the following standards:

A. The primary means of detection shall be by means of the official's normal hearing faculties, not artificially enhanced.

B. The official shall first attempt to have a direct line of sight and hearing to the vehicle or real property from which the sound or noise emanates so that the official can readily identify the offending source of the sound or noise and the distance involved. If the official is unable to have a direct line of sight and hearing to the vehicle or real property from which the sound or noise emanates, then the official shall confirm the source of the sound or noise by approaching the suspected vehicle or real property until the official is able to obtain a direct line of sight and hearing, and confirm the source of the sound or noise that was heard at the place of the original assessment of the sound or noise.

C. The official need not be required to identify words, song titles, artists, or lyrics in order to establish a violation.

(Ord. No. 2943, § 1, 1-12-10)

8.32.070 - Defenses.

In any prosecution for a violation of this chapter, it shall be a sufficient defense that the noise of which complaint is made resulted from reasons beyond the control of the person charged with making the noise, unless the noise is due to a reparable or otherwise curable cause which was not diligently cured or repaired; that it was necessary to make the noise to prevent injury to persons or property or that the creation or emission of the noise was done by or with a device, such as a horn, siren or muffler, installed and operated pursuant to state law and meeting the requirements thereof.

(Ord. No. 2943, § 1, 1-12-10)

8.32.080 - Exemptions and waivers.

The following uses of any activity shall be exempt from noise level regulations:

A. Emergency Exemption. The provisions of this chapter shall not apply to: (1) the emission of sound for the purpose of alerting persons to the existence of an emergency, or (2) the emission of sound in the performance of emergency work performed by authorized personnel for the purpose of securing the immediate health and safety of the public.

B. Warning Devices. Warning devices necessary for the protection of public safety, as for example, police, fire and ambulance sirens, and train horns, shall be exempted from the provisions of this chapter.

C. Outdoor Activities. The provisions of this chapter shall not apply to outdoor gatherings, public dances, shows and sporting and entertainment events, provided such events are conducted pursuant to a permit or license issued by the city relative to the staging of the events.

D. Any noise resulting from activities of a temporary duration permitted by law and/or for which a waiver has been granted by the director.

E. The unamplified human voice, except as provided for in Section 8.32.040(I) (Yelling and Shouting).

F. Bells, chimes, carillons while being used for religious purposes or in conjunction with religious services, or for national celebrations or public holidays.

G. Scheduled stadium events, subject, however, to frequency and time limitations, parades, school activities, including band practice sessions.

H. Refuse collection trucks, provided the trucks do not collect refuse between the hours of nine p.m. and five a.m.

I. Permitted construction during daytime hours.

J. Federal or State Preempted Activities. Any other activity to the extent regulation thereof has been preempted by state or federal law shall be exempted from the regulations of this chapter.

K. Any activity by the city or any governmental entity.

L. Any activity that is protected by the First Amendment, provided that it takes place during daytime hours, except subject to time, place manner restrictions and/or any regulations imposed by a required or issued permit for such activity.

(Ord. No. 2943, § 1, 1-12-10)

8.32.090 - Thirty-day waivers.

A. Any person seeking a waiver pursuant to this section shall file an application with the director. The application shall contain information which demonstrates that bringing the source of sound or activity for which the waiver is sought into compliance with this chapter would constitute an unreasonable hardship on the

applicant, on the community, or on other persons. The application shall be accompanied by a fee, as established by council resolution.

B. A separate application shall be filed for each noise source; provided, however, that several mobile sources under common ownership, or several fixed sources on a single property may be combined into one application.

C. Before a waiver application can be considered, the applicant must show proof that he/she has provided notice of the waiver application to all affected persons within a four-foot radius of the anticipated noise source.

D. Any individual who claims to be adversely affected by allowance of the waiver may file a statement with the director containing any information to support his or her claim. If at any time the director finds that a sufficient controversy exists regarding an application, a public hearing will be held.

E. In determining whether to grant or deny the application, the director shall balance denial as a hardship on the applicant against: (1) the adverse impact on the health, safety and welfare of other persons affected; (2) the adverse impact on property affected; and (3) any other adverse impacts of granting the waiver. Applicants and persons contesting the waiver shall be required to submit such information as the director may reasonably require.

F. A waiver shall be denied if the director determines that the balance of hardships weighs against the applicant and that granting the waiver shall substantially adversely impact the health, safety and welfare of other persons affected, including the quiet enjoyment of property. The decision on the waiver application shall be in writing, explaining the reasons therefor. The notice of denial shall issue within ten days of the application.

G. Waivers shall be granted by notice to the applicant containing all necessary conditions, including a time limit on the permitted activity. Acceptance of the waiver implies acceptance of any conditions imposed. Noncompliance with any condition of the waiver shall terminate the waiver and subject the person holding it to those provisions of this chapter for which the waiver was granted. Notification that a waiver has been granted shall issue in writing within ten days of the application.

H. A waiver will not exceed thirty days from the date on which it becomes effective. Any request for extension of time to a waiver beyond the original thirty days or for modification of other material conditions of the waiver shall require a new application.

(Ord. No. 2943, § 1, 1-12-10)

8.32.100 - Special events not subject to waiver requirement.

A special event scheduled to take place either on public or private property is exempt from the requirement of obtaining a noise disturbance waiver, provided the special event is not scheduled to last more than forty-eight hours. Notwithstanding this exemption, the organizer or sponsor of an event must obtain and comply with any and all necessary city permits.

(Ord. No. 2943, § 1, 1-12-10)

8.32.110 - Request for appeal hearing.

Any person may contest the denial of a waiver by submitting a written request to the city manager for an appeal hearing, clearly stating the reasons for the appeal, within ten days from the date of service of the denial notice. A hearing before the city manager shall be set for a date that is not less than five, nor more than twenty days from the date the request for hearing is filed. The person requesting the hearing (the appellant) shall be notified of the time and place set for the hearing at least five days prior to the date of the hearing.

(Ord. No. 2943, § 1, 1-12-10)

8.32.120 - Appeal hearing process.

A. No hearing to contest the denial of a waiver before the city manager shall be held unless and until a written request for a hearing has been timely submitted and any applicable fines have been deposited.

B. The city manager shall only consider evidence that is relevant to whether the grounds for the denial of the waiver are valid and supported by evidence.

C. The appellant shall be given the opportunity to testify and present witnesses and any relevant evidence concerning the denial of the waiver.

D. The formal rules of evidence shall not apply. All relevant evidence may be considered, and the city manager has the discretion to exclude evidence if he/she finds such evidence to be irrelevant or needlessly repetitive. The city manager has the authority to cut off presentation of evidence if he/she reasonably believes that the evidence being presented is irrelevant or needlessly repetitive.

E. 1. The failure of the appellant to appear at the appeal hearing shall be considered an abandonment of the appeal and consent to its denial.

2. Notwithstanding the above, upon a showing of good cause by the appellant, the city manager may excuse the appellant's failure to appear at the hearing and reschedule the hearing. Under no circumstances shall the hearing be rescheduled more than one time.

F. The notice of denial of the waiver and any additional documents submitted by the director shall constitute prima facie evidence of the respective facts contained in those documents.

G. At least five days prior to the hearing, the appellant shall be provided with copies of reports and any other documents submitted or relied upon by the director. No other discovery disclosure is required.

H. The city manager may continue the hearing and request additional information from the director or the appellant prior to issuing a written decision.

(Ord. No. 2943, § 1, 1-12-10)

8.32.130 - City manager's decision—Right to judicial review.

A. After considering all of the testimony and evidence submitted at the hearing, the city manager shall issue a written decision to sustain or overrule the denial of the waiver and shall list in the decision the reasons for that decision. The decision of the city manager shall be final.

B. If the decision is to overrule the denial, suspension or revocation, then the director shall issue the waiver within ten days of the service of the decision.

C. The time for a challenge to the city manager's decision in a court of law is governed by California Code of Civil Procedure Sections 1094.5 and 1094.6. Notice of the city manager's decision shall include citation to California Code of Civil Procedure Sections 1094.5 and 1094.6.

D. The city manager's written decision shall be served on the appellant within ten days from the date of the hearing by mailing to the appellant by certified mail, return receipt requested, via the U.S mail. Service of the hearing officer's decision shall be deemed to have been completed on the date of mailing.

(Ord. No. 2943, § 1, 1-12-10)

8.32.140 - Exceptions for time to comply.

A. Within ninety days following the effective date of this chapter, the owner of any commercial or industrial activity, the source of sound that constitute a violation of this chapter, may apply to the director for an exception to the ti comply with the provisions of this chapter. The director shall have the authority to grant an exception not to exce hundred eighty days from the effective date of this chapter.

B. Appeals. Appeals of an adverse decision under this section shall be made to the city manager. The city manager's review shall be limited to whether the decision is supported by substantial evidence. The appeal procedures outlined in this chapter shall apply to appeals under this section.

(Ord. No. 2943, § 1, 1-12-10)

8.32.150 - Violation—Enforcement and penalties.

A. A violation of this chapter shall be punished as prescribed in Section 1.08.010.

B. A violation of this chapter is hereby declared to be a public nuisance, which may be abated by the city in the manner provided by the laws of the State of California and the ordinances of this city for the abatement of a public nuisance, and the city shall also have all rights provided by such laws and ordinances to recover damages suffered from any such nuisance and to recover from the owner of the property upon which such nuisance is located the cost of any abatement thereof by the city.

C. Joint and Several Responsibility. In addition to the person causing the offending sound, the owner, tenant or lessee of property, or a manager, overseer or agent, or any other person lawfully entitled to possess the property from which the offending sound is emitted at the time the offending sound is emitted, shall be responsible for compliance with this chapter if the additionally responsible party knows or should have known of the offending noise disturbance. It shall not be a lawful defense to assert that some other person caused the sound. The lawful possessor or operator of the premises shall be responsible for operating or maintaining the premises in compliance with this chapter and may be cited regardless of whether or not the person actually causing the sound is also cited. Notwithstanding the foregoing, an owner, manager, overseer or agent of property from which offending sound is emitted and who does not reside on such property shall not be cited for violation of the provisions of this chapter unless such owner, manager, overseer or agent has previously been informed in writing by a law enforcement officer, code enforcement officer, or other employee or official designated by the city manager or designee of the existence of an offending noise disturbance on the property, and such disturbance continues, occurs again or is otherwise not reasonably or fully rectified or brought into compliance with this chapter.

(Ord. No. 2943, § 1, 1-12-10)

3.10 Noise

This section evaluates the potential for noise and groundborne vibration impacts to result from implementation of the proposed Enhanced Watershed Management Program (EWMP). This includes the potential for the proposed program to result in impacts associated with a substantial temporary and/or permanent increase in ambient noise levels in the vicinity of the proposed program; exposure of people in the vicinity of the proposed program to excessive noise and groundborne vibration levels; and whether this exposure is in excess of applicable, established standards in the EWMP areas of Los Angeles County (County). Mitigation measures to reduce potential noise and vibration impacts are identified, where warranted.

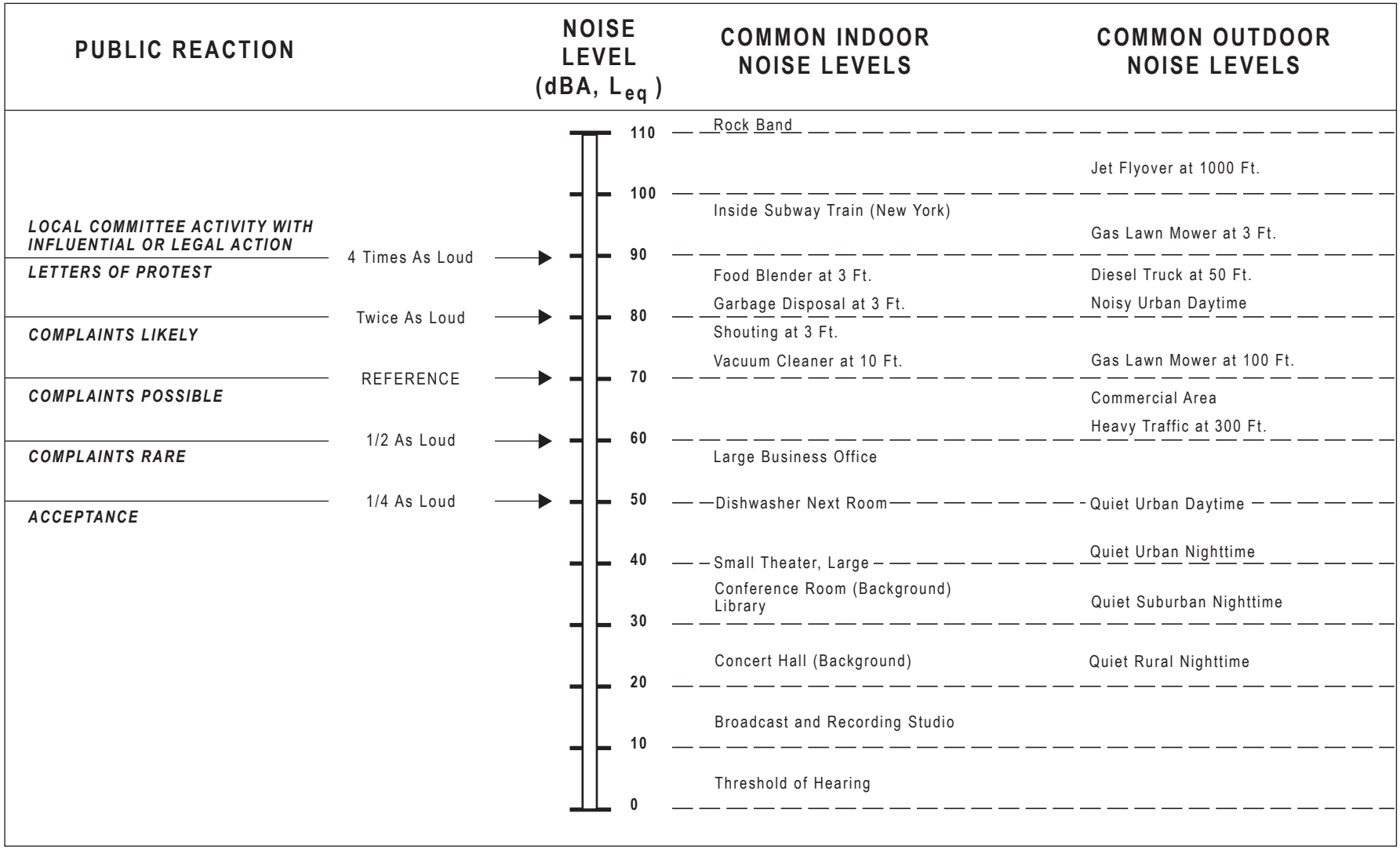
3.10.1 Principles of Noise and Vibration

Noise Principles and Descriptors

Noise is generally defined as unwanted sound, traveling in the form of waves from a source and exerting a sound pressure level (referred to as sound level) that is measured in decibels (dB), which is the standard unit of sound amplitude measurement. The dB scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound, with 0 dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude. When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that deemphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to extremely low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). A-weighting follows an international standard methodology of frequency deemphasis and is typically applied to community noise measurements. Some representative noise sources and their corresponding A-weighted noise levels are shown in **Figure 3.10-1**.



SOURCE: ESA

LA County PEIR EWMP . 140474

Figure 3.10-1
Effects of Noise on People

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in Figure 3.10-1 are representative of measured noise at a given instant in time; however, they rarely persist consistently over a long period of time. Rather, community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration, single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment change the community noise level from instant to instant, thus requiring that noise exposure be measured over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The L_{eq}, or equivalent sound level, is used to describe noise over a specified period of time in terms of a single numerical value; the L_{eq} of a time-varying signal and that of a steady signal are the same if they deliver the same acoustic energy over a given time. The L_{eq} may also be referred to as the average sound level.

L_{max}: The maximum, instantaneous noise level experienced during a given period of time.

L_{min}: The minimum, instantaneous noise level experienced during a given period of time.

L_{50}: The noise level that is equaled or exceeded 50 percent of the specified time period. The L_{50} represents the median sound level.

L_{90}: The noise level that is equaled or exceeded 90 percent of the specified time period. The L_{90} is generally considered to be representing the background or ambient level of a noise environment.

L_{dn}: Also termed the day-night average noise level (DNL), the L_{dn} is the average A-weighted noise level during a 24-hour day, obtained after an addition of 10 dBA to measured noise levels between the hours of 10:00 P.M. and 7:00 A.M. to account nighttime noise sensitivity.

CNEL: CNEL, or Community Noise Equivalent Level, is the average A-weighted noise level during a 24-hour day that is obtained after an addition of 5 dBA to measured noise levels between the hours of 7:00 P.M. and 10:00 P.M. and after an addition of 10 dBA to noise levels between the hours of 10:00 P.M. and 7:00 A.M. to account for noise sensitivity in the evening and nighttime, respectively.

Effects of Noise on People

Noise is generally loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity that is a nuisance or disruptive. The effects of noise on people can be placed into four general categories:

- Subjective effects (e.g., dissatisfaction, annoyance)
- Interference effects (e.g., communication, sleep, and learning interference)
- Physiological effects (e.g., startle response)
- Physical effects (e.g., hearing loss)

Although exposure to high noise levels has been demonstrated to cause physical and physiological effects, the principal human responses to typical environmental noise exposure are related to subjective effects and interference with activities. Interference effects of environmental noise refer to those effects that interrupt daily activities and include interference with human communication activities, such as normal conversations, watching television, telephone conversations, and interference with sleep. Sleep interference effects can include both awakening and arousal to a lesser state of sleep. With regard to the subjective effects, the responses of individuals to similar noise events are diverse and are influenced by many factors, including the type of noise, the perceived importance of the noise, the appropriateness of the noise to the setting, the duration of the noise, the time of day and the type of activity during which the noise occurs, and individual noise sensitivity.

Overall, there is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction on people. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted (i.e., comparison to the ambient noise environment). In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships generally occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived.
- Outside of the laboratory, a 3 dBA change in noise levels is considered to be a barely perceivable difference.
- A change in noise levels of 5 dBA is considered to be a readily perceivable difference.
- A change in noise levels of 10 dBA is subjectively heard as doubling of the perceived loudness.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a nonlinear fashion; hence, the decibel scale was developed.

Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for hard sites and 7.5 dBA for soft sites for each doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver, such as asphalt or concrete surfaces or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the change in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement (Caltrans, 1998).

Fundamentals of Vibration

As described in the Federal Transit Administration's (FTA's) *Transit Noise and Vibration Impact Assessment* (FTA, 2006), groundborne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, groundborne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving, and operation of heavy earthmoving equipment.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The relationship of PPV to RMS velocity is expressed in terms of the "crest factor," defined as the ratio of the PPV amplitude to the RMS amplitude. PPV is typically a factor of 1.7 to 6 times greater than RMS vibration velocity (FTA, 2006). The decibel notation acts to compress the range of numbers required to describe vibration. Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The effects of groundborne vibration include movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most

projects, with the occasional exception of blasting and pile-driving during construction. Annoyance from vibration often occurs when the vibration levels exceed the threshold of perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings. The FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 in/sec PPV (FTA, 2006).

In residential areas, the background vibration velocity level is usually around 50 VdB (approximately 0.0013 in/sec PPV). This level is well below the vibration velocity level threshold of perception for humans, which is approximately 65 VdB. A vibration velocity level of 75 VdB is considered to be the approximate dividing line between barely perceptible and distinctly perceptible levels for many people (FTA, 2006).

3.10.2 Environmental Setting

Existing Noise Sources

As the EWMP areas are located throughout Los Angeles County, existing noise levels in the EWMP areas would consist of various noise sources typically associated with highly urbanized environments. These noise sources commonly include, but are not limited to, traffic, construction work, commercial operations, human activities, emergency vehicles, aircraft overflights, etc. Of these sources, transportation-related noise associated with vehicular traffic is generally the constant, dominating noise source that comprises an urban environment's ambient noise levels. Vehicular traffic creates noise on roads and highways in residential, commercial, industrial, and mixed-use areas. Aside from vehicular traffic on roadways, other transportation-related noise sources include rail/urban transit systems and airports, which are also located throughout the County. Noise generated by stationary sources in an urban environment are generally associated with heating, ventilating, and air conditioning (HVAC) equipment for residential and commercial uses as well as other similar and larger mechanical stationary equipment for industrial uses. The use of larger-capacity stationary mechanical equipment by industrial uses generally results in higher noise levels in industrial-zoned areas when compared with residential or retail areas.

Existing Groundborne Vibration Levels

Aside from periodic construction work that may occur throughout the County where the EWMP areas are located, other sources of groundborne vibration in the County include heavy-duty vehicular travel (e.g., refuse trucks, delivery trucks, and transit buses) on local roadways. Trucks and buses traveling at a distance of 50 feet typically generate groundborne vibration velocity levels of around 63 VdB (approximately 0.006 in/sec PPV), and these levels could reach 72 VdB (approximately 0.016 in/sec PPV) where trucks pass over bumps in the road (FTA, 2006). In terms of PPV levels, a heavy-duty vehicle traveling at a distance of 50 feet can result in a vibration level of approximately 0.001 inch per second.

Sensitive Receptors

Noise-sensitive receptors are locations where people reside or where the presence of unwanted sound could adversely affect or disrupt the types of activities associated with the land use at the

location. Land uses such as residences, hotels, schools, rest homes, libraries, churches, and hospitals are generally more sensitive to noise than commercial and industrial land uses. As such, these types of land uses are considered to be noise-sensitive receptors. Given that the majority of the County is highly urbanized with a variety of land use types (e.g., open space, residential, commercial, mixed-use, public and semi-public, and industrial uses), and that the proposed program would be located in various watersheds across the County that span multiple jurisdictions, existing noise-sensitive uses such as residences, schools, guest lodging, hospitals, churches, parks, etc. would be located within and in proximity to the EWMP areas. As described in Section 3.9, *Land Use and Agriculture,* of this Program Environmental Impact Report (PEIR), many of the EWMP areas, including Ballona Creek, Beach Cities, Dominguez Channel, and Marina del Rey, have residential uses as the predominant land use.

3.10.3 Regulatory Setting

Federal

Federal Noise Standards

There are no federal noise standards that directly regulate environmental noise related to the construction or operation of the proposed program. With regard to noise exposure and workers, the Office of Safety and Health Administration (OSHA) regulations safeguard the hearing of workers exposed to occupational noise. Federal regulations also establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 Code of Federal Regulations (CFR), Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

Federal Transit Authority Vibration Standards

The FTA has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. The vibration damage criteria adopted by the FTA are shown in **Table 3.10-1**.

TABLE 3.10-1
CONSTRUCTION VIBRATION DAMAGE CRITERIA

Building Category	PPV (in/sec)
I. Reinforced concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

SOURCE: FTA, 2006.

In addition, the FTA has also adopted standards associated with human annoyance for groundborne vibration impacts for the following three land-use categories: Vibration Category 1 – High Sensitivity, Vibration Category 2 – Residential, and Vibration Category 3 – Institutional.

The FTA defines Category 1 as buildings where vibration would interfere with operations within the building, including vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. Vibration-sensitive equipment includes, but is not limited to, electron microscopes, high-resolution lithographic equipment, and normal optical microscopes. Category 2 refers to all residential land uses and any buildings where people sleep, such as hotels and hospitals. Category 3 refers to institutional land uses such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference.

Under conditions where there are an infrequent number of events per day, the FTA has established thresholds of 65 VdB for Category 1 buildings, 80 VdB for Category 2 buildings, and 83 VdB for Category 3 buildings.[1] Under conditions where there are an occasional number of events per day, the FTA has established thresholds of 65 VdB for Category 1 buildings, 75 VdB for Category 2 buildings, and 78 VdB for Category 3 buildings.[2] No thresholds have been adopted or recommended for commercial and office uses.

State

California Department of Health Services Noise Standards

The California Department of Health Services (DHS) has established guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. These guidelines for land use and noise exposure compatibility are shown in **Table 3.10-2**. In addition, Section 65302(f) of the California Government Code requires each county and city in the State to prepare and adopt a comprehensive long-range general plan for its physical development, with Section 65302(g) requiring a noise element to be included in the general plan. The noise element must: (1) identify and appraise noise problems in the community; (2) recognize Office of Noise Control guidelines; and (3) analyze and quantify current and projected noise levels.

The State of California also establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State pass-by standard is consistent with the federal limit of 80 dBA. The State pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

1 "Infrequent events" is defined by the FTA as being fewer than 30 vibration events of the same kind per day.
2 "Occasional events" is defined by the FTA as between 30 and 70 vibration events of the same source per day.

TABLE 3.10-2
COMMUNITY NOISE EXPOSURE (L_{dn} OR CNEL)

Land Use	Normally Acceptable[a]	Conditionally Acceptable[b]	Normally Unacceptable[c]	Clearly Unacceptable[d]
Single-family, Duplex, Mobile Homes	50 - 60	55 - 70	70 - 75	above 75
Multi-Family Homes	50 - 65	60 - 70	70 - 75	above 75
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 - 70	60 - 70	70 - 80	above 80
Transient Lodging – Motels, Hotels	50 - 65	60 - 70	70 - 80	above 75
Auditoriums, Concert Halls, Amphitheaters	---	50 - 70	---	above 70
Sports Arena, Outdoor Spectator Sports	---	50 - 75	---	above 75
Playgrounds, Neighborhood Parks	50 - 70	---	67 - 75	above 75
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 - 75	---	70 - 80	above 80
Office Buildings, Business and Professional Commercial	50 - 70	67 - 77	above 75	---
Industrial, Manufacturing, Utilities, Agriculture	50 - 75	70 - 80	above 75	---

[a] Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

[b] Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

[c] Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

[d] Clearly Unacceptable: New construction or development should generally not be undertaken.

SOURCE: Office of Planning and Research, State of California Genera Plan Guidelines, October 2003 (in coordination with the California Department of Health Services).

State Vibration Standards

There are no state vibration standards applicable to the proposed program. Moreover, according to the California Department of Transportation's (Caltrans') *Transportation and Construction Vibration Guidance Manual* (2013), there are no official Caltrans standards for vibration. However, this manual provides guidelines for assessing vibration damage potential to various types of buildings, ranging from 0.08 to 0.12 in/sec PPV for extremely fragile historic buildings, ruins, and ancient monuments to 0.50 to 2.0 in/sec PPV for modern industrial/commercial buildings. The vibration criteria for structural damage and human annoyance established in Caltrans' *Transportation and Construction Vibration Guidance Manual* (2013) are shown in **Tables 3.10-3** and **3.10-4**, respectively.

TABLE 3.10-3
CALTRANS VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

NOTE: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile-drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, Transportation and Construction Vibration Guidance Manual, September 2013.

TABLE 3.10-4
CALTRANS VIBRATION ANNOYANCE POTENTIAL CRITERIA

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

NOTE: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile-drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, Transportation and Construction Vibration Guidance Manual, September 2013.

Local

County of Los Angeles General Plan Noise Element

The California Government Code Section 65302(g) requires that a noise element be included in the General Plan of each county and city in the state. The Noise Element of the County of Los Angeles General Plan was established as a planning tool to develop strategies and action programs that address the multitude of noise sources and issues throughout the County. The noise guidelines used by the County are based on the community noise compatibility guidelines established by the State of California DHS (refer to Table 3.10-2), as described above. Specific regulations that implement these guidelines are set forth in the Los Angeles County Municipal Code as discussed below.

County of Los Angeles Municipal Code

Chapter 12.08, Noise Control, of the County of Los Angeles Municipal Code serves as the Noise Ordinance for the County and establishes noise standards to control unnecessary, excessive, and annoying noise and vibration in the County. Within Chapter 12.08 of the Los Angeles County Code, Section 12.08.380 assigned the following noise zones for receptor properties in the County:

1. Noise Zone 1 – Noise-sensitive areas
2. Noise Zone 2 – Residential properties
3. Noise Zone 3 – Commercial properties
4. Noise Zone 4 – Industrial properties

With respect to operational noise, Section 12.08.390 of the Noise Ordinance established exterior noise levels that should be applied to all receptor properties within a designated noise zone in the County. These exterior noise levels are shown in **Table 3.10-5**.

TABLE 3.10-5
COUNTY OF LOS ANGELES EXTERIOR NOISE STANDARDS BY NOISE ZONES

Noise Zone	Designated Noise Zone Land Use (Receptor Property)	Time Interval	Exterior Noise Level (dBA)
I	Noise-sensitive area	Anytime	45
II	Residential properties	10:00 P.M. to 7:00 A.M. (nighttime)	45
		7:00 A.M. to 10:00 P.M. (daytime)	50
III	Commercial properties	10:00 P.M. to 7:00 A.M. (nighttime)	55
		7:00 A.M. to 10:00 P.M. (daytime)	60
IV	Industrial properties	Anytime	70

SOURCE: County of Los Angeles Ordinance No. 11743, Section 12.08.390.

The exterior noise levels shown in Table 3.10-5 are meant to be further applied as noise standards based on the duration of the noise; i.e., the louder the noise, the shorter the time it is allowed to last. The Noise Ordinance uses a number of noise metrics to define the permissible noise levels. These metrics include L_{50}, L_{25}, $L_{8.3}$, $L_{1.7}$, and L_{max}, and are based upon a 1-hour timeframe which indicates exceedances of 50, 25, 8.3, and 1.7 percent of the time, plus the maximum sound level during that time period. The following noise standards should be applied to the exterior noise levels provided in Table 3.10-5:

- Standard No. 1 shall be the exterior noise level that may not be exceeded for a cumulative period of more than 30 minutes in any hour. Standard No. 1 shall be the applicable noise

level from Table 3.10-5; or, if the ambient L_{50} exceeds the forgoing level, then the ambient L_{50} becomes the exterior noise level for Standard No. 1.

- Standard No. 2 shall be the exterior noise level that may not be exceeded for a cumulative period of more than 15 minutes in any hour. Standard No. 2 shall be the applicable noise level from Table 3.10-5 plus 5 dB(A); or, if the ambient L_{25} exceeds the forgoing level, then the ambient L_{25} becomes the exterior noise level for Standard No. 2.
- Standard No. 3 shall be the exterior noise level that may not be exceeded for a cumulative period of more than 5 minutes in any hour. Standard No. 3 shall be the applicable noise level from Table 3.10-5 plus 20 dB(A); or, if the ambient $L_{8.3}$ exceeds the forgoing level, then the ambient $L_{8.3}$ becomes the exterior noise level for Standard No. 3.
- Standard No. 4 shall be the exterior noise level that may not be exceeded for a cumulative period of more than one minute in any hour. Standard No. 4 shall be the applicable noise level from Table 3.10-5 plus 15 dB(A); or, if the ambient $L_{1.7}$ exceeds the forgoing level, then the ambient $L_{1.7}$ becomes the exterior noise level for Standard No. 4.
- Standard No. 5 shall be the exterior noise level that may not be exceeded for any period of time. Standard No. 5 shall be the applicable noise level from Table 3.10-5 plus 20 dB(A); or, if the ambient L_0 exceeds the forgoing level, then the ambient L_0 becomes the exterior noise level for Standard No. 5.

Section 12.08.400 of the Noise Ordinance also established interior noise standards for dwelling units in the County based on the allowable interior noise levels shown in **Table 3.10-6**.

TABLE 3.10-6
COUNTY OF LOS ANGELES INTERIOR NOISE STANDARDS FOR DWELLING UNITS

Noise Zone	Designated Land Use	Time Interval	Allowable Interior Noise Level (dBA)
All	Multifamily	10:00 P.M. to 7:00 A.M.	40
	Residential	7:00 A.M. to 10:00 P.M.	45

SOURCE: County of Los Angeles Ordinance No. 11743, Section 12.08.400.

As indicated in Section 12.08.400, no person is allowed to operate or cause to be operated within a dwelling unit any source of sound, or allow the creation of any noise, that causes the noise level when measured inside a neighboring receiving dwelling unit to exceed the following standards:

- Standard No. 1. The applicable interior noise level from Table 3.10-6 for cumulative period of more than 5 minutes in any hour.
- Standard No. 2. The applicable interior noise level from Table 3.10-6 plus 5 dB(A) for a cumulative period of more than 1 minute in any hour.
- Standard No. 3. The applicable interior noise level from Table 3.10-6 plus 10 dB(A) or the maximum measured ambient noise level for any period of time.

With respect to construction noise in the County, Section 12.08.440 of the Noise Ordinance prohibits the operation of any tools or equipment used between weekday hours of 7:00 P.M. and 7:00 A.M., or at any time on Sundays or holidays, that will create a noise disturbance across a residential or commercial real-property line. The only exceptions would be emergency work or public safety projects (Section 12.08.0570, part 5, exemption H, Public Health and Safety Activities) or by variance issued by the health officer. Additionally, both the working hours and maximum levels of equipment and activity noise that are allowable from both mobile and stationary equipment in the County are defined by land use and shown in **Table 3.10-7**.

TABLE 3.10-7
COUNTY OF LOS ANGELES CONSTRUCTION NOISE STANDARDS

Allowable Work Dates & Hours	Residential Structures					
	Single-Family		Multi-Family		Semi-Residential/Commercial	
	Mobile Equipment [a]	Stationary Equipment [b]	Mobile Equipment [a]	Stationary Equipment [b]	Mobile Equipment [a]	Stationary Equipment [b]
Daily 7:00 A.M. to 8:00 P.M.[c]	75 dBA	60 dBA	80 dBA	65 dBA	85 dBA	70 dBA
Daily 8:00 P.M. to 7:00 A.M.[d]	60 dBA	50 dBA	64 dBA	55 dBA	70 dBA	60 dBA
	Business Structures					
Daily[d]	85 dBA					

[a] Represents maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days).
[b] Represents maximum noise level for repetitively scheduled and relatively long-term operation (periods of 10 days or more).
[c] Exception for Sundays and legal holidays.
[d] Includes all day Sunday and legal holidays.

SOURCE: County of Los Angeles Ordinance No. 11743, Section 12.08.440.

County of Los Angeles Groundborne Vibration Regulation

With respect to vibration, the County Noise Ordinance identifies a presumed perception threshold of 0.01 inches per second over the range of 1 to 100 hertz . Section 12.08.560 of the County Noise Ordinance prohibits the operation of any device that creates vibration above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet (46 meters) from the source if on a public space or public right-of-way.

City General Plans and Municipal Codes

The EWMP areas associated with the proposed program are located in multiple jurisdictions of Los Angeles County, which aside from the County also includes 46 cities. Each of these cities has their own independent General Plan and municipal code that regulates noise levels from various sources within their jurisdictional boundaries. Given that a project-level analysis for each structural BMP proposed in the EWMPs is beyond the scope of this PEIR, an extensive listing of

the noise policies and regulations of each of the participating Permittees is not provided in this PEIR.

3.10.4 Impact Assessment

The proposed program's potential impacts have been assessed using the California Environmental Quality Act (CEQA) Guidelines Appendix G Checklist. The following sections discuss the key issue areas identified in the CEQA Guidelines with respect to the proposed program's potential effect due to noise and vibration.

Thresholds of Significance

For the purposes of this PEIR and consistency with Appendix G of the CEQA Guidelines, the proposed program would have a significant noise impact if it would:

- Result in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels.
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within 2 miles of a public airport or public use airport, expose people residing or working in the area to excessive noise levels.
- For a project located in the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

Program Impact Discussion

Noise Levels Standard Exceedance

Impact 3.10-1: The proposed program could result in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Structural (Regional, Centralized, and Distributed) BMPs

Construction

Implementation of the proposed program would involve the installation of structural control measures that would be constructed as BMPs to reduce the impact of stormwater and non-stormwater on receiving water quality within the EWMP areas. Construction of the various structural BMPs proposed in the EWMP is anticipated to occur intermittently over the program implementation period. The proposed locations of individual BMPs are subject to change throughout the EWMP planning process. Definitive construction equipment lists, material lists,

construction methods, construction schedules, and workforce details would be developed in the future as specific structural BMP projects are finalized according to the EWMPs.

The construction noise impacts associated with each individual structural BMP project would be short-term in nature and limited to the period of time when construction activity is taking place for that particular project. Construction activity noise levels at and near each structural BMP construction site would fluctuate depending on the particular type, number, and duration of usage of various pieces of construction equipment. Generally, development at each BMP construction site may require the use of heavy construction equipment for activities such as site preparation, grading and excavation, and the physical development of the structural BMP. Development activities could also involve the use of smaller power tools, generators, and other sources of noise. During each stage of development for each individual structural BMP project, there would be a different mix of equipment operating and noise levels would vary based on the amount and type of equipment in operation and the location of the activity.

The USEPA has compiled data for outdoor noise levels for typical construction activities. These data are presented in **Table 3.10-8**. The noise levels shown in Table 3.10-8 represent composite noise levels associated with typical construction activities, which take into account both the number of pieces and spacing of heavy construction equipment that are typically used during each phase of construction. These noise levels would diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 84 dBA L_{eq} measured at 50 feet from the noise source to the receptor would reduce to 78 dBA L_{eq} at 100 feet from the source to the receptor, and reduce by another 6 dBA L_{eq} to 72 dBA L_{eq} at 200 feet from the source to the receptor. **Table 3.10-9** shows the typical maximum and average noise levels produced by various types of construction equipment.

TABLE 3.10-8
TYPICAL OUTDOOR CONSTRUCTION NOISE LEVELS

Construction Phase	Noise Level (dBA, $_{Leq}$)[a]
Ground Clearing	84
Excavation	89
Foundations	78
Erection	85
Finishing	89

[a] Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

SOURCE: USEPA, 1971.

TABLE 3.10-9
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Maximum Noise Level (dBA, L_{max} at 50 feet)	Average Noise Level (dBA, L_{eq} at 50 feet)[a]
Air Compressor	78	74
Backhoe	78	74
Chain Saw	84	77
Compactor (Ground)	83	76
Concrete Mixer Truck	79	75
Concrete Pump Truck	81	74
Concrete Saw	90	83
Crane	81	73
Dozer	82	78
Dump Truck	77	73
Excavator	81	77
Generator	82	79
Flat-Bed Truck	74	70
Front End Loader	79	75
Grader	85	81
Jack Hammer	89	82
Pavement Scarafier	90	83
Paver	77	74
Pneumatic Tool	85	82
Pumps	81	78
Roller	80	73
Scraper	84	80
Tractor	84	80
Vacuum Street Sweeper	82	72
Vibratory Concrete Mixer	80	73
Welder/Torch	74	70

[a] The average noise levels for the construction equipment at 50 feet were calculated from the maximum noise levels using the usage factors for each piece of equipment provided in the FHWA's RCNM.

SOURCE: FHWA, 2006.

As shown in Table 3.10-8, excavation activities can typically generate noise levels of 89 dBA L_{eq} at 50 feet from the construction noise source. Given the urbanized environment of many of the EWMP areas, many of the structural BMP projects would be constructed in proximity or adjacent to existing land uses, including those that are noise-sensitive uses. The construction activities for each structural BMP project would temporarily expose their respective existing off-site surrounding land uses to increased noise levels while construction activities are ongoing. This would be most applicable to the distributed BMPs, which are most likely to be implemented in

high-density urban, commercial, industrial, and transportation areas where they will either replace or improve upon existing stormwater infrastructure. While the larger centralized and regional structural BMP projects (which require a larger footprint than the distributed BMPs) would occur mostly in existing open space areas that may have greater buffer distances to nearby surrounding land uses, there may still be incidences where a proposed centralized or regional structural BMP site could be located directly adjacent to an existing noise-sensitive land use. Where a proposed structural BMP site is located adjacent or in proximity to existing land uses, the construction activities at the structural BMP site would expose these off-site land uses to increased temporary and intermittent noise levels that are substantially greater than existing ambient noise levels in the area.

While construction noise levels may be exempt from the noise regulations of most of the implementing agencies, there may also be instances where some of the implementing agencies have their own established numerical noise standard for construction noise levels, such as the County of Los Angeles, City of Los Angeles, and the City of El Segundo. Although it is generally anticipated that construction of the structural BMPs would comply with such construction noise standards, there may be scenarios where these local numerical noise standards could potentially be exceeded. As a result, under these conditions, construction noise impacts would be potentially significant.

Mitigation Measure NOISE-1 would reduce construction noise impacts, requiring construction activities to be conducted in accordance with the applicable local noise regulations and standards, the implementation of noise reduction devices and techniques during construction activities, and advance notification to the surrounding noise-sensitive receptors of a structural BMP site about upcoming construction activities and their hours of operation. This would serve to reduce the construction-related noise levels at nearby receptors to the maximum extent feasible. However, as discussed previously, for implementing agencies that have established numerical noise standards for construction activities, there may be circumstances where the construction activities for a particular structural BMP project may exceed established thresholds. . Because of the possibility that certain structural BMP projects may exceed noise levels established by their respective local jurisdictions, this impact would be significant and unavoidable.

Operation

As discussed previously, the majority of the distributed, centralized, and regional structural BMPs would operate passively in the sense that they would not require the use of mechanized stationary equipment for their operation; however, it is anticipated that some of the centralized and regional structural BMPs would require the use of irrigation pump stations and associated components to divert the collected stormwater. At these structural BMP sites, operational noise levels would result from operation of the pumps and associated components. However, as a stationary noise source, the pumping equipment used at a structural BMP site would be required to comply with the applicable exterior noise standards and/or regulations established by the implementing agency that has jurisdiction over the site. Additionally, it is anticipated that many of the irrigation pumps would be located belowground and all other noise-producing components (e.g., generators) would be enclosed. As such, the noise levels generated by on-site pumps and associated components at structural BMP sites associated with the project would not exceed or violate noise standards and regulations established by implementing agencies in the EWMP areas. **Mitigation Measure NOISE-2** would be implemented to ensure that the operational noise levels occurring at structural

BMP sites that employ stationary mechanized equipment would be required to adhere and comply with the local noise standards established by the responsible implementing agency. Thus, with implementation of Mitigation Measure NOISE-2, operational noise impacts would be less than significant.

Mitigation Measures:

NOISE-1: The implementing agencies shall implement the following measures during construction as needed:

- Include design measures necessary to reduce the construction noise levels to where feasible. These measures may include noise barriers, curtains, or shields.
- Place noise-generating construction activities (e.g., operation of compressors and generators, cement mixing, general truck idling) as far as possible from the nearest noise-sensitive land uses.
- Locate stationary construction noise sources as far from adjacent noise-sensitive receptors as possible.
- If construction is to occur near a school, the construction contractor shall coordinate the with school administration in order to limit disturbance to the campus. Efforts to limit construction activities to non-school days shall be encouraged.
- For the centralized and regional BMP projects located adjacent to noise-sensitive land uses, identify a liaison for these off-site sensitive receptors, such as residents and property owners, to contact with concerns regarding construction noise and vibration. The liaison's telephone number(s) shall be prominently displayed at construction locations.
- For the centralized and regional BMP projects located adjacent to noise-sensitive land uses, notify in writing all landowners and occupants of properties adjacent to the construction area of the anticipated construction schedule at least 2 weeks prior to groundbreaking.

NOISE-2: All structural BMPs that employ mechanized stationary equipment that generate noise levels shall comply with the applicable noise standards established by the implementing agency with jurisdiction over the structural BMP site. The equipment shall be designed with noise-attenuating features (e.g., enclosures) and/or located at areas (e.g., belowground) where nearby noise-sensitive land uses would not be exposed to a perceptible noise increase in their noise environment.

Significance Determination: Significant and unavoidable with mitigation for construction; less than significant with mitigation for operations. (The application of these mitigation measures to specific BMP types and categories are identified in Table 3.10-11.)

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no impacts related to construction noise.

Mitigation Measures: None required

Significance Determination: No impact

Groundborne Vibration

Impact 3.10-2: The proposed program could result in exposure of persons to, or generation of, excessive groundborne vibration.

Structural (Regional, Centralized, and Distributed) BMPs

Construction of many of the structural BMP projects would include activities such as site preparation, grading, and excavation, which would have the potential to generate low levels of groundborne vibration. Persons residing and working in an area located in proximity to a structural BMP site could be exposed to some degree of groundborne vibration or groundborne noise levels related to construction activities. Ground vibrations from construction activities only rarely reach the levels that can damage structures, but they can be perceived in the audible range and be felt in buildings very close to a construction site.

Construction activities for the various structural BMP projects would have the potential to impact their respective nearby land uses. Given the urbanized environment of the County, the potential exists for construction of a structural BMP project, especially the distributed structural BMPs that would most likely be implemented in existing high-density areas, to be located within 25 feet of an adjacent noise-sensitive land use. Consequently, existing off-site receptors that are located immediately adjacent to these structural BMP sites could be exposed to some degree of groundborne vibration. The various PPV and RMS velocity (in VdB) levels for the types of construction equipment that could operate during the construction of the structural BMP projects are identified in **Table 3.10-10**. Based on the information presented in Table 3.10-11, vibration velocities could reach as high as approximately 0.089-inch-per-second PPV at 25 feet from the operation of a large bulldozer. This corresponds to an RMS velocity level (in VdB) of 87 VdB at 25 feet from the large bulldozer.

For the types of construction methods required to construct the various structural BMPs, vibration levels at nearby sensitive receptors would not approach the Caltrans damage thresholds presented in Table 3.10-3. Although some vibration may be experienced locally, vibration-related impacts from implementation of structural BMPs would be less than significant.

TABLE 3.10-10
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Construction Equipment	PPV at 25 feet (inches/second)	RMS at 25 feet (VdB)
Large Bulldozer	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

SOURCE: FTA, 2006.

Mitigation Measures: None required

Significance Determination: Less than significant

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no impacts related to groundborne vibration or noise.

Mitigation Measures: None required

Significance Determination: No impact

Permanent Ambient Noise Levels Increase

Impact 3.10-3: The proposed program could result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Structural (Regional, Centralized, and Distributed) BMPs

Given that the majority of the distributed, centralized, and regional structural BMPs would operate in a passive manner (i.e., would not require the use of mechanized stationary equipment) after their construction, no operational noise levels would be generated by these structural BMPs. However, it is anticipated that that some of the centralized and regional structural BMPs would require the use of irrigation pump stations and associated components to divert the collected stormwater. At these structural BMP sites, noise levels generated from the long-term operation of the pumps and associated components could result in increased noise levels in the surrounding noise environment. However, as discussed under Impact 3.10-1, the pumping equipment used at a structural BMP site would be required to comply with the applicable exterior noise standards and/or regulations established by the implementing agency that has jurisdiction over the site. In addition, many of the irrigation pumps would primarily be located belowground and all other noise-producing components (e.g., generators) would be enclosed. Furthermore, with implementation of **Mitigation Measure NOISE-1**,which would require the stationary mechanized equipment employed at each structural BMP site to comply with the local noise

standards established by the responsible implementing agency with jurisdiction over the site, and for the equipment to be designed and located in a manner such that neighboring sensitive land uses would not be exposed to a perceptible noise increase in their environment (**Mitigation Measure NOISE-2)**, this impact would be less than significant.

Mitigation Measures: Implementation of **Mitigation Measures NOISE-1** and **NOISE-2**

Significance Determination: Less than significant with mitigation (The application of these mitigation measures to specific BMP types and categories are identified in Table 3.10-11.)

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the operation of new facilities. Consequently, there would be no impacts related to a substantial permanent increase in ambient noise levels resulting from implementation of the non-structural BMPs.

Mitigation Measures: None required

Significance Determination: No impact

Temporary Ambient Noise Levels Increase

Impact 3.10-4: The proposed program could result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Structural (Regional, Centralized, and Distributed) BMPs

During construction of the distributed, centralized, and regional structural BMPs, temporary or periodic increases in noise levels in and around each structural BMP site would result from the operation of construction equipment. As discussed in Impact 3.10-1, the construction activities for each individual structural BMP project would expose their respective nearby existing land uses to increased noise levels. Where a structural BMP site is located within 25 feet of an existing noise-sensitive land use, the resulting construction noise levels at that existing land use could reach as high as 95 dBA L_{eq} during excavation activities, which would result in a substantial noise increase over existing ambient noise levels at that existing land use. Although implementation of **Mitigation Measure NOISE-1** would reduce construction noise levels associated with the proposed program to the maximum extent feasible, under circumstances where future structural BMP sites are located immediately adjacent to existing sensitive land uses, the noise impacts related to a substantial temporary or periodic increase in ambient noise levels above levels existing without the structural BMPs would remain significant. Therefore, this impact for the proposed program would be significant and unavoidable. The identification of a significant and unavoidable program-level impact in this PEIR for the proposed program, however, does not preclude the finding of future less-than-significant impacts for individual structural BMP projects.

Mitigation Measures: Implementation of **Mitigation Measure NOISE-1**

Significance Determination: Significant and unavoidable with mitigation (The application of this mitigation measure to specific BMP types and categories are identified in Table 3.10-11.)

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no impacts related to a substantial temporary or periodic increase in ambient noise levels resulting from implementation of the non-structural BMPs.

Mitigation Measures: None required

Significance Determination: No impact

Exposure of Excessive Airport Noise Levels

Impact 3.10-5: For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within 2 miles of a public airport or public use airport, implementation of the proposed program could expose people residing or working in the area to excessive noise levels.

Structural (Regional, Centralized, and Distributed) BMPs

The Distributed, Centralized, and Regional structural BMPs that would be implemented as part of the proposed program would serve to reduce the impact of stormwater and non-stormwater on receiving water quality and address the water quality priorities as defined by the MS4 Permit. While some of these structural BMPs could potentially occur at paved areas of airports (excluding the landing areas and taxiways, which have specific aircraft support requirements) and the undeveloped buffer zones around airports, no permanent residents or workers would be introduced to these areas under the proposed program. While maintenance and inspection of the structural BMPs would occur, these activities would only occur periodically and would be minimal during project operations. Therefore the proposed program would not introduce permanent future residents or workers to the structural BMP areas and as such would not expose persons to excessive airport-related noise levels. Exposure to airport noise would be a less than significant impact.

Mitigation Measures: None required

Significance Determination: Less than significant

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no impacts related to the exposure of people to excessive noise levels associated with a public airport or public use airport.

Mitigation Measures: None required

Significance Determination: No impact

Exposure of Persons to Excessive Private Airstrip Noise Levels

Impact 3.10-6: For a project located in the vicinity of a private airstrip, the proposed program could expose people residing or working in the project area to excessive noise levels.

Structural (Regional, Centralized, and Distributed) BMPs

As discussed under Impact 3.10-5 above, the proposed program would not introduce permanent future residents or workers to the structural BMP areas. Thus, while future structural BMP sites could be located in the vicinity of private airstrips, no persons would be exposed to excessive airstrip-related noise levels. Exposure to airstrip-related noise would be a less than significant impact.

Mitigation Measures: None required

Significance Determination: Less than significant

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no impacts related to the exposure of people to excessive noise levels associated with a private airstrip.

Mitigation Measures: None required

Significance Determination: No impact

Cumulative Impact Discussion

Structural (Regional, Centralized, and Distributed) BMPs

Noise and vibration are both defined as localized phenomena that significantly reduce in magnitude as distance from the source increases. The structural BMPs associated with the proposed program would be constructed in multiple jurisdictions of Los Angeles County, which aside from the County also includes 46 cities and LACFCD. As such, these structural BMP projects would be generally spread over a large geographic area within the County. These structural BMPs in combination with other current and planned projects in the County would result in an increase in construction-related noise levels, which would temporarily increase the ambient noise levels of the existing noise environment in areas where a construction project would occur. This would result in significant and unavoidable impacts for construction, but less than significant for operation.

Mitigation Measures: Implementation of **Mitigation Measures NOISE-1** and **NOISE-2**

Significance Determination: Significant and unavoidable with mitigation for construction; Less than significant for operation. (The application of these mitigation measures to specific BMP types and categories are identified in Table 3.10-11.)

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no new facilities that would contribute to cumulative noise impacts. As such, no impacts related to cumulative noise would occur.

Mitigation Measures: None required

Significance Determination: No impact

Summary of Impact Assessment

Table 3.10-11 shows a summary of the structural BMPs requiring mitigation.

TABLE 3.10-11
SUMMARY OF NOISE IMPACTS REQUIRING MITIGATION MEASURES

	Thresholds of Significance				
Regional BMPs	**Exceed Noise Standards**	**Vibration**	**Ambient Noise**	**Exposure to Airport Noise**	**Cumulative Impacts**
Applicable Mitigation Measures:	**NOISE-1; NOISE-2**	**None Required**	**NOISE-1**	**None Required**	**NOISE-1; NOISE-2**
Regional Detention and Infiltration	Yes	Yes	Yes	No	Yes
Regional Capture, Detention and Use	Yes	Yes	Yes	No	Yes
Centralized BMP					
Bioinfiltration	Yes	Yes	Yes	No	Yes
Constructed Wetlands	No	No	No	No	No
Treatment/Low Flow Diversions	No	No	No	No	No
Creek, River, Estuary Restoration	No	No	No	No	No
Distributed BMPs					
Site Scale Detention	No	No	No	No	No
LID – Infiltration/Filtration BMPs – Porous Pavement, Green Streets, Bioswale/Filter Strips, downspout disconnects	No	No	No	No	No
LID – Green Infrastructure – Capture and Use – Cisterns, Rain Barrels, Green roofs, Planter Boxes	No	No	No	No	No
Flow through Treatment BMPs	No	No	No	No	No
Source Control Treatment BMPs (catch basin inserts/screens, hydrodynamic separators, gross solids removal devices)	No	No	No	No	No
Low Flow Diversions	No	No	No	No	No

NOTE: These conclusions are based on typical size and function of BMPs.

Chapter 12.08 - NOISE CONTROL

Parts:

Part 1 - GENERAL PROVISIONS

12.08.010 - Title for citation.

12.08.020 - Declaration of policy—Nuisances deemed misdemeanors.

Part 2 - DEFINITIONS

12.08.030 - Terminology—Conformity with ANSI standards.

12.08.040 - Definitions applicable.

12.08.050 - Agricultural property.

12.08.060 - Ambient noise histogram.

Part 1 - GENERAL PROVISIONS

12.08.010 - Title for citation.

The ordinance codified in this chapter may be cited as the "noise control ordinance of the county of Los Angeles."

(Ord. 11778 § 2 (Art. 1 § 101), 1978: Ord. 11773 § 2 (Art. 1 § 101), 1978.)

12.08.020 - Declaration of policy—Nuisances deemed misdemeanors.

A. In order to control unnecessary, excessive and annoying noise and vibration in the county of Los Angeles, it is declared to be the policy of the county to prohibit such noise and vibration generated from any sources as specified in this chapter. It shall be the policy of the county to maintain quiet in those areas which exhibit low noise levels and to implement programs aimed at reducing noise in those areas within the county where noise levels are above acceptable values.

B. It is determined that certain noise levels and vibration are detrimental to the public health, welfare and safety and contrary to public interest, and therefore the board of supervisors of the county does ordain and declare that creating, maintaining, causing or allowing to be created, caused or maintained any noise or vibration in a manner prohibited by or not in conformity with the provisions of this chapter is a public nuisance and shall be punishable as such.

(Ord. 11778 § 2 (Art. 2 § 201), 1978: Ord. 11773 § 2 (Art. 2 § 201), 1978.)

Part 2 - DEFINITIONS

12.08.030 - Terminology—Conformity with ANSI standards.

All terminology used in this chapter, not defined in this Part 2, shall be in conformance with applicable publications of the American National Standards Institute (ANSI) or its successor body.

(Ord. 11778 § 2 (Art. 3 § 301), 1978: Ord. 11773 § 2 (Art. 3 § 301), 1978.)

12.08.040 - Definitions applicable.

The following words, phrases and terms as used in this chapter shall have the meanings as indicated in this Part 2.

(Ord. 11778 § 2 (Art. 3 § 302 (part)), 1978: Ord. 11773 § 2 (Art. 3 § 302 (part)), 1978.)

12.08.050 - Agricultural property.

"Agricultural property" means a parcel of real property which is undeveloped for any use other than agricultural purposes.

(Ord. 11778 § 2 (Art. 3 § 302(a)), 1978: Ord. 11773 § 2 (Art. 3 § 302(a)), 1978.)

12.08.060 - Ambient noise histogram.

"Ambient noise histogram" means the composite of all noise from sources near and far, excluding the alleged intrusive noise source. In this context, the ambient noise histogram shall constitute the normal or existing level of environmental noise at a given location.

(Ord. 11778 § 2 (Art. 3 § 302(b)), 1978: Ord. 11773 § 2 (Art. 3 § 302(b)), 1978.)

12.08.070 - A-weighted sound level.

"A-weighted sound level" means the sound level in decibels as measured on a soundlevel meter using the A-weighting network. The level so read is designated dB (A) or dBA.

(Ord. 11778 § 2 (Art. 3 § 302(c)), 1978: Ord. 11773 § 2 (Art. 3 § 302(c)), 1978.)

12.08.080 - Commercial property.

"Commercial property" means a parcel of real property which is developed and used either in part or in whole for commercial purposes. In cases of multiple land uses of any property, the county zoning classification of such property pursuant to county Ordinance 1494, as amended, shall be applicable. (See Title 22 of this code.)

(Ord. 11778 § 2 (Art. 3 § 302(d)), 1978: Ord. 11773 § 2 (Art. 3 § 302(d)), 1978.)

12.08.090 - Construction.

"Construction" means any site preparation, assembly, erection, substantial repair, alteration, or similar action, for or of public or private rights-of-way, structures, utilities, or similar property.

(Ord. 11778 § 2 (Art. 3 § 302(e)), 1978: Ord. 11773 § 2 (Art. 3 § 302(e)), 1978.)

12.08.100 - Cumulative period.

"Cumulative period" means an additive period of time composed of individual time segments which may be continuous or interrupted.

(Ord. 11778 § 2 (Art. 3 § 302(f)), 1978: Ord. 11773 § 2 (Art. 3 § 302(f)), 1978.)

12.08.110 - Decibel.

"Decibel" means a unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base of 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals.

(Ord. 11778 § 2 (Art. 3 § 302(g)), 1978: Ord. 11773 § 2 (Art. 3 § 302(g)), 1978.)

12.08.120 - Dwelling unit.

"Dwelling unit" means a single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

(Ord. 11778 § 2 (Art. 3 § 302(h)), 1978: Ord. 11773 § 2 (Art. 3 § 302(h)), 1978.)

12.08.130 - Emergency machinery, vehicle or alarm.

"Emergency machinery, vehicle or alarm" means any machinery, vehicle or alarm used, employed, performed or operated in an effort to protect, provide or restore safe conditions in the community or for the citizenry, or work by private or public utilities when restoring utility service.

(Ord. 11778 § 2 (Art. 3 § 302(i)), 1978: Ord. 11773 (Art. 3 § 302(i)), 1978.)

12.08.140 - Emergency work.

"Emergency work" means any work performed for the purpose of preventing or alleviating the physical trauma or property damage threatened or caused by an emergency.

(Ord. 11778 § 2 (Art. 3 § 302(j)), 1978: Ord. 11773 (Art. 3 § 302(j)), 1978.)

12.08.150 - Fixed noise source.

"Fixed noise source" means a stationary device which creates sounds while fixed or motionless, including but not limited to residential, agricultural, industrial and commercial machinery and equipment, pumps, fans, compressors, air conditioners and refrigeration equipment.

(Ord. 11778 § 2 (Art. 3 § 302(k)), 1978: Ord. 11773 (Art. 3 § 302(k)), 1978.)

12.08.160 - Grading.

"Grading" means any excavating or filling of earth material or any combination thereof conducted at a site to prepare said site for construction or other improvements thereon.

(Ord. 11778 § 2 (Art. 3 § 302(1)), 1978: Ord. 11773 (Art. 3 § 302(1)), 1978.)

12.08.170 - Health care institution.

"Health care institution" means any hospital, convalescent home, or other similar facilities which provide health care, medical treatment, room, board or other services for the ill, retarded or convalescent.

(Ord. 11778 § 2 (Art. 3 § 302(m)), 1978: Ord. 11773 (Art. 3 § 302(m)), 1978.)

12.08.180 - Health officer.

"Health officer" means the director of the department of public health of the county of Los Angeles, or his duly authorized representative.

(Ord. 2006-0040 § 106, 2006: Ord. 11778 § 2 (Art. 3 § 302(n)), 1978: Ord. 11773 (Art. 3 § 302(n)), 1978.)

12.08.190 - Impulsive noise.

"Impulsive noise" means a sound of short duration, usually less than one second and of high intensity, with an abrupt onset and rapid decay.

(Ord. 11778 § 2 (Art. 3 § 302(o)), 1978: Ord. 11773 (Art. 3 § 302 (o)), 1978.)

12.08.200 - Industrial property.

"Industrial property" means property which is developed and used either in part or in whole for manufacturing purposes. In cases of multiple land uses of any property, the county zoning classification of such property pursuant to county Ordinance 1494, as amended, shall be applicable. (See Title 22 of this code.)

(Ord. 11778 § 2 (Art. 3 § 302(p)), 1978: Ord. 11773 § 2 (Art. 3 § 302(p)), 1978.)

12.08.210 - Intrusive noise.

"Intrusive noise" means that alleged offensive noise which intrudes over and above the existing ambient noise at the receptor property.

(Ord. 11778 § 2 (Art. 3 § 302(q)), 1978: Ord. 11773 § 2 (Art. 3 § 302(q)), 1978.)

12.08.220 - Mobile noise source.

"Mobile noise source" means any noise source other than a fixed noise source.

(Ord. 11778 § 2 (Art. 3 § 302(r)), 1978: Ord. 11773 § 2 (Art. 3 § 302(r)), 1978.)

12.08.230 - Noise disturbance.

"Noise disturbance" means an alleged intrusive noise which violates an applicable noise standard as set forth in this chapter.

(Ord. 11778 § 2 (Art. 3 § 302(s)), 1978: Ord. 11773 § 2 (Art. 3 § 302(s)), 1978.)

12.08.240 - Noise histogram.

"Noise histogram" means a graphical representation of the distribution of frequency of occurrence of all noise levels near and far measured over a given period of time.

(Ord. 11778 § 2 (Art. 3 § 302(u)), 1978: Ord. 11773 § 2 (Art. 3 § 302(u)), 1978.)

12.08.250 - Noise level (L).

"Noise level (L_N)" means that noise level expressed in decibels which exceeds the specified (L_N) value as a percentage of total time measured. For instance, an L_{25} noise level means that noise level which is exceeded 25 percent of the time measured.

(Ord. 11778 § 2 (Art. 3 § 302 (v)), 1978: Ord. 11773 § 2 (Art. 3 § 302(v)), 1978.)

12.08.260 - Noise-sensitive zone.

"Noise-sensitive zone" means any area designated pursuant to Part 4 of this chapter for the purpose of ensuring exceptional quiet.

(Ord. 11778 § 2 (Art. 3 § 302(t)), 1978: Ord. 11773 § 2 (Art. 3 § 302(t)), 1978.)

12.08.270 - Noise zone.

"Noise zone" means any defined area or region of a generally consistent land use, as described in Section 12.08.380.

(Ord. 11778 § 2 (Art. 3 § 302(w)), 1978: Ord. 11773 § 2 (Art. 3 § 302(w)), 1978.)

12.08.280 - Person.

"Person" means any individual, firm, association, partnership, joint venture, or corporation.

(Ord. 11778 § 2 (Art. 3 § 302(x)), 1978: Ord. 11773 § 2 (Art. 3 § 302(x)), 1978.)

12.08.290 - Powered model vehicle.

"Powered model vehicle" means any self-propelled airborne, waterborne or landborne plane, vessel or vehicle which is not designed to carry individuals, including but not limited to any model airplane, boat, car or rocket.

(Ord. 11778 § 2 (Art. 3 § 302(y)), 1978: Ord. 11773 § 2(Art. 3 § 302(y)), 1978.)

12.08.300 - Public right-of-way.

"Public right-of-way" means any street, avenue, boulevard, highway, sidewalk or alley, or similar place, which is owned or controlled by a governmental entity.

(Ord. 11778 § 2 (Art. 3 § 302(z)), 1978: Ord. 11773 § 2 (Art. 3 § 302(z)), 1978.)

12.08.310 - Pure tone noise.

"Pure tone noise" means any sound which can be judged as audible as a single pitch or a set of single pitches by the health officer, for the purposes of this chapter, a pure tone shall exist if the one-third octave band sound-pressure level in the band with the tone exceeds the arithmetic average of the sound-pressure levels of the two contiguous one-third octave bands by 5 dB for center frequencies of 500 Hertz and above, and by 8 dB for center frequencies between 160 and 400 Hertz, and by 15 dB for center frequencies less than or equal to 125 Hertz.

(Ord. 11778 § 2 (Art. 3 § 302(aa)), 1978: Ord. 11773 § 2 (Art. 3 § 302(aa)), 1978.)

12.08.320 - Real property boundary.

"Real property boundary" means an imaginary line along the ground surface, and its vertical extension, which separates the real property owned by one person from that owned by another person, but not including intra-building real property divisions.

(Ord. 11778 § 2 (Art. 3 § 302(bb)), 1978: Ord. 11773 § 2 (Art. 3 § 302(bb)), 1978.)

12.08.330 - Residential property.

"Residential property" means a parcel of real property which is developed and used either in part or in whole for residential purposes, other than transient uses such as hotels and motels. In cases of multiple land uses of any property, the county zoning classification of such property pursuant to county Ordinance 1494, as amended, shall be applicable.

(Ord. 11778 § 2 (Art. 3 § 302(cc)), 1978: Ord. 11773 § 2 (Art. 3 § 302(cc)), 1978.)

12.08.340 - Sound level meter.

"Sound level meter" means an instrument, including a microphone, an amplifier, an output meter and frequency weighting network, for the measurement of sound levels, which satisfies the requirements pertinent for Type S2A meters in American National Standards Institute specifications for sound level meters, S1.4-1971, or the most recent revision thereof.

(Ord. 11778 § 2 (Art. 3 § 302(dd)), 1978: Ord. 11773 § 2 (Art. 3 § 302(dd)), 1978.)

12.08.350 - Vibration.

"Vibration" means the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observations of moving objects. The perception threshold shall be presumed to be a motion velocity of 0.01 in/sec over the range of 1 to 100 Hertz.

(Ord. 11778 § 2 (Art. 3. § 302(ee)), 1978: Ord. 11773 § 2 (Art. 3 § 302(ee)), 1978.)

12.08.360 - Weekday.

"Weekday" means any day, Monday through Friday, which is not a legal holiday.

(Ord. 11778 § 2 (Art. 3 § 302(ff)), 1978: Ord. 11773 § 2 (Art. 3 § 302(ff), 1978.)

Part 3 - COMMUNITY NOISE CRITERIA

12.08.370 - Decibel measurement—Basis.

Any decibel measurement made pursuant to the provisions of this chapter shall be based on a reference sound-pressure of 20 micropascals, as measured with a sound level meter using the A-weighted network (scale) at slow response, or at the fast response when measuring impulsive sound levels and vibrations.

(Ord. 11778 § 2 (Art. 4 § 401), 1978: Ord. 11773 § 2 (Art. 4 § 401), 1978.)

12.08.380 - Noise zones designated.

Receptor properties described hereinafter in this chapter are hereby assigned to the following noise zones:

Noise Zone I—Noise-sensitive area; Noise Zone II—Residential properties; Noise Zone III—Commercial properties; Noise Zone IV—Industrial properties.

(Ord. 11778 § 2 (Art. 4 § 402), 1978: Ord. 11773 § 2 (Art. 4 § 402), 1978.)

12.08.390 - Exterior noise standards—Citations for violations authorized when.

A. Unless otherwise herein provided, the following exterior noise levels shall apply to all receptor properties within a designated noise zone:

Noise Zone	Designated Noise Zone Land Use (Receptor property)	Time Interval	Exterior Noise Level (dB)
I	Noise-sensitive area	Anytime	45
II	Residential properties	10:00 pm to 7:00 am (nighttime)	45
		7:00 am to 10:00 pm (daytime)	50
III	Commercial properties	10:00 pm to 7:00 am (nighttime)	55
		7:00 am to 10:00 pm (daytime)	60
IV	Industrial properties	Anytime	70

B. Unless otherwise herein provided, no person shall operate or cause to be operated, any source of sound at any location within the unincorporated county, or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person which causes the noise level, when measured on any other property either incorporated or unincorporated, to exceed any of the following exterior noise standards:

Standard No. 1 shall be the exterior noise level which may not be exceeded for a cumulative period of more than 30 minutes in any hour. Standard No. 1 shall be the applicable noise level from subsection A of this section; or, if the ambient L50 exceeds the foregoing level, then the ambient L50 becomes the exterior noise level for Standard No. 1.

Standard No. 2 shall be the exterior noise level which may not be exceeded for a cumulative period of more than 15 minutes in any hour. Standard No. 2 shall be the applicable noise level from subsection A of this section plus 5dB; or, if the ambient L25 exceeds the foregoing level, then the ambient L25 becomes the exterior noise level for Standard No. 2.

Standard No. 3 shall be the exterior noise level which may not be exceeded for a cumulative period of more than five minutes in any hour. Standard No. 3 shall be the applicable noise level from subsection A of this section plus 20dB; or, if the ambient L8.3 exceeds the foregoing level, then the ambient L8.3 becomes exterior noise level for Standard No. 3.

Standard No. 4 shall be the exterior noise level which may not be exceeded for a cumulative period of more than one minute in any hour. Standard No. 4 shall be the applicable noise level from subsection A of this section plus 15dB; or, if the ambient L1.7 exceeds the foregoing level, then the ambient L1.7 becomes the exterior noise level for Standard No. 4.

Standard No. 5 shall be the exterior noise level which may not be exceeded for any period of time. Standard No. 5 shall be the applicable noise level from subsection A of this section plus 20dB; or, if the ambient L0 exceeds the foregoing level then the ambient L0 becomes the exterior noise level for Standard No. 5.

C. If the measurement location is on a boundary property between two different zones, the exterior noise level utilized in subsection B of this section to determine the exterior standard shall be the arithmetic mean of the exterior noise levels in subsection A of the subject zones. Except as provided for above in this subsection C, when an intruding noise source originates on an industrial property and is impacting another noise zone, the applicable exterior noise level as designated in subsection A shall be the daytime exterior noise level for the subject receptor property.

D. The ambient noise histogram shall be measured at the same location along the property line utilized in subsection B of this section, with the alleged intruding noise source inoperative. If for any reason the alleged intruding noise source cannot be turned off, the ambient noise histogram will be estimated by performing a measurement in the same general area of the alleged intruding noise source but at a sufficient distance such that the noise from the alleged intruding noise source is at least 10dB below the ambient noise histogram in order that only the actual ambient noise histogram be measured. If the difference between the ambient noise histogram and the alleged intruding noise source is 5 to 10dB, then the level of the ambient noise histogram itself can be reasonably determined by subtracting a one-decibel correction to account for the contribution of the alleged intruding noise source.

E. In the event the intrusive exceeds the exterior noise standards as set forth in subsections B and C of this section at a specific receptor property and the health officer has reason to believe that this violation at said specific receptor property was unanticipated and due to abnormal atmospheric conditions, the health officer shall issue an abatement notice in lieu of a citation. If the specific violation is abated, no citation shall be issued therefor. If, however, the specific violation is not abated, the health officer may issue a citation.

(Ord. 11778 § 2 (Art. 4 § 403), 1978: Ord. 11773 § 2 (Art. 4 § 403), 1978.)

12.08.400 - Interior noise standards.

A. No person shall operate or cause to be operated within a dwelling unit, any source of sound, or allow the creation of any noise, which causes the noise level when measured inside a neighboring receiving dwelling unit to exceed the following standards:

Standard No. 1 The applicable interior noise level for cumulative period of more than five minutes in any hour; or

Standard No. 2 The applicable interior noise level plus 5dB for a cumulative period of more than one minute in any hour; or

Standard No. 3 The applicable interior noise level plus 10dB or the maximum measured ambient noise level for any period of time.

B. The following interior noise levels for multifamily residential dwellings shall apply, unless otherwise specifically in within all such dwellings with windows in their normal seasonal configuration.

Noise Zone	Designated Land Use	Time Interval	Allowable Interior Noise Level (dB)
All	Multifamily	10 pm—7 am	40
	Residential	7 am—10 pm	45

C. If the measured ambient noise level reflected by the L50 exceeds that permissible within any of the interior noise standards in subsection A of Section 12.08.390, the allowable interior noise level shall be increased in 5dB increments in each standard as appropriate to reflect said ambient noise level (L50).

(Ord. 11778 § 2(Art. 4 § 404), 1978: Ord. 11773 § 2 (Art. 4 § 404), 1978.)

12.08.410 - Correction for certain types of sounds.

For any source of sound which emits a pure tone or impulsive noise, the noise levels as set forth in Sections 12.08.390 and 12.08.400 shall be reduced by five decibels.

(Ord. 11778 § 2 (Art. 4 § 405), 1978: Ord. 11773 § 2 (Art. 4 § 405), 1978.)

12.08.420 - Measurement methods.

A. Utilizing the A-weighting scale of the sound-level meter and the "slow" meter response (use "fast" response for impulsive type sounds), the noise level shall be measured at a position or positions at any point on the receiver's property.

B. In general, the microphone shall be located four to five feet above the ground; 10 feet or more from the nearest reflective surface, where possible. However, in those cases where another elevation is deemed appropriate, the latter shall be utilized.

C. Interior noise measurements shall be made within the affected residential unit. The measurements shall be made at a point at least four feet from the wall, ceiling or floor nearest the noise source, with windows in the normal seasonal configuration. Calibration of the measurement equipment, utilizing an acoustic calibrator, shall be performed immediately prior to recording any noise data.

(Ord. 11778 § 2 (Art. 4 § 406), 1978: Ord. 11773 § 2 (Art. 4 § 406), 1978.)

Part 4 - SPECIFIC NOISE RESTRICTIONS

12.08.430 - Acts deemed violations when.

Notwithstanding any other provisions of this chapter, the acts set out in this Part 4, and the causing or permitting thereof, are declared to be in violation of this chapter.

