DRAFT

MITIGATED NEGATIVE DECLARATION

FOR

CASA DEI VISTA APARTMENTS

Planned Development
(File No. 18-200)

March 1, 2019

PREPARED BY THE LEAD AGENCY:

City of Vacaville
Community Development Department
650 Merchant Street
Vacaville, CA 95688

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Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Casa Dei Vista Apartments

Lead Agency: City of Vacaville | Contact Person: Albert Enault
Mailing Address: 650 Merchant Street | Phone: (707) 449-5364
City: Vacaville | Zip: 95688 | County: Solano

Project Location: County: Solano | City/Nearest Community: Vacaville
Cross Streets: Allison Drive and Travis Way | Zip Code: 95687
Longitude/Latitude (degrees, minutes and seconds): 38° 21′ 24.2″ N / -121° 57′ 57.4″ W | Total Acres: 14.41
Assessor's Parcel No.: 0131-030-860 and 0131-020-540 | Section: | Twp.: 6N | Range: 1W | Base: Mt. Diablo
Within 2 Miles: State Hwy #: I-80 and I-505 | Waterways: Ulatis Creek
Airports: Nut Tree Airport | Railways: Southern Pacific | Schools: Will C. Wood High

Document Type:

CEQA: ☐ NOP ☐ Early Cons ☐ Neg Dec ☒ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ☐ Other:
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other:

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☒ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☐ Other:

Development Type:

☒ Residential: Units 245 Acres 14.41
☐ Office: Sq.ft. Acres Employees
☐ Commercial: Sq.ft. Acres Employees
☐ Industrial: Sq.ft. Acres Employees
☐ Educational:
☐ Recreational:
☐ Water Facilities: Type MGD
☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type MW
☐ Waste Treatment: Type MGD
☐ Hazardous Waste: Type
☐ Other:

Project Issues Discussed in Document:

☐ Aesthetic/Visual
☐ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☐ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☐ Flood Plain/Flooding
☐ Forest Land/Fire Hazard
☒ Geologic/Seismic
☐ Minerals
☐ Noise
☐ Population/Housing Balance
☐ Public Services/Facilities
☐ Recreation/Parks
☐ Schools/Universities
☐ Septic Systems
☐ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☐ Solid Waste
☐ Toxic/Hazardous
☐ Traffic/Circulation
☒ Vegetation
☒ Water Quality
☐ Water Supply/Groundwater
☐ Wetland/Riparian
☐ Growth Inducement
☐ Land Use
☐ Cumulative Effects
☐ Other:

Present Land Use/Zoning/General Plan Designation:

Vacant / RLM-4.5 / Mixed Use

Project Description: *(please use a separate page if necessary)*

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The apartment complex includes seven 3-story buildings with thirty-five (35) units each, an 8,400 sq. ft. clubhouse with various on-site amenities, and 461 parking spaces with primary access on Allison Drive and secondary emergency access on Travis Way. The entire project would provide 28 studio units, 98 one-bedroom units, 105 two-bedroom units, and 14 three-bedroom units. Floor plans would range from 566 sq. ft. to 1,268 sq. ft. in floor area. The project is bound by Allison Drive (4-lane divided arterial) to the east, Travis Way (2-lane local street) to the north, vacant land to the west and Ulatis Creek to the South.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

X	Air Resources Board		Office of Historic Preservation
	Boating & Waterways, Department of		Office of Public School Construction
	California Emergency Management Agency		Parks & Recreation, Department of
	California Highway Patrol		Pesticide Regulation, Department of
X	Caltrans District # 4		Public Utilities Commission
	Caltrans Division of Aeronautics	X	Regional WQCB # 5
	Caltrans Planning		Resources Agency
	Central Valley Flood Protection Board		Resources Recycling and Recovery, Department of
	Coachella Valley Mtns. Conservancy		S.F. Bay Conservation & Development Comm.
	Coastal Commission		San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
	Colorado River Board		San Joaquin River Conservancy
	Conservation, Department of		Santa Monica Mtns. Conservancy
	Corrections, Department of		State Lands Commission
	Delta Protection Commission		SWRCB: Clean Water Grants
	Education, Department of		SWRCB: Water Quality
	Energy Commission		SWRCB: Water Rights
X	Fish & Game Region # 3		Tahoe Regional Planning Agency
	Food & Agriculture, Department of		Toxic Substances Control, Department of
	Forestry and Fire Protection, Department of		Water Resources, Department of
	General Services, Department of		
	Health Services, Department of	X	Other: Yolo-Solano Air Quality Management District
X	Housing & Community Development	X	Other: U.S. Fish and Wildlife Service
X	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date Friday, March 1, 2019 Ending Date Monday, April 1, 2019

Lead Agency (Complete if applicable):

Consulting Firm: _____
Address: _____
City/State/Zip: _____
Contact: _____
Phone: _____

Applicant: Albert Enault
Address: 650 Merchant Street
City/State/Zip: Vacaville / California / 95688
Phone: (707) 449-5364 or albert.enault@cityofvacaville.com

Signature of Lead Agency Representative: Albert Enault **Date:** March 1, 2019

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

PUBLIC NOTICE OF AVAILABILITY
ENVIRONMENTAL DOCUMENT

INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION
CASA DEI VISTA APARTMENTS (FILE NO. 18-200)

Project Location - Specific: Allison Drive and Travis Way, Vacaville, CA 95688
Assessor's Parcel Number: 0131-030-860 and 0131-020-540
Coordinates: 38º21'24.2",-121º57'57.4"

Project Location - City: Vacaville
Project Location - County: Solano County
Lead Agency: City of Vacaville
Contact Person: Albert Enault - (707) 449-5364

Description of Project: The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The apartment complex includes seven 3-story buildings with thirty-five (35) units each, an 8,400 sq. ft. clubhouse with various on-site amenities, and 461 parking spaces with primary access on Allison Drive and secondary emergency access on Travis Way. The entire project would provide 28 studio units, 98 one-bedroom units, 105 two-bedroom units, and 14 three-bedroom units. Floor plans would range from 566 sq. ft. to 1,268 sq. ft. in floor area. The project is bound by Allison Drive to the east, Travis Way to the north, vacant land to the west and Ulatis Creek to the South.

Environmental & Land Use Setting: The site is substantially surrounded by existing development. The site is generally flat with some portions that drop slightly along Ulatis Creek, and other portions that rise approximately as much as 15 ft. along the western boundary. A 6 ft. chain-link fence runs the length of the western border. The site also contains a few low mounds and shallow depressions, but these appear to represent man-made disturbances such as push-piles and borrow pits. Oaks and non-native trees and shrubs are interspersed throughout the property. The ground surface throughout the project area has been moderately disturbed by vehicle traffic and other human activity. The entire area is covered by a sparse scatter of modern debris, including plastic and glass fragments, concrete and brick fragments, discarded telephone poles, and undifferentiated metal debris.

Proposed Mitigated Negative Declaration: Pursuant to the requirements of the California Environmental Quality Act (CEQA), the City has conducted an initial study to evaluate potential environmental impacts of the project. Based on City policies, standard conditions, technical studies prepared for the project and other prior environmental documentation related to the project site and vicinity, the Initial Study concludes that mitigation measures can be incorporated into the project to address potential impacts to biological resources, cultural resources, energy, geology and soils, greenhouse gas emissions, and hydrology and water quality, and tribal cultural resources, thereby reducing potential impacts to a less than significant level.

Document Availability: The Initial Study, Draft Mitigated Negative Declaration and all other information related to the project application are available for review at the Planning Division offices located in City Hall at 650 Merchant Street, Vacaville, CA 95688. (Primary Contact – Albert Enault). Also, the document can be accessed using the following URL: http://bit.ly/VV18-200

The public is hereby invited to submit written comments regarding the environmental findings and Negative Declaration determination. Comments may be submitted in writing to the Community Development Department at the address listed above.

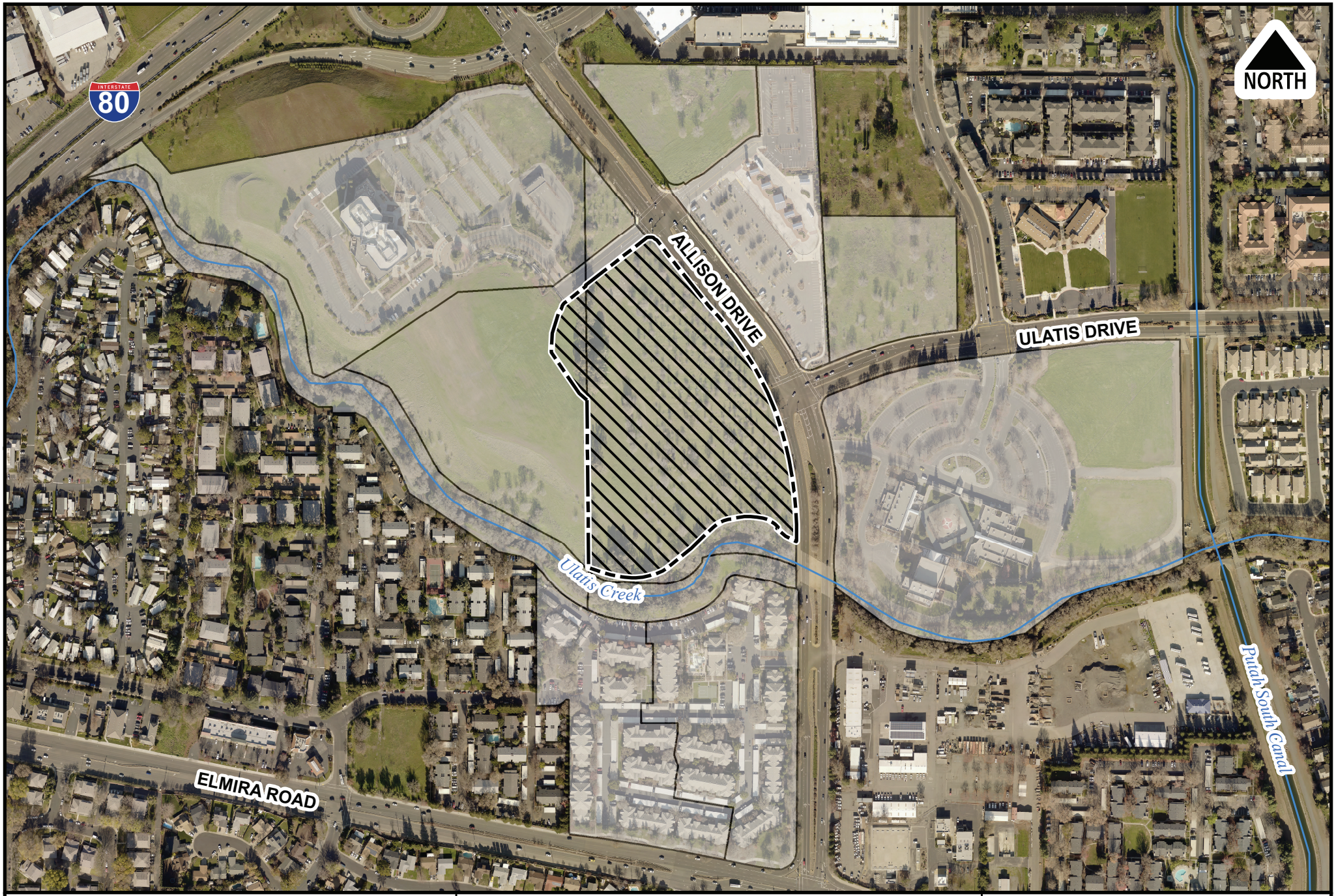
Public Review Period: March 1, 2019 through April 1, 2019

Tentative Public Hearing: Tuesday, April 16, 2019, at 7:00 PM at City of Vacaville City Hall, 650 Merchant Street, Vacaville, CA 95688

Signature: Albert Enault

Date: March 1, 2019

ALBERT ENAULT, Associate Planner



CITY OF VACAVILLE
COMMUNITY DEVELOPMENT DEPARTMENT

CASA DEI VISTA APARTMENTS

ALLISON DRIVE AND TRAVIS WAY
(APN 0131-030-860 AND 0131-020-540)

FILE NO. 18-200

NOTICE OF AVAILABILITY

PROJECT SITE

NOTIFIED PROPERTIES

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PROJECT INFORMATION

PROJECT TITLE

Casa Dei Vista Apartments (File No. 18-200)

LEAD AGENCY NAME AND ADDRESS

City of Vacaville
Community Development Department
650 Merchant Street
Vacaville, CA 95688

CONTACT PERSON AND PHONE NUMBER

Albert Enault
Associate Planner
Tel (707) 449-5364
Fax (707) 449-5423
albert.enault@cityofvacaville.com

PROJECT LOCATION

Northwest corner of Allison Drive and Travis Way
Vacaville, CA 95688
Assessor's Parcel Numbers: 0131-030-860 and 0131-020-540
Coordinates: 38º21'24.2",-121º57'57.4".

PROJECT SPONSOR'S NAME AND ADDRESS

Rich Alexander
Guardian Commercial Real Estate, L.P.
5780 Fleet Street, Suite 22
Carlsbad, CA 92008
(916) 765-0405
richa@reagan.com

GENERAL PLAN

Mixed Use (MU) and Commercial Office (CO) – The project site is designated two land use designations by the Vacaville General Plan (Figure LU-6). The site is primarily designated for MU, which provides for a combination of residential uses with commercial, public, entertainment, and/or office uses. A small portion of the site is designated CO, which provides for supporting retail and business services. Currently, these designations do not allow Residential High Density development such as the proposed project. However, the City is currently implementing General Plan Amendments to change the land use designation for the project site to Residential High Density (RH). Once complete, the project will be consistent with the Vacaville General Plan.

ZONING

Residential Low-Medium Density (RLM-4.5) and General Commercial (CG/PO) – The project site is zoned under two zoning districts. The site is primarily zoned RLM-4.5, which allows single-family residential development and other conditional uses, such as day care centers, gold courses, membership organizations and public facilities (Chapter 14.09.079 – Residential Low-Medium Density District). A small portion of the side is zoned CG/PO, which allows for medical offices and clinics, and professional offices (Chapter 14.09.107 – Professional Office Overlay District). Currently, the RLM-4.5 zoning district is inconsistent with the Vacaville General Plan, and the project is inconsistent with both existing zoning districts. However, the City is currently implementing Zoning Map Amendments to change the zoning district for the project site to Residential High Density (RH). Once complete, the project will be consistent with the City's Zoning Map.

POLICY PLAN

Allison Business Area Policy Plan (Area IIA) – The project site is located in Area IIA of the Vacaville-Golden Hills Business Park Policy Plan, which allows for Residential Low-Medium Density such as single-family homes. Currently, the project does not comply with the allowable land uses prescribed in the policy plan. However, the City is currently implementing a Policy Plan Amendment to change the allowable land use designations to include residential high density. Once complete, the project will be consistent with the Allison Business Area Policy Plan.

NUT TREE AIRPORT

Zone F (Other Airport Environments) – The project site is located in Zone F of the Nut Tree Airport Compatibility Plan, which is subject to overflight from aircraft with limited risk under flight paths. The proposed project is consistent with the allowable land uses permitted within Zone F, as denoted under Chapter 14.09.134.060 (Airport Compatibility Plan – Uses within the Nut Tree Airport Compatibility Areas) of the Vacaville Municipal Code.

PROJECT DESCRIPTION AND LOCATION

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The apartment complex includes seven 3-story buildings with thirty-five (35) units each, an 8,400 sq. ft. clubhouse with various on-site amenities, and 461 parking spaces with primary access on Allison Drive and secondary emergency access on Travis Way. The entire project would provide 28 studio units, 98 one-bedroom units, 105 two-bedroom units, and 14 three-bedroom units. Floor plans would range from 566 sq. ft. to 1,268 sq. ft. in floor area. The project is bound by Allison Drive (4-lane divided arterial) to the east, Travis Way (2-lane local street) to the north, vacant land to the west and Ulatis Creek to the South. Table 1 shows detailed project information for each building.

TABLE 1. PROJECT INFORMATION

Item	Description	
Assessor Parcel Numbers	0131-030-860 & 0131-020-540	
Gross Site Area	14.41 acres	
Developable Site Area	10.97 acres	
Number of Apartments	245 units	
Density	22.3 du/ac	
Buildings	7 Apartment Bldgs.	1 Community Bldg.
Total Building Floor Area	328,643 sq. ft.	8,400 sq. ft.
Unit Floor Area Range	566 sq. ft. – 1,268 sq. ft.	
Lot Coverage	31.5%	
Building Height	35 ft.	
Parking	461 stalls	

FIGURE 1. LOCATION MAP

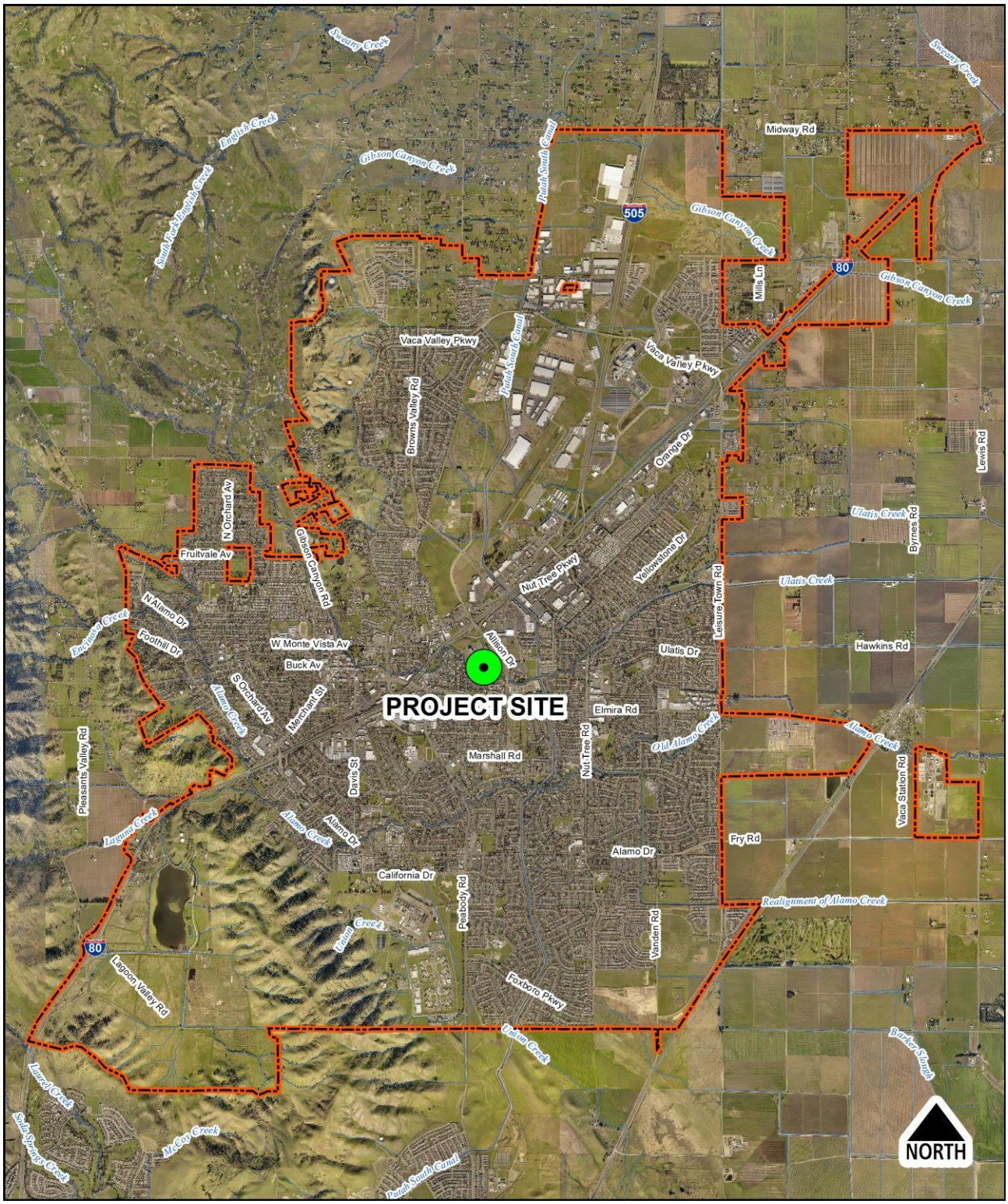


FIGURE 2. PROXIMITY MAP



FIGURE 3. SITE MAP



EXISTING CONDITIONS

The project is located on a vacant site substantially surrounded by existing urban development. The site bordered by Travis Way to the north, Allison Drive to the east, Ulatis Creek to the south, and vacant property owned by Travis Credit Union to the west. The site is generally flat with some portions that drop slightly along Ulatis Creek, and other portions that rise approximately as much as 15 ft. along the western boundary. A 6 ft. chain-link fence runs the length of the western border. The site also contains a few low mounds and shallow depressions, but these appear to represent man-made disturbances such as push-piles and borrow pits. Oaks and non-native trees and shrubs are interspersed throughout the property. The ground surface throughout the project area, to the extent that it was visible, has been moderately disturbed by vehicle traffic and other human activity. The entire area is covered by a sparse scatter of modern debris, including plastic and glass fragments, concrete and brick fragments, discarded telephone poles, and undifferentiated metal debris. Several active homeless encampments are also present in the area.

SOIL

Soil conditions 1 to 2 feet deep are generally soft to stiff and moderately to highly expansive silty and sandy clay, and clayey sands. Variable layers of medium dense to dense clayey sands and stiff to very stiff silt and clay layers were found to the maximum depth explored of 51.5 feet. No exposed bedrock was visible, although low-lying bedrock may have been obscured by the thick grass cover. Groundwater was not encountered in any of the borings at the time of drilling. Fluctuations in the groundwater conditions can occur with variations in seasonal rainfall, irrigation on the site and adjacent parcels, and variations in subsurface stratification.

HYDROLOGY

Ulatis Creek, a major riparian and stream habitat, abuts the project site along the southern border. The creek is approximately 23 feet in vertical height on the east and 28 feet on the west, with variable slope inclinations of about 1:1 to 2.5:1 ratio. The steeper sections are located on the west near the hillside ridge and on the central portion of the property. Relatively level mid-slope benches with homeless encampments are present near the eastern and central locations. The creek bank is generally covered with dense weeds, bushes and small to large mature trees. Sandstone bedrock is exposed near the toe of creek on the western end. Evidence of past shallow sloughing and erosion were evident primarily on the lower flanks of the creek bank. The site does not contain any wetlands or vernal pools.