(Ord. 11778 § 2 (Art. 5 § 501 (part)), 1978: Ord. 11773 § 2 (Art. 5 § 501 (part)), 1978.)

12.08.440 - Construction noise.

A. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real-property line, except for emergency work of public service utilities or by variance issued by the health officer is prohibited.

B. Noise Restrictions at Affected Structures. The contractor shall conduct construction activities in such a manner that the maximum noise levels at the affected buildings will not exceed those listed in the following schedule:

1. At Residential Structures.

a. Mobile Equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment:

	Single-family Residential	Multi-family Residential	Semiresidential/ Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75dBA	80dBA	85dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	60dBA	64dBA	70dBA

b. Stationary Equipment. Maximum noise level for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment:

	Single-family Residential	Multi-family Residential	Semiresidential/ Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60dBA	65dBA	70dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50dBA	55dBA	60dBA

2. At Business Structures.
    a. Mobile equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation of mobile equipment:

Daily, including Sunday and legal holidays, all hours: maximum of 85dBA.

C. All mobile or stationary internal-combustion-engine powered equipment or machinery shall be equipped with suitable exhaust and air-intake silencers in proper working order.

D. In case of a conflict between this chapter and any other ordinance regulating construction activities, provisions of any specific ordinance regulating construction activities shall control.

(Ord. 11778 § 2 (Art. 5 § 501(c)), 1978: Ord. 11778 § 2 (Art. 5 § 501(c)), 1978.)

12.08.450 - Forced-air blowers in tunnel car washes.

Operating or permitting the operation of any forced-air blower in a tunnel car wash between the hours of 7:00 a.m. and 8:00 p.m. in such a manner as to exceed any of the following sound levels is prohibited:

	Units Installed	
Measurement Location	Before 1-1-80 dB	On or After 1-1-80 dB
Any point on contiguous receptor property, five feet above grade level, no closer than three feet from any wall		
Residential	70	60
Commercial/Industrial	75	65

(Ord. 11778 § 2 (Art. 5 § 501(m)), 1978: Ord. 11773 § 2 (Art. 5 § 501(m)), 1978.)

12.08.460 - Loading and unloading operations.

Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans or similar objects between the hours of 10:00 p.m. and 6:00 a.m. in such a manner as to cause noise disturbance is prohibited.

(Ord. 11778 § 2 (Art. 5 § 501(b)), 1978: Ord. 11773 § 2 (Art. 5 § 501(b)), 1978.)

12.08.470 - Noise disturbances in noise-sensitive zones.

A. Creating or causing the creation of any noise disturbance within any noise-sensitive zone, as designated by the health officer, is prohibited, provided that conspicuous signs are displayed indicating the presence of the zone.

B. Noise-sensitive zones must be indicated by the display of conspicuous signs in at least three separate locations within 164 meters (one-tenth mile) of the institution or facility.

(Ord. 11778 § 2 (Art. 5 § 501(k)), 1978: Ord. 11773 § 2(Art. 5 § 501(k)), 1978.)

12.08.480 - Places of public entertainment.

Operating, playing or permitting the operation or playing of any radio, television, phonograph, drum, musical instrument, sound amplifier or similar device which produces, reproduces or amplifies sound in any place of public entertainment at a sound level greater than 95dBA, as read by the slow response on a soundlevel meter at any point that is normally occupied by a customer is prohibited, unless a conspicuous and legible sign is located outside such place, near each public entrance, stating "WARNING: SOUND LEVELS WITHIN MAY CAUSE HEARING IMPAIRMENT."

(Ord. 11778 § 2 (Art. 5 § 501(f)), 1978: Ord. 11773 § 2 (Art. 5 § 501(f)), 1978.)

12.08.490 - Powered model vehicles.

Operating or permitting the operation of powered model vehicles so as to create a noise disturbance across a residential real-property boundary, or within a noise-sensitive zone between the hours of 8:00 p.m. and 7:00 a.m. the following day is prohibited.

(Ord. 11778 § 2 (Art. 5 § 501(g)), 1978: Ord. 11773 § 2 (Art. 5 § 501(g)) 1978.)

12.08.500 - Emergency signaling devices.

A. The intentional sounding or permitting the sounding outdoors of any emergency signaling device, including fire, burglar or civil-defense alarm, siren, whistle, or similar stationary emergency signaling device, except for emergency purposes or for testing, as provided in subsection B2 below, is prohibited.

B. 1. Testing of a stationary emergency signaling device shall not occur before 7:00 a.m. or after 7:00 p.m. Any such testing shall use only the minimum cycle test time. In no case shall such test time exceed 60 seconds.

2. Testing of the complete emergency signaling system, including the functioning of the signaling device, and the personnel response to the signaling device, shall not occur more than once in each calendar month. Such testing shall not occur before 7:00 a.m. or after 10:00 p.m. The time limit specified in subsection B1 above shall not apply to such complete-system testing.

C. Sounding or permitting the sounding of any exterior burglar or fire alarm, or any motor-vehicle burglar alarm is prohibited, unless such alarm is terminated within 15 minutes of activation.

(Ord. 11778 § 2 (Art. 5 § 501(i)), 1978: Ord. 11773 § 2 (Art. 5 § 501(i)), 1978.)

12.08.510 - Stationary nonemergency signaling devices.

A. Sounding or permitting the sounding of any electronically amplified signal from any stationary bell, chime, siren, whistle, or similar device intended primarily for nonemergency purposes, from any place, for more than 10 consecutive seconds in any hourly period is prohibited.

B. Houses of religious worship shall be exempt for the operation of this provision.

C. Sound sources covered by this provision and not exempted under subsection B may be exempted by a variance issued by the health officer.

(Ord. 11778 § 2 (Art. 5 § 501(h)), 1978: Ord. 11773 § 2(Art. 5 § 501(h)), 1978.)

12.08.520 - Refuse collection vehicles.

A. On or after three years following August 17, 1978, the effective date of the ordinance codified in this chapter, operating or permitting the operation of the compacting mechanism of any motor vehicle which compacts refuse and which creates, during the compacting cycle, a sound level in excess of 86dBA when measured at 50 feet from any point of the vehicle is prohibited.

B. Operating or permitting the operation of the compacting mechanism of any motor vehicle which compacts refuse between the hours of 10:00 p.m. and 6:00 a.m. the following day in a residential area or noise-sensitive zone, or within 500 feet thereof is prohibited.

C. Collecting refuse with collection vehicle between the hours of 10:00 p.m. and 6:00 a.m. the following day in a residential area or noise-sensitive zone or within 500 feet thereof.

D. In the case of conflict between this chapter and any other ordinance regulating refuse collection, provisions of

any specific ordinance regulating refuse collection shall control.

(Ord. 11778 § 2 (Art. 5 § 501(j)), 1978: Ord. 11773 § 2 (Art. 5 § 501(j)), 1978.)

12.08.530 - Residential airconditioning or refrigeration equipment.

Operating or permitting the operation of any airconditioning or refrigeration equipment in such a manner as to exceed any of the following sound levels is prohibited.

Measurement Location	Units Installed Before 1-1-80 dBA	Units Installed On or After 1-1-80 dBA
Any point on neighboring property line, 5 feet above grade level, no closer than 3 feet from any wall.	60	55
Center of neighboring patio, 5 feet above grade level, no closer than 3 feet from any wall.	55	50

Outside the neighboring living area window nearest the equipment location, not more than 3 feet from the window opening, but at least 3 feet from any other surface.	55	50

(Ord. 11778 § 2 (Art. 5 § 501(1)), 1978: Ord. 11773 § 2 (Art. 5 § 501(1)), 1978.)

12.08.540 - Street sales.

Offering for sale, selling anything, or advertising by shouting or outcry within any residential or commercial area or noise-sensitive zone of the unincorporated areas of the county is prohibited except by variance issued by the health officer. The provisions of this section shall not be construed to prohibit the selling by outcry of merchandise, food and beverages at licensed sporting events, parades, fairs, circuses, or other similar licensed public-entertainment events.

(Ord. 11778 § 2 (Art 5 § 501(a)), 1978: Ord. 11773 § 2 (Art. 5 § 501(a)), 1978.)

12.08.541 - Street sales—Restrictions on sound system speakers.

A person offering for sale, selling or advertising anything edible shall not emit music or other sounds from an external speaker affixed to a motor vehicle between the hours of 8:00 p.m. and 6:00 a.m. within any residential, commercial or noise sensitive-zone of the unincorporated area of the County. The provisions of this section shall not be construed to prohibit the selling by outcry of merchandise, food and beverages, at licensed sporting events, parades, fairs, circuses, or other similar licensed-entertainment events.

(Ord. 2002-0028 § 2, 2002)

12.08.550 - Vehicle or motorboat repairs and testing.

Repairing, rebuilding, modifying or testing any motor vehicle, motorcycle or motorboat in such a manner as to cause a noise disturbance across a real-property boundary or within a noisesensitive zone is prohibited.

(Ord. 11778 § 2 (Art. 5 § 501(e)), 1978: Ord. 11773 § 2 (Art. 5 § 501(e)), 1978.)

12.08.560 - Vibration.

Operating or permitting the operation of any device that creates vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet (46 meters) from the source if on a public space or public right-of-way is prohibited. The perception threshold shall be a motion velocity of 0.01 in/sec over the range of 1 to 100 Hertz.

(Ord. 11778 § 2 (Art. 5 § 501(d)), 1978: Ord. 11773 § 2 (Art. 5 § 501(d)), 1978.)

Part 5 - EXEMPTIONS

12.08.570 - Activities exempt from chapter restrictions.

The following activities set out in this chapter shall be exempted from the provisions of this chapter:

A. Emergency Exemption. The emission of sound for the purpose of alerting persons to the existence of an emergency, or the emission of sound in the performance of emergency work;

B. Warning Devices. Warning devices necessary for the protection of public safety, as for example police, fire and ambulance sirens, and train horns;

C. Outdoor Activities. Activities conducted on public playgrounds and public or private school grounds, including but not limited to school athletic and school entertainment events;

D. Exemption from Exterior Noise Standards. The following activities are exclusively regulated by the prohibitions of Part 4 of this chapter:

1. Construction,
2. Stationary nonemergency signaling devices,
3. Emergency signaling devices,
4. Refuse collection vehicles,
5. Residential air-conditioning or refrigeration equipment,
6. Forced-air blowers;

E. Motion Picture Production and Related Activities;

F. Railroad Activities. All locomotives and rail cars operated by any railroad which is regulated by the California Public Utilities Commission;

G. Federal or State Preexempted Activities. Any activity, to the extent regulation thereof has been preempted by state or federal law;

H. Public Health and Safety Activities. All transportation, flood control, and utility company maintenance and construction operations at any time on public right-of-way, and those situations which may occur on private real property deemed necessary to serve the best interest of the public and to protect the public's health and well being, including but not limited to street sweeping, debris and limb removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, snow removal, house moving, vacuuming catchbasins, removal of damaged poles and vehicles, repair of water hydrants and mains, gas lines, oil lines, sewers, etc.;

I. Motor Vehicles on Private Right-of-way and Private Property. Except as provided in Section 12.08.550, all legal vehicles of transportation operating in a legal manner in accordance with local, state and federal vehicle-noise regulations within the public right-of-way or air space, or on private property;

J. Seismic Surveys Authorized by the State Land Commission;

K. Agricultural Operations. All mechanical devices, apparatus or equivalent associated with agricultural operations conducted on agricultural property, unless if in the vicinity of residential land uses, in which case a variance permit is required to operate noise-producing devices, with the following stipulations:

1. Operations do not take place between 8:00 p.m. and 6:00 a.m., or
2. Such operations and equipment are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions, or
3. Such operations and equipment are associated with agricultural pest-control through pesticide application, provided the application is made in accordance with permits issued by or regulations enforced by the county agricultural commissioner,
4. Such devices utilized for pest control which incorporate stationary or mobile noise sources (electro-mechanical birdscare devices, etc.) are operated only by permit issued by the health officer. The allowable hours and days for operation of these devices will be specified in the permit,
5. All equipment and machinery powered by internal combustion engines shall be equipped with a proper muffler and air-intake silencer in good working order;

L. Minor Maintenance to Residential Real Property. Noise sources associated with the minor maintenance of residential real property, provided said activities take place as follows:

1. During Pacific Standard Time between the hours of 8:00 a.m. and 6:00 p.m. on any day except Sunday, when such activities may take place between the hours of 9:00 a.m. and 6:00 p.m., and
2. During Daylight Savings Time between the hours of 8:00 a.m. and 7:00 p.m. on any day except Sunday, when such activities may take place between the hours of 9:00 a.m. and 6:00 p.m.;

M. Operation of Oil and Gas Wells.

1. Normal well servicing, remedial or maintenance work performed within an existing well which does not involve drilling or redrilling and which is restricted to the hours between 7:00 a.m. and 10:00 p.m., and
2. Drilling or redrilling work which is done in full compliance with the conditions of permits issued under Chapter 5, Article 1, of the County Zoning Ordinance, as amended, as set out in Title 22 of this code.

(Ord. 97-0007 § 1, 1997: Ord. 11778 § 2(Art. 6 § 601), 1978: Ord. 11773 § 2 (Art. 6 § 601), 1978.)

Part 6 - VARIANCES

12.08.580 - Conditions for granting variances—Health officer authority.

A. Variances from the requirements of this chapter may be granted by the health officer for a period of not to exceed two years, subject to such terms, conditions and requirements as he may deem reasonable. A variance may be granted only if the health officer makes the findings that:

1. Additional time is necessary for the applicant to alter or modify his activity, operation or noise source to comply with this chapter; or
2. The activity, operation or noise source cannot feasibly be done in a manner that would comply with the provisions of this chapter, and no other reasonable alternative is available to the applicant.

B. In granting a variance, the health officer may prescribe any conditions or requirements he deems necessary to minimize adverse effects upon the community or the surrounding neighborhood.

C. In granting variances, the health officer shall consider the magnitude of nuisance caused by the offensive noise, t property within the area of impingement by the noise, operations carried on under existing nonconforming right conditional use permits or zone variances, the time factors related to study, design, financing and construction o work, the economic factors related to age and useful life of the equipment, the general public interest, health an the feasibility of plans submitted for correction, and the effect on the community if the variance was refused.

(Ord. 11778 § 2 (Art. 7 § 701), 1978: Ord. 11773 § 2 (Art. 7 § 701), 1978.)

12.08.590 - Application—Contents.

Every applicant for a variance shall file with the health officer a written application on a form prescribed by the health officer. The application shall state the name and address of the applicant, the nature of the noise source involved, and such other information as the health officer may require.

(Ord. 11778 § 2 (Art. 7 § 702), 1978: Ord. 11773 § 2 (Art. 7 § 702), 1978.)

12.08.600 - Application—Fee.

Every applicant shall pay a fee of $25.00 for each application for variance.

(Ord. 11778 § 2 (Art. 7 § 703), 1978: Ord. 11773 § 2 (Art. 7 § 703), 1978.)

12.08.610 - Application—Action by health officer.

A. The health officer shall act, within 30 days, if possible, on an application for a variance, and shall notify the applicant of the action taken, namely, approval, conditional approval, or denial. Before acting on an application for a variance, the health officer may require the applicant to furnish further information. Failure of the applicant to provide such further information may be grounds for denial of the variance.

B. In the event of denial of an application for a variance, the health officer shall notify the applicant in writing of the reasons therefor. The health officer shall not accept a further application unless the applicant has complied with the objections specified by the health officer as his reasons for denial.

(Ord. 11778 § 2 (Art. 7 § 704), 1978: Ord. 11773 § 2 (Art. 7 § 704), 1978.)

12.08.620 - Application—Denial conditions.

The applicant may at his option deem the variance denied if the health officer fails to act on the application within 30 days after filing or within 10 days after applicant furnishes the further information requested by the health officer, whichever is later.

(Ord. 11778 § 2 (Art. 7 § 705), 1978: Ord. 11773 § 2 (Art. 7 § 705), 1978.)

12.08.630 - Public hearing—For reconsideration of health officer decision.

Within 10 days after notice by the health officer of the decision on application for variance, any interested party may petition the health officer in writing for a public hearing to reconsider the decision. The health officer shall thereupon appoint a hearing officer to conduct said hearing.

(Ord. 11778 § 2 (Art. 7 § 706), 1978: Ord. 11773 § 2 (Art. 7 § 706), 1978.)

12.08.640 - Public hearing—Decision and findings—Appeals.

A. Based upon the evidence presented at the public hearing, the hearing officer may affirm, modify or reverse the previous determination subject to such terms, conditions and requirements as he may deem necessary. The hearing officer shall be guided by the same considerations as set forth in Section 12.08.580.

B. A decision by the hearing officer to grant a variance may be made only if the hearing officer makes the findings that:

1. Additional time is necessary for the applicant to alter or modify his activity, operation or noise source to comply with this chapter; or
2. The activity, operation or noise source cannot feasibly be done in a manner that would comply with the provisions of this chapter, and no other reasonable alternative is available to the applicant.

C. The decision of the hearing officer shall be by written order, and shall be final. Appeals from an adverse decision shall be made to a court of competent jurisdiction.

(Ord. 11778 § 2 (Art. 7 § 707), 1978: Ord. 11773 § 2 (Art. 7 § 707), 1978.)

Part 7 - VIOLATIONS AND ENFORCEMENT

12.08.650 - Enforcement—Health officer powers and duties.

The health officer shall have primary responsibility for the enforcement of the noise regulations contained in this chapter. The health officer shall make all noise-level measurements required for the enforcement of this chapter. Nothing in this chapter shall prevent the health officer from efforts to obtain voluntary compliance by way of warning, notice, or educational means.

(Ord. 11778 § 2 (Art. 8 § 801), 1978: Ord. 11773 § 2 (Art. 8 § 801), 1978.)

12.08.660 - Initial violations.

In the event of an initial violation of the provisions of this chapter a written notice of violation shall be given the alleged violator, specifying the time by which the condition shall be corrected or an application for permit or variance shall be received by the health officer. The health officer shall take no further action in the event the cause of the violation has been removed, the condition abated or fully corrected within the time period specified in the written notice.

(Ord. 11778 § 2 (Art. 8 § 802), 1978: Ord. 11773 § 2 (Art. 8 § 802), 1978.)

12.08.670 - Violation—Penalty.

Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not more than $500.00 or be imprisoned in the County Jail for a period not exceeding six months or by both such fine and imprisonment. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such.

(Ord. 11778 § 2 (Art. 8 § 803), 1978: Ord. 11773 § 2 (Art. 8 § 803, 1978.)

12.08.680 - Severability.

If any provision, clause, sentence or paragraph of this chapter or the application thereof to any person or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of the provisions of this chapter which can be given effect without the invalid provisions or application and, to this end, the provisions of this chapter are hereby declared to be severable.

(Ord. 11778 § 2 (Art. 8 § 804), 1978: Ord. 11773 § 2 (Art. 8 § 804), 1978.)

Chapter 12.12 - BUILDING CONSTRUCTION NOISE

12.12.010 - Definitions.

A. "Board" means the board of supervisors of the county of Los Angeles.

B. "Person" means an individual, partnership, firm or corporation.

C. "Section" means a section of the ordinance codified in this chapter.

(Ord. 8594 §§ 1, 2 and 3, 1964.)

12.12.020 - References to provisions.

Whenever any reference is made to the ordinance codified in this chapter or any other ordinance, or to any statute, such reference shall apply to all amendments and additions thereto now or hereafter made.

(Ord. 8594 § 4, 1964.)

12.12.030 - Construction noise prohibited when.

Except as otherwise provided in this chapter, a person, on any Sunday, or at any other time between the hours of 8:00 p.m. and 6:30 a.m. the following day, shall not perform any construction or repair work of any kind upon any building or structure, or perform any earth excavating, filling or moving, where any of the foregoing entails the use of any air compressors; jackhammers; power-driven drill; riveting machine; excavator, diesel-powered truck, tractor or other earth moving equipment; hand hammers on steel or iron, or any other machine, tool, device or equipment which makes loud noises to the disturbance of persons occupying sleeping quarters in a dwelling, apartment, hotel, mobilehome, or other place of residence.

(Ord. 9818 § 1, 1969: Ord. 8594 § 6, 1964.)

12.12.040 - Exemptions—Certain zoned areas.

The provisions of this chapter do not apply in any territory which is in a zone in which the Zoning Ordinance, codified in Title 22 of this code, prohibits any residential use and which is not less than 500 feet from any territory in any residential zone as defined in Section 201 of Ordinance 1494, or any territory in a residential zone in any city.

(Ord. 8594 § 11, 1964.)

12.12.050 - Exemptions—Work performed with county engineer's permission.

The provisions of Section 12.12.030 do not apply to any person who performs the construction, repair, excavation or earthmoving work involved pursuant to the express written permission of the county engineer to perform such work at times prohibited in Section 12.12.030. Upon receipt of an application in writing therefor, stating the reasons for the request and the

facts upon which such reasons are based, the county engineer may grant such permission if he finds that:

A. The work proposed to be done is effected with a public interest; or

B. Hardship or injustice, or unreasonable delay, would result from the interruption thereof during the hours and days specified in Section 12.12.030; or

C. The building or structure involved is devoted or intended to be devoted to a use immediately incident to public defense.

(Ord. 9818 § 2, 1969: Ord. 8594 § 7, 1964.)

12.12.060 - Exemptions—Work by public utilities—Conditions.

The provisions of Section 12.12.030 do not apply to the construction, repair or excavation by a public utility which is subject to the jurisdiction of the Public Utilities Commission as may be necessary for the preservation of life or property, and where such necessity makes it necessary to construct, repair or excavate during the prohibited hours.

(Ord. 8594 § 10, 1964.)

12.12.070 - Exemptions—Emergency work—Permit requirements.

The provisions of Section 12.12.030 do not apply to such construction, repair or excavation during prohibited hours as may be necessary for the preservation of life or property when such necessity arises during such hours as the offices of the county are closed or where such necessity requires immediate action prior to the time at which it would be possible to obtain a permit pursuant to Section 12.12.050, if the person doing such construction, repair or excavation obtains a permit therefor within one day after the offices of the county engineer are first opened subsequent to the making of such construction, repair or excavation.

(Ord. 8594 § 9, 1964.)

12.12.080 - Appeals from county engineer's decision.

Any person dissatisfied with the decision of the county engineer may appeal to the business license commission as provided in Ordinance 5860, on business licenses, set out at Title 7 of this code, including the appointment of and reference to a referee, as in the case of a notification by the tax collector that he intends to deny a license.

(Ord. 9849 § 1, 1969: Ord. 8594 § 8, 1964.)

12.12.090 - Violation—Penalty.

Any person violating any provision of this chapter is guilty of a misdemeanor punishable by a fine of not more than $500.00 or by imprisonment in the County Jail for not more than six months, or by both such fine and imprisonment. Every such person is guilty of a separate offense for every day during any portion of which any violation or any of the provisions of this chapter is committed, continued or permitted by such person, and shall be punished as provided by this chapter.

(Ord. 8594 § 12, 1964.)

12.12.100 - Severability.

If any provision of the ordinance codified in this chapter or the application thereof to any person or circumstance is held invalid, the remainder of the ordinance, and the application of such provision to other persons or circumstances, shall not be affected thereby.

(Ord. 8594 § 5, 1964.)

Appendix B

HVAC Specification Sheet

MENU

PRODUCT SPECIFICATIONS

6

Feature	MERIT SERIES  **ML14XC1 Air Conditioner**
Rating	★★★★½ (4.5)
Energy Efficiency	Up to 16 SEER
Stages of Cooling	Single-Stage
Sound Rating	As low as 76 dB
ENERGY STAR® Certified	✔
Environmentally Responsible	R-410A Refrigerant
Cabinet	PermaGuard™ Cabinet

Full Line of Scroll Compressors	✔
Compressor/Parts Warranty	5-Year Limited Warranty on covered components including compressor. This product may be eligible for valuable 10-Year Limited Extended Warranty coverage with product registration.

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ABOUT
HELP
BECOME A DEALER
MEDIA ROOM

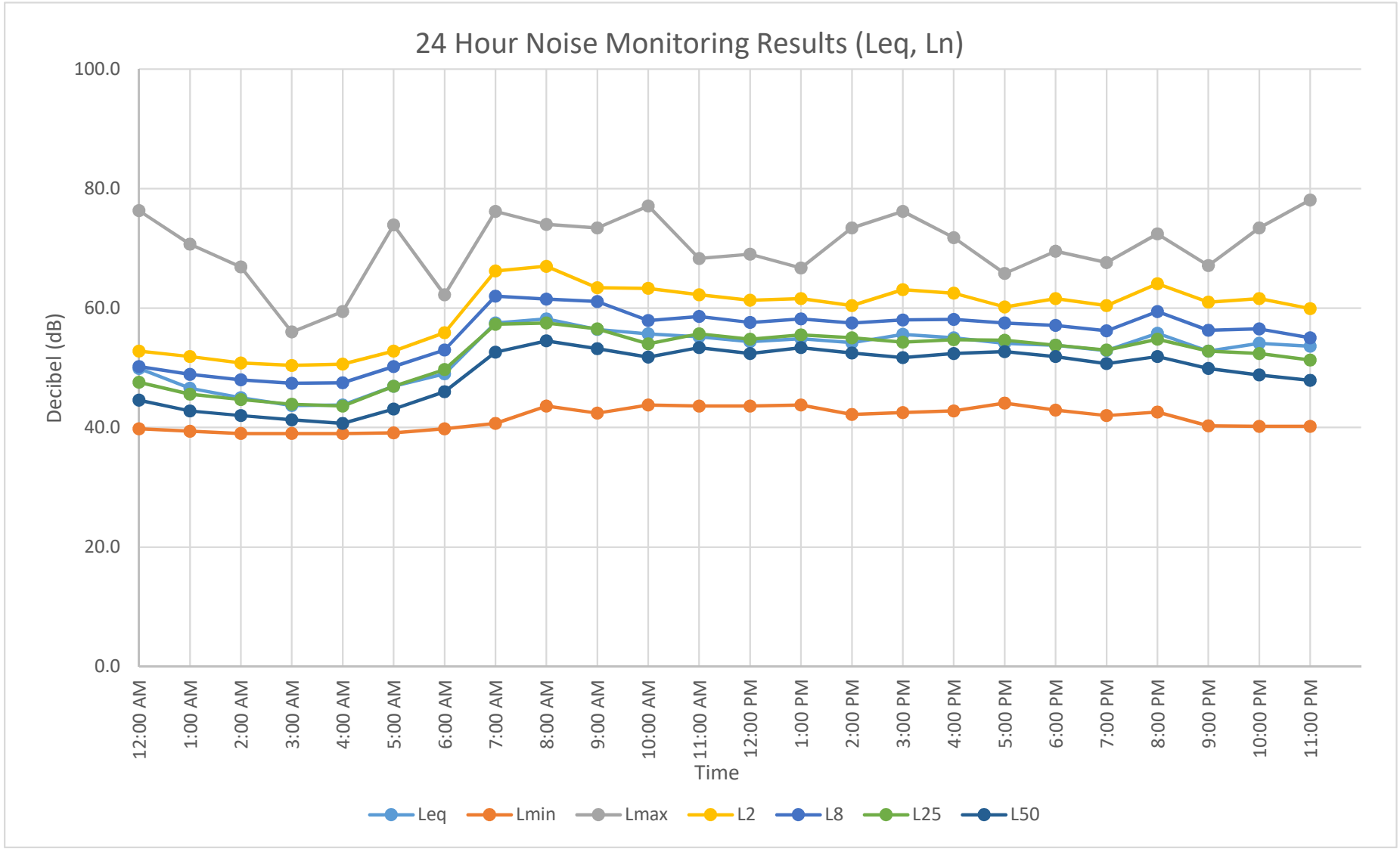
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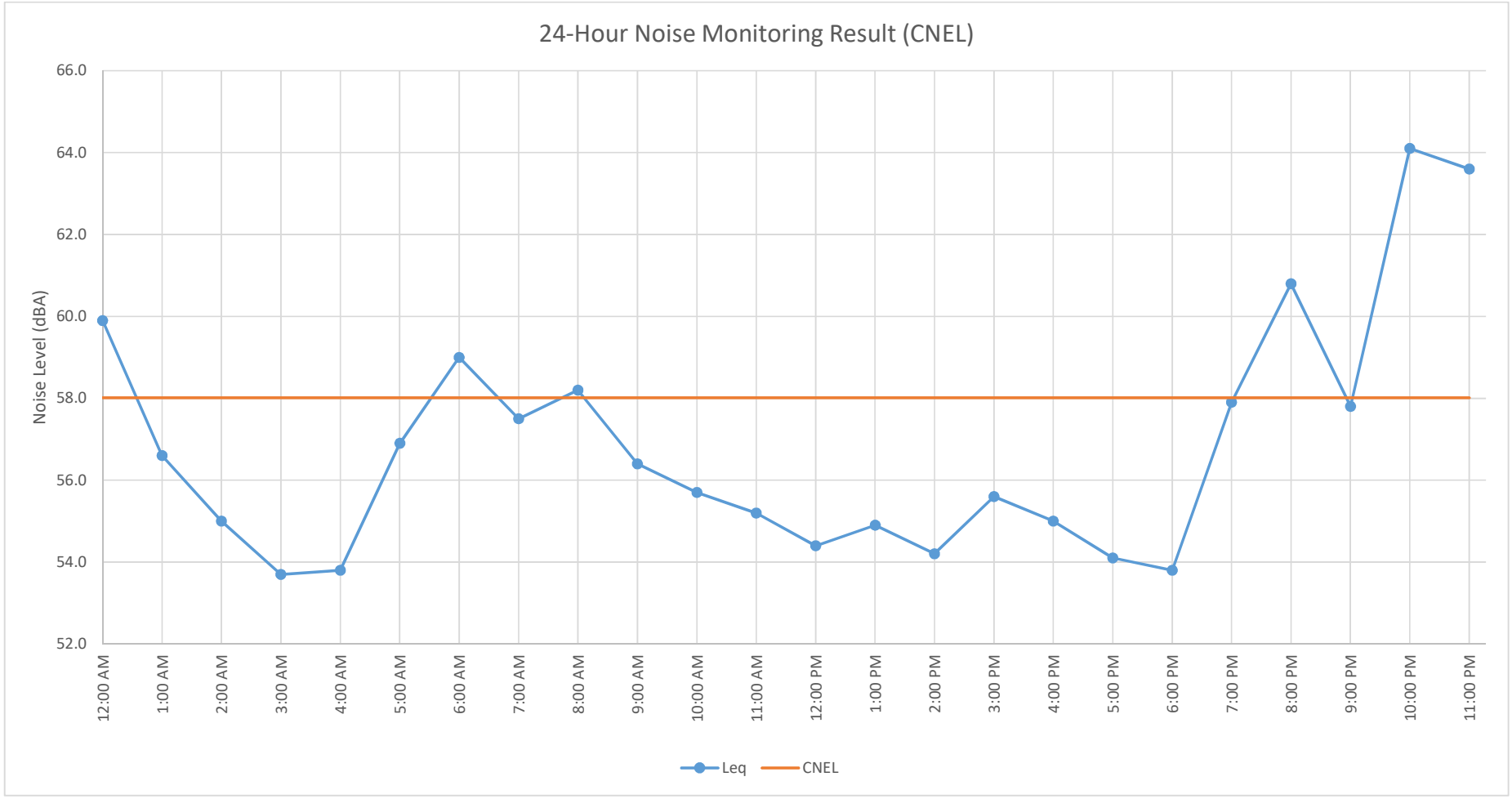
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Appendix C

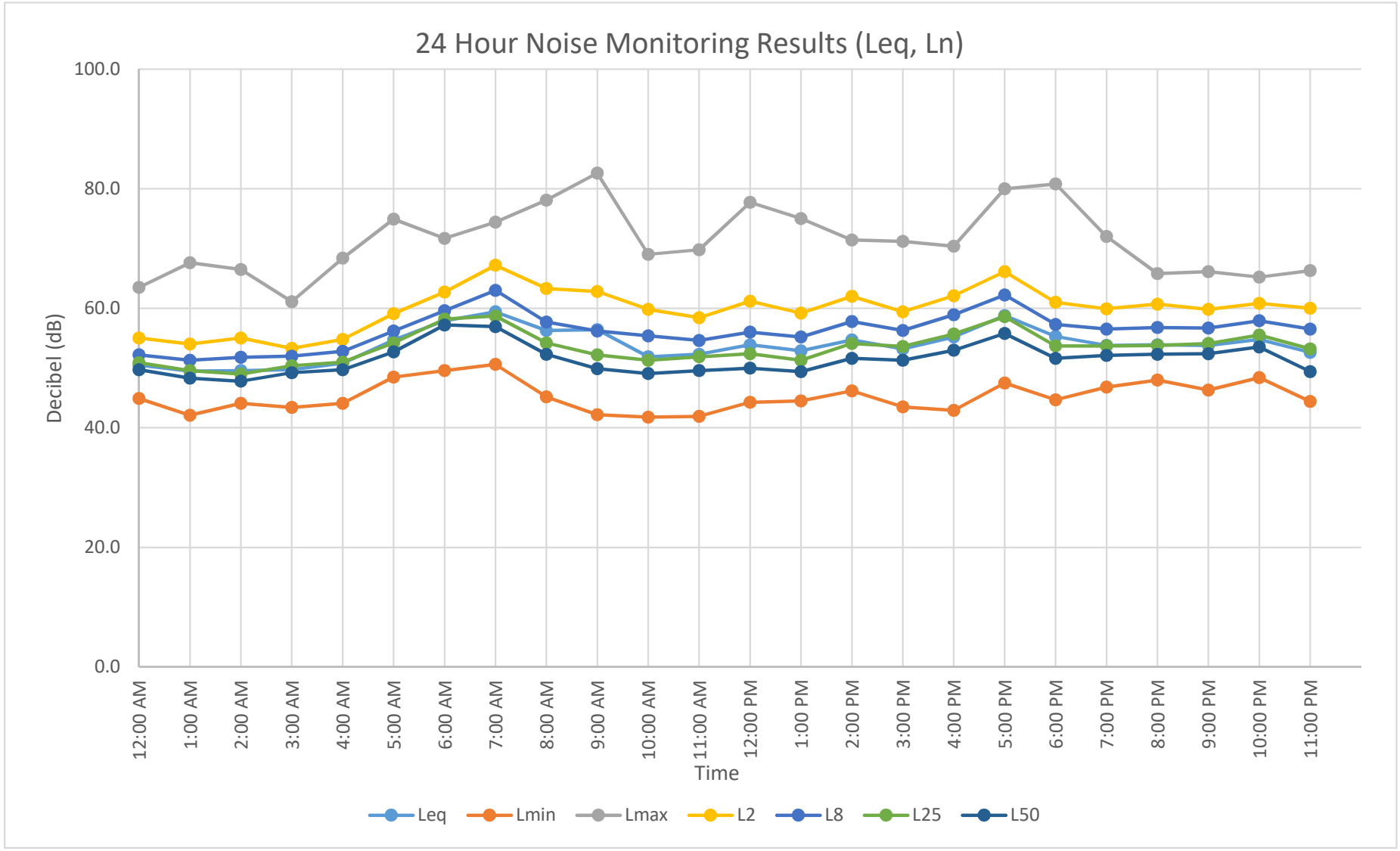
Noise Measurement Data

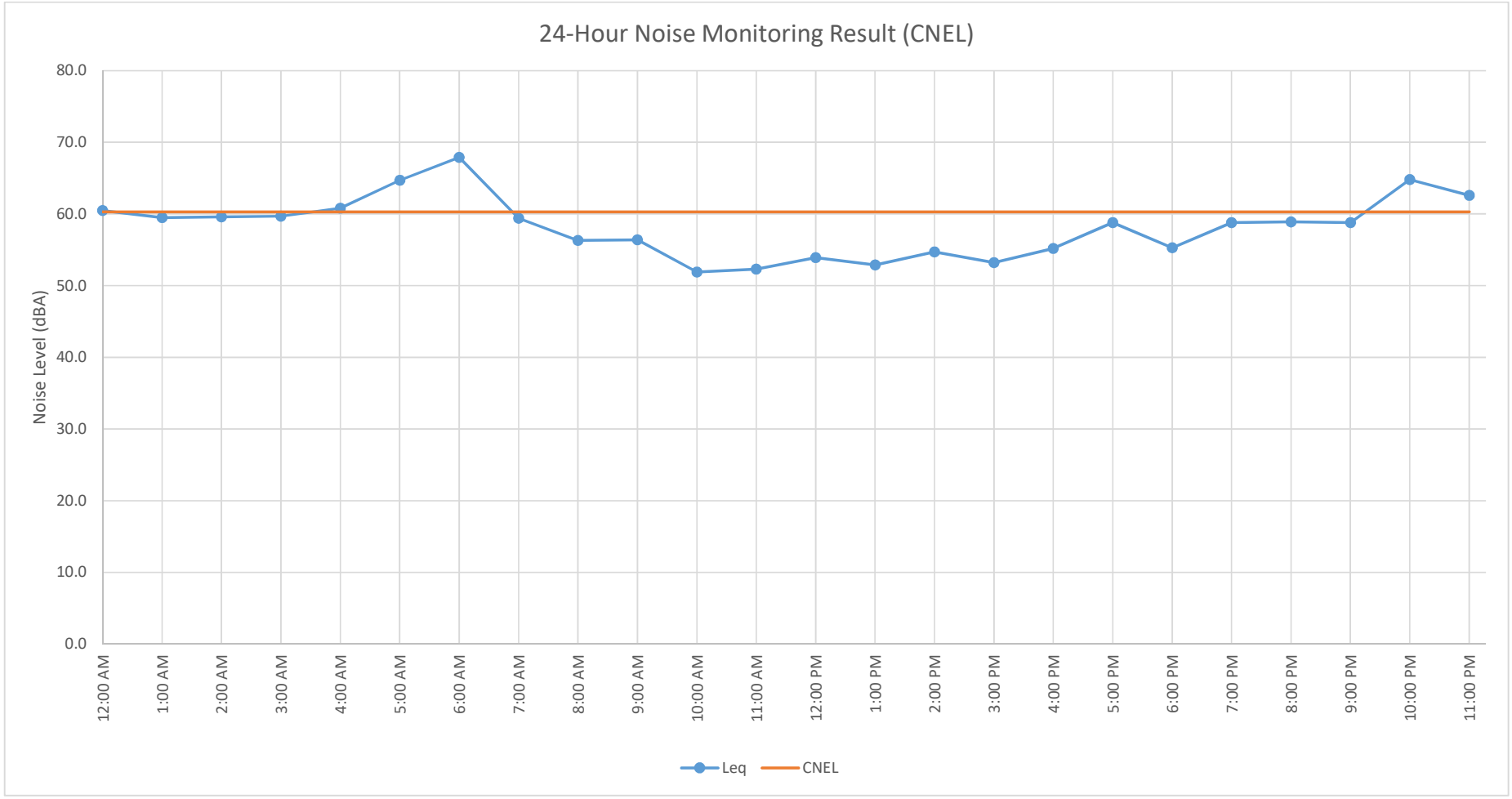
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NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	20-Feb-20
LOCATION:	PROPERTY LINE TO THE NORTHEAST					BY:	D. Shivaiah
Time	Leq	Lmin	Lmax	L2	L8	L25	L50
12:00 AM	49.9	39.8	76.3	52.8	50.2	47.6	44.6
1:00 AM	46.6	39.4	70.7	51.9	48.9	45.6	42.8
2:00 AM	45	39	66.9	50.8	48	44.7	42
3:00 AM	43.7	39	56	50.4	47.4	43.9	41.3
4:00 AM	43.8	39	59.4	50.6	47.5	43.6	40.7
5:00 AM	46.9	39.1	73.9	52.8	50.2	46.9	43.1
6:00 AM	49	39.8	62.2	55.9	53	49.7	46
7:00 AM	57.5	40.7	76.2	66.2	62	57.3	52.6
8:00 AM	58.2	43.6	74	67	61.5	57.5	54.5
9:00 AM	56.4	42.4	73.4	63.4	61.1	56.5	53.2
10:00 AM	55.7	43.8	77.1	63.3	57.9	54	51.8
11:00 AM	55.2	43.6	68.3	62.2	58.6	55.7	53.4
12:00 PM	54.4	43.6	69	61.3	57.6	54.8	52.4
1:00 PM	54.9	43.8	66.7	61.6	58.2	55.5	53.4
2:00 PM	54.2	42.2	73.4	60.4	57.5	55	52.5
3:00 PM	55.6	42.5	76.2	63.1	58	54.3	51.7
4:00 PM	55	42.8	71.8	62.5	58.1	54.7	52.4
5:00 PM	54.1	44.1	65.8	60.2	57.5	54.6	52.7
6:00 PM	53.8	42.9	69.5	61.6	57.1	53.8	51.9
7:00 PM	52.9	42	67.6	60.4	56.2	53	50.7
8:00 PM	55.8	42.6	72.4	64.1	59.4	54.8	51.9
9:00 PM	52.8	40.3	67.1	61	56.3	52.8	49.9
10:00 PM	54.1	40.2	73.4	61.6	56.5	52.4	48.8
11:00 PM	53.6	40.2	78.1	59.9	55	51.3	47.9
Daytime	55.3	40.2	77.1	63.0	58.7	55.0	52.3
Nighttime	48.6	39.0	78.1	54.5	50.9	47.5	44.2


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Time
Leq
Lmin
Lmax
L2
L8
L25
L50

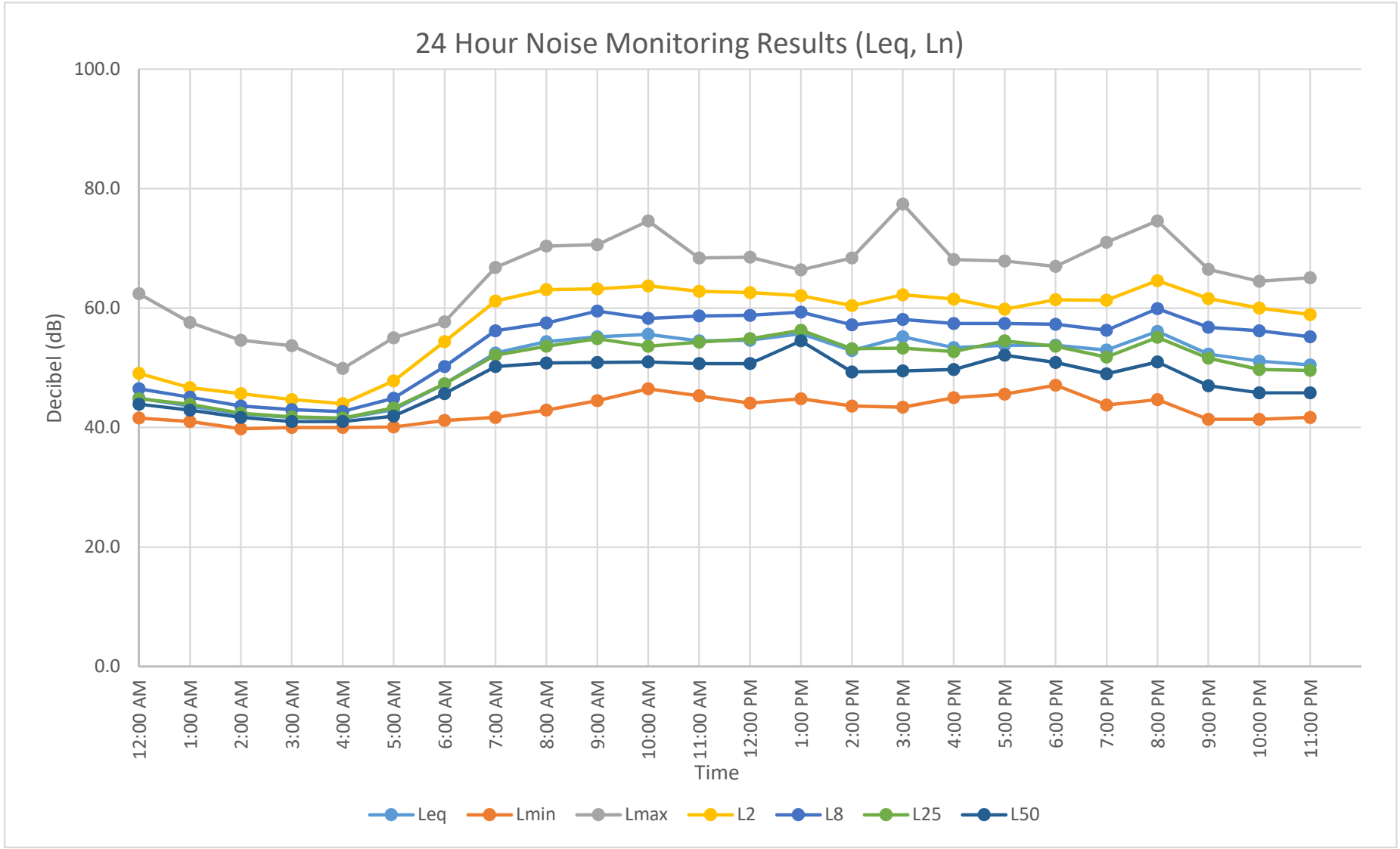

24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
66.0
64.0
62.0
60.0
58.0
56.0
54.0
52.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

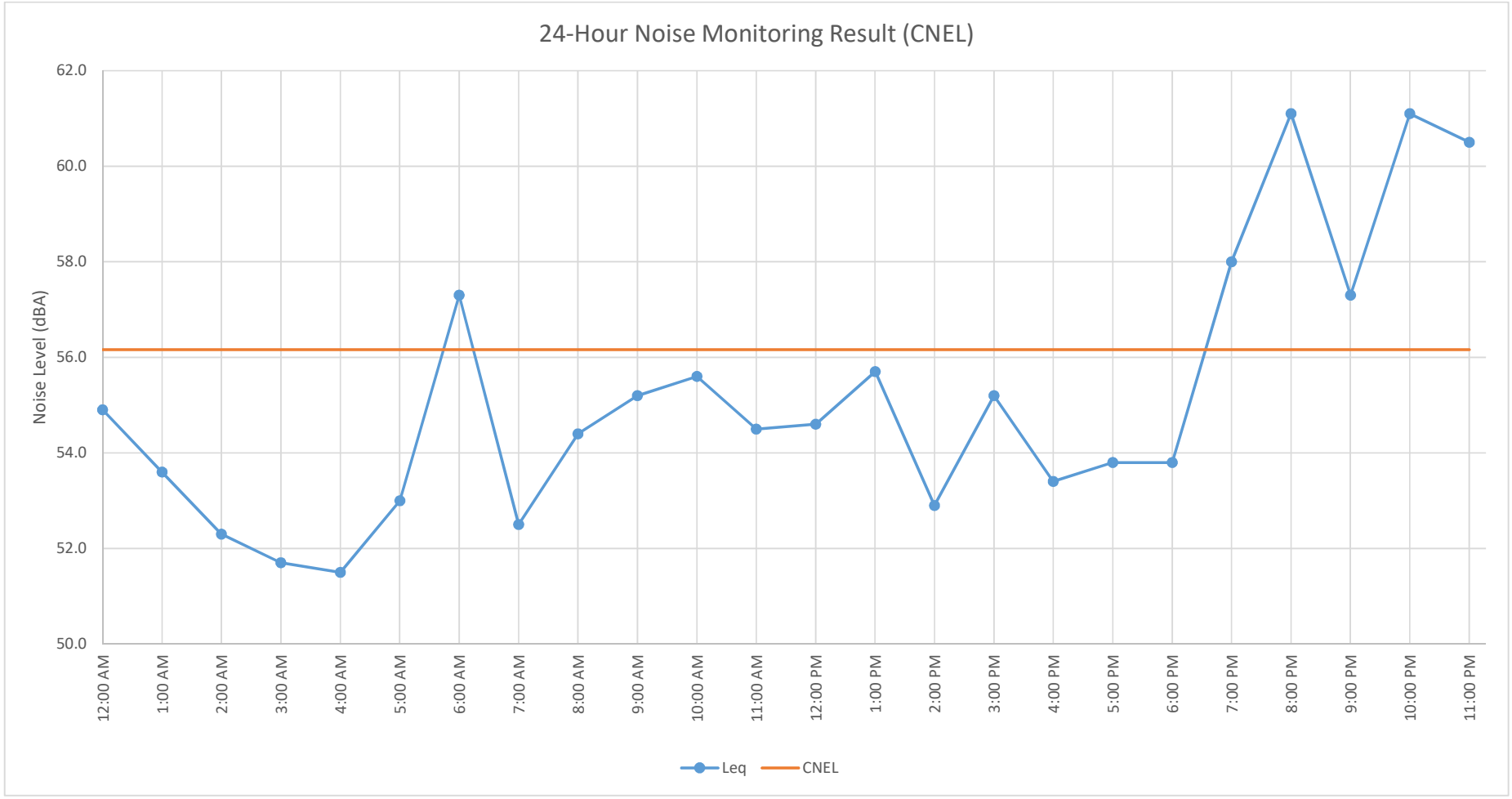
PROJECT:	Whittier Floral Residential Project					JOB #:	1373-2020-03
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	20-Feb-20
LOCATION:	PROPERTY LINE TO THE NORTHWEST					BY:	D. Shivaiah
Time	Leq	Lmin	Lmax	L2	L8	L25	L50
12:00 AM	50.5	44.9	63.5	55.0	52.2	50.9	49.7
1:00 AM	49.5	42.1	67.6	54	51.3	49.6	48.3
2:00 AM	49.6	44.1	66.5	55	51.8	49	47.8
3:00 AM	49.7	43.4	61.1	53.3	52	50.4	49.2
4:00 AM	50.8	44.1	68.4	54.8	52.8	51	49.7
5:00 AM	54.7	48.5	74.9	59.1	56.2	54.2	52.7
6:00 AM	57.9	49.6	71.7	62.7	59.6	58.2	57.2
7:00 AM	59.4	50.6	74.4	67.2	63	58.7	56.9
8:00 AM	56.3	45.2	78.1	63.3	57.7	54.2	52.3
9:00 AM	56.4	42.2	82.6	62.8	56.2	52.2	49.9
10:00 AM	51.9	41.8	69	59.8	55.4	51.3	49.1
11:00 AM	52.3	41.9	69.8	58.4	54.6	51.9	49.6
12:00 PM	53.9	44.3	77.7	61.2	56	52.4	50
1:00 PM	52.9	44.5	75	59.2	55.2	51.3	49.4
2:00 PM	54.7	46.2	71.4	62	57.8	54.1	51.6
3:00 PM	53.2	43.5	71.2	59.4	56.3	53.6	51.3
4:00 PM	55.2	42.9	70.4	62.1	58.9	55.7	53
5:00 PM	58.8	47.5	80	66.1	62.2	58.6	55.8
6:00 PM	55.3	44.7	80.8	61	57.3	53.7	51.6
7:00 PM	53.8	46.8	72	59.9	56.5	53.7	52.1
8:00 PM	53.9	48	65.8	60.7	56.8	53.8	52.3
9:00 PM	53.8	46.3	66.1	59.8	56.7	54.1	52.4
10:00 PM	54.8	48.4	65.2	60.8	57.9	55.5	53.5
11:00 PM	52.6	44.4	66.3	60	56.5	53.2	49.4
Daytime	55.3	41.8	82.6	62.2	58.1	54.7	52.5
Nighttime	53.0	42.1	74.9	58.0	55.1	53.2	51.7


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
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11:00 PM
Time
Leq
Lmin
Lmax
L2
L8
L25
L50

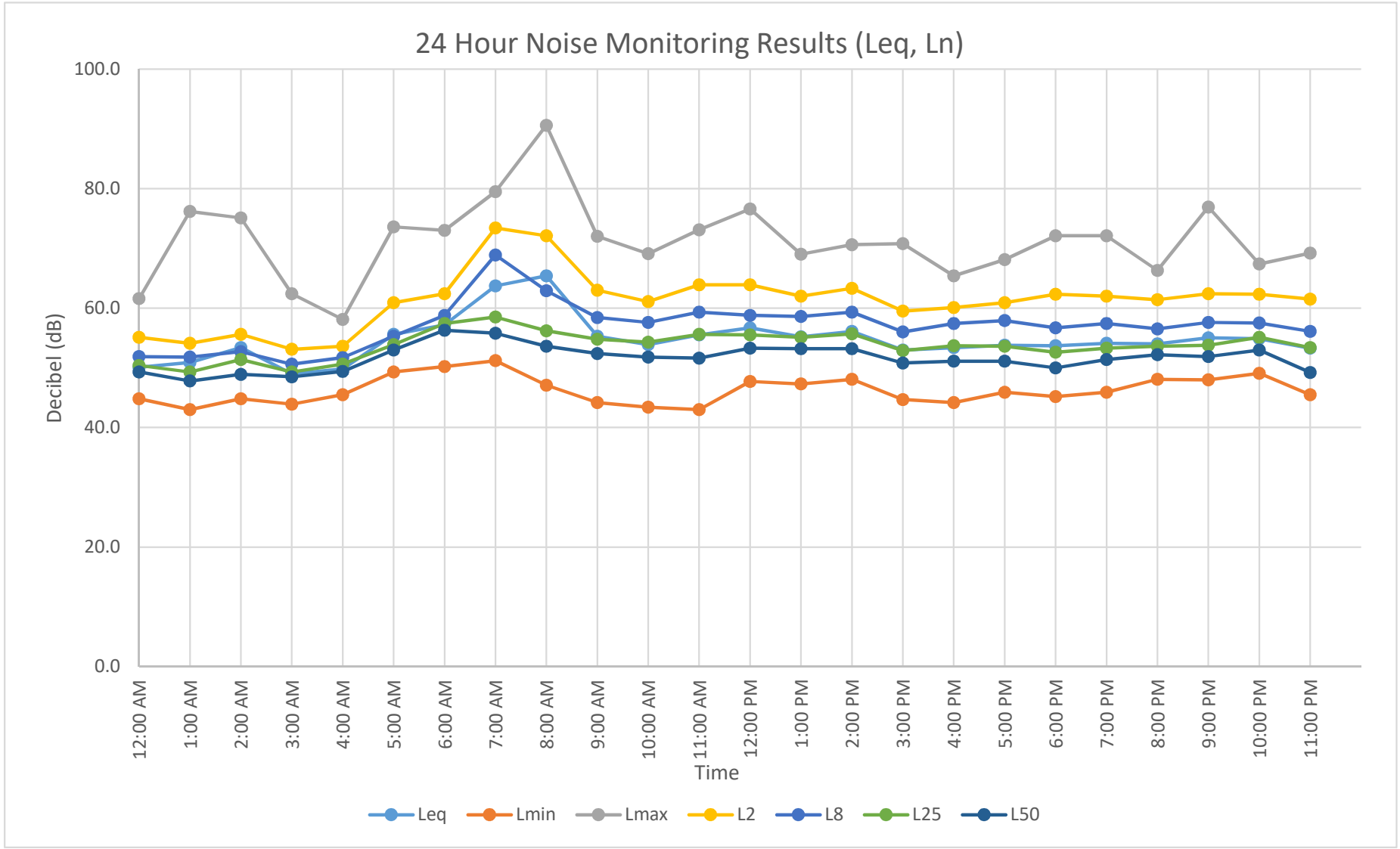

24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
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10:00 PM
11:00 PM
Leq
CNEL

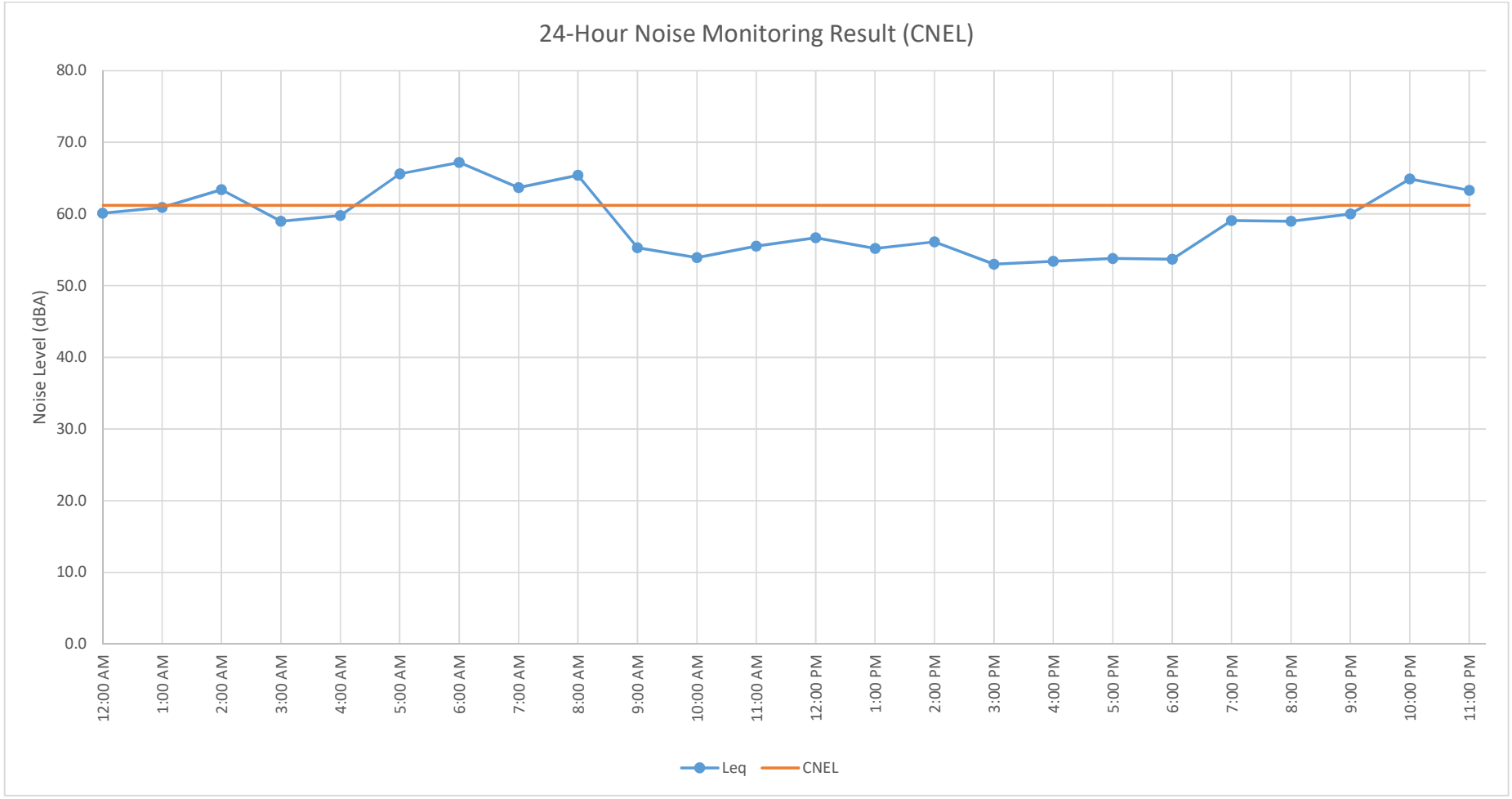
PROJECT:	Whittier Floral Residential Project					JOB #:	1373-2020-03
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	20-Feb-20
LOCATION:	PROPERTY LINE TO THE SOUTHWEST					BY:	D. Shivaiah
Time	Leq	Lmin	Lmax	L2	L8	L25	L50
12:00 AM	44.9	41.6	62.4	49.1	46.5	44.8	43.9
1:00 AM	43.6	41	57.6	46.7	45.1	43.9	42.9
2:00 AM	42.3	39.8	54.6	45.7	43.6	42.4	41.7
3:00 AM	41.7	40	53.7	44.7	43	41.8	41
4:00 AM	41.5	40	49.9	44	42.7	41.6	41
5:00 AM	43	40.1	55	47.8	44.9	43.3	41.9
6:00 AM	47.3	41.2	57.7	54.4	50.2	47.3	45.7
7:00 AM	52.5	41.7	66.8	61.2	56.2	52.1	50.2
8:00 AM	54.4	42.9	70.4	63.1	57.5	53.6	50.8
9:00 AM	55.2	44.5	70.6	63.2	59.5	54.9	50.9
10:00 AM	55.6	46.5	74.6	63.7	58.3	53.6	51
11:00 AM	54.5	45.3	68.4	62.8	58.7	54.3	50.7
12:00 PM	54.6	44.1	68.5	62.6	58.8	54.9	50.7
1:00 PM	55.7	44.8	66.4	62.1	59.3	56.3	54.5
2:00 PM	52.9	43.6	68.4	60.4	57.2	53.2	49.3
3:00 PM	55.2	43.4	77.4	62.2	58.1	53.3	49.5
4:00 PM	53.4	45	68.1	61.5	57.4	52.7	49.7
5:00 PM	53.8	45.6	67.9	59.8	57.4	54.5	52.1
6:00 PM	53.8	47.1	67	61.4	57.3	53.6	50.9
7:00 PM	53	43.8	71	61.3	56.3	51.8	49
8:00 PM	56.1	44.7	74.6	64.6	59.9	55.1	51
9:00 PM	52.3	41.4	66.5	61.6	56.8	51.6	47
10:00 PM	51.1	41.4	64.5	60	56.2	49.7	45.8
11:00 PM	50.5	41.7	65.1	58.9	55.2	49.6	45.8
Daytime	54.2	41.4	77.4	62.2	58.0	53.7	50.6
Nighttime	45.5	39.8	65.1	52.2	48.8	45.3	43.4


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Time
Leq
Lmin
Lmax
L2
L8
L25
L50


24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
62.0
60.0
58.0
56.0
54.0
52.0
50.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

PROJECT:	Whittier Floral Residential Project					JOB #:	1373-2020-03
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	20-Feb-20
LOCATION:	PROPERTY LINE TO THE SOUTHWEST					BY:	D. Shivaiah
Time	Leq	Lmin	Lmax	L2	L8	L25	L50
12:00 AM	50.1	44.8	61.6	55.1	51.9	50.4	49.3
1:00 AM	50.9	43	76.2	54.1	51.8	49.3	47.8
2:00 AM	53.4	44.8	75.1	55.6	52.7	51.4	48.9
3:00 AM	49	43.9	62.4	53.1	50.6	49.3	48.5
4:00 AM	49.8	45.5	58.1	53.6	51.7	50.6	49.4
5:00 AM	55.6	49.3	73.6	60.9	55.3	53.9	53
6:00 AM	57.2	50.2	73	62.4	58.8	57.4	56.3
7:00 AM	63.7	51.2	79.5	73.4	68.9	58.5	55.8
8:00 AM	65.4	47.1	90.6	72.1	62.9	56.2	53.6
9:00 AM	55.3	44.2	72	63	58.4	54.8	52.4
10:00 AM	53.9	43.4	69.1	61.1	57.6	54.3	51.8
11:00 AM	55.5	43	73.1	63.9	59.3	55.6	51.6
12:00 PM	56.7	47.7	76.6	63.9	58.8	55.5	53.3
1:00 PM	55.2	47.3	69	62	58.6	55.1	53.2
2:00 PM	56.1	48.1	70.6	63.3	59.3	55.7	53.2
3:00 PM	53	44.7	70.8	59.5	56	52.9	50.8
4:00 PM	53.4	44.2	65.4	60.1	57.4	53.7	51.1
5:00 PM	53.8	45.9	68.1	60.9	57.9	53.6	51.1
6:00 PM	53.7	45.2	72.1	62.3	56.7	52.6	50
7:00 PM	54.1	45.9	72.1	62	57.4	53.3	51.4
8:00 PM	54	48.1	66.3	61.4	56.5	53.6	52.2
9:00 PM	55	48	76.9	62.4	57.6	53.8	51.9
10:00 PM	54.9	49.1	67.4	62.3	57.5	55.1	53
11:00 PM	53.3	45.5	69.2	61.5	56.1	53.4	49.2
Daytime	58.0	43.0	90.6	65.8	60.6	54.9	52.5
Nighttime	53.3	43.0	76.2	58.6	54.5	52.9	51.3


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Time
Leq
Lmin
Lmax
L2
L8
L25
L50


24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

Appendix D

SoundPLAN Worksheets

Whittier Floral Residential Project
Noise emissions of industry sources

Source name	Reference	Level		Frequency spectrum [dB(A)]							Corrections		
				125	250	500	1	2	4	8	Cwall	CI	CT
			dB(A)	Hz	Hz	Hz	kHz	kHz	kHz	kHz	dB(A)	dB(A)	dB(A)
HVAC-1	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-2	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-3	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-4	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-5	Lw/unit	Day	72.0	47.5	53.5	62.9	66.6	66.8	66.1	55.0	-	-	-
		Night	72.0	47.5	53.5	62.9	66.6	66.8	66.1	55.0	-	-	-
HVAC-6	Lw/unit	Day	72.0	47.5	53.5	62.9	66.6	66.8	66.1	55.0	-	-	-
		Night	72.0	47.5	53.5	62.9	66.6	66.8	66.1	55.0	-	-	-
HVAC-7	Lw/unit	Day	72.0	47.5	53.5	62.9	66.6	66.8	66.1	55.0	-	-	-
		Night	72.0	47.5	53.5	62.9	66.6	66.8	66.1	55.0	-	-	-
HVAC-8	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-9	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-10	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-11	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-12	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-13	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-14	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-15	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-16	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-17	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-18	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-19	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-20	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-21	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-22	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-23	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-24	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-25	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
HVAC-26	Lw/unit	Day	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-
		Night	74.0	49.5	55.5	64.9	68.6	68.8	68.1	57.0	-	-	-

Whittier Floral Residential Project
Receiver list

No.	Receiver name	Building side	Floor	Limit		Level w/o NP		Level w NP		Difference		Conflict	
				Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
				dB(A)		dB(A)		dB(A)		dB		dB	
1	Reciver at the PL-1	-	GF	-	-	30.0	30.0	27.3	27.3	-2.7	-2.7	-	-
2	Reciver at the PL-2	-	GF	-	-	37.8	37.8	34.6	34.6	-3.2	-3.2	-	-
3	Reciver at the PL-3	-	GF	-	-	36.8	36.8	33.3	33.3	-3.5	-3.5	-	-
4	Reciver at the PL-4	-	GF	-	-	37.6	37.6	34.4	34.4	-3.1	-3.1	-	-
5	Reciver at the PL-5	-	GF	-	-	28.1	28.1	26.2	26.2	-1.8	-1.8	-	-

Whittier Floral Residential Project
Contribution levels of the receivers

Source name		Level w/o NP		Level w NP	
		Day	Night	Day	Night
		dB(A)		dB(A)	
Reciver at the PL-1	GF	30.0	30.0	27.3	27.3
HVAC-1		20.3	20.3	17.0	17.0
HVAC-2		26.3	26.3	22.7	22.7
HVAC-3		24.2	24.2	21.9	21.9
HVAC-4		18.6	18.6	15.0	15.0
HVAC-5		4.9	4.9	4.9	4.9
HVAC-6		3.9	3.9	3.9	3.9
HVAC-7		4.4	4.4	4.4	4.4
HVAC-8		6.9	6.9	6.9	6.9
HVAC-9		8.6	8.6	8.6	8.6
HVAC-10		5.8	5.8	5.8	5.8
HVAC-11		7.1	7.1	7.1	7.1
HVAC-12		7.0	7.0	7.0	7.0
HVAC-13		9.0	9.0	9.0	9.0
HVAC-14		5.6	5.6	5.6	5.6
HVAC-15		9.4	9.4	9.4	9.4
HVAC-16		7.4	7.4	7.3	7.3
HVAC-17		7.2	7.2	7.2	7.2
HVAC-18		8.2	8.2	8.2	8.2
HVAC-19		3.7	3.7	3.7	3.7
HVAC-20		7.4	7.4	7.4	7.4
HVAC-21		5.4	5.4	5.4	5.4
HVAC-22		14.5	14.5	10.0	10.0
HVAC-23		7.4	7.4	7.4	7.4
HVAC-24		6.2	6.2	6.2	6.2
HVAC-25		6.0	6.0	6.0	6.0
HVAC-26		3.7	3.7	3.7	3.7
Reciver at the PL-2	GF	37.8	37.8	34.6	34.6
HVAC-1		6.9	6.9	6.9	6.9
HVAC-2		7.6	7.6	7.5	7.5
HVAC-3		8.4	8.4	8.4	8.4
HVAC-4		8.0	8.0	8.0	8.0
HVAC-5		9.1	9.1	9.1	9.1
HVAC-6		9.1	9.1	9.1	9.1
HVAC-7		8.3	8.3	8.3	8.3
HVAC-8		11.4	11.4	11.4	11.4
HVAC-9		9.3	9.3	9.3	9.3
HVAC-10		12.1	12.1	12.1	12.1
HVAC-11		12.9	12.9	12.9	12.9
HVAC-12		10.9	10.9	10.9	10.9
HVAC-13		21.0	21.0	20.9	20.9
HVAC-14		15.3	15.3	15.3	15.3
HVAC-15		12.6	12.6	12.6	12.6
HVAC-16		19.9	19.9	19.2	19.2
HVAC-17		13.7	13.7	13.7	13.7
HVAC-18		11.6	11.6	11.6	11.6
HVAC-19		15.9	15.9	15.9	15.9
HVAC-20		19.2	19.2	19.2	19.2
HVAC-21		22.8	22.8	22.8	22.8
HVAC-22		37.1	37.1	32.9	32.9
HVAC-23		19.5	19.5	19.5	19.5
HVAC-24		16.9	16.9	16.9	16.9
HVAC-25		14.6	14.6	14.6	14.6
HVAC-26		12.3	12.3	12.3	12.3
Reciver at the PL-3	GF	36.8	36.8	33.3	33.3
HVAC-1		32.5	32.5	28.7	28.7
HVAC-2		20.7	20.7	17.7	17.7
HVAC-3		21.2	21.2	18.1	18.1
HVAC-4		34.2	34.2	30.5	30.5
HVAC-5		9.1	9.1	9.1	9.1
HVAC-6		7.4	7.4	7.4	7.4
HVAC-7		5.9	5.9	5.9	5.9
HVAC-8		5.8	5.8	6.0	6.0

Whittier Floral Residential Project
Contribution levels of the receivers

Source name		Level w/o NP Day	Level w/o NP Night	Level w NP Day	Level w NP Night
		dB(A)		dB(A)	
HVAC-9		8.1	8.1	8.1	8.1
HVAC-10		6.3	6.3	6.3	6.3
HVAC-11		6.5	6.5	6.5	6.5
HVAC-12		8.7	8.7	8.8	8.8
HVAC-13		8.7	8.7	8.7	8.7
HVAC-14		8.6	8.6	8.6	8.6
HVAC-15		8.9	8.9	8.9	8.9
HVAC-16		9.2	9.2	9.2	9.2
HVAC-17		9.9	9.9	9.9	9.9
HVAC-18		11.7	11.7	11.7	11.7
HVAC-19		3.7	3.7	3.7	3.7
HVAC-20		4.9	4.9	4.9	4.9
HVAC-21		5.8	5.8	5.8	5.8
HVAC-22		7.3	7.3	7.3	7.3
HVAC-23		8.7	8.7	8.7	8.7
HVAC-24		7.2	7.2	7.2	7.2
HVAC-25		6.7	6.7	6.7	6.7
HVAC-26		6.5	6.5	6.5	6.5
Reciver at the PL-4	GF	37.6	37.6	34.4	34.4
HVAC-1		21.5	21.5	17.4	17.4
HVAC-2		11.9	11.9	11.9	11.9
HVAC-3		15.9	15.9	14.4	14.4
HVAC-4		25.0	25.0	20.9	20.9
HVAC-5		34.3	34.3	30.1	30.1
HVAC-6		19.4	19.4	19.4	19.4
HVAC-7		31.7	31.7	29.2	29.2
HVAC-8		7.7	7.7	8.3	8.3
HVAC-9		8.8	8.8	8.8	8.8
HVAC-10		9.7	9.7	9.7	9.7
HVAC-11		11.2	11.2	11.2	11.2
HVAC-12		9.3	9.3	9.3	9.3
HVAC-13		16.2	16.2	16.2	16.2
HVAC-14		14.3	14.3	14.3	14.3
HVAC-15		13.4	13.4	13.4	13.4
HVAC-16		13.9	13.9	13.9	13.9
HVAC-17		17.1	17.1	17.1	17.1
HVAC-18		17.6	17.6	17.6	17.6
HVAC-19		8.4	8.4	8.4	8.4
HVAC-20		9.5	9.5	9.5	9.5
HVAC-21		10.4	10.4	10.4	10.4
HVAC-22		11.7	11.7	11.7	11.7
HVAC-23		13.1	13.1	13.1	13.1
HVAC-24		14.0	14.0	14.0	14.0
HVAC-25		20.7	20.7	18.1	18.1
HVAC-26		26.5	26.5	23.3	23.3
Reciver at the PL-5	GF	28.1	28.1	26.2	26.2
HVAC-1		4.1	4.1	4.1	4.1
HVAC-2		7.2	7.2	7.2	7.2
HVAC-3		9.3	9.3	9.3	9.3
HVAC-4		5.8	5.8	5.8	5.8
HVAC-5		5.9	5.9	5.9	5.9
HVAC-6		4.4	4.4	4.4	4.4
HVAC-7		-2.0	-2.0	-2.0	-2.0
HVAC-8		24.2	24.2	20.4	20.4
HVAC-9		19.0	19.0	15.5	15.5
HVAC-10		15.4	15.4	15.3	15.3
HVAC-11		15.0	15.0	15.0	15.0
HVAC-12		16.6	16.6	13.7	13.7
HVAC-13		9.6	9.6	9.6	9.6
HVAC-14		12.4	12.4	12.4	12.4
HVAC-15		11.7	11.7	11.7	11.7
HVAC-16		12.2	12.2	12.2	12.2
HVAC-17		10.4	10.4	10.4	10.4

Whittier Floral Residential Project
Contribution levels of the receivers

Source name	Level w/o NP		Level w NP	
	Day	Night	Day	Night
	dB(A)		dB(A)	
HVAC-18	10.3	10.3	10.3	10.3
HVAC-19	15.2	15.2	15.2	15.2
HVAC-20	11.2	11.2	11.2	11.2
HVAC-21	9.3	9.3	9.3	9.3
HVAC-22	9.8	9.8	9.8	9.8
HVAC-23	7.8	7.8	7.8	7.8
HVAC-24	7.0	7.0	7.0	7.0
HVAC-25	5.5	5.5	5.5	5.5
HVAC-26	2.3	2.3	2.3	2.3

Whittier Floral Residential Noise Impact Study

City of Whittier



Signs and symbols

- Ground effects
- Wall
- Wall
- Receiver
- Point source

1 : 1132

0 5 10 20 30 40 m

Whittier Floral Residential Noise Impact Study

City of Whittier

Signs and symbols

- Ground effects
- Wall
- Wall
- Point source

Levels in dB(A)

	<= 35
	35 - 40
	40 - 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	65 - 70
	> 70

1 : 1132

0 5 10 20 30 40 m

N

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Appendix E

Construction Noise and Vibration Worksheets

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/4/2020
Case Description: Whittier Floral Residential Project

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Demolition	Residential	55	50	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	50	0
Dozer	No	40		81.7	50	0

Results

Calculated (dBA)

Equipment	*Lmax	Leq
Concrete Mixer Truck	78.8	74.8
Dozer	81.7	77.7
Total	81.7	79.5

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/4/2020
Case Description: Whittier Floral Residential Project

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Site Preparation	Residential	55	50	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		50	0
Tractor	No	40	84		50	0

Results

Calculated (dBA)

Equipment	*Lmax	Leq
Grader	85	81
Tractor	84	80
Total	85	83.6

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/4/2020
Case Description: Whittier Floral Residential Project

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Grading	Residential	55	50	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		50	0
Dozer	No	40		81.7	50	0

Results

Calculated (dBA)

Equipment	*Lmax	Leq
Grader	85	81
Dozer	81.7	77.7
Total	85	82.7

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/4/2020
Case Description: Whittier Floral Residential Project

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Building Construction	Residential	55	50	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50	0
Generator	No	50		80.6	50	0
Tractor	No	40	84		50	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Crane		80.6	72.6
Generator		80.6	77.6
Tractor		84	80
	Total	84	82.5

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/4/2020
Case Description: Whittier Floral Residential Project

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Paving	Residential	55	50	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	50	0
Paver	No	50		77.2	50	0
Roller	No	20		80	50	0
Tractor	No	40	84		50	0

Results

	Calculated (dBA)	
Equipment	*Lmax	Leq
Concrete Mixer Truck	78.8	74.8
Paver	77.2	74.2
Roller	80	73
Tractor	84	80
Total	84	82.5

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/28/2020
Case Description: Whittier Floral Residential Project

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Architectural Coating	Residential	55	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	50	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		77.7	73.7
	Total	77.7	73.7

*Calculated Lmax is the Loudest value.

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Whittier Floral Residential Project	JOB #:	1373-2020-3
SOURCE:	Worst Case Construction Noise	DATE:	05-Mar-20
LOCATION:	Receptor at 50 Feet	BY:	Darshan Shivaiah

NOISE INPUT DATA

OBS DIST=	50.0			
DT WALL=	40.0			
DT W/OB=	10.0			
HTH WALL=	6.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	8.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	-4.96
NOISE EL =	0.0		NOISE HTH EL=	8.0
DROP-OFF=	10.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	50	82.7	82.7	82.7	82.7	82.7	82.7
PROJ LEVEL	50	82.7	82.7	82.7	82.7	82.7	82.7
SHIELDING	50	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
ADJ LEVEL	50	***77.7***	***77.7***	***77.7***	***77.7***	***77.7***	***77.7***

NOISE LEVEL REDUCTION DUE TO DISTANCE = 0

PROJECT:	Vibration Study	JOB #:	1373-2020-03
ACTIVITY:	Whittier Floral Residential Project	DATE:	5-Mar-20
LOCATION:	Residential Units to the west and so	ENGINEER:	Darshan Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.089 in/sec**

Equipment Type =	2	Large Bulldozer
PPV_{ref} =	0.089	Reference PPV at 25 ft.
D =	25.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Vibration Study	JOB #:	1373-2020-03
ACTIVITY:	Whittier Floral Residential Project	DATE:	5-Mar-20
LOCATION:	Residential Units to the west and so	ENGINEER:	Darshan Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.210 in/sec**

Equipment Type =	1	Vibratory Roller
PPV_{ref} =	0.210	Reference PPV at 25 ft.
D =	25.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Vibration Study	JOB #:	1373-2020-03
ACTIVITY:	Whittier Floral Residential Project	DATE:	5-Mar-20
LOCATION:	Residential Units to the west and so	ENGINEER:	Darshan Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.076 in/sec**

Equipment Type =	4	Loaded Trucks
PPV_{ref} =	0.076	Reference PPV at 25 ft.
D =	25.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

Suggested "n" Values Based on Soil Classes		
Soil Class	**Description of Soil Material**	**Suggested Value of "n"**
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, weathered rock.	1.3
III	Hard soils: dense compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

Guideline Vibration Damage Potential Threshold Criteria		
Structure and Condition	**Maximum PPV (in/sec)**	
	Transient Sources	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Guideline Vibration Annoyance Potential Criteria		
Human Response	**Maximum PPV (in/sec)**	
	Transient Sources	**Continuous/Frequent Intermittent Sources**
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans Transportation and Construction-Induced Vibration Guidance Manual, June 2004

Appendix I Traffic Impact Analysis & Parking Study

WHITTIER FLORAL RESIDENTIAL PROJECT
TRAFFIC IMPACT ANALYSIS
City of Whittier, California



WHITTIER FLORAL RESIDENTIAL PROJECT
TRAFFIC IMPACT ANALYSIS & PARKING STUDY
City of Whittier, California

Prepared for:

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March 26, 2021

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1.0 Introduction

1.1 Purpose of Report & Study Objectives

The purpose of this traffic impact analysis and parking study is to evaluate the development of the proposed Whittier Floral Residential project from a traffic circulation and parking supply and demand perspective. The proposed development is located within the City of Whittier. The project is planned to open in 2022 and has been analyzed in one (1) complete phase.

This traffic study has been prepared in accordance to guidelines, requirements, and thresholds of significance outlined in the *Traffic Impact Analysis Report Preparation Guidelines* established by the City of Whittier Department of Public Works, revised May 2nd, 2011. The study has also been prepared in accordance with the scope of work previously reviewed and approved by City staff.

The purpose of the parking analysis is to evaluate and determine whether the future parking supply and demand at the project site will be adequate with the implementation of the development.

1.2 Site Location & Project Description

The project proposes to construct and operate 25 single family detached dwelling units. The project site is currently occupied by the Trinity Lutheran Church upon a 3.59-acre lot for religious gathering and assembly. The Church plans to subdivide the property into two parcels; one (1) 2.56-acre lot for the residential development project and one (1) 1.03-acre lot for the Church, which will remain in operation.

The residential project will displace the former church school buildings on-site which are currently vacant. The Church also propose to expand the sanctuary building by an additional 2,809 square feet. Table 1 summarizes the proposed project land uses.

Table 1

Land Use Summary

Land Use	Quantity	Metric[1]
Single Family Residential	25	Dwelling Units
Church	2,809	S.F.

The project consist of demolition of 13,334 square feet of school buildings and 14,545 square feet of the gymnasium building as part of the construction process. The site requires grading and import of approximately 8,905 cubic yards of fill material during grading phase.

The project requires a General Plan amendment to change the land use from Private School to Medium Density Residential land use and requires a zone change from Low Density Residential (R-1) to Medium Density Residential (R-2).

Construction of the project is estimated to begin in the year 2021 and last approximately 17 months. Construction activities are expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. The project is expected to be operational in the year 2022.

Access to the project site will be from two (2) non-gated entryways on Floral Drive. The primary entry way is located at the northeasterly corner of the site. Access to the Trinity Lutheran Church will continue to use the existing driveway on Floral Drive located at the west end of the frontage.

Exhibit 1-1 illustrates the site location and traffic analysis study area.

Exhibit 1-2 illustrates the project site plan used for this analysis, provided by KTGY Architecture.

It should be noted that the project site plan has been slightly modified compared to what was originally analyzed in this traffic impact analysis. The changes to the site plan are not substantial. Therefore, the traffic analysis shown in this report, which is based on the original site plan, still provides an adequate and reasonable assessment of potential project impacts. Any minor changes to the analysis as a result of the new site plan would not affect the overall findings of this study.

1.3 Traffic Study Area & Analysis Scenarios

The study area consists of the following intersections:

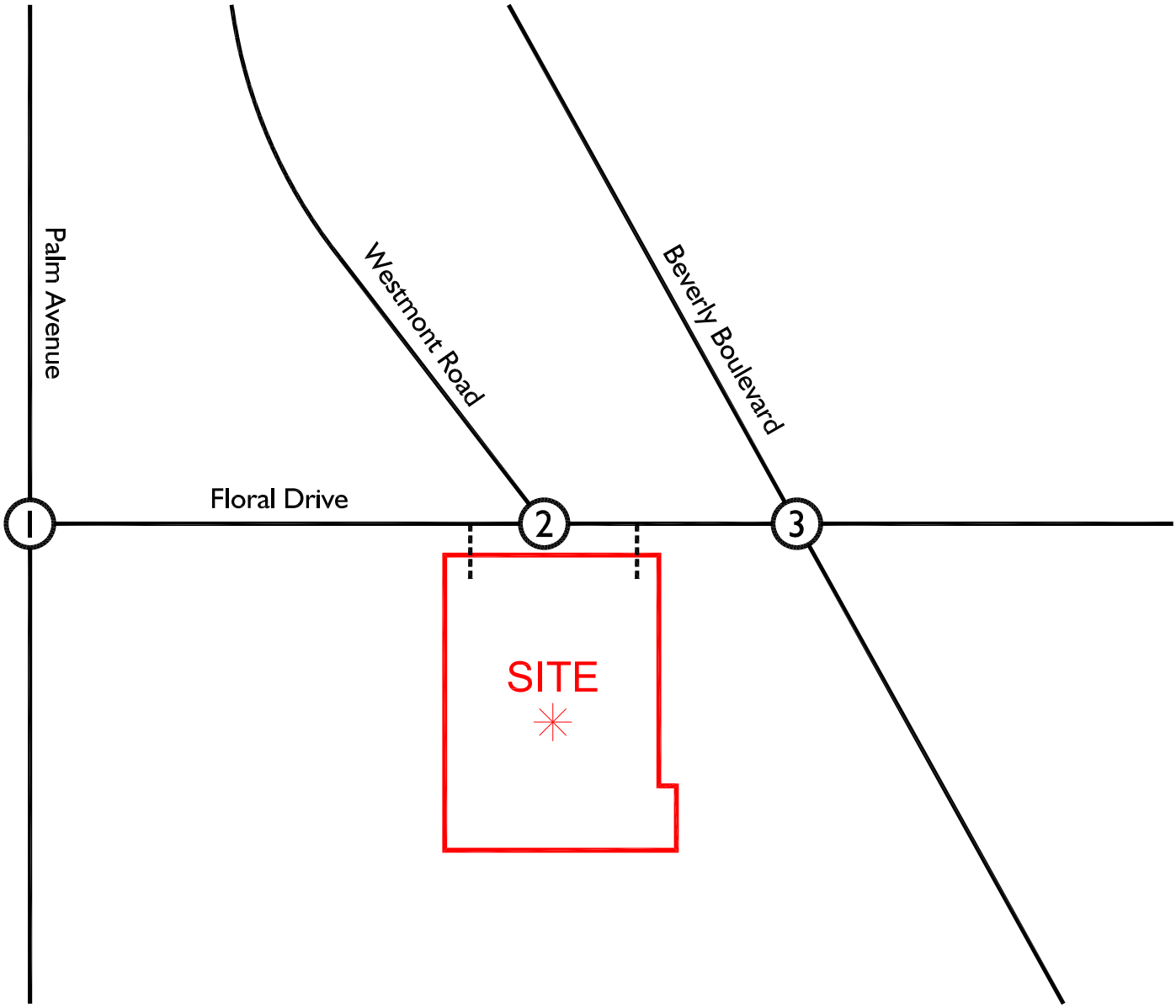
#	North-South Street	East-West Street	Notes
1.	Palm Avenue	Floral Drive	Existing – Unsignalized
2.	Westmont Road	Floral Drive	Existing – Unsignalized
3.	Beverly Boulevard	Floral Drive	Existing – Signalized

Exhibit 1-1, illustrates the site location and traffic analysis study area.

The analysis evaluates traffic conditions of the study intersections for the following scenarios in accordance with the City of Whittier and the approved scope of work:

- Existing Conditions;
- Existing Plus Project Conditions;
- Opening Year (2022) With Cumulative Projects Conditions; and
- Opening Year (2022) With Cumulative Projects Conditions Plus Project Conditions.

Exhibit 1-1
Location Map



Legend:

1 = Study Area Intersection

= Project Site

= Project Site Boundary

= Project Access Driveway

N

RK engineering group, inc.

Exhibit 1-2
Site Plan



N

2.0 Analysis Methodologies, Performance Criteria & Thresholds of Significance

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report in accordance with the City of Whittier requirements.

This section also discusses the agency-established applicable performance criteria and thresholds of significance for the study facilities.

2.1 Intersection Peak Hour Level of Service Analysis Methodology

Level of Service (LOS) is commonly used as a qualitative description of intersection operation and is based on the capacity of the intersection and the volume of traffic using the intersection.

The definitions of level of service for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- LOS A represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.

- LOS B is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.

- LOS C is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.

- LOS D represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.

- LOS E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.

- LOS F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

The *Intersection Capacity Utilization (ICU)* analysis method is utilized by the City Whittier to determine the operating LOS of signalized intersections.

To calculate the ICU, the volume of traffic using the intersection is compared with the capacity of the intersection. ICU is usually expressed as a ratio. This ratio represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. The ICU analysis methodology utilizes the following parameters consistent with the governing agencies' requirements and guidelines:

The ICU analysis methodology describes the operation of an intersection using a range of LOS from LOS A (free-flow conditions) to LOS F (severely congested conditions), based on the corresponding ranges of volume-to-capacity at intersections. The following thresholds are used in assigning a letter value to the resulting Levels of Service.

ICU Intersection LOS & V/C Ranges

LOS	CRITICAL VOLUME TO CAPACITY RATIO
A	0.00 - 0.60
B	0.61 - 0.70
C	0.71 - 0.80
D	0.81 - 0.90
E	0.91 - 1.00
F	>1.00

The Highway Capacity Manual (HCM) methodology is the adopted methodology for evaluation of City of Whittier unsignalized study intersections.

The HCM methodology defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS (Level of Service) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted.

For all-way stop-controlled intersections, average control delay per vehicle is used to determine the level of service. For intersections and driveways with stop control on the

minor approach only, the calculation of level of service is dependent on the occurrence of gaps occurring in the free-flow traffic movement of the main street, and the level of service is determined based on the worst individual movements on the stop-controlled minor approach or movements sharing a single lane on the stop-controlled minor approach.

The HCM analysis methodology describes the operation of an intersection using a range of LOS from LOS A (free-flow conditions) to LOS F (severely congested conditions), based on the corresponding ranges of stopped delay experienced per vehicle for signalized and unsignalized intersections. The following thresholds are used in assigning a letter value to the resulting Levels of Service.

HCM Intersection LOS & Delay Ranges

	Average Control Delay Per Vehicle (Seconds)
LOS	Unsignalized
A	0.00 - 10.00
B	10.01 - 15.00
C	15.01 - 25.00
D	25.01 - 35.00
E	35.01 - 50.00
F	>50.00

All analysis parameters utilized in this analysis are in accordance with the City of Whittier Traffic Study Guidelines.

2.2 Level of Service Performance Criteria & Thresholds of Significance

This analysis considers Level of Service D or better to be the acceptable LOS for the City of Whittier.

In accordance with the City of Whittier thresholds of significance, for signalized intersections, a project results in a significant traffic impact when any of the following changes in the volume to capacity (V/C) ratios occur between the "without Project" and the "with Project" conditions:

Pre-Project LOS	Pre-Project V/C	Project V/C Increase
C	0.71 – 0.80	0.04 or more
D	0.81 – 0.90	0.02 or more
E/F	0.91 or more	0.01 or more

The City of Whittier Traffic Impact Study Guidelines do not contain any significant impact criteria for unsignalized intersections. The analysis utilizes the following criteria to determine if a project results in significant traffic impact at unsignalized intersections:

- For unsignalized intersections, the impact is considered significant if the project related increase in traffic results in a deficient operation (LOS E or worse), or adds traffic to a deficiently operating intersection and the intersection satisfies the Manual of Uniform Traffic Control Devices (MUTCD) peak hour signal warrants during one or more of the peak hours.

3.0 Existing Traffic Volumes & Circulation System

This section provides a discussion of existing study area conditions and traffic volumes.

3.1 Existing Traffic Controls & Intersection Geometrics

Exhibit 3-1 identifies the existing roadway conditions for the study area roadways. The number of through traffic lanes for existing roadways and the existing intersection controls are identified.

3.2 Existing Conditions Traffic Volumes

Existing conditions intersection level of service calculations are based upon manual AM, Mid-day, PM, and Sunday peak hour turning movement counts taken in February and March 2020. The AM peak hour traffic volumes were determined by counting the two-hour period between 7:00 a.m. and 9:00 a.m. In order to capture the traffic volumes that stem from the nearby Dexter Middle School being dismissed, the Mid-day peak hour traffic volumes were collected between 1:30 p.m. and 3:30 p.m. The PM peak hour traffic volumes were identified by counting the two-hour period between 4:00 p.m. and 6:00 p.m. In order to capture traffic volumes that stem from the Trinity Lutheran Church gatherings and assemblies, Sunday peak hour traffic volumes were collected between 8:00 a.m. and 12:00 p.m.

The traffic count worksheets are included in Appendix A.

Existing traffic volumes for the study area intersections are shown on Exhibit 3-2A and Exhibit 3-2B.

3.3 Existing Pedestrian and Bicycle Volumes

Due to the vicinity of Dexter Middle School to the project site, as requested by the City, for informational purposes, RK collected pedestrian and bicycle 2-way directional counts to determine how many pedestrians/students are crossing in front of the project site. The pedestrian and bicycle 2-way directional counts were collected during one typical weekday and one typical Sunday during the analysis peak periods. The pedestrian and bicycle counts were collected at a point near the project driveway.

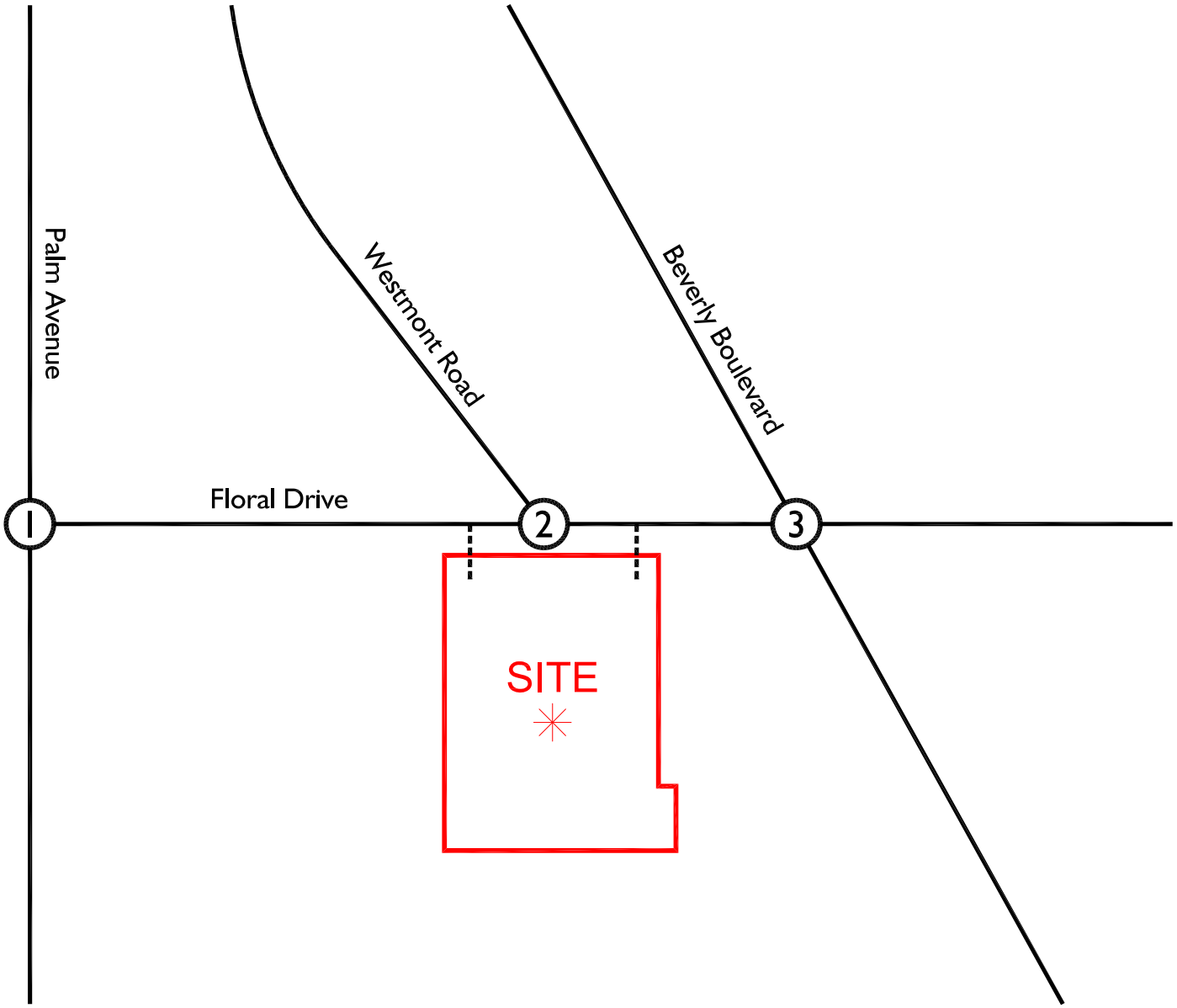
Existing pedestrian traffic volumes are shown on Exhibit 3-3.

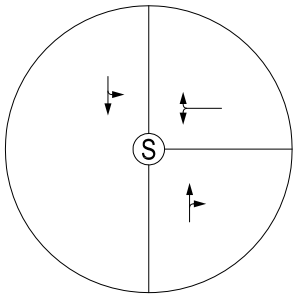
Existing bicycle traffic volumes are shown on Exhibit 3-4.

The pedestrian and bicycle 2-way directional count worksheets are included in Appendix A.

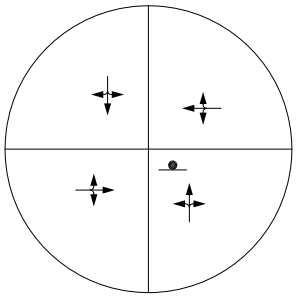
Exhibit 3-1

Existing Lane Geometry and Traffic Controls

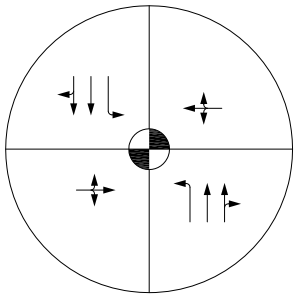




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

Legend:

= Traffic Signal

(S) = All Way Stop

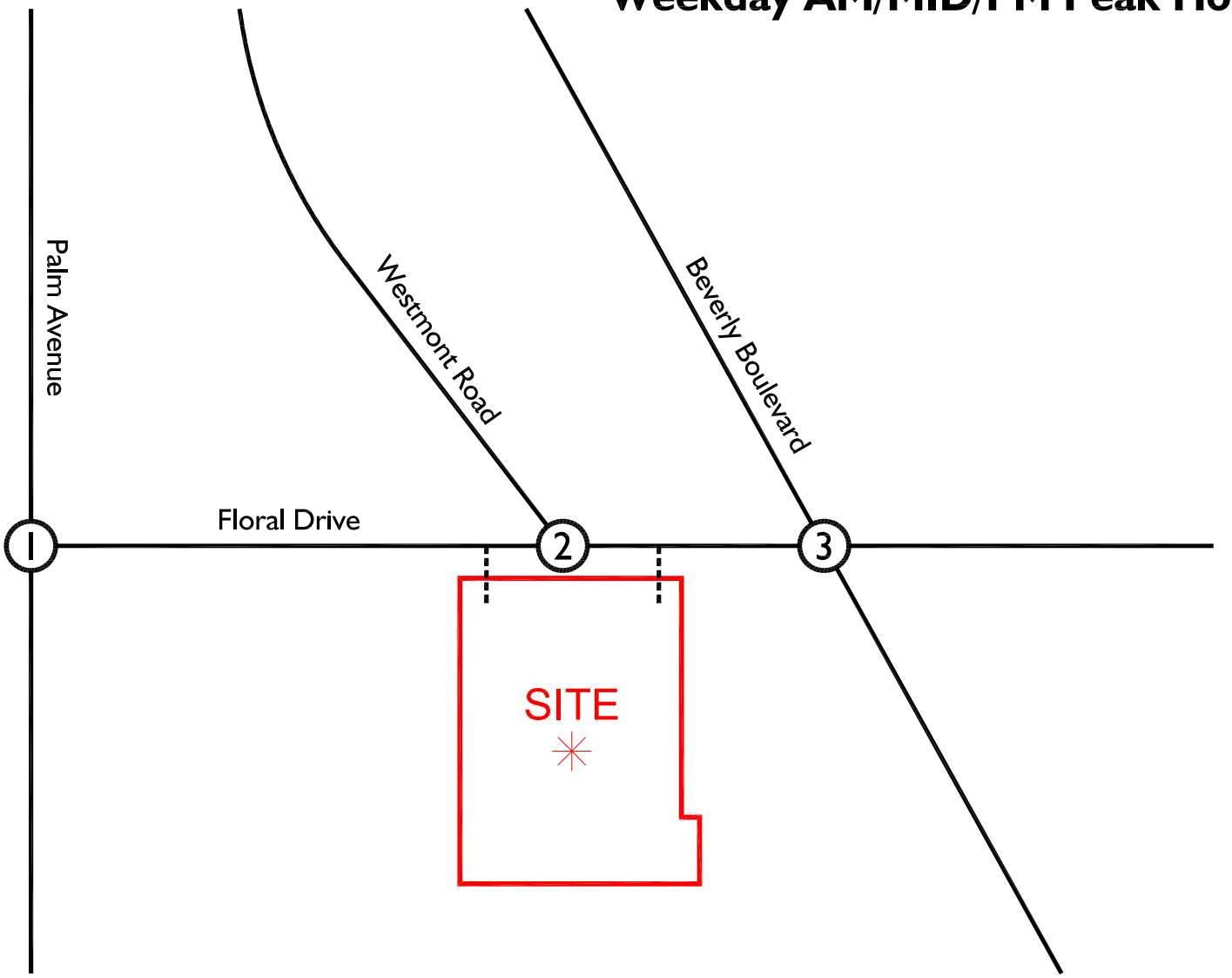
= Stop Sign

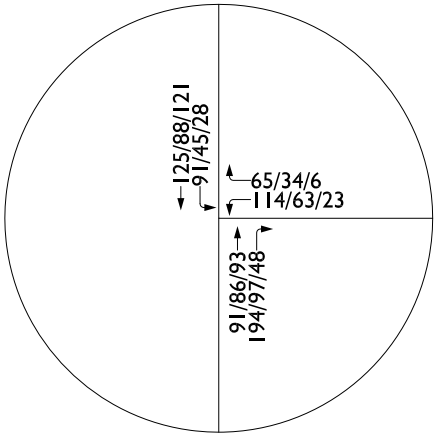
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RK engineering group, inc.

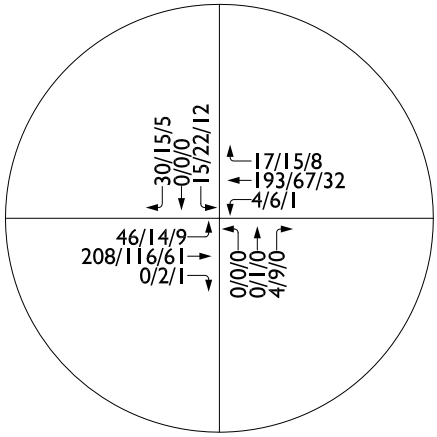
Exhibit 3-2 A

Existing Traffic Volumes
Weekday AM/MID/PM Peak Hour

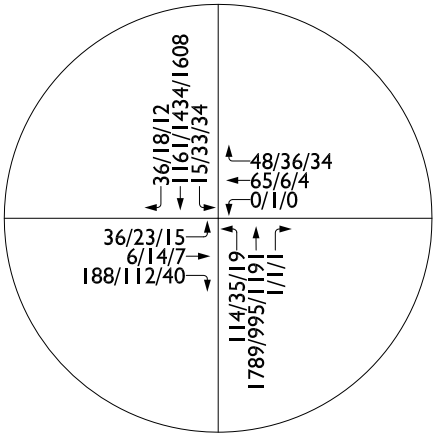




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

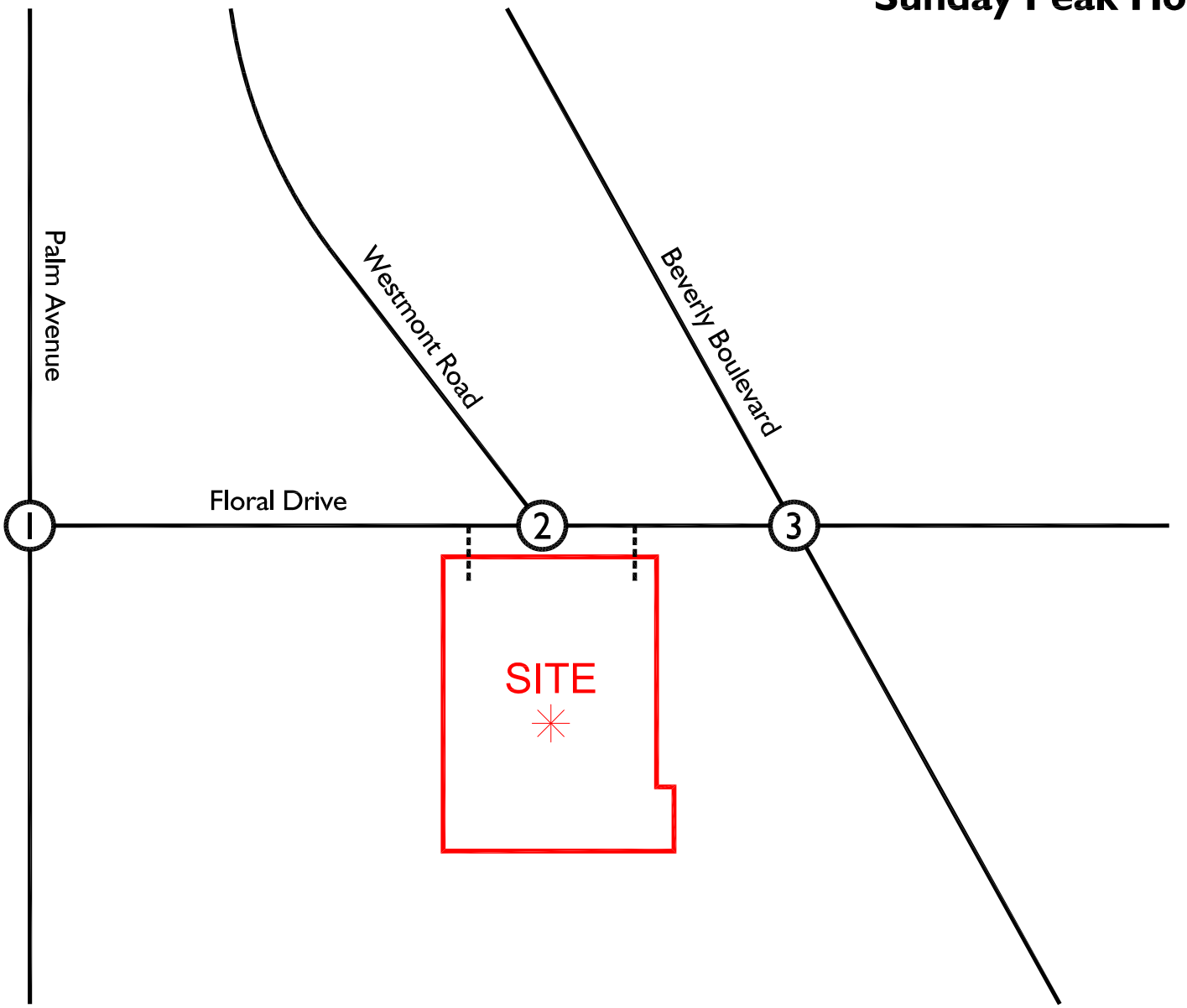
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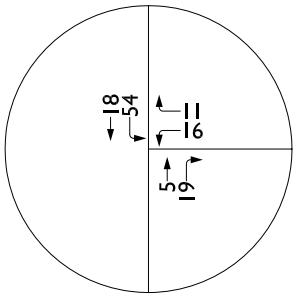
Legend:

10/20/30 = Weekday AM/MID/PM Peak Hour Volumes

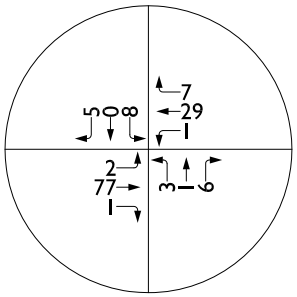
Exhibit 3-2 B

Existing Traffic Volumes
Sunday Peak Hour

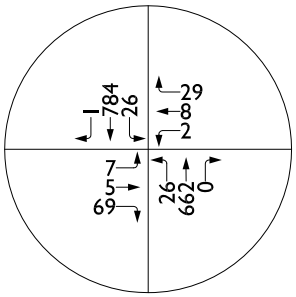




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

N

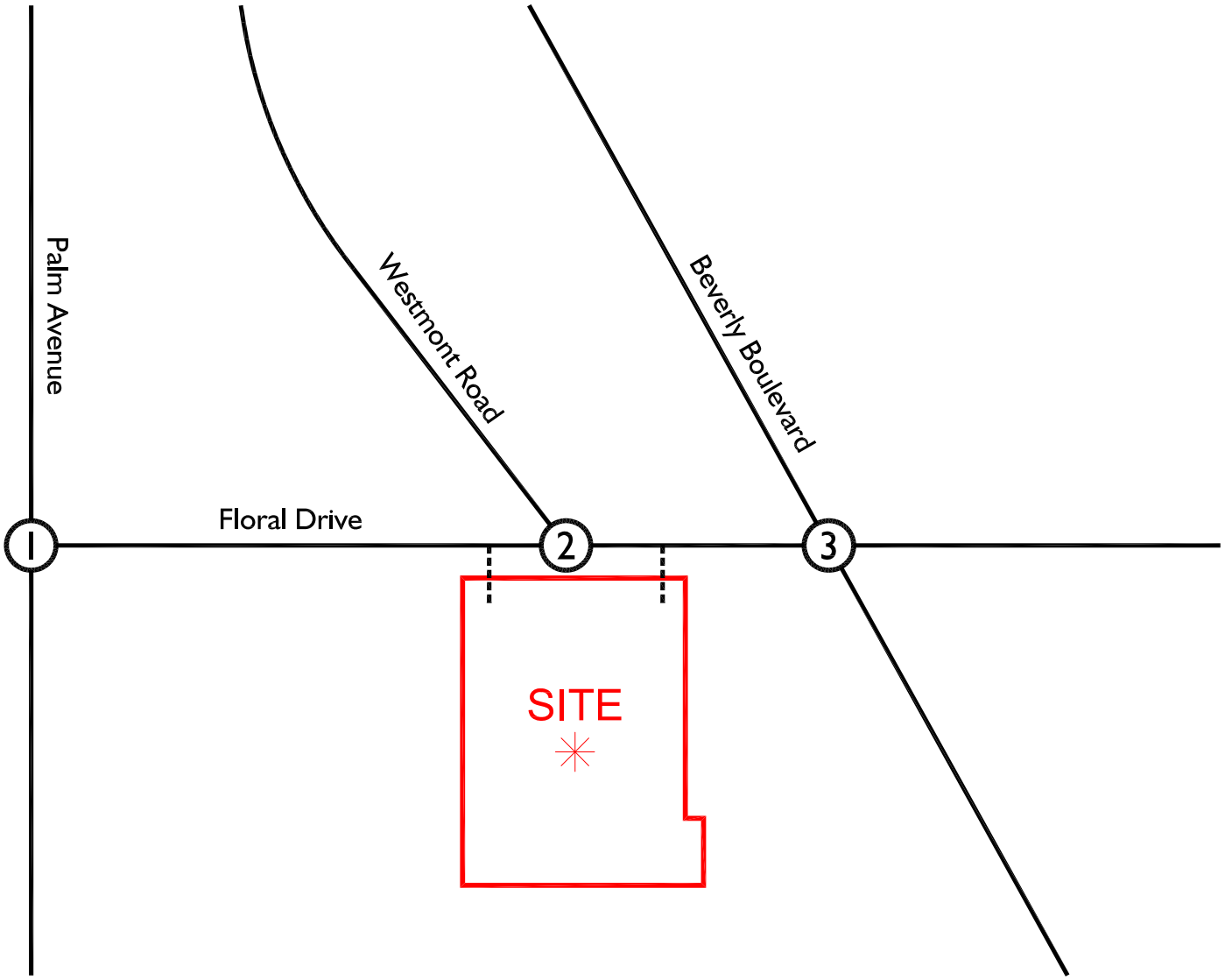
Legend:

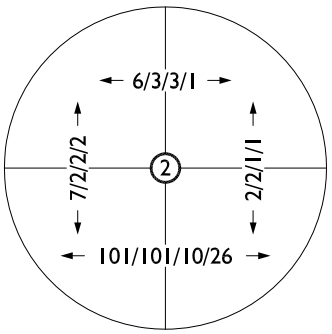
10 = Sunday Peak Hour Volumes

RK engineering group, inc.

Exhibit 3-3

Existing Pedestrian Traffic Volumes





2. Westmont Road (NS) & Floral Drive (EW)

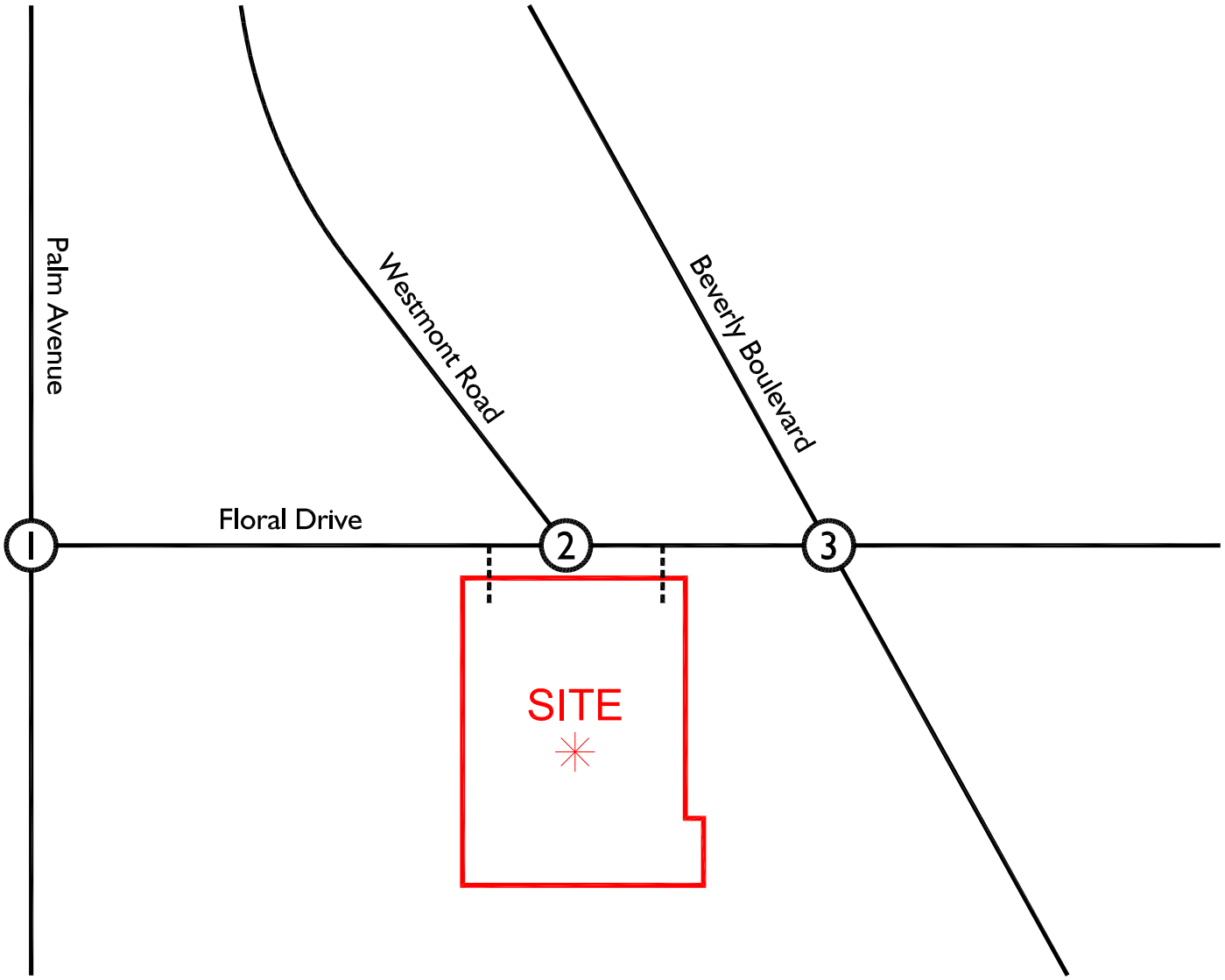
N

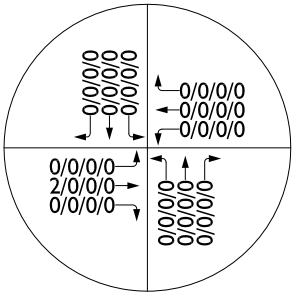
Legend:

10/20/30/40 = Weekday AM/MID/PM and Sunday Pesdestrian Traffic Volumes

Exhibit 3-4

Existing Bicycle Traffic Volumes





2. Westmont Road (NS) & Floral Drive (EW)

N

Legend:

10/20/30/40 = Weekday AM/MID/PM and Sunday Bicycle Traffic Volumes

4.0 Projected & Future Traffic Volumes

This section provides a discussion on methodologies utilized to derive future traffic volumes for the study area.

4.1. Project Traffic Conditions

4.1.1 Trip Generation

As previously mentioned, the project site plan has been slightly modified compared to what was originally analyzed in this traffic impact analysis. The changes to the site plan are not substantial. Therefore, the trip generation and traffic analysis shown in this report, which is based on the original site plan, still provides an adequate and reasonable assessment of potential project impacts. Any minor changes to the analysis as a result of the new site plan would not affect the overall findings of this study.

Trip generation represents the amount of traffic that is attracted and produced by a development.

Trip generation for the proposed project is determined based on ITE 10th Edition trip generation rates for the proposed land uses as shown in Table 4-1.

The proposed project consists of developing Single Family Detached Condominiums upon the site and a limited Church facility expansion. For this analysis, RK conservatively utilized trip generation rates for Single Family Homes to estimate the trip generation for the proposed project in place of trip generation rates for Multi-Family Housing as trip generation rates for Single Family Homes are typically higher.

Utilizing the ITE trip generation rates shown in Table 4-1, Table 4-2 summarizes the daily, and peak hour trip generation for the proposed project.

The proposed project consists of a residential development and church expansion. The trip generation of the proposed project has accounted for the new trips generated by the church expansion element of the project. The residential portion of the project will displace former and currently vacant church buildings used for religious education purposes. Due to their vacancy, the trip generation of proposed project will not account for trip credit/reduction due to displacement.

As shown in Table 4-2, the proposed project is forecast to generate approximately 265 net weekday daily trips which include approximately 20 net weekday AM peak hour trips, 28 net weekday Mid-day peak hour trips, and 28 net weekday PM peak hour trips.

As also shown in Table 4-2, the proposed project is forecast to generate approximately 300 net Sunday daily trips which include approximately 50 net Sunday Mid-day peak hour trips.

It should be noted the project trip generation is conservative since it does not account for the walkability to the nearby school. In reality, some of the trips generated by the proposed residential project would be reduced since students will be able to walk to the nearby Dexter Middle school.

4.1.2 General Plan Consistency

According to the City of Whittier Zoning and Land Use ArcGIS Map, the project lot is currently designated as a R1- Single Family Residential Zone. Per Municipal Code 18.16.030, the City of Whittier standardizes all single-family residential dwelling units (DU) to have a minimum lot area size of 7,000 square feet (6.22 DU/acre).

The proposed project consists of 2.56 acres for residential development. Based upon the City of Whittier developmental standards previously mentioned, a maximum fifteen (15) single family residential dwelling units may be developed.

Utilizing the ITE trip generation rates shown in Table 4-1 for Single Family Homes, Table 4-3 summarizes the daily and peak hour trip generation for the fifteen (15) single family residential dwelling units permitted for development.

As shown in Table 4-3, the allowable 15-unit residential development is forecast to generate approximately 142 weekday daily trips which include approximately 11 weekday AM peak hour trips, 15 weekday Mid-day peak hour trips, and 15 weekday PM peak hour trips.

As also shown in Table 4-3, the allowable 15-unit residential development is forecast to generate approximately 128 Sunday daily trips which include approximately 13 Sunday Mid-day peak hour trips.

As previously noted, the proposed project consists of developing Single Family Detached Condominiums upon the site and a limited Church facility expansion. The project requires a General Plan amendment to change the land use from Private School to Medium Density Residential land use and requires a zone change from Low Density Residential (R-1) to Medium Density Residential (R-2). For this analysis, RK conservatively utilized trip generation rates for Single Family Homes to estimate the trip generation for the proposed project in place of trip generation rates for Multi-Family Housing as trip generation rates for Single Family Homes are typically higher.

Table 4-4 shows the trip generation comparison between the allowable R-1 residential development and proposed R-2 residential development.

As shown in Table 4-4, when compared to the allowable 15-unit development, the proposed 26-unit residential project is expected to generate approximately 103 additional weekday daily trips, 8 additional weekday AM peak hour trips, 11 additional weekday Mid-day peak hour trips, and 9 additional PM peak hour tips.

As also shown in Table 4-4, when compared to the allowable 15-unit development, the proposed 26-unit residential project is expected to generate approximately 94 additional Sunday daily trips which includes 9 additional Sunday Mid-day peak hour trips.

4.1.3 Trip Distribution

Trip distribution represents the directional orientation of traffic to and from the project. Trip distribution is heavily influenced by the geographical location of the site, the location of retail, employment, recreational opportunities, and the proximity to the regional freeway system. The directional orientation of traffic was determined by evaluating existing and proposed land uses and highways within the community.

Forecast trip distribution for the proposed project has been developed through discussions with the City during the scoping process.

Exhibit 4-1 shows the trip distribution for the proposed project.

4.1.4 Modal Split

Modal split denotes the proportion of traffic generated by a project that would use any of the transportation modes, namely buses, cars, bicycles, motorcycles, trains, carpools, etc. The traffic reducing potential of public transit and other modes is significant. However, the traffic projections in this study are conservative in that public transit and alternative transportation may be able to reduce the traffic volumes, but, no modal split reduction is applied to the projections. With the implementation of transit service and provision of alternative transportation ideas and incentives, the automobile traffic demand can be reduced significantly.

4.1.5 Project Peak Hour Traffic Volumes/Assignment

The assignment of traffic from the project site to the adjoining roadway system has been based upon the project's trip generation, trip distribution, and proposed arterial highway and local street systems that this traffic study assumes would be in place by the time of occupancy of the site.

Project traffic volumes are shown on Exhibit 4-2A and 4-2B.

4.2 Existing Plus Project Conditions Traffic Volumes

Existing Plus Project Conditions traffic volumes are derived by adding the project traffic volumes shown in Exhibit 4-2A and Exhibit 4-2B to the existing traffic volumes shown in Exhibit 3-2A and Exhibit 3-2B.

Existing Plus Project Conditions traffic volumes are shown in Exhibit 4-3A and Exhibit 4-3B.

4.3 Background Traffic

4.3.1 Method of Projection

To assess future conditions, project traffic is combined with existing traffic, area-wide growth, and cumulative projects' traffic.

For opening year (2022) conditions, to account for area wide/ambient growth in the study area, an annual growth rate of one percent (1%) has been applied to existing traffic volumes over a two-year period, as directed by City Staff.

4.3.2 Cumulative Projects Traffic

Information on future projects in the vicinity of study area has been obtained from the City of Whittier staff for inclusion in this analysis and shown in Table 4-5.

"Probable future projects" include projects that have been filed with the City but are not yet approved or projects that the City reasonably anticipates will be submitted in the foreseeable future.

Table 4-5 shows the proposed land uses for the nearby cumulative projects provided by the City staff. Table 4-5 also shows the peak hour and daily trip generation for the cumulative projects.

Cumulative Projects traffic volumes are shown on Exhibit 4-4A and Exhibit 4-4B.

In reality, some of the cumulative projects may be downsized or may not be developed by project opening year (2022). In addition, many of the related projects have been or will be subject to a variety of mitigation measures that will reduce the potential environmental impacts associated with those projects. However, those mitigation measures have not been taken into account in projecting the environmental impact of the related projects.

Therefore, the cumulative analyses set forth below are conservative and could result in greater impacts than actually anticipated. Additionally, the analysis utilizes a growth rate of one (1) percent per year for project opening year (2022) conditions, which would already capture and account for most projects in the area. The growth rate methodology is considered conservative since it is applied to all movements of the study intersections.

4.4 Opening Year (2022) With Cumulative Projects Conditions Traffic Volumes

Opening Year (2022) With Cumulative Projects Conditions traffic volumes consist of existing traffic volumes and a 2% growth rate (to account for two years of annual growth at 1%) and also the traffic associated with cumulative projects in year 2022.

Opening Year (2022) With Cumulative Projects Conditions traffic volumes are shown on Exhibit 4-5A and Exhibit 4-5B.

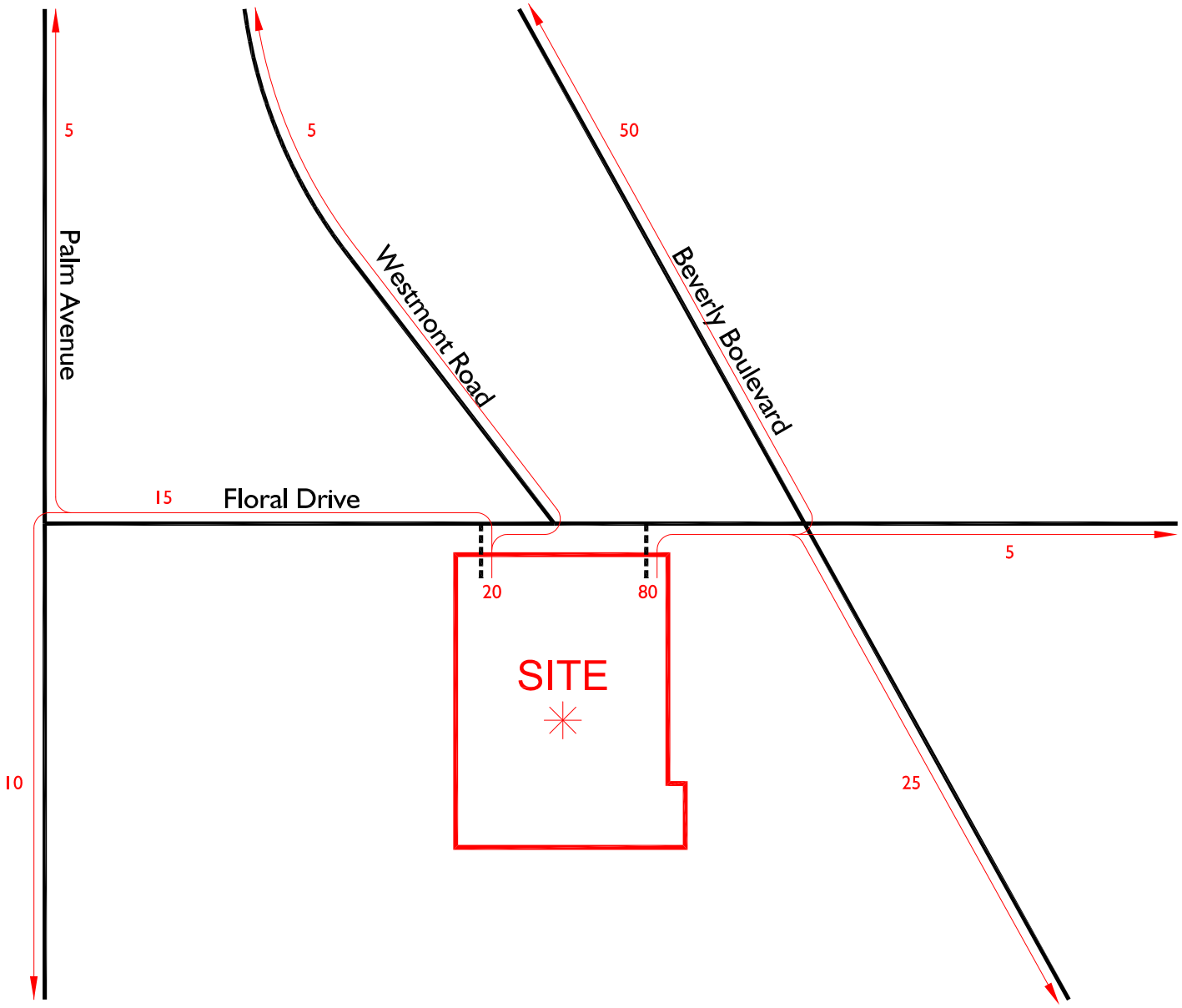
4.5 Opening Year (2022) With Cumulative Projects Plus Project Conditions Traffic Volumes

Opening Year (2022) With Cumulative Projects Plus Projects Conditions traffic volumes consist of existing traffic volumes and a 2% growth rate (to account for two years of annual growth at 1%), the traffic associated with cumulative projects in year 2022, and also the traffic generated by the proposed project.

Opening Year (2022) With Cumulative Projects Plus Project Conditions traffic volumes are shown on Exhibit 4-6A and Exhibit 4-6B.

Exhibit 4-1

Project Trip Distribution



Legend:

10 = Percent to/from Project

✳ = Project Site

— = Project Site Boundary

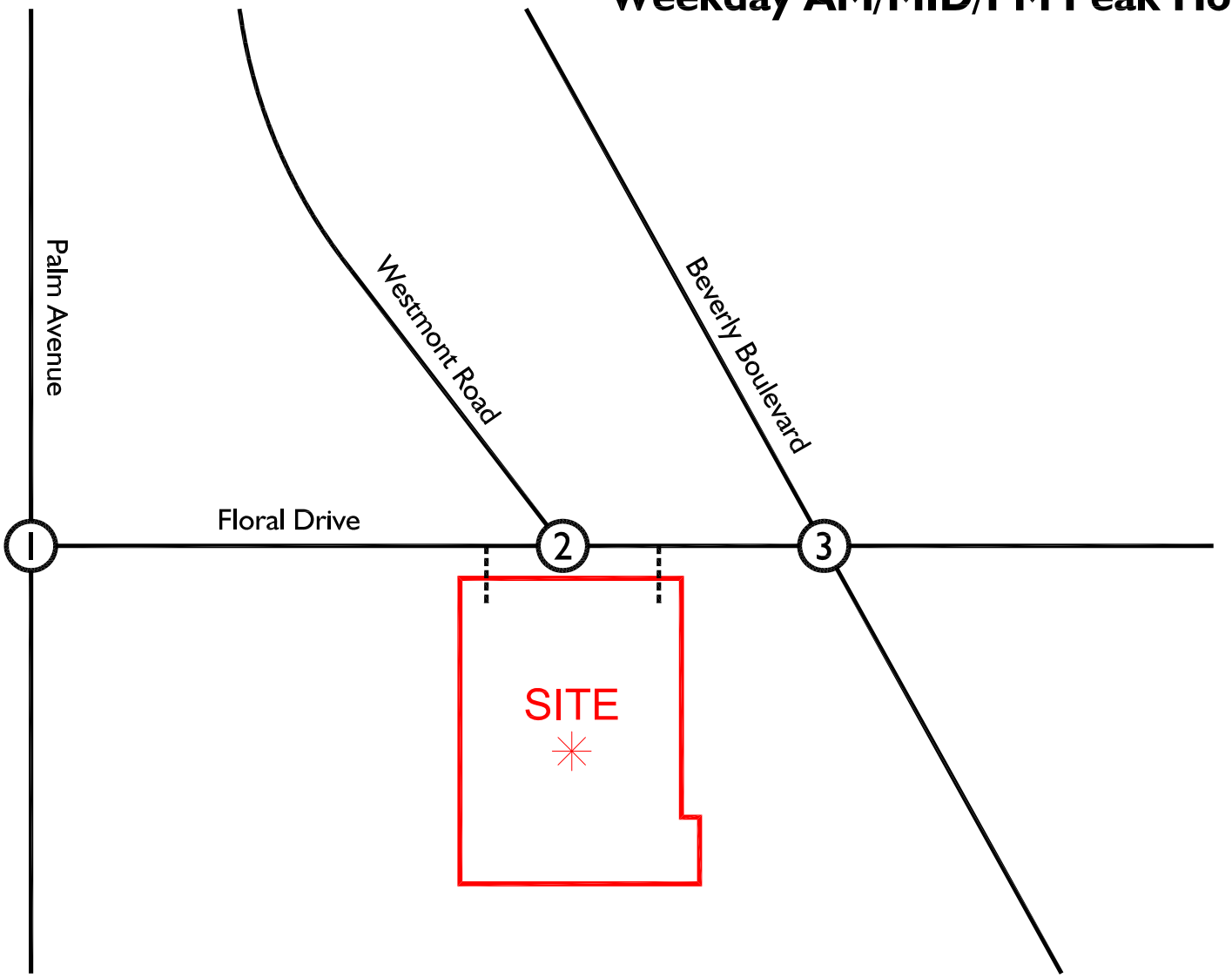
- - - = Project Access Driveway

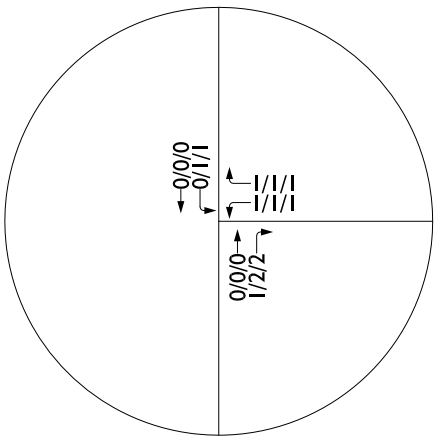
N

RK engineering group, inc.

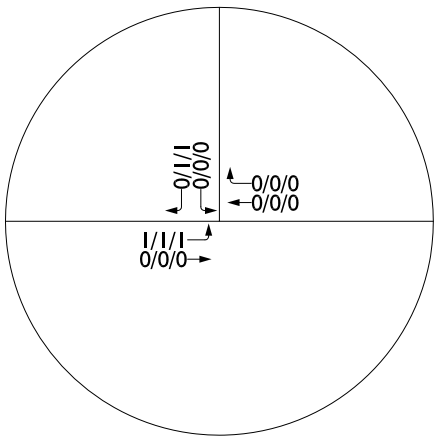
Exhibit 4-2 A

Project Traffic Volumes
Weekday AM/MID/PM Peak Hour

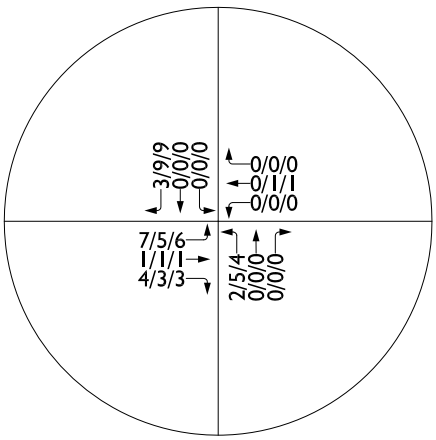




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

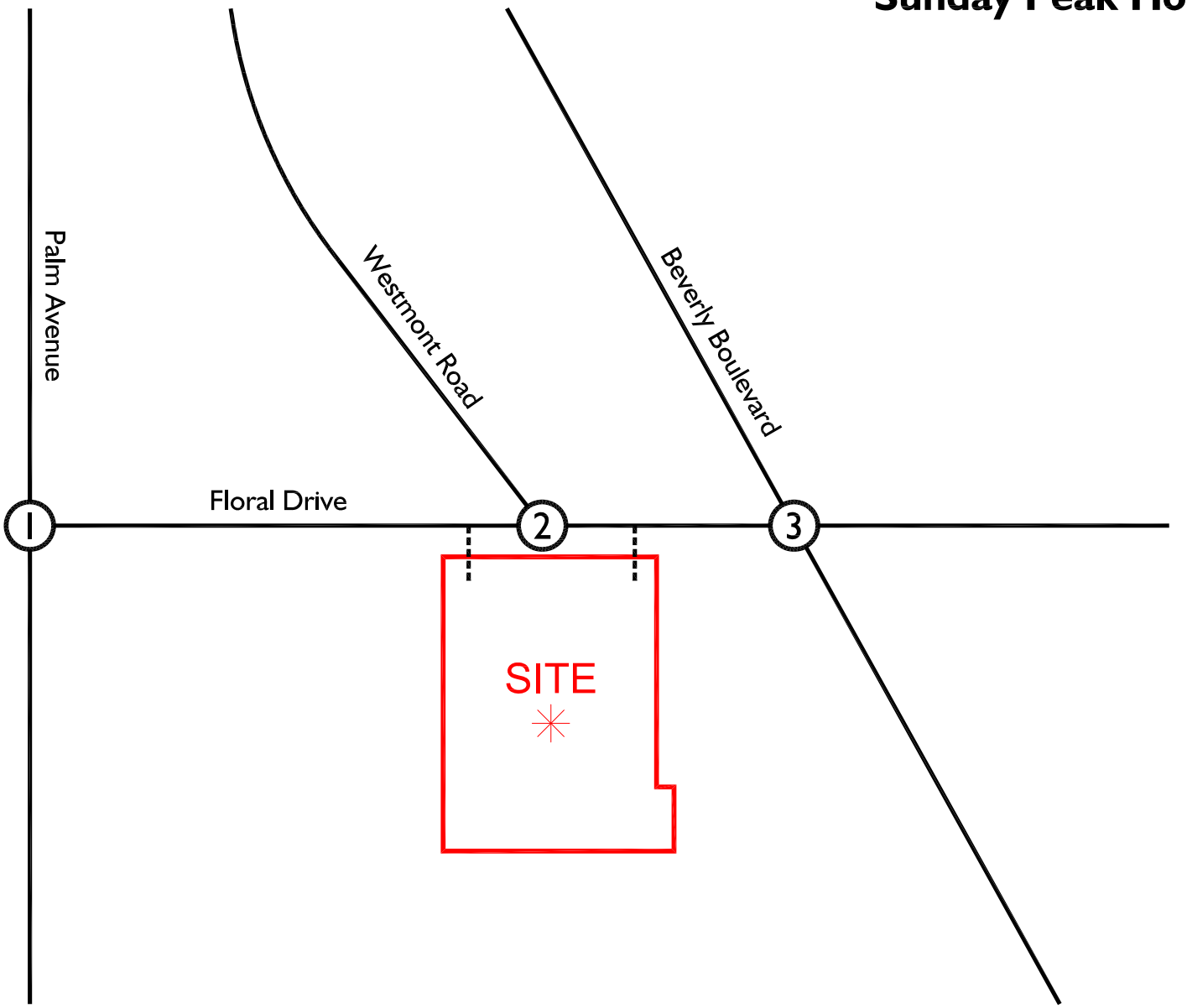
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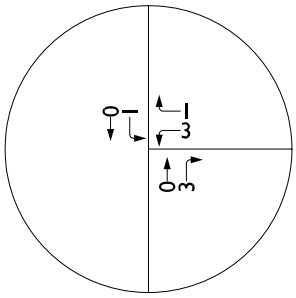
Legend:

10/20/30 = Weekday AM/MID/PM Peak Hour Volumes

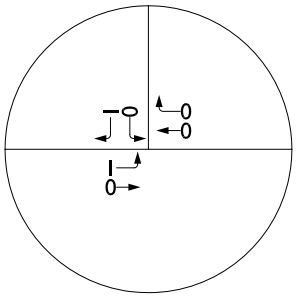
Exhibit 4-2 B

Project Traffic Volumes
Sunday Peak Hour

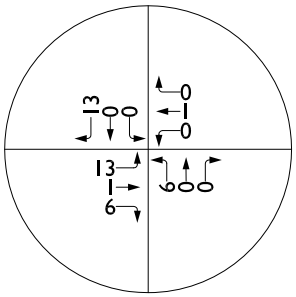




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

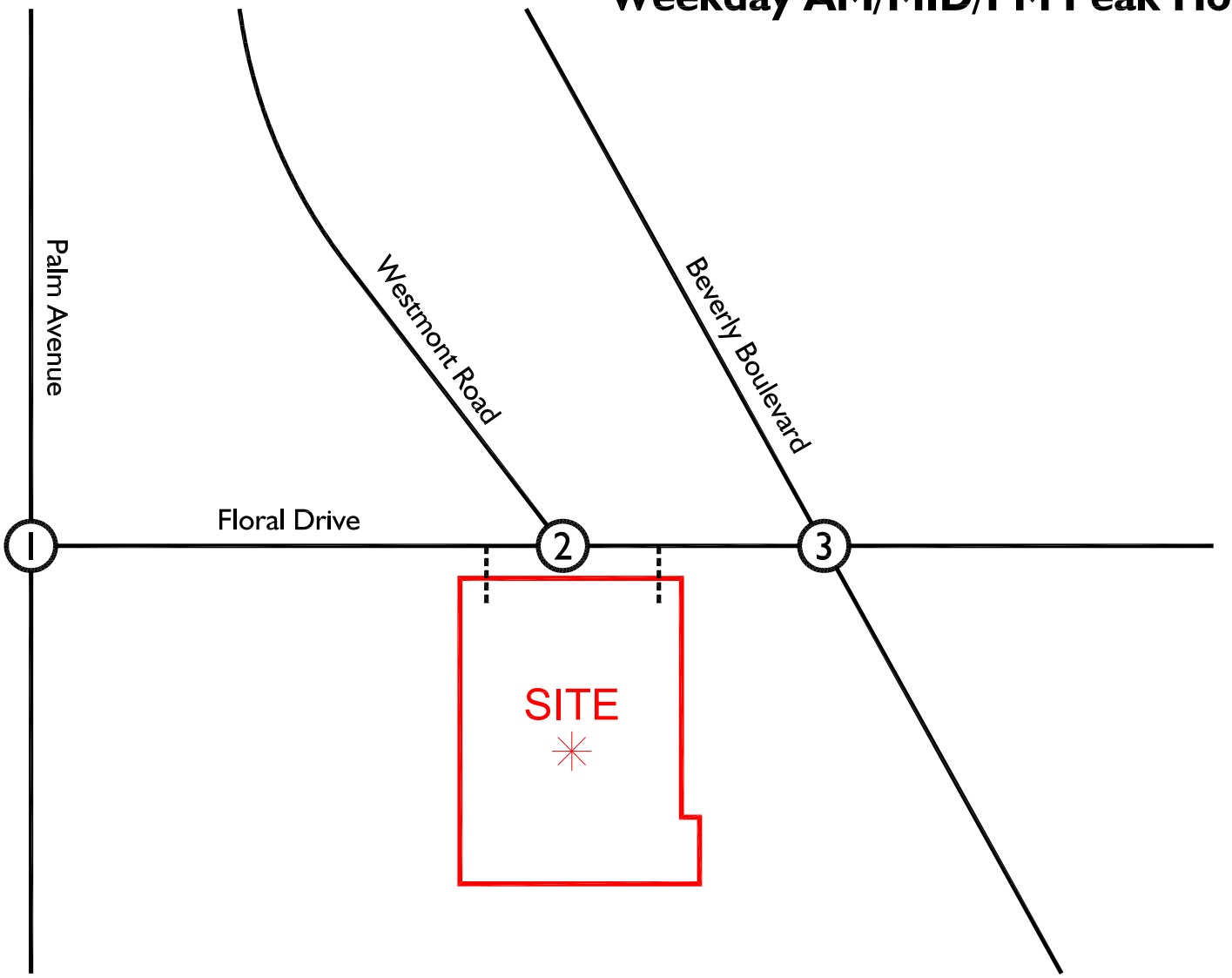
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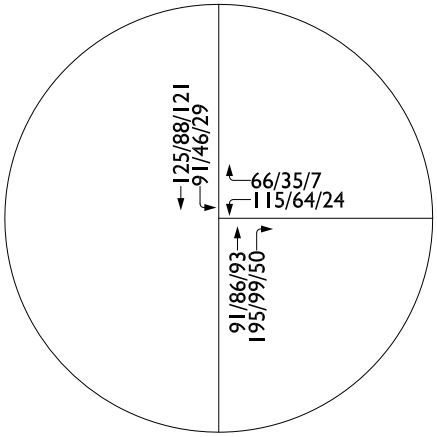
Legend:

10 = Sunday Peak Hour Volumes

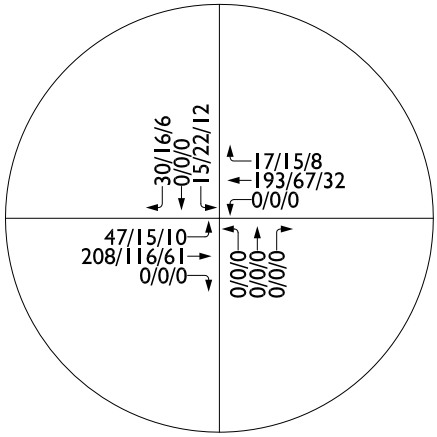
Exhibit 4-3 A

Existing Plus Project Traffic Volumes
Weekday AM/MID/PM Peak Hour

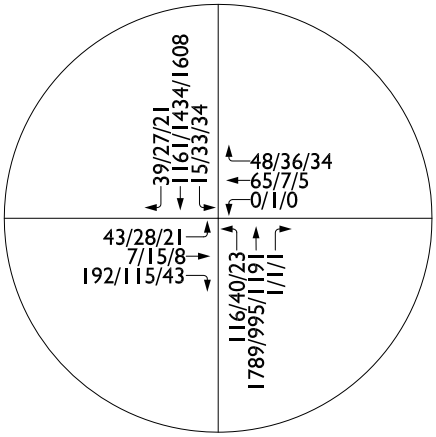




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

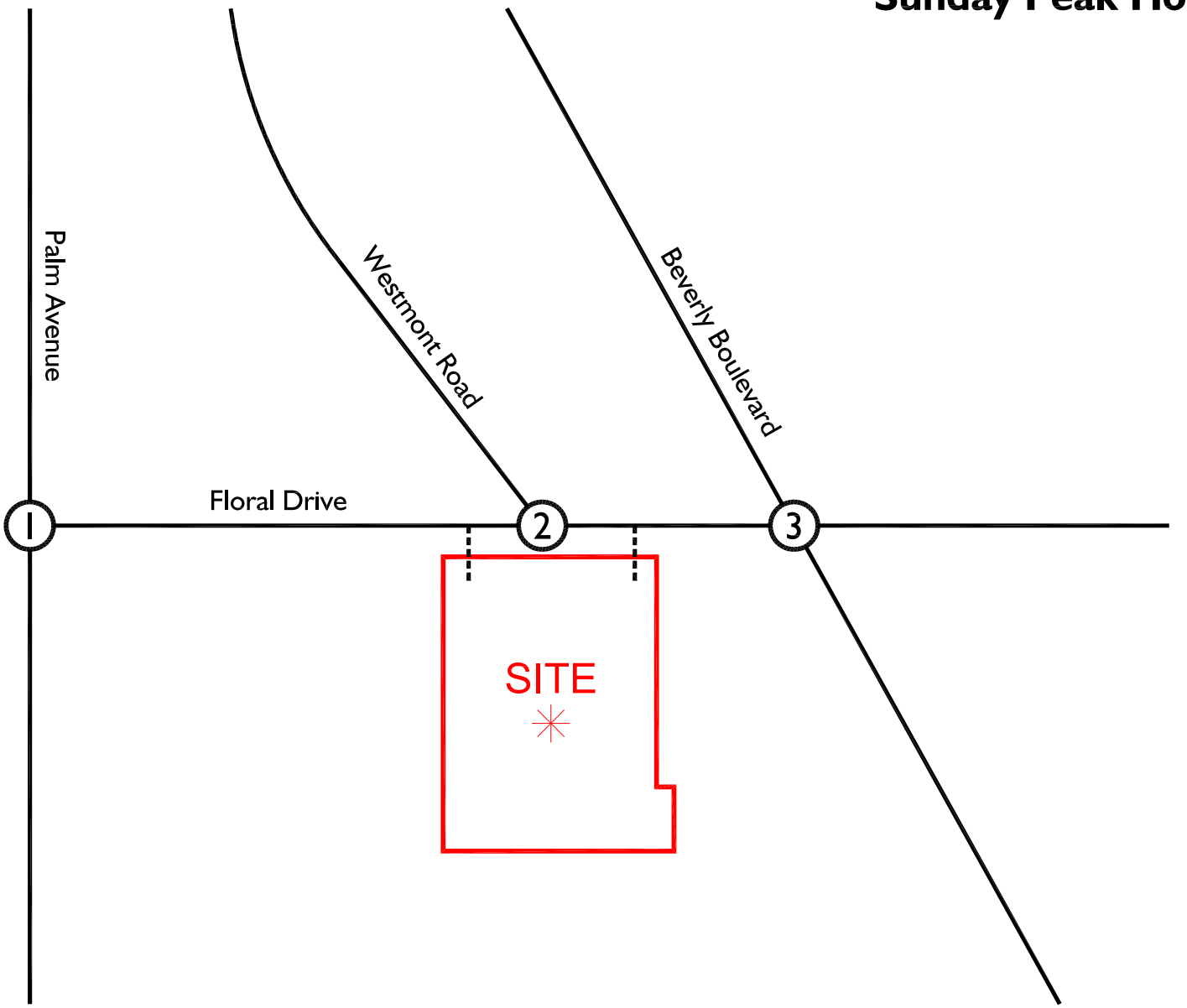
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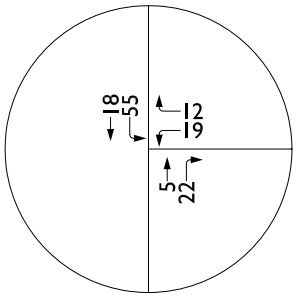
Legend:

10/20/30 = Weekday AM/MID/PM Peak Hour Volumes

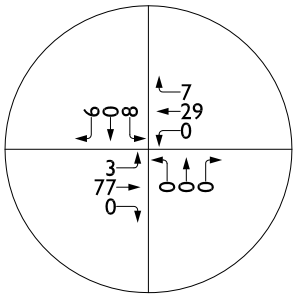
Exhibit 4-3 B

Existing Plus Project Traffic Volumes
Sunday Peak Hour

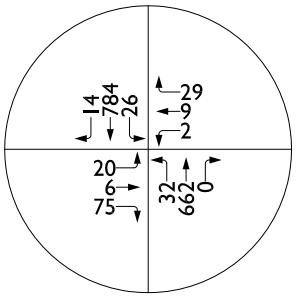




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

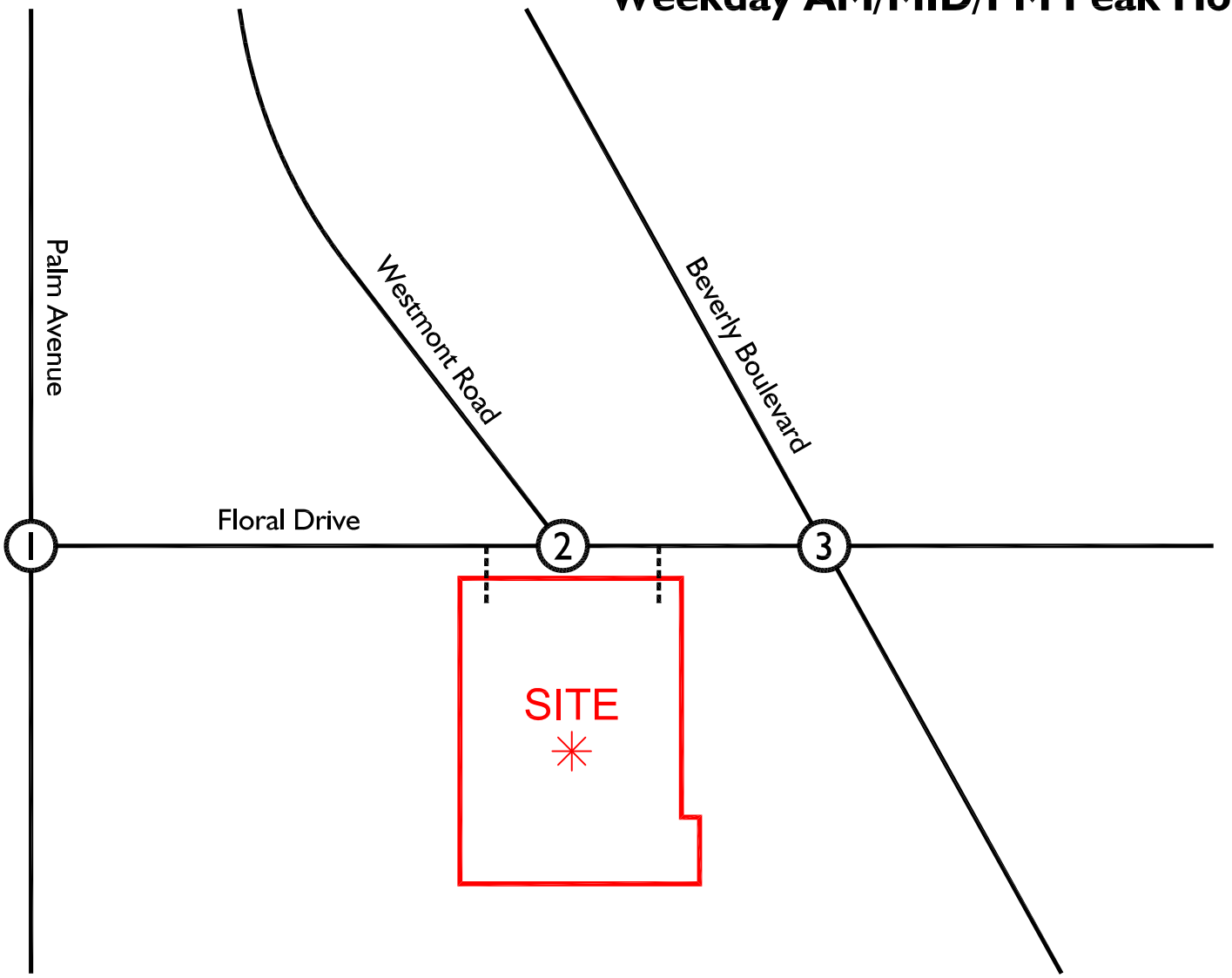
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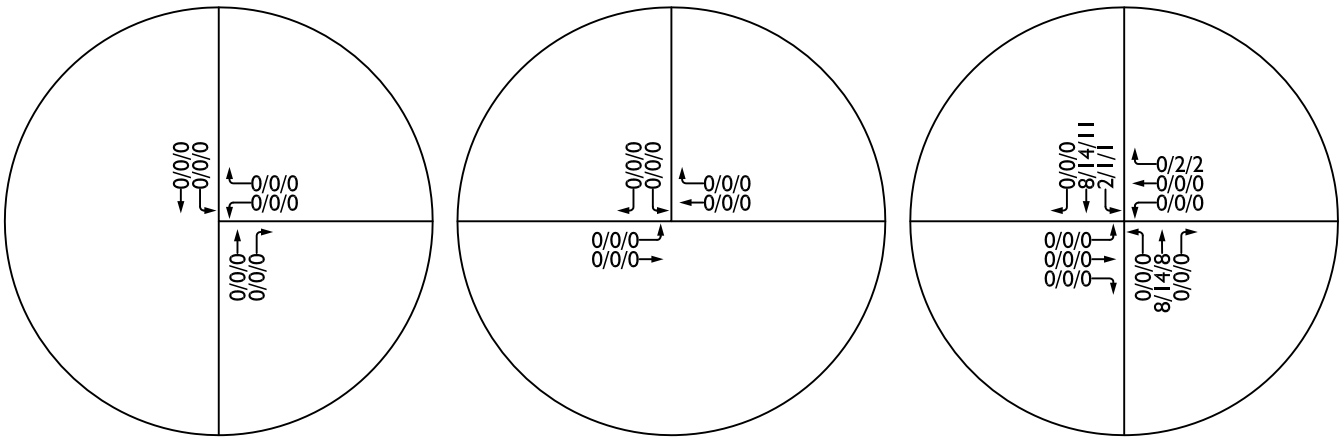
Legend:

10 = Sunday Peak Hour Volumes

Exhibit 4-4 A

Cumulative Projects Traffic Volumes
Weekday AM/MID/PM Peak Hour





1. Palm Avenue (NS) & Floral Drive (EW)

2. Westmont Road (NS) & Floral Drive (EW)

3. Beverly Boulevard (NS) & Floral Drive (EW)

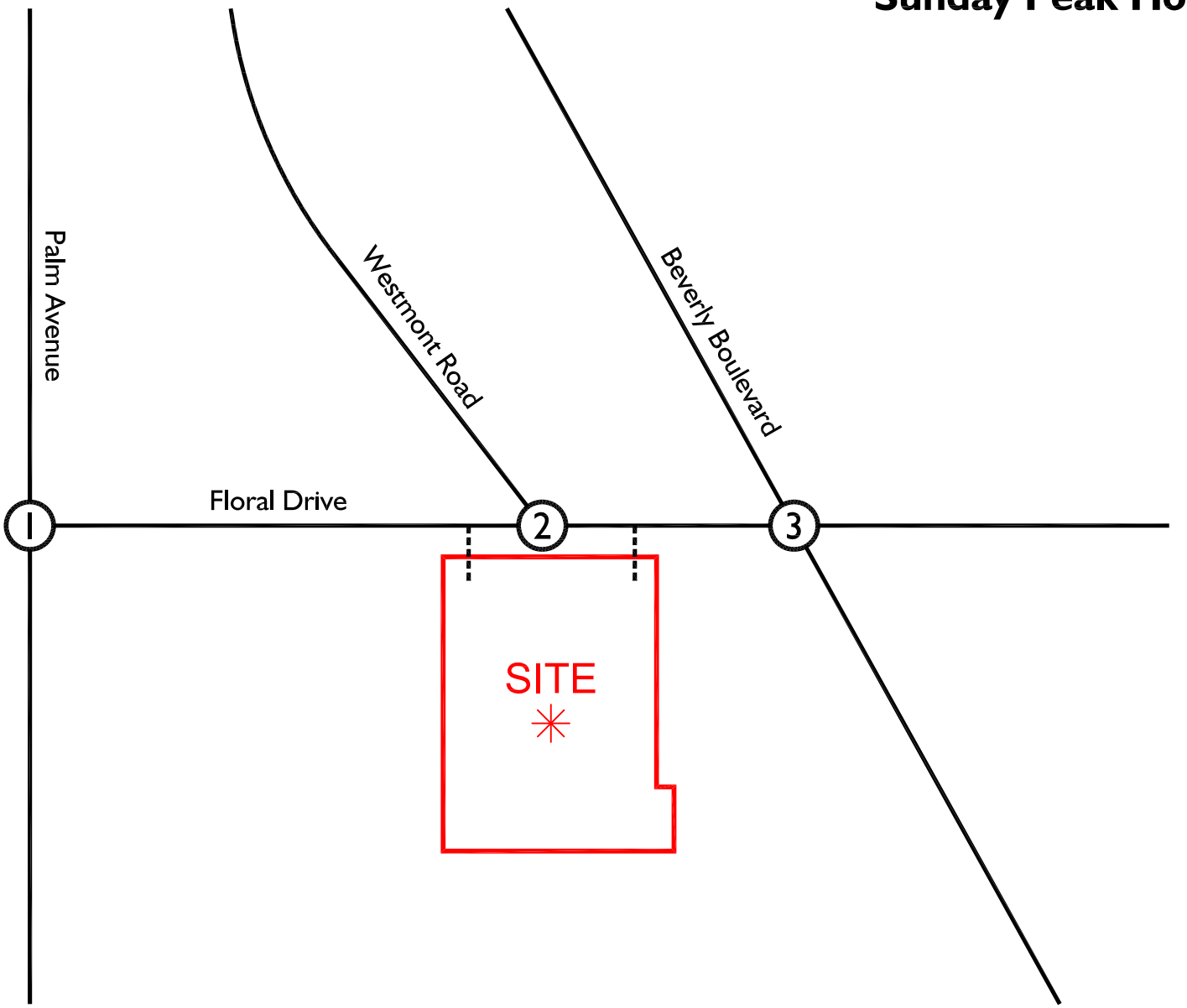
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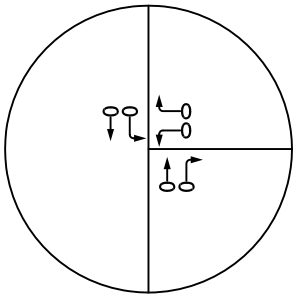
Legend:

10/20/30 = Weekday AM/MID/PM Peak Hour Volumes

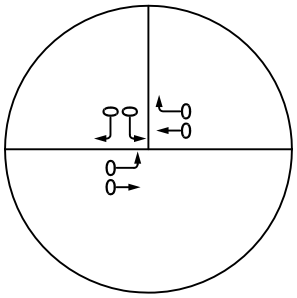
Exhibit 4-4 B

Cumulative Projects Traffic Volumes
Sunday Peak Hour

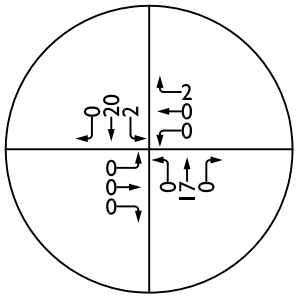




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

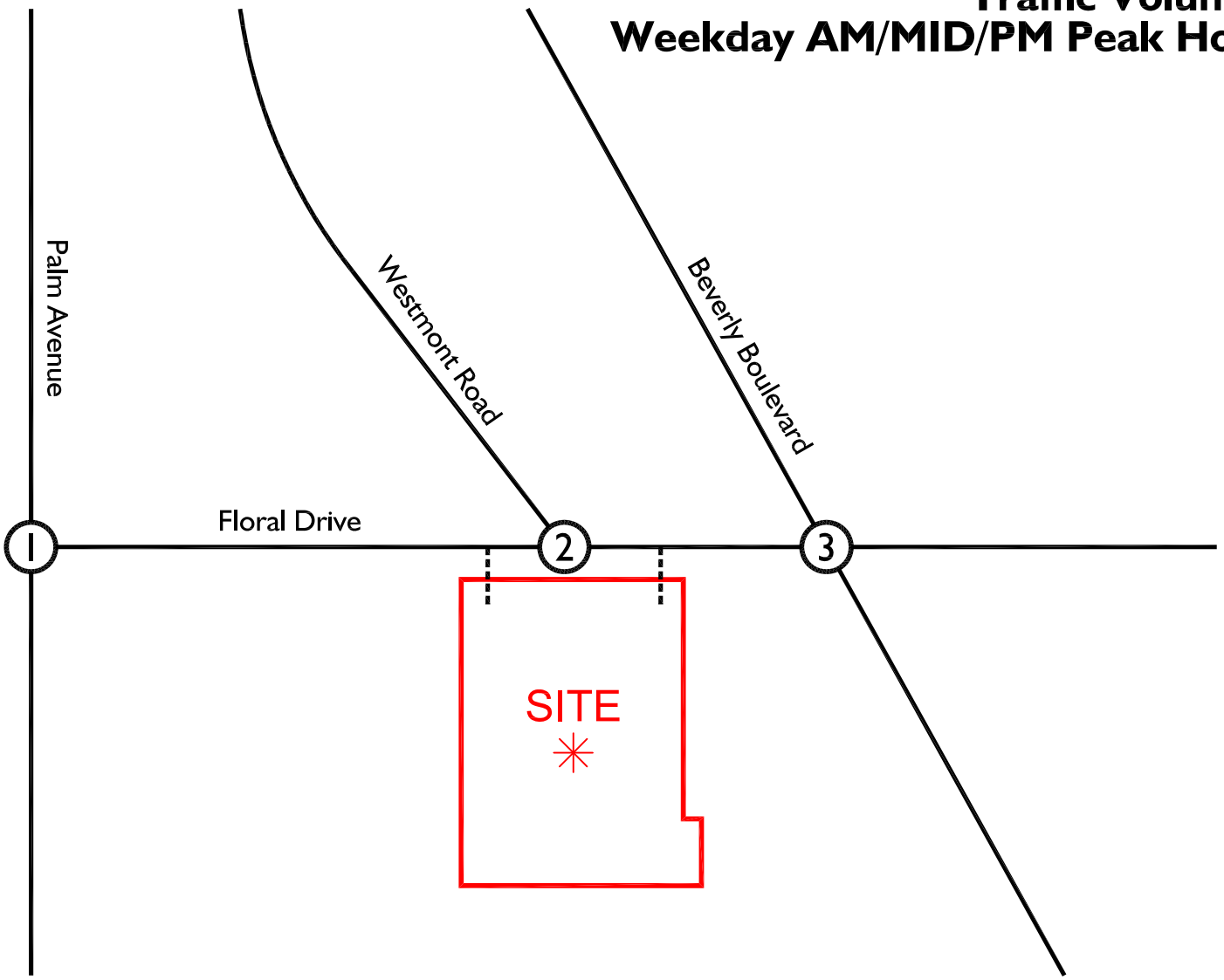
N

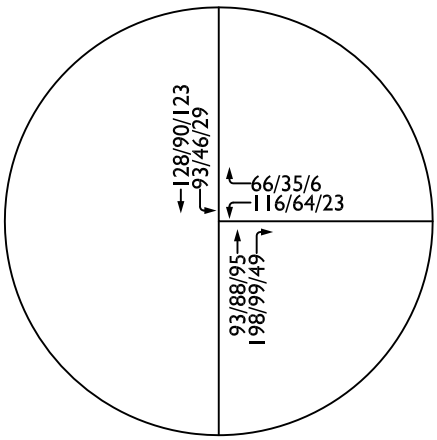
Legend:

10 = Sunday Peak Hour Volumes

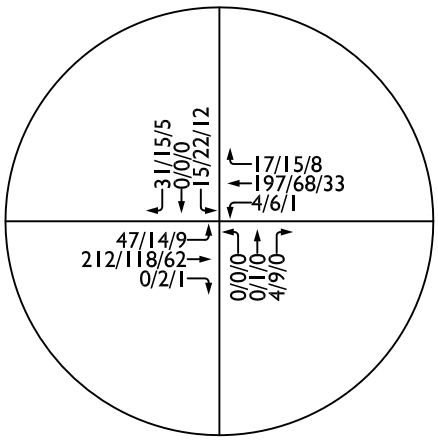
Exhibit 4-5 A

Opening Year (2022) With Cumulative Projects Conditions Traffic Volumes Weekday AM/MID/PM Peak Hour

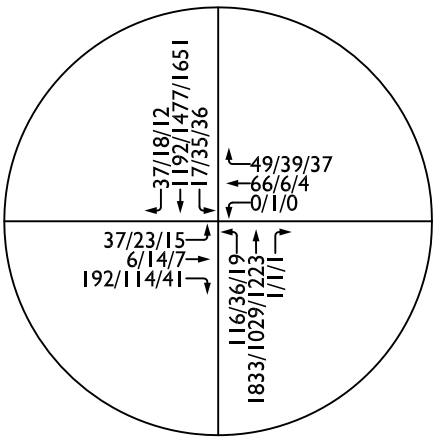




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

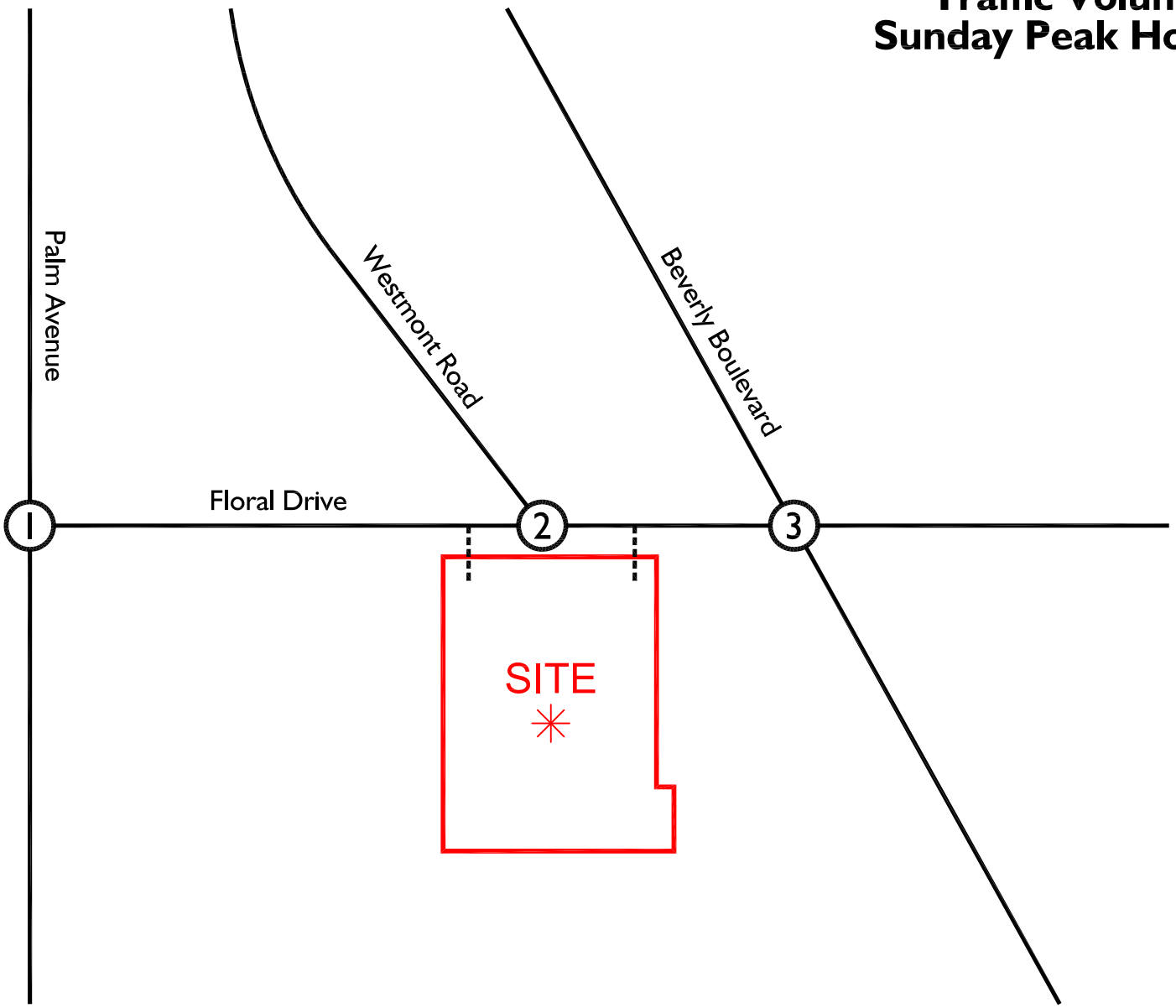
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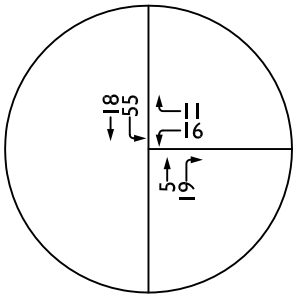
Legend:

10/20/30 = Weekday AM/MID/PM Peak Hour Volumes

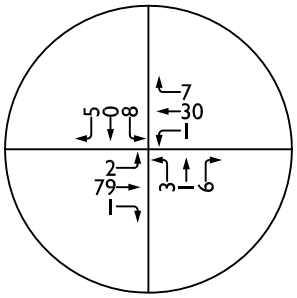
Exhibit 4-5 B

Opening Year (2022) With Cumulative Projects Conditions Traffic Volumes Sunday Peak Hour

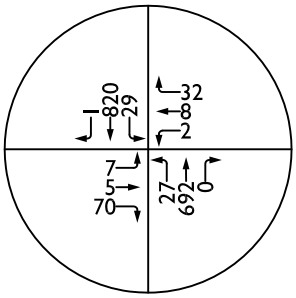




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

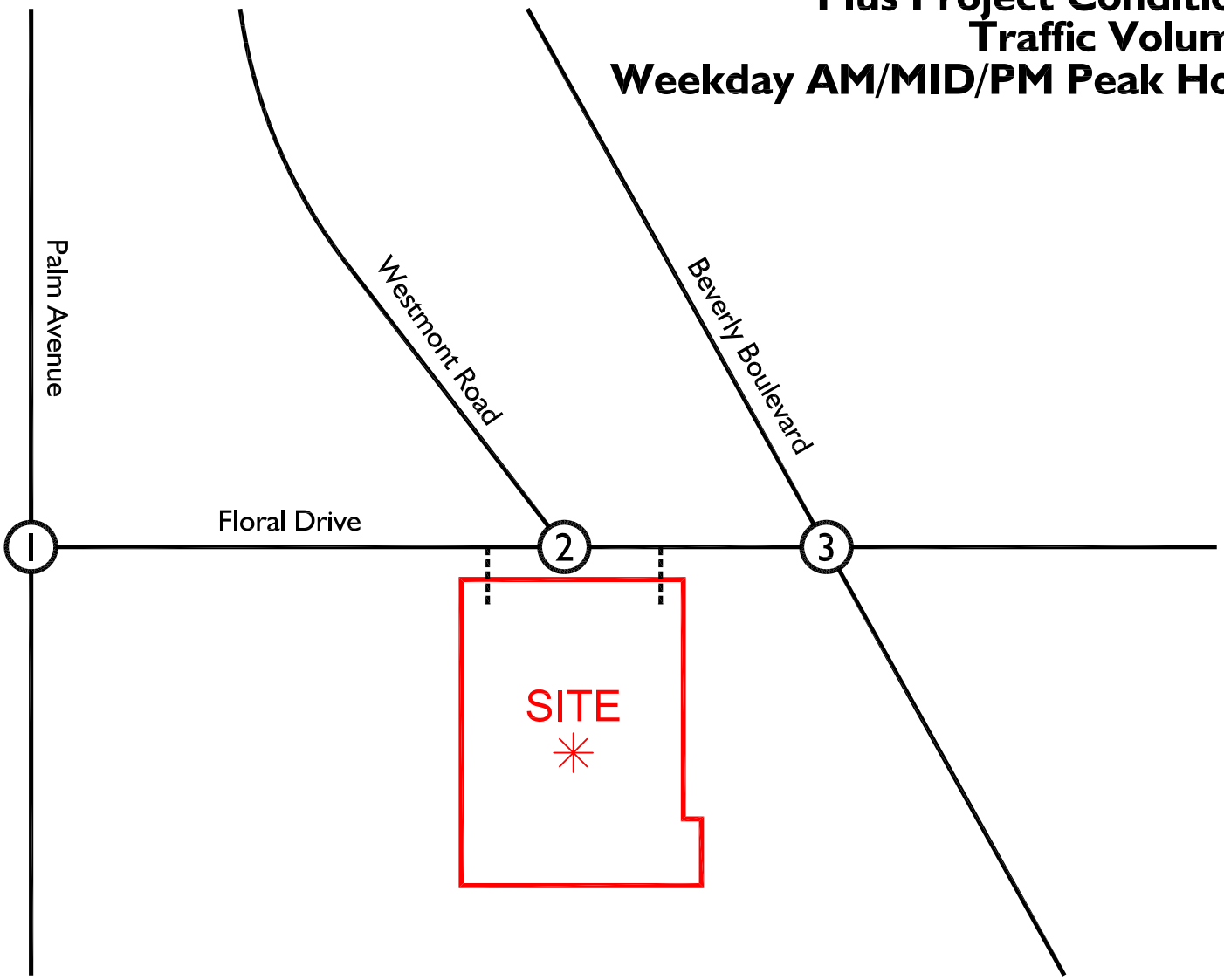
N

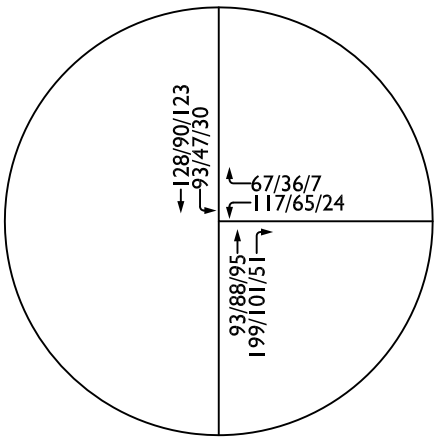
Legend:

10 = Sunday Peak Hour Volumes

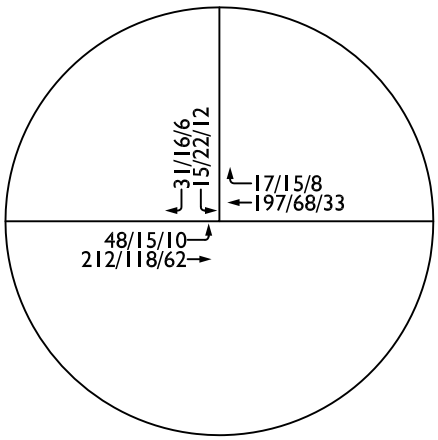
Exhibit 4-6 A

Opening Year (2022) With Cumulative Projects Plus Project Conditions Traffic Volumes Weekday AM/MID/PM Peak Hour

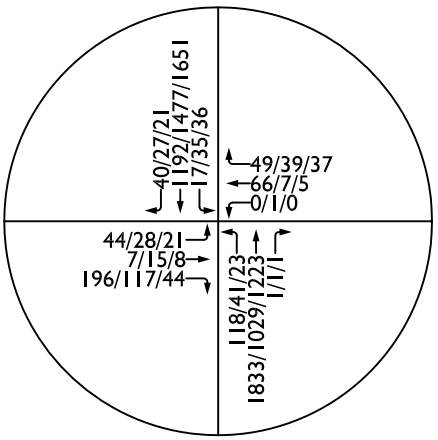




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

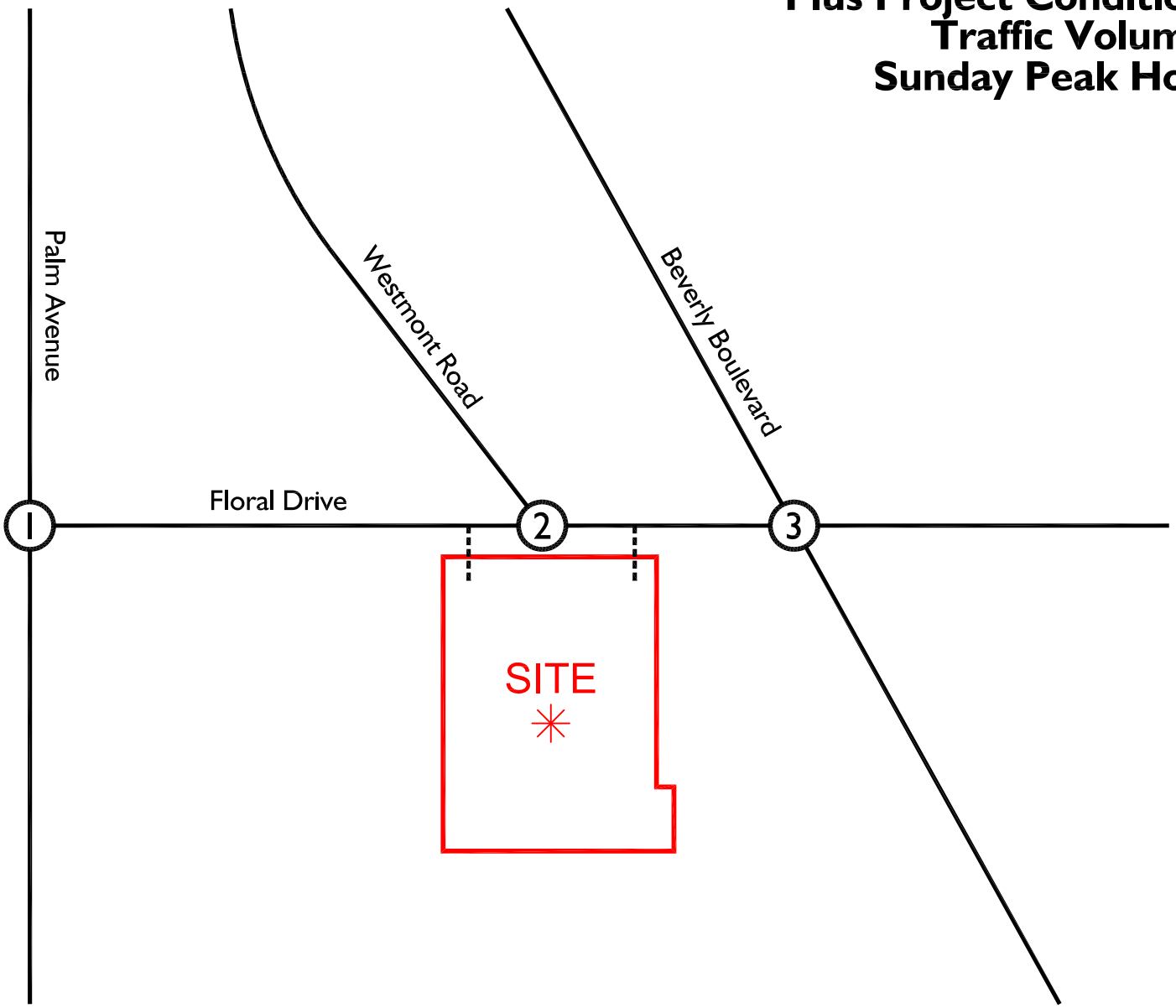
N

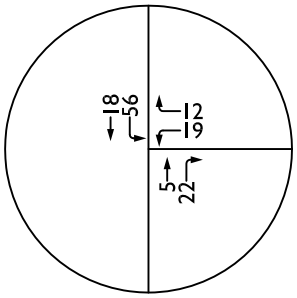
Legend:

10/20/30 = Weekday AM/MID/PM Peak Hour Volumes

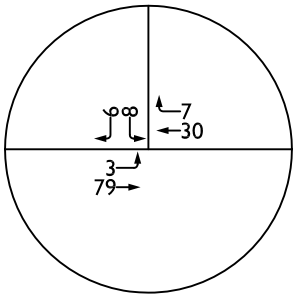
Exhibit 4-6 B

Opening Year (2022) With Cumulative Projects Plus Project Conditions Traffic Volumes Sunday Peak Hour

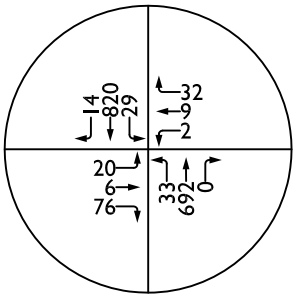




1. Palm Avenue (NS) & Floral Drive (EW)



2. Westmont Road (NS) & Floral Drive (EW)



3. Beverly Boulevard (NS) & Floral Drive (EW)

N

Legend:

10 = Sunday Peak Hour Volumes

Table 4-1
ITE Trip Generation Rates[1]

Land Use	ITE Code	Units[2]	Weekday AM			Weekday MID			Weekday PM			Weekday Daily	SUN			Sunday Daily
			In	Out	Total	In	Out	Total	In	Out	Total		In	Out	Total	
Single Family Homes	210	DU	0.19	0.56	0.74	0.64	0.36	1.00	0.62	0.37	0.99	9.44	0.45	0.40	0.85	8.55
Church	560	TSF	0.20	0.13	0.33	0.50	0.30	0.80	0.22	0.27	0.49	6.95	4.80	5.19	9.99	27.63

[1] Source: *2017 ITE Trip Generation Manual (10th Edition)* .

[2] DU = Dwelling Units;
TSF = Thousand Square Feet.

Table 4-2
Project Trip Generation[1]

Land Use	Quantity	Units[2]	AM			MID			PM			Daily	SUN			Daily
			In	Out	Total	In	Out	Total	In	Out	Total		In	Out	Total	
Single Family Homes	26	DU	5	14	19	17	9	26	16	10	26	245	12	10	22	222
Church	2.809	TSF	1	0	1	1	1	2	1	1	2	20	13	15	28	78
Total			**6**	**14**	**20**	**18**	**10**	**28**	**17**	**11**	**28**	**265**	**25**	**25**	**50**	**300**

[1] Source: *2017 ITE Trip Generation Manual (10th Edition)* .

[2] DU = Dwelling Units;
TSF = Thousand Square Feet.

[3] The project development plan was modified in March 2021 and now inlcudes a total of twenty five (25) dwelling units. The change in trips from one less unit is considered minor and would not affect the overall findings of this analysis. To be conservative, the traffic impact analysis is still based on the worst case scenario of impacts from 26 dwelling units.

Table 4-3
General Plan Allowable Residential Development Trip Generation[1]

Land Use	Quantity	Units[2]	Weekday AM			Weekday MID			Weekday PM			Weekday Daily	SUN			Sunday Daily
			In	Out	Total	In	Out	Total	In	Out	Total		In	Out	Total	
Single Family Homes	15	DU	3	8	11	10	5	15	9	6	15	142	7	6	13	128

[1] Source: *2017 ITE Trip Generation Manual (10th Edition)* .

[2] DU = Dwelling Units;

Table 4-4
Trip Generation Comparison[1]
General Plan Allowable Residential Development & Proposed Residential Development

Land Use	Quantity	Units[2]	Weekday AM			Weekday MID			Weekday PM			Weekday Daily	SUN			Sunday Daily
			In	Out	Total	In	Out	Total	In	Out	Total		In	Out	Total	
General Plan Allowable Residiential Development																
Single Family Homes	15	DU	3	8	11	10	5	15	9	6	15	142	7	6	13	128
Proposed Residiential Development																
Single Family Homes	26	DU	5	14	19	17	9	26	16	10	26	245	12	10	22	222
Trip Generation Difference			**2**	**6**	**8**	**7**	**4**	**11**	**7**	**4**	**11**	**103**	**5**	**4**	**9**	**94**

[1] Source: *2017 ITE Trip Generation Manual (10th Edition)* .

[2] DU = Dwelling Units;

5.0 Traffic Level of Service Analysis

This section provides a discussion on the study intersection peak hour level of service analysis and findings.

5.1 Existing Conditions Level of Service

Existing Conditions Level of Service (LOS) calculations for the study intersections are shown in Table 5-1 and are based upon the manual peak hour turning movement counts compiled for RK in February and March 2020 and shown in Exhibit 3-2A and 3-2B and the existing lane geometry shown in Exhibit 3-1.

As shown in Table 5-1, all study area intersections are currently operating at an acceptable level of service (LOS D or better) during the peak hours for Existing Conditions.

Detailed LOS analysis sheets for Existing Conditions are contained in Appendix B.

5.2 Existing Plus Project Conditions Level of Service

Existing Plus Project Conditions Level of Service (LOS) calculations for the study intersections are shown in Table 5-2 and are based upon the Existing Plus Project Conditions traffic volumes shown in Exhibit 4-3A and Exhibit 4-3B. It should be noted that with the implementation of the project, the lane geometry at the study area intersection of Westmont Road / Floral Drive will be converted from a four-legged intersection to a three-legged intersection as the entry driveway to the project site was relocated to northeasterly corner of the site. This lane geometry modification was accounted for in the Existing Plus Project Conditions Level of Service (LOS) calculations for the study intersections.

As shown in Table 5-2, all study area intersections are forecast to continue to operate at an acceptable level of service (LOS D or better) during the peak hours for Existing Plus Project Conditions.

As also shown in Table 5-2, based on agency-established thresholds of significance, the proposed project is forecast to not result in any significant traffic impacts at the study intersections for Existing Plus Project Conditions.

Detailed LOS analysis sheets for Existing Plus Project Conditions are contained in Appendix C.

5.3 Opening Year (2022) With Cumulative Projects Conditions Level of Service

Opening Year (2022) With Cumulative Projects Conditions Level of Service (LOS) calculations for the study intersections are shown in Table 5-3 and are based upon the Opening Year (2022) With Cumulative Projects Conditions traffic volumes shown in Exhibit 4-5A and Exhibit 4-5B and the existing lane geometry shown in Exhibit 3-1.

As shown in Table 5-3, all study area intersections are forecast to continue to operate at an acceptable level of service (LOS D or better) during the peak hours for Opening Year (2022) With Cumulative Projects Conditions.

Detailed LOS analysis sheets for Opening Year (2022) With Cumulative Projects Conditions are contained in Appendix D.

5.4 Opening Year (2022) With Cumulative Projects Plus Project Conditions Level of Service

Opening Year (2022) With Cumulative Projects Plus Project Conditions Level of Service (LOS) calculations for the study intersections are shown in Table 5-4 and are based upon the Opening Year (2022) Plus Cumulative Projects Plus Project Conditions traffic volumes shown in Exhibit 4-6A and Exhibit 4-6B. It should be noted that with the implementation of the project, the lane geometry at the study area intersection of Westmont Road / Floral Drive will be converted from a four-legged intersection to a three-legged intersection as the entry driveway to the project was relocated to the northeasterly corner of the site. This lane geometry was accounted for in the Opening Year (2022) With Cumulative Projects Plus Project Conditions Level of Service (LOS) calculations for the study intersections.

As shown in Table 5-4, all study area intersections are forecast to continue to operate at an acceptable level of service (LOS D or better) during the peak hours for Opening Year (2022) With Cumulative Projects Plus Project Conditions.

As also shown in Table 5-4, based on agency-established thresholds of significance, the proposed project is forecast to not result in any significant traffic impacts at the study intersections for Opening Year (2022) With Cumulative Projects Plus Project Conditions.

Detailed LOS analysis sheets for Opening Year (2020) Plus Cumulative Projects With Project Conditions are contained in Appendix E.

Table 5-1
Study Intersection LOS Analysis Summary
Existing Conditions

	Intersection	Traffic Control[4]	Methodology	Delay[2] (Secs)				V/C Ratio[3]				Level of Service			
				AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN
1.	Palm Avenue (NS) / Floral Drive (EW)	AWS	HCM	12.4	9.1	8.0	7.4	- -	- -	- -	- -	B	A	A	A
2.	Westmont Road (NS) / Floral Drive (EW)	CSS	HCM	13.2	11.4	9.5	9.1	- -	- -	- -	- -	B	B	A	A
3.	Beverly Boulevard (NS) / Floral Drive (EW)	TS	ICU	- -	- -	- -	- -	0.813	0.669	0.657	0.413	D	B	B	A

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. Where "1" is indicated for the through movement and "0"s are indicated for R/L movements, the R and/or L turns are shared with the through movement.

Deficient operation shown in **Bold.**

L = Left; T = Through; R = Right; > = Right Turn Overlap; >> = Free Right Turn; * = Defacto Right Turn Lane; ! = Indicates general purpose lane;

Bold Underline = Improvement;

[2] HCM Analysis Software: Synchro, Version 10.0. Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] ICU Analysis Software: Traffix, Version 8.0. V/C = Volume to capacity ratio.

[4] AWS = All-Way Stop

CSS = Cross-Street Stop

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Table 5-2
Study Intersection LOS Analysis Summary
Existing Plus Project Conditions

	Intersection	Traffic Control[4]	Methodology	Existing Conditions												Existing Plus Project Conditions															
				Delay[2] (Secs)				V/C Ratio[3]				Level of Service				Delay[2] (Secs)				V/C Ratio[3]				Change in V/C Ratio				Level of Service				Significant Impact?			
				AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN
1.	Palm Avenue (NS) / Floral Drive (EW)	AWS	HCM	12.4	9.1	8.0	7.4	- -	- -	- -	- -	B	A	A	A	12.4	9.1	8.0	7.5	- -	- -	- -	- -	- -	- -	- -	- -	B	A	A	A	No	No	No	No
2.	Westmont Road (NS) / Floral Drive (EW)	CSS	HCM	13.2	11.4	9.5	9.1	- -	- -	- -	- -	B	B	A	A	12.5	10.7	9.4	9.0	- -	- -	- -	- -	- -	- -	- -	- -	B	B	A	A	No	No	No	No
3.	Beverly Boulevard (NS) / Floral Drive (EW)	TS	ICU	- -	- -	- -	- -	0.813	0.669	0.657	0.413	D	B	B	A	- -	- -	- -	- -	0.820	0.681	0.668	0.434	0.007	0.012	0.011	0.021	D	B	B	A	No	No	No	No

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. Where "1" is indicated for the through movement and "0"s are indicated for R/L movements, the R and/orL turns are shared with the through movement.
Deficient operation shown in **Bold.**

L = Left; T = Through; R = Right; > = Right Turn Overlap; >> = Free Right Turn; * = Defacto Right Turn Lane; ! = Indicates general purpose lane; **Bold Underline** = Improvement;

[2] HCM Analysis Software: Synchro, Version 10.0. Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] ICU Analysis Software: Traffix, Version 8.0. V/C = Volume to capacity ratio.

[4] AWS = All-Way Stop
CSS = Cross-Street Stop
TS = Traffic Signal

Table 5-3
Study Intersection LOS Analysis Summary
Opening Year (2022) With Cumulative Projects Conditions

	Intersection	Traffic Control[4]	Methodology	Delay[2] (Secs)				V/C Ratio[3]				Level of Service			
				AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN
1.	Palm Avenue (NS) / Floral Drive (EW)	AWS	HCM	12.6	9.2	8.0	7.4	- -	- -	- -	- -	B	A	A	A
2.	Westmont Road (NS) / Floral Drive (EW)	CSS	HCM	13.3	11.5	9.5	9.1	- -	- -	- -	- -	B	B	A	A
3.	Beverly Boulevard (NS) / Floral Drive (EW)	TS	ICU	- -	- -	- -	- -	0.831	0.685	0.667	0.426	D	B	B	A

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. Where "1" is indicated for the through movement and "0"s are indicated for R/L movements, the R and/or L turns are shared with the through movement.

Deficient operation shown in **Bold.**

L = Left; T = Through; R = Right; > = Right Turn Overlap; >> = Free Right Turn; * = Defacto Right Turn Lane; ! = Indicates general purpose lane;

Bold Underline = Improvement;

[2] HCM Analysis Software: Synchro, Version 10.0. Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] ICU Analysis Software: Traffix, Version 8.0. V/C = Volume to capacity ratio.

[4] AWS = All-Way Stop

CSS = Cross-Street Stop

Table 5-4

Study Intersection LOS Analysis Summary

Opening Year (2022) With Cumulative Projects Conditions Plus Projects Conditions

	Intersection	Traffic Control[4]	Methodology	Existing Conditions												Existing Plus Project Conditions															
				Delay[2] (Secs)				V/C Ratio[3]				Level of Service				Delay[2] (Secs)				V/C Ratio[3]				Change in V/C Ratio				Level of Service				Significant Impact?			
				AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN	AM	MID	PM	SUN
1.	Palm Avenue (NS) / Floral Drive (EW)	AWS	HCM	12.6	9.2	8.0	7.4	- -	- -	- -	- -	B	A	A	A	12.7	9.2	8.0	7.5	- -	- -	- -	- -	- -	- -	- -	- -	B	A	A	A	No	No	No	No
2.	Westmont Road (NS) / Floral Drive (EW)	CSS	HCM	13.3	11.5	9.5	9.1	- -	- -	- -	- -	B	B	A	A	12.6	10.7	9.4	9.0	- -	- -	- -	- -	- -	- -	- -	- -	B	A	A	A	No	No	No	No
3.	Beverly Boulevard (NS) / Floral Drive (EW)	TS	ICU	- -	- -	- -	- -	0.831	0.685	0.667	0.426	D	B	B	A	- -	- -	- -	- -	0.838	0.697	0.683	0.446	0.007	0.012	0.016	0.020	D	B	B	A	No	No	No	No

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. Where "1" is indicated for the through movement and "0"s are indicated for R/L movements, the R and/orL turns are shared with the through movement.
Deficient operation shown in **Bold.**

L = Left; T = Through; R = Right; > = Right Turn Overlap; >> = Free Right Turn; * = Defacto Right Turn Lane; ! = Indicates general purpose lane; **Bold Underline** = Improvement;

[2] HCM Analysis Software: Synchro, Version 10.0. Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] ICU Analysis Software: Traffix, Version 8.0. V/C = Volume to capacity ratio.

[4] AWS = All-Way Stop
CSS = Cross-Street Stop

6.0 Parking Analysis

This section provides a discussion on the parking adequacy and conditions for the proposed project and its vicinity.

The parking analysis evaluates the following:

- Weekday conditions existing parking capacity, demand and utilization on the church site as well the surrounding on-street parking along Floral Drive between Palm Avenue and Beverly Boulevard;

- Sunday conditions existing parking capacity, demand and utilization on the church site as well the surrounding on-street parking along Floral Drive between Palm Avenue and Beverly Boulevard;

- Adequacy of on-site parking capacity planned to be provided for the church expansion and the proposed residential project after implementation of the proposed project.

6.1 Weekday Conditions Existing Parking Capacity, Demand, and Utilization

To determine the weekday existing parking capacity, demand and utilization of the church site and the surrounding on-street parking along Floral Drive between Palm Avenue and Beverly Boulevard, hourly observed parking counts were conducted during one typical weekday on Thursday February 27, 2020.

The on-street counts were collected through observations on an hourly basis from 5:00 a.m. to 1:00 a.m.

The church parking was observed from 8:00 a.m. to 3:00 p.m. based on discussions and input from the church to capture the peak operations of the church. Table 6-1 summarizes the results of the observed parking counts for weekday conditions.

As shown in Table 6-1:

- The maximum ***weekday*** hourly utilization of the parking along ***north side*** of Floral Drive between Palm Avenue and Beverly Boulevard occurred at 9:00 a.m. with 74 percent of the parking capacity being utilized (25 parked vehicles). Generally, ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to reach full utilization during certain hours.

- The maximum ***weekday*** hourly utilization of the parking along ***south side*** of Floral Drive between Palm Avenue and Beverly Boulevard occurred at 2:00 p.m. with 89 percent of the parking capacity being utilized (39 parked vehicles). Generally, ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to reach full utilization during certain hours.

- The maximum ***weekday*** hourly utilization of the parking for the church occurred from 11:00 a.m. to 1:00 p.m. with 15 percent of the parking capacity being utilized (5 parked vehicles in the total of 43 stalls).

Hence, based on the observed counts, more than adequate parking is currently provided on the church site and the overall on-street parking capacity is not being fully utilized during ***weekday*** conditions.

6.2 Sunday Conditions Existing Parking Capacity, Demand, and Utilization

To determine the Sunday existing parking capacity, demand and utilization of the church site and the surrounding on-street parking along Floral Drive between Palm Avenue and Beverly Boulevard, hourly observed parking counts were conducted during one typical Sunday on March 8, 2020.

The on-street counts were collected through observations on an hourly basis from 5:00 a.m. to 1:00 a.m.

The church parking was observed from 8:00 a.m. to 3:00 p.m. based on discussions and input from the church to capture the peak operations of the church.

Table 6-2 summarizes the results of the observed parking counts for Sunday conditions.

As shown in Table 6-2:

- The maximum ***Sunday*** hourly utilization of the parking along ***north side*** of Floral Drive between Palm Avenue and Beverly Boulevard occurred at 11:00 p.m. with 68 percent of the parking capacity being utilized (23 parked vehicles). Ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to be almost fully utilized. Generally, ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to reach full utilization during certain hours.

- The maximum ***Sunday*** hourly utilization of the parking along ***south side*** of Floral Drive between Palm Avenue and Beverly Boulevard occurred at 12:00 a.m. (midnight) with 48 percent of the parking capacity being utilized (21 parked vehicles). Ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to be almost fully utilized. Generally, ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to reach full utilization during certain hours.

- The maximum ***Sunday*** hourly utilization of the parking for the church occurred at 10:00 a.m. with 79 percent of the parking capacity being utilized (27 parked vehicles in the total of 43 stalls).

Hence, based on the observed counts, more than adequate parking is currently provided on the church site and the overall on-street parking capacity is not being fully utilized during ***Sunday*** conditions.

6.3 Proposed Project Parking Capacity & Demand

An evaluation of the required parking for the proposed residential use and the church expansion has been conducted based on the City of Whittier Municipal Code parking requirements and observed data to determine if adequate parking capacity is planned to be provided.

After completion, the proposed residential use is planned to provide a total of 64 parking spaces comprising of 57 resident spaces and 7 guest spaces. As shown in Table 6-3, and based on the City of Whittier Municipal Code, the proposed residential use is required to provide and total of 62.5 parking spaces (56.25 for residents and 6.25 for guests). Hence, the residential use is planned to provide adequate parking to serve the use based on the City of Whittier Municipal Code.

The church is proposing to provide a total of 48 parking spaces to accommodate the 144 seat Church sanctuary/assembly hall use (5 additional spaces compared to its existing parking capacity of 43 spaces). The City of Whittier Municipal Code requires 1 parking space for every 3 seats within the Church.

As previously shown, based on the observed parking counts, the existing 43 spaces for the church have a maximum utilization of 79 percent (27 spaces). Hence, the church currently has ample parking capacity for serving the parking demand of the existing congregation

The church will also include a Narthex antechamber and parish hall where the congregation will meet before and after services. The parish hall is an ancillary meeting space for the Church which will not be used host separate events during times when the main Church assembly is taking place. Hence additional parking for the parish hall would not be necessary. Based on the City of Whittier Municipal Code and the observed parking analysis, the Church will provide adequate parking to accommodate the expected demand on the site.

Table 6-1
Existing Parking Capacity, Demand & Utilization
Thursday, February 27th, 2020

Time	Floral Drive between Palm and Beverly								Trinity Church Parking Lot				
	North Side				South Side								
	Palm - Westmont	Westmont - Beverly	Total	Percent Occupied	Palm - Westmont	Westmont - Beverly	Total	Percent Occupied	Church	Handicap	School	Total	Percent Occupied
Inventory	26	8	**34**		32	12	**44**		41	2	-	**43**	
5:00 AM	16	6	22	65%	6	9	15	34%	---	---	---	0	0%
6:00 AM	15	6	21	62%	6	10	16	36%	---	---	---	0	0%
7:00 AM	13	6	19	56%	10	9	19	43%	---	---	---	0	0%
8:00 AM	13	3	16	47%	24	8	32	73%	3	0	0	3	9%
9:00 AM	21	4	25	74%	21	8	29	66%	3	0	0	3	9%
10:00 AM	20	5	25	74%	21	7	28	64%	4	0	0	4	12%
11:00 AM	18	4	22	65%	24	7	31	70%	5	0	0	5	15%
12:00 PM	16	5	21	62%	21	7	28	64%	5	0	0	5	15%
1:00 PM	15	3	18	53%	17	8	25	57%	4	0	0	4	12%
2:00 PM	18	4	22	65%	31	8	39	89%	4	0	0	4	12%
3:00 PM	12	4	16	47%	19	7	26	59%	---	---	---	0	0%
4:00 PM	14	3	17	50%	12	6	18	41%	---	---	---	0	0%
5:00 PM	13	4	17	50%	7	7	14	32%	---	---	---	0	0%
6:00 PM	15	5	20	59%	10	11	21	48%	---	---	---	0	0%
7:00 PM	13	8	21	62%	5	13	18	41%	---	---	---	0	0%
8:00 PM	11	8	19	56%	4	9	13	30%	---	---	---	0	0%
9:00 PM	11	7	18	53%	5	11	16	36%	---	---	---	0	0%
10:00 PM	14	6	20	59%	6	11	17	39%	---	---	---	0	0%
11:00 PM	13	6	19	56%	5	10	15	34%	---	---	---	0	0%
12:00 AM	13	7	20	59%	5	10	15	34%	---	---	---	0	0%

Note: Counts exceeding inventory total, are illegally parked vehicles in red zones or in front of garages and driveways.

Table 6-2
Existing Parking Capacity, Demand & Utilization
Sunday, March 8th, 2020

	Floral Drive between Palm and Beverly								Trinity Church Parking Lot				
	North Side				South Side								
Time	Palm - Westmont	Westmont - Beverly	Total	Percent Occupied	Palm - Westmont	Westmont - Beverly	Total	Percent Occupied	Church	Handicap	School	Total	Percent Occupied
Inventory	26	8	**34**		32	12	**44**		41	2	-	**43**	
5:00 AM	14	7	21	62%	6	12	18	41%	---	---	---	0	0%
6:00 AM	14	7	21	62%	6	12	18	41%	---	---	---	0	0%
7:00 AM	14	7	21	62%	6	12	18	41%	---	---	---	0	0%
8:00 AM	14	7	21	62%	6	12	18	41%	4	0	3	7	21%
9:00 AM	14	7	21	62%	6	11	17	39%	17	0	3	20	59%
10:00 AM	11	5	16	47%	8	12	20	45%	21	1	5	27	79%
11:00 AM	13	5	18	53%	7	11	18	41%	15	1	5	21	62%
12:00 PM	12	5	17	50%	7	10	17	39%	7	0	5	12	35%
1:00 PM	10	7	17	50%	6	12	18	41%	4	0	4	8	24%
2:00 PM	11	7	18	53%	7	12	19	43%	4	0	5	9	26%
3:00 PM	13	6	19	56%	5	11	16	36%	---	---	---	0	0%
4:00 PM	13	7	20	59%	5	12	17	39%	---	---	---	0	0%
5:00 PM	14	8	22	65%	5	12	17	39%	---	---	---	0	0%
6:00 PM	12	6	18	53%	5	13	18	41%	---	---	---	0	0%
7:00 PM	14	7	21	62%	5	14	19	43%	---	---	---	0	0%
8:00 PM	13	6	19	56%	5	13	18	41%	---	---	---	0	0%
9:00 PM	14	7	21	62%	6	12	18	41%	---	---	---	0	0%
10:00 PM	15	7	22	65%	7	12	19	43%	---	---	---	0	0%
11:00 PM	16	7	23	68%	7	12	19	43%	---	---	---	0	0%
12:00 AM	16	7	23	68%	7	14	21	48%	---	---	---	0	0%

Note: Counts exceeding inventory total, are illegally parked vehicles in red zones or in front of garages and driveways.

Table 6-3
Parking Required per City of Whittier Municipal Code Section 18.48.020

Land Use	City Required Parking		Project Unit Count	Parking Required	Parking Provided	Adequate Parking Provided?
	Type	Required Parking				
Proposed Project						
Condos / Multi-Family Residential	Studio & 1 Bedroom Units	2.0 Spaces per Unit	0	0	0	**Yes**
	2 Bedroom Units	2.0 Spaces per Unit	0	0	0	
	3 or more Bedroom Units	2.25 Spaces per Unit	25	56.25	57	
	Guest Space	1 Guest Space per 4.0 Units	--	6.25	7	
	Total		**25**	**62.5**	**64**	
Church after Expansion						
Church	Seats	1 Space per 3 Seats	144 Seats	48	48	**Yes**
	Total		**144**	**48**	**48**	

7.0 Vehicle Miles Traveled (VMT) Analysis

Effective July 1, 2020, the longstanding metric of roadway level of service (LOS), which is typically measured in terms of auto delay or volume-to-capacity, will no longer be considered a significant impact under the California Environmental Quality Act (CEQA).

Pursuant to the 2020 CEQA Guidelines, Section 15064.3, *"Generally, vehicle miles traveled is the most appropriate measure of transportation impacts. Other relevant considerations may include the effects of the project on transit and non-motorized travel."*

For land use projects, the CEQA guidelines provides the following criteria for analyzing Transportation Impacts and VMT:

- Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact.

- Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact.

- Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

The City of Whittier is still in the process of adopting criteria for the uniform evaluation of VMT impacts under CEQA, including the preferred analysis methodology, modeling requirements, and thresholds of significance. Per Section 15064.3 (a)(3) of the CEQA Guidelines, a qualitative analysis is allowable if existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered.

Hence, this study primarily evaluates the project's effect on transit and non-motorized travel and does not rely on a numerical threshold of significance for determining impact. The State of California Governor's Office of Planning and Research (OPR) Technical Advisory on Evaluating Transportation Impacts in CEQA serves as a general guidance document for this report.

The following factors are reviewed with regards to VMT for this project:

a. Proximity to Transit

b. Access to Multi-Modal Transportation

c. Diversifying Land Use

7.1 Proximity to Transit

As specified in the CEQA guidelines, generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. A high-quality transit corridor is defined by the Southern California Association of Governments (SCAG) as being a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

- Bus Route 7. The project site is located approximately 350 feet (~0.07 miles) from the nearest bus stop along the Norwalk Transit System bus route. The Norwalk Transit System shuttle operates daily from 4:07 a.m. to 9:11 p.m. Fares are only 1.25 dollars per trip for adults and are 60 cents to seniors (62 years and older) and persons with disabilities / Medicare. Children under the age of 5 are allowed to ride free of charge. The Norwalk Transit System provides southeastern Los Angeles County residents access to major destinations and connectivity to the nearby cities of Norwalk, Santa Fe Springs, Downey, Whittier and El Monte.

- Bus Route 1. The project site is located approximately 3,969 feet (0.7 miles) from another bus route provided by the Norwalk Transit System. Bus Route 1 shares the same fare rates as described for Bus Route 7. The Norwalk Transit System shuttle operates from 5:29 a.m. to 10:47 p.m. The Norwalk Transit System Bus Route 1 travels northbound and southbound between the Woodruff / Rosecrans station and the Rio Hondo College station with service headway as low as 30 minutes during peak commute times.

- Bus Line 274. The project site is located approximately 4,224 feet (0.8) miles from Bus Line 274 which is provided by Foothill Transit. The Foothill Transit shuttle operates daily from 5:00 a.m. to 9:32 p.m. Foothill Transit provides users various payment options and transit passes which allow for one-time payments,

daily/monthly subscriptions, and subscriptions that allow use of other local transportation agencies partnered with Foothill Transit. Bus Line 274 travels northbound and southbound between the cities of Whittier and Baldwin Park.

- Montebello / Commerce Metrolink Station. The project site is located approximately 5.9 miles from the Montebello / Commerce Metrolink Station. Metrolink provides regional rail access to LA, Ventura, San Bernardino, Orange, Riverside, and San Diego Counties.

Since the project is located within one-half mile of multiple bus stops (Beverly Boulevard / Floral Drive, Norwalk Boulevard / Beverly Boulevard, Workman Mill Road / Sierra Morena Avenue) the project is in close proximity to public transit. The Norwalk Transit System Bus Routes 1 and 7 and Foothill Transit Bus Line 274 do not provide service intervals less than 15 minutes during peak commute hours to qualify as high-quality transit corridors. However, they do provide alternative transportations options to serve the project and would be expected to have a reduction effect on VMT.

The Norwalk Transit System Bus Routes 1 and 7 and Foothill Transit Bus Line 274 Bus Route Schedules are shown in Appendix F.

7.2 Access to Multi-Modal Transportation

In addition to the proximity of the site to transit described above, the project is located approximately 1,056 feet (0.2 miles) to the Palm Park Center with pedestrian access provided via Palm Avenue and Floral Drive.

The project site is also located approximately 3,168 feet (0.60 miles) from the closest Class-2 Bike Path facility located at the intersection of Norwalk Boulevard – Workman Mill Road / Beverly Boulevard.

Exhibit 7-1 shows the City of Whittier Bicycle Transportation Plan Map.

7.3 Diversifying Land Use

Section 21099 of the California Public Resources Code states that the criteria for determining the significance of transportation impacts must promote a diversity of land uses. This includes prioritizing infill developments.

- The project would consist of a detached multi-family residential project with an increase in land use density resulting in 9.8 dwelling units per acre.

- The project would be located approximately 528 feet (0.10 miles) from the adjacent Dexter Middle School.

The California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures, August 2010 report states increasing the density of land use can achieve up to 30% reduction in VMT.

Increased densities affect the distance people travel and provide greater options for the mode of travel they choose, for example, studies have shown that transit ridership increases with density. The TRB Special Report 298 literature suggests that doubling neighborhood density across a metropolitan area might lower household VMT by about 5 to 12 percent.

Therefore, as a result of the increased density, the project would help to reduce VMT compared to existing Church use and surrounding predominantly single family neighborhood. Hence, **the proposed project is presumed to have a less than significant transportation impact based on VMT**.

7.4 Transportation Demand Management Strategies

The following transportation demand management (TDM) strategies are provided to help further reduce project VMT.

- Provide all residents with information regarding the availability of transit options in the vicinity of the site, including the Norwalk Transit System Bus Routes, Foothill Transit Bus Lines, and Montebello / Commerce Metrolink Station.

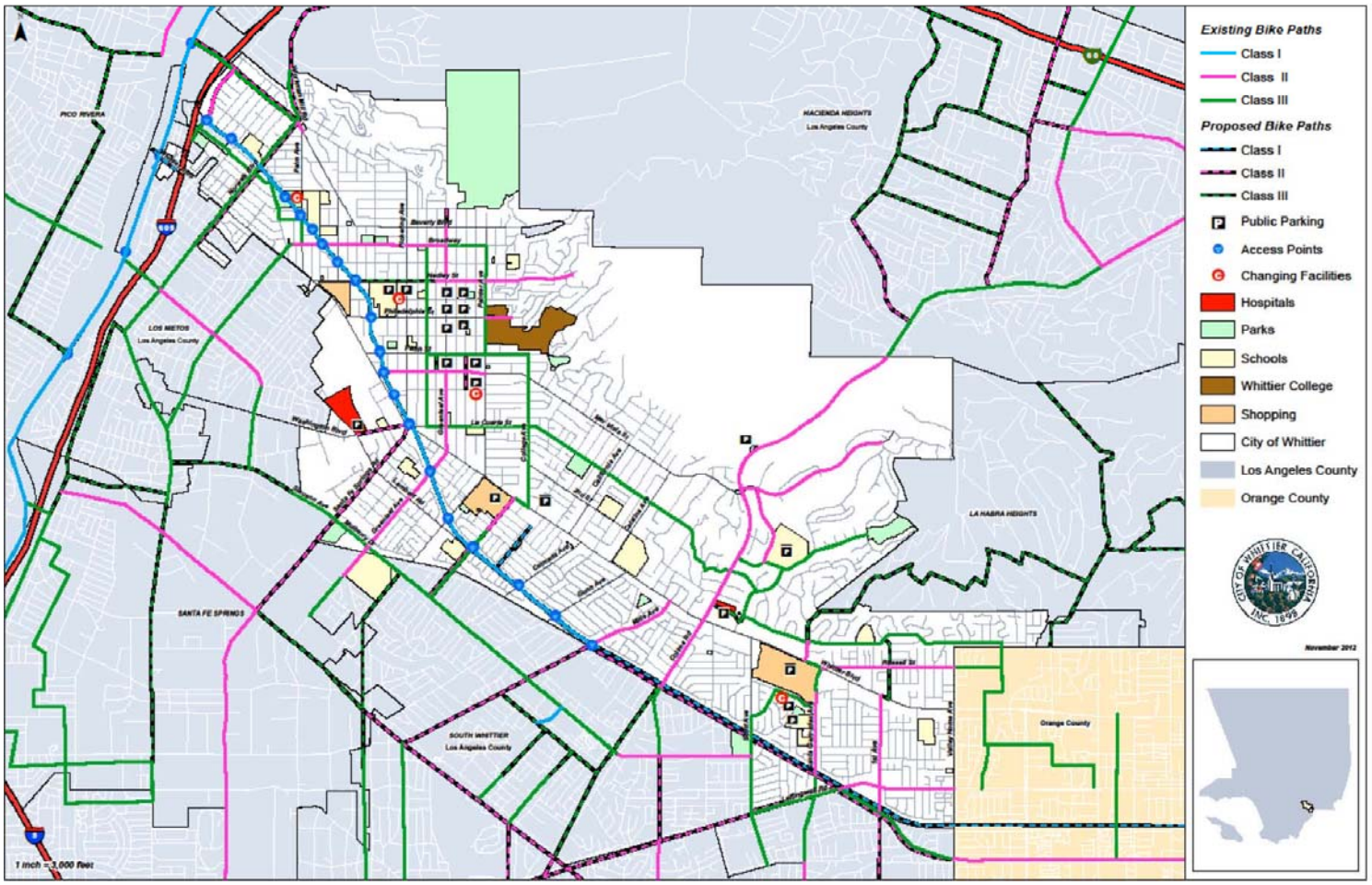
- The project should notify future residents of the site that the City of Whittier offers discounted bus passes to residents.

7.5 Vehicles Miles Traveled (VMT) Summary and Findings

The proposed project meets the CEQA requirements for reducing VMT by providing an infill project that would increase the land use density of the site. Additional VMT reduction strategies may also be incorporated with the project. Therefore, **the project's transportation impact is considered less than significant.**

Exhibit 7-1

City of Whittier Bicycle Transportation Plan Map



N

8.0 Sight Distance Evaluation

The project shall ensure adequate sight distance is provided at each project access location intersecting a public roadway per the California Department of Transportation (Caltrans) standards. The California Highway Design Manual, Section 405.1 indicates that the minimum corner sight distance for intersections of private roads shall be equal to the stopping sight distance given in Table 201.1 of the Highway Design Manual, provided in Appendix G.

Floral Drive is classified as a Local Street with a posted speed limit of 25 mph. The minimum required corner sight distance for a private roadway intersection is 150 feet. Exhibit 8-1 shows the required sight distance diagram for the project access on Floral Drive.

In order to ensure adequate sight distance is maintained, the following recommendations are provided:

- A limited use area shall be maintained where a clear line of sight can be established.
- The limited use area shall be used for the purpose of prohibiting or clearing obstructions to maintain adequate sight distance at intersections.
- Limited use area to be kept clear of all obstructions over 30 inches high, including vegetation.
- No trees, walls, or any obstructions shall be allowed in the limited use area.
- The toe of the slope shall not encroach into the limited use area.

By complying with the sight distance recommendations, the project would not substantially increase hazards due to sight distance.

Exhibit 8-1

Sight Distance Evaluation - Project Access Driveways



Notes:

Floral Drive has a posted speed limit of 25 MPH. The Highway Design Manual suggests a 150 feet line of sight be provided to safely accomondate drivers manuevering onto Floral Drive, given the design speed.

Legend:

= Limited Use Area

Existing Curb

N

9.0 Findings, Recommendations & Conclusions

The purpose of this traffic impact analysis and parking study is to evaluate the development of the proposed Whittier Floral Residential project from a traffic circulation and parking supply and demand perspective. The proposed development is located within the City of Whittier. The project is planned to open in 2022 and has been analyzed in one (1) complete phase.

This traffic study has been prepared in accordance to guidelines, requirements, and thresholds of significance outlined in the *Traffic Impact Analysis Report Preparation Guidelines* established by the City of Whittier Department of Public Works, revised May 2nd, 2011. The study has also been prepared in accordance with the scope of work previously reviewed and approved by City staff.

The purpose of the parking analysis is to evaluate and determine whether the future parking supply and demand at the project site will be adequate with the implementation of the development.

9.1 Proposed Project

The project proposes to construct and operate 25 single family detached dwelling units. The project site is currently occupied by the Trinity Lutheran Church upon a 3.59-acre lot for religious gathering and assembly. The Church plans to subdivide the property into two parcels; one (1) 2.56-acre lot for the residential development project and one (1) 1.03-acre lot for the Church, which will remain in operation.

The residential project will displace the former church school buildings on-site which are currently vacant. The Church also propose to expand the sanctuary building by an additional 2,809 square feet.

The project consist of demolition of 13,334 square feet of school buildings and 14,545 square feet of the gymnasium building as part of the construction process. The site requires grading and import of approximately 8,905 cubic yards of fill material during grading phase.

The project requires a General Plan amendment to change the land use from Private School to Medium Density Residential land use and requires a zone change from Low Density Residential (R-1) to Medium Density Residential (R-2).

Construction of the project is estimated to begin in the year 2021 and last approximately 17 months. Construction activities are expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. The project is expected to be operational in the year 2022.

Access to the project site will be from two (2) non-gated entryways on Floral Drive. The primary entry way is located at the northeasterly corner of the site. Access to the Trinity Lutheran Church will continue to use the existing driveway on Floral Drive located at the west end of the frontage.

9.2 Project Trip Generation

The proposed project is forecast to generate approximately 265 net weekday daily trips which include approximately 20 net weekday AM peak hour trips, 28 net weekday Mid-day peak hour trips, and 28 net weekday PM peak hour trips.

The proposed project is forecast to generate approximately 300 net Sunday daily trips which include approximately 50 net Sunday Mid-day peak hour trips.

9.3 General Plan Consistency

According to the City of Whittier Zoning and Land Use ArcGIS Map, the project lot is currently designated as an R1- Single Family Residential Zone. Per Municipal Code 18.16.030, the City of Whittier standardizes all single-family residential dwelling units (DU) to have a minimum lot area size of 7,000 square feet (6.22 DU/acre).

The proposed project consists of 2.56 acres for residential development. Based upon the City of Whittier developmental standards previously mentioned, a maximum fifteen (15) single family residential dwelling units may be developed.

When compared to the allowable 15-unit development, the proposed 26-unit residential project is expected to generate approximately 103 additional weekday daily trips, 8 additional weekday AM peak hour trips, 11 additional weekday Mid-day peak hour trips, and 9 additional PM peak hour tips.

When compared to the allowable 15-unit development, the proposed 26-unit residential project is expected to generate approximately 94 additional Sunday daily trips which includes 9 additional Sunday Mid-day peak hour trips.

9.4 Study Area & Conditions

The study area consists of the following intersections:

#	North-South Street	East-West Street	Notes
1.	Palm Avenue	Floral Drive	Existing – Unsignalized
2.	Westmont Road	Floral Drive	Existing – Unsignalized
3.	Beverly Boulevard	Floral Drive	Existing – Signalized

The analysis evaluates traffic conditions of the study intersections for the following scenarios in accordance with the City of Whittier and the approved scope of work:

- Existing Conditions;
- Existing Plus Project Conditions;
- Opening Year (2022) With Cumulative Projects Conditions; and
- Opening Year (2022) With Cumulative Projects Conditions Plus Project Conditions.

9.5 LOS Analysis & Significant Impact Summary

All study area intersections are currently operating at an acceptable LOS (LOS D or better) and are forecast to continue to operate at an acceptable level of service (LOS D or better) during the peak hours for all of the analysis scenarios evaluated as part of this report.

Based on agency-established thresholds of significance, the proposed project is forecast to not result in any significant traffic impacts at the study intersections.

Hence, no mitigation measures are required for the proposed project.