VEGETATION

The site contains two vegetation habitat types: mixed riparian woodland and valley oak woodland. Between 1960s and 1990s, the site was an almond orchard. Currently, the site is fallow, reverting back to a valley oak (Quercus lobata) woodland habitat interspersed with occasional specimens of old almond trees (Prunus dulcis). The understory and open areas are primarily comprised of rip-gut brome (Bromus diandrus), spring vetch (Vicia villosa), medusa-head grass (Elymus caput-medusae), and soft brome (Bromus hordeaceus). The southern portion supports mixed riparian woodland made up of valley oak, elderberry (Sambucus nigra), willows (Salix spp.), and Fremont's cottonwood (Populus fremontii). In total, there are 145 trees measuring 4 inches in diameter and larger, which are primarily comprised of Valley Oak and Pecan trees. Several elderberry shrubs are located on the site. Except for one shrub situated south of Travis Way, all are located directly within the Ulatis Creek riparian corridor.

SPECIAL-STATUS PLANTS AND WILDLIFE

No special-status species or habitat were identified from a records search of the California Natural Diversity Database (CNDDB). A field survey determined there are no wetlands or vernal pools at the site. Several elderberry shrubs, a host plant for the valley elderberry longhorn beetle (VELB), are located on the site. Except for two shrubs situated within the project site, all are located directly within the Ulatis Creek riparian corridor. No construction will occur within the driplines of the shrubs along Ulatis Creek. The other two shrubs located in the site would be removed. No burrowing owls were observed at the site. Although several appropriately-sized ground squirrel burrows are present at the site, no evidence of burrowing owl use was observed. The site does contain numerous trees large enough to support raptor nests including those for Swainson's hawks, but no active nests were observed. Ulatis Creek meanders through the southern edge of the site, but no work is proposed within the creek.

SURROUNDING LAND USES

The currently project site is bordered by the following:

North: The northern boundary adjoins Travis Way and Travis Credit Union.
South: The southern boundary adjoins Ulatis Creek.
West: The western boundary adjoins vacant commercial land.
East: The eastern boundary adjoins Allison Drive.

OTHER PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED

This IS/MND would be used by the City, as the Lead Agency, in evaluating the potential environmental impacts of the proposed project. In order for the proposed project to be implemented, a series of actions and approvals would be required from several agencies. Anticipated project approvals/actions would include, but are not limited to, the following:

- Adoption of Environmental Determination (MND): City of Vacaville.
- Design Review (DR) approval of a land use permit: City of Vacaville.
- Building Permits: City of Vacaville.

TRIBAL CONSULTATION

According to the California Indian Tribal Homelands and Trust Land Map produced by the California Department of Water Resources, the City of Vacaville is situated in the ethnographic territory of the Patwin (http://www.water.ca.gov/tribal/maps.cfm). At this time, the Yocha Dehe Wintun Nation is the only regionally affiliated tribe to request formal notification pursuant to Public Resources Code Section 21080.3.1. On November 28, 2018, the City of Vacaville provided formal notification to the Yocha Dehe Wintun Nation via United States Postal Service (USPS) certified mail. On December 21, 2018, the Lead Agency received a response with a request to perform a site visit with YDWN, which occurred on January 8, 2019. On February 5, 2019, the Lead Agency received a letter from YDWN, which confirmed the potential for discovery of unknown tribal cultural resources. The response letter included a request to establish a monitoring agreement to ensure a Tribal Cultural Monitor is present during initial ground disturbing activities. More information on Tribal Cultural Resources can be read under Section XVII of the draft Initial Study and Mitigated Negative Declaration.

ACRONYMS

CDFW – California Department of Fish and Wildlife
CEQA – California Environmental Quality Act
CNDDB – California Natural Diversity Database
CRHR – California Register of Historical Resources
FEMA – Federal Emergency Management Agency
LUDC – Vacaville Land Use and Development Code
MND – Mitigated Negative Declaration
NAHC – Native American Heritage Commission
NWIC – Northwest Information Center
USFWS – U.S. Fish and Wildlife Service
YDWN – Yocha Dehe Wintun Nation

PURPOSE OF THIS DOCUMENT

The City of Vacaville has prepared this Initial Study per the requirements of the California Environmental Quality Act (CEQA) of 1970 (Public Resources Code [PRC] Section 21000, et seq.), and the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000, et seq.).

CEQA requires that all state and local government agencies consider the environmental consequences of projects over which they have discretionary authority before acting on those projects. This Initial Study is a public document that assesses the environmental effects of the project. The document has been prepared as required by CEQA and in compliance with the State CEQA Guidelines (14 California Administrative Code 1400 et seq.).

The City is soliciting the views of interested persons and agencies on the content of the information, analyses, and conclusions presented in this environmental document. Due to the time limits mandated by state law, comments must be sent at the earliest possible date, but no later than 5:00 p.m. at the end of the 30-day review period identified on the notice of negative declaration.

MITIGATED NEGATIVE DECLARATION CIRCULATION PERIOD

March 1, 2019 through April 1, 2019 (5:00 p.m.)

Please send written comments to:

Albert Enault
Associate Planner
City of Vacaville
Planning Division,
650 Merchant Street, Vacaville, CA 95688
Phone (707) 449-5364
Fax (707) 449-5423
Email: albert.enault@cityofvacaville.com

MITIGATION MONITORING PROGRAM

CEQA allows a lead agency to adopt a mitigated negative declaration when all the impacts identified in the Initial Study are reduced by adopted mitigation measures to a less-than-significant level. The project proponent must agree, before release of the Initial Study, to implement all the mitigation measures identified in the Initial Study to qualify for the mitigated negative declaration. As the project proponents and lead agency, the City and Project Sponsor have reviewed all the mitigation measures identified in this Initial Study and agreed to incorporate all of the measures into the project.

When approving a mitigated negative declaration, Section 21081.6 of the Public Resources Code requires the lead agency to adopt a monitoring program that includes each mitigation measure in the Initial Study that would avoid or mitigate significant environmental effects. A mitigation monitoring program has been prepared and is available upon request. Mitigation measures identified in Table 2 will be adopted to ensure that the project has a less-than-significant impact on the environment.

MITIGATION MEASURES

TABLE 2. MITIGATION MEASURES

BIO-1	Prior to the commencement of construction activities, all crew members shall attend an Environmental Awareness Training focused on potentially occurring special-status species. Interpretation shall be provided for non-English speaking workers, and the same instruction shall be provided for any new workers prior to their performing work on-site. This training would instruct workers to recognize these species, their habitat(s), the nature and purpose of project protection measures, each species' legislative protection under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA), and penalties for violations of legislative protection.
BIO-2	Depending on the specific construction timeframe, to avoid disturbing nesting raptors and other migratory birds, the following measures shall be implemented: a. If construction activities are scheduled to occur during the nesting season (approximately February 15 through August 31), a qualified wildlife biologist shall be retained to conduct a pre-construction nesting survey within the appropriate habitat. • Surveys shall be conducted within the project site and all potential nesting habitat within 500 feet of this area (this distance covers recommended Swainson's hawk buffers); • The surveys shall be conducted within one week before initiation of construction activities at any time between February 15 and August 31. If no active nests are detected, then no additional mitigation is required; or • If surveys indicate that migratory bird nests are found in any areas that would be directly or indirectly affected by construction activities, a no-disturbance buffer shall be established around the site to avoid disturbance or destruction of the nest site until after the breeding season or after a wildlife biologist determines that the young have fledged. The extent of these buffers shall be determined by a qualified biologist and shall depend on the special-status species present, the level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. These factors shall be analyzed to make an appropriate decision on buffer distances. b. If construction activities begin outside the breeding season (approximately September 1 through February 14) then construction may proceed until it is determined that an active migratory bird or raptor nest would be subject to abandonment as a result of construction activities. Optimally, all necessary vegetation removal shall be conducted before the breeding season so that nesting birds would not be present in the construction area during construction activities. If any bird nests are in the project site under pre-existing construction conditions, then it is assumed that they are habituated (or would habituate) to the construction activities. Under this scenario, the pre-construction survey described previously shall still be conducted on or after February 15 to identify any active nests in the vicinity. Active sites shall be monitored by a qualified biologist periodically until after the breeding season or after the young have fledged. If active nests are identified on or immediately adjacent to the project site, then all

	non-essential construction activities (e.g., equipment storage and meetings) shall be avoided in the immediate vicinity of the nest site, but the remainder of construction activities may proceed.
BIO-3	The Project Sponsor shall implement the following measures for shrubs EB-1, EB-2 and three shrubs in cluster EB-4: a. Fencing – All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible. b. Worker education – Prior to any work on the trail, including grading or vegetation clearing, a qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for non-compliance. c. Trimming – In order to avoid and minimize adverse effects to VELB when trimming elderberry shrubs, trimming will occur between November and February and will avoid the removal of any branches or stems that are ≥ 1 inch in diameter. This requirement would apply to any future trimming that may be required for maintenance purposes. d. Chemical Usage – Herbicides will not be used within the drip-line of the shrub. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method. e. Mowing – Mechanical weed removal within the drip-line of the shrub(s) will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry. f. Erosion Control and Re-vegetation – Erosion control will be implemented, and the affected area will be re-vegetated with appropriate native plants. g. Construction monitoring – A qualified biologist will monitor the work area during trail construction to assure that the above avoidance and minimization measures are implemented. h. Signage – Signs shall be placed every 50 feet along the edge of the buffer zone with the following information: *"This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Federal Endangered Species Act. Violators are subject to prosecution, fines, and imprisonment."* The signs shall be clearly readable from a distance of 20 feet and must be maintained for the duration of construction.
CUL-1	Prior to the initiation of construction or ground-disturbing activities HELIX recommends that all construction personnel be trained in the protection of cultural resources, the recognition of buried cultural remains, and the notification procedures to be followed upon the discovery of archaeological materials, including Native American burials. The training should be presented by an archaeologist who meets the Secretary of Interior's Standards for Prehistoric and Historic Archaeology, and should include recognition of both prehistoric and historic resources. Personnel should be instructed that unauthorized collection or disturbance of artifacts or other cultural materials is illegal, and that violators will be subject to prosecution under the appropriate state and federal laws. Supervisors should also be briefed on the consequences of intentional or inadvertent damage to cultural resources.

CUL-2	If any cultural or archeological resources are encountered during ground disturbance or subsurface construction activities (e.g., trenching, grading), all construction activities within a 50-foot radius of the identified potential resource shall cease until a Secretary of the Interior qualified archaeologist evaluates the item for its significance and records the item on the appropriate State Department of Parks and Recreation (DPR) 523 series forms. All forms and associated reports will be submitted to the NWIC of the California Historical Resources Information System (CHRIS). The archaeologist shall determine whether the resource requires further study. If, after the qualified archaeologist conducts appropriate technical analyses, the resource is determined to be eligible for listing on the California Register of Historical Resources or as a unique archaeological resource as defined in Public Resources Code Section 15064.5, the archaeologist shall develop a plan for the treatment of the resource. This shall contain appropriate mitigation measures, including avoidance, preservation in place, data recovery excavation, or other appropriate measures, as outlined in Public Resources Code Section 21083.2.
CUL-3	In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken: (1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: a. The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and b. If the coroner determines the remains to be Native American: i. The coroner shall contact the Native American Heritage Commission within 24 hours. ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code section 5097.98; or (2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance. a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission. b. The descendant identified fails to make a recommendation; or c. The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

ENG-1	Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
GEO-1	A design-level geotechnical and geologic investigation report shall be completed and submitted to the City of Vacaville for review prior to issuance of grading and construction permits. The investigation shall include site-specific subsurface investigation (e.g. borings, test pits, geophysical methods, etc.) and laboratory testing sufficient to further characterize Project Area geologic materials and their anticipated response to seismic activity. The design-level geotechnical investigation report shall be signed and stamped by appropriately licensed professionals and at the City's discretion may be subject to a peer review. Construction of Project improvements shall be in compliance with the design-level geotechnical and geologic investigation report approved by the City.
GEO-2	In the event that paleontological resources, including individual fossils or assemblages of fossils, are encountered during construction activities all ground disturbing activities shall halt and a qualified paleontologist shall be procured to evaluate the discovery and make treatment recommendations.
GHG-1	In accordance with Communitywide Measure EC-1 from the ECAS, the project sponsor shall use energy-efficient lighting technologies that meet or exceed Title 24 standards in the apartment buildings and clubhouse.
GHG-2	In accordance with Communitywide Measure EC-3 from the ECAS, the project sponsor shall incorporate any combination of the following strategies to reduce heat gain for fifty (50) percent of the non-roof impervious site landscape, which includes roads, sidewalks, courtyards, parking lots, and driveways: a. Shaded within five years of occupancy; b. Paving materials with a Solar Reflectance Index (SRI) of at least 29, as determined in accordance with American Society for Testing and materials (ASTM) Standards E1918 or C1549; c. Open grid pavement system; or d. Parking spaces underground, under deck, under roof, or under a building. Any roof used to shade or cover parking must have an SRI of at least 29.
GHG-3	In accordance with Communitywide Measure EC-4 from the ECAS, the project sponsor shall use LED, induction, or other energy-efficient lighting for parking lot lights.
GHG-4	In accordance with Communitywide Measure WW-1 from the ECAS, the project sponsor shall install water-efficient landscaping in accordance with Chapter 14.12 (Water Efficient Landscaping) of the Vacaville Municipal Code.
GHG-5	In accordance with Communitywide Measure SW-1 from the ECAS, the project sponsor shall provide recycling areas for all residents.

HYD-1	A Storm Water Pollution Prevention Plan (SWPPP), prepared in accordance with the State Water Resources Control Board (SWRCB), National Pollutant Discharge Elimination System (NPDES) Construction General Permit, shall be implemented for all construction activities where required under SWRCB regulations. The SWPPP shall include Best Management Practices (BMPs) for controlling sediment, turbidity, and the release of other pollutants into aquatic habitats during construction. The SWPPP shall be subject to the approval of the Regional Water Quality Control Board (RWQCB) prior to the start of work.
HYD-2	Seed mixes shall be composed of native or noninvasive naturalized species. No invasive exotic plant species shall be allowed, including those identified in the California Exotic Pest Plant Council's database, which is accessible at: http://www.cal-ipc.org/ip/inventory/weedlist.php.
HYD-3	Any concrete structures below the tops of banks of creeks, wetlands, or other aquatic habitats shall be poured in tightly sealed forms and shall not be allowed contact with surface waters until the cement has fully cured (minimum of 30 days). During that time, the poured concrete shall be kept moist, and runoff from the concrete shall not be allowed to enter aquatic habitats. Commercial sealants may be applied to the poured concrete surface in locations where the exclusion of water flow for a long period is difficult. If a sealant is used, water shall be excluded from the site until the sealant is dry and fully cured according to the manufacturer's specifications.
HYD-4	Water that contacts wet concrete and has a pH greater than 9.0 shall be pumped out and disposed of outside an aquatic habitat.
HYD-5	No substances toxic to aquatic life shall be discharged or allowed to leach into an aquatic habitat. Every reasonable precaution to protect aquatic habitats from pollution with fuels, oils, bitumens, calcium chloride, dust suppressants, and other harmful materials shall be implemented.
TCR-1	The Project Sponsor shall coordinate with the Yocha Dehe Wintun Nation to have tribal cultural monitors at the site during initial ground disturbing activities.

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	☐ Agricultural Resources	☐ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Energy
☒ Geology/Soils	☒ Greenhouse Gas Emissions	☐ Hazards/Hazardous Material
☒ 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

ENVIRONMENTAL DETERMINATION – On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ 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.



ALBERT ENAULT, Associate Planner

March 1, 2019

Date

EVALUATION OF ENVIRONMENTAL IMPACTS:

Scope of the Environmental Assessment

This environmental assessment analyzes the project-specific impacts of the Casa Dei Vista Apartments in accordance with the requirements of the California Environmental Quality Act (CEQA). The scope of review includes only those improvements associated with the project plans, and as described in the project description. The method of environmental analysis includes a review to determine whether the impact related to the City's evaluation criteria would be: potentially significant; less than significant unless mitigation is incorporated; less than significant; or none. The analysis includes a summary of the affected environment and a review of the threshold for determining significance. The evaluation of potential impacts applies the threshold, determines significance and, if necessary, includes recommended mitigation measures to reduce identified impacts to a level of less-than-significant.

For this evaluation, the following designations are used:

Potentially Significant Impact: An impact that could be significant, and for which mitigation has not been identified. If any potentially significant impacts are identified, an EIR must be prepared. An ISMND cannot be used in the case of a project for which this conclusion is reached in any impact category.

Less-Than Significant with Mitigation Incorporated: This designation applies where applicable and feasible mitigation measures previously identified in prior applicable EIRs or in the General Plan EIR have reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact", and pursuant to Section 21155.2 of the Public Resources Code (PRC), those measures are incorporated into the ISMND.

This designation also applies where the incorporation of new project-specific mitigation measures not previously identified in prior applicable EIRs or in the General Plan EIR has reduced an effect from "Potentially Significant Impact" to a "Less-Than Significant Impact".

Less-Than Significant Impact: Any impact that would not be considered significant under CEQA, relative to existing standards.

No Impact: The project would not have any impact.

I. AESTHETICS

Except as provided in Public Resources Code Section 21099, would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
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) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from public accessible vantage point). If the project is in an urbanized area, would the project 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?	☐	☐	☒	☐

Affected Environment

The project site is approximately located in the center of Vacaville. The site is adjacent to a major arterial street (Allison Drive) to the east, Ulatis Creek to the south, a local street to the north (Travis Way) and vacant open land to the west. Most of the site was an almond orchard from the 1960s to the 1990s. It is currently fallow reverting to a valley oak woodland interspersed with occasional specimens of old almond trees. The site contains 145 trees with the primary species being Valley Oak and Pecan. Lighting around the project site is primarily produced by public street lights on Allison Drive and Travis Way. Other sources of light include light pollution from parking lots on surrounding urbanized properties such as Travis Credit Union, the City's Transit Center and Ulatis Community Center across Allison Drive to the east. The site is not located on any prominent points within the region. Images 1 and 2 show the project site as seen from Allison Drive and Travis Way.

IMAGE 1. ALLISON DRIVE



Source: Google Earth (2018).

IMAGE 2. TRAVIS WAY



Source: Google Earth (2018).

Discussion of Impacts

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

As described in the Conservation and Open Space Element of the Vacaville General Plan (pg. COS-24), most of Vacaville's scenic resources are associated with the open space, natural resources, and agricultural uses of the Planning Area. Such areas include: (1) riparian corridors, which are habitat and vegetation zones associated with the banks and floodplains of a river, stream, or lake) that run throughout the city; (2) views of the rural and undeveloped lands surrounding the city; and (3) Vacaville's hillside areas. Many of the scenic resources that are valued by Vacaville residents, such as the ridgelines of the Vaca Mountains and English Hills, are located outside the city limits or even beyond the Planning Area boundary.

There are no scenic vistas located on the site. As noted above, the site is bound by Ulatis creek to the south, which is a riparian corridor and scenic resource as defined by the Vacaville General Plan. As designed, the project will avoid impacts to Ulatis Creek, because: (1) the project is setback away from the creek; and (2) no improvements are proposed within the creek or stable top-of-bank. Therefore, the Project will have a **no impact** on scenic vistas.

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

The project site does not adjoin a state scenic highway. There are no rock outcroppings or historic buildings located at the site. The site does contain several native and non-native trees with ruderal weeds. The existing trees and vegetation are not considered a scenic resource as defined by the Open Space and Conservation Element of the General Plan (pg. COS-24). Although the majority of existing vegetation will be removed from the site, the resulting improvements from the building and landscaping will improve the frontage appearance on Allison Drive and Travis Way. Therefore, the project will have a **less-than significant impact** on scenic resources.

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

Please see the "Affected Environment" and "Project Description" sections. The existing visual characteristic consists of vacant land with non-native grasses, trees and volunteer landscaping. The existing vegetation does not provide any valuable aesthetic benefits for the surrounding area. The proposed project would improve the character of the site, because: (1) the new buildings and landscaping will improve the street frontage appearance along Allison Drive and Travis Way; and (2) some mature trees will be preserved at the site. The project is located in an urbanized area, and would comply with City standards for building design and landscaping. Based on this assessment, the project will have **less-than significant impact** on the site's existing visual character or quality.

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

The project would introduce new light sources from exterior building lights and parking lot light poles, which are not currently present. However, the new sources would not adversely affect

day or nighttime views in the area because the surrounding streets and properties are inundated within existing light sources from light poles and buildings on Allison Drive, Travis Way, Ulatis Community Center, City Transit Center and Travis Credit Union. All light sources from the project site will be pointed downward to avoid excess light pollution and glare onto adjoining properties. Based on this assessment, the project will have a **less-than significant impact** on day-time and night-time views in the area.

Impact Conclusion

The Project will have a less-than significant impact on aesthetics.

Mitigation Measures

No mitigation is required.

II. AGRICULTURAL RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
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) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒

Affected Environment

The project site is approximately located in the center of Vacaville. The site is adjacent to a major arterial street (Allison Drive) to the east, Ulatis Creek to the south, a local street to the north (Travis Way) and vacant open land to the west. Most of the site was an almond orchard from the 1960s to the 1990s. It is currently fallow reverting to a valley oak woodland interspersed with occasional specimens of old almond trees. The site contains 145 trees with the primary species being Valley Oak and Pecan. According to Figure COS-2 (Important Farmlands) of the Conservation and Open Space Element in the Vacaville General Plan, the project site is not designated for Grazing Land. According to the Solano County Williamson Act Map (FY 2013/2014) prepared by the Department

of Conservation, the site does not contain an active Williamson Act Contract. As a result, the project will have no effect on the City's agricultural resources.

Discussion of Impacts

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?

See "Affected Environment" and "Project Description" sections above. No impact.

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

See "Affected Environment" and "Project Description" sections above. No impact.

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

See "Affected Environment" and "Project Description" sections above. **No impact**.

Impact Conclusion

The Project will not result in impacts to agricultural resources.

Mitigation Measures

No mitigation is required.

III. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
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?	☐	☐	☒	☐

Affected Environment

The project site is approximately located in the center of Vacaville. The site is adjacent to a major arterial street (Allison Drive) to the east, Ulatis Creek to the south, a local street to the north (Travis Way) and vacant open land to the west. Most of the site was an almond orchard from the 1960s to the 1990s. It is currently fallow reverting to a valley oak woodland interspersed with occasional specimens of old almond trees. The site contains 145 trees with the primary species being Valley Oak and Pecan.

As noted under the project description, the project would construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The apartment complex includes seven 3-story buildings with thirty-five (35) units each, an 8,400 sq. ft. clubhouse with various on-site amenities, and 461 parking spaces with primary access on Allison Drive and secondary emergency access on Travis Way. Construction activity is anticipated to start in May 2019 with an end date near September 2021. Temporary generators would be used for approximately 2-3 months during initial project implementation.

The site is located in the Sacramento Valley AirBasin (SVAB) (Vacaville General Plan, pg. COS-30). The prevailing winds in Vacaville are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north. The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. Surface concentrations of pollutants are highest when stagnant conditions are combined with temperature

inversions that trap pollutants near the ground. Air pollutants of concern in Vacaville include ozone (O_3), carbon monoxide (CO), nitrogen oxides (NO_2 and NO_x), sulfur dioxide (SO_2), and particulate matter (PM). These pollutants originate from sources both within and outside of Vacaville. For this project, air pollutants of concern would only be generated by construction activities.