9.6 Parking Analysis

The parking analysis evaluates the following:

- Weekday conditions existing parking capacity, demand and utilization on the church site as well the surrounding on-street parking along Floral Drive between Palm Avenue and Beverly Boulevard;

- Sunday conditions existing parking capacity, demand and utilization on the church site as well the surrounding on-street parking along Floral Drive between Palm Avenue and Beverly Boulevard;

- Adequacy of on-site parking capacity planned to be provided for the church expansion and the proposed residential project after implementation of the proposed project.

To determine the existing parking capacity, demand and utilization of the church site and the surrounding on-street parking along Floral Drive between Palm Avenue and Beverly Boulevard, hourly observed parking counts were conducted during one typical weekday on Thursday February 27, 2020 and one typical Sunday on March 8, 2020.

The on-street counts were collected through observations on an hourly basis from 5:00 a.m. to 1:00 a.m.

The church parking was observed from 8:00 a.m. to 3:00 p.m. based on discussions and input from the church to capture the peak operations of the church.

Weekday Conditions:

- The maximum ***weekday*** hourly utilization of the parking along ***north side*** of Floral Drive between Palm Avenue and Beverly Boulevard occurred at 9:00 a.m. with 74 percent of the parking capacity being utilized (25 parked vehicles). Generally, ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to reach full utilization during certain hours.

- The maximum ***weekday*** hourly utilization of the parking along ***south side*** of Floral Drive between Palm Avenue and Beverly Boulevard occurred at 2:00 p.m. with 89 percent of the parking capacity being utilized (39 parked vehicles). Generally, ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to reach full utilization during certain hours.

- The maximum ***weekday*** hourly utilization of the parking for the church occurred from 11:00 a.m. to 1:00 p.m. with 15 percent of the parking capacity being utilized (5 parked vehicles in the total of 43 stalls).

Hence, based on the observed counts, more than adequate parking is currently provided on the church site and the overall on-street parking capacity is not being fully utilized during ***weekday*** conditions.

Sunday Conditions:

- The maximum ***Sunday*** hourly utilization of the parking along ***north side*** of Floral Drive between Palm Avenue and Beverly Boulevard occurred at 11:00 p.m. with 68 percent of the parking capacity being utilized (23 parked vehicles). Ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to be almost fully utilized. Generally, ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to reach full utilization during certain hours.

- The maximum ***Sunday*** hourly utilization of the parking along ***south side*** of Floral Drive between Palm Avenue and Beverly Boulevard occurred at 12:00 a.m. (midnight) with 48 percent of the parking capacity being utilized (21 parked vehicles). Ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to be almost fully utilized. Generally, ample available parking capacity was observed between Palm Avenue to Westmont Road. The parking capacity between Westmont Road and Beverly Boulevard was observed to reach full utilization during certain hours.

- The maximum ***Sunday*** hourly utilization of the parking for the church occurred at 10:00 a.m. with 79 percent of the parking capacity being utilized (27 parked vehicles in the total of 43 stalls).

Hence, based on the observed counts, more than adequate parking is currently provided on the church site and the overall on-street parking capacity is not being fully utilized during ***Sunday*** conditions.

Proposed Project Parking Capacity & Demand:

An evaluation of the required parking for the proposed residential use and the church expansion has been conducted based on the City of Whittier Municipal Code parking requirements and observed data to determine if adequate parking capacity is planned to be provided.

After completion, the proposed residential use is planned to provide a total of 64 parking spaces comprising of 57 resident spaces and 7 guest spaces. As shown in Table 6-3, and based on the City of Whittier Municipal Code, the proposed residential use is required to provide and total of 62.5 parking spaces (56.25 for residents and 6.25 for guests). Hence, the residential use is planned to provide adequate parking to serve the use based on the City of Whittier Municipal Code.

The church is proposing to provide a total of 48 parking spaces to accommodate the 144 seat Church sanctuary/assembly hall use (5 additional spaces compared to its existing parking capacity of 43 spaces). The City of Whittier Municipal Code requires 1 parking space for every 3 seats within the Church.

As previously shown, based on the observed parking counts, the existing 43 spaces for the church have a maximum utilization of 79 percent (27 spaces). Hence, the church currently has ample parking capacity for serving the parking demand of the existing congregation

The church will also include a Narthex antechamber and parish hall where the congregation will meet before and after services. The parish hall is an ancillary meeting space for the Church which will not be used host separate events during times when the main Church assembly is taking place. Hence additional parking for the parish hall would not be necessary. Based on the City of Whittier Municipal Code and the observed parking analysis, the Church will provide adequate parking to accommodate the expected demand on the site.

9.7 Vehicle Miles Traveled (VMT)

The proposed project meets the CEQA requirements for reducing VMT by providing an infill project that would increase the land use density of the site. Additional VMT reduction strategies may also be incorporated with the project. Therefore, **the project's transportation impact is considered less than significant.**

9.8 Sight Distance Evaluation

The project shall ensure adequate sight distance is provided at each project access location intersecting a public roadway per the California Department of Transportation (Caltrans) standards.

In order to ensure adequate sight distance is maintained, the following recommendations are provided:

- A limited use area shall be maintained where a clear line of sight can be established.
- The limited use area shall be used for the purpose of prohibiting or clearing obstructions to maintain adequate sight distance at intersections.
- Limited use area to be kept clear of all obstructions over 30 inches high, including vegetation.
- No trees, walls, or any obstructions shall be allowed in the limited use area.
- The toe of the slope shall not encroach into the limited use area.

Appendix A

Existing Traffic Count Worksheets

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Whittier
N/S: Palm Avenue
E/W: Floral Drive
Weather: Clear

File Name : 01_WTR_Palm_Floral AM
Site Code : 10520113
Start Date : 2/27/2020
Page No : 1

Groups Printed- Total Volume

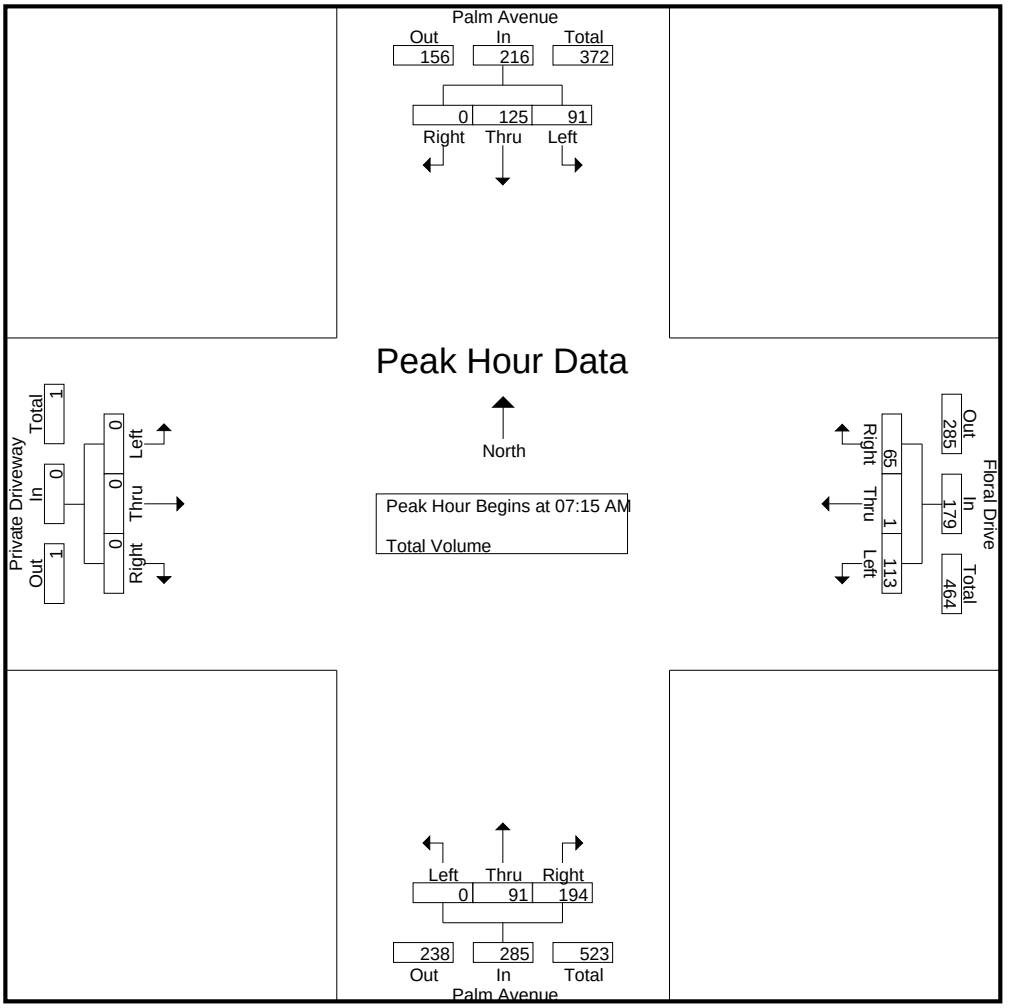
	Palm Avenue Southbound				Floral Drive Westbound				Palm Avenue Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	4	14	0	18	8	0	6	14	0	17	16	33	0	0	0	0	65
07:15 AM	22	25	0	47	17	0	8	25	0	17	43	60	0	0	0	0	132
07:30 AM	31	42	0	73	41	0	19	60	0	28	75	103	0	0	0	0	236
07:45 AM	33	39	0	72	34	1	31	66	0	27	50	77	0	0	0	0	215
Total	90	120	0	210	100	1	64	165	0	89	184	273	0	0	0	0	648
08:00 AM	5	19	0	24	21	0	7	28	0	19	26	45	0	0	0	0	97
08:15 AM	4	16	0	20	8	0	4	12	0	14	9	23	0	0	0	0	55
08:30 AM	2	10	0	12	3	0	1	4	0	10	7	17	0	0	0	0	33
08:45 AM	2	12	0	14	3	0	2	5	0	7	2	9	0	0	0	0	28
Total	13	57	0	70	35	0	14	49	0	50	44	94	0	0	0	0	213
Grand Total	103	177	0	280	135	1	78	214	0	139	228	367	0	0	0	0	861
Apprch %	36.8	63.2	0		63.1	0.5	36.4		0	37.9	62.1		0	0	0		
Total %	12	20.6	0	32.5	15.7	0.1	9.1	24.9	0	16.1	26.5	42.6	0	0	0	0	

	Palm Avenue Southbound				Floral Drive Westbound				Palm Avenue Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	22	25	0	47	17	0	8	25	0	17	43	60	0	0	0	0	132
07:30 AM	31	**42**	0	**73**	**41**	0	19	60	0	**28**	**75**	**103**	0	0	0	0	**236**
07:45 AM	**33**	39	0	72	34	**1**	**31**	**66**	0	27	50	77	0	0	0	0	215
08:00 AM	5	19	0	24	21	0	7	28	0	19	26	45	0	0	0	0	97
Total Volume	91	125	0	216	113	1	65	179	0	91	194	285	0	0	0	0	680
% App. Total	42.1	57.9	0		63.1	0.6	36.3		0	31.9	68.1		0	0	0		
PHF	.689	.744	.000	.740	.689	.250	.524	.678	.000	.813	.647	.692	.000	.000	.000	.000	.720

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City of Whittier
N/S: Palm Avenue
E/W: Floral Drive
Weather: Clear

File Name : 01_WTR_Palm_Floral AM
Site Code : 10520113
Start Date : 2/27/2020
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:00 AM			
+0 mins.	22	25	0	47	17	0	8	25	0	17	43	60	0	0	0	0
+15 mins.	31	**42**	0	**73**	**41**	0	19	60	0	**28**	**75**	**103**	0	0	0	0
+30 mins.	**33**	39	0	72	34	**1**	**31**	**66**	0	27	50	77	0	0	0	0
+45 mins.	5	19	0	24	21	0	7	28	0	19	26	45	0	0	0	0
Total Volume	91	125	0	216	113	1	65	179	0	91	194	285	0	0	0	0
% App. Total	42.1	57.9	0		63.1	0.6	36.3		0	31.9	68.1		0	0	0	
PHF	.689	.744	.000	.740	.689	.250	.524	.678	.000	.813	.647	.692	.000	.000	.000	.000

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City of Whittier
N/S: Palm Avenue
E/W: Floral Drive
Weather: Clear

File Name : 01_WTR_Palm_Floral MD
Site Code : 10520113
Start Date : 2/27/2020
Page No : 1

Groups Printed- Total Volume

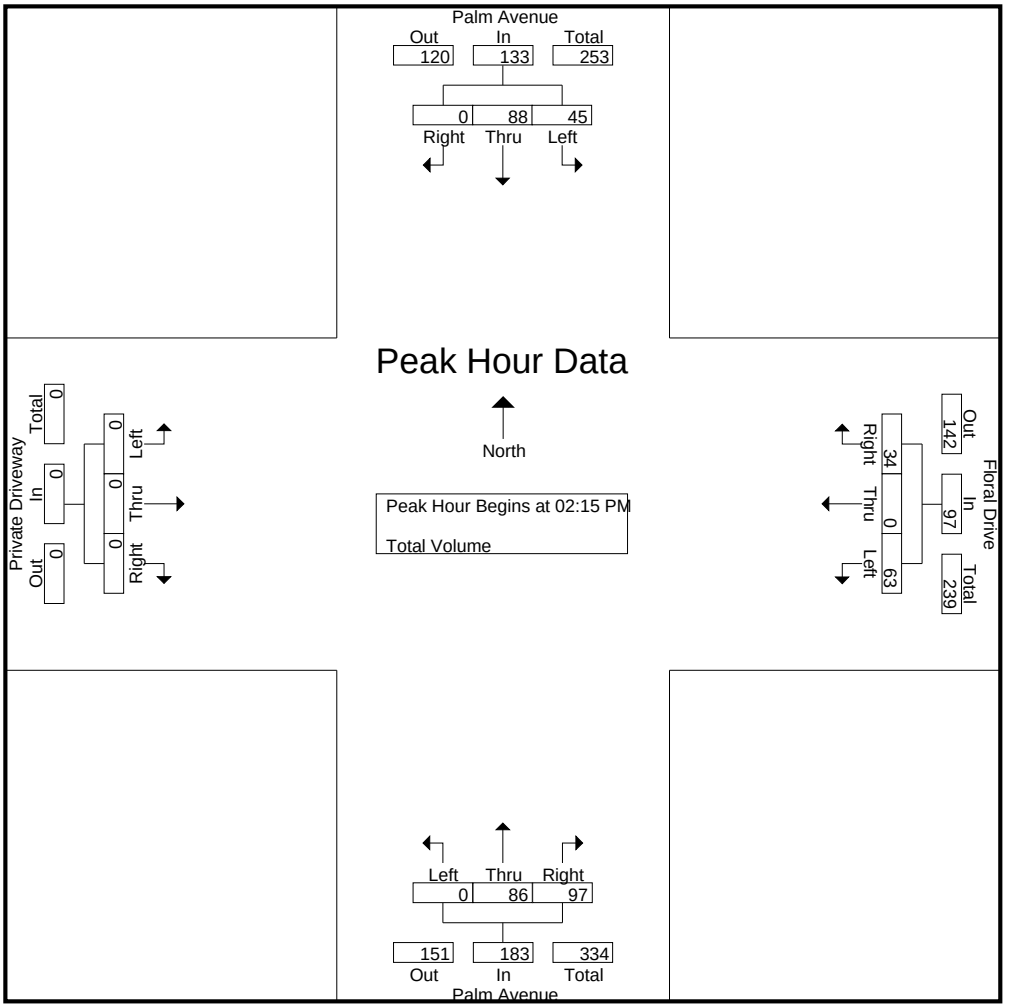
	Palm Avenue Southbound				Floral Drive Westbound				Palm Avenue Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
01:30 PM	2	11	0	13	1	0	0	1	0	6	4	10	0	0	0	0	24
01:45 PM	3	17	0	20	1	0	1	2	0	16	14	30	0	0	0	0	52
Total	5	28	0	33	2	0	1	3	0	22	18	40	0	0	0	0	76
02:00 PM	4	18	0	22	6	0	0	6	0	18	9	27	0	0	0	0	55
02:15 PM	8	26	0	34	11	0	11	22	0	23	18	41	0	0	0	0	97
02:30 PM	23	29	0	52	24	0	17	41	0	16	40	56	0	0	0	0	149
02:45 PM	11	20	0	31	17	0	2	19	0	23	27	50	0	0	0	0	100
Total	46	93	0	139	58	0	30	88	0	80	94	174	0	0	0	0	401
03:00 PM	3	13	0	16	11	0	4	15	0	24	12	36	0	0	0	0	67
03:15 PM	3	19	0	22	3	0	0	3	0	13	9	22	0	0	0	0	47
Grand Total	57	153	0	210	74	0	35	109	0	139	133	272	0	0	0	0	591
Apprch %	27.1	72.9	0		67.9	0	32.1		0	51.1	48.9		0	0	0		
Total %	9.6	25.9	0	35.5	12.5	0	5.9	18.4	0	23.5	22.5	46	0	0	0	0	

	Palm Avenue Southbound				Floral Drive Westbound				Palm Avenue Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 01:30 PM to 03:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:15 PM																	
02:15 PM	8	26	0	34	11	0	11	22	0	23	18	41	0	0	0	0	97
02:30 PM	**23**	**29**	0	**52**	**24**	0	**17**	**41**	0	16	**40**	**56**	0	0	0	0	**149**
02:45 PM	11	20	0	31	17	0	2	19	0	23	27	50	0	0	0	0	100
03:00 PM	3	13	0	16	11	0	4	15	0	**24**	12	36	0	0	0	0	67
Total Volume	45	88	0	133	63	0	34	97	0	86	97	183	0	0	0	0	413
% App. Total	33.8	66.2	0		64.9	0	35.1		0	47	53		0	0	0		
PHF	.489	.759	.000	.639	.656	.000	.500	.591	.000	.896	.606	.817	.000	.000	.000	.000	.693

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File Name : 01_WTR_Palm_Floral MD
Site Code : 10520113
Start Date : 2/27/2020
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Peak Hour Analysis From 01:30 PM to 03:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM				02:15 PM				02:15 PM				01:30 PM			
+0 mins.	4	18	0	22	11	0	11	22	0	23	18	41	0	0	0	0
+15 mins.	8	26	0	34	**24**	0	**17**	**41**	0	16	**40**	**56**	0	0	0	0
+30 mins.	**23**	**29**	0	**52**	17	0	2	19	0	23	27	50	0	0	0	0
+45 mins.	11	20	0	31	11	0	4	15	0	**24**	12	36	0	0	0	0
Total Volume	46	93	0	139	63	0	34	97	0	86	97	183	0	0	0	0
% App. Total	33.1	66.9	0		64.9	0	35.1		0	47	53		0	0	0	
PHF	.500	.802	.000	.668	.656	.000	.500	.591	.000	.896	.606	.817	.000	.000	.000	.000

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City of Whittier
N/S: Palm Avenue
E/W: Floral Drive
Weather: Clear

File Name : 01_WTR_Palm_Floral PM
Site Code : 10520113
Start Date : 2/27/2020
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Groups Printed- Total Volume

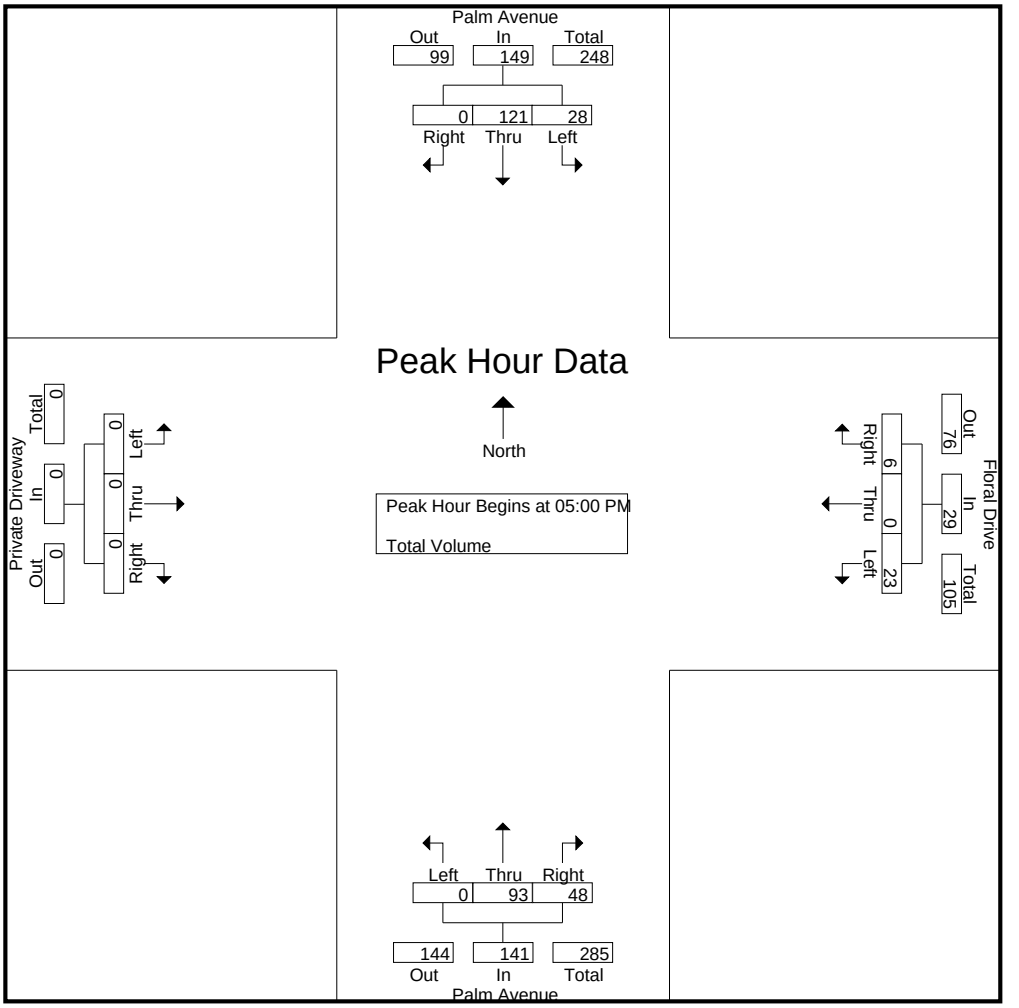
	Palm Avenue Southbound				Floral Drive Westbound				Palm Avenue Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	2	27	0	29	4	0	1	5	0	18	13	31	0	0	0	0	65
04:15 PM	3	21	0	24	8	0	3	11	0	15	18	33	0	0	0	0	68
04:30 PM	5	23	0	28	11	0	0	11	0	26	7	33	0	0	0	0	72
04:45 PM	4	34	0	38	8	0	4	12	0	16	8	24	0	0	0	0	74
Total	14	105	0	119	31	0	8	39	0	75	46	121	0	0	0	0	279
05:00 PM	5	32	0	37	8	0	1	9	0	21	9	30	0	0	0	0	76
05:15 PM	5	30	0	35	4	0	1	5	0	28	11	39	0	0	0	0	79
05:30 PM	4	27	0	31	4	0	0	4	0	24	15	39	0	0	0	0	74
05:45 PM	14	32	0	46	7	0	4	11	0	20	13	33	0	0	0	0	90
Total	28	121	0	149	23	0	6	29	0	93	48	141	0	0	0	0	319
Grand Total	42	226	0	268	54	0	14	68	0	168	94	262	0	0	0	0	598
Apprch %	15.7	84.3	0		79.4	0	20.6		0	64.1	35.9		0	0	0		
Total %	7	37.8	0	44.8	9	0	2.3	11.4	0	28.1	15.7	43.8	0	0	0	0	

	Palm Avenue Southbound				Floral Drive Westbound				Palm Avenue Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	5	**32**	0	37	**8**	0	1	9	0	21	9	30	0	0	0	0	76
05:15 PM	5	30	0	35	4	0	1	5	0	**28**	11	**39**	0	0	0	0	79
05:30 PM	4	27	0	31	4	0	0	4	0	24	**15**	39	0	0	0	0	74
05:45 PM	**14**	32	0	**46**	7	0	**4**	**11**	0	20	13	33	0	0	0	0	**90**
Total Volume	28	121	0	149	23	0	6	29	0	93	48	141	0	0	0	0	319
% App. Total	18.8	81.2	0		79.3	0	20.7		0	66	34		0	0	0		
PHF	.500	.945	.000	.810	.719	.000	.375	.659	.000	.830	.800	.904	.000	.000	.000	.000	.886

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City of Whittier
N/S: Palm Avenue
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Weather: Clear

File Name : 01_WTR_Palm_Floral PM
Site Code : 10520113
Start Date : 2/27/2020
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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:15 PM				05:00 PM				04:00 PM			
+0 mins.	5	**32**	0	37	8	0	3	11	0	21	9	30	0	0	0	0
+15 mins.	5	30	0	35	**11**	0	0	11	0	**28**	11	**39**	0	0	0	0
+30 mins.	4	27	0	31	8	0	**4**	**12**	0	24	**15**	39	0	0	0	0
+45 mins.	**14**	32	0	**46**	8	0	1	9	0	20	13	33	0	0	0	0
Total Volume	28	121	0	149	35	0	8	43	0	93	48	141	0	0	0	0
% App. Total	18.8	81.2	0		81.4	0	18.6		0	66	34		0	0	0	
PHF	.500	.945	.000	.810	.795	.000	.500	.896	.000	.830	.800	.904	.000	.000	.000	.000

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City of Whittier
N/S: Palm Avenue
E/W: Floral Drive
Weather: Clear

File Name : 01_WTR_Palm_Floral Sun
Site Code : 10520113
Start Date : 3/8/2020
Page No : 1

Groups Printed- Total Volume

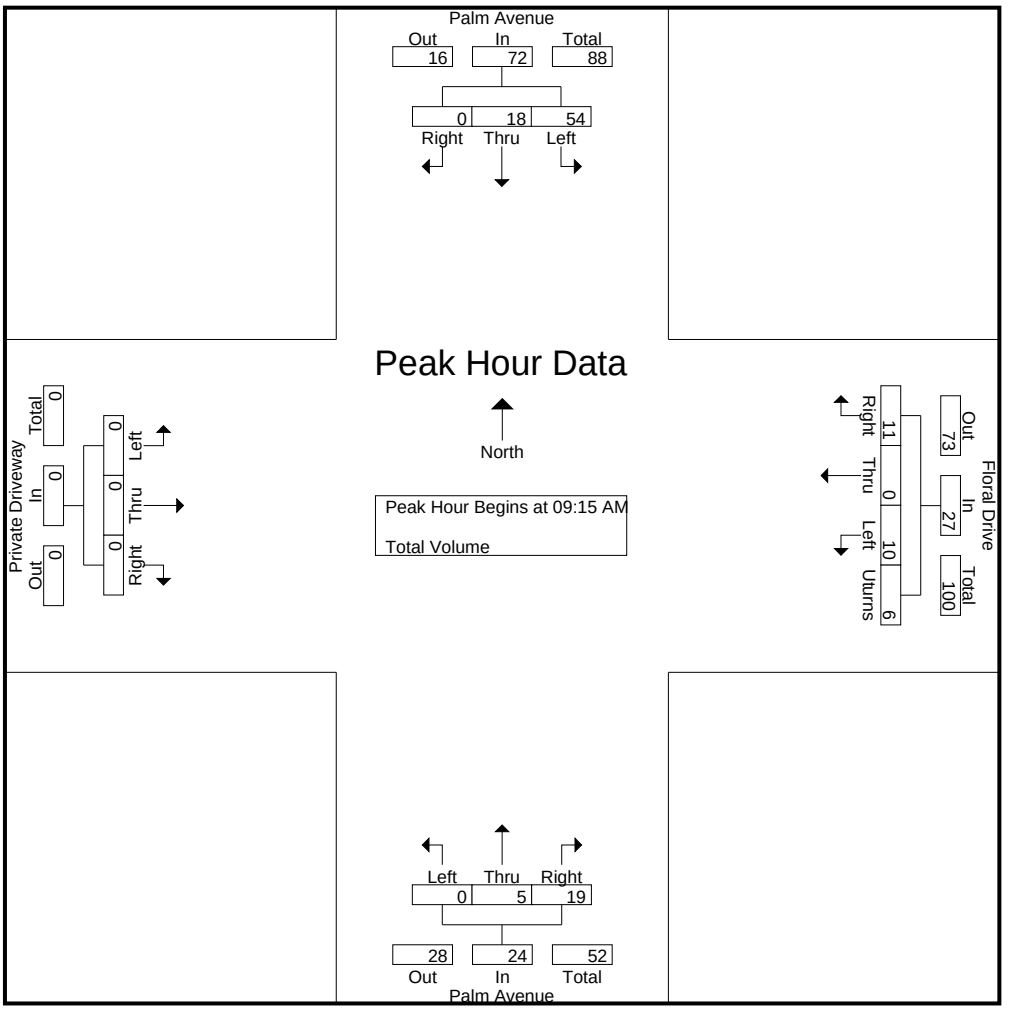
	Palm Avenue Southbound				Floral Drive Westbound					Palm Avenue Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Uturns	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
08:00 AM	2	1	0	3	0	0	0	1	1	0	1	1	2	0	0	0	0	6
08:15 AM	8	7	0	15	1	0	1	0	2	0	1	1	2	0	0	0	0	19
08:30 AM	6	1	0	7	1	0	1	0	2	0	0	0	0	0	0	0	0	9
08:45 AM	10	4	0	14	1	0	1	0	2	0	1	2	3	0	0	0	0	19
Total	26	13	0	39	3	0	3	1	7	0	3	4	7	0	0	0	0	53
09:00 AM	11	0	0	11	2	0	3	2	7	0	5	6	11	0	0	0	0	29
09:15 AM	21	8	0	29	1	0	3	3	7	0	1	5	6	0	0	0	0	42
09:30 AM	8	1	0	9	1	0	3	0	4	0	0	1	1	0	0	0	0	14
09:45 AM	16	6	0	22	5	0	4	3	12	0	1	2	3	0	0	0	0	37
Total	56	15	0	71	9	0	13	8	30	0	7	14	21	0	0	0	0	122
10:00 AM	9	3	0	12	3	0	1	0	4	0	3	11	14	0	0	0	0	30
10:15 AM	7	2	0	9	0	0	2	1	3	0	0	2	2	0	0	0	0	14
10:30 AM	11	2	0	13	1	0	3	1	5	0	0	2	2	0	0	0	0	20
10:45 AM	10	2	0	12	1	0	3	1	5	0	3	3	6	0	0	0	0	23
Total	37	9	0	46	5	0	9	3	17	0	6	18	24	0	0	0	0	87
11:00 AM	4	1	0	5	0	0	6	2	8	0	4	0	4	0	0	0	0	17
11:15 AM	18	4	0	22	4	0	8	1	13	0	1	2	3	0	0	0	0	38
11:30 AM	14	3	0	17	4	0	1	0	5	0	4	2	6	0	0	0	0	28
11:45 AM	5	2	0	7	5	0	5	1	11	0	4	4	8	0	0	0	0	26
Total	41	10	0	51	13	0	20	4	37	0	13	8	21	0	0	0	0	109
Grand Total	160	47	0	207	30	0	45	16	91	0	29	44	73	0	0	0	0	371
Apprch %	77.3	22.7	0		33	0	49.5	17.6		0	39.7	60.3		0	0	0		
Total %	43.1	12.7	0	55.8	8.1	0	12.1	4.3	24.5	0	7.8	11.9	19.7	0	0	0	0	

	Palm Avenue Southbound				Floral Drive Westbound					Palm Avenue Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Uturns	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 08:00 AM to 11:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 09:15 AM																		
09:15 AM	21	8	0	29	1	0	3	3	7	0	1	5	6	0	0	0	0	42
09:30 AM	8	1	0	9	1	0	3	0	4	0	0	1	1	0	0	0	0	14
09:45 AM	16	6	0	22	5	0	4	3	12	0	1	2	3	0	0	0	0	37
10:00 AM	9	3	0	12	3	0	1	0	4	0	3	11	14	0	0	0	0	30
Total Volume	54	18	0	72	10	0	11	6	27	0	5	19	24	0	0	0	0	123
% App. Total	75	25	0		37	0	40.7	22.2		0	20.8	79.2		0	0	0		
PHF	.643	.563	.000	.621	.500	.000	.688	.500	.563	.000	.417	.432	.429	.000	.000	.000	.000	.732

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City of Whittier
N/S: Palm Avenue
E/W: Floral Drive
Weather: Clear

File Name : 01_WTR_Palm_Floral Sun
Site Code : 10520113
Start Date : 3/8/2020
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Peak Hour Analysis From 08:00 AM to 11:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	09:15 AM				11:00 AM					09:15 AM				08:00 AM			
+0 mins.	21	8	0	29	0	0	6	2	8	0	1	5	6	0	0	0	0
+15 mins.	8	1	0	9	4	0	8	1	13	0	0	1	1	0	0	0	0
+30 mins.	16	6	0	22	4	0	1	0	5	0	1	2	3	0	0	0	0
+45 mins.	9	3	0	12	5	0	5	1	11	0	3	11	14	0	0	0	0
Total Volume	54	18	0	72	13	0	20	4	37	0	5	19	24	0	0	0	0
% App. Total	75	25	0		35.1	0	54.1	10.8		0	20.8	79.2		0	0	0	
PHF	.643	.563	.000	.621	.650	.000	.625	.500	.712	.000	.417	.432	.429	.000	.000	.000	.000

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City of Whittier
N/S: Westmont Road
E/W: Floral Drive
Weather: Clear

File Name : 02_WTR_Westmont_Floral AM
Site Code : 10520113
Start Date : 2/27/2020
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Groups Printed- Total Volume

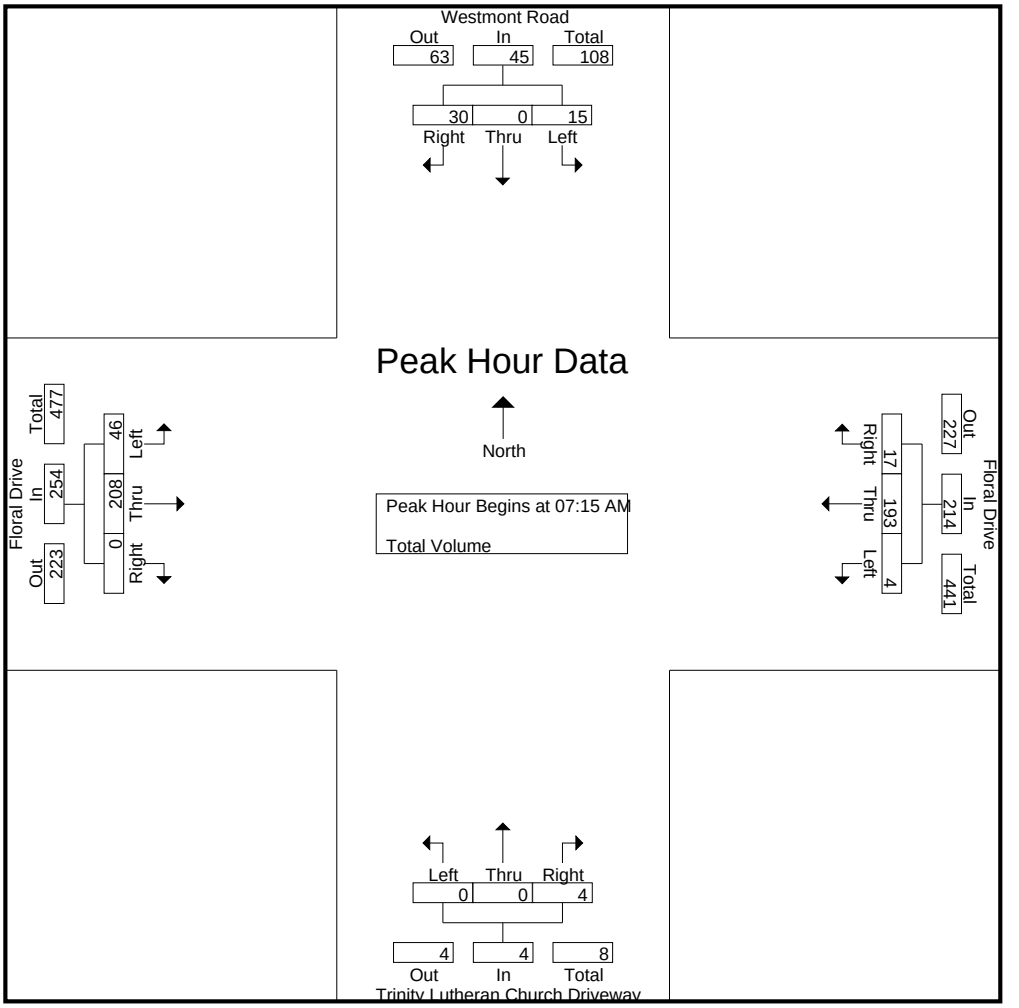
	Westmont Road Southbound				Floral Drive Westbound				Trinity Lutheran Church Driveway Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	0	0	1	0	14	2	16	0	0	0	0	0	8	0	8	25
07:15 AM	2	0	7	9	1	31	2	34	0	0	1	1	7	33	0	40	84
07:30 AM	7	0	8	15	2	69	5	76	0	0	2	2	14	73	0	87	180
07:45 AM	4	0	14	18	1	66	7	74	0	0	1	1	19	79	0	98	191
Total	14	0	29	43	4	180	16	200	0	0	4	4	40	193	0	233	480
08:00 AM	2	0	1	3	0	27	3	30	0	0	0	0	6	23	0	29	62
08:15 AM	3	0	0	3	0	8	1	9	0	0	0	0	3	13	0	16	28
08:30 AM	3	0	0	3	0	5	0	5	0	0	0	0	1	7	0	8	16
08:45 AM	2	0	0	2	0	5	1	6	0	0	0	0	1	5	0	6	14
Total	10	0	1	11	0	45	5	50	0	0	0	0	11	48	0	59	120
Grand Total	24	0	30	54	4	225	21	250	0	0	4	4	51	241	0	292	600
Apprch %	44.4	0	55.6		1.6	90	8.4		0	0	100		17.5	82.5	0		
Total %	4	0	5	9	0.7	37.5	3.5	41.7	0	0	0.7	0.7	8.5	40.2	0	48.7	

	Westmont Road Southbound				Floral Drive Westbound				Trinity Lutheran Church Driveway Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	2	0	7	9	1	31	2	34	0	0	1	1	7	33	0	40	84
07:30 AM	**7**	0	8	15	**2**	**69**	5	**76**	0	0	**2**	**2**	14	73	0	87	180
07:45 AM	4	0	**14**	**18**	1	66	**7**	74	0	0	1	1	**19**	**79**	0	**98**	**191**
08:00 AM	2	0	1	3	0	27	3	30	0	0	0	0	6	23	0	29	62
Total Volume	15	0	30	45	4	193	17	214	0	0	4	4	46	208	0	254	517
% App. Total	33.3	0	66.7		1.9	90.2	7.9		0	0	100		18.1	81.9	0		
PHF	.536	.000	.536	.625	.500	.699	.607	.704	.000	.000	.500	.500	.605	.658	.000	.648	.677

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City of Whittier
N/S: Westmont Road
E/W: Floral Drive
Weather: Clear

File Name : 02_WTR_Westmont_Floral AM
Site Code : 10520113
Start Date : 2/27/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:00 AM				07:15 AM			
+0 mins.	2	0	7	9	1	31	2	34	0	0	0	0	7	33	0	40
+15 mins.	**7**	0	8	15	**2**	**69**	5	**76**	0	0	1	1	14	73	0	87
+30 mins.	4	0	**14**	**18**	1	66	**7**	74	0	0	**2**	**2**	**19**	**79**	0	**98**
+45 mins.	2	0	1	3	0	27	3	30	0	0	1	1	6	23	0	29
Total Volume	15	0	30	45	4	193	17	214	0	0	4	4	46	208	0	254
% App. Total	33.3	0	66.7		1.9	90.2	7.9		0	0	100		18.1	81.9	0	
PHF	.536	.000	.536	.625	.500	.699	.607	.704	.000	.000	.500	.500	.605	.658	.000	.648

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City of Whittier
N/S: Westmont Road
E/W: Floral Drive
Weather: Clear

File Name : 02_WTR_Westmont_Floral MD
Site Code : 10520113
Start Date : 2/27/2020
Page No : 1

Groups Printed- Total Volume

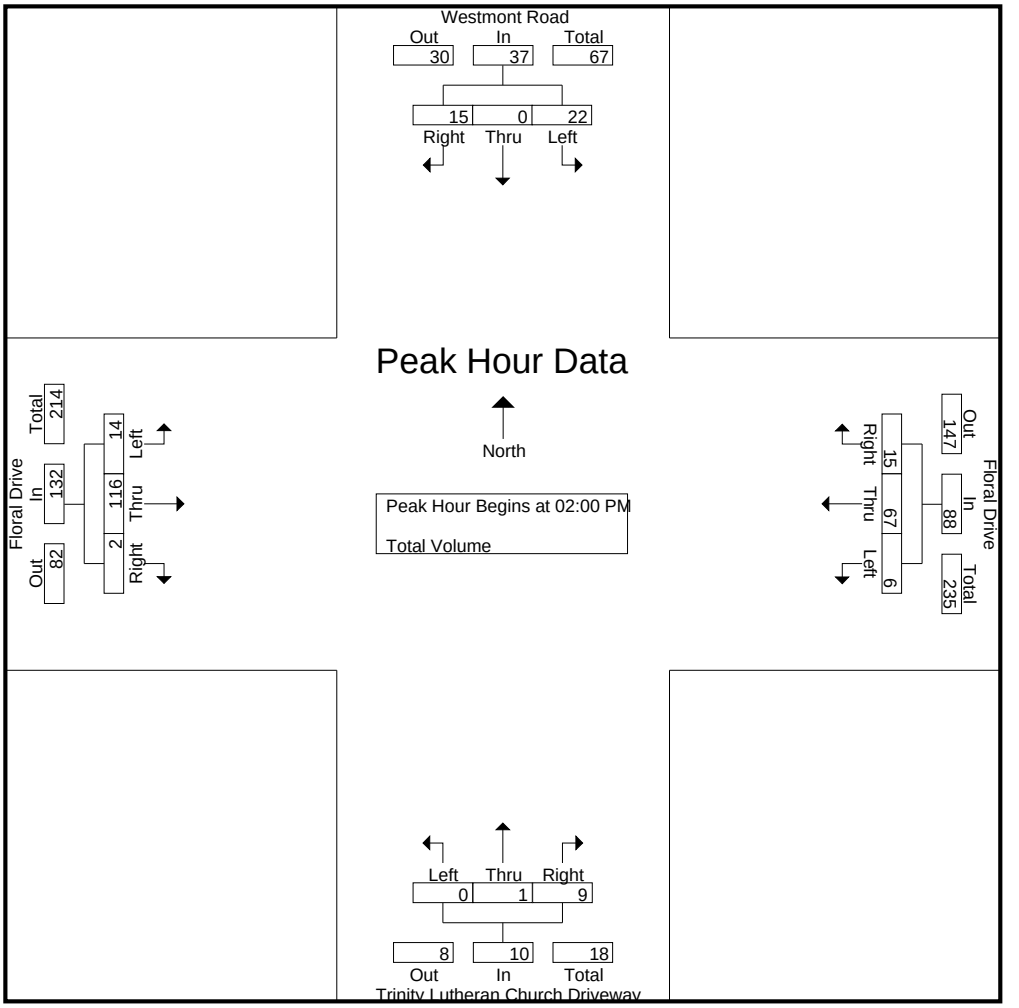
	Westmont Road Southbound				Floral Drive Westbound				Trinity Lutheran Church Driveway Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
01:30 PM	1	0	2	3	0	3	0	3	0	0	0	0	0	4	0	4	10
01:45 PM	1	0	0	1	0	5	3	8	0	0	0	0	1	3	1	5	14
Total	2	0	2	4	0	8	3	11	0	0	0	0	1	7	1	9	24
02:00 PM	7	0	1	8	1	13	3	17	0	0	0	0	0	9	1	10	35
02:15 PM	1	0	1	2	5	19	4	28	0	1	3	4	3	11	1	15	49
02:30 PM	9	0	12	21	0	18	6	24	0	0	6	6	8	60	0	68	119
02:45 PM	5	0	1	6	0	17	2	19	0	0	0	0	3	36	0	39	64
Total	22	0	15	37	6	67	15	88	0	1	9	10	14	116	2	132	267
03:00 PM	2	0	2	4	0	11	1	12	0	0	0	0	4	15	0	19	35
03:15 PM	4	0	1	5	0	7	2	9	0	0	0	0	3	14	0	17	31
Grand Total	30	0	20	50	6	93	21	120	0	1	9	10	22	152	3	177	357
Apprch %	60	0	40		5	77.5	17.5		0	10	90		12.4	85.9	1.7		
Total %	8.4	0	5.6	14	1.7	26.1	5.9	33.6	0	0.3	2.5	2.8	6.2	42.6	0.8	49.6	

	Westmont Road Southbound				Floral Drive Westbound				Trinity Lutheran Church Driveway Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 01:30 PM to 03:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	7	0	1	8	1	13	3	17	0	0	0	0	0	9	**1**	10	35
02:15 PM	1	0	1	2	**5**	**19**	4	**28**	0	**1**	3	4	3	11	1	15	49
02:30 PM	**9**	0	**12**	**21**	0	18	**6**	24	0	0	**6**	**6**	**8**	**60**	0	**68**	**119**
02:45 PM	5	0	1	6	0	17	2	19	0	0	0	0	3	36	0	39	64
Total Volume	22	0	15	37	6	67	15	88	0	1	9	10	14	116	2	132	267
% App. Total	59.5	0	40.5		6.8	76.1	17		0	10	90		10.6	87.9	1.5		
PHF	.611	.000	.313	.440	.300	.882	.625	.786	.000	.250	.375	.417	.438	.483	.500	.485	.561

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City of Whittier
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Site Code : 10520113
Start Date : 2/27/2020
Page No : 2



Peak Hour Analysis From 01:30 PM to 03:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM				02:00 PM				01:45 PM				02:30 PM			
+0 mins.	7	0	1	8	1	13	3	17	0	0	0	0	**8**	**60**	0	**68**
+15 mins.	1	0	1	2	**5**	**19**	4	**28**	0	0	0	0	3	36	0	39
+30 mins.	**9**	0	**12**	**21**	0	18	**6**	24	0	**1**	3	4	4	15	0	19
+45 mins.	5	0	1	6	0	17	2	19	0	0	**6**	**6**	3	14	0	17
Total Volume	22	0	15	37	6	67	15	88	0	1	9	10	18	125	0	143
% App. Total	59.5	0	40.5		6.8	76.1	17		0	10	90		12.6	87.4	0	
PHF	.611	.000	.313	.440	.300	.882	.625	.786	.000	.250	.375	.417	.563	.521	.000	.526

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City of Whittier
N/S: Westmont Road
E/W: Floral Drive
Weather: Clear

File Name : 02_WTR_Westmont_Floral PM
Site Code : 10520113
Start Date : 2/27/2020
Page No : 1

Groups Printed- Total Volume

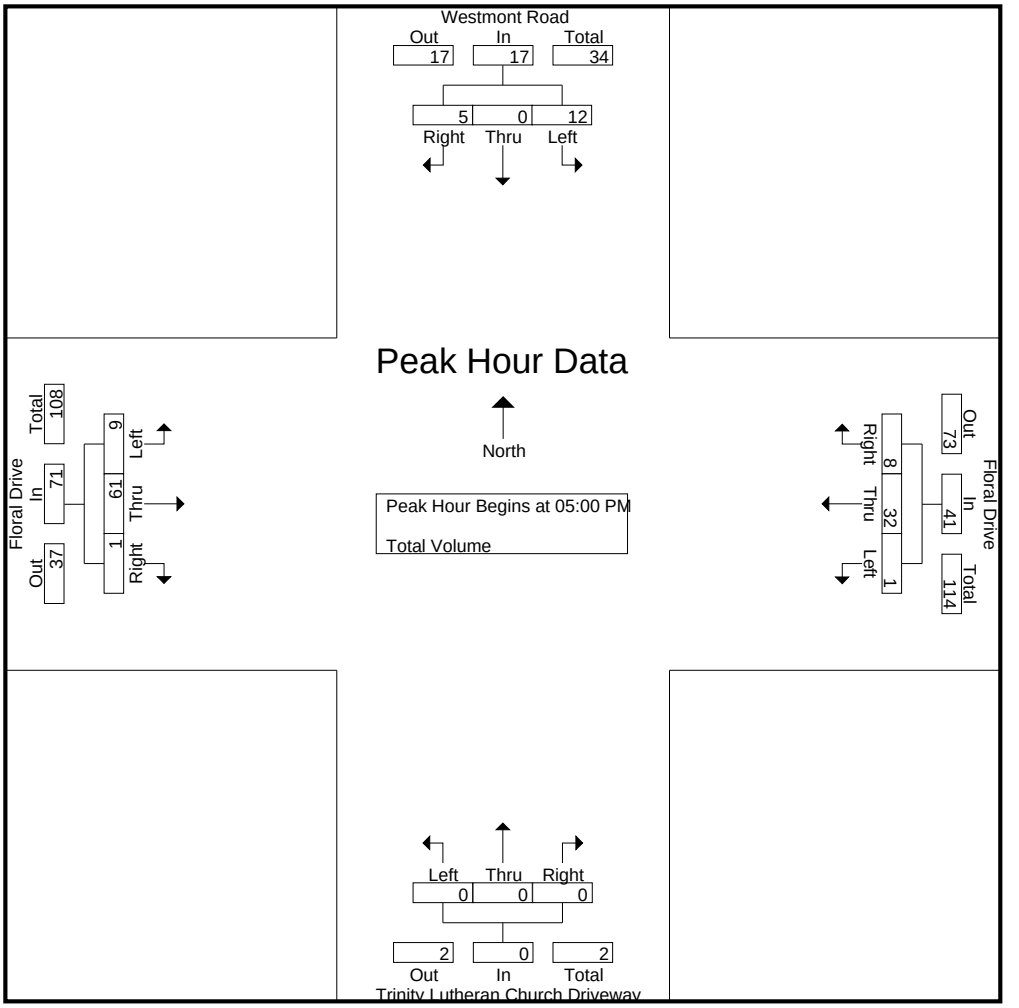
	Westmont Road Southbound				Floral Drive Westbound				Trinity Lutheran Church Driveway Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	2	0	1	3	1	6	1	8	0	0	1	1	3	7	0	10	22
04:15 PM	2	0	1	3	0	8	2	10	0	0	0	0	1	13	0	14	27
04:30 PM	2	0	1	3	0	8	1	9	0	0	0	0	2	18	1	21	33
04:45 PM	1	0	2	3	0	10	3	13	0	0	0	0	1	10	0	11	27
Total	7	0	5	12	1	32	7	40	0	0	1	1	7	48	1	56	109
05:00 PM	3	0	1	4	0	8	1	9	0	0	0	0	1	11	0	12	25
05:15 PM	4	0	1	5	0	7	3	10	0	0	0	0	2	14	0	16	31
05:30 PM	0	0	1	1	0	9	2	11	0	0	0	0	1	9	0	10	22
05:45 PM	5	0	2	7	1	8	2	11	0	0	0	0	5	27	1	33	51
Total	12	0	5	17	1	32	8	41	0	0	0	0	9	61	1	71	129
Grand Total	19	0	10	29	2	64	15	81	0	0	1	1	16	109	2	127	238
Apprch %	65.5	0	34.5		2.5	79	18.5		0	0	100		12.6	85.8	1.6		
Total %	8	0	4.2	12.2	0.8	26.9	6.3	34	0	0	0.4	0.4	6.7	45.8	0.8	53.4	

	Westmont Road Southbound				Floral Drive Westbound				Trinity Lutheran Church Driveway Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	3	0	1	4	0	8	1	9	0	0	0	0	1	11	0	12	25
05:15 PM	4	0	1	5	0	7	**3**	10	0	0	0	0	2	14	0	16	31
05:30 PM	0	0	1	1	0	**9**	2	**11**	0	0	0	0	1	9	0	10	22
05:45 PM	**5**	0	**2**	**7**	**1**	8	2	11	0	0	0	0	**5**	**27**	**1**	**33**	**51**
Total Volume	12	0	5	17	1	32	8	41	0	0	0	0	9	61	1	71	129
% App. Total	70.6	0	29.4		2.4	78	19.5		0	0	0		12.7	85.9	1.4		
PHF	.600	.000	.625	.607	.250	.889	.667	.932	.000	.000	.000	.000	.450	.565	.250	.538	.632

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City of Whittier
N/S: Westmont Road
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Weather: Clear

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Site Code : 10520113
Start Date : 2/27/2020
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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:00 PM				05:00 PM			
+0 mins.	3	0	1	4	0	**10**	**3**	**13**	0	0	**1**	**1**	1	11	0	12
+15 mins.	4	0	1	5	0	8	1	9	0	0	0	0	2	14	0	16
+30 mins.	0	0	1	1	0	7	3	10	0	0	0	0	1	9	0	10
+45 mins.	**5**	0	**2**	**7**	0	9	2	11	0	0	0	0	**5**	**27**	**1**	**33**
Total Volume	12	0	5	17	0	34	9	43	0	0	1	1	9	61	1	71
% App. Total	70.6	0	29.4		0	79.1	20.9		0	0	100		12.7	85.9	1.4	
PHF	.600	.000	.625	.607	.000	.850	.750	.827	.000	.000	.250	.250	.450	.565	.250	.538

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City of Whittier
N/S: Westmont Road
E/W: Floral Drive
Weather: Clear

File Name : 02_WTR_Westmont_Floral Sun
Site Code : 10520113
Start Date : 3/8/2020

Groups Printed- Total Volume

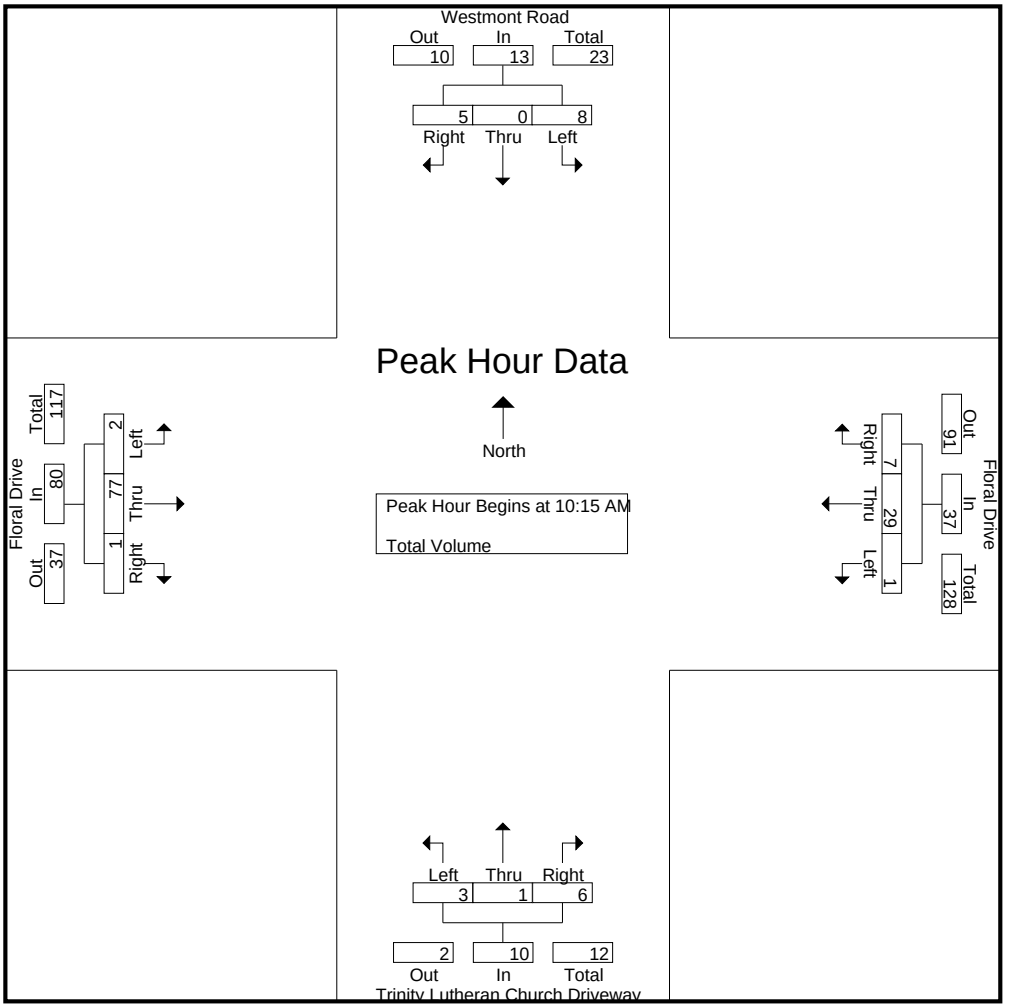
	Westmont Road Southbound				Floral Drive Westbound				Trinity Lutheran Church Driveway Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
08:00 AM	3	2	1	6	3	3	2	8	0	0	1	1	0	17	3	20	35
08:15 AM	0	0	2	2	1	3	3	7	0	0	0	0	2	20	1	23	32
08:30 AM	2	0	1	3	0	5	2	7	0	0	0	0	2	9	0	11	21
08:45 AM	1	0	1	2	0	8	0	8	0	0	0	0	0	22	0	22	32
Total	6	2	5	13	4	19	7	30	0	0	1	1	4	68	4	76	120
09:00 AM	1	0	2	3	0	2	0	2	0	0	1	1	0	20	1	21	27
09:15 AM	1	0	0	1	0	4	0	4	0	0	0	0	0	12	0	12	17
09:30 AM	4	0	0	4	0	4	0	4	0	1	3	4	0	13	0	13	25
09:45 AM	2	0	0	2	0	7	3	10	1	0	2	3	0	15	0	15	30
Total	8	0	2	10	0	17	3	20	1	1	6	8	0	60	1	61	99
10:00 AM	1	0	0	1	0	6	1	7	1	0	3	4	0	9	1	10	22
10:15 AM	3	0	2	5	0	11	1	12	0	0	0	0	0	23	0	23	40
10:30 AM	0	0	1	1	1	4	0	5	1	0	2	3	1	18	0	19	28
10:45 AM	2	0	2	4	0	9	1	10	0	1	3	4	0	12	0	12	30
Total	6	0	5	11	1	30	3	34	2	1	8	11	1	62	1	64	120
11:00 AM	3	0	0	3	0	5	5	10	2	0	1	3	1	24	1	26	42
11:15 AM	3	0	0	3	1	3	3	7	0	0	1	1	0	17	0	17	28
11:30 AM	2	0	0	2	0	3	1	4	0	0	0	0	0	13	0	13	19
11:45 AM	0	0	1	1	0	4	1	5	0	0	1	1	1	13	0	14	21
Total	8	0	1	9	1	15	10	26	2	0	3	5	2	67	1	70	110
Grand Total	28	2	13	43	6	81	23	110	5	2	18	25	7	257	7	271	449
Apprch %	65.1	4.7	30.2		5.5	73.6	20.9		20	8	72		2.6	94.8	2.6		
Total %	6.2	0.4	2.9	9.6	1.3	18	5.1	24.5	1.1	0.4	4	5.6	1.6	57.2	1.6	60.4	

	Westmont Road Southbound				Floral Drive Westbound				Trinity Lutheran Church Driveway Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 08:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 10:15 AM																	
10:15 AM	**3**	0	**2**	**5**	0	**11**	1	**12**	0	0	0	0	0	23	0	23	40
10:30 AM	0	0	1	1	**1**	4	0	5	1	0	2	3	**1**	18	0	19	28
10:45 AM	2	0	2	4	0	9	1	10	0	**1**	**3**	**4**	0	12	0	12	30
11:00 AM	3	0	0	3	0	5	**5**	10	**2**	0	1	3	1	**24**	**1**	**26**	**42**
Total Volume	8	0	5	13	1	29	7	37	3	1	6	10	2	77	1	80	140
% App. Total	61.5	0	38.5		2.7	78.4	18.9		30	10	60		2.5	96.2	1.2		
PHF	.667	.000	.625	.650	.250	.659	.350	.771	.375	.250	.500	.625	.500	.802	.250	.769	.833

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City of Whittier
N/S: Westmont Road
E/W: Floral Drive
Weather: Clear

File Name : 02_WTR_Westmont_Floral Sun
Site Code : 10520113
Start Date : 3/8/2020
Page No : 2



Peak Hour Analysis From 08:00 AM to 11:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				10:15 AM				09:15 AM				10:15 AM			
+0 mins.	**3**	**2**	1	**6**	0	**11**	1	**12**	0	0	0	0	0	23	0	23
+15 mins.	0	0	**2**	2	**1**	4	0	5	0	**1**	**3**	**4**	**1**	18	0	19
+30 mins.	2	0	1	3	0	9	1	10	**1**	0	2	3	0	12	0	12
+45 mins.	1	0	1	2	0	5	**5**	10	1	0	3	4	1	**24**	**1**	**26**
Total Volume	6	2	5	13	1	29	7	37	2	1	8	11	2	77	1	80
% App. Total	46.2	15.4	38.5		2.7	78.4	18.9		18.2	9.1	72.7		2.5	96.2	1.2	
PHF	.500	.250	.625	.542	.250	.659	.350	.771	.500	.250	.667	.688	.500	.802	.250	.769

Location: Whittier
N/S: Westmont Road
E/W: Floral Drive

PEDESTRIANS

Date: 2/27/2020
Day: Thursday

	North Leg Westmont Road	East Leg Floral Drive	South Leg Trinity Church Driveway	West Leg Floral Drive	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	0	0	3	1	4
7:15 AM	2	0	14	1	17
7:30 AM	2	0	52	2	56
7:45 AM	2	2	27	1	32
8:00 AM	0	0	3	0	3
8:15 AM	0	0	2	2	4
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	6	2	101	7	116

Date: 2/27/2020
Day: Thursday

	North Leg Westmont Road	East Leg Floral Drive	South Leg Trinity Church Driveway	West Leg Floral Drive	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
1:30 PM	0	0	0	0	0
1:45 PM	0	0	1	0	1
2:00 PM	0	0	0	1	1
2:15 PM	2	1	44	0	47
2:30 PM	1	1	48	1	51
2:45 PM	0	0	4	0	4
3:00 PM	0	0	2	0	2
3:15 PM	0	0	2	0	2
TOTAL VOLUMES:	3	2	101	2	108

Date: 2/27/2020
Day: Thursday

	North Leg Westmont Road	East Leg Floral Drive	South Leg Trinity Church Driveway	West Leg Floral Drive	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	0	1	0	1
4:15 PM	0	0	4	0	4
4:30 PM	0	0	1	0	1
4:45 PM	0	0	3	0	3
5:00 PM	1	1	1	0	3
5:15 PM	1	0	0	1	2
5:30 PM	0	0	0	0	0
5:45 PM	1	0	0	1	2
TOTAL VOLUMES:	3	1	10	2	16

Date: 3/8/2020
Day: Sunday

	North Leg Westmont Road	East Leg Floral Drive	South Leg Trinity Church Driveway	West Leg Floral Drive	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
8:00 AM	0	0	3	0	3
8:15 AM	0	0	1	0	1
8:30 AM	0	0	2	0	2
8:45 AM	0	0	1	1	2
9:00 AM	0	0	2	1	3
9:15 AM	0	0	0	0	0
9:30 AM	0	1	5	0	6
9:45 AM	0	0	6	0	6
10:00 AM	0	0	1	0	1
10:15 AM	1	0	1	0	2
10:30 AM	0	0	4	0	4
10:45 AM	0	0	0	0	0
11:00 AM	0	0	0	0	0
11:15 AM	0	0	0	0	0
11:30 AM	0	0	0	0	0
11:45 AM	0	0	0	0	0
TOTAL VOLUMES:	1	1	26	2	30

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Location: Whittier
N/S: Westmont Road
E/W: Floral Drive

BICYCLES

Date: 2/27/2020
Day: Thursday

	Southbound Westmont Road			Westbound Floral Drive			Northbound Trinity Church Driveway			Eastbound Floral Drive			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	2	0	0	0	0	0	0	0	2

Date: 2/27/2020
Day: Thursday

	Southbound Westmont Road			Westbound Floral Drive			Northbound Trinity Church Driveway			Eastbound Floral Drive			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

Date: 2/27/2020
Day: Thursday

	Southbound Westmont Road			Westbound Floral Drive			Northbound Trinity Church Driveway			Eastbound Floral Drive			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

Date: 3/8/2020
Day: Sunday

	Southbound Westmont Road			Westbound Floral Drive			Northbound Trinity Church Driveway			Eastbound Floral Drive			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

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City of Whittier
N/S: Beverly Boulevard
E/W: Floral Drive
Weather: Clear

File Name : 03_WTR_Beverly_Floral AM
Site Code : 10520113
Start Date : 2/27/2020
Page No : 1

Groups Printed- Total Volume

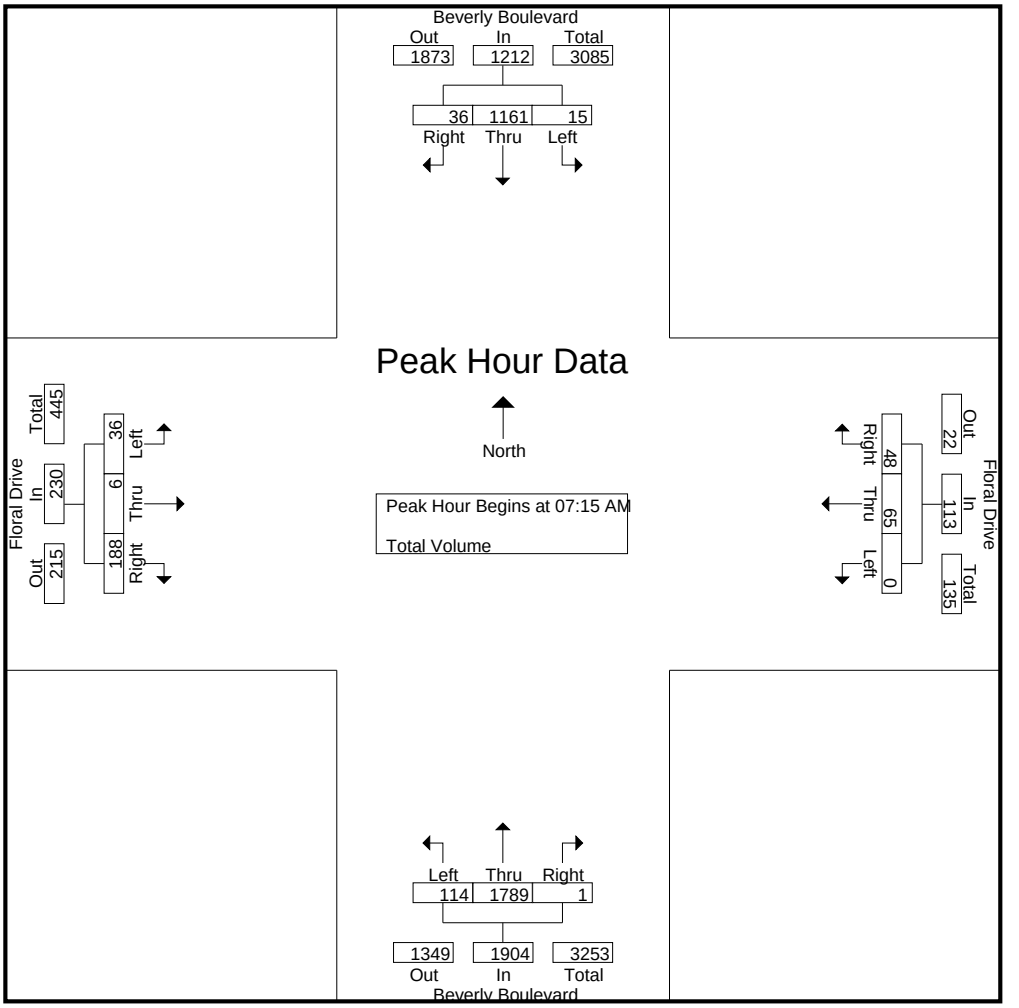
	Beverly Boulevard Southbound				Floral Drive Westbound				Beverly Boulevard Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	5	165	8	178	1	1	25	27	8	414	0	422	6	0	5	11	638
07:15 AM	2	255	9	266	0	10	16	26	21	477	0	498	10	1	24	35	825
07:30 AM	4	262	12	278	0	22	13	35	40	411	0	451	9	0	74	83	847
07:45 AM	3	342	10	355	0	23	10	33	40	478	0	518	11	1	62	74	980
Total	14	1024	39	1077	1	56	64	121	109	1780	0	1889	36	2	165	203	3290
08:00 AM	6	302	5	313	0	10	9	19	13	423	1	437	6	4	28	38	807
08:15 AM	8	276	1	285	1	0	9	10	5	352	0	357	4	0	9	13	665
08:30 AM	7	258	3	268	0	0	9	9	1	352	0	353	4	1	4	9	639
08:45 AM	4	264	2	270	0	1	3	4	2	323	0	325	3	0	4	7	606
Total	25	1100	11	1136	1	11	30	42	21	1450	1	1472	17	5	45	67	2717
Grand Total	39	2124	50	2213	2	67	94	163	130	3230	1	3361	53	7	210	270	6007
Apprch %	1.8	96	2.3		1.2	41.1	57.7		3.9	96.1	0		19.6	2.6	77.8		
Total %	0.6	35.4	0.8	36.8	0	1.1	1.6	2.7	2.2	53.8	0	56	0.9	0.1	3.5	4.5	

	Beverly Boulevard Southbound				Floral Drive Westbound				Beverly Boulevard Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	2	255	9	266	0	10	**16**	26	21	477	0	498	10	1	24	35	825
07:30 AM	4	262	**12**	278	0	22	13	**35**	**40**	411	0	451	9	0	**74**	**83**	847
07:45 AM	3	**342**	10	**355**	0	**23**	10	33	40	**478**	0	**518**	**11**	1	62	74	**980**
08:00 AM	**6**	302	5	313	0	10	9	19	13	423	**1**	437	6	**4**	28	38	807
Total Volume	15	1161	36	1212	0	65	48	113	114	1789	1	1904	36	6	188	230	3459
% App. Total	1.2	95.8	3		0	57.5	42.5		6	94	0.1		15.7	2.6	81.7		
PHF	.625	.849	.750	.854	.000	.707	.750	.807	.713	.936	.250	.919	.818	.375	.635	.693	.882

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Site Code : 10520113
Start Date : 2/27/2020
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:00 AM				07:15 AM				07:15 AM			
+0 mins.	4	262	**12**	278	**1**	1	**25**	27	21	477	0	498	10	1	24	35
+15 mins.	3	**342**	10	**355**	0	10	16	26	**40**	411	0	451	9	0	**74**	**83**
+30 mins.	6	302	5	313	0	22	13	**35**	40	**478**	0	**518**	**11**	1	62	74
+45 mins.	**8**	276	1	285	0	**23**	10	33	13	423	**1**	437	6	**4**	28	38
Total Volume	21	1182	28	1231	1	56	64	121	114	1789	1	1904	36	6	188	230
% App. Total	1.7	96	2.3		0.8	46.3	52.9		6	94	0.1		15.7	2.6	81.7	
PHF	.656	.864	.583	.867	.250	.609	.640	.864	.713	.936	.250	.919	.818	.375	.635	.693

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City of Whittier
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Weather: Clear

File Name : 03_WTR_Beverly_Floral MD
Site Code : 10520113
Start Date : 2/27/2020
Page No : 1

Groups Printed- Total Volume

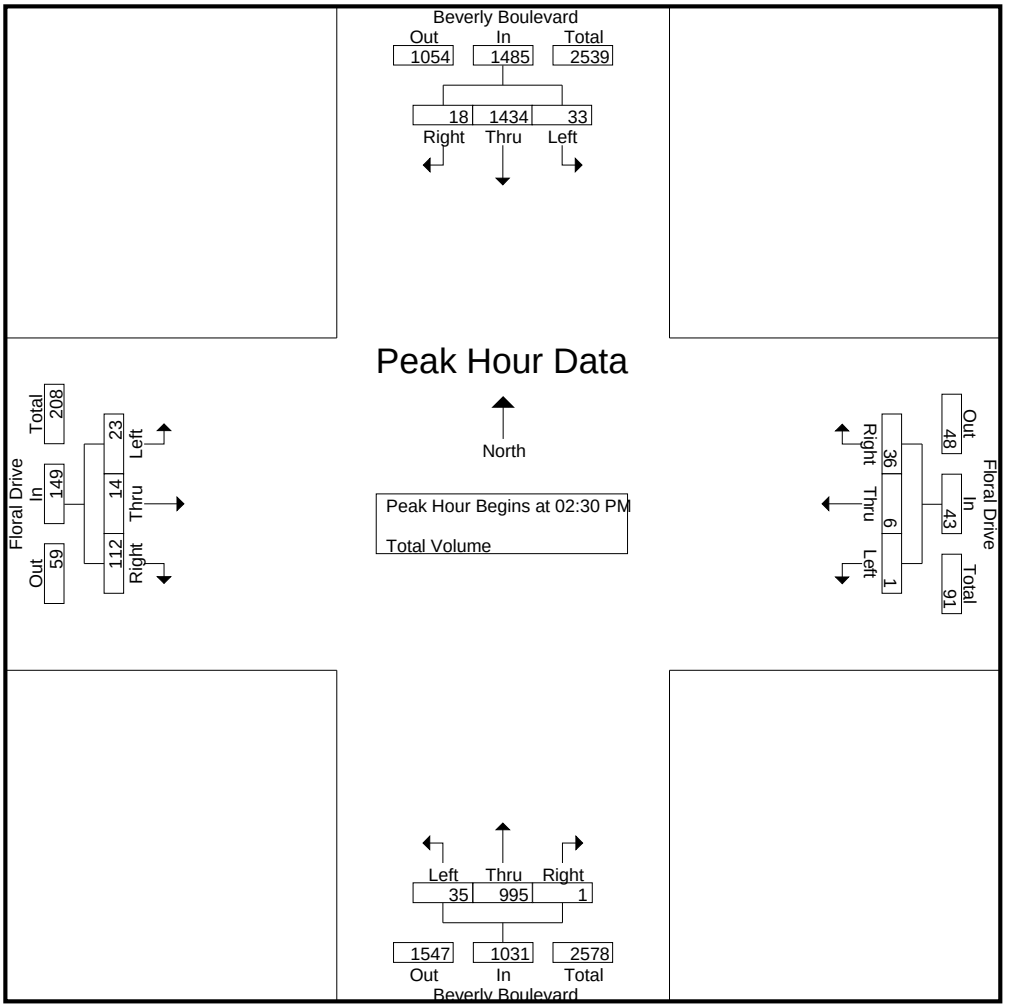
	Beverly Boulevard Southbound				Floral Drive Westbound				Beverly Boulevard Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
01:30 PM	3	194	2	199	1	2	5	8	0	191	0	191	0	2	4	6	404
01:45 PM	5	261	1	267	1	2	5	8	5	254	0	259	1	0	3	4	538
Total	8	455	3	466	2	4	10	16	5	445	0	450	1	2	7	10	942
02:00 PM	5	276	5	286	0	1	11	12	8	276	1	285	2	0	8	10	593
02:15 PM	8	277	8	293	0	6	4	10	23	216	0	239	2	4	14	20	562
02:30 PM	12	367	6	385	0	0	8	8	17	229	0	246	14	7	48	69	708
02:45 PM	15	346	6	367	1	4	8	13	8	235	1	244	4	6	33	43	667
Total	40	1266	25	1331	1	11	31	43	56	956	2	1014	22	17	103	142	2530
03:00 PM	3	344	2	349	0	1	7	8	8	278	0	286	3	0	18	21	664
03:15 PM	3	377	4	384	0	1	13	14	2	253	0	255	2	1	13	16	669
Grand Total	54	2442	34	2530	3	17	61	81	71	1932	2	2005	28	20	141	189	4805
Apprch %	2.1	96.5	1.3		3.7	21	75.3		3.5	96.4	0.1		14.8	10.6	74.6		
Total %	1.1	50.8	0.7	52.7	0.1	0.4	1.3	1.7	1.5	40.2	0	41.7	0.6	0.4	2.9	3.9	