The site is under the jurisdiction of the Yolo-Solano Air Quality Management District (YSAQMD), which is tasked with achieving and maintaining healthful air quality in the project vicinity in accordance with State and Federal standards. YSAQMD has developed an attainment plan for the purpose of bringing the district into compliance with the federal and state ambient air quality standards[4]. The plan includes strategies for progressive reduction of air pollutants by promoting active public involvement, by encouraging compliance through positive influence and behavior, and through public education in both the public and private sectors. YSAQMD also provides a handbook of guidelines for determining air quality thresholds of significance and mitigation measures for proposed development projects that generate emissions from motor vehicles. YSAQMD has identified four pollutants of concern with recommended thresholds of significance for determining whether projects have significant adverse impacts to air quality[5].

Construction-related emissions associated with typical construction activities were modeled using the California Emissions Estimator Model (CalEEMod), Version 2013.2.2[7]. CalEEMod allows the user to enter project-specific construction information, such as types, number, and horsepower of construction equipment, and number and length of offsite motor vehicle trips. Table 3 provides a brief summary of the potential level of construction and operational pollutants generated by the proposed project. Attachment 6 shows the complete emission calculations for the project, as generated by the CalEEMod software.

TABLE 3. YSAQMD POLLUTANTS OF CONCERN

Pollutant	Threshold of Significance	Construction	Operations
Reactive Organic Gases (ROG)	10 tons/year	1.88 tons/year	2.09 tons/year
Nitrogen Dioxide (NO_x)	10 tons/year	3.45 tons/year	3.72 tons/year
Coarse Particulate Matter (PM_{10})	80 lbs/day	9.08 lbs/day (summer/winter)	8.17 lbs/day (summer/winter)
Carbon Monoxide (CO)	Refer to State Standard[1]	3.62 tons/year	6.96 tons/year

Source: YSAQMD 2007.

Notes: [1]The state ambient air quality standards for CO are 9.0 parts per million (8-hour standard) and 20 parts per million (1-hour standard).

Discussion of Impacts

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

The YSAQMD thresholds of significance for criteria pollutants are applied to evaluate regional impacts of project-specific emissions of air pollutants and their impact on the YSAQMD's ability to reach attainment. Emissions that are above these thresholds have not been accommodated in the air quality plans and would not be consistent with the air quality plans. As shown in Table 3, project-related emissions would not exceed the significance thresholds developed by the YSAQMD for construction and operational emissions. Therefore, the project would not conflict with YSAQMD air quality plan, and resulting in a **less than significant impact**.

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

Criteria pollutants include CO, ROG, NO_x, and PM_{10}. These pollutants would be generated from construction activities (off-road equipment exhaust, on-road vehicle exhaust and entrained road dust) and from operational activities (resident vehicle traffic, landscaping equipment, and energy sources). Table 4 identifies the current YSAQMD attainment status for each criteria pollutant.

TABLE 4. YSAQMD ATTAINMENT STATUS

YSAQMD Attainment Designation Status		
Pollutant	**State Standards**	**Federal Standards**
Ozone	Non-attainment	Non-attainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_x)	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
Coarse Particulate Matter (PM_{10})	Non-attainment	Attainment
Fine Particulate Matter ($PM_{2.5}$)	Unclassified	Non-attainment
Sulfates	Attainment	N/A
Lead	Attainment	Attainment
Hydrogen Sulfide	Unclassified	N/A
Visibility Reducing Particles	Unclassified	N/A

Notes: N/A – not applicable, state or federal standard does not exist for the combination of pollutant and averaging time. Unclassified areas are those for which air monitoring has not been conducted but which are assumed to be in attainment.

Sources:

California Air Resources Board. (2013). "Area Designation Maps/States and National" (*www.arb.ca.gov/desig/adm/adm.htm*)

Yolo-Solano Air Quality Management. District (2014). "Meeting Health Standards". (*http://ysaqmd.org/planning/status.php*)

YSAQMD is currently not in attainment for two criteria pollutants: Ozone (O_3) and Fine Particulate Matter ($PM_{2.5}$). The nonattainment status of these pollutants is a result of past and present development, therefore, cumulative impacts related to these pollutants could be considered cumulatively significant. Future attainment of standards is a function of successful implementation of YSAQMD attainment plans. Consequently, YSAQMD's approach to cumulative thresholds of significance is relevant to whether a project's individual emissions would result in a cumulatively considerable contribution to the existing regional cumulative impacts related to air quality conditions.

According to the YSAQMD Handbook for Assessing and Mitigating Air Quality Impacts, the YSAQMD has developed control measures for stationary, area, and transportation sources of air pollution. Emissions above individual thresholds as defined in the handbook would have a significant cumulative impact on regional air quality unless offset. As shown in Table 3, emissions from the project would not exceed the YSAQMD recommended thresholds. In addition, the project would be required to comply with all applicable YSAQMD rules and regulations. Therefore, the project's individual emissions would not be expected to result in a

cumulatively considerable contribution to a significant cumulative impact, and impacts would be considered **less than significant**.

c) Expose sensitive receptors to substantial pollutant concentrations?

Although the project is not located next to any sensitive land uses, the project site itself is a sensitive receptor. The following sections describe whether the project sensitive receptors will be exposed to substantial pollutant concentrations including Naturally-Occurring Asbestos (NOA), construction-generated Diesel Particulate Matter (DPM), operational related Toxic Air Contaminants (TAC), or operational CO hotspots.

Construction Emissions

Naturally-Occurring Asbestos

According to the California Department of Conservation, the project site is located in an area mapped as having a low likelihood of containing ultramafic rock, serpentine, or NOA. When inhaled, asbestos fibers may remain in the lungs and with time may be linked to such diseases as asbestosis, lung cancer, and mesothelioma. The risk of disease is dependent upon the intensity and duration of exposure. The closest known occurrence of ultramafic rock outcroppings is in Napa County, approximately 15 miles northwest of the project. Therefore, potential health hazards resulting from NOA dust would be **less than significant**.

Diesel Particulate Matter (DPM)

Construction activities have the potential to generate DPM emissions related to the number and types of equipment typically associated with construction. Off-road, heavy-duty diesel equipment used for site grading, paving, and other construction activities result in the generation of DPM. However, construction would be temporary and would occur over a relatively short duration in comparison to the operational lifetime of the project. In addition, only portions of the site would be disturbed at a time, with operation of construction equipment regulated by federal, state, and local regulations, including YSAQMD rules and regulations, and occurring intermittently throughout the course of a day over the course of the construction schedule. Given this understanding, there is a low likelihood that any one sensitive receptor would be exposed to high concentrations of DPM for any extended period. Therefore, the potential health hazards resulting from construction related DPM exposure would be **less than significant**.

Operational Emissions

TAC Emissions

The CARB Air Quality and Land Use Handbook[26] contains recommendations that will "help keep California's children and other vulnerable populations out of harm's way with respect to nearby sources of air pollution" (CARB 2017c), including recommendations for distances between sensitive receptors and certain land uses. The CARB recommendations are noted below:

- **Heavily Traveled Roads:** CARB recommends avoiding new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day. Epidemiological studies indicate that the distance from the roadway and truck traffic densities were key factors in the correlation of health effects,

particularly in children. The project is not located within 500 feet of any high-traffic-volume roadways. Interstate 80 is located approximately 0.27 mile north of the site.

- **Distribution Centers:** CARB also recommends avoiding siting new sensitive land uses within 1,000 feet of a distribution center. There are no distribution centers within 1,000 feet of the site.
- **Fueling stations:** CARB recommends avoiding new sensitive land uses within 300 feet of a large fueling station (a facility with a throughput of 3.6 million gallons per year or more). CARB recommends a 50-foot separation for typical gas-dispensing facilities. The nearest gas station is an ARCO gas station located at 199 Elmira Road, approximately 0.20 mile southwest of the site.
- **Dry Cleaning Operations:** CARB recommends avoiding siting new sensitive land uses within 300 feet of any dry-cleaning operation that uses perchloroethylene. For operations with two or more machines, CARB recommends a buffer of 500 feet. For operations with three or more machines, CARB recommends consultation with the local air district. The nearest dry-cleaning operation is Family Cleaners located at 500 Elmira Road, approximately 0.26 mile south of the project site.

Because the project is located beyond the recommended distances from the above land uses, impacts would be considered **less than significant**.

CO Hotspots

The YSAQMD recommends using a screening approach, originally developed by San Joaquin Valley Unified Air Quality Management District (SJVAQMD), to estimate whether or not a project's traffic impact would cause a potential CO hotspot at any given intersection. The following criteria was established to determine whether a project can be said to have the potential to create a violation of the CO standard:

- Criteria 1 – A traffic study for the project indicates that the peak-hour Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity would be reduced to an unacceptable LOS (typically LOS E or F); or
- Criteria 2 – A traffic study indicates that the project would substantially worsen an already existing peak-hour LOS F on one or more streets or at one or more intersections in the project vicinity. "Substantially worsen" includes situations where delay would increase by 10 seconds or more when project-generated traffic is included.

According to the Traffic Impact Study prepared by GHD (Attachment 7), the project would not generate traffic that would result in deterioration of an intersection from acceptable Level of Service (LOS) (LOS A through D) to LOS E or F under existing plus project conditions. Therefore, in accordance with YSAQMD's screening criteria, the project would not be expected to result in the generation of localized CO emissions in excess of the applicable threshold of significance. **Less-than significant impact**.

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

The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Although offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies. Project operations are not anticipated to produce odorous emissions. Construction activities associated with the project could result in short-

term odorous emissions from diesel exhaust associated with construction equipment. However, these emissions would be intermittent and would dissipate rapidly from the source. In addition, this diesel-powered equipment would only be present during construction activities. Operational activities would not create objectionable odors. **Less than significant impact**.

Impact Conclusion

The Project will have a less than significant impact on air quality.

Mitigation Measures

No mitigation is required.

IV. BIOLOGICAL RESOURCES

Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
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 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 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?	☐	☐	☐	☒

Affected Environment

The project is located on a vacant site substantially surrounded by existing urban development. The site bordered by Travis Way to the north, Allison Drive to the east, Ulatis Creek to the south, and vacant property owned by Travis Credit Union to the west. The site is generally flat with some portions that drop slightly along Ulatis Creek, and other portions that rise approximately as much as 15 ft. along the western boundary. A 6 ft. chain-link fence runs the length of the western border. The site also contains a few low mounds and shallow depressions, but these appear to represent man-made disturbances such as push-piles and borrow pits. Oaks and non-native trees and shrubs are interspersed throughout the property. The ground surface throughout the project area, to the extent that it was visible, has been moderately disturbed by vehicle traffic and other human activity. The entire area is covered by a sparse scatter of modern debris, including plastic and glass fragments, concrete and brick fragments, discarded telephone poles, and undifferentiated metal debris. Several active homeless encampments are also present in the area.

The Project Sponsor contracted with Madrone Ecological Consulting to evaluate existing conditions at the site, and determine whether the project site has any special-status habitat, plants or wildlife species that may be impacted at the project site. The Biological Assessment from Madrone has been included as Attachment 2, which consists of CNDDB records search and a site visit conducted on February 14, 2018, and December 14, 2018.

Discussion of Impacts

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 Game or US Fish and Wildlife Service?

Avian Species

No special-status avian species were observed at the site during surveys on February 14, 2018 and December 14, 2018. However, according to CNDDB there are four special-status avian species that have the potential to use the site for foraging and nesting: Tricolored blackbird, Burrowing owl, Swainson's hawk, and White-tailed kite.

- Tricolored Blackbird – The species has the potential to occur because the site is within the known range of the species and there is marginally suitable habitat. However, the likelihood is low, because: (1) the thickets of Himalayan blackberry provide marginal nesting habitat; (2) surrounding lands are intensely developed; and (3) the species was not observed during the site visit.
- Burrowing Owl – The species has the potential to occur because the site is within the known range of the species and there is marginally suitable habitat. However, the likelihood is low, because: (1) the surrounding lands are intensely developed; (2) no owls were observed during the site visit; (3) although several appropriately-sized ground squirrel burrows were identified at the site, no evidence of use was observed; and (4) the nearest burrowing owl occurrence recorded by CNDDB is approximately one mile to the northeast near the Nut Tree Airport.
- Swainson's Hawk – The species has the potential to occur because the site is within the known range of the species and there is marginally suitable habitat. However, the likelihood is low, because: (1) the surrounding lands are intensely developed; (2) no

active nests were observed during the site visit; and (3) the open areas within the valley oak woodland provides marginal foraging habitat.

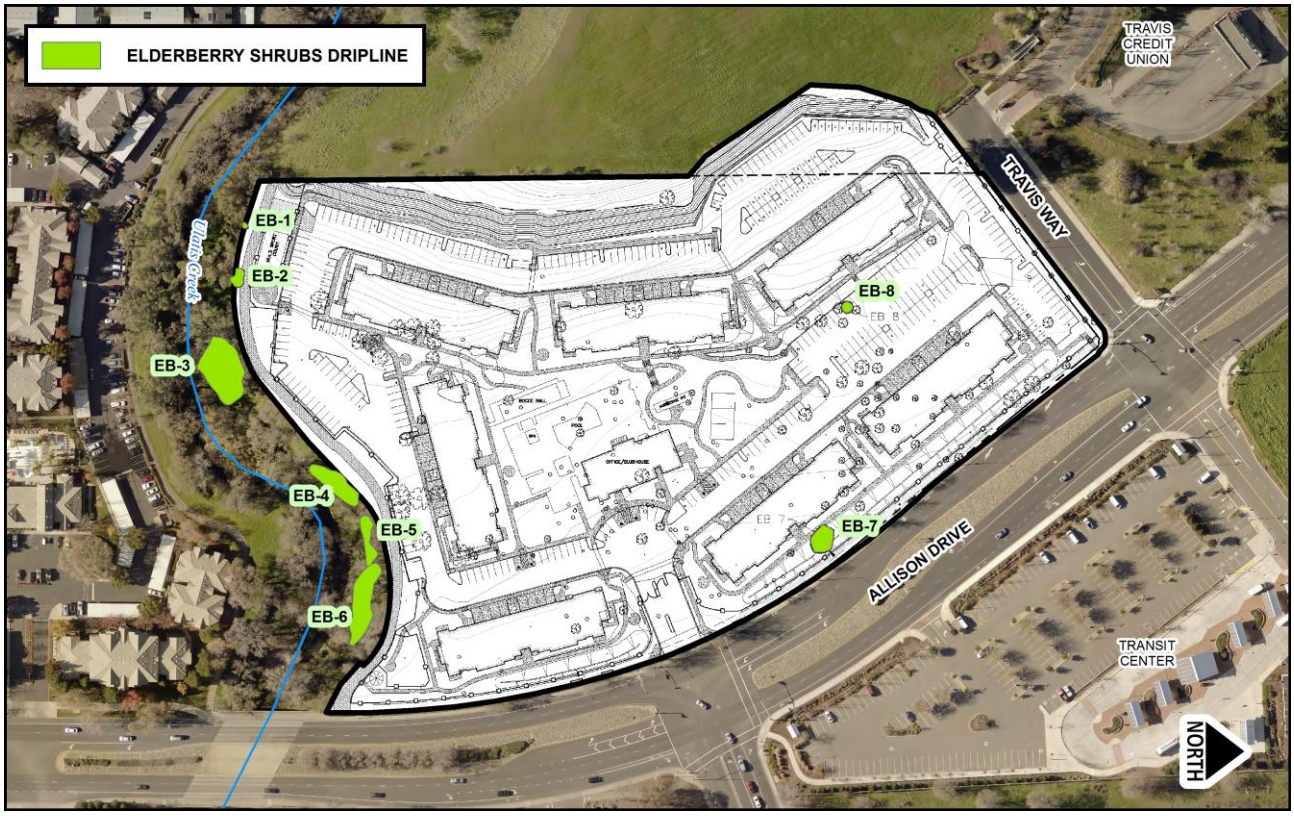
- White-Tailed Kite – The species has the potential to occur because the site is within the known range of the species and there is marginally suitable habitat. However, the likelihood is low, because the surrounding lands are intensely developed and this species wasn't observed during the site visit.

As noted above, there are four special-status avian species that have a low likelihood of using the site for nesting and foraging. The possibility of impacting these special-status avian species is low. However, there is a potential that other migratory birds may use the site for nesting and foraging. As an effort to avoid take, the Lead Agency will require the implementation of mitigation measures BIO-1 and BIO-2. Impacts to avian species, both common and special-status, are expected to be **less-than significant with mitigation measures incorporated.**

Valley Elderberry Longhorn Beetle

The Valley Elderberry Longhorn Beetle (VELB) is a federally listed and threatened species. VELB is associated with elderberry shrubs in the Central Valley and adjacent foothills during its entire 2-year life cycle. Several elderberry shrubs were observed on the project site. Except for two shrubs situated south of Travis Way, all are located directly within the Ulatis Creek riparian corridor. In order to assess the Project's potential impacts, the drip lines for each shrub/shrub cluster were surveyed. Figure 4 shows the driplines of the shrubs. On December 14, 2018, an additional survey was conducted on shrubs EB-1, EB-2, EB-7 and EB-8 to determine the presence of exit holes; no exist holes were identified on these shrubs.

FIGURE 4. ELDERBERRY SHRUBS



The project has the potential to impact VELB. Specifically, the Project would require the removal of two elderberry shrubs (EB-7 and EB-8), and would also require construction of a 12-foot wide trail/maintenance road adjacent to Ulatis Creek; portions of the trail would be within 20-feet of the drip lines of elderberry shrubs/clusters EB-1 through EB-6. The majority of the elderberry shrubs in shrub clusters EB-3 through EB-6 are located downslope of the proposed trail/maintenance road and will not be impacted by construction activities.

USFWS was contacted to determine the need for a Section 10(a)(1)(B) permit for removal of the two isolated shrubs and/or for construction of the trail. In reviewing the USFWS publication *Framework for Assessing Impacts to VELB*[27] *(Desmocerus californicus dimorphus)*, USFWS determined that a Section 10(a)(1)(B) permit would not be required for the removal of shrubs EB-7 and EB-8 because the shrubs are isolated and lack exit holes. However, USFWS recommended avoidance and minimization measures to avoid impacts to those shrubs located in the Ulatis Creek riparian corridor (EB-1 through EB-6). Therefore, the Lead Agency will require the implementation of mitigation measure BIO-3, as recommended by USFWS. Impacts to VELB are expected to be **less-than significant with mitigation measures incorporated.**

Western Pond Turtle

The Western Pond Turtle is designated as a Species of Special Concern by the California Department of Fish and Wildlife (CDFW). The site is within the known range of the species and suitable habitat exists in the Ulatis Creek riparian corridors. The project would not impact this species because no work will be conducted within the riparian corridor. **No Impact.**

Plants

No special-status plant species were observed at the site. However, according to CNDDB there are three plant species that have a low potential to occur at the site: Round-leaved filaree, Adobe-lily and Brewer's western flax. These three species are designated as CBPR-2B (Plants rare, threatened, or endangered in California, but more comment elsewhere) by CDFW and the California Native Plant Society (CNPS). The Lead Agency anticipates no impacts to these species, because: (1) these species were not observed at the site; (2) the site represents marginal habitat; and (3) the site was an active almond orchard between the 1960s (at least) to the 1990s. **No Impact.**

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 Game or US Fish and Wildlife Service?

The City of Vacaville contains three broad natural community types: (1) Valley Floor Grassland/Vernal Pool; (2) Inner Coast Range; and (3) Riparian, Stream and Freshwater Marsh. All other areas not included within these categories are defined as urban or agriculture. According to Figure COS-1 (Natural Community Boundaries) of the Vacaville General Plan, the majority of the site is defined as agriculture, which is consistent with the historical use of the property as an orchard from 1960s (at least) to the 1990s. The Ulatis Creek riparian corridor is the only sensitive natural community that exists on the project site; no other sensitive natural community (i.e., wetlands or vernal pools) exist at the site. The Lead Agency is anticipating no impact to this natural community because all work will commence outside of the corridor. **No impact.**

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

No wetlands occur on the site. **No impact.**

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?

The Ulatis Creek riparian corridor is the only wildlife corridor that occurs on the project site. The Lead Agency anticipates no impact to native resident or migratory wildlife using this corridor because all work will occur outside of the creek. **No impact.**

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

Tree preservation in Vacaville is regulated under Chapter 14.09.131 (Tree Preservation) of the City of Vacaville Land Use and Development Code. Under the City's tree preservation ordinance, tree is defined as any live woody plant having one or more well defined perennial stems with an aggregate circumference of 31 inches or more, when measured at 4-1/2 feet above ground level. According to the Arborist Report (Attachment 3), the site contains 145 native and non-native trees, but only 68 trees meet the size and species requirements for preservation. Figure 5 shows the locations of all trees located at the site and health.

FIGURE 5. EXISTING TREES



The project has been designed to preserve 23 existing native Valley Oak trees at the project site; these trees are labeled as 1 through 23 under Figure 5. The remaining 45 trees would be removed from the site. Without replacement, removal of these trees would conflict with the City's tree preservation ordinance, resulting in a significant impact. Therefore, the Lead Agency will require the implementation of mitigation measure BIO-4. Impacts to trees will be **less-than significant with mitigation measures incorporated.**

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

The Solano County Habitat Conservation Plan[8], of which the City of Vacaville is a participant, has not yet been adopted. Nevertheless, the project site is within an area identified for development within the City of Vacaville's urban zone (Zone 1). Implementation of the project would not conflict with the long term goals and objectives of the Draft HCP (SCWA 2013), and appropriate mitigation measures have been adapted from the Solano HCP for the proposed project. Based on this evaluation, the project will not conflict with the provisions of the Solano HCP. **No impact**.

Impact Conclusion

The proposed project will have a less than significant impact on biological resources, with the following mitigation measures incorporated.

Mitigation Measures

BIO-2: Prior to the commencement of construction activities, all crew members shall attend an Environmental Awareness Training focused on potentially occurring special-status species. Interpretation shall be provided for non-English speaking workers, and the same instruction shall be provided for any new workers prior to their performing work on-site. This training would instruct workers to recognize these species, their habitat(s), the nature and purpose of project protection measures, each species' legislative protection under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA), and penalties for violations of legislative protection.

BIO-3: Depending on the specific construction timeframe, to avoid disturbing nesting raptors and other migratory birds, the following measures shall be implemented:

c. If construction activities are scheduled to occur during the nesting season (approximately February 15 through August 31), a qualified wildlife biologist shall be retained to conduct a pre-construction nesting survey within the appropriate habitat.