	Beverly Boulevard Southbound				Floral Drive Westbound				Beverly Boulevard Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 01:30 PM to 03:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:30 PM																	
02:30 PM	12	367	**6**	**385**	0	0	8	8	**17**	229	0	246	**14**	**7**	**48**	**69**	**708**
02:45 PM	**15**	346	6	367	**1**	**4**	8	13	8	235	**1**	244	4	6	33	43	667
03:00 PM	3	344	2	349	0	1	7	8	8	**278**	0	**286**	3	0	18	21	664
03:15 PM	3	**377**	4	384	0	1	**13**	**14**	2	253	0	255	2	1	13	16	669
Total Volume	33	1434	18	1485	1	6	36	43	35	995	1	1031	23	14	112	149	2708
% App. Total	2.2	96.6	1.2		2.3	14	83.7		3.4	96.5	0.1		15.4	9.4	75.2		
PHF	.550	.951	.750	.964	.250	.375	.692	.768	.515	.895	.250	.901	.411	.500	.583	.540	.956

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Site Code : 10520113
Start Date : 2/27/2020
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Peak Hour Analysis From 01:30 PM to 03:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:30 PM				02:00 PM				02:30 PM				02:15 PM			
+0 mins.	12	367	**6**	**385**	0	1	**11**	12	**17**	229	0	246	2	4	14	20
+15 mins.	**15**	346	6	367	0	**6**	4	10	8	235	**1**	244	**14**	**7**	**48**	**69**
+30 mins.	3	344	2	349	0	0	8	8	8	**278**	0	**286**	4	6	33	43
+45 mins.	3	**377**	4	384	**1**	4	8	**13**	2	253	0	255	3	0	18	21
Total Volume	33	1434	18	1485	1	11	31	43	35	995	1	1031	23	17	113	153
% App. Total	2.2	96.6	1.2		2.3	25.6	72.1		3.4	96.5	0.1		15	11.1	73.9	
PHF	.550	.951	.750	.964	.250	.458	.705	.827	.515	.895	.250	.901	.411	.607	.589	.554

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File Name : 03_WTR_Beverly_Floral PM
Site Code : 10520113
Start Date : 2/27/2020
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Groups Printed- Total Volume

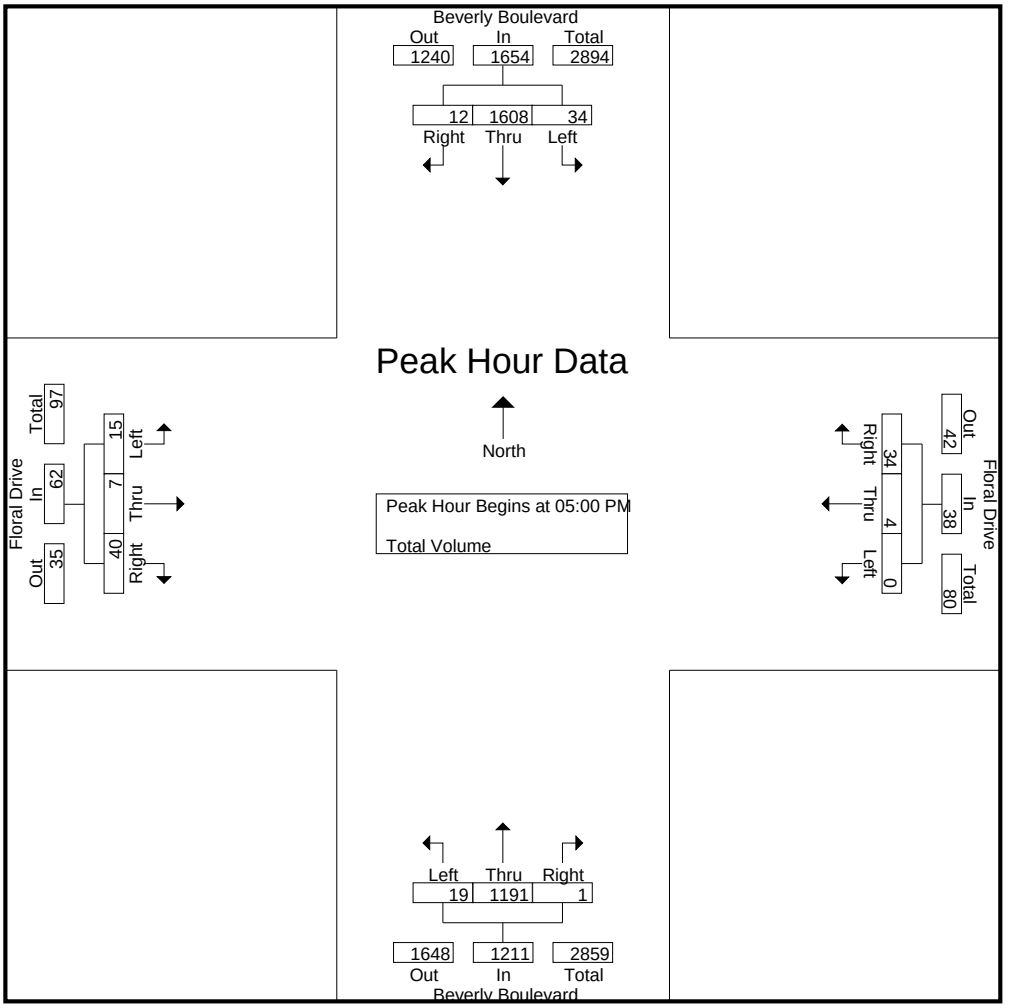
	Beverly Boulevard Southbound				Floral Drive Westbound				Beverly Boulevard Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	6	379	1	386	1	2	13	16	3	284	0	287	2	2	4	8	697
04:15 PM	9	338	2	349	0	3	3	6	7	264	0	271	6	8	4	18	644
04:30 PM	7	451	2	460	0	0	7	7	11	282	0	293	4	1	12	17	777
04:45 PM	9	355	2	366	0	2	8	10	6	284	0	290	1	2	6	9	675
Total	31	1523	7	1561	1	7	31	39	27	1114	0	1141	13	13	26	52	2793
05:00 PM	8	384	3	395	0	1	6	7	5	290	1	296	3	3	7	13	711
05:15 PM	7	413	1	421	0	1	3	4	3	344	0	347	2	1	9	12	784
05:30 PM	6	393	4	403	0	1	19	20	4	274	0	278	1	1	10	12	713
05:45 PM	13	418	4	435	0	1	6	7	7	283	0	290	9	2	14	25	757
Total	34	1608	12	1654	0	4	34	38	19	1191	1	1211	15	7	40	62	2965
Grand Total	65	3131	19	3215	1	11	65	77	46	2305	1	2352	28	20	66	114	5758
Apprch %	2	97.4	0.6		1.3	14.3	84.4		2	98	0		24.6	17.5	57.9		
Total %	1.1	54.4	0.3	55.8	0	0.2	1.1	1.3	0.8	40	0	40.8	0.5	0.3	1.1	2	

	Beverly Boulevard Southbound				Floral Drive Westbound				Beverly Boulevard Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	8	384	3	395	0	**1**	6	7	5	290	**1**	296	3	**3**	7	13	711
05:15 PM	7	413	1	421	0	1	3	4	3	**344**	0	**347**	2	1	9	12	**784**
05:30 PM	6	393	**4**	403	0	1	**19**	**20**	4	274	0	278	1	1	10	12	713
05:45 PM	**13**	**418**	4	**435**	0	1	6	7	**7**	283	0	290	**9**	2	**14**	**25**	757
Total Volume	34	1608	12	1654	0	4	34	38	19	1191	1	1211	15	7	40	62	2965
% App. Total	2.1	97.2	0.7		0	10.5	89.5		1.6	98.3	0.1		24.2	11.3	64.5		
PHF	.654	.962	.750	.951	.000	1.00	.447	.475	.679	.866	.250	.872	.417	.583	.714	.620	.945

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Weather: Clear

File Name : 03_WTR_Beverly_Floral PM
Site Code : 10520113
Start Date : 2/27/2020



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:30 PM				05:00 PM			
+0 mins.	8	384	3	395	0	**2**	8	10	**11**	282	0	293	3	**3**	7	13
+15 mins.	7	413	1	421	0	1	6	7	6	284	0	290	2	1	9	12
+30 mins.	6	393	**4**	403	0	1	3	4	5	290	**1**	296	1	1	10	12
+45 mins.	**13**	**418**	4	**435**	0	1	**19**	**20**	3	**344**	0	**347**	**9**	2	**14**	**25**
Total Volume	34	1608	12	1654	0	5	36	41	25	1200	1	1226	15	7	40	62
% App. Total	2.1	97.2	0.7		0	12.2	87.8		2	97.9	0.1		24.2	11.3	64.5	
PHF	.654	.962	.750	.951	.000	.625	.474	.513	.568	.872	.250	.883	.417	.583	.714	.620

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Weather: Clear

File Name : 03_WTR_Beverly_Floral Sun
Site Code : 10520113
Start Date : 3/8/2020
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Groups Printed- Total Volume

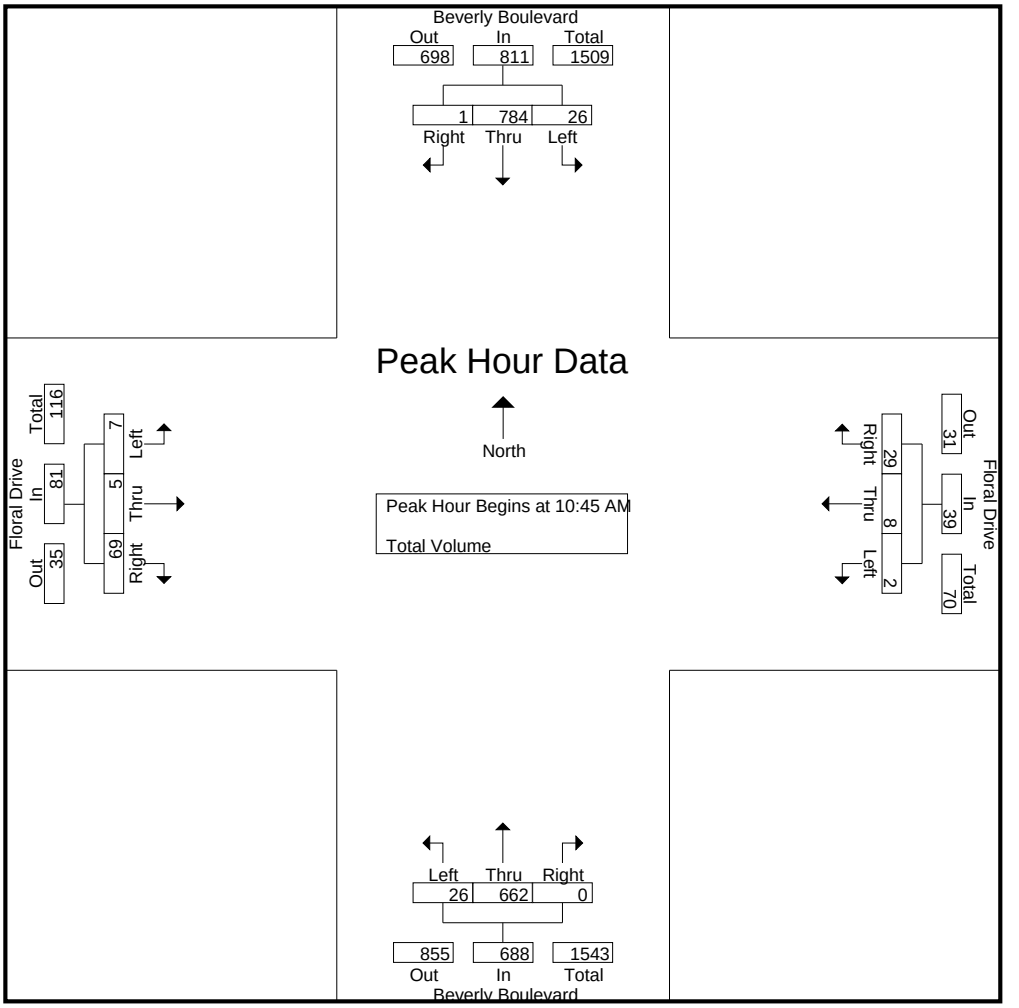
	Beverly Boulevard Southbound				Floral Drive Westbound				Beverly Boulevard Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
08:00 AM	3	76	1	80	0	2	6	8	1	54	0	55	0	0	3	3	146
08:15 AM	1	56	0	57	0	1	2	3	1	69	0	70	2	0	8	10	140
08:30 AM	3	104	0	107	0	0	5	5	3	75	0	78	0	0	9	9	199
08:45 AM	1	123	1	125	0	2	8	10	7	78	0	85	1	1	19	21	241
Total	8	359	2	369	0	5	21	26	12	276	0	288	3	1	39	43	726
09:00 AM	1	157	2	160	0	0	8	8	8	102	0	110	4	0	20	24	302
09:15 AM	4	122	2	128	0	1	10	11	5	111	0	116	0	0	22	22	277
09:30 AM	1	161	1	163	0	2	10	12	4	105	0	109	1	0	10	11	295
09:45 AM	5	188	1	194	0	2	8	10	4	133	0	137	1	0	27	28	369
Total	11	628	6	645	0	5	36	41	21	451	0	472	6	0	79	85	1243
10:00 AM	1	171	0	172	0	1	5	6	4	124	1	129	1	0	22	23	330
10:15 AM	3	153	1	157	0	0	14	14	2	163	0	165	2	1	12	15	351
10:30 AM	3	187	0	190	1	2	9	12	2	156	0	158	3	1	17	21	381
10:45 AM	6	221	1	228	1	2	8	11	5	164	0	169	3	0	16	19	427
Total	13	732	2	747	2	5	36	43	13	607	1	621	9	2	67	78	1489
11:00 AM	7	171	0	178	1	1	7	9	7	153	0	160	0	2	12	14	361
11:15 AM	8	186	0	194	0	3	9	12	8	177	0	185	2	2	22	26	417
11:30 AM	5	206	0	211	0	2	5	7	6	168	0	174	2	1	19	22	414
11:45 AM	4	194	2	200	0	2	3	5	5	169	0	174	2	0	15	17	396
Total	24	757	2	783	1	8	24	33	26	667	0	693	6	5	68	79	1588
Grand Total	56	2476	12	2544	3	23	117	143	72	2001	1	2074	24	8	253	285	5046
Apprch %	2.2	97.3	0.5		2.1	16.1	81.8		3.5	96.5	0		8.4	2.8	88.8		
Total %	1.1	49.1	0.2	50.4	0.1	0.5	2.3	2.8	1.4	39.7	0	41.1	0.5	0.2	5	5.6	

	Beverly Boulevard Southbound				Floral Drive Westbound				Beverly Boulevard Northbound				Floral Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 08:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 10:45 AM																	
10:45 AM	6	**221**	**1**	**228**	**1**	2	8	11	5	164	0	169	**3**	0	16	19	**427**
11:00 AM	7	171	0	178	1	1	7	9	7	153	0	160	0	**2**	12	14	361
11:15 AM	**8**	186	0	194	0	**3**	**9**	**12**	**8**	**177**	0	**185**	2	2	**22**	**26**	417
11:30 AM	5	206	0	211	0	2	5	7	6	168	0	174	2	1	19	22	414
Total Volume	26	784	1	811	2	8	29	39	26	662	0	688	7	5	69	81	1619
% App. Total	3.2	96.7	0.1		5.1	20.5	74.4		3.8	96.2	0		8.6	6.2	85.2		
PHF	.813	.887	.250	.889	.500	.667	.806	.813	.813	.935	.000	.930	.583	.625	.784	.779	.948

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Whittier
N/S: Beverly Boulevard
E/W: Floral Drive
Weather: Clear

File Name : 03_WTR_Beverly_Floral Sun
Site Code : 10520113
Start Date : 3/8/2020
Page No : 2



Peak Hour Analysis From 08:00 AM to 11:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	10:45 AM				10:15 AM				11:00 AM				09:45 AM			
+0 mins.	6	**221**	**1**	**228**	0	0	**14**	**14**	7	153	0	160	1	0	**27**	**28**
+15 mins.	7	171	0	178	**1**	**2**	9	12	**8**	**177**	0	**185**	1	0	22	23
+30 mins.	**8**	186	0	194	1	2	8	11	6	168	0	174	2	**1**	12	15
+45 mins.	5	206	0	211	1	1	7	9	5	169	0	174	**3**	1	17	21
Total Volume	26	784	1	811	3	5	38	46	26	667	0	693	7	2	78	87
% App. Total	3.2	96.7	0.1		6.5	10.9	82.6		3.8	96.2	0		8	2.3	89.7	
PHF	.813	.887	.250	.889	.750	.625	.679	.821	.813	.942	.000	.936	.583	.500	.722	.777

Appendix B

Existing Conditions Intersection Analysis Worksheets



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.951		0.908			
Flt Protected	0.969					0.979
Satd. Flow (prot)	1717	0	1691	0	0	1824
Flt Permitted	0.969					0.979
Satd. Flow (perm)	1717	0	1691	0	0	1824
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	114	65	91	194	91	125
Future Volume (vph)	114	65	91	194	91	125
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	158	90	126	269	126	174
Shared Lane Traffic (%)						
Lane Group Flow (vph)	248	0	395	0	0	300

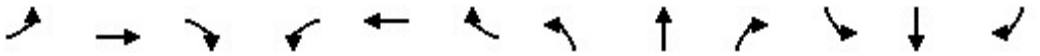
Intersection Summary

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	114	65	91	194	91	125
Future Vol, veh/h	114	65	91	194	91	125
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	158	90	126	269	126	174
Number of Lanes	1	0	1	0	0	1

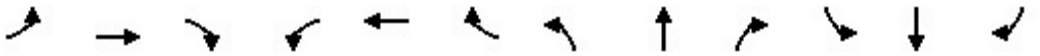
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	11.9	12.7	12.3
HCM LOS	B	B	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	64%	42%
Vol Thru, %	32%	0%	58%
Vol Right, %	68%	36%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	285	179	216
LT Vol	0	114	91
Through Vol	91	0	125
RT Vol	194	65	0
Lane Flow Rate	396	249	300
Geometry Grp	1	1	1
Degree of Util (X)	0.518	0.381	0.438
Departure Headway (Hd)	4.708	5.519	5.256
Convergence, Y/N	Yes	Yes	Yes
Cap	772	651	684
Service Time	2.708	3.555	3.287
HCM Lane V/C Ratio	0.513	0.382	0.439
HCM Control Delay	12.7	11.9	12.3
HCM Lane LOS	B	B	B
HCM 95th-tile Q	3	1.8	2.2



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.989			0.865			0.910	
Flt Protected		0.991			0.999						0.984	
Satd. Flow (prot)	0	1846	0	0	1840	0	0	1611	0	0	1668	0
Flt Permitted		0.991			0.999						0.984	
Satd. Flow (perm)	0	1846	0	0	1840	0	0	1611	0	0	1668	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		778			433			151			1175	
Travel Time (s)		17.7			9.8			3.4			26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	46	208	0	4	193	17	0	0	4	15	0	30
Future Volume (vph)	46	208	0	4	193	17	0	0	4	15	0	30
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	68	306	0	6	284	25	0	0	6	22	0	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	374	0	0	315	0	0	6	0	0	66	0

Intersection Summary

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	46	208	0	4	193	17	0	0	4	15	0	30
Future Vol, veh/h	46	208	0	4	193	17	0	0	4	15	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	68	68	68	68	68	68	68	68	68
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	68	306	0	6	284	25	0	0	6	22	0	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	309	0	0	306	0	0	773	763	306	754	751	297
Stage 1	-	-	-	-	-	-	442	442	-	309	309	-
Stage 2	-	-	-	-	-	-	331	321	-	445	442	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1252	-	-	1255	-	-	316	334	734	326	340	742
Stage 1	-	-	-	-	-	-	594	576	-	701	660	-
Stage 2	-	-	-	-	-	-	682	652	-	592	576	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1252	-	-	1255	-	-	281	310	734	306	316	742
Mov Cap-2 Maneuver	-	-	-	-	-	-	281	310	-	306	316	-
Stage 1	-	-	-	-	-	-	555	539	-	655	656	-
Stage 2	-	-	-	-	-	-	638	648	-	549	539	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0.1	9.9	13.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	734	1252	-	-	1255	-	-	503
HCM Lane V/C Ratio	0.008	0.054	-	-	0.005	-	-	0.132
HCM Control Delay (s)	9.9	8	0	-	7.9	0	-	13.2
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	0.5

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
EXISTING CONDITIONS
AM PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.813
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	70	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1! 0	0	0 0	0	1 0
Volume Module:												
Base Vol:	114	1789	1	15	1161	36	36	6	188	0	65	48
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	114	1789	1	15	1161	36	36	6	188	0	65	48
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	114	1789	1	15	1161	36	36	6	188	0	65	48
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	114	1789	1	15	1161	36	36	6	188	0	65	48
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	114	1789	1	15	1161	36	36	6	188	0	65	48
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	1.94	0.06	0.16	0.02	0.82	0.00	0.58	0.42
Final Sat.:	1600	3198	2	1600	3104	96	250	42	1308	0	920	680
Capacity Analysis Module:												
Vol/Sat:	0.07	0.56	0.56	0.01	0.37	0.37	0.02	0.14	0.14	0.00	0.07	0.07
Crit Moves:		****			****			****			****	



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.953		0.928			
Flt Protected	0.969					0.983
Satd. Flow (prot)	1720	0	1729	0	0	1831
Flt Permitted	0.969					0.983
Satd. Flow (perm)	1720	0	1729	0	0	1831
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	63	34	86	97	45	88
Future Volume (vph)	63	34	86	97	45	88
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	91	49	125	141	65	128
Shared Lane Traffic (%)						
Lane Group Flow (vph)	140	0	266	0	0	193

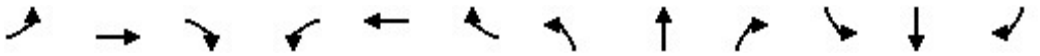
Intersection Summary

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	63	34	86	97	45	88
Future Vol, veh/h	63	34	86	97	45	88
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	49	125	141	65	128
Number of Lanes	1	0	1	0	0	1

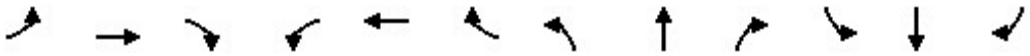
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9	9.1	9.2
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	65%	34%
Vol Thru, %	47%	0%	66%
Vol Right, %	53%	35%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	183	97	133
LT Vol	0	63	45
Through Vol	86	0	88
RT Vol	97	34	0
Lane Flow Rate	265	141	193
Geometry Grp	1	1	1
Degree of Util (X)	0.308	0.189	0.248
Departure Headway (Hd)	4.187	4.85	4.626
Convergence, Y/N	Yes	Yes	Yes
Cap	859	739	777
Service Time	2.213	2.887	2.656
HCM Lane V/C Ratio	0.308	0.191	0.248
HCM Control Delay	9.1	9	9.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.3	0.7	1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.977			0.880			0.945	
Flt Protected		0.995			0.997						0.971	
Satd. Flow (prot)	0	1850	0	0	1814	0	0	1639	0	0	1709	0
Flt Permitted		0.995			0.997						0.971	
Satd. Flow (perm)	0	1850	0	0	1814	0	0	1639	0	0	1709	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		778			433			151			1175	
Travel Time (s)		17.7			9.8			3.4			26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	14	116	2	6	67	15	0	1	9	22	0	15
Future Volume (vph)	14	116	2	6	67	15	0	1	9	22	0	15
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	25	207	4	11	120	27	0	2	16	39	0	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	236	0	0	158	0	0	18	0	0	66	0

Intersection Summary

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	14	116	2	6	67	15	0	1	9	22	0	15
Future Vol, veh/h	14	116	2	6	67	15	0	1	9	22	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	56	56	56	56	56	56	56	56	56	56	56	56
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	207	4	11	120	27	0	2	16	39	0	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	147	0	0	211	0	0	428	428	209	424	417	134
Stage 1	-	-	-	-	-	-	259	259	-	156	156	-
Stage 2	-	-	-	-	-	-	169	169	-	268	261	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1435	-	-	1360	-	-	537	519	831	540	527	915
Stage 1	-	-	-	-	-	-	746	694	-	846	769	-
Stage 2	-	-	-	-	-	-	833	759	-	738	692	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1435	-	-	1360	-	-	510	504	831	517	512	915
Mov Cap-2 Maneuver	-	-	-	-	-	-	510	504	-	517	512	-
Stage 1	-	-	-	-	-	-	731	680	-	829	762	-
Stage 2	-	-	-	-	-	-	801	752	-	707	678	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.5	9.7	11.4
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	780	1435	-	-	1360	-	-	628
HCM Lane V/C Ratio	0.023	0.017	-	-	0.008	-	-	0.105
HCM Control Delay (s)	9.7	7.6	0	-	7.7	0	-	11.4
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.4

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
EXISTING CONDITIONS
MID-DAY PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.669
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	46	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1! 0	0	0 0	1! 0	0
Volume Module:												
Base Vol:	35	995	1	33	1434	18	23	14	112	1	6	36
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	35	995	1	33	1434	18	23	14	112	1	6	36
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	35	995	1	33	1434	18	23	14	112	1	6	36
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	35	995	1	33	1434	18	23	14	112	1	6	36
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	35	995	1	33	1434	18	23	14	112	1	6	36
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	1.98	0.02	0.15	0.09	0.76	0.02	0.14	0.84
Final Sat.:	1600	3197	3	1600	3160	40	247	150	1203	37	223	1340
Capacity Analysis Module:												
Vol/Sat:	0.02	0.31	0.31	0.02	0.45	0.45	0.01	0.09	0.09	0.00	0.03	0.03
Crit Moves:	****			****			****			****		

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.971		0.954			
Flt Protected	0.962					0.991
Satd. Flow (prot)	1740	0	1777	0	0	1846
Flt Permitted	0.962					0.991
Satd. Flow (perm)	1740	0	1777	0	0	1846
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	23	6	93	48	28	121
Future Volume (vph)	23	6	93	48	28	121
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	26	7	104	54	31	136
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	158	0	0	167

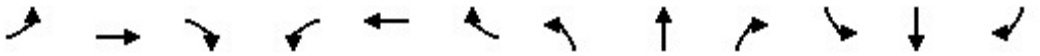
Intersection Summary

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	6	93	48	28	121
Future Vol, veh/h	23	6	93	48	28	121
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	7	104	54	31	136
Number of Lanes	1	0	1	0	0	1

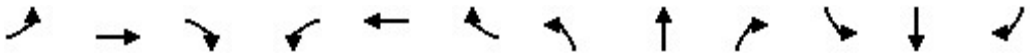
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.9	7.8	8.2
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	79%	19%
Vol Thru, %	66%	0%	81%
Vol Right, %	34%	21%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	141	29	149
LT Vol	0	23	28
Through Vol	93	0	121
RT Vol	48	6	0
Lane Flow Rate	158	33	167
Geometry Grp	1	1	1
Degree of Util (X)	0.172	0.042	0.193
Departure Headway (Hd)	3.912	4.659	4.148
Convergence, Y/N	Yes	Yes	Yes
Cap	908	773	859
Service Time	1.976	2.659	2.201
HCM Lane V/C Ratio	0.174	0.043	0.194
HCM Control Delay	7.8	7.9	8.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.1	0.7



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.973						0.960	
Flt Protected		0.994			0.998						0.966	
Satd. Flow (prot)	0	1848	0	0	1809	0	0	1863	0	0	1727	0
Flt Permitted		0.994			0.998						0.966	
Satd. Flow (perm)	0	1848	0	0	1809	0	0	1863	0	0	1727	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		778			433			151			1175	
Travel Time (s)		17.7			9.8			3.4			26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	9	61	1	1	32	8	0	0	0	12	0	5
Future Volume (vph)	9	61	1	1	32	8	0	0	0	12	0	5
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	14	97	2	2	51	13	0	0	0	19	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	113	0	0	66	0	0	0	0	0	27	0

Intersection Summary

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	61	1	1	32	8	0	0	0	12	0	5
Future Vol, veh/h	9	61	1	1	32	8	0	0	0	12	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	97	2	2	51	13	0	0	0	19	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	64	0	0	99	0	0	192	194	98	188	189	58
Stage 1	-	-	-	-	-	-	126	126	-	62	62	-
Stage 2	-	-	-	-	-	-	66	68	-	126	127	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1538	-	-	1494	-	-	768	701	958	772	706	1008
Stage 1	-	-	-	-	-	-	878	792	-	949	843	-
Stage 2	-	-	-	-	-	-	945	838	-	878	791	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1538	-	-	1494	-	-	756	693	958	766	698	1008
Mov Cap-2 Maneuver	-	-	-	-	-	-	756	693	-	766	698	-
Stage 1	-	-	-	-	-	-	869	784	-	940	842	-
Stage 2	-	-	-	-	-	-	937	837	-	869	783	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.2	0	9.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1538	-	-	1494	-	-	824
HCM Lane V/C Ratio	-	0.009	-	-	0.001	-	-	0.033
HCM Control Delay (s)	0	7.4	0	-	7.4	0	-	9.5
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
EXISTING CONDITIONS
PM PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.657
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	45	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1!	0 0	0 0	0	1 0
Volume Module:												
Base Vol:	19	1191	1	34	1608	12	15	7	40	0	4	34
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	19	1191	1	34	1608	12	15	7	40	0	4	34
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	19	1191	1	34	1608	12	15	7	40	0	4	34
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	19	1191	1	34	1608	12	15	7	40	0	4	34
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	19	1191	1	34	1608	12	15	7	40	0	4	34
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	1.99	0.01	0.24	0.11	0.65	0.00	0.11	0.89
Final Sat.:	1600	3197	3	1600	3176	24	387	181	1032	0	168	1432
Capacity Analysis Module:												
Vol/Sat:	0.01	0.37	0.37	0.02	0.51	0.51	0.01	0.04	0.04	0.00	0.02	0.02
Crit Moves:	****			****			****			****		

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945		0.894			
Flt Protected	0.971					0.964
Satd. Flow (prot)	1709	0	1665	0	0	1796
Flt Permitted	0.971					0.964
Satd. Flow (perm)	1709	0	1665	0	0	1796
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	16	11	5	19	54	18
Future Volume (vph)	16	11	5	19	54	18
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	22	15	7	26	74	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	0	33	0	0	99

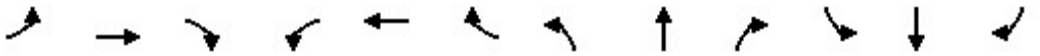
Intersection Summary

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	11	5	19	54	18
Future Vol, veh/h	16	11	5	19	54	18
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	15	7	26	74	25
Number of Lanes	1	0	1	0	0	1

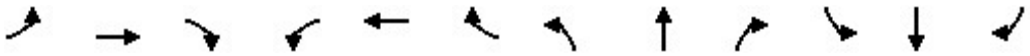
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.3	6.8	7.7
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	59%	75%
Vol Thru, %	21%	0%	25%
Vol Right, %	79%	41%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	24	27	72
LT Vol	0	16	54
Through Vol	5	0	18
RT Vol	19	11	0
Lane Flow Rate	33	37	99
Geometry Grp	1	1	1
Degree of Util (X)	0.033	0.041	0.114
Departure Headway (Hd)	3.598	4.035	4.174
Convergence, Y/N	Yes	Yes	Yes
Cap	991	880	860
Service Time	1.636	2.092	2.193
HCM Lane V/C Ratio	0.033	0.042	0.115
HCM Control Delay	6.8	7.3	7.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.975			0.921			0.949	
Flt Protected		0.999			0.999			0.984			0.970	
Satd. Flow (prot)	0	1859	0	0	1814	0	0	1688	0	0	1715	0
Flt Permitted		0.999			0.999			0.984			0.970	
Satd. Flow (perm)	0	1859	0	0	1814	0	0	1688	0	0	1715	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		778			433			151			1175	
Travel Time (s)		17.7			9.8			3.4			26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	2	77	1	1	29	7	3	1	6	8	0	5
Future Volume (vph)	2	77	1	1	29	7	3	1	6	8	0	5
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	2	93	1	1	35	8	4	1	7	10	0	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	96	0	0	44	0	0	12	0	0	16	0

Intersection Summary

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	77	1	1	29	7	3	1	6	8	0	5
Future Vol, veh/h	2	77	1	1	29	7	3	1	6	8	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	93	1	1	35	8	4	1	7	10	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	43	0	0	94	0	0	142	143	94	143	139	39
Stage 1	-	-	-	-	-	-	98	98	-	41	41	-
Stage 2	-	-	-	-	-	-	44	45	-	102	98	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1566	-	-	1500	-	-	828	748	963	826	752	1033
Stage 1	-	-	-	-	-	-	908	814	-	974	861	-
Stage 2	-	-	-	-	-	-	970	857	-	904	814	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1566	-	-	1500	-	-	822	747	963	818	750	1033
Mov Cap-2 Maneuver	-	-	-	-	-	-	822	747	-	818	750	-
Stage 1	-	-	-	-	-	-	907	813	-	973	860	-
Stage 2	-	-	-	-	-	-	963	856	-	895	813	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.2	9.1	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	891	1566	-	-	1500	-	-	889
HCM Lane V/C Ratio	0.014	0.002	-	-	0.001	-	-	0.018
HCM Control Delay (s)	9.1	7.3	0	-	7.4	0	-	9.1
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
EXISTING CONDITIONS
SUNDAY PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.413
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	29	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1! 0	0	0 0	1! 0	0
Volume Module:												
Base Vol:	26	662	0	26	784	1	7	5	69	2	8	29
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	26	662	0	26	784	1	7	5	69	2	8	29
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	26	662	0	26	784	1	7	5	69	2	8	29
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	26	662	0	26	784	1	7	5	69	2	8	29
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	26	662	0	26	784	1	7	5	69	2	8	29
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.99	0.01	0.09	0.06	0.85	0.05	0.21	0.74
Final Sat.:	1600	3200	0	1600	3196	4	138	99	1363	82	328	1190
Capacity Analysis Module:												
Vol/Sat:	0.02	0.21	0.00	0.02	0.25	0.25	0.00	0.05	0.05	0.00	0.02	0.02
Crit Moves:	****			****			****			****		

Appendix C

Existing Plus Project Conditions Intersection Analysis Worksheets



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.951		0.908			
Flt Protected	0.969					0.979
Satd. Flow (prot)	1717	0	1691	0	0	1824
Flt Permitted	0.969					0.979
Satd. Flow (perm)	1717	0	1691	0	0	1824
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	115	66	91	195	91	125
Future Volume (vph)	115	66	91	195	91	125
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	160	92	126	271	126	174
Shared Lane Traffic (%)						
Lane Group Flow (vph)	252	0	397	0	0	300

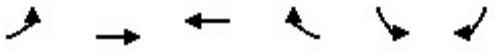
Intersection Summary

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	115	66	91	195	91	125
Future Vol, veh/h	115	66	91	195	91	125
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	160	92	126	271	126	174
Number of Lanes	1	0	1	0	0	1

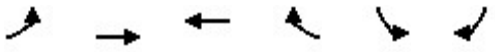
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	12	12.7	12.4
HCM LOS	B	B	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	64%	42%
Vol Thru, %	32%	0%	58%
Vol Right, %	68%	36%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	286	181	216
LT Vol	0	115	91
Through Vol	91	0	125
RT Vol	195	66	0
Lane Flow Rate	397	251	300
Geometry Grp	1	1	1
Degree of Util (X)	0.521	0.386	0.439
Departure Headway (Hd)	4.719	5.522	5.267
Convergence, Y/N	Yes	Yes	Yes
Cap	771	651	684
Service Time	2.719	3.56	3.301
HCM Lane V/C Ratio	0.515	0.386	0.439
HCM Control Delay	12.7	12	12.4
HCM Lane LOS	B	B	B
HCM 95th-tile Q	3.1	1.8	2.2



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.989		0.910	
Flt Protected		0.991			0.984	
Satd. Flow (prot)	0	1846	1842	0	1668	0
Flt Permitted		0.991			0.984	
Satd. Flow (perm)	0	1846	1842	0	1668	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		778	433		1175	
Travel Time (s)		17.7	9.8		26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Volume (vph)	47	208	193	17	15	30
Future Volume (vph)	47	208	193	17	15	30
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	69	306	284	25	22	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	375	309	0	66	0

Intersection Summary

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	47	208	193	17	15	30
Future Vol, veh/h	47	208	193	17	15	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	306	284	25	22	44

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	309	0	-	0	741	297
Stage 1	-	-	-	-	297	-
Stage 2	-	-	-	-	444	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1252	-	-	-	384	742
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	646	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1252	-	-	-	359	742
Mov Cap-2 Maneuver	-	-	-	-	359	-
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	646	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1252	-	-	-	547
HCM Lane V/C Ratio	0.055	-	-	-	0.121
HCM Control Delay (s)	8	0	-	-	12.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
EXISTING PLUS PROJECT CONDITIONS
AM PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.820
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	71	Level Of Service:	D

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0 1	1	0	1	0 1	1	0	0	0 1!	0	0	0	0 0	1	0
Volume Module:																
Base Vol:	114	1789	1		15	1161	36		36	6	188		0	65	48	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	114	1789	1		15	1161	36		36	6	188		0	65	48	
Added Vol:	2	0	0		0	0	3		7	1	4		0	0	0	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	116	1789	1		15	1161	39		43	7	192		0	65	48	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	116	1789	1		15	1161	39		43	7	192		0	65	48	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	116	1789	1		15	1161	39		43	7	192		0	65	48	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	116	1789	1		15	1161	39		43	7	192		0	65	48	
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600	
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Lanes:	1.00	1.99	0.01		1.00	1.94	0.06		0.18	0.03	0.79		0.00	0.58	0.42	
Final Sat.:	1600	3198	2		1600	3096	104		284	46	1269		0	920	680	
Capacity Analysis Module:																
Vol/Sat:	0.07	0.56	0.56		0.01	0.38	0.38		0.03	0.15	0.15		0.00	0.07	0.07	
Crit Moves:		****				****					****			****		

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.952		0.928			
Flt Protected	0.969					0.983
Satd. Flow (prot)	1718	0	1729	0	0	1831
Flt Permitted	0.969					0.983
Satd. Flow (perm)	1718	0	1729	0	0	1831
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	64	35	86	99	46	88
Future Volume (vph)	64	35	86	99	46	88
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	93	51	125	143	67	128
Shared Lane Traffic (%)						
Lane Group Flow (vph)	144	0	268	0	0	195

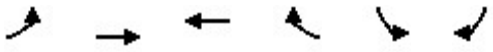
Intersection Summary

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	64	35	86	99	46	88
Future Vol, veh/h	64	35	86	99	46	88
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	93	51	125	143	67	128
Number of Lanes	1	0	1	0	0	1

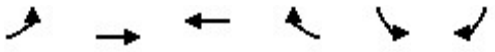
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.1	9.1	9.2
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	65%	34%
Vol Thru, %	46%	0%	66%
Vol Right, %	54%	35%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	185	99	134
LT Vol	0	64	46
Through Vol	86	0	88
RT Vol	99	35	0
Lane Flow Rate	268	143	194
Geometry Grp	1	1	1
Degree of Util (X)	0.312	0.194	0.25
Departure Headway (Hd)	4.194	4.856	4.639
Convergence, Y/N	Yes	Yes	Yes
Cap	855	737	773
Service Time	2.223	2.895	2.671
HCM Lane V/C Ratio	0.313	0.194	0.251
HCM Control Delay	9.1	9.1	9.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.3	0.7	1



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.975		0.942	
Flt Protected		0.994			0.972	
Satd. Flow (prot)	0	1852	1816	0	1706	0
Flt Permitted		0.994			0.972	
Satd. Flow (perm)	0	1852	1816	0	1706	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		778	433		1175	
Travel Time (s)		17.7	9.8		26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Volume (vph)	15	116	67	15	22	16
Future Volume (vph)	15	116	67	15	22	16
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	27	207	120	27	39	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	234	147	0	68	0

Intersection Summary

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	116	67	15	22	16
Future Vol, veh/h	15	116	67	15	22	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	56	56	56	56	56	56
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	207	120	27	39	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	147	0	-	0	395	134
Stage 1	-	-	-	-	134	-
Stage 2	-	-	-	-	261	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1435	-	-	-	610	915
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1435	-	-	-	597	915
Mov Cap-2 Maneuver	-	-	-	-	597	-
Stage 1	-	-	-	-	873	-
Stage 2	-	-	-	-	783	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1435	-	-	-	699
HCM Lane V/C Ratio	0.019	-	-	-	0.097
HCM Control Delay (s)	7.6	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
EXISTING PLUS PROJECT CONDITIONS
MID-DAY PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.681
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	48	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	35	995	1	33	1434	18	23	14	112	1	6	36
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	35	995	1	33	1434	18	23	14	112	1	6	36
Added Vol:	5	0	0	0	0	9	5	1	3	0	1	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	40	995	1	33	1434	27	28	15	115	1	7	36
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	40	995	1	33	1434	27	28	15	115	1	7	36
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	40	995	1	33	1434	27	28	15	115	1	7	36
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	40	995	1	33	1434	27	28	15	115	1	7	36
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	1.96	0.04	0.18	0.09	0.73	0.02	0.16	0.82
Final Sat.:	1600	3197	3	1600	3141	59	284	152	1165	36	255	1309
Capacity Analysis Module:												
Vol/Sat:	0.03	0.31	0.31	0.02	0.46	0.46	0.02	0.10	0.10	0.00	0.03	0.03
Crit Moves:	****			****			****			****		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.969		0.953			
Flt Protected	0.963					0.990
Satd. Flow (prot)	1738	0	1775	0	0	1844
Flt Permitted	0.963					0.990
Satd. Flow (perm)	1738	0	1775	0	0	1844
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	24	7	93	50	29	121
Future Volume (vph)	24	7	93	50	29	121
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	27	8	104	56	33	136
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	160	0	0	169

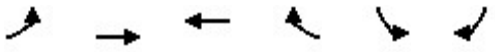
Intersection Summary

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	7	93	50	29	121
Future Vol, veh/h	24	7	93	50	29	121
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	8	104	56	33	136
Number of Lanes	1	0	1	0	0	1

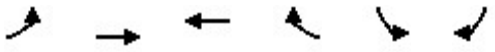
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.9	7.8	8.2
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	77%	19%
Vol Thru, %	65%	0%	81%
Vol Right, %	35%	23%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	143	31	150
LT Vol	0	24	29
Through Vol	93	0	121
RT Vol	50	7	0
Lane Flow Rate	161	35	169
Geometry Grp	1	1	1
Degree of Util (X)	0.175	0.045	0.195
Departure Headway (Hd)	3.912	4.653	4.155
Convergence, Y/N	Yes	Yes	Yes
Cap	908	774	858
Service Time	1.979	2.653	2.211
HCM Lane V/C Ratio	0.177	0.045	0.197
HCM Control Delay	7.8	7.9	8.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.1	0.7



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.973		0.953	
Flt Protected		0.993			0.968	
Satd. Flow (prot)	0	1850	1812	0	1718	0
Flt Permitted		0.993			0.968	
Satd. Flow (perm)	0	1850	1812	0	1718	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		778	433		1175	
Travel Time (s)		17.7	9.8		26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Volume (vph)	10	61	32	8	12	6
Future Volume (vph)	10	61	32	8	12	6
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	16	97	51	13	19	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	113	64	0	29	0

Intersection Summary

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	61	32	8	12	6
Future Vol, veh/h	10	61	32	8	12	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	97	51	13	19	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	64	0	-	0	187	58
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	129	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1538	-	-	-	802	1008
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	897	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1538	-	-	-	793	1008
Mov Cap-2 Maneuver	-	-	-	-	793	-
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	897	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1538	-	-	-	854
HCM Lane V/C Ratio	0.01	-	-	-	0.033
HCM Control Delay (s)	7.4	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
EXISTING PLUS PROJECT CONDITIONS
PM PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.668
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	46	Level Of Service:	B

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0 1	1	0	1	0 1	1	0	0	0 1!	0	0	0	0 0	1	0
Volume Module:																
Base Vol:	19	1191	1		34	1608	12		15	7	40		0	4	34	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	19	1191	1		34	1608	12		15	7	40		0	4	34	
Added Vol:	4	0	0		0	0	9		6	1	3		0	1	0	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	23	1191	1		34	1608	21		21	8	43		0	5	34	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	23	1191	1		34	1608	21		21	8	43		0	5	34	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	23	1191	1		34	1608	21		21	8	43		0	5	34	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	23	1191	1		34	1608	21		21	8	43		0	5	34	
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600	
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Lanes:	1.00	1.99	0.01		1.00	1.97	0.03		0.29	0.11	0.60		0.00	0.13	0.87	
Final Sat.:	1600	3197	3		1600	3159	41		467	178	956		0	205	1395	
Capacity Analysis Module:																
Vol/Sat:	0.01	0.37	0.37		0.02	0.51	0.51		0.01	0.04	0.04		0.00	0.02	0.02	
Crit Moves:	****					****				****				****		

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.949		0.891			
Flt Protected	0.970					0.964
Satd. Flow (prot)	1715	0	1660	0	0	1796
Flt Permitted	0.970					0.964
Satd. Flow (perm)	1715	0	1660	0	0	1796
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	19	12	5	22	55	18
Future Volume (vph)	19	12	5	22	55	18
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	26	16	7	30	75	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	37	0	0	100

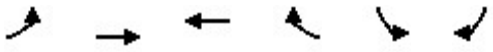
Intersection Summary

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	12	5	22	55	18
Future Vol, veh/h	19	12	5	22	55	18
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	16	7	30	75	25
Number of Lanes	1	0	1	0	0	1

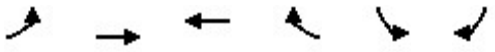
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.3	6.8	7.8
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	61%	75%
Vol Thru, %	19%	0%	25%
Vol Right, %	81%	39%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	27	31	73
LT Vol	0	19	55
Through Vol	5	0	18
RT Vol	22	12	0
Lane Flow Rate	37	42	100
Geometry Grp	1	1	1
Degree of Util (X)	0.037	0.048	0.116
Departure Headway (Hd)	3.595	4.06	4.188
Convergence, Y/N	Yes	Yes	Yes
Cap	990	874	856
Service Time	1.638	2.12	2.211
HCM Lane V/C Ratio	0.037	0.048	0.117
HCM Control Delay	6.8	7.3	7.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.2	0.4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.975		0.944	
Flt Protected		0.998			0.971	
Satd. Flow (prot)	0	1859	1816	0	1707	0
Flt Permitted		0.998			0.971	
Satd. Flow (perm)	0	1859	1816	0	1707	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		778	433		1175	
Travel Time (s)		17.7	9.8		26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Volume (vph)	3	77	29	7	8	6
Future Volume (vph)	3	77	29	7	8	6
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	4	93	35	8	10	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	97	43	0	17	0

Intersection Summary

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	77	29	7	8	6
Future Vol, veh/h	3	77	29	7	8	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	93	35	8	10	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	43	0	-	0	140	39
Stage 1	-	-	-	-	39	-
Stage 2	-	-	-	-	101	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1566	-	-	-	853	1033
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	923	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1566	-	-	-	850	1033
Mov Cap-2 Maneuver	-	-	-	-	850	-
Stage 1	-	-	-	-	980	-
Stage 2	-	-	-	-	923	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1566	-	-	-	920
HCM Lane V/C Ratio	0.002	-	-	-	0.018
HCM Control Delay (s)	7.3	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
EXISTING PLUS PROJECT CONDITIONS
SUNDAY PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.434
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	30	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1! 0	0	0 0	1! 0	0
Volume Module:												
Base Vol:	26	662	0	26	784	1	7	5	69	2	8	29
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	26	662	0	26	784	1	7	5	69	2	8	29
Added Vol:	6	0	0	0	0	13	13	1	6	0	1	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	32	662	0	26	784	14	20	6	75	2	9	29
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	32	662	0	26	784	14	20	6	75	2	9	29
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	32	662	0	26	784	14	20	6	75	2	9	29
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	32	662	0	26	784	14	20	6	75	2	9	29
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.96	0.04	0.20	0.06	0.74	0.05	0.22	0.73
Final Sat.:	1600	3200	0	1600	3144	56	317	95	1188	80	360	1160
Capacity Analysis Module:												
Vol/Sat:	0.02	0.21	0.00	0.02	0.25	0.25	0.01	0.06	0.06	0.00	0.03	0.03
Crit Moves:	****			****			****			****		

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Appendix D

Opening Year (2022) With Cumulative Projects Conditions
Intersection Analysis Worksheets



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.951		0.908			
Flt Protected	0.969					0.979
Satd. Flow (prot)	1717	0	1691	0	0	1824
Flt Permitted	0.969					0.979
Satd. Flow (perm)	1717	0	1691	0	0	1824
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	116	66	93	198	93	128
Future Volume (vph)	116	66	93	198	93	128
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	161	92	129	275	129	178
Shared Lane Traffic (%)						
Lane Group Flow (vph)	253	0	404	0	0	307

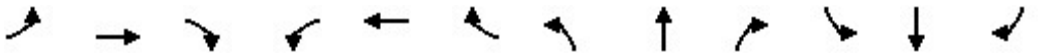
Intersection Summary

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	116	66	93	198	93	128
Future Vol, veh/h	116	66	93	198	93	128
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	161	92	129	275	129	178
Number of Lanes	1	0	1	0	0	1

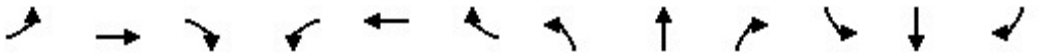
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	12.1	13	12.6
HCM LOS	B	B	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	64%	42%
Vol Thru, %	32%	0%	58%
Vol Right, %	68%	36%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	291	182	221
LT Vol	0	116	93
Through Vol	93	0	128
RT Vol	198	66	0
Lane Flow Rate	404	253	307
Geometry Grp	1	1	1
Degree of Util (X)	0.532	0.39	0.451
Departure Headway (Hd)	4.741	5.561	5.289
Convergence, Y/N	Yes	Yes	Yes
Cap	764	647	681
Service Time	2.741	3.599	3.32
HCM Lane V/C Ratio	0.529	0.391	0.451
HCM Control Delay	13	12.1	12.6
HCM Lane LOS	B	B	B
HCM 95th-tile Q	3.2	1.8	2.3



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.989			0.865			0.909	
Flt Protected		0.991			0.999						0.984	
Satd. Flow (prot)	0	1846	0	0	1840	0	0	1611	0	0	1666	0
Flt Permitted		0.991			0.999						0.984	
Satd. Flow (perm)	0	1846	0	0	1840	0	0	1611	0	0	1666	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		778			433			151			1175	
Travel Time (s)		17.7			9.8			3.4			26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	47	212	0	4	197	17	0	0	4	15	0	31
Future Volume (vph)	47	212	0	4	197	17	0	0	4	15	0	31
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	69	312	0	6	290	25	0	0	6	22	0	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	381	0	0	321	0	0	6	0	0	68	0

Intersection Summary

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	47	212	0	4	197	17	0	0	4	15	0	31
Future Vol, veh/h	47	212	0	4	197	17	0	0	4	15	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	68	68	68	68	68	68	68	68	68
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	69	312	0	6	290	25	0	0	6	22	0	46

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	315	0	0	312	0	0	788	777	312	768	765	303
Stage 1	-	-	-	-	-	-	450	450	-	315	315	-
Stage 2	-	-	-	-	-	-	338	327	-	453	450	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1245	-	-	1248	-	-	309	328	728	319	333	737
Stage 1	-	-	-	-	-	-	589	572	-	696	656	-
Stage 2	-	-	-	-	-	-	676	648	-	586	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1245	-	-	1248	-	-	274	304	728	299	309	737
Mov Cap-2 Maneuver	-	-	-	-	-	-	274	304	-	299	309	-
Stage 1	-	-	-	-	-	-	550	534	-	649	652	-
Stage 2	-	-	-	-	-	-	630	644	-	542	534	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0.1	10	13.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	728	1245	-	-	1248	-	-	499
HCM Lane V/C Ratio	0.008	0.056	-	-	0.005	-	-	0.136
HCM Control Delay (s)	10	8.1	0	-	7.9	0	-	13.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	0.5

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
OPENING YEAR (2022) WITH CUMULATIVE PROJECTS CONDITIONS
AM PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.831
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	74	Level Of Service:	D

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0 1	1	0	1	0 1	1	0	0	0 1!	0	0	0	0 0	1	0
Volume Module:																
Base Vol:	114	1789	1		15	1161	36		36	6	188		0	65	48	
Growth Adj:	1.02	1.02	1.02		1.02	1.02	1.02		1.02	1.02	1.02		1.02	1.02	1.02	
Initial Bse:	116	1825	1		15	1184	37		37	6	192		0	66	49	
Added Vol:	0	8	0		2	8	0		0	0	0		0	0	0	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	116	1833	1		17	1192	37		37	6	192		0	66	49	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	116	1833	1		17	1192	37		37	6	192		0	66	49	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	116	1833	1		17	1192	37		37	6	192		0	66	49	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	116	1833	1		17	1192	37		37	6	192		0	66	49	
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600	
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Lanes:	1.00	1.99	0.01		1.00	1.94	0.06		0.16	0.02	0.82		0.00	0.58	0.42	
Final Sat.:	1600	3198	2		1600	3104	96		250	42	1308		0	920	680	
Capacity Analysis Module:																
Vol/Sat:	0.07	0.57	0.57		0.01	0.38	0.38		0.02	0.15	0.15		0.00	0.07	0.07	
Crit Moves:		****				****					****			****		

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.952		0.929			
Flt Protected	0.969					0.983
Satd. Flow (prot)	1718	0	1730	0	0	1831
Flt Permitted	0.969					0.983
Satd. Flow (perm)	1718	0	1730	0	0	1831
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	64	35	88	99	46	90
Future Volume (vph)	64	35	88	99	46	90
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	93	51	128	143	67	130
Shared Lane Traffic (%)						
Lane Group Flow (vph)	144	0	271	0	0	197

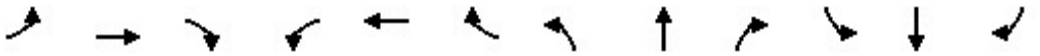
Intersection Summary

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	64	35	88	99	46	90
Future Vol, veh/h	64	35	88	99	46	90
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	93	51	128	143	67	130
Number of Lanes	1	0	1	0	0	1

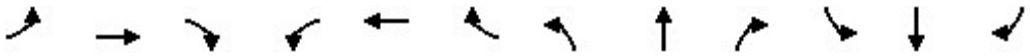
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.1	9.2	9.3
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	65%	34%
Vol Thru, %	47%	0%	66%
Vol Right, %	53%	35%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	187	99	136
LT Vol	0	64	46
Through Vol	88	0	90
RT Vol	99	35	0
Lane Flow Rate	271	143	197
Geometry Grp	1	1	1
Degree of Util (X)	0.316	0.194	0.254
Departure Headway (Hd)	4.203	4.87	4.643
Convergence, Y/N	Yes	Yes	Yes
Cap	856	736	773
Service Time	2.23	2.909	2.674
HCM Lane V/C Ratio	0.317	0.194	0.255
HCM Control Delay	9.2	9.1	9.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.4	0.7	1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.977			0.880			0.945	
Flt Protected		0.995			0.997						0.971	
Satd. Flow (prot)	0	1850	0	0	1814	0	0	1639	0	0	1709	0
Flt Permitted		0.995			0.997						0.971	
Satd. Flow (perm)	0	1850	0	0	1814	0	0	1639	0	0	1709	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		778			433			151			1175	
Travel Time (s)		17.7			9.8			3.4			26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	14	118	2	6	68	15	0	1	9	22	0	15
Future Volume (vph)	14	118	2	6	68	15	0	1	9	22	0	15
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	25	211	4	11	121	27	0	2	16	39	0	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	240	0	0	159	0	0	18	0	0	66	0

Intersection Summary

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	14	118	2	6	68	15	0	1	9	22	0	15
Future Vol, veh/h	14	118	2	6	68	15	0	1	9	22	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	56	56	56	56	56	56	56	56	56	56	56	56
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	211	4	11	121	27	0	2	16	39	0	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	148	0	0	215	0	0	433	433	213	429	422	135
Stage 1	-	-	-	-	-	-	263	263	-	157	157	-
Stage 2	-	-	-	-	-	-	170	170	-	272	265	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1434	-	-	1355	-	-	533	516	827	536	523	914
Stage 1	-	-	-	-	-	-	742	691	-	845	768	-
Stage 2	-	-	-	-	-	-	832	758	-	734	689	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1434	-	-	1355	-	-	506	501	827	512	508	914
Mov Cap-2 Maneuver	-	-	-	-	-	-	506	501	-	512	508	-
Stage 1	-	-	-	-	-	-	727	677	-	828	761	-
Stage 2	-	-	-	-	-	-	800	751	-	703	675	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.5	9.7	11.5
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	776	1434	-	-	1355	-	-	623
HCM Lane V/C Ratio	0.023	0.017	-	-	0.008	-	-	0.106
HCM Control Delay (s)	9.7	7.6	0	-	7.7	0	-	11.5
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.4

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
OPENING YEAR (2022) WITH CUMULATIVE PROJECTS CONDITIONS
MID-DAY PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.685
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	48	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	35	995	1	33	1434	18	23	14	112	1	6	36
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	36	1015	1	34	1463	18	23	14	114	1	6	37
Added Vol:	0	14	0	1	14	0	0	0	0	0	0	2
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	36	1029	1	35	1477	18	23	14	114	1	6	39
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	36	1029	1	35	1477	18	23	14	114	1	6	39
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	36	1029	1	35	1477	18	23	14	114	1	6	39
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	36	1029	1	35	1477	18	23	14	114	1	6	39
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	1.98	0.02	0.15	0.09	0.76	0.02	0.13	0.85
Final Sat.:	1600	3197	3	1600	3161	39	247	150	1203	36	214	1351
Capacity Analysis Module:												
Vol/Sat:	0.02	0.32	0.32	0.02	0.47	0.47	0.01	0.09	0.09	0.00	0.03	0.03
Crit Moves:	****			****			****			****		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.971		0.954			
Flt Protected	0.962					0.990
Satd. Flow (prot)	1740	0	1777	0	0	1844
Flt Permitted	0.962					0.990
Satd. Flow (perm)	1740	0	1777	0	0	1844
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	23	6	95	49	29	123
Future Volume (vph)	23	6	95	49	29	123
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	26	7	107	55	33	138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	162	0	0	171

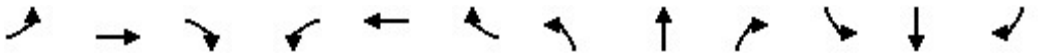
Intersection Summary

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	6	95	49	29	123
Future Vol, veh/h	23	6	95	49	29	123
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	7	107	55	33	138
Number of Lanes	1	0	1	0	0	1

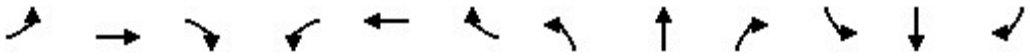
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.9	7.8	8.2
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	79%	19%
Vol Thru, %	66%	0%	81%
Vol Right, %	34%	21%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	144	29	152
LT Vol	0	23	29
Through Vol	95	0	123
RT Vol	49	6	0
Lane Flow Rate	162	33	171
Geometry Grp	1	1	1
Degree of Util (X)	0.176	0.042	0.197
Departure Headway (Hd)	3.915	4.674	4.151
Convergence, Y/N	Yes	Yes	Yes
Cap	908	771	859
Service Time	1.98	2.674	2.205
HCM Lane V/C Ratio	0.178	0.043	0.199
HCM Control Delay	7.8	7.9	8.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.1	0.7



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.974						0.960	
Flt Protected		0.994			0.999						0.966	
Satd. Flow (prot)	0	1848	0	0	1812	0	0	1863	0	0	1727	0
Flt Permitted		0.994			0.999						0.966	
Satd. Flow (perm)	0	1848	0	0	1812	0	0	1863	0	0	1727	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		778			433			151			1175	
Travel Time (s)		17.7			9.8			3.4			26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	9	62	1	1	33	8	0	0	0	12	0	5
Future Volume (vph)	9	62	1	1	33	8	0	0	0	12	0	5
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	14	98	2	2	52	13	0	0	0	19	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	114	0	0	67	0	0	0	0	0	27	0

Intersection Summary

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	62	1	1	33	8	0	0	0	12	0	5
Future Vol, veh/h	9	62	1	1	33	8	0	0	0	12	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	98	2	2	52	13	0	0	0	19	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	65	0	0	100	0	0	194	196	99	190	191	59
Stage 1	-	-	-	-	-	-	127	127	-	63	63	-
Stage 2	-	-	-	-	-	-	67	69	-	127	128	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1537	-	-	1493	-	-	765	699	957	770	704	1007
Stage 1	-	-	-	-	-	-	877	791	-	948	842	-
Stage 2	-	-	-	-	-	-	943	837	-	877	790	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1537	-	-	1493	-	-	753	691	957	764	696	1007
Mov Cap-2 Maneuver	-	-	-	-	-	-	753	691	-	764	696	-
Stage 1	-	-	-	-	-	-	868	783	-	939	841	-
Stage 2	-	-	-	-	-	-	935	836	-	868	782	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.2	0	9.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1537	-	-	1493	-	-	822
HCM Lane V/C Ratio	-	0.009	-	-	0.001	-	-	0.033
HCM Control Delay (s)	0	7.4	0	-	7.4	0	-	9.5
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
OPENING YEAR (2022) WITH CUMULATIVE PROJECTS CONDITIONS
PM PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.667
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	46	Level Of Service:	B

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0 1	1	0	1	0 1	1	0	0	0 1!	0	0	0	0 0	1	0
Volume Module:																
Base Vol:	19	1191	1		34	1608	12		15	7	40		0	4	34	
Growth Adj:	1.02	1.02	1.02		1.02	1.02	1.02		1.02	1.02	1.02		1.02	1.02	1.02	
Initial Bse:	19	1215	1		35	1640	12		15	7	41		0	4	35	
Added Vol:	0	8	0		1	11	0		0	0	0		0	0	2	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	19	1223	1		36	1651	12		15	7	41		0	4	37	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	19	1223	1		36	1651	12		15	7	41		0	4	37	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	19	1223	1		36	1651	12		15	7	41		0	4	37	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	19	1223	1		36	1651	12		15	7	41		0	4	37	
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600	
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Lanes:	1.00	1.99	0.01		1.00	1.99	0.01		0.24	0.11	0.65		0.00	0.10	0.90	
Final Sat.:	1600	3197	3		1600	3176	24		387	181	1032		0	160	1440	
Capacity Analysis Module:																
Vol/Sat:	0.01	0.38	0.38		0.02	0.52	0.52		0.01	0.04	0.04		0.00	0.03	0.03	
Crit Moves:	****					****			****					****		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945		0.894			
Flt Protected	0.971					0.964
Satd. Flow (prot)	1709	0	1665	0	0	1796
Flt Permitted	0.971					0.964
Satd. Flow (perm)	1709	0	1665	0	0	1796
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	16	11	5	19	55	18
Future Volume (vph)	16	11	5	19	55	18
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	22	15	7	26	75	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	0	33	0	0	100

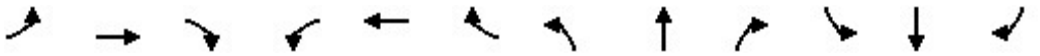
Intersection Summary

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	11	5	19	55	18
Future Vol, veh/h	16	11	5	19	55	18
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	15	7	26	75	25
Number of Lanes	1	0	1	0	0	1

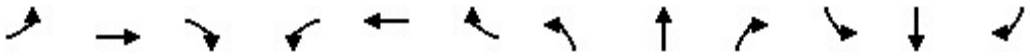
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.3	6.8	7.7
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	59%	75%
Vol Thru, %	21%	0%	25%
Vol Right, %	79%	41%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	24	27	73
LT Vol	0	16	55
Through Vol	5	0	18
RT Vol	19	11	0
Lane Flow Rate	33	37	100
Geometry Grp	1	1	1
Degree of Util (X)	0.033	0.041	0.116
Departure Headway (Hd)	3.599	4.037	4.174
Convergence, Y/N	Yes	Yes	Yes
Cap	990	880	860
Service Time	1.638	2.096	2.194
HCM Lane V/C Ratio	0.033	0.042	0.116
HCM Control Delay	6.8	7.3	7.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.976			0.921			0.949	
Flt Protected		0.999			0.999			0.984			0.970	
Satd. Flow (prot)	0	1859	0	0	1816	0	0	1688	0	0	1715	0
Flt Permitted		0.999			0.999			0.984			0.970	
Satd. Flow (perm)	0	1859	0	0	1816	0	0	1688	0	0	1715	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		778			433			151			1175	
Travel Time (s)		17.7			9.8			3.4			26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	2	79	1	1	30	7	3	1	6	8	0	5
Future Volume (vph)	2	79	1	1	30	7	3	1	6	8	0	5
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	2	95	1	1	36	8	4	1	7	10	0	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	45	0	0	12	0	0	16	0

Intersection Summary

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	79	1	1	30	7	3	1	6	8	0	5
Future Vol, veh/h	2	79	1	1	30	7	3	1	6	8	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	95	1	1	36	8	4	1	7	10	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	44	0	0	96	0	0	145	146	96	146	142	40
Stage 1	-	-	-	-	-	-	100	100	-	42	42	-
Stage 2	-	-	-	-	-	-	45	46	-	104	100	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1564	-	-	1498	-	-	824	745	960	823	749	1031
Stage 1	-	-	-	-	-	-	906	812	-	972	860	-
Stage 2	-	-	-	-	-	-	969	857	-	902	812	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1564	-	-	1498	-	-	818	744	960	815	748	1031
Mov Cap-2 Maneuver	-	-	-	-	-	-	818	744	-	815	748	-
Stage 1	-	-	-	-	-	-	905	811	-	971	859	-
Stage 2	-	-	-	-	-	-	962	856	-	893	811	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.2	9.1	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	888	1564	-	-	1498	-	-	886
HCM Lane V/C Ratio	0.014	0.002	-	-	0.001	-	-	0.018
HCM Control Delay (s)	9.1	7.3	0	-	7.4	0	-	9.1
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
OPENING YEAR (2022) WITH CUMULATIVE PROJECTS CONDITIONS
SUNDAY PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.426
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	30	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1! 0	0	0 0	1! 0	0
Volume Module:												
Base Vol:	26	662	0	26	784	1	7	5	69	2	8	29
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	27	675	0	27	800	1	7	5	70	2	8	30
Added Vol:	0	17	0	2	20	0	0	0	0	0	0	2
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	27	692	0	29	820	1	7	5	70	2	8	32
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	27	692	0	29	820	1	7	5	70	2	8	32
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	692	0	29	820	1	7	5	70	2	8	32
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	27	692	0	29	820	1	7	5	70	2	8	32
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.99	0.01	0.09	0.06	0.85	0.05	0.19	0.76
Final Sat.:	1600	3200	0	1600	3196	4	138	99	1363	78	312	1209
Capacity Analysis Module:												
Vol/Sat:	0.02	0.22	0.00	0.02	0.26	0.26	0.00	0.05	0.05	0.00	0.03	0.03
Crit Moves:	****			****			****			****		

Appendix E

Opening Year (2022) With Cumulative Projects Plus Project Conditions
Intersection Analysis Worksheets



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.951		0.908			
Flt Protected	0.969					0.979
Satd. Flow (prot)	1717	0	1691	0	0	1824
Flt Permitted	0.969					0.979
Satd. Flow (perm)	1717	0	1691	0	0	1824
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	117	67	93	199	93	128
Future Volume (vph)	117	67	93	199	93	128
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	163	93	129	276	129	178
Shared Lane Traffic (%)						
Lane Group Flow (vph)	256	0	405	0	0	307

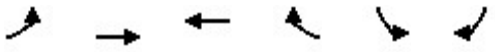
Intersection Summary

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	117	67	93	199	93	128
Future Vol, veh/h	117	67	93	199	93	128
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	163	93	129	276	129	178
Number of Lanes	1	0	1	0	0	1

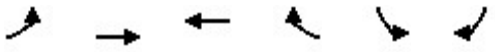
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	12.2	13.1	12.7
HCM LOS	B	B	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	64%	42%
Vol Thru, %	32%	0%	58%
Vol Right, %	68%	36%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	292	184	221
LT Vol	0	117	93
Through Vol	93	0	128
RT Vol	199	67	0
Lane Flow Rate	406	256	307
Geometry Grp	1	1	1
Degree of Util (X)	0.535	0.395	0.452
Departure Headway (Hd)	4.752	5.567	5.301
Convergence, Y/N	Yes	Yes	Yes
Cap	762	647	678
Service Time	2.752	3.604	3.334
HCM Lane V/C Ratio	0.533	0.396	0.453
HCM Control Delay	13.1	12.2	12.7
HCM Lane LOS	B	B	B
HCM 95th-tile Q	3.2	1.9	2.4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.989		0.909	
Flt Protected		0.991			0.984	
Satd. Flow (prot)	0	1846	1842	0	1666	0
Flt Permitted		0.991			0.984	
Satd. Flow (perm)	0	1846	1842	0	1666	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		778	433		1175	
Travel Time (s)		17.7	9.8		26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Volume (vph)	48	212	197	17	15	31
Future Volume (vph)	48	212	197	17	15	31
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	71	312	290	25	22	46
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	383	315	0	68	0

Intersection Summary

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	212	197	17	15	31
Future Vol, veh/h	48	212	197	17	15	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	312	290	25	22	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	315	0	-	0	757	303
Stage 1	-	-	-	-	303	-
Stage 2	-	-	-	-	454	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1245	-	-	-	375	737
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	640	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1245	-	-	-	349	737
Mov Cap-2 Maneuver	-	-	-	-	349	-
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	640	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1245	-	-	-	541
HCM Lane V/C Ratio	0.057	-	-	-	0.125
HCM Control Delay (s)	8.1	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
OPENING YEAR (2022) WITH CUMULATIVE PROJECTS PLUS PROJECT CONDITIONS
AM PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.838
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	76	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1!	0 0	0 0	0	1 0
Volume Module:												
Base Vol:	114	1789	1	15	1161	36	36	6	188	0	65	48
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	116	1825	1	15	1184	37	37	6	192	0	66	49
Added Vol:	2	8	0	2	8	3	7	1	4	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	118	1833	1	17	1192	40	44	7	196	0	66	49
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	118	1833	1	17	1192	40	44	7	196	0	66	49
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	118	1833	1	17	1192	40	44	7	196	0	66	49
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	118	1833	1	17	1192	40	44	7	196	0	66	49
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	1.94	0.06	0.18	0.03	0.79	0.00	0.58	0.42
Final Sat.:	1600	3198	2	1600	3097	103	284	46	1270	0	920	680
Capacity Analysis Module:												
Vol/Sat:	0.07	0.57	0.57	0.01	0.39	0.39	0.03	0.15	0.15	0.00	0.07	0.07
Crit Moves:		****		****				****		****		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.952		0.928			
Flt Protected	0.969					0.983
Satd. Flow (prot)	1718	0	1729	0	0	1831
Flt Permitted	0.969					0.983
Satd. Flow (perm)	1718	0	1729	0	0	1831
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	65	36	88	101	47	90
Future Volume (vph)	65	36	88	101	47	90
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	94	52	128	146	68	130
Shared Lane Traffic (%)						
Lane Group Flow (vph)	146	0	274	0	0	198

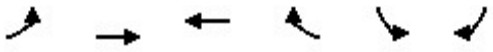
Intersection Summary

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	65	36	88	101	47	90
Future Vol, veh/h	65	36	88	101	47	90
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	94	52	128	146	68	130
Number of Lanes	1	0	1	0	0	1