- Surveys shall be conducted within the project site and all potential nesting habitat within 500 feet of this area (this distance covers recommended Swainson's hawk buffers);
- The surveys shall be conducted within one week before initiation of construction activities at any time between February 15 and August 31. If no active nests are detected, then no additional mitigation is required; or
- If surveys indicate that migratory bird nests are found in any areas that would be directly or indirectly affected by construction activities, a no-disturbance buffer

shall be established around the site to avoid disturbance or destruction of the nest site until after the breeding season or after a wildlife biologist determines that the young have fledged. The extent of these buffers shall be determined by a qualified biologist and shall depend on the special-status species present, the level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. These factors shall be analyzed to make an appropriate decision on buffer distances.

d. If construction activities begin outside the breeding season (approximately September 1 through February 14) then construction may proceed until it is determined that an active migratory bird or raptor nest would be subject to abandonment as a result of construction activities. Optimally, all necessary vegetation removal shall be conducted before the breeding season so that nesting birds would not be present in the construction area during construction activities. If any bird nests are in the project site under pre-existing construction conditions, then it is assumed that they are habituated (or would habituate) to the construction activities. Under this scenario, the pre-construction survey described previously shall still be conducted on or after February 15 to identify any active nests in the vicinity. Active sites shall be monitored by a qualified biologist periodically until after the breeding season or after the young have fledged. If active nests are identified on or immediately adjacent to the project site, then all non-essential construction activities (e.g., equipment storage and meetings) shall be avoided in the immediate vicinity of the nest site, but the remainder of construction activities may proceed.

BIO-4: The Project Sponsor shall implement the following measures for shrubs EB-1, EB-2 and three shrubs in cluster EB-4:

a. Fencing – All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible.
b. Worker education – Prior to any work on the trail, including grading or vegetation clearing, a qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for non-compliance.
c. Trimming – In order to avoid and minimize adverse effects to VELB when trimming elderberry shrubs, trimming will occur between November and February and will avoid the removal of any branches or stems that are ≥ 1 inch in diameter. This requirement would apply to any future trimming that may be required for maintenance purposes.
d. Chemical Usage – Herbicides will not be used within the drip-line of the shrub. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method.
e. Mowing – Mechanical weed removal within the drip-line of the shrub(s) will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.
f. Erosion Control and Re-vegetation – Erosion control will be implemented, and the affected area will be re-vegetated with appropriate native plants.
g. Construction monitoring – A qualified biologist will monitor the work area during trail construction to assure that the above avoidance and minimization measures are implemented.

h. Signage – Signs shall be placed every 50 feet along the edge of the buffer zone with the following information:

"This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Federal Endangered Species Act. Violators are subject to prosecution, fines, and imprisonment."

The signs shall be clearly readable from a distance of 20 feet and must be maintained for the duration of construction.

BIO-5: Plans submitted for Building Permits shall include a Tree Preservation Plan that incorporates preservation methods for the protection of 23 trees located on the project site (#1-23). Also, the project sponsor shall provide on-site replacement trees to mitigate the removal of 45 mature trees (#24-68) in accordance with General Plan Policy COS-A1.10. In the event the site cannot accommodate the replacement trees, the Applicant shall purchase land from a mitigation bank located in Solano County to replant the trees. The replacement ratios are as follows:

a. Native Trees:
   i. Native trees with a diameter at breast height (dbh) of 6 to 10 inches shall be replaced at a ratio of two replacement trees to one removed tree (2:1).
   ii. Native trees with a dbh of 10.1 to 18 inches shall be replaced at a ratio of 4:1.
   iii. Native trees with a dbh of 18.1 to 36 inches shall be replaced at a ratio of 6:1.
   iv. Native trees with a dbh over 36 inches shall be replaced at a ratio of 8:1.

b. Non-Native Trees:
   i. Trees with a dbh of 6 to 10 inches shall be replaced at a ratio of 1:1.
   ii. Trees with a dbh of 10.1 to 18 inches shall be replaced at a ratio of 2:1.
   iii. Trees with a dbh of 18.1 to 36 inches shall be replaced at a ratio of 3:1.
   iv. Trees with a dbh over 36 inches shall be replaced at a ratio of 4:1.

V. CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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 dedicated cemeteries?	☐	☒	☐	☐

Affected Environment

The project site is approximately located in the center of Vacaville. The site is adjacent to a major arterial street (Allison Drive) to the east, Ulatis Creek to the south, a local street to the north (Travis Way) and vacant open land to the west. Most of the site was an almond orchard from the 1960s to the 1990s. It is currently fallow reverting to a valley oak woodland interspersed with occasional specimens of old almond trees. The site contains 145 trees with the primary species being Valley Oak and Pecan. The project area is dominated by soil assigned to the Yolo series, a silty clay loam. Yolo series soils, which typically occur adjacent to stream channels and as levee and floodplain deposits, date to between 1,000 and 2,000 years before present (BP). Scher (2012) conducted a detailed analysis of stratigraphic, radiocarbon, and obsidian hydration evidence to identify and define soil sequences and produce a refined landform surface age map of the Vacaville area. Her research determined that Yolo series soils have a high potential for containing buried Late Holocene archaeological sites.

The project sponsor contracted with Helix Environmental Planning to evaluate cultural resources located at the site. Helix prepared a Cultural Resources Assessment (Attachment 5) consisting of a complete record search at the Northwest Information Center (NWIC), a review of pertinent historical topographic maps and surveyor's plats, and an intensive pedestrian survey on July 13, 2018.

Discussion of Impacts

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

On July 18, 2018, Helix conducted an archival records search at the Northwest Information Center (NWIC) at Sonoma State University. The records search addressed the project area and a 0.5-mile radius around the project area. Sources of information included previous survey

and cultural resources files; the National Register of Historic Places (NRHP); the California Register of Historical Resources (CRHR); the Office of Historic Preservation (OHP) Archaeological Determinations of Eligibility; the OHP Directory of Properties in the Historic Property Data File; and historical topographic maps and aerial photographs. The records search identified 27 studies that have previously been conducted within 0.5 mile of the project area. None of the studies addressed the project area itself. The records search determined that no previously recorded cultural resources are located within the project area. Based on this information, the project will not impact any historical resources. **No impact.**

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

On July 13, 2018, Helix conducted an archaeological survey at the project site. The ground surface throughout the project area, to the extent that it was visible, has been moderately disturbed by vehicle traffic and other human activity. The entire area is covered by a sparse scatter of modern debris, including plastic and glass fragments, concrete and brick fragments, discarded telephone poles, and undifferentiated metal debris. Several active homeless encampments are also present in the area. No archaeological resources were seen on the surface of the project area. All observed cultural materials appear to be less than 50 years old, or are non-diagnostic fragments that cannot be assigned to a specific date range. It should be noted that survey conditions throughout the project area were very poor, with thick dry grass impairing the visibility of over 90 percent of the ground surface.

Ethnographic evidence indicates that large Patwin villages were concentrated along perennial streams in the area, and the village of Ululato is known to have been located somewhere along Ulatis Creek within the present city of Vacaville, although its exact location remains unknown. Further, Yolo series soils, such as those found in the project area, have been shown to have a high potential for containing buried Late Holocene archaeological sites. Based on these findings the project site has a high potential for retaining intact archaeological deposits, particularly at depths of two feet or more (i.e., below the depth that would normally be disturbed by routine disking or plowing). Therefore, the Lead Agency will require the implementation of mitigation measures CUL-1 through CUL-3 to reduce potential impacts to unknown archaeological resources. **Less than significant impact with mitigation measures incorporated.**

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

No human remains were identified in the project site. Although unlikely, should unidentified human remains be encountered during ground disturbance, their disturbance could result in a significant impact under CEQA. Therefore, the Lead Agency will implement mitigation measure CUL-3, which will mitigate this potential impact to a less-than-significant level by incorporating avoidance in the project work program. In the event that avoidance is not possible, the project will treat the potential disturbance of human remains in accordance with the regulatory requirements of the procedures in the cultural report, which parallel the core requirements of California Health and Safety §7050.5. This treatment would address the disposition of the remains in a way that respectfully incorporates the wishes of the descendant community representatives. **Less than significant impact with mitigation measures incorporated.**

Impact Conclusion

The Project will have a less than significant impact on Cultural Resources, with the following mitigation measures incorporated.

Mitigation Measures

CUL-1: Prior to the initiation of construction or ground-disturbing activities, all construction personnel shall be trained in the protection of cultural resources, the recognition of buried cultural remains, and the notification procedures to be followed upon the discovery of archaeological materials, including Native American burials. The training should be presented by an archaeologist who meets the Secretary of Interior's Standards for Prehistoric and Historic Archaeology, and should include recognition of both prehistoric and historic resources. Personnel should be instructed that unauthorized collection or disturbance of artifacts or other cultural materials is illegal, and that violators will be subject to prosecution under the appropriate state and federal laws. Supervisors should also be briefed on the consequences of intentional or inadvertent damage to cultural resources.

CUL-2: If any cultural or archeological resources are encountered during ground disturbance or subsurface construction activities (e.g., trenching, grading), all construction activities within a 50-foot radius of the identified potential resource shall cease until a Secretary of the Interior qualified archaeologist evaluates the item for its significance and records the item on the appropriate State Department of Parks and Recreation (DPR) 523 series forms. All forms and associated reports will be submitted to the NWIC of the California Historical Resources Information System (CHRIS). The archaeologist shall determine whether the resource requires further study. If, after the qualified archaeologist conducts appropriate technical analyses, the resource is determined to be eligible for listing on the California Register of Historical Resources or as a unique archaeological resource as defined in Public Resources Code Section 15064.5, the archaeologist shall develop a plan for the treatment of the resource. This shall contain appropriate mitigation measures, including avoidance, preservation in place, data recovery excavation, or other appropriate measures, as outlined in Public Resources Code Section 21083.2.

CUL-3: In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

(3) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

a. The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and
b. If the coroner determines the remains to be Native American:
    i. The coroner shall contact the Native American Heritage Commission within 24 hours.
    ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.
    iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code section 5097.98; or

(4) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.
b. The descendant identified fails to make a recommendation; or
c. The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

VI. ENERGY

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐

Affected Environment

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The apartment complex includes seven 3-story buildings with thirty-five (35) units each, an 8,400 sq. ft. clubhouse with various on-site amenities, and 461 parking spaces with primary access on Allison Drive and secondary emergency access on Travis Way. The entire project would provide 28 studio units, 98 one-bedroom units, 105 two-bedroom units, and 14 three-bedroom units. Floor plans would range from 566 sq. ft. to 1,268 sq. ft. in floor area. The project is bound by Allison Drive (4-lane divided arterial) to the east, Travis Way (2-lane local street) to the north, vacant land to the west and Ulatis Creek to the South.

Energy 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.

According to the Vacaville General Plan (pg. COS-28), the residential sector's energy demands constitute approximately 52 percent consumption within Vacaville city limits, with 23% from electricity and 29% from natural gas. Typically, the most important factors influencing residential energy consumption are the size of the house, the type of house (detached single-family or multi-family structure), the number of major appliances, and the construction and siting of the structure. Residential energy needs are often fulfilled by electricity or a combination of gas and electricity. Space heating is the most energy-consuming activity in residential structures.

Electricity

Electricity, a consumptive utility, is a man-made resource. The production of electricity requires the consumption or conversion of energy resources, including water, wind, oil, gas, coal, solar, geothermal, and nuclear resources, into energy. 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. 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.

Energy capacity, or electrical power, is generally measured in watts while energy use is measured in watt-hours. For example, if a light bulb has a capacity rating of 100 watts, the energy required to keep the bulb on for 1 hour would be 100 watt-hours. If ten 100 watt bulbs were on for 1 hour, the energy required would be 1,000 watt-hours or 1 kilowatt-hour (kWh). On a utility scale, a generator's capacity is typically rated in megawatts, which is one million watts, while energy usage is measured in megawatt-hours or gigawatt-hours (GWh), which is one billion watt-hours.

Natural Gas

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.

California Energy Consumption

According to the California Energy Commission (CEC), total system electric generation for California in 2017 was 292,039 gigawatt-hours (GWh).[16] 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. 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.[17] In 2012, total natural gas demand in California for industrial, residential, commercial, and electric power generation was 2,313 billion cubic feet.[17] According to the CEC, gasoline has remained the dominant fuel within the transportation sector, with diesel fuel and aviation fuels following.[18] In 2016, California consumed approximately 15 billion gallons of gasoline and approximately 3.35 billion gallons of diesel fuel.[18] An increasing amount of electricity is being used for transportation energy, which is chiefly attributed to the acceleration of light-duty plug-in electric vehicles. In 2016, transportation in California, consisting of light-duty vehicles, medium/heavy-duty vehicles, trolleys, and rail transit, consumed approximately 1.53 million megawatt hours (MWh).[18]

Vacaville General Plan

The proposed project is subject to the goals and policies outlined in the Vacaville General Plan aimed at reducing energy consumption. The following policies from the General Plan are particularly applicable to the subject project:

- POLICY COS-P10.1 – Encourage the development of energy generated by renewable fuel sources within the city, provided that significant adverse environmental impacts associated with such development can be successfully mitigated.

- POLICY COS-P10.3 – Encourage the installation of solar voltaic panels on new homes and businesses through reduced building permit fees or other incentives.

- POLICY COS-P10.4 – Encourage the use of solar water and pool heaters.

- POLICY COS-P11.1 – Require that new development incorporate energy-efficient design features for HVAC, lighting systems, and insulation that exceed Title 24.

- POLICY COS-P11.2 – Require that site and structure designs for new development promote energy efficiency.

Discussion of Impacts

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

Construction Activities

Site preparation, grading, paving, and building construction would consume energy in the form of gasoline and diesel fuel through the operation of heavy off-road equipment, trucks, and worker traffic. Consumption of such resources would be temporary and would cease upon the completion of construction. Excess vehicle idling during construction would result in wasteful inefficient consumption of energy. Therefore, the Lead Agency will require implementation of mitigation measure ENG-1, which limits idling to no more than 5 minutes. As mitigated, construction activities would not result in inefficient energy consumption during construction. **Less than significant impact with mitigation measures incorporated**

Operation

Long-term operational energy use associated with the project includes electricity and natural gas consumption associated with the new buildings (e.g., lighting, electronics, heating, air conditioning, refrigeration), energy consumption related to water usage and solid waste disposal, and fuel consumption (gasoline and diesel) by vehicles associated with the project through the generation of new vehicle trips. CalEEMod[7] was used to estimate energy use at project operation (Attachment 6).

At operation, the proposed project would result in the consumption of approximately 1,011,450 kWh of electricity per year (1.011450 GWh of electricity per year). As described above, in 2017, the total system electric generation for California was 292,039 GWh. As a result, the project's consumption of electricity at operation would represent approximately 0.0001 percent of the 2017 statewide total system electric generation, which is an insignificant fraction of statewide consumption.

At operation, the proposed project would result in the consumption of approximately 2,116,670 kBTU of natural gas per year (2,075,166 cubic feet of natural gas per year). As noted above, California consumed a total of 2,313 billion cubic feet of natural gas in 2012. As a result, the

project's consumption of natural gas at operation would represent approximately 0.000000897 percent of the 2012 statewide annual natural gas consumption, which is an insignificant fraction of statewide consumption.

At operation, the proposed project would result in the consumption of petroleum-fuel related to vehicular travel quantified as vehicle miles traveled (VMT) to and from the project site. Table 5 presents the projected consumption of approximately 17,734 gallons of diesel and 136,465 gallons of gasoline per year, for a total of 154,199 gallons of petroleum-based fuels per year. The projected annual fuel consumption is based on an annual estimate of 3,613,299 VMT for the Project as generated from CalEEMod[7], and fuel efficiency rates obtained from the U.S. Department of Transportation and Federal Highway Administration's publication titled, "Our Nation's Highways 2011." The estimates are conservative since they assume that no electric, hybrid, or other alternative fuel use vehicles are in the fleet mix. Federal and state laws and regulations will continue to require further improvements in fuel efficiency in motor vehicles produced and/or sold in the United States and total annual consumption of petroleum-based fuel is expected to decrease over time.

TABLE 5: ESTIMATED PETROLEUM-BASED FUEL USAGE AT OPERATION

MOBILE SOURCE	FLEET MIX[A]	GENERATION FACTOR[B,C]	ANNUAL CONSUMPTION (IN GALLONS)
Diesel (gallons)	13.89%	501,887/28.3 mpg	17,734
Gasoline (gallons)	86.11%	3,111,412/22.8 mpg	136,465
Total Gasoline Usage			**154,199**

Source: CalEEMod Data; Notes: mpg = miles per gallon

A Data Source: USDOT and FHWA, Our Nation's Highways 2011, Chapter 5, Motor Fuel, Fuel Consumption by State and Type, https://www.fhwa.dot.gov/policyinformation/pubs/hf/pl11028/onh2011.pdf

B Data Source: California Department of Transportation, 2007 California Motor Vehicle Stock, Travel and Fuel Forecast, http://www.energy.ca.gov/2008publications/CALTRANS-1000-2008-036/CALTRANS-1000-2008-036.PDF

C Diesel fuel contains roughly 10-15% more energy per gallon than gasoline. US Department of Energy, Model Year 2017 Fuel Economy Guide, http://www.fueleconomy.gov/feg/pdfs/guides/FEG2017.pdf

In 2016, California consumed approximately 15 billion gallons of gasoline and approximately 3.35 billion gallons of diesel fuel. As shown in Table 5 above, operation of the proposed project would use approximately 136,465 gallons of gasoline and 17,734 gallons of diesel. As a result, the project's consumption of gasoline would represent approximately 0.000009 percent of the 2016 statewide annual gasoline consumption, which is an insignificant fraction of statewide consumption. The project's consumption of diesel would represent approximately 0.000001 percent of the 2016 statewide annual diesel consumption, which is an insignificant fraction of statewide consumption.

Petroleum-based fuel consumption during Project operation would result in small percentage of the total petroleum-based fuel consumed by the State of California. Therefore, the Project would not result in the wasteful, inefficient, and unnecessary consumption of petroleum-based fuel during Project operation. As such, operational-related energy impacts related to the consumption of petroleum-based fuel would be less than significant.

In conclusion, energy would be consumed through construction activities, general operational activities in the new building, and daily vehicle use. While the long-term operation of the project would result in an increase in energy consumption compared to existing conditions, the project will incorporate design measures (related to electricity, natural gas and water use) in compliance with Title 24 and Vacaville General Plan to minimize energy consumption. As

such, the project would promote energy efficiency. Therefore, operation of the proposed project would not result in the wasteful, inefficient, and unnecessary consumption of energy.

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

State Plan

In December 2007, the CEC prepared the State Alternative Fuels Plan in partnership with the CARB and in consultation with the other state, federal, and local agencies. The plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality. As described under Section VIII (Greenhouse Gas Emissions), the project will incorporate measures to conserve energy, which would not conflict with or obstruct implementation of the State Alternative Fuels Plan. **Less than significant impact.**

Local Plan

In 2015, the City of Vacaville adopted an Energy and Conservation Strategy (ECAS) to address the reduction of major sources of GHG emissions in accordance with the 2008 Scoping Plan. The ECAS includes control measures related to the energy sector. The energy control measures in the ECAS aim to decarbonize electricity production and decrease electricity demand. As described under Section VIII (Greenhouse Gas Emissions), the project would not conflict with local plans for renewable energy, because the project will incorporate measures to reduce energy consumption. **Less-than significant impact.**

Impact Conclusion

Energy consumed by the project will have a less-than significant impact on the environment, with the following mitigation measure incorporated.

Mitigation Measures

ENG-1: Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

VII. GEOLOGY & SOILS

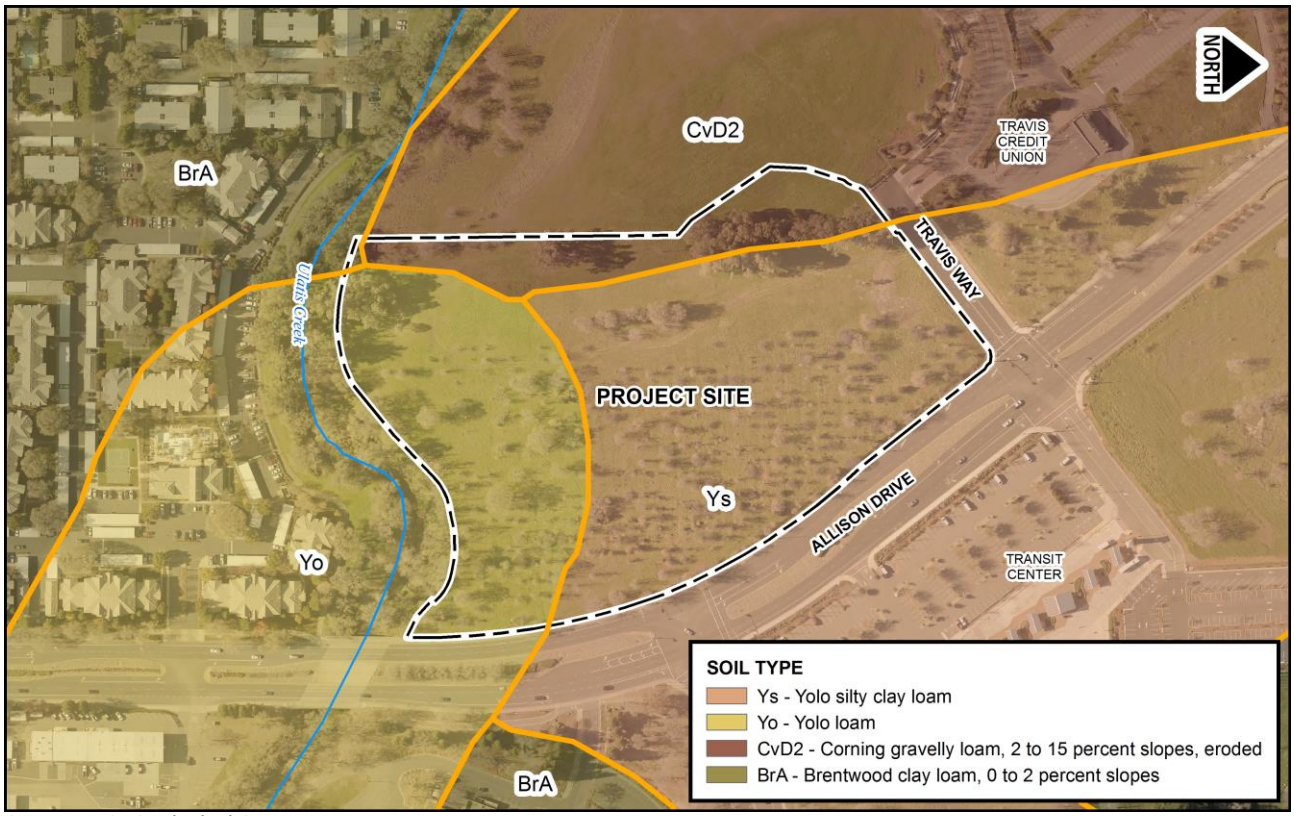
Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☒	☐	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? 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 wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☒	☐

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

Affected Environment

The project site is comprised primarily of Yolo silty clay loam, with portions of Brentwood clay loam (0 to 2 percent slopes) and Corning gravelly loam (2 to 15 percent slopes, eroded). ACE and KC Engineering performed geotechnical investigations on the site to determine soil conditions (Attachment 4). Soil conditions 1 to 2 feet deep are generally soft to stiff and moderately to highly expansive silty and sandy clay, and clayey sands. Variable layers of medium dense to dense clayey sands and stiff to very stiff silt and clay layers were found to the maximum depth explored of 51.5 feet. No exposed bedrock was visible, although low-lying bedrock may have been obscured by the thick grass cover. Ulatis Creek is located south of the project. The creek bank is approximately 23 feet in vertical height on the east and 28 feet on the west. The steeper sections are located on the west near the hillside ridge and on the central portion of the property. Sandstone bedrock is exposed near the toe of creek on the western end. Evidence of past shallow sloughing and erosion were evident primarily on the lower flanks of the creek bank. Groundwater was not encountered in any of the borings at the time of drilling. Fluctuations in the groundwater conditions can occur with variations in seasonal rainfall, irrigation on the site and adjacent parcels, and variations in subsurface stratification. Figure 6 below shows soil composition of the site as depicted by the U.S. Geological Survey.[9]

FIGURE 6. SOIL INFORMATION



Source: U.S. Geological Survey

Discussion of Impacts

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

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

The California Geological Survey (CGS) establishes regulatory zones (known as Earthquake Fault Zones or Alquist-Priolo Zones) around the surface traces of active faults, and issues maps to all affected cities, counties, and State agencies for use in planning and controlling development. The maps provided by CGS is shown in Figure SAF-1 (Regional Faults) of the Vacaville General Plan. According to the Vacaville General Plan, the Vaca-Kirby Hills Fault system is the only fault system that passes through the Vacaville Planning Area. The Vaca Fault has not experienced displacement within the past 11,700 years, and there is no evidence for displacement along the Kirby Hills Fault during the last 700,000 years.