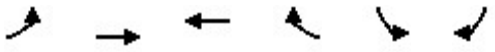
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.1	9.2	9.3
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	64%	34%
Vol Thru, %	47%	0%	66%
Vol Right, %	53%	36%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	189	101	137
LT Vol	0	65	47
Through Vol	88	0	90
RT Vol	101	36	0
Lane Flow Rate	274	146	199
Geometry Grp	1	1	1
Degree of Util (X)	0.32	0.198	0.257
Departure Headway (Hd)	4.21	4.877	4.655
Convergence, Y/N	Yes	Yes	Yes
Cap	855	733	770
Service Time	2.238	2.919	2.687
HCM Lane V/C Ratio	0.32	0.199	0.258
HCM Control Delay	9.2	9.1	9.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.4	0.7	1



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.975		0.942	
Flt Protected		0.994			0.972	
Satd. Flow (prot)	0	1852	1816	0	1706	0
Flt Permitted		0.994			0.972	
Satd. Flow (perm)	0	1852	1816	0	1706	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		778	433		1175	
Travel Time (s)		17.7	9.8		26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Volume (vph)	15	118	68	15	22	16
Future Volume (vph)	15	118	68	15	22	16
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	27	211	121	27	39	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	238	148	0	68	0

Intersection Summary

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	118	68	15	22	16
Future Vol, veh/h	15	118	68	15	22	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	56	56	56	56	56	56
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	211	121	27	39	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	148	0	-	0	400	135
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	265	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1434	-	-	-	606	914
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	779	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1434	-	-	-	593	914
Mov Cap-2 Maneuver	-	-	-	-	593	-
Stage 1	-	-	-	-	872	-
Stage 2	-	-	-	-	779	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1434	-	-	-	696
HCM Lane V/C Ratio	0.019	-	-	-	0.097
HCM Control Delay (s)	7.6	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
OPENING YEAR (2022) WITH CUMULATIVE PROJECTS PLUS PROJECT CONDITIONS
MID-DAY PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.697
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	50	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	35	995	1	33	1434	18	23	14	112	1	6	36
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	36	1015	1	34	1463	18	23	14	114	1	6	37
Added Vol:	5	14	0	1	14	9	5	1	3	0	1	2
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	41	1029	1	35	1477	27	28	15	117	1	7	39
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	41	1029	1	35	1477	27	28	15	117	1	7	39
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	41	1029	1	35	1477	27	28	15	117	1	7	39
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	41	1029	1	35	1477	27	28	15	117	1	7	39
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	1.96	0.04	0.18	0.09	0.73	0.02	0.15	0.83
Final Sat.:	1600	3197	3	1600	3142	58	283	152	1165	35	243	1322
Capacity Analysis Module:												
Vol/Sat:	0.03	0.32	0.32	0.02	0.47	0.47	0.02	0.10	0.10	0.00	0.03	0.03
Crit Moves:	****			****			****			****		

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.969		0.953			
Flt Protected	0.963					0.990
Satd. Flow (prot)	1738	0	1775	0	0	1844
Flt Permitted	0.963					0.990
Satd. Flow (perm)	1738	0	1775	0	0	1844
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	24	7	95	51	30	123
Future Volume (vph)	24	7	95	51	30	123
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	27	8	107	57	34	138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	164	0	0	172

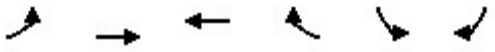
Intersection Summary

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	7	95	51	30	123
Future Vol, veh/h	24	7	95	51	30	123
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	8	107	57	34	138
Number of Lanes	1	0	1	0	0	1

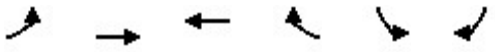
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.9	7.8	8.3
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	77%	20%
Vol Thru, %	65%	0%	80%
Vol Right, %	35%	23%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	146	31	153
LT Vol	0	24	30
Through Vol	95	0	123
RT Vol	51	7	0
Lane Flow Rate	164	35	172
Geometry Grp	1	1	1
Degree of Util (X)	0.178	0.045	0.199
Departure Headway (Hd)	3.915	4.666	4.158
Convergence, Y/N	Yes	Yes	Yes
Cap	907	772	856
Service Time	1.982	2.666	2.214
HCM Lane V/C Ratio	0.181	0.045	0.201
HCM Control Delay	7.8	7.9	8.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.1	0.7



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.973		0.953	
Flt Protected		0.993			0.968	
Satd. Flow (prot)	0	1850	1812	0	1718	0
Flt Permitted		0.993			0.968	
Satd. Flow (perm)	0	1850	1812	0	1718	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		778	433		1175	
Travel Time (s)		17.7	9.8		26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Volume (vph)	10	62	33	8	12	6
Future Volume (vph)	10	62	33	8	12	6
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	16	98	52	13	19	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	114	65	0	29	0

Intersection Summary

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	62	33	8	12	6
Future Vol, veh/h	10	62	33	8	12	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	98	52	13	19	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	65	0	-	0	189	59
Stage 1	-	-	-	-	59	-
Stage 2	-	-	-	-	130	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1537	-	-	-	800	1007
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	896	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1537	-	-	-	791	1007
Mov Cap-2 Maneuver	-	-	-	-	791	-
Stage 1	-	-	-	-	953	-
Stage 2	-	-	-	-	896	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1537	-	-	-	852
HCM Lane V/C Ratio	0.01	-	-	-	0.034
HCM Control Delay (s)	7.4	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
OPENING YEAR (2022) WITH CUMULATIVE PROJECTS PLUS PROJECT CONDITIONS
PM PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.683
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	48	Level Of Service:	B

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0 1	1	0	1	0 1	1	0	0	0 1!	0	0	0	0 0	1	0
Volume Module:																
Base Vol:	19	1191	1		34	1608	12		15	7	40		0	4	34	
Growth Adj:	1.02	1.02	1.02		1.02	1.02	1.02		1.02	1.02	1.02		1.02	1.02	1.02	
Initial Bse:	19	1215	1		35	1640	12		15	7	41		0	4	35	
Added Vol:	4	8	0		1	11	9		6	1	3		0	1	2	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	23	1223	1		36	1651	21		21	8	44		0	5	37	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	23	1223	1		36	1651	21		21	8	44		0	5	37	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	23	1223	1		36	1651	21		21	8	44		0	5	37	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	23	1223	1		36	1651	21		21	8	44		0	5	37	
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600	
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Lanes:	1.00	1.99	0.01		1.00	1.97	0.03		0.29	0.11	0.60		0.00	0.12	0.88	
Final Sat.:	1600	3197	3		1600	3159	41		465	178	957		0	195	1405	
Capacity Analysis Module:																
Vol/Sat:	0.01	0.38	0.38		0.02	0.52	0.52		0.01	0.05	0.05		0.00	0.03	0.03	
Crit Moves:	****					****				****				****		

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.949		0.891			
Flt Protected	0.970					0.964
Satd. Flow (prot)	1715	0	1660	0	0	1796
Flt Permitted	0.970					0.964
Satd. Flow (perm)	1715	0	1660	0	0	1796
Link Speed (mph)	30		30			30
Link Distance (ft)	778		1047			1492
Travel Time (s)	17.7		23.8			33.9

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	19	12	5	22	56	18
Future Volume (vph)	19	12	5	22	56	18
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	26	16	7	30	77	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	37	0	0	102

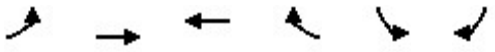
Intersection Summary

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	12	5	22	56	18
Future Vol, veh/h	19	12	5	22	56	18
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	16	7	30	77	25
Number of Lanes	1	0	1	0	0	1

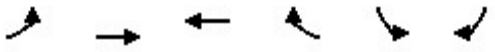
Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.3	6.8	7.8
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	61%	76%
Vol Thru, %	19%	0%	24%
Vol Right, %	81%	39%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	27	31	74
LT Vol	0	19	56
Through Vol	5	0	18
RT Vol	22	12	0
Lane Flow Rate	37	42	101
Geometry Grp	1	1	1
Degree of Util (X)	0.037	0.048	0.118
Departure Headway (Hd)	3.596	4.062	4.188
Convergence, Y/N	Yes	Yes	Yes
Cap	989	874	857
Service Time	1.64	2.124	2.212
HCM Lane V/C Ratio	0.037	0.048	0.118
HCM Control Delay	6.8	7.3	7.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.2	0.4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.975		0.944	
Flt Protected		0.998			0.971	
Satd. Flow (prot)	0	1859	1816	0	1707	0
Flt Permitted		0.998			0.971	
Satd. Flow (perm)	0	1859	1816	0	1707	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		778	433		1175	
Travel Time (s)		17.7	9.8		26.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Volume (vph)	3	79	30	7	8	6
Future Volume (vph)	3	79	30	7	8	6
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	4	95	36	8	10	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	99	44	0	17	0

Intersection Summary

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	79	30	7	8	6
Future Vol, veh/h	3	79	30	7	8	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	95	36	8	10	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	44	0	-	0	143	40
Stage 1	-	-	-	-	40	-
Stage 2	-	-	-	-	103	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1564	-	-	-	850	1031
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	921	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1564	-	-	-	847	1031
Mov Cap-2 Maneuver	-	-	-	-	847	-
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	921	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1564	-	-	-	917
HCM Lane V/C Ratio	0.002	-	-	-	0.018
HCM Control Delay (s)	7.3	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

WHITTIER FLORAL PROJECT (JN: 1373-2019-02)
OPENING YEAR (2022) WITH CUMULATIVE PROJECTS PLUS PROJECT CONDITIONS
SUNDAY PEAK HOUR

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 BEVERLY BOULEVARD (NS) AT FLORAL DRIVE (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.446
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	31	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1! 0	0	0 0	1! 0	0
Volume Module:												
Base Vol:	26	662	0	26	784	1	7	5	69	2	8	29
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	27	675	0	27	800	1	7	5	70	2	8	30
Added Vol:	6	17	0	2	20	13	13	1	6	0	1	2
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	33	692	0	29	820	14	20	6	76	2	9	32
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	33	692	0	29	820	14	20	6	76	2	9	32
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	33	692	0	29	820	14	20	6	76	2	9	32
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	33	692	0	29	820	14	20	6	76	2	9	32
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.97	0.03	0.20	0.06	0.74	0.05	0.21	0.74
Final Sat.:	1600	3200	0	1600	3146	54	314	95	1191	76	343	1181
Capacity Analysis Module:												
Vol/Sat:	0.02	0.22	0.00	0.02	0.26	0.26	0.01	0.06	0.06	0.00	0.03	0.03
Crit Moves:	****			****			****			****		

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Appendix F

Norwalk Transit System Bus Routes 1 & 7 Schedules and
Foothill Transit Bus Line 274 Schedule

We'll get you there!
¡Lo llevaremos ahí!

norwalk transit

CITY OF NORWALK
A Connected Community

Route 1
Rio Hondo/Bellflower
Ruta 1



Effective September 9, 2018 Efectivo el 9 de septiembre 2018

NORWALK TRANSIT FARE POLICY

Adult Fare 1.25
Student (Grade K-12) 1.00
Senior (Age 62 & older) / Disabled / Medicare
Card Holder 0.60
Two children under 5 ride free when accompanied by an adult paying one full fare.
NTS Local Transfer 0.50
Interagency Transfer 0.50
(Transfers are additional. Interagency transfers are accepted only at transfer points. Coach operator does not make change.)

EZ transit passes, and TAP cards with sufficient NTS stored value are accepted on Norwalk Transit buses. Metro Annual, 30-Day, and Day passes loaded onto a TAP card are not valid on Norwalk Transit buses.

For more information about NTS service, please call (562) 929-5550.

DIAL-A-RIDE

The Norwalk Transit System (NTS) also provides curb-to-curb service to qualified physically challenged riders and those age 60 and above in Norwalk. The fare is $1.00 for a one-way trip. Dial-A-Ride trips must be scheduled in advance.

POLÍTICA DE PASAJES DE NORWALK TRANSIT

Tarifa de Adulto 1.25
Estudiante (Grado K-12) 1.00
Adultos mayores (62 años o más)/Incapacitados/
Titular de la Tarjeta de Medicare 0.60
Dos niños menores de 5 años viajan gratis cuando están acompañados por un adulto que pague pasaje completo.
Trasbordo local de NTS 0.50
Trasbordo entre Agencias 0.50
(Los trasbordos son adicionales. Los trasbordos entre agencias solo se aceptan en los puntos de trasbordo. El Conductor del autobús no le da cambio.)
Pases EZ transit, y las tarjetas TAP con suficiente valor almacenado de NTS son aceptadas en los autobuses de Norwalk Transit. Los pases anuales, de 30 días y diarios de Metro no son válidos en los autobuses de Norwalk Transit.

Para más información de los servicios de NTS, por favor llame al (562) 929-5550.

MARQUE PARA UN AVENTÓN (DIAL-A-RIDE)

Norwalk Transit System (NTS) también proporciona servicios de curva-a-curva para residentes de Norwalk que son mayores de 60 años o que cumplan los requisitos como pasajeros con desafío físico. El viaje de ida cuesta $1.00. Los viajes de Marque Para Un Aventón deben ser reservados con anticipación.

More than 40 years of dedicated transit service for the City of Norwalk and surrounding communities.

Más de 40 años dedicados al servicio de tránsito para la ciudad de Norwalk y las comunidades circundantes.



Holiday Schedule

There will be no service for Route 1 on the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

(Horarios y días feriados: No hay servicio los dias de New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day y Christmas Day.)

norwalk transit

www.norwalk.org/norwalktransit
(562) 929-5550

HWDS 11/2019

Route 1
Ruta 1



WEEKDAY SCHEDULE

Servicio Entre Semana

Northbound to RIO HONDO COLLEGE

WOODRUFF / ROSECRANS	ALONDRA / STUDEBAKER	PIONEER/ ALONDRA	PIONEER/ ROSECRANS	NORWALK/ IMPERIAL	FLORENCE/ ORR & DAY	NORWALK/ WASHINGTON	NORWALK/ WHITTIER	RIO HONDO COLLEGE
①	②	③	④	⑤	⑥	⑦	⑧	⑨
–	–	–	5:30	5:38	5:48	6:03	6:09	6:19
–	–	–	6:00	6:08	6:18	6:33	6:39	6:49
6:07	6:15	6:24	6:30	6:38	6:48	7:03	7:09	7:19
6:37	6:45	6:54	7:00	7:08	7:18	7:33	7:39	7:49
7:07	7:15	7:24	7:30	7:38	7:48	8:03	8:09	8:19
7:37	7:45	7:54	8:00	8:08	8:18	8:33	8:39	8:49
8:07	8:15	8:24	8:30	8:38	8:48	9:03	9:09	9:19
8:37	8:45	8:54	9:00	9:08	9:18	9:33	9:39	9:49
9:07	9:15	9:24	9:30	9:38	9:48	10:03	10:09	10:19
9:37	9:45	9:54	10:00	10:08	10:18	10:33	10:39	10:49
10:14	10:22	10:31	10:37	10:45	10:55	11:10	11:16	11:26
10:44	10:52	11:01	11:07	11:15	11:25	11:40	11:46	11:56
11:14	11:22	11:31	11:37	11:45	11:55	**12:10**	**12:16**	**12:26**
11:44	11:52	**12:01**	**12:07**	**12:15**	**12:25**	**12:40**	**12:46**	**12:56**
12:14	**12:22**	**12:31**	**12:37**	**12:45**	**12:55**	**1:10**	**1:16**	**1:26**
12:44	**12:52**	**1:01**	**1:07**	**1:15**	**1:25**	**1:40**	**1:46**	**1:56**
1:21	**1:29**	**1:38**	**1:44**	**1:52**	**2:02**	**2:17**	**2:23**	**2:33**
1:51	**1:59**	**2:08**	**2:14**	**2:22**	**2:32**	**2:47**	**2:53**	**3:03**
2:21	**2:29**	**2:38**	**2:44**	**2:52**	**3:02**	**3:17**	**3:23**	**3:33**
2:51	**2:59**	**3:08**	**3:14**	**3:22**	**3:32**	**3:47**	**3:53**	**4:03**
3:21	**3:29**	**3:38**	**3:44**	**3:52**	**4:02**	**4:17**	**4:23**	**4:33**
3:51	**3:59**	**4:08**	**4:14**	**4:22**	**4:32**	**4:47**	**4:53**	**5:03**
4:28	**4:36**	**4:45**	**4:51**	**4:59**	**5:09**	**5:24**	**5:30**	**5:40**
4:58	**5:06**	**5:15**	**5:21**	**5:29**	**5:39**	**5:54**	**6:00**	**6:10**
5:28	**5:36**	**5:45**	**5:51**	**5:59**	**6:09**	**6:24**	**6:30**	**6:40**
5:58	**6:06**	**6:15**	**6:21**	**6:29**	–	–	–	–
6:28	**6:36**	**6:45**	**6:51**	**6:59**	**7:09**	**7:24**	**7:30**	**7:40**
6:58	**7:06**	**7:15**	**7:21**	**7:29**	**7:39**	**7:54**	**8:00**	**8:10**
7:35	**7:43**	**7:52**	**7:58**	**8:06**	–	–	–	–
8:05	**8:13**	**8:22**	**8:28**	**8:36**	**8:46**	**9:01**	**9:07**	**9:17**
8:35	**8:43**	**8:52**	**8:58**	**9:06**	**9:16**	**9:31**	**9:37**	**9:47**
9:35	**9:43**	**9:52**	**9:58**	**10:06**	–	–	–	–

PM times are indicated in bold. *(Horas después del medio día aparecen con números resaltados)*

WEEKDAY SCHEDULE

Servicio Entre Semana

Southbound to BELLFLOWER

RIO HONDO COLLEGE	NORWALK/ WHITTIER	NORWALK/ WASHINGTON	PIONEER/ GLENWORTH	NORWALK/ IMPERIAL	PIONEER/ ROSECRANS	PIONEER/ ALONDRA	ALONDRA/ STUDEBAKER	FLOWER/ BELLFLOWER	CLARK/ ROSECRANS	WOODRUFF/ ROSECRANS
1	2	3	4	5	6	7	8	9	10	11
–	–	–	–	5:29	5:35	5:41	5:48	5:56	6:03	6:07
–	–	–	–	5:59	6:05	6:11	6:18	6:26	6:33	6:37
–	–	–	–	6:29	6:35	6:41	6:48	6:56	7:03	7:07
–	–	–	–	6:59	7:05	7:11	7:18	7:26	7:33	7:37
6:30	6:39	6:46	6:59	7:12	7:18	7:24	7:31	7:40	7:47	7:51
7:00	7:09	7:16	7:29	7:42	7:50	7:56	8:03	8:12	8:19	8:23
7:30	7:39	7:46	7:59	8:12	8:20	8:26	8:33	8:42	8:49	8:53
8:00	8:09	8:16	8:29	8:42	8:50	8:56	9:03	9:12	9:19	9:23
8:37	8:46	8:53	9:06	9:19	9:27	9:33	9:40	9:49	9:56	10:00
9:07	9:16	9:23	9:36	9:49	9:57	10:03	10:10	10:19	10:26	10:30
9:37	9:46	9:53	10:06	10:19	10:27	10:33	10:40	10:49	10:56	11:00
10:07	10:16	10:23	10:36	10:49	10:57	11:03	11:10	11:19	11:26	11:30
10:37	10:46	10:53	11:06	11:19	11:27	11:33	11:40	11:49	11:56	12:00
11:07	11:16	11:23	11:36	11:49	11:57	**12:03**	**12:10**	**12:19**	**12:26**	**12:30**
11:44	11:53	**12:00**	**12:13**	**12:26**	**12:34**	**12:40**	**12:47**	**12:56**	**1:03**	**1:07**
12:14	**12:23**	**12:30**	**12:43**	**12:56**	**1:04**	**1:10**	**1:17**	**1:26**	**1:33**	**1:37**
12:44	**12:53**	**1:00**	**1:13**	**1:26**	**1:34**	**1:40**	**1:47**	**1:56**	**2:03**	**2:07**
1:14	**1:23**	**1:30**	**1:43**	**1:56**	**2:04**	**2:10**	**2:17**	**2:26**	**2:33**	**2:37**
1:44	**1:53**	**2:00**	**2:13**	**2:26**	**2:34**	**2:40**	**2:47**	**2:56**	**3:03**	**3:07**
2:14	**2:23**	**2:30**	**2:43**	**2:56**	**3:04**	**3:10**	**3:17**	**3:26**	**3:33**	**3:37**
2:51	**3:00**	**3:07**	**3:20**	**3:33**	**3:41**	**3:47**	**3:54**	**4:03**	**4:10**	**4:14**
3:21	**3:30**	**3:37**	**3:50**	**4:03**	**4:11**	**4:17**	**4:24**	**4:33**	**4:40**	**4:44**
3:51	**4:00**	**4:07**	**4:20**	**4:33**	**4:41**	**4:47**	**4:54**	**5:03**	**5:10**	**5:14**
4:21	**4:30**	**4:37**	**4:50**	**5:03**	**5:11**	**5:17**	**5:24**	**5:33**	**5:40**	**5:44**
4:51	**5:00**	**5:07**	**5:20**	**5:33**	**5:41**	**5:47**	**5:54**	**6:03**	**6:10**	**6:14**
5:21	**5:30**	**5:37**	**5:50**	**6:03**	**6:11**	**6:17**	**6:24**	**6:33**	**6:40**	**6:44**
5:58	**6:07**	**6:14**	**6:27**	**6:40**	**6:48**	**6:54**	**7:01**	**7:10**	**7:17**	**7:21**
6:28	**6:37**	**6:44**	**6:57**	**7:10**	**7:18**	**7:24**	**7:31**	**7:40**	**7:47**	**7:51**
6:58	**7:07**	**7:14**	**7:27**	**7:40**	**7:48**	**7:54**	**8:01**	**8:10**	**8:17**	**8:21**
7:58	**8:07**	**8:14**	**8:27**	**8:40**	**8:48**	**8:54**	**9:01**	**9:10**	**9:17**	**9:21**
8:28	**8:37**	**8:44**	**8:57**	**9:10**	–	–	–	–	–	–
9:35	**9:44**	**9:51**	**10:04**	**10:17**	–	–	–	–	–	–
10:05	**10:14**	**10:21**	**10:34**	**10:47**	–	–	–	–	–	–

PM times are indicated in bold. *(Horas después del medio día aparecen con números resaltados)*

WEEKEND SCHEDULE

Servicio Entre Semana

To RIO HONDO COLLEGE–Northbound

WOODRUFF/ ROSECRANS	ALONDRA/ STUDEBAKER	PIONEER/ ALONDRA	PIONEER/ ROSECRANS	NORWALK/ IMPERIAL	FLORENCE/ ORR & DAY	NORWALK/ WASHINGTON	NORWALK/ WHITTIER	RIO HONDO COLLEGE
1	2	3	4	5	6	7	8	9
–	–	–	7:52	8:00	8:07	8:19	8:24	8:32
–	–	–	8:42	8:50	8:57	9:09	9:14	9:22
9:05	9:12	9:21	9:27	9:35	9:42	9:54	9:59	10:07
9:55	10:02	10:11	10:17	10:25	10:32	10:44	10:49	10:57
10:45	10:52	11:01	11:07	11:15	11:22	11:34	11:39	11:47
11:35	11:42	11:51	11:57	**12:05**	**12:12**	**12:24**	**12:29**	**12:37**
12:25	**12:32**	**12:41**	**12:47**	**12:55**	**1:02**	**1:14**	**1:19**	**1:27**
1:15	**1:22**	**1:31**	**1:37**	**1:45**	**1:52**	**2:04**	**2:09**	**2:17**
2:05	**2:12**	**2:21**	**2:27**	**2:35**	**2:42**	**2:54**	**2:59**	**3:07**
2:55	**3:02**	**3:11**	**3:17**	**3:25**	**3:32**	**3:44**	**3:49**	**3:57**
3:45	**3:52**	**4:01**	**4:07**	**4:15**	**4:22**	**4:34**	**4:39**	**4:47**
4:35	**4:40**	**4:46**	**4:51**	–	–	–	–	–

To BELLFLOWER–Southbound

RIO HONDO COLLEGE	NORWALK / WHITTIER	NORWALK/ WASHINGTON	PIONEER/ GLENWORTH	NORWALK/ IMPERIAL	PIONEER/ ROSECRANS	PIONEER/ ALONDRA	ALONDRA/ STUDEBAKER	FLOWER/ BELLFLOWER	CLARK/ ROSECRANS	WOODRUFF/ ROSECRANS
1	2	3	4	5	6	7	8	9	10	11
–	–	–	–	8:25	8:31	8:37	8:43	8:50	8:56	9:00
8:42	8:51	8:56	9:07	9:15	9:21	9:27	9:33	9:40	9:46	9:50
9:32	9:41	9:46	9:57	10:05	10:11	10:17	10:23	10:30	10:36	10:40
10:17	10:26	10:31	10:42	10:50	10:56	11:02	11:08	11:15	11:21	11:25
11:07	11:16	11:21	11:32	11:40	11:46	11:52	11:58	**12:05**	**12:11**	**12:15**
11:57	**12:06**	**12:11**	**12:22**	**12:30**	**12:36**	**12:42**	**12:48**	**12:55**	**1:01**	**1:05**
12:47	**12:56**	**1:01**	**1:12**	**1:20**	**1:26**	**1:32**	**1:38**	**1:45**	**1:51**	**1:55**
1:37	**1:46**	**1:51**	**2:02**	**2:10**	**2:16**	**2:22**	**2:28**	**2:35**	**2:41**	**2:45**
2:27	**2:36**	**2:41**	**2:52**	**3:00**	**3:06**	**3:12**	**3:18**	**3:25**	**3:31**	**3:35**
3:17	**3:26**	**3:31**	**3:42**	**3:50**	**3:56**	**4:02**	**4:08**	**4:15**	**4:21**	**4:25**
4:17	**4:26**	**4:31**	**4:42**	**4:50**	–	–	–	–	–	–
5:02	**5:11**	**5:16**	**5:27**	**5:35**	–	–	–	–	–	–

PM times are indicated in bold. *(Horas después del medio día aparecen con números resaltados)*

We'll get you there!
¡Lo llevaremos ahí!

norwalk transit

CITY OF NORWALK
A Connected Community

Route 7
Green Line Station/
El Monte Station, Formerly
Metro Line 270
Ruta 7



Effective June 27, 2016 Efectivo el 27 de junio 2016

NORWALK TRANSIT FARE POLICY

Adult Fare 1.25
Student (Grade K-12) 1.00
Senior (Age 62 & older) / Disabled / Medicare
Card Holder 0.60
Two children under 5 ride free when accompanied by an adult paying one full fare.
NTS Local Transfer 0.50
Interagency Transfer 0.50
(Transfers are additional. Interagency transfers are accepted only at transfer points. Coach operator does not make change.)

EZ transit passes, and TAP cards with sufficient NTS stored value are accepted on Norwalk Transit buses. Also, Metro 30-Day, and Day passes loaded onto a TAP card will be accepted on Norwalk Transit Route 7 only (effective 6/27/16 thru 6/27/17).

For more information about NTS service, please call (562) 929-5550.

DIAL-A-RIDE

The Norwalk Transit System (NTS) also provides curb-to-curb service to qualified physically challenged riders and those age 60 and above in Norwalk. The fare is $1.00 for a one-way trip. Dial-A-Ride trips must be scheduled in advance.

POLÍTICA DE PASAJES DE NORWALK TRANSIT

Tarifa de Adulto 1.25
Estudiante (Grado K-12) 1.00
Adultos mayores (62 años o más)/Incapacitados/
Titular de la Tarjeta de Medicare 0.60
Dos niños menores de 5 años viajan gratis cuando están acompañados por un adulto que pague pasaje completo.

Trasbordo local de NTS 0.50
Trasbordo entre Agencias 0.50
(Los trasbordos son adicionales. Los trasbordos entre agencias solo se aceptan en los puntos de trasbordo. El Conductor del autobús no le da cambio.)

Pases EZ transit, y las tarjetas TAP con suficiente valor almacenado de NTS son aceptadas en los autobuses de Norwalk Transit. También pases de Metro del día y de 30 días cargadas en una tarjeta de TAP solamente se aceptaran en la Ruta 7 de NTS (efectivo 6/27/16 hasta 6/27/17).

Para más información de los servicios de NTS, por favor llame al (562) 929-5550.

MARQUE PARA UN AVENTÓN (DIAL-A-RIDE)

Norwalk Transit System (NTS) también proporciona servicios de curvaa- curva para residentes de Norwalk que son mayores de 60 años o que cumplan los requisitos como pasajeros con desafío físico. El viaje de ida cuesta $1.00. Los viajes de Marque Para Un Aventón deben ser reservados con anticipación.

More than 40 years of dedicated transit service for the City of Norwalk and surrounding communities.

Más de 40 años dedicados al servicio de tránsito para la ciudad de Norwalk y las comunidades circundantes.



Holiday Schedule

There will be no service for Route 7 on Sunday and the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

(Horarios de domingo y días feriados: No hay servicio en domingo, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day y Christmas Day.)

norwalk transit

www.norwalk.org/norwalktransit
(562) 929-5550

HWDS 11/2019

Route 7

Ruta 7



WEEKDAY SCHEDULE *Servicio Entre Semana*

PM times are indicated in bold. *(Horas después del medio día aparecen con números resaltados)*

NORTHBOUND

NORWALK GREEN LINE STATION	BLOOMFIELD/ IMPERIAL	BLOOMFIELD/ TELEGRAPH	MAR VISTA/ GREENLEAF	WORKMAN MILL/ COLLEGE	PECK/ELLIOTT	EL MONTE BUS STATION
1	2	3	4	5	6	7
–	–	4:07	4:20	4:34	4:44	4:54
–	–	4:52	5:05	5:20	5:30	5:40
5:19	5:35	5:38	5:51	6:08	6:19	6:30
6:03	6:19	6:22	6:35	6:54	7:06	7:18
6:42	6:58	7:04	7:19	7:40	7:52	8:05
7:30	7:46	7:54	8:09	8:28	8:40	8:53
8:25	8:40	8:46	9:01	9:20	9:31	9:45
9:18	9:34	9:39	9:54	10:13	10:24	10:39
–	–	–	–	10:57	11:08	11:23
10:19	10:35	10:40	10:55	11:14	11:25	11:40
–	–	–	–	11:47	11:58	12:14
11:07	11:23	11:28	11:44	**12:03**	**12:14**	**12:30**
–	–	–	–	**12:38**	**12:49**	**1:05**
11:54	**12:10**	**12:15**	**12:31**	**12:51**	**1:02**	**1:18**
–	–	–	–	**1:29**	**1:40**	**1:56**
12:45	**1:01**	**1:06**	**1:22**	**1:42**	**1:53**	**2:09**
–	–	–	–	**2:24**	**2:36**	**2:52**
1:40	**1:56**	**2:02**	**2:18**	**2:38**	**2:50**	**3:06**
–	–	–	–	**3:19**	**3:31**	**3:47**
2:43	**3:00**	**3:06**	**3:23**	**3:44**	**3:56**	**4:12**
–	–	–	–	**4:13**	**4:25**	**4:41**
3:34	**3:53**	**3:58**	**4:14**	**4:35**	**4:47**	**5:03**
–	–	–	–	**5:05**	**5:17**	**5:33**
4:23	**4:42**	**4:47**	**5:03**	**5:23**	**5:35**	**5:51**
–	–	–	–	**5:58**	**6:10**	**6:24**
5:17	**5:37**	**5:42**	**5:56**	**6:16**	**6:28**	**6:42**
6:22	**6:41**	**6:44**	**6:58**	**7:16**	**7:26**	**7:38**
7:32	**7:48**	**7:51**	**8:04**	**8:21**	**8:31**	**8:42**

SOUTHBOUND

EL MONTE BUS STATION	PECK/ELLIOTT	WORKMAN MILL/ COLLEGE	MAR VISTA/ GREENLEAF	BLOOMFIELD / TELEGRAPH	BLOOMFIELD IMPERIAL	NORWALK GREEN LINE STATION
1	2	3	4	5	6	7
5:21	5:30	5:39	5:55	6:07	6:12	6:25
6:12	6:22	6:32	6:49	7:02	7:07	7:22
6:20	6:30	6:40	–	–	–	–
6:38	6:48	6:58	–	–	–	–
7:01	7:11	7:22	7:41	7:54	7:59	8:14
7:17	7:26	7:37	–	–	–	–
7:42	7:53	8:04	–	–	–	–
7:56	8:07	8:18	8:37	8:50	8:55	9:09
8:37	8:48	8:59	–	–	–	–
8:56	9:07	9:18	9:37	9:50	9:55	10:09
9:26	9:38	9:48	–	–	–	–
9:42	9:54	10:03	10:22	10:35	10:40	10:54
10:15	10:27	10:38	–	–	–	–
10:29	10:41	10:52	11:11	11:24	11:29	11:43
11:20	11:32	11:43	**12:02**	**12:15**	**12:20**	**12:34**
12:14	**12:26**	**12:37**	**12:56**	**1:09**	**1:15**	**1:29**
1:16	**1:28**	**1:40**	**1:59**	**2:12**	**2:18**	**2:32**
2:07	**2:19**	**2:30**	**2:50**	**3:03**	**3:09**	**3:23**
2:55	**3:07**	**3:18**	**3:38**	**3:51**	**3:57**	**4:12**
3:49	**4:01**	**4:12**	**4:32**	**4:45**	**4:51**	**5:06**
4:47	**4:59**	**5:10**	**5:30**	**5:42**	**5:48**	**6:03**
5:51	**6:03**	**6:14**	**6:34**	**6:46**	**6:52**	**7:06**
6:41	**6:53**	**7:04**	**7:22**	**7:34**	**7:42**	**7:52**
7:25	**7:35**	**7:45**	**8:02**	**8:13**	**8:18**	**8:31**
8:08	**8:18**	**8:27**	**8:43**	**8:54**	**8:59**	**9:11**

SATURDAY SCHEDULE *Servicio el Sabado*

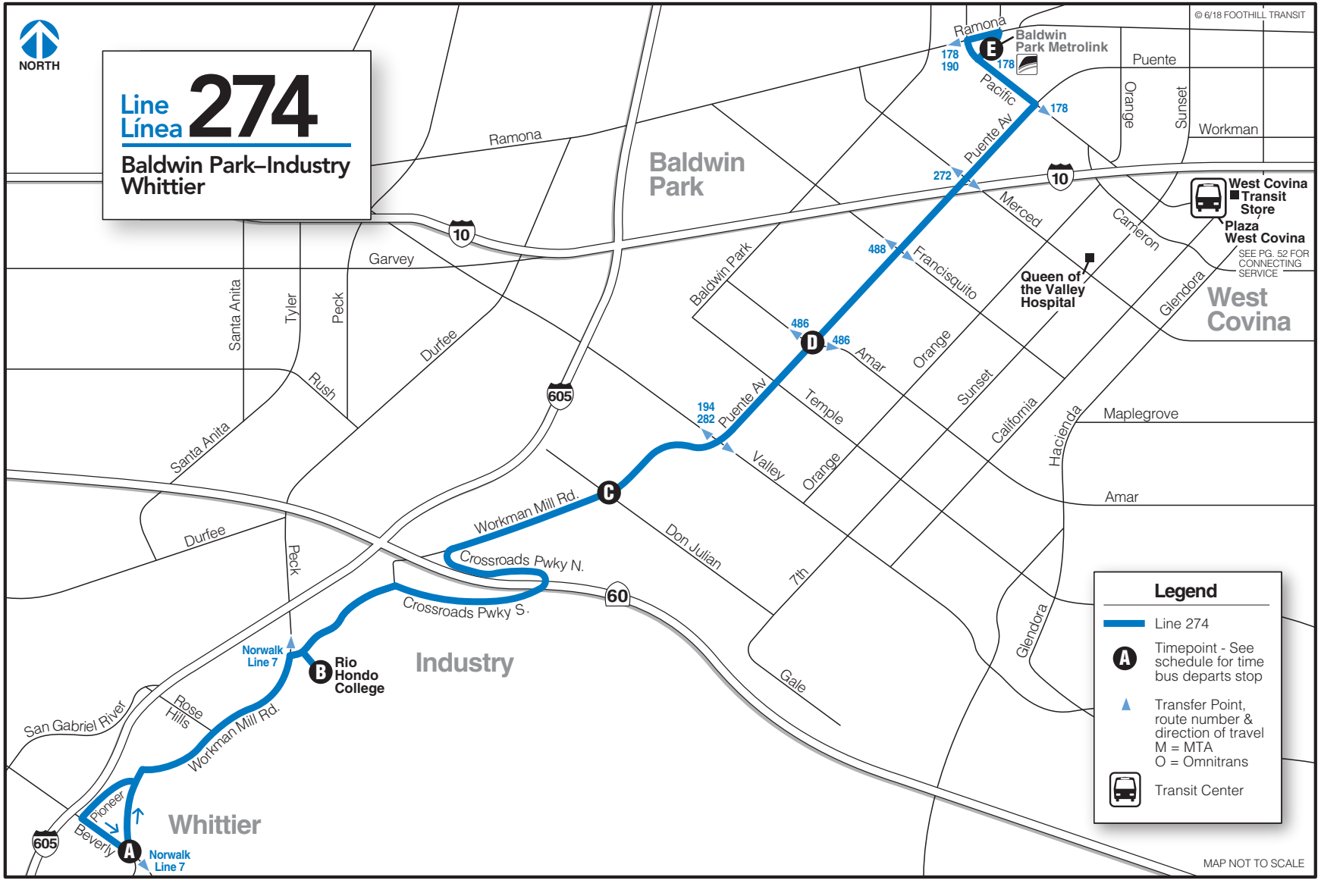
NORTHBOUND

NORWALK GREEN LINE STATION	BLOOMFIELD/ IMPERIAL	BLOOMFIELD/ TELEGRAPH	MAR VISTA/ GREENLEAF	WORKMAN MILL/ COLLEGE	PECK/ELLIOTT	EL MONTE BUS STATION
1	2	3	4	5	6	7
5:49	6:01	6:04	6:14	6:27	6:37	6:47
6:42	6:54	6:57	7:07	7:22	7:32	7:42
7:31	7:45	7:48	8:00	8:17	8:27	8:38
8:23	8:39	8:42	8:55	9:12	9:22	9:34
9:23	9:39	9:42	9:55	10:12	10:22	10:34
10:21	10:37	10:40	10:54	11:11	11:21	11:34
11:19	11:35	11:38	11:53	**12:10**	**12:21**	**12:34**
12:18	**12:35**	**12:38**	**12:53**	**1:10**	**1:21**	**1:34**
1:18	**1:36**	**1:39**	**1:53**	**2:10**	**2:21**	**2:34**
2:20	**2:37**	**2:40**	**2:54**	**3:11**	**3:21**	**3:34**
3:22	**3:39**	**3:42**	**3:55**	**4:12**	**4:22**	**4:34**
4:24	**4:40**	**4:44**	**4:57**	**5:13**	**5:23**	**5:34**
5:26	**5:41**	**5:45**	**5:58**	**6:14**	**6:24**	**6:35**
6:32	**6:47**	**6:51**	**7:04**	**7:19**	**7:28**	**7:37**

SOUTHBOUND

EL MONTE BUS STATION	PECK/ELLIOTT	WORKMAN MILL/ COLLEGE	MAR VISTA/ GREENLEAF	BLOOMFIELD/ TELEGRAPH	BLOOMFIELD IMPERIAL	NORWALK GREEN LINE STATION
1	2	3	4	5	6	7
–	–	–	6:35	6:46	6:50	7:02
7:03	7:12	7:21	7:36	7:47	7:51	8:03
8:03	8:13	8:22	8:37	8:49	8:53	9:08
9:03	9:13	9:22	9:37	9:49	9:53	10:07
10:03	10:14	10:24	10:40	10:52	10:56	11:11
11:03	11:14	11:24	11:41	11:53	11:57	**12:12**
12:03	**12:14**	**12:24**	**12:41**	**12:53**	**12:58**	**1:12**
1:03	**1:14**	**1:24**	**1:41**	**1:53**	**1:58**	**2:12**
2:03	**2:14**	**2:24**	**2:41**	**2:53**	**2:58**	**3:12**
3:03	**3:14**	**3:23**	**3:39**	**3:51**	**3:56**	**4:09**
4:03	**4:14**	**4:23**	**4:39**	**4:51**	**4:56**	**5:08**
5:03	**5:14**	**5:23**	**5:39**	**5:50**	**5:53**	**6:07**
5:59	**6:09**	**6:18**	**6:33**	**6:43**	**6:46**	**7:00**
6:57	**7:07**	**7:16**	**7:30**	**7:40**	**7:43**	**7:57**

PM times are indicated in bold. *(Horas después del medio día aparecen con números resaltados)*


NORTH
Line 274
Línea 274
Baldwin Park–Industry
Whittier
© 6/18 FOOTHILL TRANSIT
Ramona
Baldwin Park
Baldwin Park Metrolink
178
190
178
178
Pacific
Puente
Orange
Sunset
Workman
Puente Av
272
10
West Covina Transit Store
Plaza West Covina
SEE PG. 52 FOR CONNECTING SERVICE
Merced
Cameron
488
Francisquito
Queen of the Valley Hospital
West Covina
Glendora
Baldwin Park
Garvey
Santa Anita
Tyler
Peck
Durfee
Rush
605
486
D
486
Amar
Orange
Sunset
194
282
Puente Av
Temple
California
Hacienda
Maplegrove
Amar
Valley
Orange
Santa Anita
Workman Mill Rd.
C
Durfee
Peck
Crossroads Pwky N.
Don Julian
7th
Crossroads Pwky S.
60
Norwalk Line 7
B
Rio Hondo College
Industry
Glendora
Gale
San Gabriel River
Rose Hills
Workman Mill Rd.
Pioneer
Beverly
605
A
Norwalk Line 7
Whittier
Legend
Line 274
Timepoint - See schedule for time bus departs stop
Transfer Point, route number & direction of travel
M = MTA
O = Omnitrans
Transit Center
MAP NOT TO SCALE

Line-Línea

274

NORTHBOUND/EN DIRECCíON NORTE

WHITTIER TO BALDWIN PARK
WHITTIER HACIA BALDWIN PARK

WEEKDAY
ENTRE SEMANA

Beverly Blvd. & Norwalk Blvd.	Rio Hondo College	Workman Mill Rd. & Don Julian Rd.	Puente Ave. & Amar Rd.	Baldwin Park Metrolink
A	B	C	D	E
5:00	5:04	5:13	5:18	5:37
6:00	6:04	6:13	6:18	6:37
6:55	6:59	7:08	7:13	7:32
7:55	7:59	8:08	8:13	8:32
8:55	8:59	9:08	9:13	9:32
9:55	9:59	10:08	10:13	10:32
10:55	10:59	11:08	11:13	11:32
11:55	11:59	**12:08**	**12:13**	**12:32**
12:55	**12:59**	**1:08**	**1:13**	**1:32**
1:55	**1:59**	**2:08**	**2:13**	**2:32**
2:55	**2:59**	**3:08**	**3:13**	**3:32**
3:55	**3:59**	**4:08**	**4:13**	**4:32**
4:55	**4:59**	**5:08**	**5:13**	**5:32**
5:55	**5:59**	**6:08**	**6:13**	**6:32**
6:55	**6:59**	**7:08**	**7:13**	**7:32**
7:55	**7:59**	**8:08**	**8:13**	**8:32**
8:55	**8:59**	**9:08**	**9:13**	**9:32**

WEEKEND/HOLIDAY
FIN DE SEMANA Y DÍA FESTIVO

A	B	C	D	E
6:00	6:05	6:12	6:16	6:36
7:30	7:35	7:42	7:46	8:06
9:00	9:05	9:12	9:16	9:36
10:30	10:35	10:42	10:46	11:06
11:15	11:20	11:27	11:31	11:51
12:00	**12:05**	**12:12**	**12:16**	**12:36**
12:45	**12:50**	**12:57**	**1:01**	**1:21**
1:30	**1:35**	**1:42**	**1:46**	**2:06**
2:15	**2:20**	**2:27**	**2:31**	**2:51**
3:00	**3:05**	**3:12**	**3:16**	**3:36**
3:45	**3:50**	**3:57**	**4:01**	**4:21**
4:30	**4:35**	**4:42**	**4:46**	**5:06**
6:00	**6:05**	**6:12**	**6:16**	**6:36**

LIGHT TYPE = AM
BOLD TYPE = PM

Line-Línea

274

SOUTHBOUND/EN DIRECCíON SUR

BALDWIN PARK TO WHITTIER
BALDWIN PARK HACIA WHITTIER

WEEKDAY
ENTRE SEMANA

Baldwin Park Metrolink	Puente Ave. & Amar Rd.	Workman Mill Rd. & Don Julian Rd.	Rio Hondo College	Beverly Blvd. & Norwalk Blvd.
E	D	C	B	A
5:00	5:09	5:14	5:24	5:38
6:00	6:09	6:14	6:24	6:38
6:30	6:39	6:44	6:54	7:08
7:00	7:09	7:14	7:24	7:38
8:00	8:09	8:14	8:24	8:38
9:00	9:09	9:14	9:24	9:38
10:00	10:09	10:14	10:24	10:38
11:00	11:09	11:14	11:24	11:38
12:00	**12:09**	**12:14**	**12:24**	**12:38**
1:00	**1:10**	**1:15**	**1:25**	**1:39**
2:00	**2:10**	**2:15**	**2:25**	**2:39**
3:00	**3:11**	**3:16**	**3:26**	**3:40**
4:00	**4:11**	**4:16**	**4:26**	**4:40**
5:00	**5:11**	**5:16**	**5:26**	**5:40**
6:00	**6:11**	**6:16**	**6:26**	**6:40**
7:00	**7:10**	**7:15**	**7:25**	**7:39**
8:00	**8:10**	**8:15**	**8:25**	**8:39**

WEEKEND/HOLIDAY
FIN DE SEMANA Y DÍA FESTIVO

E	D	C	B	A
6:43	6:53	6:59	7:06	7:18
8:13	8:23	8:29	8:36	8:48
9:43	9:53	9:59	10:06	10:18
10:28	10:38	10:44	10:51	11:03
11:13	11:23	11:29	11:36	11:48
11:58	**12:08**	**12:14**	**12:21**	**12:33**
12:43	**12:53**	**12:59**	**1:06**	**1:18**
1:28	**1:38**	**1:44**	**1:51**	**2:03**
2:13	**2:23**	**2:29**	**2:36**	**2:48**
2:58	**3:08**	**3:14**	**3:21**	**3:33**
3:43	**3:53**	**3:59**	**4:06**	**4:18**
4:28	**4:38**	**4:44**	**4:51**	**5:03**
5:13	**5:23**	**5:29**	**5:36**	**5:48**

Appendix G

Highway Design Manual Standards

PRIVATE STREET STANDARDS

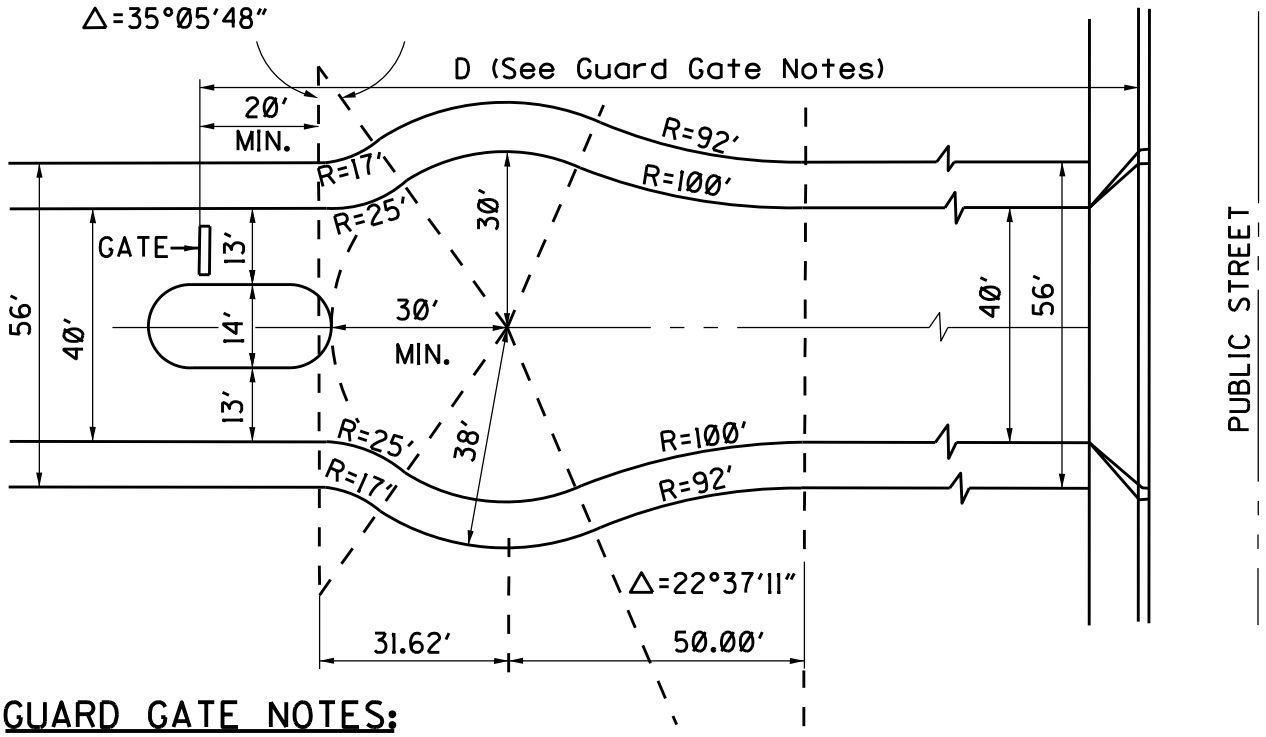
NOTES:

1. Private streets shall be permitted only as described in the Orange County Subdivision Code, subject to review and approval by the Engineer, the Subdivision Committee, and the Planning Commission.

2. Private streets shall provide a paved travel way in conformance with Std. Plan 1107. Walkways shall be provided on all private streets in conformance with Std. Plans 1107 and 1205 unless an alternate pedestrian circulation system is provided meeting the approval of the Engineer.

3. Required pavement structural section shall be determined by the Engineer.

4. Entryways to private tracts shall be designed to emphasize their private status. Textured concrete or wide flare driveways, guard gates or other access controls shall be required for private tracts. Entry gates shall be set back from the near curb line of any public street to provide a minimum 100 feet of storage for entering vehicles to stack without interfering with through traffic. Minimum design criteria and required features for guard gates are shown below:



GUARD GATE NOTES:

1. D= 1 foot Per Dwelling Unit Served, 100 feet Minimum
   (Multiple Lanes may be used to satisfy storage distance requirement).

COUNTY OF ORANGE, OC PUBLIC WORKS DEPARTMENT

Approved _____
Ignacio G. Ochoa, Chief Engineer

Revision: April 2013

STD. PLAN

1107

SHT. 3 OF 4

OTHER STREET IMPROVEMENTS

CHAPTER 100 – BASIC DESIGN POLICIES

Topic 101 – Design Speed

101.1 Selection of Design Speed

Design Speed is a speed selected to establish specific minimum geometric design elements for a particular section of street or highway. Design elements include things such as sight distance and horizontal and vertical alignment. Design Speed represents the maximum reasonable or prudent speed that can be maintained when conditions (weather, environment, traffic, etc.) are so favorable that the design elements of the street or highway govern.

The Design Speed for a street or highway is dependent upon the type of street or highway under design. Orange County has street and arterial highway classifications progressing from local streets, which are primarily to provide traffic access (with corresponding lower speeds) to principal arterial highways, which are primarily to provide traffic movement (with corresponding higher speeds).

101.2 Design Speed Standards and Definitions
(Design Speed Standards)

Listed below are the classifications and corresponding design speeds for streets and highways in Orange County.

Classification	Minimum Design Speed (MPH)	Reference
Transportation Corridor	70	Caltrans
Principal Arterial Highway	60	SP1100
Major Arterial Highway	60	SP1101
Primary Arterial Highway	55	SP1103
Secondary Arterial Highway	50	SP1105
Rural Secondary Highway	50	SP1108
Commuter Arterial Highway	45	SP1107
Industrial/Commercial Collector Street	35	SP1107
Rural Collector Street	35	SP1109
Residential Collector Street	35	SP1107
Industrial/Commercial Local Street	25	SP1107
Rural Local Street	25	SP1110
Residential Local Street	25	SP1107

(1) Transportation Corridor

A Transportation Corridor is a multimodal facility, having four to twelve lanes based on projected traffic volumes and a median of sufficient width to be utilized in the future for transit considerations such as fixed rail or high occupancy vehicles. Transportation Corridors will provide for high speed movement of vehicular traffic where projected volumes exceed Principal Arterial capacities. Transportation Corridors are depicted on the Circulation Plan and the Master Plan of Arterial Highways (MPAH) map as either conceptually proposed or established alignments. These routes will function similar to freeways and expressways and might eventually

be incorporated into the freeway and expressway system. Therefore, they are designed to meet minimum State and Federal standards.

(2) Arterial Highway

The MPAH serves primarily to indicate the general location and classification of all arterial highways and transportation corridors designed within Orange County. The purpose of these highways is to provide regional circulation which transcends city boundaries and provides an integrated roadway network serving the entire County and extending outside the County boundaries. In 1995, the Orange County Transportation Authority (OCTA) became the steward of the MPAH. OCTA's role is to coordinate with the cities to develop a consistent intercommunity highway system which will adequately serve existing and projected future land uses. The Transportation Corridors and Arterial Highways within the Unincorporated County of Orange are shown on the County of Orange Circulation Plan.

The typical sections shown on the Circulation Plan legend are simplified diagrams based upon adopted Orange County design standards. For more detailed typical sections refer to the Orange County Standard Plans. For definitions of Level of Service refer to topic 102. The following are definitions of highway classifications in Orange County:

(a) A PRINCIPAL Arterial Highway is designated as a eight-lane divided roadway with a typical right of way width of 144 feet and a roadway width from curb to curb of 126 feet. A Principal has a planned capacity to accommodate between 45,000 to 60,000 vehicle trips per day at level of service C or better. Principal Arterials carry a large volume of regional through traffic not handled by the freeway system.

(b) A MAJOR Arterial Highway is designed as a six-lane divided roadway, with a typical right of way width of 120 feet and a roadway width from curb to curb of 102 feet. A Major has a planned capacity to accommodate between 30,000 and 45,000 vehicle trips per day at level of service C or better. A Major Arterial's function is similar to that of a Principal Arterial. The principal difference is capacity.

A MODIFIED MAJOR Arterial Highway is designed to accommodate traffic volumes when a Major Arterial Highway is warranted in already developed areas, but a full 120 feet of right of way is not feasible due to existing structures or topography. The use of a MODIFIED MAJOR Arterial Highway and any deviation to the standards of design shall require Chief Engineer's approval.

(c) A PRIMARY Arterial Highway is designed as a four–lane divided roadway, with a typical right of way width of 100 feet and a roadway width from curb to curb of 84 feet. A Primary has a planned capacity to accommodate between 20,000 and 30,000 vehicle trips per day at level of service C or better. A Primary Arterial's function is similar to that of a Principal Arterial. The principal difference is capacity.

A MODIFIED PRIMARY Arterial Highway is designed to accommodate traffic volumes when a Primary arterial Highway is warranted in already developed areas, but a full 100 feet of right of way is not feasible due to existing structures or topography. The use of a MODIFIED PRIMARY Arterial Highway and any deviation to the standards of design shall require Chief Engineer's approval.

(d) A SECONDARY Arterial Highway is designed as a four-lane undivided (no median) roadway, with a typical right of way width of 80 feet and a roadway width from curb to curb of 64 feet. A Secondary has a planned capacity to accommodate between 10,000 and 20,000 vehicle trips per day at level of service C or better. A Secondary Arterial serves as a collector, distributing traffic between local streets and Principal, Major and Primary Arterials. Although some Secondary Arterials serve as through routes, most provide more direct access from surrounding land uses than do Principal, Major or Primary Arterials.

(e) A RURAL SECONDARY Arterial Highway is designed as a four-lane undivided (no median) roadway through a rural area, with a typical right of way width of 80 feet and roadway width from edge of pavement to edge of pavement of 64 feet. If asphalt concrete dikes (curbs) are placed at the edge of pavement, the 64 feet shall be measured from the front of dike. A Rural Secondary has a planned capacity to accommodate between 10,000 and 20,000 vehicle trips per day at level of service C or better. This highway is characterized by not having concrete curb, gutter and sidewalk. The drainage is handled by asphalt concrete dikes (curbs) or drainage ditch(es) at the side of the highway. This section shall only be used in approved areas.

(f) A COMMUTER Arterial Highway is designed as a two-lane undivided, restricted access roadway, with a typical right of way width of 56 feet and a roadway width from curb to curb of 40 feet. A Commuter has a planned capacity to accommodate up to 10,000 vehicle trips per day at level of service C or better.

(3) Collector Streets

(a) INDUSTRIAL/COMMERCIAL COLLECTOR Street – A non-arterial four-lane undivided highway with a planned capacity between 4,000 and 10,000 vehicle trips per day. This section is primarily used in industrial zoned areas but is also useful in some office and commercial areas.

(b) RURAL COLLECTOR Street – A non-arterial street through a rural area, with a planned capacity between 500 and 6,000 vehicle trips per day. This street is characterized by not having concrete curb, gutter and sidewalk. The drainage is handled by asphalt concrete dikes (curbs) or drainage ditch(es) at the side of the street. This section shall only be used in approved areas.

(c) RESIDENTIAL COLLECTOR Street – A non-arterial street, normally through a residential area, designed to collect traffic from local streets and distribute it onto arterials and with a planned capacity between 1,200 and 6,000 vehicle trips per day. Residential collectors shall not have residential frontage.

(4) Local Streets

(a) INDUSTRIAL/COMMERCIAL LOCAL Street – A non-arterial street that may be striped for either four-lanes or two-lanes with parking lanes and a median lane having a planned capacity less than 4,000 vehicle trips per day. This section is used the same way as the industrial collector, except it is used for lower traffic volumes.

(b) RURAL LOCAL Street – A non-arterial street through a rural area with a planned capacity of less than 500 vehicle trips per day. This street is characterized by not having concrete curb, gutter and sidewalk. The drainage is handled by asphalt concrete dikes (curbs) or drainage ditch(es) at the side of the street. This section shall only be used in approved areas.

(c) RESIDENTIAL LOCAL Street – A non-arterial street with direct residential frontage having a planned capacity of less than 1,200 vehicle trips per day.

Topic 102 – Highway Capacity

102.1 Design Capacities

Design capacity is the maximum volume of traffic a highway is designed to carry at a selected level of service. In Orange County, the goal for design capacity is to provide a level of service C on arterial highway links (a link is the portion of the roadway between two arterial intersections) with the intent of maintaining a level of service D through intersections.

There are several factors that affect the capacity of a highway including the following:

- Grades.
- Width of lanes.
- Level of service selected.
- Number of lanes.
- Presence or absence of shoulders.
- Spacing and timing of traffic signals.
- Volumes of trucks, buses, and recreational vehicles.
- Side friction generated by parking, driveways, intersections, and interchanges.
- Operating speed.
- Lateral clearance.
- Sight distance.
- Pedestrian and bicycle traffic
- Horizontal and vertical alignment.

(1) Highway Capacity Values

Table 102.1 is used for planning the highway system at the General Plan level. In most cases it should also be adequate for design level work. If a more complete analysis of capacity is needed, see Section 102.2.

TABLE 102.1

HIGHWAY CAPACITY VALUES

Transportation Corridors

Lane Configuration	Levels of Service* D
12 lanes divided	205,000
10 lanes divided	175,000
8 lanes divided	145,000
6 lanes divided	115,000
4 lanes divided	65,000

Arterial Highways

Type of Arterial	Lane Configuration	Levels of Service*					
		A	B	C	D	E	F
Principal	8 lanes divided	45,000	52,500	60,000	67,500	75,000	-
Major	6 lanes divided	33,900	39,400	45,000	50,600	56,300	-
Primary	4 lanes divided	22,500	26,300	30,000	33,600	37,500	-
Secondary	4 lanes undivided	15,000	17,500	20,000	22,500	25,000	-
Commuter	2 lanes undivided	7,500	8,800	10,000	11,300	12,500	-

*The volumes shown in the table above are daily two way traffic volumes and assume that the highways are built to their ultimate typical section as shown in the Standard Plans.

(2) Levels of Service

Levels of service are usually defined as A thru F. Beyond level of service E, capacity has been exceeded, and arriving traffic will exceed the ability of a given street to accommodate it. A description of the meaning of the six Levels of Service (LOS) follows:

(a) Level of Service A indicates no physical restriction on operating speeds.

(b) Level of Service B indicates stable flow with few restrictions on operating speed.

(c) Level of Service C indicates stable flow and more restrictions on speed and lane changing due to higher volumes of traffic.

(d) Level of Service D indicates approaching unstable flow conditions with little freedom to maneuver and which may be tolerable for short periods.

(e) Level of Service E is the absolute capacity of the road. It is characterized by unstable flow, lower operating speeds than LOS D, and some momentary stoppages.

(f) Level of Service F indicates forced flow operation (more traffic demand than there is capacity on the road) where the highway acts as a storage area and many stoppages occur.

CHAPTER 200 GEOMETRIC DESIGN AND STRUCTURE STANDARDS

Topic 201 - Sight Distance

Index 201.1 - General

Sight distance is the continuous length of highway ahead, visible to the highway user. Four types of sight distance are considered herein: passing, stopping, decision, and corner. Passing sight distance is used where use of an opposing lane can provide passing opportunities (see Index 201.2). Stopping sight distance is the minimum sight distance for a given design speed to be provided on multilane highways and on 2-lane roads when passing sight distance is not economically obtainable. Stopping sight distance also is to be provided for all users, including motorists and bicyclists, at all elements of interchanges and intersections at grade, including private road connections (see Topic 504, Index 405.1, & Figure 405.7). Decision sight distance is used at major decision points (see Indexes 201.7 and 504.2). Corner sight distance is used at intersections (see Index 405.1, Figure 405.7, and Figure 504.3I).

Table 201.1 shows the minimum standards for stopping sight distance related to design speed for motorists. Stopping sight distances given in the table are suitable for Class II and Class III bikeways. The stopping sight distances are also applicable to roundabout design on the approach roadway, within the circulatory roadway, and on the exits prior to the pedestrian crossings. Also shown in Table 201.1 are the values for use in providing passing sight distance.

See Chapter 1000 for Class I bikeway sight distance guidance.

Chapter 3 of "A Policy on Geometric Design of Highways and Streets," AASHTO, contains a thorough discussion of the derivation of stopping sight distance.

201.2 Passing Sight Distance

Passing sight distance is the minimum sight distance required for the driver of one vehicle to pass another vehicle safely and comfortably. Passing must be accomplished assuming an oncoming vehicle comes into view and maintains the design speed, without reduction, after the overtaking maneuver is started.

Table 201.1
Sight Distance Standards

Design Speed[1] (mph)	Stopping[2] (ft)	Passing (ft)
10	50	---
15	100	---
20	125	800
25	150	950
30	200	1,100
35	250	1,300
40	300	1,500
45	360	1,650
50	430	1,800
55	500	1,950
60	580	2,100
65	660	2,300
70	750	2,500
75	840	2,600
80	930	2,700

(1) See Topic 101 for selection of design speed.
(2) For sustained downgrades, refer to advisory standard in Index 201.3

The sight distance available for passing at any place is the longest distance at which a driver whose eyes are 3 ½ feet above the pavement surface can see the top of an object 4 ¼ feet high on the road. See Table 201.1 for the calculated values that are associated with various design speeds.

In general, 2-lane highways should be designed to provide for passing where possible, especially those routes with high volumes of trucks or recreational vehicles. Passing should be done on tangent horizontal alignments with constant grades or a slight sag vertical curve. Not only are drivers reluctant to pass on a long crest vertical curve, but it is impracticable to design crest vertical curves to provide for passing sight distance because of high cost where crest cuts are involved. Passing sight

distance for crest vertical curves is 7 to 17 times longer than the stopping sight distance.

Ordinarily, passing sight distance is provided at locations where combinations of alignment and profile do not require the use of crest vertical curves.

Passing sight distance is considered only on 2-lane roads. At critical locations, a stretch of 3- or 4-lane passing section with stopping sight distance is sometimes more economical than two lanes with passing sight distance.

Passing on sag vertical curves can be accomplished both day and night because headlights can be seen through the entire curve.

See Part 3 of the California Manual on Uniform Traffic Control Devices (California MUTCD) for criteria relating to the placement of barrier striping for no-passing zones. Note, that the passing sight distances shown in the California MUTCD are based on traffic operational criteria. Traffic operational criteria are different from the design characteristics used to develop the values provided in Table 201.1 and Chapter 3 of AASHTO, A Policy on Geometric Design of Highways and Streets. The aforementioned table and AASHTO reference are also used to design the vertical profile and horizontal alignment of the highway. Consult the Headquarters (HQ) Traffic Liaison when using the California MUTCD criteria for traffic operating-control needs.

Other means for providing passing opportunities, such as climbing lanes or turnouts, are discussed in Index 204.5. Chapter 3 of AASHTO, A Policy on Geometric Design of Highways and Streets, contains a thorough discussion of the derivation of passing sight distance.

201.3 Stopping Sight Distance

The minimum stopping sight distance is the distance required by the user, traveling at a given speed, to bring the vehicle or bicycle to a stop after an object ½-foot high on the road becomes visible. Stopping sight distance for motorists is measured from the driver's eyes, which are assumed to be 3 ½ feet above the pavement surface, to an object ½-foot high on the road. See Index 1003.1(10) for Class I bikeway stopping sight distance guidance.

The stopping sight distances in Table 201.1 should be increased by 20 percent on sustained downgrades steeper than 3 percent and longer than one mile.

201.4 Stopping Sight Distance at Grade Crests

Figure 201.4 shows graphically the relationships between length of highway crest vertical curve, design speed, and algebraic difference in grades. Any one factor can be determined when the other two are known.

201.5 Stopping Sight Distance at Grade Sags

From the curves in Figure 201.5, the minimum length of vertical curve which provides headlight sight distance in grade sags for a given design speed can be obtained.

If headlight sight distance is not obtainable at grade sags, lighting may be considered. The District approval authority or Project Delivery Coordinator, depending upon the current District Design Delegation Agreement, and the HQ Traffic Liaison shall be contacted to review proposed grade sag lighting to determine if such use is appropriate.

201.6 Stopping Sight Distance on Horizontal Curves

Where an object off the pavement such as a bridge pier, building, cut slope, or natural growth restricts sight distance, the minimum radius of curvature is determined by the stopping sight distance.

Available stopping sight distance on horizontal curves is obtained from Figure 201.6. It is assumed that the driver's eye is 3 ½ feet above the center of the inside lane (inside with respect to curve) and the object is ½-foot high. The line of sight is assumed to intercept the view obstruction at the midpoint of the sight line and 2 feet above the center of the inside lane when the road profile is flat (i.e. no vertical curve). Crest vertical curves can cause additional reductions in sight distance. The clear distance (m) is measured from the center of the inside lane to the obstruction.

The design objective is to determine the required clear distance from centerline of inside lane to a retaining wall, bridge pier, abutment, cut slope, or other obstruction for a given design speed. Using

radius of curvature and minimum sight distance for that design speed, Figure 201.6 gives the clear distance (*m*) from centerline of inside lane to the obstruction.

See Index 1003.1(12) for bikeway stopping sight distance on horizontal curve guidance.

When the radius of curvature and the clear distance to a fixed obstruction are known, Figure 201.6 also gives the sight distance for these conditions.

See Index 101.1 for technical reductions in design speed caused by partial or momentary horizontal sight distance restrictions. See Index 203.2 for additional comments on glare screens.

Cuts may be widened where vegetation restricting horizontal sight distance is expected to grow on finished slopes. Widening is an economic trade-off that must be evaluated along with other options. See Index 902.2 for sight distance requirements on landscape projects.

201.7 Decision Sight Distance

At certain locations, sight distance greater than stopping sight distance is desirable to allow drivers time for decisions without making last minute erratic maneuvers (see Chapter III of AASHTO, A Policy on Geometric Design of Highways and Streets, for a thorough discussion of the derivation of decision sight distance.)

On freeways and expressways the decision sight distance values in Table 201.7 should be used at lane drops and at off-ramp noses to interchanges, branch connections, roadside rests, vista points, and inspection stations. When determining decision sight distance on horizontal and vertical curves, Figures 201.4, 201.5, and 201.6 can be used. Figure 201.7 is an expanded version of Figure 201.4 and gives the relationship among length of crest vertical curve, design speed, and algebraic difference in grades for much longer vertical curves than Figure 201.4.

Decision sight distance is measured using the 3 ½-foot eye height and ½-foot object height. See Index 504.2 for sight distance at secondary exits on a collector-distributor road.

Table 201.7
Decision Sight Distance

Design Speed (mph)	Decision Sight Distance (ft)
30	450
35	525
40	600
45	675
50	750
55	865
60	990
65	1,050
70	1,105
75	1,180
80	1,260

Topic 202 - Superelevation

202.1 Basic Criteria

When a vehicle moves in a circular path, it undergoes a centripetal acceleration that acts toward the center of curvature. This force is countered by the perceived centrifugal force experienced by the motorist.

On a superelevated highway, this force is resisted by the vehicle weight component parallel to the superelevated surface and by the side friction developed between the tires and pavement. It is impractical to balance centrifugal force by superelevation alone, because for any given curve radius a certain superelevation rate is exactly correct for only one driving speed. At all other speeds there will be a side thrust either outward or inward, relative to the curve center, which must be offset by side friction.

If the vehicle is not skidding, these forces are in equilibrium as represented by the following simplified curve equation, which is used to design a curve for a comfortable operation at a particular speed:

(4) Trailer Track – Semitrailer axle width, measured from outside face of tires.

(5) Lock To Lock Time - The time in seconds that an average driver would take under normal driving conditions to turn the steering wheel of a vehicle from the lock position on one side to the lock position on the other side. The default in AutoTurn software is 6 seconds.

(6) Steering Lock Angle - The maximum angle that the steering wheels can be turned. It is further defined as the average of the maximum angles made by the left and right steering wheels with the longitudinal axis of the vehicle.

(7) Articulating Angle - The maximum angle between the tractor and semitrailer.

Topic 405 - Intersection Design Standards

405.1 Sight Distance

(1) Stopping Sight Distance. See Index 201.1 for minimum stopping sight distance requirements.

(2) *Corner Sight Distance.*

(a) General--At unsignalized intersections a substantially clear line of sight should be maintained between the driver of a vehicle, bicyclist or pedestrian waiting at the crossroad and the driver of an approaching vehicle. Line of sight for all users should be included in right of way, in order to preserve sight lines.

Adequate time must be provided for the waiting user to either cross all lanes of through traffic, cross the near lanes and turn left, or turn right, without requiring through traffic to radically alter their speed.

The values given in Table 405.1A provide 7-1/2 seconds for the driver on the crossroad to complete the necessary maneuver while the approaching vehicle travels at the assumed design speed of the main highway. The 7-1/2 second criterion is normally applied to all lanes of through traffic in order to cover all possible maneuvers by the vehicle at the crossroad. However, by providing the standard corner sight distance to the lane nearest to and farthest from the waiting vehicle, adequate time should be obtained to make the necessary movement. On multilane highways a 7-1/2 second criterion for the outside lane, in both directions of travel, normally will provide increased sight distance to the inside lanes. Consideration should be given to increasing these values on downgrades steeper than 3 percent and longer than 1 mile (see Index 201.3), where there are high truck volumes on the crossroad, or where the skew of the intersection substantially increases the distance traveled by the crossing vehicle.

In determining corner sight distance, a set back distance for the vehicle waiting at the crossroad must be assumed. **Set back for the driver of the vehicle on the crossroad shall be a minimum of 10 feet plus the shoulder width of the major road but not less than 15 feet.** Line of sight for corner sight distance is to be determined from a 3 and 1/2-foot height at the location of the driver of the vehicle on the minor road to a 4 and 1/4-foot object height in the center of the approaching lane of the major road as illustrated in Figure 504.3I. If the major road has a median barrier, a 2-foot object height should be used to determine the median barrier set back.

In some cases the cost to obtain 7-1/2 seconds of corner sight distances may be excessive. High costs may be attributable to right of way acquisition, building removal, extensive excavation, or immitigable environmental impacts. In such cases a lesser value of corner sight distance, as described under the following headings, may be used.

(b) Public Road Intersections (Refer to Topic 205)--<u>At unsignalized public road intersections (see Index 405.7) corner sight distance values given in Table 405.1A should be provided.</u>

At signalized intersections the values for corner sight distances given in Table 405.1A should also be applied whenever possible. Even though traffic flows are designed to move at separate times, unanticipated conflicts can occur due to violation of signal, right turns on red, malfunction of the signal, or use of flashing red/yellow mode.

Table 405.1A Corner Sight Distance (7-1/2 Second Criteria)

Design Speed (mph)	Corner Sight Distance (ft)
25	275
30	330
35	385
40	440
45	495
50	550
55	605
60	660
65	715
70	770

Where restrictive conditions exist, similar to those listed in Index 405.1(2)(a), the minimum value for corner sight distance at both signalized and unsignalized intersections shall be equal to the stopping sight distance as given in Table 201.1, measured as previously described.

(c) Private Road Intersections (Refer to Index 205.2) and Rural Driveways (Refer to Index 205.4)--**The minimum corner sight distance shall be equal to the stopping sight distance as given in Table 201.1, measured as previously described.**

(d) Urban Driveways (Refer to Index 205.3)--Corner sight distance requirements as described above are not applied to urban driveways.

(3) Decision Sight Distance. At intersections where the State route turns or crosses another State route, the decision sight distance values given in Table 201.7 should be used. In computing and measuring decision sight distance, the 3.5-foot eye height and the 0.5-foot object height should be used, the object being located on the side of the intersection nearest the approaching driver.

The application of the various sight distance requirements for the different types of intersections is summarized in Table 405.1B.

Table 405.1B Application of Sight Distance Requirements

Intersection Types	Sight Distance		
	Stopping	Corner	Decision
Private Roads	X	X(1)	
Public Streets and Roads	X	X	
Signalized Intersections	X	(2)	
State Route Intersections & Route Direction Changes, with or without Signals	X	X	X

NOTES:

(1) Per Index 405.1(2)(c), the minimum corner sight distance shall be equal to the stopping sight distance as given in Table 201.1. See Index 405.1(2)(a) for setback requirements.

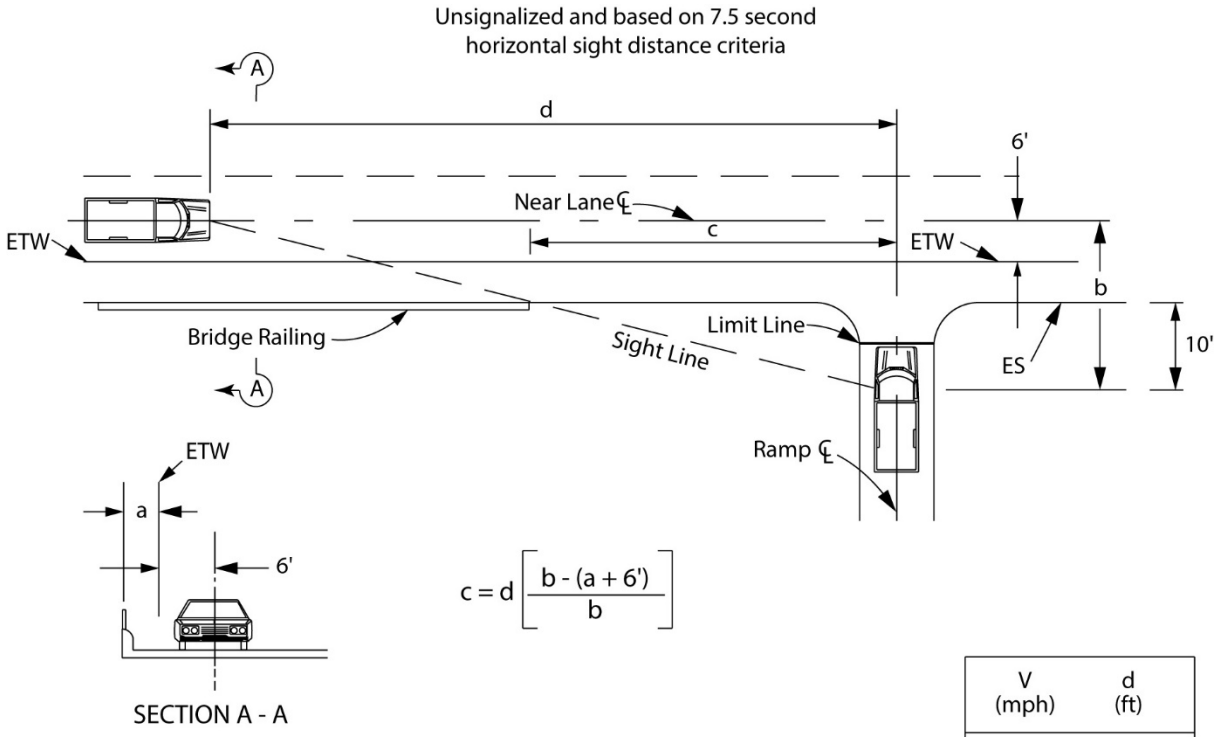
(2) Apply corner sight distance requirements at signalized intersections whenever possible due to unanticipated violations of the signals or malfunctions of the signals. See Index 405.1(2)(b).

(4) Acceleration Lanes for Turning Moves onto State Highways. At rural intersections, with "STOP" control on the local cross road, acceleration lanes for left and right turns onto the State facility should be considered. At a minimum, the following features should be evaluated for both the major highway and the cross road:

- divided versus undivided

Figure 504.3I

Location of Ramp Intersections on the Crossroads



$$c = d\left[\frac{b - (a + 6')}{b}\right]$$

V (mph)	d (ft)
25	275
30	330
35	385
40	440
45	495
50	550
55	605
60	660
65	715
70	770

a = Distance from edge of traveled way to bridge railing.

b = Distance from center of near lane to eye of ramp vehicle driver. Ramp driver's eye is assumed to be located 10′ from the edge of shoulder, but not less than 15′ from the ETW (therefore, b = 6′ + shoulder width + 10′). See Index 405.1.

c = Ramp set back from end of bridge railling.

d = Corner Sight distance along highway from intersection. (See Table above) Sight distance is measured from a 3½′ eye height on the ramp to a 4¼′ object height on the crossroad.

V = Anticipated prevailing speed on crossroad.

NOTE:

(1) See the California MUTCD for limit line placement and guidance.

Appendix J Sanitary Sewer Analysis

“Sanitary Sewer Analysis”

For
Tract 82802
Floral Drive

City of Whittier

Date: April 26, 2020

Governing District: **City of Whittier**
13230 Penn Street
Whittier, CA 91010

Prepared for: **Brandywine Homes**
Contact: Alex Hernandez
16580 Aston
Irvine, CA 92606
949-296-2400

Prepared by: **KES Technologies, Inc**
Contact: Daryl Kessler, 949.339.5331
1 Venture Ste 130
Irvine, CA 92618

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Exhibit (3) .....Proposed Site Plan
Exhibit (4)…….. Vicinity Map
Exhibit (5)…….. Manning's Equation Results
Exhibit (6)…….. As-built plan

Introduction:

The purpose of this Sewer Analysis study is to provide sewer flow calculations for the proposed Housing Project, TM 82802 encompassing 1.26 net acres, in the City of Whittier, California.

The subject project site proposes to construct 26 detached residential units and one church site. Each unit will have its own dedicated sewer lateral joining to the on site private main within the private drive aisles. The private main flows into a sewer lift station that force mains effluent flows to the public right of way in Floral Drive. When the sewer flows into the public right of way it will be in a gravity condition. The church site will connect directly into Floral Drive. The existing site is currently a school site for proposed housing. The church site is currently a church that will be renovated. For the purpose of this study the proposed and existing flows for the church are expected to remain the same

Methodology/Rational:

In accordance with the City of Whittier and the Uniform Plumbing Code, the subject site was designed to accommodate flows based on Estimate Average Daily Sewer Flows per the Los Angeles County Table locate in Appendices 1. Per the existing table the anticipated sewer flow is 300 gallons per day for residential units having 3 or more bedrooms. The total amount of units for the subject site is 26 units resulting in a maximum demand of (26 units * 300 GPD) 7800 GPD or 0.012 cfs. The proposed development will be in addition to the flow monitored maximum flow of 0.049 MGD (0.076 cfs). Therefore the combine flows within the existing 6" line in Floral is 0.088 cfs.

Conclusions:

The results from this sewer analysis using methods provided by the Uniform Plumbing Code, demonstrate that the flows of the subject site, would generate a calculated peak flow of 0.012 cfs resulting in a combine depth of effluent within the existing line in Floral of a maximum of 0.12 feet and a velocity of 2.42 fps.

APPENDIX

Exhibit (1) .....Estimated Average Dailey Sewage Flows for Various Occupancies
Exhibit (2) .....ADS Flow Monitoring
Exhibit (3) .....Proposed Site Plan
Exhibit (4)…….. Vicinity Map
Exhibit (5)…….. Manning's Equation Results
Exhibit (6)…….. As-built plan

Estimated Average Daily Sewage Flows for Various Occupancies

Occupancy	Abbreviation	*Average daily flow	
Apartment Buildings:			
Bachelor or Single dwelling units	Apt	100	gal/D.U. → 150
1 bedroom dwelling units	Apt	150	gal/D.U. → 200
2 bedroom dwelling units	Apt	200	gal/D.U. → 250
3 bedroom or more dwelling units	Apt	250	gal/D.U. → use 300 GPD per SMD
Auditoriums, churches, etc.	Aud	5	gal/seat
Automobile parking	P	25	gal/1000 sq ft gross floor area
Bars, cocktails lounges, etc.	Bar	20	gal/seat
Commercial Shops & Stores	CS	100	gal/1000 sq ft gross floor area
Hospitals (surgical)	HS	500	gal/bed
Hospitals (convalescent)	HC	85	gal/bed
Hotels	H	150	gal/room
Medical Buildings	MB	300	gal/1000 sq ft gross floor area
Motels	M	150	gal/unit
Office Buildings	Off	200	gal/1000 sq ft gross floor area
Restaurants, cafeterias, etc.	R	50	gal/seat
Schools:			
Elementary or Jr. High	S	10	gal/student
High Schools	HS	15	gal/student
Universities or Colleges	U	20	gal/student
College Dormitories	CD	85	gal/student

*Multiply the average daily flow by 2.5 to obtain the peak flow

Zoning Coefficients

Zone	Coefficient (cfs/Acre)
Agriculture	0.001
Residential+:	
R-1	0.004
R-2	0.008
R-3	0.012
R-4	0.016*
Commercial:	
C-1 through C-4	0.015*
Heavy Industrial:	
M1 through M-4	0.021*

*Individual building, commercial or industrial plant capacities shall be the determining factor when they exceed the coefficients shown

+ Use 0.001 (cfs/unit) for condominiums only

Floral Drive Sewer Flow Study 2017
Whittier, CA

October 10, 2017 – October 16, 2017

Final Report Submitted to:
Brandywine Homes
October 30, 2017

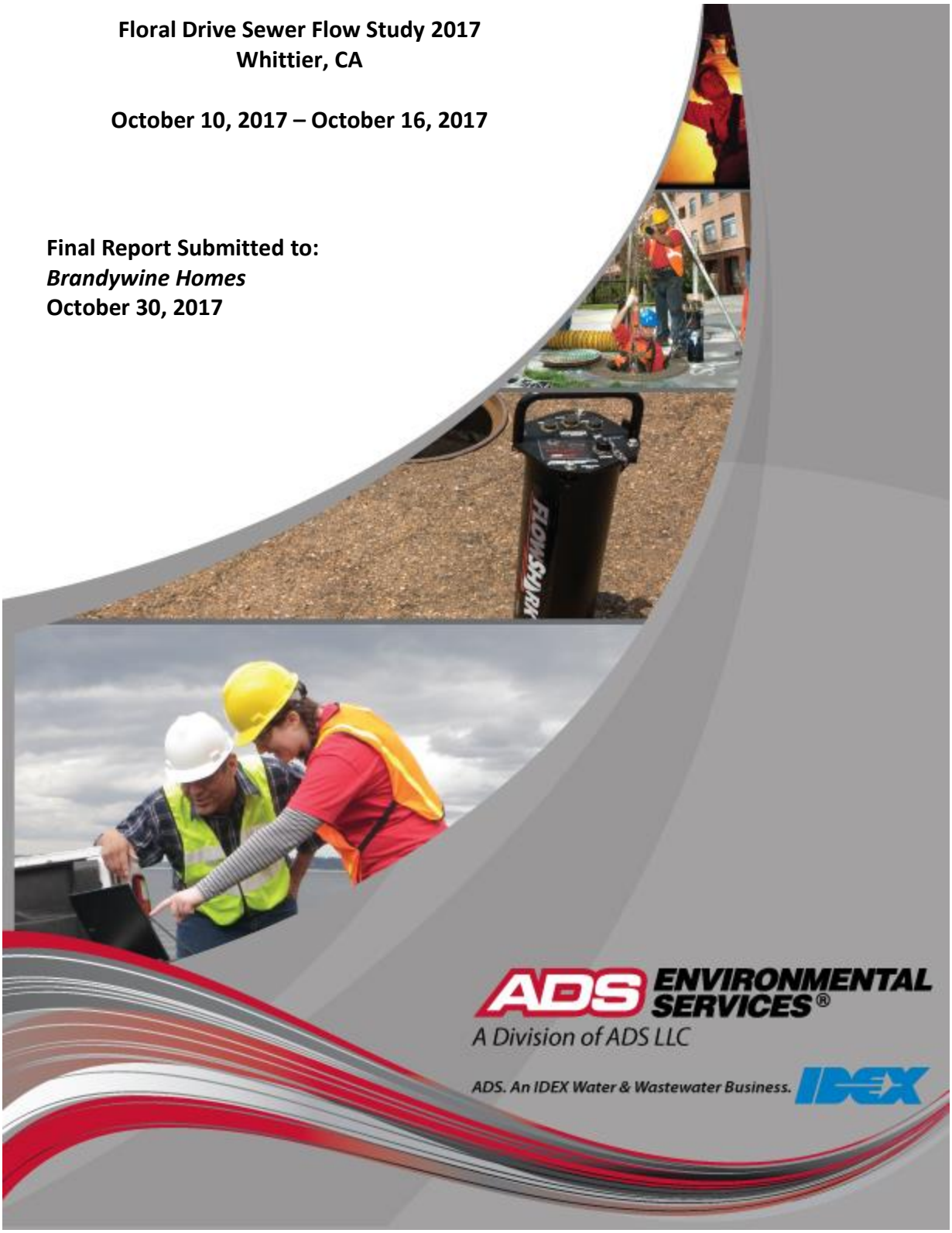


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Floral Drive Sewer Flow Study 2017, Whittier, CA

Prepared for:

Alex G. Hernandez
President
Brandywine Homes

Prepared by:

ADS, LLC
15201 Springdale Street
Huntington Beach, CA 92649

Letter of Transmittal

ADS LLC

October **30**, 2017

Alex G. Hernandez
President
Brandywine Homes

SUBJECT: Floral Drive Sewer Flow Study 2017, Whittier, CA

Dear Mr. Hernandez,

ADS is pleased to submit the report for the Floral Drive Sewer Flow Study 2017, Whittier, CA conducted on behalf of Brandywine Homes. The metering was conducted for seven (7) days at one (1) location. The study period is October 10, 2017 - October 16, 2017. All available data has been provided for the location.

The report contains hourly averaged depth, velocity, and quantity hydrographs as well as daily long tables for the metering period in pdf format. An Excel file containing depth, quantity, and velocity entities for the monitoring location in 5-minute format was provided previously.

In addition, we would be happy to further explain any details about the report that may seem unclear. Should you have any questions or comments, you may contact the Project Manager, Paul Mitchell at (714) 379-9778 ext 223.

It has been our pleasure to serve you in the performance of this project. Thank you for choosing ADS products and services to meet your flow monitoring needs.

Sincerely,
ADS ENVIRONMENTAL SERVICES

Sean O'Donnell
Data Analyst

Scope and Methodology

Introduction

Brandywine Homes entered into an agreement with ADS Environmental Services to conduct flow monitoring at one (1) metering point within the Whittier, CA Collection System. The study was conducted over a seven (7) day period. The primary objective of the monitoring was to determine current flows for development planning purposes.

Project Scope

The scope of this study involved using flow monitors to quantify wastewater flows at the designated locations. Specifically, the study included the following key components.

- Investigate the proposed flow-monitoring sites for adequate hydraulic conditions.
- Flow monitor installations.
- Flow monitor confirmations and data collections.
- Flow data analysis.

Equipment installation was completed on October 9, 2017. The study period began on October 10, 2017 and was completed on October 16, 2017 .

Flow Monitoring Equipment





The ***ADS FlowShark Triton*** monitor was selected for this project. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow.

The ADS FlowShark Triton monitor consists of data acquisition sensors and a battery-powered microcomputer. The microcomputer includes a processor unit, data storage, and an on-board clock to control and synchronize the sensor recordings. The monitor was programmed to acquire and store depth of flow and velocity readings at 5-minute intervals.

The FS Triton monitor features cross-checking using multiple technologies in each sensor for continuous running of comparisons and tolerances. The FS Triton monitor can support two (2) sets of sensors. The sensor option used for this project was:

The Peak Combo Sensor installed at the bottom of the pipe includes three types of data acquisition technologies.

The ***up looking ultrasonic depth*** uses sound waves from two independent transceivers to measure the distance from the sensor upward toward the flow surface; applying the speed of sound in the water and the temperature measured by sensor to calculate depth.

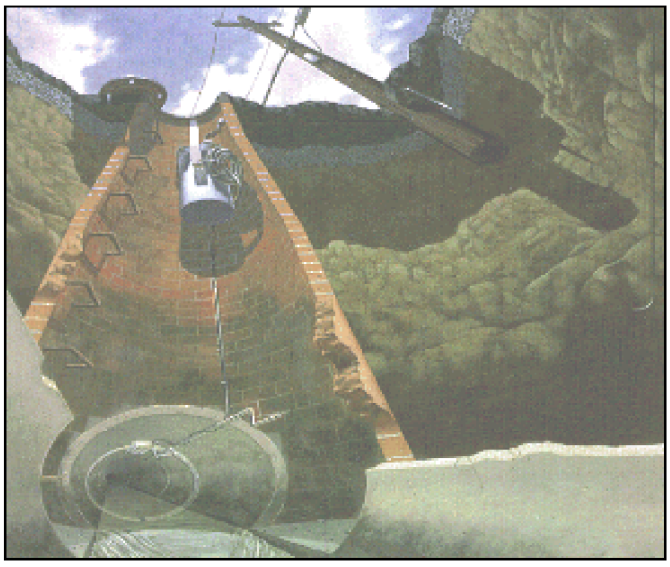
The ***pressure depth*** is calculated by using a piezo-resistive crystal to determine the difference between hydrostatic and atmospheric pressure. The pressure sensor is temperature compensated and vented to the atmosphere through a desiccant filled breather tube.

To obtain ***peak velocity*,** the sensor sends an ultrasonic signal at an angle upward through the widest cross-section of the oncoming flow. The signal is reflected by suspended particles, air bubbles, or organic matter with a frequency shift proportional to the velocity of the reflecting objects. The reflected signal is received by the sensor and processed using digital spectrum analysis to determine the peak flow velocity.

Installation

Installation of flow monitoring equipment typically proceeds in four steps. First, the site is investigated for safety and to determine physical and hydraulic suitability for the flow monitoring equipment. Second, the equipment is physically installed at the selected location. Third, the monitor is tested to assure proper operation of the velocity and depth of flow sensors and verify that the monitor clock is operational and synchronized to the master computer clock. Fourth, the depth and velocity sensors are confirmed and line confirmations are performed.

In pipes up to 42 inches in diameter, the sensors were mounted on expandable stainless steel rings, inserted at least a foot upstream into influent pipes and tightened against the inside walls of the pipes. Influent pipe installations reduce the influences of turbulence and backwater often caused by changes in channel geometry in manholes.





Data Collection, Confirmation, and Quality Assurance

Data collects were done remotely via wireless connect on a weekly basis via ADS Field Representatives. During the monitoring period, field crews visit each monitoring location to verify proper monitor operation and document field conditions. The following quality assurance steps are taken to assure the integrity of the collected data:

Measure power supplies: monitors were powered by dry cell battery packs. Voltages were recorded and battery packs replaced, as necessary. Separate batteries provided back-up power to memory allowing primary batteries to be replaced without loss of data.

Clock synchronization: Field crews synchronized monitor clocks to master clocks.

Confirm depth and velocity readings: Field crews descended into meter manholes to manually measure depths and velocities and compare them meter readings to confirm that they agreed. They also measured silt levels, if any, in the inverts of the pipes. Silt areas were subtracted from flow areas to compute true areas of flow.

Confirm average velocities through cross-sectional velocity profiles: Since ADS velocity sensors measure peak velocity, field crews collected cross-sectional velocity profiles in order to develop a relationship between peak and average velocity in lines that meet the hydraulic criteria.

Upload and Review Data: Data collected from the monitors were uploaded and reviewed by a Data Analyst for completeness, outliers and deviations in the flow patterns, which indicate system anomalies or equipment failure.

Flow Quantification Methods

There are two main equations used to measure open channel flow: the ***Continuity Equation*** and the ***Manning Equation.*** The Continuity Equation, which is considered

the most accurate, can be used if both depth of flow and velocity are available. In cases where velocity measurements are not available or not practical to obtain, the Manning Equation can be used to estimate velocity from the depth data based on certain physical characteristics of the pipe (i.e. the slope and roughness of the pipe being measured). However, the Manning equation assumes uniform, steady flow hydraulic conditions with non-varying roughness, which are typically invalid assumptions in most sanitary sewers. The Continuity Equation was used exclusively for this study.

Continuity Equation

The Continuity Equation states that the flow quantity (Q) is equal to the wetted area (A) multiplied by the average velocity (V) of the flow.

$$Q = A * V$$

This equation is applicable in a variety of conditions including backwater, surcharge, and reverse flow.

Data Analysis and Presentation

Data Analysis

A flow monitor is typically programmed to collect data at either 15-minute or 5-minute intervals throughout the monitoring period. The monitor stores raw data consisting of (1) the ultrasonic depth, (2) the peak velocity and (3) the pressure depth. The data is imported into ADS's proprietary software and is examined by a data analyst to verify its integrity. The data analyst also reviews the daily field reports and site visit records to identify conditions that would affect the collected data.

Velocity profiles and the line confirmation data developed by the field personnel are reviewed by the data analyst to identify inconsistencies and verify data integrity. Velocity profiles are reviewed and an average to peak velocity ratio is calculated for the site. This ratio is used in converting the peak velocity measured by the sensor to the average velocity used in the Continuity equation. The data analyst selects which depth sensor entity will be used to calculate the final depth information. Silt levels present at each site visit are reviewed and representative silt levels established.

Occasionally the velocity sensor's performance may be compromised resulting in invalid readings sporadically during the monitoring period. This is generally caused by excessive debris (silt) blocking the sensor's crystals, shallow flows (~< 2") that may drop below the top of the sensor or very clear flows lacking the particles needed to measure rate. In order to use the Continuity equation to quantify the flow during these periods, a Data Analyst and/or Engineer will use the site's historical pipe curve (depth vs. velocity) data along with valid field confirmations to reconstitute and replace the false velocity recordings with expected velocity readings for a given historical depth along the curve.

Selections for the above parameters can be constant or can change during the monitoring period. While the data analysis process is described in a linear manner, it often requires an iterative approach to accurately complete.

Data Presentation

This type of flow monitoring project generates a large volume of data. To facilitate review of the data, results have been provided in graphical and tabular formats. The flow data is presented graphically in the form of scattergraphs and hydrographs. Hydrographs are based on hourly averaging. Tables are provided in daily average format. These tables show the flow rate for each day, along with the daily minimum and maximums, the times they were observed, the total daily flow, and total flow for the month (or monitoring period). The following explanation of terms may aid in interpretation of the tables and hydrographs.

DEPTH - Final calculated depth measurement (in inches)

QUANTITY - Final calculated flow rate (in MGD)

VELOCITY - Final calculated flow velocity (in feet per second)

REPORT TOTAL - Total volume of flow recorded for the indicated time period (in MG)

Site Commentary

Site Information

Floral01	
Pipe Dimensions	6
Silt Level	0.00"

Overview

Site Floral01 functioned under normal conditions during the period Tuesday, October 10, 2017 to Monday, October 16, 2017. Flows in this line are shallow with sluggish velocity. No surcharge conditions were recorded. Review of the scattergraph shows that flows remained free flowing throughout the period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Tuesday, October 10, 2017 to Monday, October 16, 2017 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.51	0.65	0.017
Minimum	0.93	0.23	0.004
Maximum	2.11	1.25	0.049
Time of Minimum	10/14/2017 5:10 AM	10/16/2017 2:50 AM	10/16/2017 2:30 AM
Time of Maximum	10/16/2017 11:05 AM	10/16/2017 6:50 PM	10/16/2017 11:05 AM

Data Quality

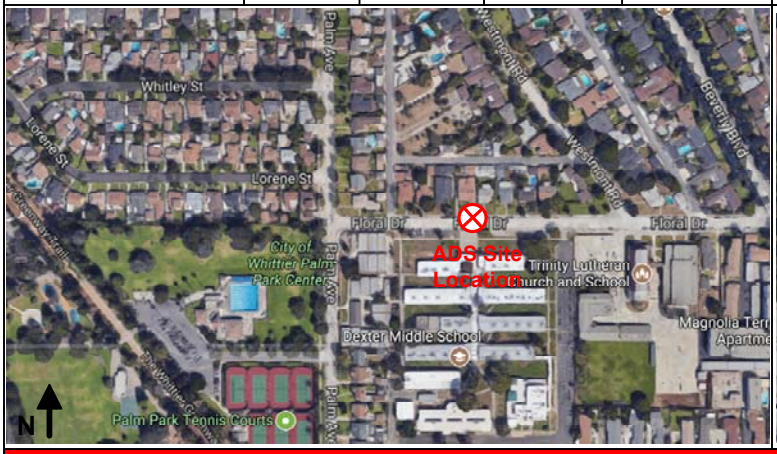
Data uptime observed during the Tuesday, October 10, 2017 to the Monday, October 16, 2017 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

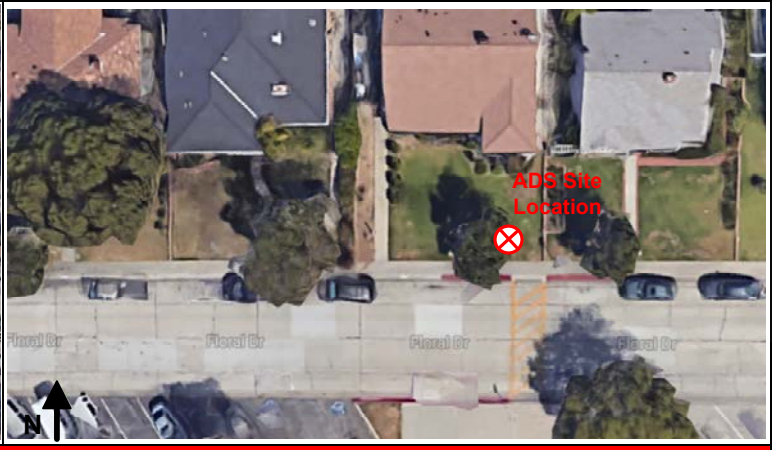
Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name:	Whittier Floral Dr. TFM 2017	**City:**	Whittier	**Agency:** Whittier	**FM Initials:** SK
Site Name:	Floral01	**Install Date:**	10/9/17	**Monitor Type**	Peak Doppler
Address/Location:	11533 Floral Dr.			**Monitor Model**	Triton
				Data Acquisition	Manual/Wireless Collect
				Manhole ID	
Access:	Drive	**Type of System:**	Sanitary [X] Storm [ ] Combined [ ]	**Pipe Height:**	6.00 "
				Pipe Width:	6.00 "





Investigation Information:

Date/Time of Investigation:	10/9/17 @0900
Site Hydraulics:	Good straight through flow.
Upstream Input: (L/S, P/S)	--
Upstream Manhole:	Not investigated
Downstream Manhole:	Not investigated
Depth of Flow:	1.25 " +/- 0.13"
Range (Air DOF):	+/-
Peak Velocity:	.93 fps
Silt:	0.00 Inches

Manhole Information:

Manhole Depth:	5'
Manhole Material / Condition	Precast/OK
Pipe Material / Condition:	VCP/Good

Land Use:	Residential	Commercial	Industrial	Trunk
	[X]	[ ]	[ ]	[ ]

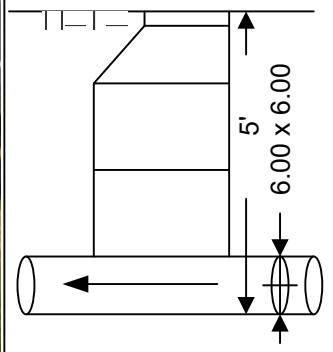
Oxygen: 20.9	**H2S:** 0	**LEL:** 0	**CO:** 0

Safety Notes:

2 man crew required and one blower is to be operated at all times.

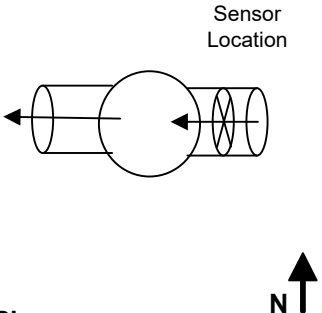
Other Information:





Cross Section





Plan

Installation Information	
Installation Type:	Standard
Sensors Devices:	Ultrasonic / Pressure/Velocity
Surcharge Height:	0
Rain Gauge Zone:	

Backup	Yes	No	?	Distance
Trunk	[ ]	[x]	[ ]	
Lift / Pump Station	[ ]	[x]	[ ]	
WWTP	[ ]	[x]	[ ]	
Other	[ ]	[X]	[ ]	

Additional Site Information / Comments:

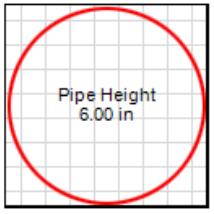
Standard Traffic Control with No Safety Concerns

SCATTERGRAPH REPORT

Floral01

Flow Monitor

Floral01

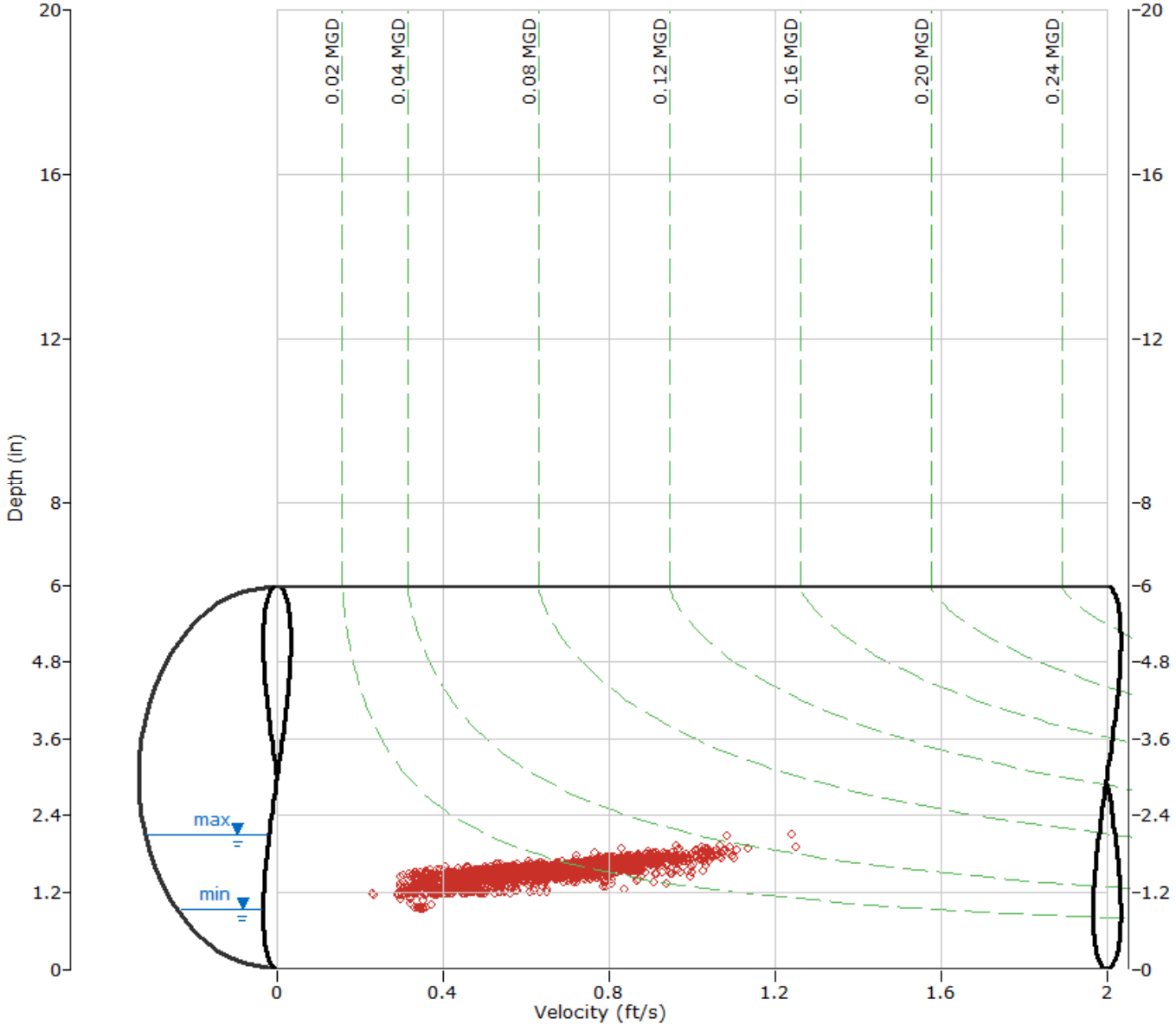


Report Period

10/10/2017
To
10/16/2017

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

Floral01

Flow Monitor

Floral01

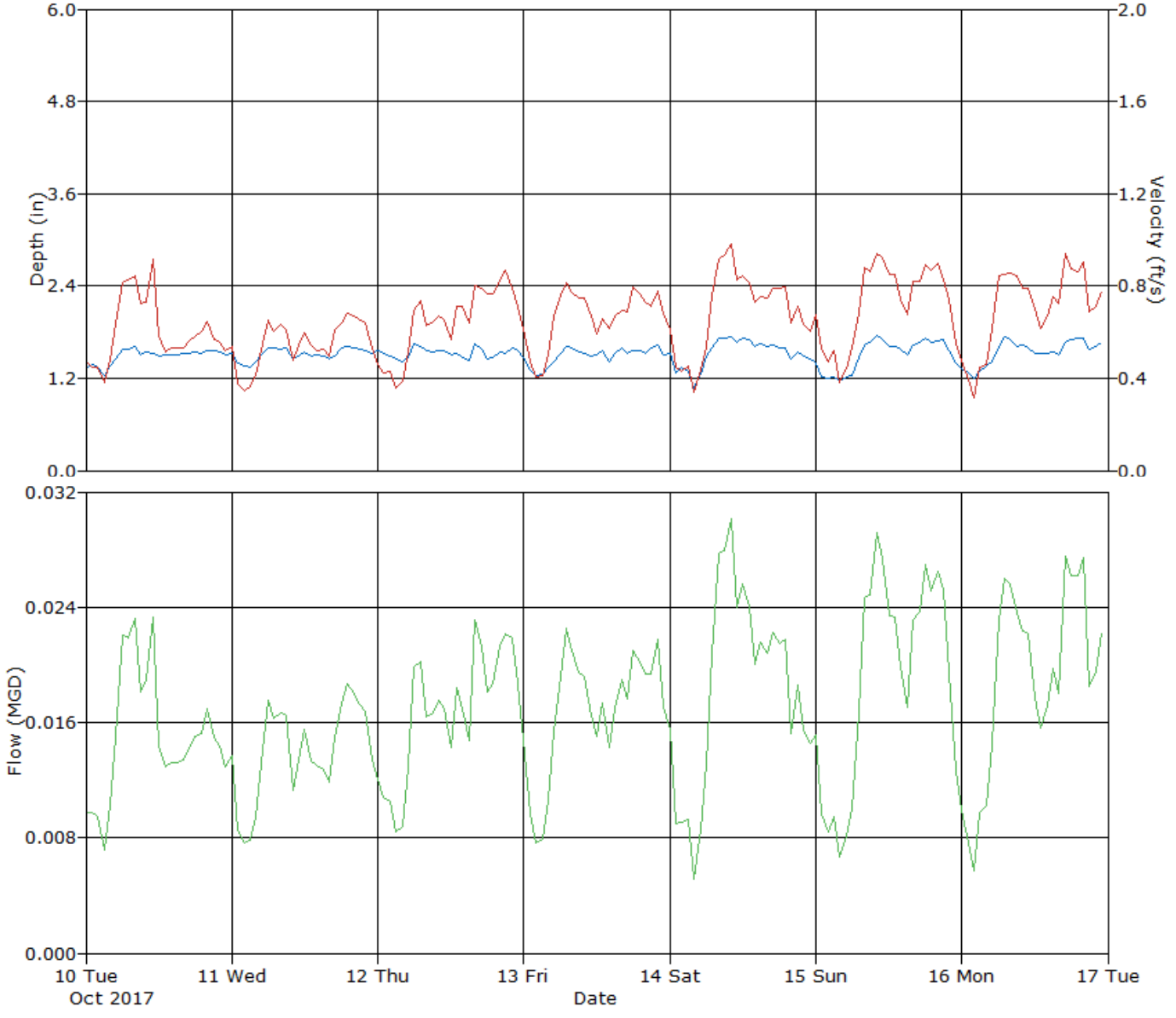
Pipe Height
6.00 in

Report Period

10/10/2017
To
10/16/2017

Legend

- Depth
- Velocity
- Quantity



ADS ENVIRONMENTAL SERVICES

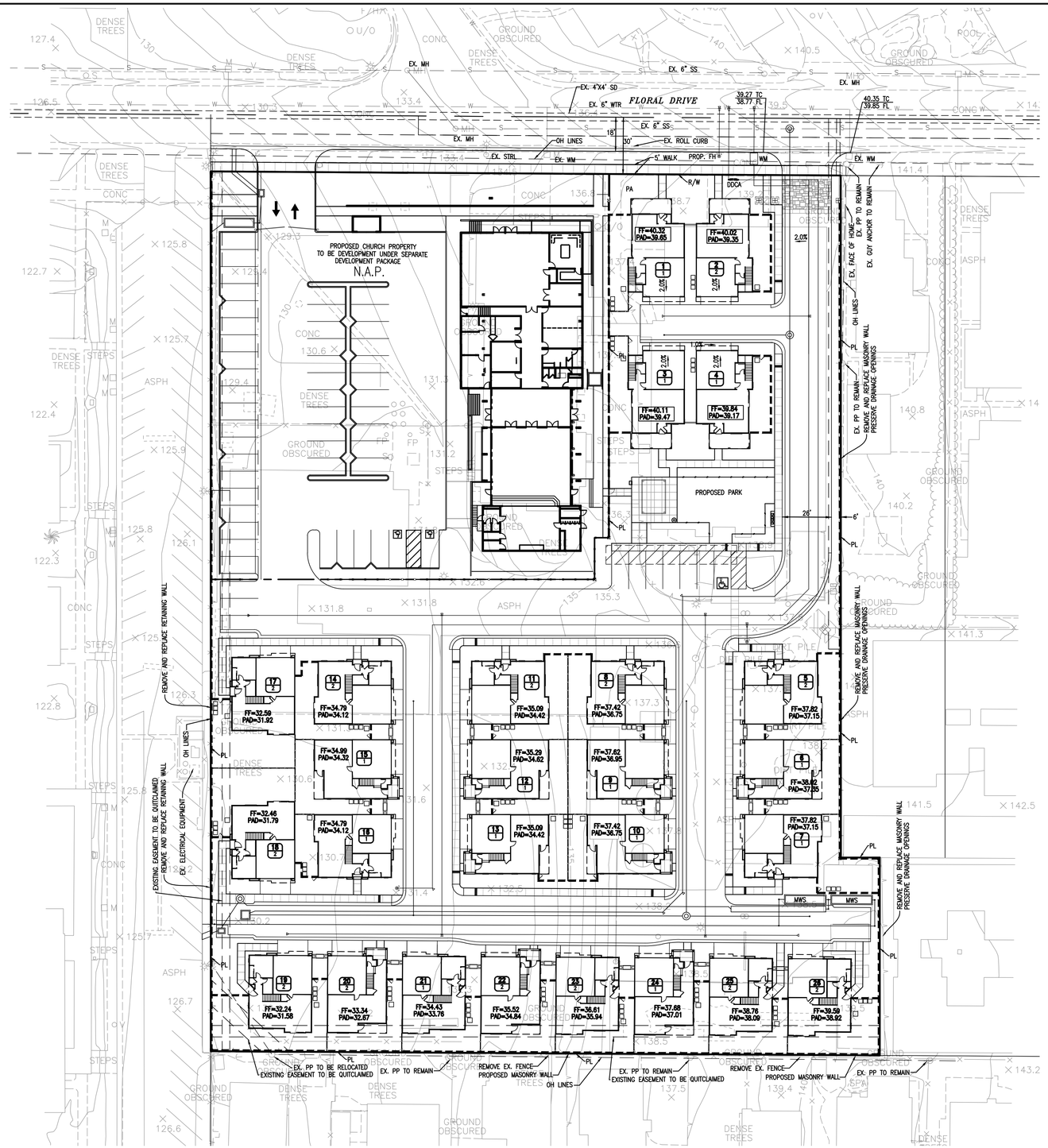
Week 1 - Daily Flow View For The Period 10/10/2017 - 10/16/2017

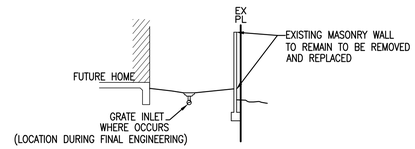
Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total ft3) : Q Rain (in) : Rain

Time	Tue, 10/10/2017				Wed, 10/11/2017				Thu, 10/12/2017				Fri, 10/13/2017				Sat, 10/14/2017				Sun, 10/15/2017				Mon, 10/16/2017			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.32	0.47	0.010		1.52	0.54	0.014		1.56	0.46	0.012		1.46	0.61	0.015		1.52	0.61	0.016		1.39	0.68	0.015		1.32	0.48	0.010	
01:00	1.37	0.45	0.010		1.40	0.37	0.008		1.52	0.42	0.011		1.30	0.47	0.010		1.27	0.45	0.009		1.21	0.53	0.010		1.26	0.39	0.008	
02:00	1.34	0.45	0.009		1.37	0.35	0.008		1.48	0.43	0.011		1.23	0.40	0.008		1.33	0.43	0.009		1.19	0.47	0.008		1.20	0.31	0.006	
03:00	1.24	0.38	0.007		1.34	0.37	0.008		1.45	0.36	0.008		1.25	0.41	0.008		1.29	0.45	0.009		1.21	0.52	0.009		1.29	0.45	0.010	
04:00	1.35	0.48	0.010		1.41	0.41	0.009		1.41	0.39	0.009		1.35	0.50	0.011		1.06	0.34	0.005		1.17	0.38	0.007		1.37	0.46	0.010	
05:00	1.44	0.64	0.015		1.53	0.55	0.014		1.46	0.52	0.013		1.42	0.67	0.015		1.25	0.43	0.009		1.21	0.44	0.008		1.41	0.61	0.014	
06:00	1.58	0.81	0.022		1.59	0.65	0.018		1.64	0.69	0.020		1.52	0.76	0.019		1.48	0.54	0.013		1.23	0.53	0.010		1.61	0.84	0.023	
07:00	1.57	0.82	0.022		1.60	0.60	0.016		1.61	0.74	0.020		1.62	0.81	0.023		1.59	0.76	0.021		1.48	0.68	0.017		1.73	0.85	0.026	
08:00	1.61	0.84	0.023		1.57	0.63	0.017		1.55	0.63	0.016		1.60	0.77	0.021		1.72	0.92	0.028		1.62	0.88	0.025		1.71	0.85	0.026	
09:00	1.51	0.72	0.018		1.59	0.61	0.016		1.54	0.64	0.017		1.54	0.75	0.019		1.71	0.93	0.028		1.66	0.86	0.025		1.62	0.84	0.024	
10:00	1.54	0.73	0.019		1.45	0.48	0.011		1.56	0.67	0.017		1.53	0.75	0.019		1.74	0.98	0.030		1.75	0.94	0.029		1.64	0.79	0.022	
11:00	1.53	0.92	0.023		1.49	0.54	0.013		1.56	0.65	0.017		1.49	0.67	0.016		1.67	0.83	0.024		1.70	0.92	0.027		1.59	0.79	0.022	
12:00	1.48	0.59	0.014		1.54	0.60	0.016		1.50	0.57	0.014		1.50	0.59	0.015		1.73	0.85	0.026		1.62	0.85	0.023		1.52	0.70	0.018	
13:00	1.51	0.52	0.013		1.49	0.54	0.013		1.52	0.71	0.018		1.56	0.66	0.017		1.69	0.82	0.024		1.60	0.85	0.023		1.52	0.61	0.016	
14:00	1.50	0.53	0.013		1.51	0.52	0.013		1.46	0.71	0.017		1.42	0.62	0.014		1.60	0.73	0.020		1.57	0.74	0.020		1.52	0.67	0.017	
15:00	1.50	0.53	0.013		1.48	0.52	0.013		1.43	0.64	0.015		1.52	0.67	0.017		1.65	0.75	0.022		1.50	0.68	0.017		1.55	0.76	0.020	
16:00	1.52	0.53	0.013		1.45	0.50	0.012		1.66	0.80	0.023		1.60	0.69	0.019		1.62	0.75	0.021		1.63	0.82	0.023		1.50	0.72	0.018	
17:00	1.52	0.56	0.014		1.49	0.61	0.015		1.58	0.79	0.021		1.51	0.69	0.018		1.62	0.79	0.022		1.67	0.82	0.024		1.67	0.94	0.028	
18:00	1.54	0.58	0.015		1.60	0.64	0.017		1.45	0.76	0.018		1.57	0.79	0.021		1.60	0.79	0.021		1.71	0.89	0.027		1.69	0.87	0.026	
19:00	1.52	0.60	0.015		1.61	0.68	0.019		1.48	0.77	0.019		1.56	0.77	0.020		1.59	0.79	0.022		1.67	0.87	0.025		1.73	0.86	0.026	
20:00	1.57	0.64	0.017		1.59	0.67	0.018		1.54	0.82	0.021		1.53	0.73	0.019		1.45	0.64	0.015		1.69	0.90	0.026		1.72	0.91	0.027	
21:00	1.56	0.57	0.015		1.57	0.65	0.017		1.53	0.87	0.022		1.60	0.71	0.019		1.54	0.71	0.019		1.70	0.83	0.025		1.58	0.69	0.018	
22:00	1.54	0.56	0.014		1.55	0.64	0.017		1.60	0.79	0.022		1.63	0.78	0.022		1.48	0.63	0.016		1.55	0.74	0.019		1.60	0.71	0.020	
23:00	1.50	0.52	0.013		1.52	0.53	0.013		1.56	0.71	0.019		1.50	0.68	0.017		1.45	0.61	0.015		1.40	0.55	0.013		1.66	0.78	0.022	

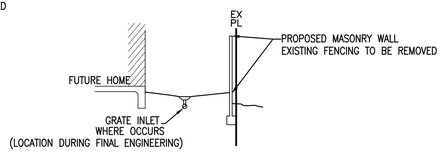
	Tue, 10/10/2017				Wed, 10/11/2017				Thu, 10/12/2017				Fri, 10/13/2017				Sat, 10/14/2017				Sun, 10/15/2017				Mon, 10/16/2017			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			2004				1870				2232				2243				2460				2543				2542	
Avg	1.48	0.60	0.015		1.51	0.55	0.014		1.53	0.65	0.017		1.49	0.66	0.017		1.53	0.69	0.018		1.51	0.72	0.019		1.54	0.70	0.019	
Time	03:20	03:20	03:20		03:50	03:50	03:50		05:15	03:10	05:20		01:50	01:50	01:50		05:10	04:05	04:50		04:15	05:25	05:25		02:40	02:50	02:30	
Min	1.15	0.30	0.005		1.21	0.30	0.005		1.25	0.30	0.006		1.08	0.32	0.005		0.93	0.30	0.004		1.15	0.32	0.006		1.15	0.23	0.004	
Time	10:20	06:25	06:25		19:55	12:05	12:05		13:15	13:15	13:15		17:45	20:35	20:35		10:50	09:55	10:45		21:00	10:05	21:00		11:05	18:50	11:05	
Max	1.74	1.03	0.030		1.74	0.90	0.025		1.88	1.03	0.035		1.84	1.10	0.035		1.83	1.10	0.035		2.08	1.14	0.042		2.11	1.25	0.049	

	D	V	Q	Rain
Total			15895	
Avg	1.51	0.65	0.017	

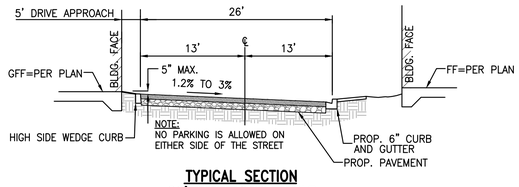




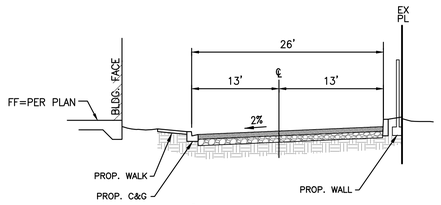
EAST PL SECTION
LOOKING NORTH N.T.S.



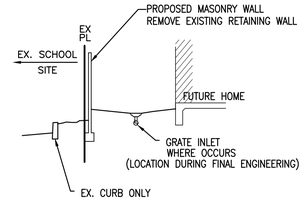
SOUTH PL SECTION
LOOKING EAST N.T.S.



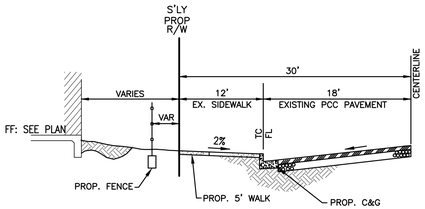
TYPICAL SECTION
26' MAIN DRIVE AISLE
NTS



26' MAIN ENTRY DRIVE AISLE
NTS



WEST PL SECTION
LOOKING NORTH N.T.S.

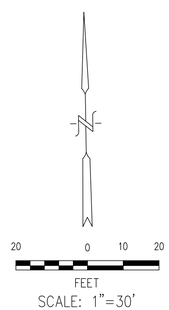


FLORAL DRIVE STREET SECTION
N.T.S.

PRELIMINARY EARTHWORK SUMMARY:
QUANTITIES FOR PLAN CHECKING PURPOSES ONLY
QUANTITIES NOT TO BE USED AS GRADING PAY QUANTITIES

RAW CUT	6453 CY
SPOILS	900 CY
RAW IMPORT	400 CY
OVER EXCAVATION	7744 CY
ADJUSTED IMPORT	8905 CY
EXPORT	5792 CY

ASSUMPTIONS:
1. SITE SUBSIDENCE IS ASSUMED NEGLIGIBLE.
2. ENTIRE SITE TO BE OVER-EXCAVATED.



FIRE WATER NOTE:
PROPOSED PRIVATE FIRE WATER MAIN: 6" PVC

WATER NOTE:
PROPOSED SEWER/ALLEY MAIN: 4" MAIN LATERAL PVC
PROPOSED HOUSE LATERALS: 1.5" PVC

SEWER NOTE:
PROPOSED SEWER/ALLEY MAIN: 6" MAIN LATERAL PVC
PROPOSED HOUSE LATERALS: 4" PVC
ALL PROPOSED MAIN LINE SEWER TO BE PRIVATE
ALL PROPOSED ALLEY SEWER LATERALS TO BE PRIVATE

PROPOSED EASEMENT
AN EASEMENT IS PROPOSED OVER ALL VEHICULAR PAVEMENT AREA FOR INGRESS/EGRESS AND UTILITY PURPOSES.

DIGALERT
DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

REVISIONS

NO	DATE	INITIAL	DESCRIPTION	APP	DATE

OWNER/DEVELOPER:
BRANDYWINE HOMES, INC.
16580 ASTON
IRVINE, CA 92606
(949) 296-2400

PREPARED BY :
KES TECHNOLOGIES INC
CIVIL ENGINEERING
LAND PLANNING AND SURVEYING
1 VENTURE STE 130
IRVINE, CALIFORNIA 92618
PHONE (949) 339-5331
FAX (866) 426-2201

REGISTERED PROFESSIONAL ENGINEER — ALI MONSHIZADEH — C67674 — EXP. 06/30/2021 — CIVIL — STATE OF CALIFORNIA

I hereby certify that:
1. These plans have been prepared under my supervision:
2. The grading shown hereon will not divert drainage from its natural downstream course or obstruct the drainage of adjacent properties:
3. All specimen trees located on this properly are shown:
4. Existing ground contours and elevations were obtained by field survey on/aerial topography flown on MAY, 2018

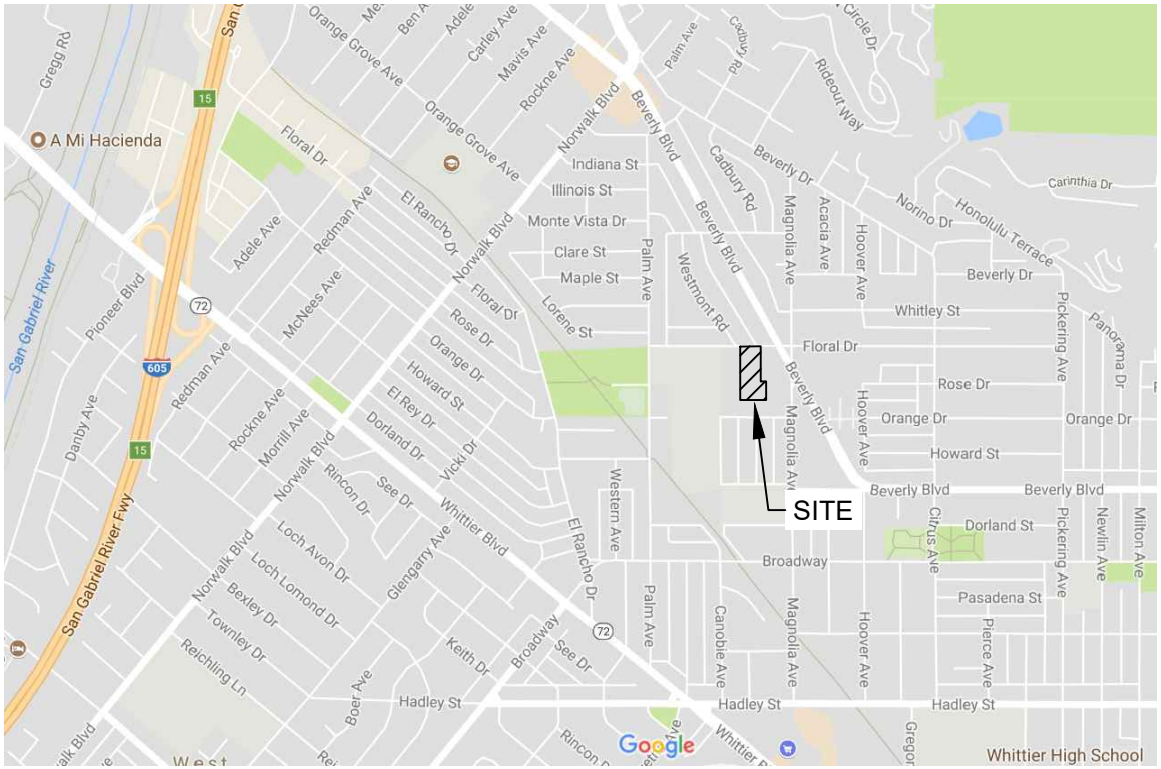
ENGINEER _____ DATE _____
RCE 67674 EXP. DATE 6-31-21

VESTING TENTATIVE TRACT NO. 82802 (FOR CONDOMINIUM PURPOSES)
GRADING AND UTILITY PLAN
LOCATED IN THE CITY OF WHITTIER THE COUNTY OF LOS ANGELES, STATE OF CA

SHEET 2 OF 3

SCALE: AS SHOWN | DRAWN BY: DSK | CHECKED BY: AM

CITY OF WHITTIER



VICINITY MAP

NOT TO SCALE

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Sunday, Apr 26 2020

<Name>

Circular

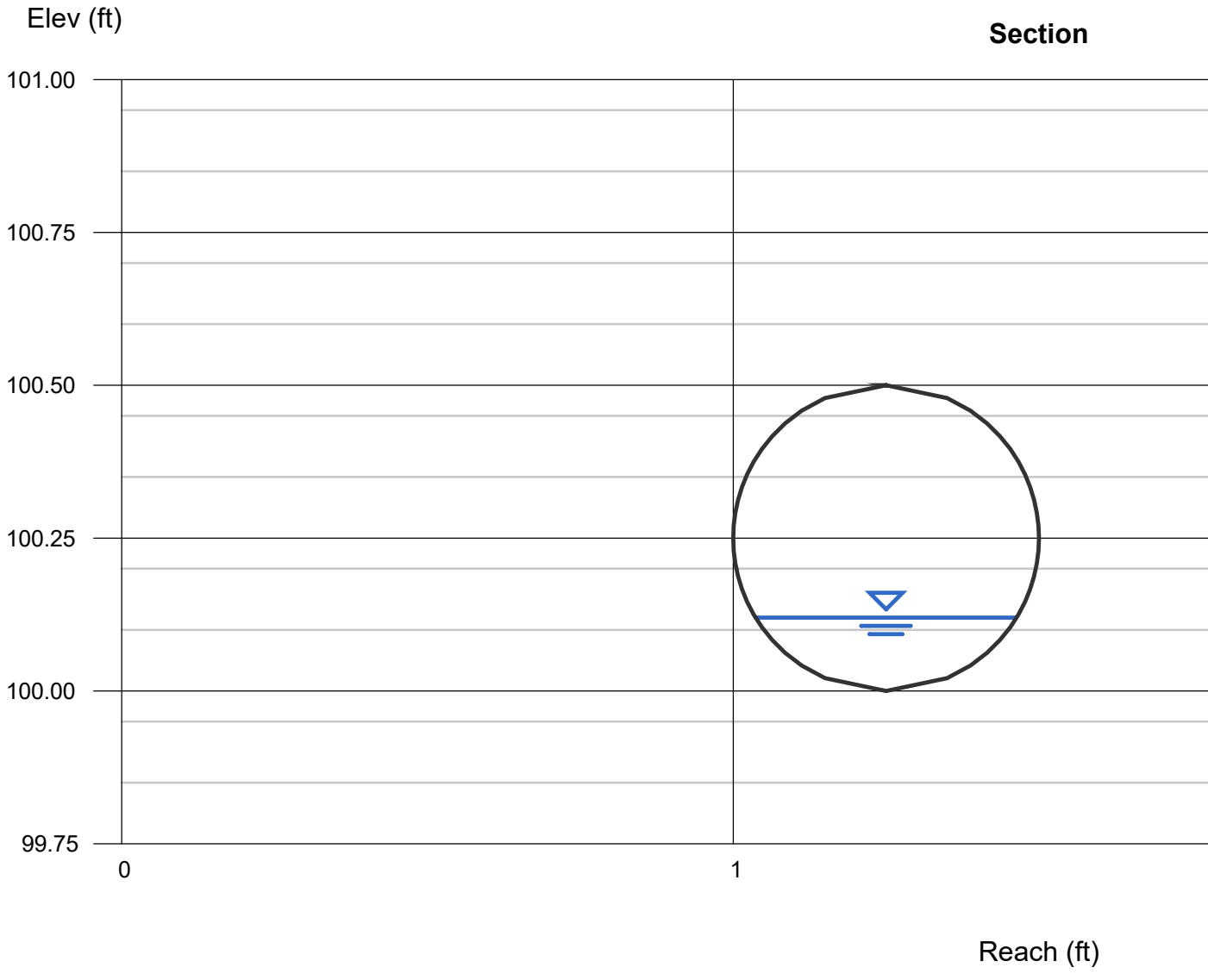
Diameter (ft)	= 0.50
Invert Elev (ft)	= 100.00
Slope (%)	= 1.55
N-Value	= 0.013

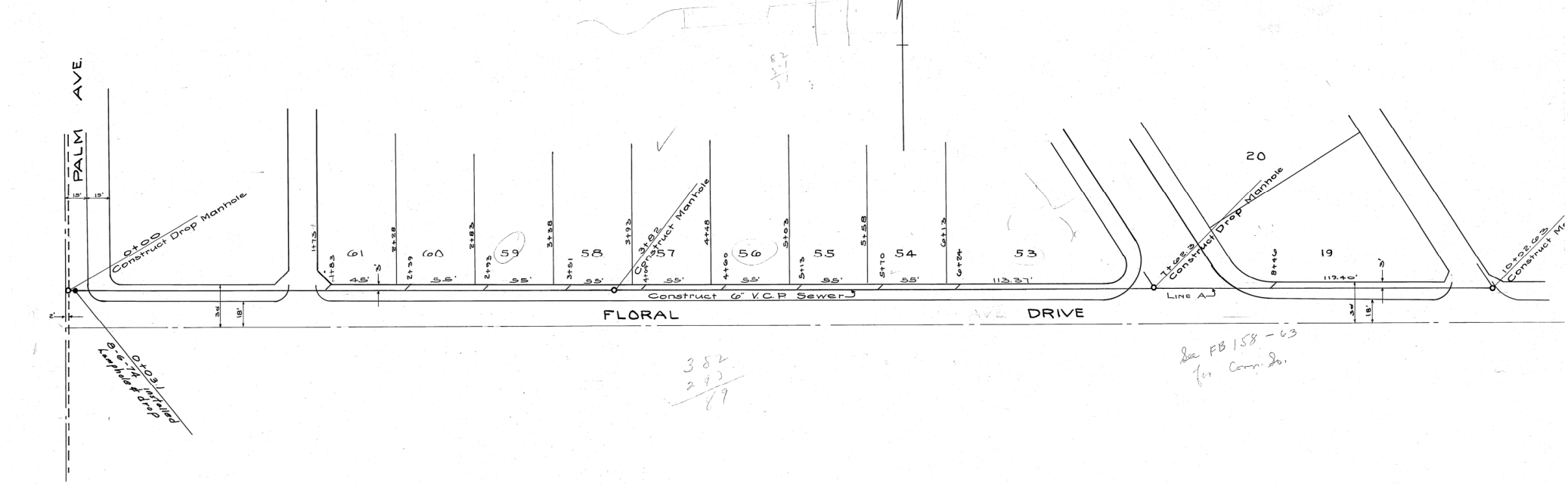
Calculations

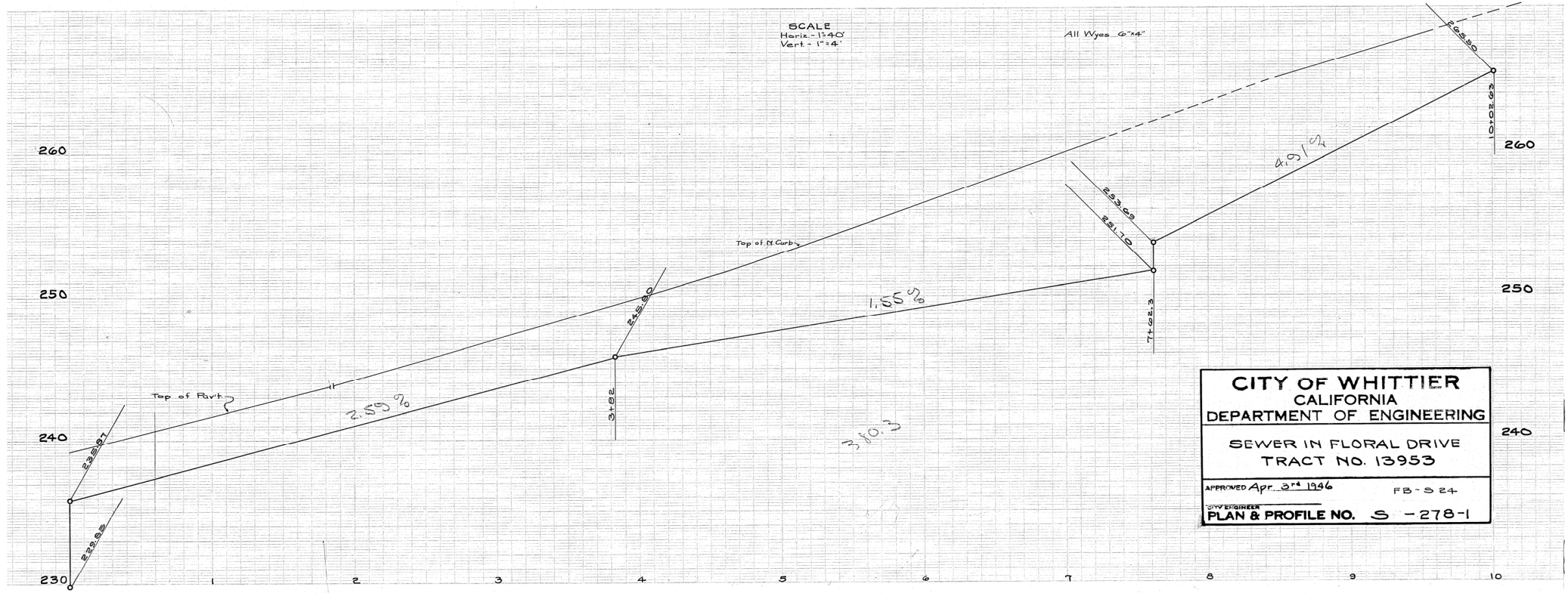
Compute by:	Known Q
Known Q (cfs)	= 0.09

Highlighted

Depth (ft)	= 0.12
Q (cfs)	= 0.088
Area (sqft)	= 0.04
Velocity (ft/s)	= 2.42
Wetted Perim (ft)	= 0.51
Crit Depth, Yc (ft)	= 0.15
Top Width (ft)	= 0.43
EGL (ft)	= 0.21







CITY OF WHITTIER
CALIFORNIA
DEPARTMENT OF ENGINEERING

SEWER IN FLORAL DRIVE
TRACT NO. 13953

APPROVED Apr. 3rd 1946 FB-S 24

CITY ENGINEER

PLAN & PROFILE NO. S -278-1

Appendix K Will Serve Letters

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

9/12/17

BrandyWine Homes

Floral Dr. Palm Ave. to Beverly Blvd., Whittier

Your project is located in Southern California Edison (SCE) service territory. SCE will serve the above subject project's electrical requirements per the California Public Utilities Commission and Federal Energy Regulatory Commission tariffs.

SCE may need to conduct utility studies, where applicable, to assess whether additions or modifications to the existing electric infrastructure are required to serve this project. Where applicable, SCE has attached Appendix (B) which not only describes the study, and permitting, but includes a Project Information Sheet that will need to be completed by you and submitted to SCE if your project is at a point where SCE has to determine the required electrical utility work. This Will-Serve letter does not imply that either: (i) these studies have been completed, or (ii) that any required California Environmental Quality Act (CEQA) analysis of project-related electric utility impacts has been conducted.

I am the SCE Design Representative currently assigned to this project. SCE or Applicant will design and construct all required electrical infrastructure to serve this project provided you enter into the applicable contractual agreements with SCE identify scope of electrical utility work required, and supply the following information:

- Site plans as required
- Required contracts and agreements (fully executed)
- Applicable fees
- Local permits
- Required easement documents

Your project will be scheduled for construction once SCE has all the necessary information for your project and you have submitted or agreed to the applicable requirements as stated above, and paid any necessary fees.

If your project will not require SCE services, please notify us so that we can update our records.

SCE appreciates your business. If you have any questions, please feel free to call me at (714) 296-7609.

Sincerely,

SCE Design Representative

Enclosure: Appendix B, where applicable

Appendix B

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

9/12/17

BrandyWine Homes

Floral Dr. Palm Ave. to Beverly Blvd., Whittier

As your Southern California Edison (SCE) Design Representative for this project, I am committed to providing you with excellent customer service. The following information is intended to help explain SCE's planning and permitting process for the electric infrastructure needed to serve your Project.

Depending on the scope of work necessary to serve your project (electric facility installation, removal, relocation, rearrangement and/or replacement), it may be necessary for you to submit an Advanced Engineering Fee. This Fee will be applied to certain expenses associated with preliminary design and engineering work required to estimate the cost for SCE to perform the electric work associated with your project. Please note: Depending on factors such as resource constraints, construction or relocation of SCE facilities requirements, the need for environmental review, and so forth, delays in meeting your projected completion date may occur. To help minimize the potential for delays it is imperative that you provide all requested information as early as possible.

If the project results in the need for SCE to perform work on SCE electrical facilities that operate at between 50 and 200 kilovolts (kV), please be advised these facilities are subject to the California Public Utilities Commission's (CPUC's) General Order 131-D (GO 131-D) Permit to Construct (PTC) requirements. For the CPUC PTC review, the CPUC acts as the lead agency under the California Environmental Quality Act (CEQA). Depending on the scope of SCE's work, certain exemptions to the PTC requirements may be available. If no exemptions are available, the PTC application preparation and environmental approval process could take a minimum of 24 - 48 months.

If you anticipate that your project will require work to be performed on SCE electrical facilities operated at between 50 kV and 200 kV, please inform me at your earliest possible convenience for further assistance to determine the potential G.O.131-D permitting requirements and/or permitting exemption(s).

In order for SCE to determine the required electrical utility work necessary to support your project, and to determine any permitting requirements and costs associated with constructing these facilities, project plans and a completed Customer Project Information Sheet will need to be submitted.

If you have any additional questions, please feel free to call me at (714) 296-7609.

Sincerely,

SCE Design Representative

1919 S. State College Blvd.
Anaheim, CA 92806-6114

September 21, 2017

Brandywine Homes
16580 Aston
Irvine, CA 92606

Attn: Matt Ashton

Subject: Map and Will Serve request for Floral Dr from Palm Ave to Beverley Blvd; Whittier.

Thank you for inquiring about the availability of natural gas service for your project. We are pleased to inform you that Southern California Gas Company (SoCalGas) has facilities in the area where the above named project is being proposed. The service would be in accordance with SoCalGas' policies and extension rules on file with the California Public Utilities Commission (CPUC) at the time contractual arrangements are made.

This letter should not be considered a contractual commitment to serve the proposed project, and is only provided for informational purposes only. The availability of natural gas service is based upon natural gas supply conditions and is subject to changes in law or regulation. As a public utility, SoCalGas is under the jurisdiction of the Commission and certain federal regulatory agencies, and gas service will be provided in accordance with the rules and regulations in effect at the time service is provided. Natural gas service is also subject to environmental regulations, which could affect the construction of a main or service line extension (for example, if hazardous wastes were encountered in the process of installing the line). Applicable regulations will be determined once a contract with SoCalGas is executed.

If you need assistance choosing the appropriate gas equipment for your project, or would like to discuss the most effective applications of energy efficiency techniques, please contact our area Service Center at 800-427-2200.

Thank you again for choosing clean, reliable, and safe natural gas, your best energy value.

Katrina Regan
Planning Supervisor
SouthEast Region - Anaheim Planning & Engineering

KR/rl
wilserv.doc

October 3, 2017

Matt Ashton
Branydwine Homes
16580 Aston
Irvine, CA 92606

SUBJECT: Utility Request Name

In concern of Charter facilities at the property located near Floral Drive and Palm Avenue in Whittier, CA. Charter has existing coax and/or fiber facilities near this location that may provide a possible point-of-connection for available services in the future.

Services for any Commercial or Multi-Family Parcels will be available dependent upon the right-of-entry agreement and entry routing for the respective buildings, as determined by contract. Contact our Commercial Business Class Sales department, at (866)519-1263 to facilitate a request for new commercial service, or your local MDU Sales Department for all residential services. In addition to initiating your request, they can also provide specifics regarding costs and other details associated with obtaining our services in this area at the appropriate point in time.

For future reference, please send all utility coordination, abandonments, encroachments, plat signatures, or serviceability requests, or notices of relocation to DL-socal-charter-engineering@charter.com. Please share this information with whoever needs these services.

Sincerely,



Lisa Law
Sr. Manager, Data Operations
Charter Communications
750 Canyon Drive
Coppell TX 75019

Frontier COMMUNICATIONS

www.Frontier.com

May 8, 2020

BJ Palmer & Associates INC
Attn: Reed A Reznicek
760-390-7584
rreznicek@bj-palmer.com

Dear Mr. Reznicek

Subject: Will Serve Letter- 11716 Floral Drive Whittier , CA 90601

We have received your request for a Will Serve Letter for the above referenced location. The site is located inside the basic rate area of our serving area.

Telephone facilities will be provided under the provisions of the tariffs on file with the Public Utilities Commission of the State of California. No additional charges other than normal installation costs apply.

If you have any questions, please contact me.

Very truly yours,

Carl Specht
OSP Engineering
1400 E Phillips Blvd, BLD A
Pomona, CA 91766
Tel: 909-469-4731
E-mail: carl.specht@ftr.com

City of Whittier

13230 Penn Street, Whittier, California 90602-1772
(562) 567-9500 Fax (562) 567-2874

September 13, 2017

MF Kessler
Attn: Daryl Kessler
One Venture, Suite 130
Irvine, CA 92618

Subject: 11716 Floral Drive - Water and Sewer will serve

Dear Mr. Kessler,

This is in response to your August 25, 2017 request for a "Will-Serve" letter for the above-referenced address.

Water Facilities

The above-referenced parcel is within the water service area of the City of Whittier and there is an existing 6-inch water main along the Floral Drive frontage.

All water service connections, whether existing or proposed, are governed by latest version of the City of Whittier Municipal Code Title 13, Division I. New water connections and/or water system improvements may be permitted, but are subject to review and approval; this shall include the payment of all applicable water connection and permit fees. In addition, all new water connections shall be installed and constructed in accordance with the latest version of the City of Whittier Water Utility Standard Specifications. Contact the City of Whittier Public Works Department at 562.567.9500 to obtain a copy of the latest version.

Sewer Facilities:

The City-owned 6-inch sewer exists on Floral Avenue. This system will receive sewage flow generated by a said development pending the following:

The developer shall conduct a flow study to determine if existing sewer system has sufficient capacity to accept increased sewage from the proposed project. Any deficiencies caused by the proposed development shall be mitigated by the developer as approved by the Director of Public Works. In the case where sewer deficiencies are already identified in the City of Whittier's Sewer Master Plan, and the deficient segment of sewer main has been planned for sewer upgrade, the developer shall determine and pay the City approved fair-share cost for the sewer upgrade project.

If you have questions regarding water, please contact Raul Flore at 562.567.9525 and for questions regarding sewer, please contact Lucila Martinez at 562.567.9527.

Sincerely,

Kyle Cason, P.E.
Assistant Director of Public Works