According to the Geotechnical Exploration Report (Attachment 4), the site is not located within an Alquist-Priolo Earthquake Fault Zone. There are no known active faults crossing the site as mapped and/or recognized by the State of California. However, Vacaville is located in a seismically-active region and earthquake related ground shaking should be expected during the design life of structures constructed on the sites. The California Geological Survey has defined an active fault as one that has had surface displacement in the last 11,000 years, or has experienced earthquakes in recorded history. According to this criteria, the nearest active faults are the Green Valley/Cordelia Fault Zones located approximately 0.9 miles southwest, 9 miles southwest and 11 miles southwest.

Although the project site is not located in an active fault, the proximity of habitable structures near the Green Valley/Cordelia Fault Zones could result in fault rupture through the site. This would be considered a significant impact. Therefore, the Lead Agency will require implementation of mitigation measure GEO-1, which requires a design-level geotechnical and geologic investigation report to be completed, and the recommendations of which to be incorporated into the final design and construction phases of the project. With implementation of Measure GEO-1, impacts associated with proximity to Green Valley/Cordelia Fault Zones would be reduced to less than significant levels. **Less than significant impact with mitigation measures incorporated.**

ii) Strong seismic ground shaking?

Vacaville is located within a seismically active region and earthquakes have the potential to cause ground shaking of significant magnitude. Impacts created by strong seismic ground shaking is expected to be less-than significant, because the Lead Agency is requiring implementation of mitigation measure GEO-1. The project will designed consistent with all seismic related Building Code requirements intended to protect structures and inhabitants from potential dangers of strong seismic shaking. **Less than significant impact**.

iii) Seismic-related ground failure, including liquefaction?

Soil liquefaction is a phenomenon in which loose and saturated cohesionless soils are subject to a temporary, but essentially total loss of shear strength, due to pore pressure

build-up under the reversing cyclic shear stresses associated with earthquakes. According to Figure SAF-2 (Liquefaction Potential) of the Vacaville General Plan, the project is located in an area with very-low susceptibility to liquefaction. According to the Geotechnical Exploration Report (Attachment 4), the subsurface sand deposits were found to be medium dense to dense. Groundwater was not found within the upper 50 feet for the two projects. Therefore, the subsurface deposits are not considered to be liquefiable. **Less than significant impact**.

iv) Landslides?

According to the Figure SAF-3 (Historic Mapped Landslides) of the Vacaville General Plan, the site is located in an area susceptible to few landslides. As noted in the Geotechnical Report, the site is relatively flat, except for the western uphill slope and the southern bank of Ulatis Creek. Slope instabilities were not observed on the western hillside, nor are any landslides shown on published geologic maps. The southern creek bank does have evidence of past shallow sliding, slumps and erosion. The stability and stable top of bank determination of Ulatis Creek bank is noted below. On-site improvements will be designed to stabilize the project site and protect construction workers and future businesses from landslides. Therefore, there will be no impacts from landslides. **Less-than significant impact.**

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

Development of the project will require site preparation and grading activities that will potentially result in soil erosion or the loss of topsoil if not properly controlled. Water and wind serve as the primary catalyst of soil erosion, with steeper slopes intensifying the effects. Vegetation removal as part of the site preparation process as well as grading and ground disturbing activities associated with development can heighten the potential for and accelerate soil erosion. Project activities are not expected to generate a substantial loss in topsoil, but will involve the removal of vegetation such as trees and root systems and ruderal vegetation. Accordingly, construction activities do hold the potential to result in soil erosion if not properly performed. However, all ground disturbing activities associated with the project will be carried out pursuant to Vacaville Municipal Code Division 14.19 (Grading), including Chapter 14.19.244.010 (Grading Standards – Erosion Control Measures).

Furthermore, as described in Chapter X (Hydrology and Water Quality), the project will adhere to National Pollution Discharge Elimination System (NPDES) requirements including the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) and compliance with the RWQCB Order No. R1-2009-0045, Waste Discharge Requirements. Erosion control requirements are stipulated in the NPDES Permit issued by the RWQCB. These requirements include the preparation and implementation of a SWPPP that contains BMPs. The purpose of the SWPPP is to identify potential sediment sources and other pollutants and prescribe BMPs to ensure that potential adverse erosion, siltation, and contamination impacts would not occur during construction activities. The implementation of a SWPPP with BMPs is required in Mitigation Measure HYD-1.

In conclusion, compliance with the mandatory requirements described above, and implementation of HYDRO-1, would prevent substantial soil erosion. Impacts from soil erosion or the loss of topsoil is expected to be **less-than-significant with mitigation measures incorporated.**

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?

See "Affected Environment" and Sections "a" and "d". The site is located in an area with low susceptible to landslides and liquefaction. As noted under mitigation measure, GEO-1, the project sponsor will be required to provide a design-level geotechnical investigation, which will contain recommendations to reduce impacts associated with unstable soil. **Less-than significant impact**.

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

The site's near surface soils are considered moderately to highly expansive and prone to heave and shrink movements with changes in moisture content and, consequently, must be carefully considered in the design of grading, foundations, drainage, and landscaping. In addition, the proposed pad grading may result in fills and cuts of variable thicknesses which will require mitigative grading to provide uniform support and to minimize potential settlement.

Due to the expansive soil conditions and expected variable pad conditions, the Geotechnical Report recommends mitigation measures to help minimize the detrimental effects of expansive soil movement. The implementation of mitigation measure GEO-1 will help ensure the project is designed in accordance with design-level geotechnical investigation. **Less-than-significant impact with mitigation measures incorporated.**

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

Please see the "Affected Environment" section. Septic tanks are not proposed as part of the project. **No Impact**.

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

Vacaville lies in a geological transition zone between the Sacramento Valley to the east and the Coast Ranges to the west. The deposits underlying the Vacaville area comprise a variety of rock types dating from various geologic periods, with certain formations containing fossils, some of which may be paleontologically significant. Fossils are the preserved remains of ancient organisms. Mineralized organisms are the most commonly known type of fossils and usually consist of hard material such as bone, shell, and wood. Many common fossils have shapes that can look very bone-like and are usually preserved after being quickly buried in sediment.

As noted under Section V (Cultural Resources), an archival records search was conducted for the project site to determine the potential for cultural, historical or archeological resources. The records search identified 27 studies that were previously conducted within 0.5 mile of the site. None of the studies addressed the project area itself. The records search determined that no previously recorded cultural resources are located within the project area. Although the project site has been previously disturbed, the potential remains for the discovery of buried paleontological resources. Because the potential for inadvertent discovery of paleontological or unique geological resources exists, the Lead Agency will require implementation of mitigation

measure GEO-2, in accordance with General Plan Policy COS-P6.4 and COS-P6.5. GEO-2 ensures that proper procedures are followed in the event of discovery; thereby reducing potential impacts to paleontological resources to levels below significance. **Less-than significant impact with mitigation measures incorporated.**

Impact Conclusion

The Project will have a less than significant impact on geology and soils, with mitigation incorporated.

Mitigation Measures

GEO-1: A design-level geotechnical and geologic investigation report shall be completed and submitted to the City of Vacaville for review prior to issuance of grading and construction permits. The investigation shall include site-specific subsurface investigation (e.g. borings, test pits, geophysical methods, etc.) and laboratory testing sufficient to further characterize Project Area geologic materials and their anticipated response to seismic activity. The design-level geotechnical investigation report shall be signed and stamped by appropriately licensed professionals and at the City's discretion may be subject to a peer review. Construction of Project improvements shall be in compliance with the design-level geotechnical and geologic investigation report approved by the City.

GEO-2: In the event that paleontological resources, including individual fossils or assemblages of fossils, are encountered during construction activities all ground disturbing activities shall halt and a qualified paleontologist shall be procured to evaluate the discovery and make treatment recommendations.

VIII. GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? Cause a substantial increase in cumulative greenhouse gas emissions?	☐	☒	☐	☐
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

Affected Environment

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The apartment complex includes seven 3-story buildings with thirty-five (35) units each, an 8,400 sq. ft. clubhouse with various on-site amenities, and 461 parking spaces with primary access on Allison Drive and secondary emergency access on Travis Way. The entire project would provide 28 studio units, 98 one-bedroom units, 105 two-bedroom units, and 14 three-bedroom units. Floor plans would range from 566 sq. ft. to 1,268 sq. ft. in floor area. The project is bound by Allison Drive (4-lane divided arterial) to the east, Travis Way (2-lane local street) to the north, vacant land to the west and Ulatis Creek to the South.

The project is located in the Yolo-Solano Air Quality Management District (YSAQMD). As described in the Conservation and Open Space Element of the Vacaville General Plan (pg. COS-24), a balance of naturally occurring gases in the atmosphere determines the earth's climate by trapping solar heat through a phenomenon known as the greenhouse effect. *Greenhouse gases (GHGs)*, including carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, and water vapor, keep solar radiation from exiting our atmosphere. In a process very similar to the windows on a greenhouse, GHGs trap so much heat that the temperature within the earth's atmosphere is rising. Emissions from human activities, such as electricity production, motor vehicle use, and agriculture, are contributing to the concentration of GHGs in the atmosphere and have led to a trend of unnatural warming of the earth's climate, which is known as global warming.

Regulatory Setting

The California State Legislature has proposed and the Governor has approved laws and policies to reduce the amount of Greenhouse Gas (GHG) generated each year. Global Warming Solutions Act (AB 32), passed in 2006, requires statewide GHG emissions in California be reduced to 1990 levels by the year 2020 and requires the California Air Resources Board (CARB) to adopt rules and regulations to achieve this goal. In 2008, CARB developed the Climate Change Scoping Plan (Scoping Plan), which is California's roadmap to reach the GHG reduction goals required in AB 32.

The 2008 Scoping Plan recommends, but does not require, that local governments (cities and counties) reduce GHG emissions by fifteen (15) percent below "current" (i.e. 2005-2008) emissions by 2020. Some local governments have used this recommended target for local GHG emission reduction plans, while others have established their target as a 30-percent reduction from 2020 BAU GHG emissions. Some jurisdictions have established other targets that take into account local considerations, such as local air district guidance.

In 2015, the City of Vacaville adopted an Energy and Conservation Strategy (ECAS) to address the reduction of major sources of GHG emissions in accordance with the 2008 Scoping Plan. As noted in the ECAS, Vacaville adopted an emission reduction value of 21.7 percent below the 2020 business as usual forecast. To meet this goal, the City of Vacaville adopted communitywide measures to reduce emissions, which are reflect in the ECAS. Each Communitywide Measure reduces GHG emissions by a measurable amount. The purpose for these measures is to demonstrate that each project is incorporating reduction measures that reduce baseline construction or operational GHG emissions by 21.7 percent.

Methodology

The project-specific impacts on GHGs were analyzed and measured using project region recommended thresholds of significance for the aforementioned pollutants of concern. The project-level thresholds of significance were established by YSAQMD for PM_{10}, CO and the precursors to Ozone, which are Reactive Organic Gases (ROG) and Nitrogen Oxide (NO_x). Construction-related and operations-related GHG emissions were estimated using CalEEMod[7]; results have been included as Attachment 6.

Discussion of Impacts

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

The project is expected to generate GHG emissions from construction-related activities operational activities. Total project construction and operational GHG emissions were estimated using the methodology discussed earlier under Air Quality. YSAQMD currently has not established a threshold of significance for construction or operation-related GHG emissions. Therefore, the City utilizes a GHG emission reduction goal of 21.7 percent. For this project, GHG emissions were calculated for construction and operational activities, which are shown in Table 6. As shown in Table 6, the total annual GHG emissions for construction and operations would be 2,593.11 $MTCO_2e$. In order for the project to contribute towards the City's goal of reducing GHG emissions by 21.7 percent, the project sponsor will be required to implement mitigation measures GHG-1 through GHG-5. Given an anticipated resident population of 701 people, the GHG efficiency-based metric would be 4.21 $MTCO_2e$ per person, per year. As a result, project-specific impacts from GHG emissions will be **less than significant with mitigation measures incorporated.**

TABLE 6. ESTIMATED GHG EMISSIONS

Emissions Source	Project ($MTCO_2e$)
Construction GHG Emissions	
Total Construction Emissions	592.06
Operational GHG Emissions	
Area	3.04
Energy	409.02
Mobile (Typical)	1,845.09
Waste	56.68
Water	47.22
Total Annual Operational Emissions	2,361.05
Total Project GHG Emissions	**2,953.11**
Resident Population	701
Project GHG efficiency-based metric ($MTCO_2e$/year/SP)	12.05

Notes:

$MTCO_2e$ = million metric tons of carbon dioxide equivalents

$MTCO_2e$/year/SP = million metric tons of carbon dioxide equivalents per year per service population

According to the City's ECAS, community-wide baseline emissions for the year 2020 were forecasted at 1,202,710 $MTCO_2e$. As compared to the proposed project, the project would represent approximately 0.002 percent of the 2020 city-wide emissions, which is an insignificant fraction of citywide consumption. As proposed, cumulative impacts produced by the project are expected to be **less-than significant, with mitigation measures incorporated.**

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

In 2015, the City of Vacaville adopted an Energy and Conservation Strategy to address the reduction of major sources of GHG emissions. An emission target was adopted of 21.7 percent below Vacaville's 2020 business as usual forecast. To meet this goal, the City of Vacaville adopted communitywide measures to reduce emissions. As noted under Section (a) above, the project will comply with the applicable measures to reduce GHG emissions. The project would not conflict with any applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions. **No impact.**

Impact Conclusion

Greenhouse Gas Emissions produced by the Project will have a less than significant impact the environment, with adoption of the following mitigation measures.

Mitigation Measures

GHG-1: In accordance with Communitywide Measure EC-1 from the ECAS, the project sponsor shall use energy-efficient lighting technologies that meet or exceed Title 24 standards in the apartment buildings and clubhouse.

GHG-2: In accordance with Communitywide Measure EC-3 from the ECAS, the project sponsor shall incorporate any combination of the following strategies to reduce heat gain for fifty (50) percent of the non-roof impervious site landscape, which includes roads, sidewalks, courtyards, parking lots, and driveways:

e. Shaded within five years of occupancy;
f. Paving materials with a Solar Reflectance Index (SRI) of at least 29, as determined in accordance with American Society for Testing and materials (ASTM) Standards E1918 or C1549;
g. Open grid pavement system; or
h. Parking spaces underground, under deck, under roof, or under a building. Any roof used to shade or cover parking must have an SRI of at least 29.

GHG-3: In accordance with Communitywide Measure EC-4 from the ECAS, the project sponsor shall use LED, induction, or other energy-efficient lighting for parking lot lights.

GHG-4: In accordance with Communitywide Measure WW-1 from the ECAS, the project sponsor shall install water-efficient landscaping in accordance with Chapter 14.12 (Water Efficient Landscaping) of the Vacaville Municipal Code.

GHG-5: In accordance with Communitywide Measure SW-1 from the ECAS, the project sponsor shall provide recycling areas for all residents.

IX. HAZARDS & HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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 reasonably foreseeable upset and accident conditions 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, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

Affected Environment

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The apartment complex includes seven 3-story buildings with thirty-five (35) units each, an 8,400 sq. ft. clubhouse with various on-site amenities, and 461 parking spaces with primary access on Allison Drive and secondary emergency access on Travis Way. The entire project would provide 28 studio units, 98 one-bedroom units, 105 two-bedroom units, and 14 three-bedroom units. Floor plans would range from 566 sq. ft. to 1,268 sq. ft. in floor area. The project is bound by Allison Drive (4-lane divided arterial) to the east, Travis Way (2-lane local street) to the north, vacant land to the west and Ulatis Creek to the South.

Hazardous Materials

According to the State Water Resources Control Board GeoTracker database[19] and the Department of Toxic Substances Control EnviroStor database[20], the site does not contain any leaking underground storage tanks sites. Also, the site has not been used to store hazardous waste and substances. Neither database identified any existing or past clean-up efforts at the site.

Airport Hazards

The Nut Tree Airport is located approximately 5,000 feet north of the site. According to Figure 14.09.134-1 (Nut Tree Airport Compatibility Map) of the Vacaville Land Use and Development Code, the site is located within compatibility Zone F, which allows multi-family residential development. Travis Air Force Base is also located approximately 6.25 miles south of the site. According to the Travis Air Force Base Land Use Compatibility Plan[25], the site resides within Zone D which has building height restrictions. *Zone D* includes all other locations beneath any of the Travis Air Force Base airspace protection surfaces delineated in accordance with Federal Aviation Regulations Part 77. Limitations on the height of structures are the only compatibility factors within this zone. The project will not conflict with the restrictions imposed by Zone D, because the project will not exceed 200 feet above ground.

Wildfire Hazards

According to Figure SAF-9 (CALFIRE Hazard Severity Zones) of the Vacaville General Plan, the site is not located in an area where wildfires are a threat. According to Figure PUB-1 (Fire Protection Service Providers) of the Vacaville General Plan, emergency services will be provided by the Vacaville Fire Department (VFD), which includes the following coverage: fires, emergency medical incidents, public assists, traffic and vehicle accidents, and other emergency situations. The closest fire station is Station 72 located at 2001 Ulatis Drive, which is approximately 0.2 miles to the east as the vehicle drives.

Discussion of Impacts

a) Create a public health hazard through the transport, use, or disposal of hazardous materials?

Site preparation and construction activities will result in the temporary presence of potentially hazardous materials including, but not limited to fuels and lubricants, paints, solvents, insulation, electrical wiring, and other construction related materials onsite. Although these potentially hazardous materials may be present onsite during construction, the applicant is

required to comply with all existing federal, state and local safety regulations governing the transportation, use, handling, storage and disposal of potentially hazardous materials.

Prior to commencing construction, the project sponsor will be require to prepare a Stormwater Pollution Prevention Plan (SWPPP) that includes Best Management Practices (BMPs), which will be implemented during all construction activities (see mitigation measure HYD-1 under Section X). This includes good housekeeping of construction equipment, stockpiles and active construction areas, ensures that spill and leak prevention procedures are established, and that clean up kit and materials are readily available for use onsite during all construction activities. Compliance with all existing Federal, State, and local safety regulations governing the transportation, use, handling, storage, and disposal of potentially hazardous materials ensure that impacts due to temporary construction will be less than significant. **Less than significant impact.**

b) Create a public hazard through upset or accident involving the release of hazardous materials?

Please see "Affected Environment" and Section (a) above. According to SWRCB and DTSC, the site does not contain any underground hazardous materials in the soil. During construction activities, the project would involve the use of hazardous materials such as gasoline for refueling vehicles and paint. The project sponsor would store, label, and dispose of hazardous materials in accordance with applicable federal, state, and local regulations; and would be responsible for reporting any accidental discharges of hazardous materials or other similar substances (where amounts are above the threshold for reportable quantities). Operational activities will not require the storage of any hazardous materials at the site. As proposed, the project-related impacts created by hazardous materials would be **less than significant.**

c) Emit hazardous emissions or involve handling hazardous materials within one-quarter mile of an existing or proposed school?

No existing or planned elementary, middle/intermediate, or high school is within 0.25 mile (1,320 feet) of the project site. Therefore, **no impact** would occur.

d) Be located on a site that is listed as hazardous by CAL-EPA?

Please see "Affected Environment". The site is not included on any list of hazardous materials sites. Therefore, **no impact** would occur.

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

Please see "Affected Environment". There are no additional restrictions that would prohibit development of the apartment project. According to Chapter 14.09.134 (Airport Land Use Compatibility) of the Vacaville Municipal Code, the project site is located in an area susceptible to limited risk associated with flight paths. Airport activities are not anticipated to create a safety hazard for those construction workers and future residents at the project site, because the site is located approximately 5,000 ft. south of the airport. **Less-than significant impact.**

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

The project would not impact any emergency response or evacuation plans adopted by the City or County. As determined by the Vacaville Fire and Police Departments, adequate emergency ingress and egress will be provided for the site, and will be designed to comply with the access requirements of the Fire Department. **No impact**.

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

According to the Safety Element of the Vacaville General Plan (pg. SAF-20), the California Department of Forestry (CDF) has developed a Fire Hazard Severity Scale that utilizes three criteria in order to evaluate and designate potential fire hazards in wildland areas. The criteria are fuel loading (vegetation), fire weather (winds, temperatures, humidity levels, and fuel moisture contents), and topography (degree of slope). Figure SAF-9 (CALFIRE Hazard Severity Zones) in the Safety Element shows the Fire Hazard Severity Zones for the City of Vacaville. According to Figure SAF-9, the project site is not located in any areas considered to have moderate or high fire hazard severity. **No impact.**

Impact Conclusion

The Project will have a less than significant impact on hazard and hazardous materials.

Mitigation Measures

No mitigation is required.

X. HYDROLOGY & WATER QUALITY

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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-site or off-site?	☐	☐	☒	☐
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site?	☐	☐	☒	☐
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?	☐	☐	☒	☐
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?	☐	☐	☒	☐

Affected Environment

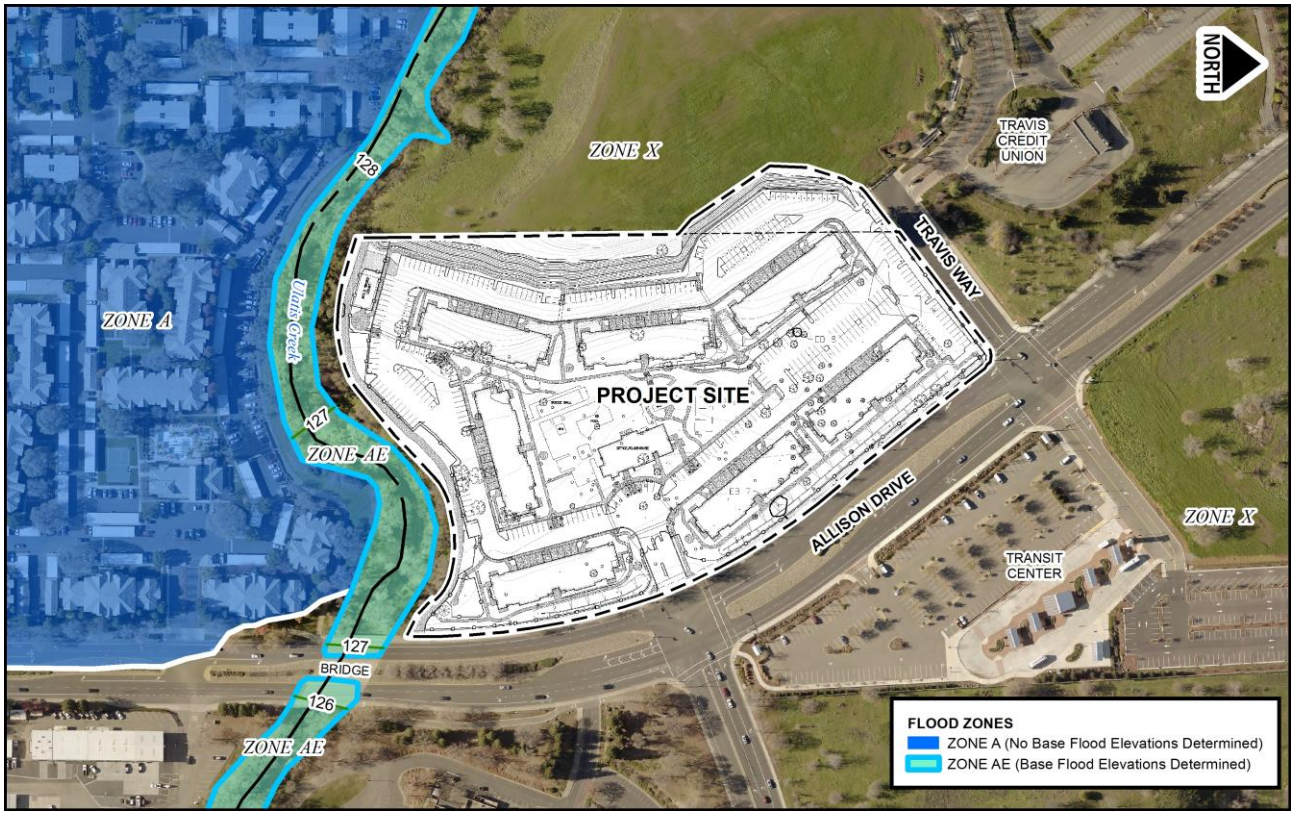
Vacaville is located within four watersheds (Gibson Canyon Creek, Horse Creek, Ulatis Creek, and Alamo Creek), all of which are part of the larger, 150-square mile Ulatis Creek watershed. The topography across most of the city is relatively flat. The western portion of the city is in the rugged, steep Vaca Mountain Range, which defines the western boundary of the Ulatis Creek watershed. The mountain range is dominated by Mount Vaca, with a peak elevation of 2,819 feet. Alamo, Ulatis, Encinosa, and Laguna Creeks all have their headwaters in the Vaca Mountains[2].

The project site abuts Ulatis Creek, a major riparian and stream habitat, along the southern border. The creek is approximately 23 feet in vertical height on the east and 28 feet on the west, with variable slope inclinations of about 1:1 to 2.5:1 ratio. The steeper sections are located on the west near the hillside ridge and on the central portion of the property. Relatively level mid-slope benches with homeless encampments are present near the eastern and central locations. The creek bank is generally covered with dense weeds, bushes and small to large mature trees. Sandstone bedrock is exposed near the toe of creek on the western end. Evidence of past shallow sloughing and erosion were evident primarily on the lower flanks of the creek bank. The site does not contain any wetlands or vernal pools.

Flood Zone

According to Figure SAF-6 (FEMA Flood Zones) of the Vacaville General Plan, the site does not reside within a 100-year or 500-year flood zone. According to Federal Emergency Management Agency (FEMA) Map 06095C0277E[11], the site is located in Zone X in an area determined to be outside the 0.2% annual chance floodplain.

FIGURE 7. FEMA FLOOD INSURANCE RATE MAP



Dams and Reservoirs

There are two existing reservoirs in Vacaville: (1) Lagoon Valley Lake; and (2) Basherini Reservoir. The Lagoon Valley Lake is a tributary to Laguna Creek, draining a portion of Lower Lagoon Valley, and is located 2.72 miles southwest. The Basherini Reservoir is located 1.35 miles northwest along Vine Street, which is owned and operated by the Solano Irrigation District. According to Figure SAF-7 (Dam Inundation Areas) of the Vacaville General Plan, the northeastern portion of Vacaville is subject to potential dam inundation by the Monticello Dam. The site is not located in this inundation area, and will not be affected by these existing dams.

Discussion of Impacts

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

Construction activities have the potential to result in runoff that contains sediment and other pollutants that could degrade water quality if not properly controlled. Sources of potential pollution associated with construction include fuel, grease, oil and other fluids, concrete material, sediment, and litter. These pollutants have the potential to result in impacts due to chemical contamination from the release of construction equipment and materials that could pose a hazard to the environment or degrade water quality if not properly managed.

To minimize these potential impacts, the proposed project will be required to implement mitigation measures HYD-1 through HYD-5, which requires the project sponsor to comply with the National Pollutant Discharge Elimination System (NPDES) General Construction Permit (GCP), as well as prepare a Storm Water Pollution Prevention Plan (SWPPP) that requires the incorporation of BMPs set forth by the City's Stormwater Management Plan to control sedimentation, erosion, and hazardous materials contamination of runoff during construction. The State Water Resources Control Board (SWRCB) mandates that projects that disturb one or more acres must obtain coverage under the Statewide GCP. Since the proposed project would involve the disturbance of approximately 10.97 acres, it would be subject to these requirements. The GCP also requires that prior to the start of construction activities the City must file Permit Registration Documents (PRDs) with the SWRCB, which includes a Notice of Intent (NOI), risk assessment, site map, annual fee, signed certification statement, SWPPP, and post-construction water balance calculations. Therefore, implementation of Mitigation Measure HYD-1 through HYD-5 would reduce the temporary, short-term construction-related drainage and water quality impacts to a less than significant level. **Less than significant impact with mitigation measures incorporated.**

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The project will not require the use of groundwater resources. Development of the project will not result in the lowering of the aquifer or the local groundwater table. The project's water demands are consistent with water demands evaluated in the Vacaville General Plan, which found that sufficient water supplies are available to meet existing and proposed project. Groundwater reserves will not be impacted by the proposed development. Therefore, the project will have a **less than significant impact** to groundwater supplies and recharge.

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-site or off-site?

The project would improve 10.97 acres of vacant land with asphalt, concrete, buildings and landscaping. Drainage collected on-site from stormwater would be directed to on-site stormwater catch basins that carry water to bioswales for pretreatment, and then onto the City's existing stormwater collection system along Allison Drive. All exposed cut or fill areas will be landscaped or hydroseeded to avoid erosion. Through design, the project is not expected to create substantial erosion or siltation on-site or off-site. **Less-than significant impact.**

ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site?

The project would introduce new impervious surfaces. However, the project would also introduce new storm drainage infrastructure onsite to capture, convey and manage additional discharge resulting from new impervious surfaces introduced. Onsite improvements will capture and filter storm water runoff prior to its discharge into the reinforced concrete pipes on the project site. Therefore. impacts to the drainage pattern, storm drain system and runoff as a result of the proposed project would be **less than significant**.

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?

The major creeks that flow through Vacaville are largely in their natural state and alignment, except at the eastern edge of the city where flood control channels have been constructed. The natural, unaltered portions of the creeks generally do not have adequate flow capacity to convey a 100-year storm event. In addition, there is not adequate capacity in some areas to accommodate a 10-year storm event, which is a storm that has a 10 percent chance of occurring in any given year. Occasionally, overbank flows in Vacaville have resulted in flooding of residential properties, road blockages, and traffic disruptions.

To address these flooding problems, Vacaville uses a variety of flood control facilities and measures. As shown in Figure SAF-5 of the Vacaville General Plan, the city has built several regional detention basins that reduce the flow from the Vaca Mountains before they reach the city in order to reduce urban flooding. Ulatis Detention Basin #2 serves the general area around the project site. The City also maintains a network of storm drains, and works to keep channel flowlines free from debris and vegetation. As part of past flood control efforts, certain creekways have been engineered to handle larger volumes of stormwater than they would in their natural states.

The Vacaville Public Works Department regulates storm drain facilities to ensure that flow area capable of accommodating the peak flows. The City's Public Works Department has reviewed the project and determined that there is remaining capacity in the existing system to accommodate stormwater runoff generated by the project. The project dos not require the expansion of existing facilities nor does it warrant construction of new storm drain facilities. Therefore, impacts to the storm drain system would be **less than significant.**

iv) Impede or redirect flood flows?

The project will not alter the course of a stream or river. Following the natural gradient of the existing land, stormwater runoff will be directed to the Allison Drive and delivered to the City's storm drain facilities. The project will not affect drain inlets into the creek. **No impact.**

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

As described above, the Project site is not located near any tidally influenced water bodies nor is it near any large bodies of water that could be affected by a tsunami or seiche. The Project would **no impact** on exposing people or structures to inundation by seiche, tsunami, or mudflow.

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

Please see Section (a) above. The project sponsor will be required to comply with the National Pollutant Discharge Elimination System (NPDES) General Construction Permit (GCP), as well as prepare a Storm Water Pollution Prevention Plan (SWPPP) that requires the incorporation of BMPs set forth by the City's Stormwater Management Plan to control sedimentation, erosion, and hazardous materials contamination of runoff during construction. **Less than significant impact.**

Impact Conclusion

The project will have a less than significant impact on hydrology and water quality, with the following mitigation measures incorporated.

Mitigation Measures

HYD-1: A Storm Water Pollution Prevention Plan (SWPPP), prepared in accordance with the State Water Resources Control Board (SWRCB), National Pollutant Discharge Elimination System (NPDES) Construction General Permit, shall be implemented for all construction activities where required under SWRCB regulations. The SWPPP shall include Best Management Practices (BMPs) for controlling sediment, turbidity, and the release of other pollutants into aquatic habitats during construction. The SWPPP shall be subject to the approval of the Regional Water Quality Control Board (RWQCB) prior to the start of work.

HYD-2: Seed mixes shall be composed of native or noninvasive naturalized species. No invasive exotic plant species shall be allowed, including those identified in the California Exotic Pest Plant Council's database, which is accessible at: http://www.cal-ipc.org/ip/inventory/weedlist.php.

HYD-3: Any concrete structures below the tops of banks of creeks, wetlands, or other aquatic habitats shall be poured in tightly sealed forms and shall not be allowed contact with surface waters until the cement has fully cured (minimum of 30 days). During that time, the poured concrete shall be kept moist, and runoff from the concrete shall not be allowed to enter aquatic habitats. Commercial sealants may be applied to the poured

concrete surface in locations where the exclusion of water flow for a long period is difficult. If a sealant is used, water shall be excluded from the site until the sealant is dry and fully cured according to the manufacturer's specifications.

HYD-4: Water that contacts wet concrete and has a pH greater than 9.0 shall be pumped out and disposed of outside an aquatic habitat.

HYD-5: No substances toxic to aquatic life shall be discharged or allowed to leach into an aquatic habitat. Every reasonable precaution to protect aquatic habitats from pollution with fuels, oils, bitumens, calcium chloride, dust suppressants, and other harmful materials shall be implemented.

XI. LAND USE & PLANNING

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding mitigation or environmental effect?	☐	☐	☒	☐

Affected Environment

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The project is bound by Allison Drive (4-lane divided arterial) to the east, Travis Way (2-lane local street) to the north, vacant land to the west and Ulatis Creek to the South. The project is subject to compliance with the following regulatory documents: (1) General Plan; (2) Zoning Map; (3) Energy Conservation Action Strategy; and (4) Allison Business Area Policy Plan.

Discussion of Impacts

a) Physically divide an established community?

The project is located on vacant land. The project would not divide any existing neighborhood in the surrounding area. **No impact.**

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

General Plan

The project site has a current General Plan designation for Mixed Use, which allows for a combination of commercial and residential development. As proposed the project would introduce residential-only development on the project site, which is not consistent with the City's Mixed Use designation. The City is currently amending the Vacaville General Plan to change the Mixed Use designation to Residential High Density, which would allow the proposed project. The anticipated adoption date for this amendment is March 12th, with a second reading on March 26, 2019. As amended, the project would comply with the City's General Plan Map. **Less-than significant impact.**

Zoning

The project site has a current Zoning designation for Residential Low-Medium Density (minimum 4,500 sq. ft. lot size), which allows for single-family homes on lot sizes no smaller

than 4,500 sq. ft. As proposed, the project would introduce multi-family development, which is a conditionally permitted under the current zoning district (See Table 14.09.075.01 – Summary of Uses in Residential Zoning Districts). In conjunction with the General Plan amendment noted above, the City is currently amending the Vacaville Zoning Map to change the RLM-4.5 zoning district to Residential High Density (RHD), which would allow the proposed project as a permitted land use. As amended, the project would comply with the City's Zoning Map. **Less-than significant impact.**

Energy Conservation Action Strategy

The project will comply with the City's Energy Conservation Action Strategy[22] and all application avoidance and minimization measures designed to reduce energy consumption and Greenhouse Gas emissions. **No impact.**

Allison Business Area Policy Plan

The site is located in Area IIA of the Allison Business Area Policy Plan[21], with allows single-family homes. As proposed, the project would introduce multi-family development, which is not allowed on Area IIA. In conjunction with the General Plan amendment noted above, the City is currently amending the Allison Business Area policy plan to allow multi-family development in Area IIA. As amendment, the project would comply with the policy plan. **Less-than significant impact.**

Impact Conclusion

The Project will have a less-than significant impact on land use and planning.

Mitigation Measures

No mitigation is required.

XII. MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

Affected Environment

According to the U.S. Geological Survey, the Vacaville Planning Area contains limited mineral resources that are being extracted. Near the southern boundary of the Planning Area in the vicinity of Cement Hill, limestone deposits show evidence of some historic use. Stone quarries in the Vaca Mountains produced dimensioned and ornamental stone. Although the western hills contain sandstone and conglomerates which may be used for sands, gravel, and stone, none of these resources are currently being mined. Commercial extraction is not expected within the planning period, therefore policies and land use designations for mineral resource areas are not included in the General Plan. The site has not been designated by the Vacaville General Plan as an area containing mineral resources. Therefore, development of the project site will have no impact on mineral resources in the region.

Discussion of Impacts

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?

Please see the "Affected Environment" section. **No impact**.

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?

Please see the "Affected Environment" section. **No impact**.

Impact Conclusion

The Project will not result in impacts to mineral resources.

Mitigation Measures

No mitigation is required.

XIII. NOISE

Would the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Generation of 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 ground-borne vibration or ground-borne noise levels?	☐	☐	☒	☐
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?	☐	☐	☐	☒

Affected Environment

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The project is bound by Allison Drive (4-lane divided arterial) to the east, Travis Way (2-lane local street) to the north, vacant land to the west and Ulatis Creek to the South.

Sensitive Receptors

As described in the Noise Element of the Vacaville General Plan (pg. NOI-1), noise is generally defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. Noise is especially a concern in the vicinity of noise-sensitive uses, which are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the use of land. For the purpose of this project, sensitive receptors are defined as people(s) who will be exposed to noise created by the project during construction hours and during normal operating hours. The level of threshold for measures noise impacts is derived from Section 14.09.127.120 (Performance Standards – Noise) of the Vacaville Land Use and Development Code, which states that exterior noise levels shall not exceed 50 dB_{avg} between 7:00 am and 10:00 pm, and 45 dB_{avg} between 10:00 pm and 7:00 am for residences, transient lodging (motels and hotels), hospital and nursing homes.

Discussion of Impacts

a) Generation of 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?

Construction Noise

According to the Construction Noise Handbook from the U.S. Environmental Protection Agency[14], the following noise levels are expected for common construction equipment:

TABLE 7. NOISE LEVELS FROM COMMON CONSTRUCTION EQUIPMENT

Construction Equipment	Typical Sound Pressure Level at 50 ft. (dba)
Scraper	85
Grader	85
Compactor	83
Crane	85
Front End Loader	80
Dump Truck	84
Excavator	85
Paver	85

Source: EPA, Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Construction of the project would involve grading, construction of new the structures, and paving of the site. Construction activity is assumed to occur between the hours of 7:00 a.m. and 7:00 p.m. from Monday through Saturday. Because construction would take place during these hours, noise impacts would be less than significant. For informational purposes, noise calculations for typical construction equipment are provided in the Acoustical Analysis Report (Attachment 8). Construction equipment would not all operate at the same time or location and would not be in constant use during a typical operating day. The nearest sensitive land use would be multi-family residences approximately 300 feet from the residential structure construction. **Less-than significant impact.**

Long-Term Operational Noise

The proposed project would have HVAC units on the rooftops of each structure. The nearest sensitive land use would be the residential property approximately 300 feet to the south. At these distances, noise levels from the project's rooftop HVAC units would be approximately 35 dBA, below the 45 dBA nighttime limits for residential uses. Operational noise levels would be less than significant. **Less-than significant impact**.

b) Generation of excessive ground-borne vibration or ground-borne noise levels?

Construction activities known to generate excessive ground-borne vibration, such as pile driving, are not expected for the project. A possible source of vibration during general project construction activities would be a vibratory roller, which may be used for building foundations, at a distance of over 300 feet from the nearest off-site sensitive use to the south. According to the City's General Plan EIR[23], a vibratory roller would generate approximately 94 VdB at 25 feet, less than the 96 VdB damage threshold for particularly fragile structures, and less than the

100 VdB damage threshold for all other structures. Furthermore, no potentially fragile structures are located within the vicinity of the project. At a distance of 300 feet, the vibration level of a vibratory roller would equal 61.6 VdB.1. This would be less than the 96 VdB damage threshold for particularly fragile structures, and less than the 100 VdB damage threshold for all other structures. Furthermore, it would be less than 70 VdB, which is considered the limit for annoyance due to vibration in residential settings[2]. **Less than significant impact**.

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

The project site may be affected by on-going airport operations from the Nut Tree Airport. The Nut Tree Airport contains six compatibility zones (A – F) located around the airport that are referred to as Compatibility Areas, which represent areas affected by aircraft operations. The project site is located within Zone F (Other Airport Environments). Projects located within this zones are subject to limited risk associated with frequent noise intrusion from airport activities. The proposed project involves the development of an apartment complex, which is not identified as a sensitive use and is allowed within compatibilities Zone F. Noise generated from airport operations are expected to have a **less than significant impact** on the project.

Impact Conclusion

Noise generated from the proposed project will have a less than significant impact.

Mitigation Measures

No mitigation is required.

XIV. POPULATION & HOUSING

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

Affected Environment

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The project site has been designated for residential development since the 1990 General Plan was adopted. According to the City's Housing Element, Vacaville's estimated population size was 92,428 in 2010, which includes a substantial group-quarters population housed in two state prisons located in City limits. The estimated group-quarters population was 8,022 in 2010. By 2020, Vacaville's population size is estimated to be 98,200. The City's regional housing needs allocation (RHNA) for the 2014 through 2022 cycle, as described in the Housing Element, is 938 new residential units.[24]

The demand for rental apartments in Vacaville has increased among both people formerly renting single-family homes and former homeowners. Renters who face unemployment are no longer able to afford renting a house, and therefore rent an apartment unit, which is generally less expensive than renting a house. Former homeowners who experienced foreclosure on their homes rent apartment units to meet their housing needs. A common "rule of thumb" is that a 5 percent rental and 2 percent ownership vacancy rate represent a market with a healthy balance of supply and demand, allowing enough vacancy for tenant movement between units.

In 2014, a city-wide survey of apartments was prepared. According to the results of that survey, the overall apartment vacancy rate was 2.3 percent, which illustrates a shortage of apartment units in Vacaville. This is a decrease from the beginning of the previous housing element planning period in 2009, at which time the overall vacancy rate was 4.0 percent. Vacancy rates have decreased since that time for one-bedroom units from 4.8 to 2.7 percent, for two-bedroom units from 3.3 to 2.0 percent, and for three-bedroom units from 4.1 to 1.5 percent.

Discussion of Impacts

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)?

The project site is located within the Vacaville Urban Growth Boundary (UBG) and will not directly or indirectly induce substantial growth. The project would introduce 245 new apartments units for an estimated population of 701 persons. The projected number of additional residents does not constitute a substantial increase in population and remains sufficiently below the estimated population for 2020. Development of the project would provide housing opportunities for the renting population as envisioned by the City's Housing Element. Accordingly, the project is consistent with the growth anticipated by the City's General Plan.

The project site is already served by existing services and infrastructure and will not require the expansion or construction of new utilities to provide adequate service. There are no other elements of the project that would induce growth at levels beyond what was been anticipated by the City's General Plan and Housing Element. Therefore, the project will have a less-than significant impact, directly or indirectly, related to growth inducement. **Less-than significant impact**.

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

No housing units or people will be displaced as a result of this project. **No impact.**

Impact Conclusion

The Project will result in less-than significant impacts to population and housing.

Mitigation Measures

No mitigation is required.

XV. PUBLIC SERVICES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☒	☐
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☒	☐
Parks?	☐	☐	☒	☐
Other public facilities?	☐	☐	☒	☐

Affected Environment

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The project is bound by Allison Drive (4-lane divided arterial) to the east, Travis Way (2-lane local street) to the north, vacant land to the west and Ulatis Creek to the South. The site is located in the incorporated boundaries of the City of Vacaville; all public services and facilities are available to serve the project site, as noted below.

Fire, Rescue, and Emergency Medical Services

The Vacaville Fire Department (VFD) provides fire and emergency medical services to approximately 28 square miles within the City of Vacaville, as well as emergency medical services to approximately 160 square miles of unincorporated county land surrounding the city. VFD responds to calls to service for fires, hazardous materials emergencies, certain technical emergencies, vehicle accidents and extrication incidents, and first responder and transport services. VFD also organizes and conducts a fire prevention and public education program in Vacaville, including business and occupancy inspections.

VFD maintains several facilities and a variety of equipment. In addition to its administrative offices at City Hall, VFD has five existing fire stations in the city that serve Vacaville. Beyond ambulances and basic fire engines, VFD maintains and operates a variety of specialty and support equipment. Funding for VFD comes from the City's General Fund, ambulance transport fees, Special Paramedic tax, Inspections fees, impact fees from new development, and from public safety Community Facilities Districts (CFDs), which have been formed for new development areas to offset the costs of providing public safety services to such areas through the levy of special taxes.

Fire service for the areas surrounding the city limits is provided by fire protection districts, including the Vacaville Fire Protection District, Dixon Fire Protection District, and Suisun Fire Protection District. In addition, VFD is actively involved in formal agreements with the City of Dixon, the City of Fairfield, and the Vacaville Fire Protection District to provide automatic aid responses in designated areas. VFD also participates in a Mutual Aid Plan with other fire departments in Solano County.

Law Enforcement

The Vacaville Police Department (VPD) provides law enforcement service to the City of Vacaville. Responsibilities of VPD include a 24/7 communication center, crime suppression and prevention, investigations, traffic patrol, and emergency service. In addition, VPD oversees the Reserve Officer and Cadet Programs and administers specialty units. There is one main VPD police station, which is located at 660 Merchant Street, adjacent to Vacaville City Hall. VPD is currently meeting or exceeding its adopted standards for response times.

Funding for VPD mainly comes from the City's General Fund. A small percentage of other funding comes from grants and development impact fees. In addition, public safety CFDs have been formed for new development areas to offset the costs of providing public safety services to such areas through the levy of special taxes.

VPD participates in a regional Office of Emergency Services mutual aid agreement. By participating in this mutual aid agreement, VPD commits staff and other resources to assist with disasters throughout the state. In return, VPD receives assistance from outside entities should a significant emergency occur in Vacaville. Additionally, the Solano County Sheriff's Office provides law enforcement and emergency response in unincorporated parts of Solano County and provides a small degree of support for Vacaville police, assisting the City with police services approximately ten to 15 times per year.

Schools

Schools play a central role in the daily life of the city. New families contemplating a home in Vacaville look at the quality of local schools as part of their evaluation of whether to settle in town, and existing residents are actively engaged in schools to help them maintain a high level of achievement. School children require an environment that excites and stimulates learning. Moreover, because children spend a significant part of their lives in school, school buildings constitute important landmarks in the image that the young residents of Vacaville form of their community. The City of Vacaville does not have jurisdiction over local schools. However, schools are an important part of the community, and the General Plan can support the mission of local school districts and the provision of high-quality education for Vacaville's children.

Parks

The City's current inventory of parks is classified into three categories: Neighborhood Parks, Community Parks and Regional Parks. The Vacaville General Plan outlines the service area standards for neighborhood and community parks. The service area is a radius drawn around a neighborhood or community park, rather than as travel time; although significant barriers to transportation, such as freeways and canals, should be taken into consideration. All residential areas of the city should be served by a neighborhood and a community park within the service area standards provided below; although, a community park may serve the residents within ½ mile as their neighborhood park. There is no service area standard for regional parks because Lagoon

Valley Regional Park serves the greater Vacaville region and it is expected that most users will need to travel a distance to access the park.

Other Public Facilities

The City of Vacaville owns and/or operates numerous public buildings in the city, including City Hall, a public works corporation yard, remote City offices at the corner of Buck Avenue and Eldridge Street, and the Easterly Waste Water Treatment Plant. City Hall is located at 650 Merchant Street. The facility provides for governance and administrative functions, such as the City Council, City Manager, City Attorney, Finance Department, and the City Clerk, and also houses the administrative offices of multiple City departments, including Community Development, Police, Fire, and Public Works. The Public Works corporation yard is located at 1001 Allison Drive, just east of Downtown Vacaville. It provides facilities for municipal building, engineering, and maintenance, and public works functions. The remote City offices located at the corner of Buck Avenue and Eldridge Street house the City's Community Services and Housing Services departments. The Easterly Waste Water Treatment Plant, which is discussed further in the wastewater section of this Element, is located at 6040 Vaca Station Road and treats wastewater collected in the city.

There are two libraries in Vacaville and both are maintained by the Solano County Library System in cooperation with the Vacaville Unified School District Library District. The Town Square branch of the Vacaville Public Library, located at 1 Town Square Place, opened in 2005 and features 25,000 square feet of space. The Cultural Center branch, located at 1020 Ulatis Drive, was remodeled in 2005 and features 24,000 square feet of space. Both libraries feature a meeting room, a study room, and a computer center, as well as additional equipment and technological amenities.

Discussion of Impacts

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection: Development of the project would result in an increased demand for fire protection. As required by the California Fire Code, the project would be required to include site specific design features such as ensuring appropriate emergency access and requiring structures to be built with approved building materials. Conformance with this code reduces the risks associated with fire hazards. Fire service is currently provided to the project site by the VFD. The site plan includes access roads for complete access to all buildings in case of emergencies. Payment of Public Facilities Impact Fees would offset fire protection and paramedic services demands associated with this population increase. Impacts on fire services from the project site would be considered less than significant. **Less-than significant impact**.

Police protection: Development of the project would result in an increased demand for police protection. The project would result in approximately 701 new persons living in the project site. Law enforcement services for the project site are provided by VPD. The project would not significantly impact VPD response time goals because the project site is already being patrolled and according to the General Plan, the VPD is currently meeting or exceeding its adopted standards for response times. Additionally, payment of Public Facilities Impact Fees would

offset project demand for police protection. As such, impacts would be less than significant. **Less-than significant impact**.

Schools: The project would increase the population by as much as 701 persons. According to the US Census data for the City of Vacaville, approximately 28.5% of the population is between the ages of six and 17 years old, the average school age (United States Census Bureau 2016). Therefore, it is assumed approximately up to 200 of the 701 residents generated from the project would be between the ages of six and 17 years old. Development of the project would result in an increased demand for schools within the VUSD. However, according to the General Plan EIR, future enrollment projections indicate that there should be sufficient capacity for students in all grades over the next five years. Additionally, the project is subject to developer fees at the time building permits are approved. These fees would contribute to the construction or expansion of facilities accommodate students from the project. As such, impacts would be less than significant. **Less-than significant impact**.

Parks: Development of the project would result in an increased demand for parks. The residential component of the project would result in an increase of approximately 701 residents in the project site. To offset increased demand for city parks, the project design includes private recreational facilities that would be used by residents. The project is also subject to developer fees at the time building permits are approved. These fees would contribute to the expansion of facilities to accommodate population growth generated by the project. **Less-than significant impact**.

Other public facilities: The project would result in approximately 701 new residents and potentially increase the use of other public facilities. Ulatis Community Center is the closest community facility to the project site. The project is subject to the payment of development impact fees for other governmental services. Therefore, with the payment of development impact fees, impacts associated with other public facilities, including public libraries, would be less than significant. **Less-than significant impact**.

Impact Conclusion

The Project will have a less-than significant impact on public services.

Mitigation Measures

No mitigation is required.

XVI. RECREATION

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	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?	☐	☐	☒	☐

Affected Environment

City residents have access to a variety of City-owned and operated parks and recreational facilities. The City owns and operates three categories of parks: neighborhood, community, and regional parks. In addition, the City owns and operates accessible open space, special purpose facilities, and trails. The City has over 2,700 acres of parks and open space, including seven community parks, 25 neighborhood parks, 22 accessible open spaces, and one regional park. The nearest park is a neighborhood park, Hawkins Park, located approximately 0.6 miles (12 minutes walking) east of the project.

Under the parks standards outlined in the General Plan, the City aims to provide 1.8 acres of neighborhood parkland, 1.7 acres of community parkland, and one acre of regional parkland per 1,000 Vacaville residents, for a total of 4.5 acres of developed parkland per 1,000 Vacaville residents. Currently, the City is deficient in meeting the service standard for neighborhood parks and community parks but does exceed the standard for regional and total parkland categories.[2]

Per the City's Municipal Code section 11.01.020, residential projects are required to pay the City's Park and Recreation Facilities Impact Fee so that the City can fund additional parks and recreational facilities. The fee total is assessed based on the type and number of dwelling units that would be constructed.

Discussion of Impacts

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?

The City is not meeting its service standard for neighborhood parks and community parks but does exceed the standard for regional and total parkland categories[2]. The project would develop a total of 245 residential (rental apartment) units. According to the CalEEMod calculations, the project would generate 701 new residents. The project would include onsite

recreational facilities for use by residents of the project including a clubhouse, swimming pool, private patios and decks, common park space with play equipment, and a walkway along Ulatis Creek. Additionally, payment of the City's Parks and Recreation Impact Fee would provide for additional park sites and recreation facilities to offset project impacts. Therefore, the project would not result in the deterioration of City recreational facilities and there would be a less than significant impact. **Less-than significant impact**.

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?

As described above, the project will provide private onsite open space and recreational facilities that would reduce use of City parks. The recreational facilities will not produce any additional impacts not already analyzed in previous sections. **Less-than significant impact.**

Impact Conclusion

The Project will have a less-than significant impact to recreational services & facilities.

Mitigation Measures

No mitigation is required.

XVII. TRANSPORTATION

Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian system?	☐	☐	☒	☐
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?	☐	☐	☐	☒

Affected Environment

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The apartment complex includes seven 3-story buildings with thirty-five (35) units each, a 6,000 sq. ft. clubhouse with various on-site amenities, and 470 parking spaces with primary access on Allison Drive and secondary emergency access on Travis Way. The entire project would provide 28 studio units, 98 one-bedroom units, 105 two-bedroom units, and 14 three-bedroom units. Floor plans would range from 566 sq. ft. to 1,268 sq. ft. in floor area. The following roadways provide primary circulation within the City of Vacaville and vicinity of the proposed Project:

- Allison Drive is a major north-south 4-lane arterial roadway that traverses Vacaville between Browns Valley Parkway and Elmira Road. Within the study area, Allison Drive has a posted speed of 35 MPH.
- E. Monte Vista Avenue is a major east-west arterial roadway that traverses Vacaville between Alamo Drive and Vaca Valley Parkway. E. Monte Vista Avenue is two lanes wide east of County Airport Road and four lanes wide west of County Airport Road. Within the study area, E. Monte Vista Avenue has a posted speed of 30 MPH.
- Elmira Drive is a major east-west arterial roadway that traverses Vacaville between Leisure Town Road and the Interstate 80 under crossing. Elmira Drive is 4 lanes wide to the east of Allison Drive and 6 lanes wide to the west of Allison Drive. Within the study area, Elmira Drive has a posted speed of 40 MPH.

- Ulatis Drive is an east-west 4-lane collector that traverses Vacaville between Leisure Town Road and Allison Drive. Within the study area, Ulatis Drive has a posted speed of 35 MPH when school is not in session.

Discussion of Impacts

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

According to the Traffic Impact Study prepared by GHD (Attachment 7), the 245-unit apartment complex is projected to generate 113 AM peak hour trips and 130 PM peak hour trips which will be distributed to the surrounding roadways. The traffic impact study analyzed the project with 252 units with a lightly higher trips (115 AM peak hour and 134 PM peak hour trips). The cumulative transportation impact contributed by the project is inconsequential and would be mitigated by participating in the Transportation portion of established local and regional Transportation Impact Fee Programs. Therefore, City implementation of transportation impact fee program will allow acceptable levels of service to be maintained. **Less than significant impact.**

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Please see response to Section (a) above. **No impact.**

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

The project is located within an area of existing and planned development that has or will occur under an existing policy plan and was developed consistent with Federal, State and Local Standards. No changes to roadways are proposed beyond developing the Project in conjunction with the existing access roadway. Access improvements will be conditioned to be constructed consistent with City's Engineering Standards. The project will not increase hazards due to the design. The project proposal is to construct seven 3-story apartment buildings and 8,000 sq. ft. clubhouse which is compatible with the zoning/policy plan. Therefore, the project does not introduce an incompatible use or substantially increase hazards due to a design feature. **No impact.**

d) Result in inadequate emergency access?

The project is located within an existing area designed consistent with local emergency access policy, standards and requirements. Therefore, the project will not result in inadequate emergency access. **No impact.**

Impact Conclusion

Transportation and traffic created by the project will have a less-than significant impact.

Mitigation Measures

No mitigation is required.

XVIII. TRIBAL CULTURAL RESOURCES

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:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
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)?	☐	☐	☐	☒
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?	☐	☒	☐	☐

Affected Environment

According to Public Resources Code (PRC) Section 21074, a resource is a tribal cultural resource if it is either:

1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

    a. Included or determined to be eligible for inclusion in the California Register of Historical Resources; or
    b. Included in a local register of historical resources as defined in PRC Section 5020.1(k).

2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). In applying the criteria set forth in PRC Section 5024.1(c), the lead agency shall consider the significance of the resource to a California Native American tribe.

3) A cultural landscape that meets the criteria of PRC Section 21074(a) to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

4) A historical resource described in PRC Section 21084.1, a unique archaeological resource as defined in PRC Section 21083.2(g), or a "non-unique archaeological resource" as defined in PRC Section 21083.2(h), if it conforms with the criteria of PRC Section 21074(a).

In accordance with PRC Section 21084.2, lead agencies are required to consider Tribal Cultural Resources (TCR) including a site feature, place, cultural landscape, sacred place or object, of cultural value to the tribe and is listed on the California Register of Historic Resources (CRHR) or a local register, or the Lead agency, at its discretion, chooses to treat resources as such.
In accordance with PRC Section 21080.3.1(b)(1), to date, the Yocha Dehe Wintun Nation is the only Tribe to request in writing to be informed by the City through formal notification of proposed projects in Vacaville.

Sacred Lands Search

As stated in the Cultural Resources Study (Attachment 5), Helix Environmental Planning requested that the Native American Heritage Commission (NAHC) conduct a search of their Sacred Lands File for the presence of Native American sacred sites or human remains in the vicinity of the proposed project area. A written response received from the NAHC on July 10, 2018, stated that the Sacred Lands File failed to indicate the presence of Native American cultural resources in the immediate project area. On July 12, 2018, HELIX sent letters to three Native American contacts that recommended by the NAHC as potential sources of information related to cultural resources in the vicinity of the project area:

- Anthony Roberts, Chairman, Yocha Dehe Wintun Nation
- Gene Whitehouse, Chairman, United Auburn Indian Community of the Auburn Rancheria
- Charlie Wright, Chairman, Cortina Rancheria - Kletsel Dehe Band of Wintun Indians

The letters advised the tribes and specific individuals of the proposed project and requested information regarding cultural resources in the immediate area, as well as any feedback or concerns related to the proposed project. To date, no responses have been received from any of the contacts.

Assembly Bill (AB) 52 Consultations

The Yocha Dehe Wintun Nation is the only regionally affiliated representatives that has requested formal notification on projects in the City of Vacaville. On November 28, 2018, the City of Vacaville provided formal notification to the Yocha Dehe Wintun Nation via United States Postal Service (USPS) certified mail. On December 21, 2018, the Lead Agency received a response with a request to perform a site visit with YDWN, which occurred on January 8, 2019. On February 5, 2019, the Lead Agency received a letter from YDWN, which confirmed there is potential for discovering unknown tribal cultural resources at the site. The response letter included a request to establish a monitoring agreement to ensure a Tribal Cultural Monitor is present during initial ground disturbing activities. Refer to Cultural Resources Report (Attachment 5), for the natural setting as well as prehistoric and historic-period contextual information.

Discussion of Impacts

a) Cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing on any state or local historic registry defined by Public Resource Code Section 5020.1(k)?

As described in the Cultural Resources Report (Attachment 5), a search of the Sacred Lands file was conducted and did not indicate the presence of a Native American Sacred Site within or in the immediate vicinity of the project site. Therefore, the project would have no impact on a tribal cultural resource that is 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). **No impact.**

b) Cause a substantial adverse change in the significance of a tribal cultural resource that is determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to Public Resources Code Section 5024.1(c)?

The Cultural Resources Study did not identify any tribal cultural resources onsite. However, the Yocha Dehe Wintun Nation indicated that there is a possibility that the project site may contain unknown tribal cultural resources, due to proximity of Ulatis Creek. As an effort to avoid potential impacts to unknown resources, the lead agency will require implementation of mitigation measure TCR-1, which requires the applicant to coordinate with Yocha Dehe Wintun Nation to have tribal monitors at the site during initial ground disturbing activities. Therefore, the proposed project would have less than significant impact on Tribal Cultural Resources, with mitigation measures incorporated. **Less-than significant impact with mitigation measures incorporated.**

Impact Conclusion

The Project will have a less-than significant impact on Tribal Cultural Resources, with mitigation measures incorporated.

Mitigation Measures

TCR-1: The Project Sponsor shall coordinate with the Yocha Dehe Wintun Nation to have tribal cultural monitors at the site during initial ground disturbing activities.

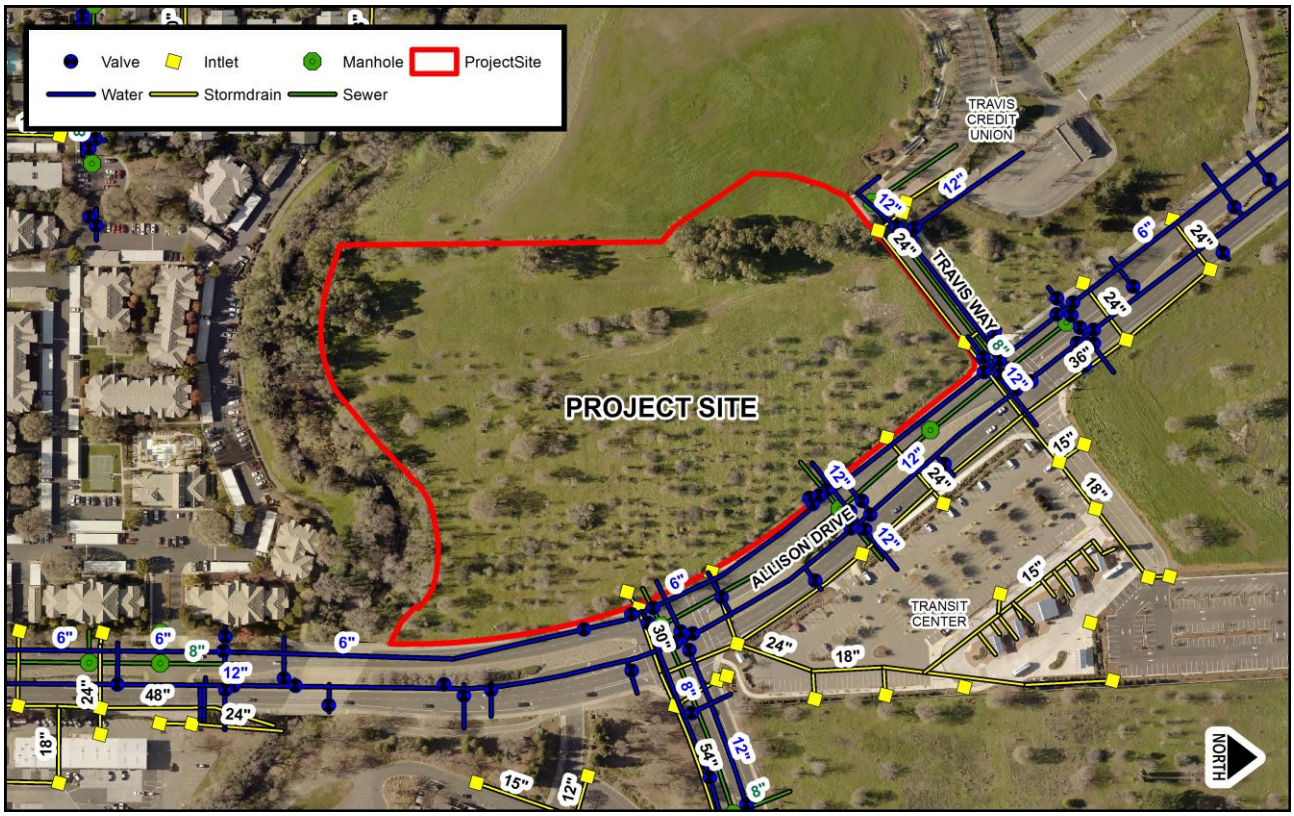
XIX. UTILITIES & SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication 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?	☐	☐	☐	☒

Affected Environment

The project proposal is to construct a 245-unit apartment complex on a vacant 14.41-acre site located at the southwest corner of Allison Drive and Travis Way. The project is bound by Allison Drive (4-lane divided arterial) to the east, Travis Way (2-lane local street) to the north, vacant land to the west and Ulatis Creek to the South. The site is located in the incorporated boundaries of the City of Vacaville; the project will be served by existing utilities, as depicted by Figure 8 below.

FIGURE 8. EXISTING UTILITIES



Water Service

As described in the Public Utilities and Services Element of the Vacaville General Plan (pg. PUB-19), the City's distribution system consists of one main pressure zone, which primarily serves development with building pad elevations between 82 and 222 feet, and several upper pressure zones, which serve development above 222 feet. The system includes approximately 292 miles of distribution pipelines, including 18-inch, 24-inch, and 30-inch transmission mains, as well as 4-inch to 12-inch water distribution mains. In addition, water is stored by the City in various elevated storage reservoirs, including five reservoirs in the main zone and three reservoirs in the upper pressure zones. The project will be served by existing 12-inch water mains located along Allison Drive.

Wastewater

As described in the Public Utilities and Services Element of the Vacaville General Plan (pg. PUB-22), the City owns and operates the wastewater collection system in Vacaville, which consists of gravity and pressure sewers, lift stations, and associated facilities. The City performs routine wastewater collection system flow monitoring at various permanent metering locations throughout the city and at the Easterly Wastewater Treatment Plant (EWWTP). Additionally, the City maintains a collection system model for the purpose of simulating peak flow conditions in major sewers to determine existing and future needs for collection system improvements. Based on this model, the City uses Development Impact Fees to replace undersized facilities, giving priority to those facilities that are expected to reach capacity in the near future. The project will be served by existing 8-inch gravity sewer mains located along Allison Drive.

Solid Waste and Recycling

As described in the Public Utilities and Services Element of the Vacaville General Plan (pg. PUB-16), the City of Vacaville contracts with a private waste collection company to provide weekly solid waste, green waste, and recyclable material collection to Vacaville residents and commercial businesses. The California Department of Resources Recycling and Recovery (CalRecycle) has allocated the City of Vacaville with a disposal rate target of 6.5 pounds of waste per person per day. In 2010, the City of Vacaville's disposal rate was 4.9 pounds of waste per person per day, which was well below the CalRecycle target. The project will be served by existing providers under contract with the City.

Storm Drain Services

As described in the Safety Element of the Vacaville General Plan (pg. SAF-9), the City of Vacaville uses a variety of flood control facilities and measures to address flooding problems. As shown in Figure SAF-5 (Existing and Proposed Drainage Facility) of the Safety Element, the City has built several regional detention basins that reduce the flow from the Vaca Mountains before they reach the city in order to reduce urban flooding. The City also maintains a network of storm drains, and works to keep channel flowlines free from debris and vegetation. As part of past flood control efforts, certain creekways have been engineered to handle larger volumes of stormwater than they would in their natural states. The project site will be served by existing 24-inch and 30-inch storm drain piping located along Allison Drive.

Other Services

Pacific Gas and Electric (PG&E) will provide natural gas and electricity to the project site. Service is provided through underground pipelines and above ground transmission lines. AT&T, US Sprint, MCI, and Pacific Bell all provide telecommunications services to Vacaville. These services are also provided via underground and aboveground transmission lines. The project site will be served by existing services.

Discussion of Impacts

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?

Please see the "Affected Environment" section. **No impact.**

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Please see the "Affected Environment" section. **No impact.**

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?

Please see the "Affected Environment" section. **No impact.**

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?

Please see the "Affected Environment" section. **No impact.**

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Please see the "Affected Environment" section. The project proponent will be required to comply with all Federal, State and Local statutes and regulations for disposal of solid waste. **No impact.**

Impact Conclusion

The Project will have no impact to utilities and service systems.

Mitigation Measures

No mitigation is required.

XX. WILDFIRE

If located in or near state responsibility areas of lands classified as very high fire hazard severity zones, would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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 a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
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?	☐	☐	☐	☒

Affected Environment

Highly flammable vegetation and warm, dry summers create the potential for wildland fires in Vacaville. The risk of wildland fires is related to a combination of factors, including winds, temperatures, humidity levels, and fuel moisture content. Of these four factors, wind is the most crucial. Steep slopes also contribute to fire hazards by intensifying the effects of wind and making fire suppression difficult. Where there is easy public access to dry vegetation, fire hazards increase due to greater chance of human carelessness. As described in the Vacaville General Plan, high hazard areas in include outlying residential parcels and open lands adjacent to residential areas.[2]

To quantify this potential risk, the California Department of Forestry (CDF) has developed a Fire Hazard Severity Scale that utilizes three criteria in order to evaluate and designate potential fire hazards in wildland areas. The criteria are fuel loading (vegetation), fire weather (winds, temperatures, humidity levels, and fuel moisture contents), and topography (degree of slope).

To reduce risks from wildland fires, the City of Vacaville adopted Chapter 14.20.290 of the Municipal Code, Standards for New Construction Adjacent to Open Space Lands Where Wildfire is a Threat. Chapter 14.20.290 provides development standards for new construction adjacent to permanent open or other open lands where no development is anticipated in the near future (as identified in the General Plan) and where wildfire is a threat. Some of the fire reduction strategies incorporated in the code include providing for fire access roads, maintaining a defensible space of non-combustible vegetation around structures, and installing indoor sprinkler systems.

Discussion of Impacts

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

According to Figure SAF-9 (CALFIRE Hazard Severity Zones) of the Vacaville General Plan, the site is not located in an area where wildfires are a threat. According to Figure PUB-1 (Fire Protection Service Providers) of the Vacaville General Plan, emergency services will be provided by the Vacaville Fire Department (VFD), which includes the following coverage: fires, emergency medical incidents, public assists, traffic and vehicle accidents, and other emergency situations. The closest fire station is Station 72 located at 2001 Ulatis Drive, which is approximately 0.2 miles to the east as the vehicle drives. **No impact.**

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

According to Figure SAF-9 (CALFIRE Hazard Severity Zones) of the Vacaville General Plan, the site is not located in an area where wildfires are a threat. **No impact.**

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

According to Figure SAF-9 (CALFIRE Hazard Severity Zones) of the Vacaville General Plan, the site is not located in an area where wildfires are a threat. **No impact.**

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?

According to Figure SAF-9 (CALFIRE Hazard Severity Zones) of the Vacaville General Plan, the site is not located in an area where wildfires are a threat. **No impact.**

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

Does the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) 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) 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) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Conclusion

a) 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?

As evaluated in this document, the project would not 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; reduce the number or restrict the range of an endangered, rare, or threatened species; or eliminate important examples of the major periods of California history or prehistory. Mitigation Measures BIO-1, BIO-2, BIO-3, CUL-1, CUL-2, CUL-3, ENG-1, GEO-1, GEO-2, HYD-1, HYD-2, HYD-3, HYD-4, HYD-5 and TCR-1, have been included herein to lessen the significance of potential impacts to special-status species and habitats, and inadvertent

discovery of cultural and tribal resources, and reduce impacts to water quality, geology and soils and energy consumption. **Less than significant impact.**

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)?

The project is located in Area IIA of the Allison Business Area Policy Plan, which has been designated for development. The project would not induce development beyond the area that which has already been planned for and adopted as part of the policy plan. While construction of the project would potentially contribute to cumulative impacts related to air quality, biological resources, water quality, cultural resources and tribal resources, these would be mitigated with the implementation of Mitigation Measures BIO-1, BIO-2, BIO-3, CUL-1, CUL-2, CUL-3, ENG-1, GEO-1, GEO-2, HYD-1, HYD-2, HYD-3, HYD-4, HYD-5 and TCR-1. **Less-than significant impact.**

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

All impacts identified in this document are either less than significant after mitigation or less than significant and do not require mitigation. Therefore, the project would not result in environmental effects that cause substantial adverse effects on human beings either directly or indirectly. **Impacts would be less than significant with mitigation.**

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ATTACHMENT 1

PROJECT PLANS

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CASA dei VISTA APARTMENTS

ALLISON DRIVE VACAVILLE, CA

PROJECT SUMMARY

APN	0131-030-860 0131-020-530
EXISTING GEN. PLAN USE	MU & CO
EXISTING ZONE	RLM 4.5 & CG (PO
ZONE CHANGE	RMH
GROSS ACREAGE	14.41± AC
UNDEVELOPABLE AREA	
CREEK (FROM BLDG. SETBACK)	2.05± AC
HILLSIDE SLOPE	1.07± AC
NEW ALLISON RIGHT-OF-WAY	0.32± AC
NET DEVELOPABLE ACREAGE	10.97± AC
TOTAL UNITS (7 x 35 UNITS)	245
DENSITY	22.3 DU/AC

OWNER

CCC ASSOCIATES
P.O. BOX 2955
SAN RAMON, CA 94583

APPLICANT

GUARDIAN COMMERCIAL REAL STATE
RICH ALEXANDER
5780 FLEET STREET SUITE 225
CARLSBAD, CA 92008
(916) 765-0405

PARKING SUMARRY

PARKING PROVIDED:

STD. OPEN SPACE	90 80 WITH 4 ACCESSIBLE
COMPACT OPEN SPACE	25 20
STANDARD COVERED SPACE	185 WITH 5 ACCESSIBLE
GARAGE (7 x 8)	56
TANDEM (7 x 8)	56
TOTAL	466 461 SPACES

PARKING RATIO (245 UNITS) = 1.9 SPACE/UNIT
1.88

CIVIL ENGINEER

PHILLIPPI ENGINEERING, INC.
425 MERCHANT STREET, SUITE 200
VACAVILLE, CA 95688
(707) 451-6556

ARCHITECT

BSB DESIGN INC.
300 UNIVERSITY AVE. SUITE 220
SACRAMENTO, CA 95825
(916) 941-0990

LANDSCAPE ARCHITECT

FUHRMAN LEAMY LAND GROUP
2140 PROFESSIONAL DR. SUITE 115
ROSEVILLE, CA 95661
(916) 783-5263

LAND USE SUMMARY:

PROPERTY AREA:	14.42± AC
DEVELOPABLE AREA:	10.97± AC
UNIT COUNT:	
35-PLEX:	
7 BUILDINGS:	245 UNITS
ON-SITE PARKING COUNT:	
UNCOVERED:	
STD. PARKING STALLS:	16
ACCESSIBLE STALLS:	2
COMPACT PARKING STALLS:	12
35-PLEX DRIVEWAY STALLS:	56
TOTAL:	86
COVERED:	
STD. PARKING STALLS:	256
ACCESSIBLE STALLS:	7
COMPACT PARKING STALLS:	69
TOTAL:	332
GARAGE:	
STD. PARKING STALLS:	56
GRAND TOTAL:	474
PARKING RATIO (SPACE/UNIT):	1.9
TOTAL ACCESSIBLE PARKING:	9
TOTAL COVERED (GARAGE+COVERED):	388
LOT COVERAGE:	
ROOF COVERAGE:	
CLUBHOUSE AREA:	7,781± SF
35-PLEX AREA (x7 BUILDINGS):	94,136± SF
STD COVERED PARKING (9'x20'):	46,080± SF
COMP. COVERED PARKING (9'x16'):	9,936± SF
ACCESSIBLE AISLE (8'x20'):	480± SF
TOTAL:	158,413± SF
TOTAL LOT COVERAGE:	33%

LEGEND

PROPOSED	EXISTING	
		SANITARY SEWER CLEANOUT
		CURB GUTTER AND SIDEWALK
		DROP INLET
		PUBLIC STREET LIGHT
		PRIVATE STREET LIGHT
TC	EXTC	TOP OF CURB GRADE
12"ø W/M		FIRE HYDRANT AND VALVE ASSEMBLY
12"ø SS		SANITARY SEWER PIPE AND MANHOLE, SIZE AND SLOPE DIRECTION
18"ø SD		STORM DRAIN PIPE AND MANHOLE, SIZE AND SLOPE DIRECTION
		TRAFFIC SIGN AS NOTED
8"ø WM	8"ø WM	WATER MAIN PIPE, SIZE AND VALVE
8"ø WM-NP	8"ø WM-NP	WATER MAIN PIPE, SIZE AND VALVE NON POTABLE
		OVERLAND RELEASE ARROW

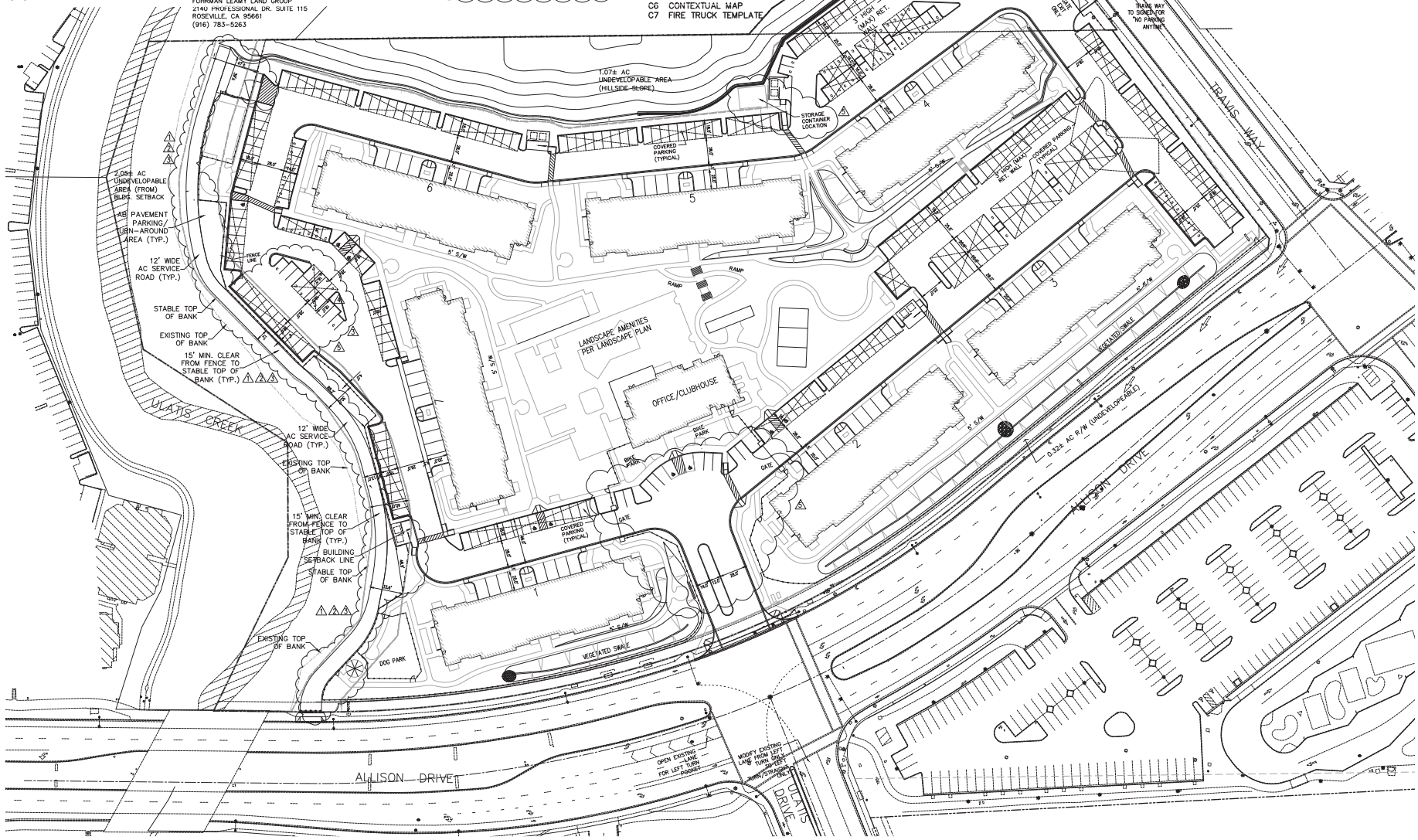
INDEX OF SHEETS

C1 SITE LAYOUT / COVER SHEET
C2 GRADING PLAN
C3 GRADING SECTIONS
C4 UTILITY PLAN
C5 TOPOGRAPHIC MAP
C6 CONTEXTUAL MAP
C7 FIRE TRUCK TEMPLATE

SCALE : 1" = 40'

PROJECT LOCATION





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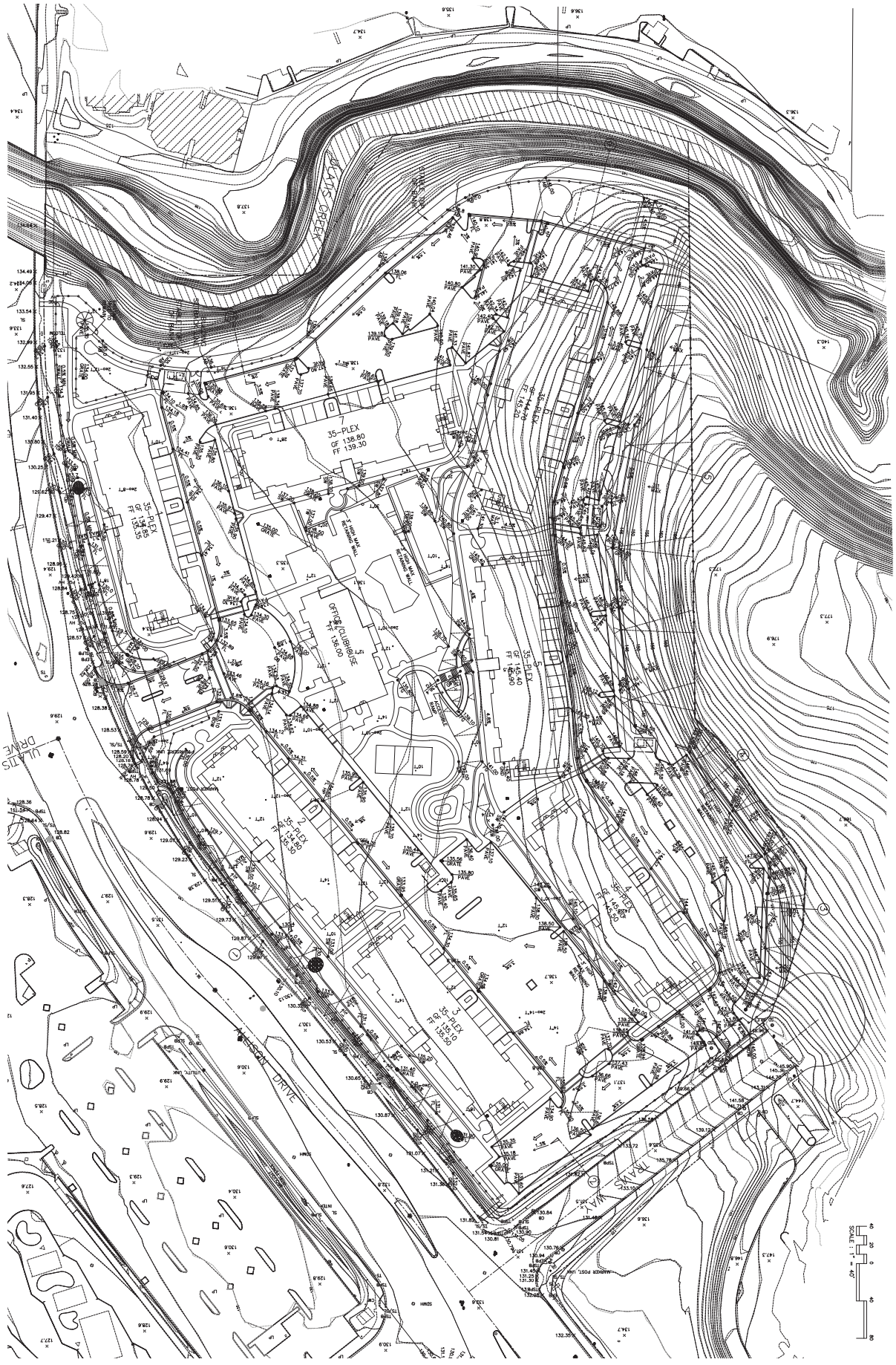
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VACAVILLE
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2	REVISED SERVICE AB ROAD & PARKING SUMMARY	12-07-18
3	REVISED PARKING LAYOUT & PARKING COUNT	01-15-19
4	ADD TRASH COMPACTOR, REVISED PARKING COUNT & COVERED PARKING LOCATION	02-01-19
5	STORAGE CONT., CHNG PKNG, REVISE COMP. ENTRY	02-07-19

DRAWING FILE: XR:20170820TM, T

ISSUE DATE: 11-13-2018
PROJECT NO.: 20170820
SHEET NO.: 1 OF 7



NOTE:
UNLESS NOTED OTHERWISE, ALL EXISTING TREES ONSITE SHALL BE REMOVED.

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SHEET NO.: 2 OF 7		DRAWING FILE:	DRAWING TITLE: GRADING PLAN

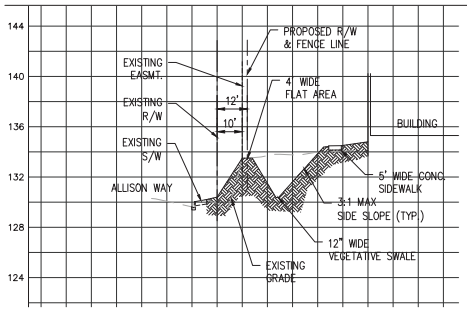
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CIVIL ENGINEERING - LAND SURVEYING
425 MERCHANT STREET VACAVILLE, CA 95688
P.O.BOX 6338 VACAVILLE, CA 95696
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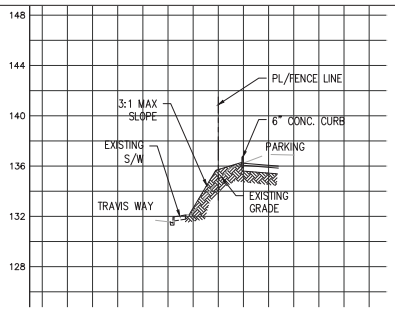
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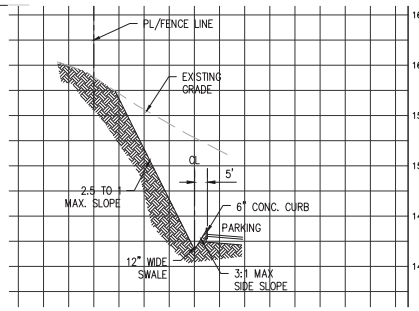
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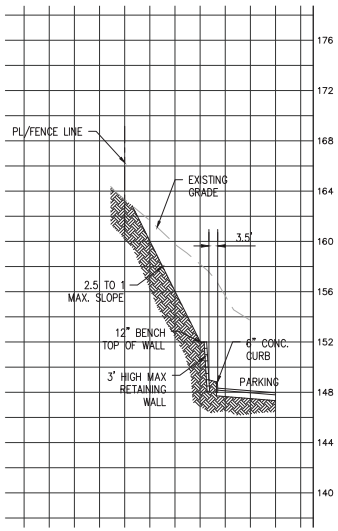
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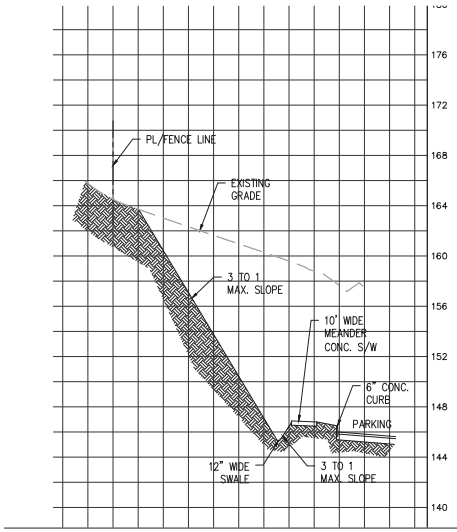
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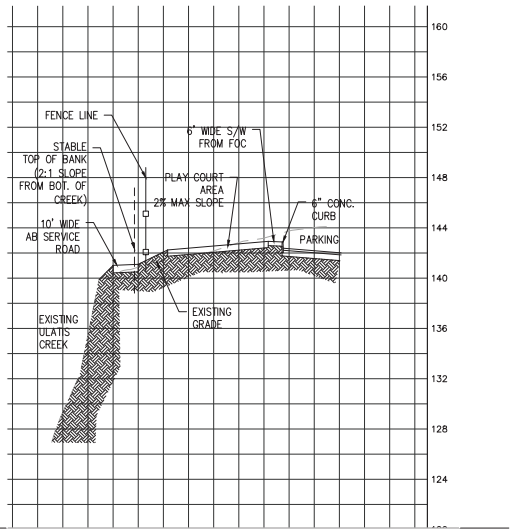
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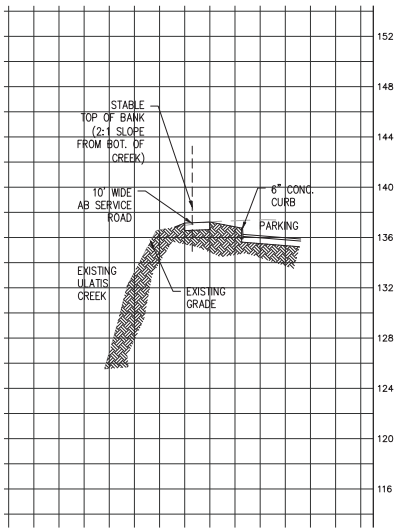
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SECTION – 5



SECTION – 6



SECTION – 7

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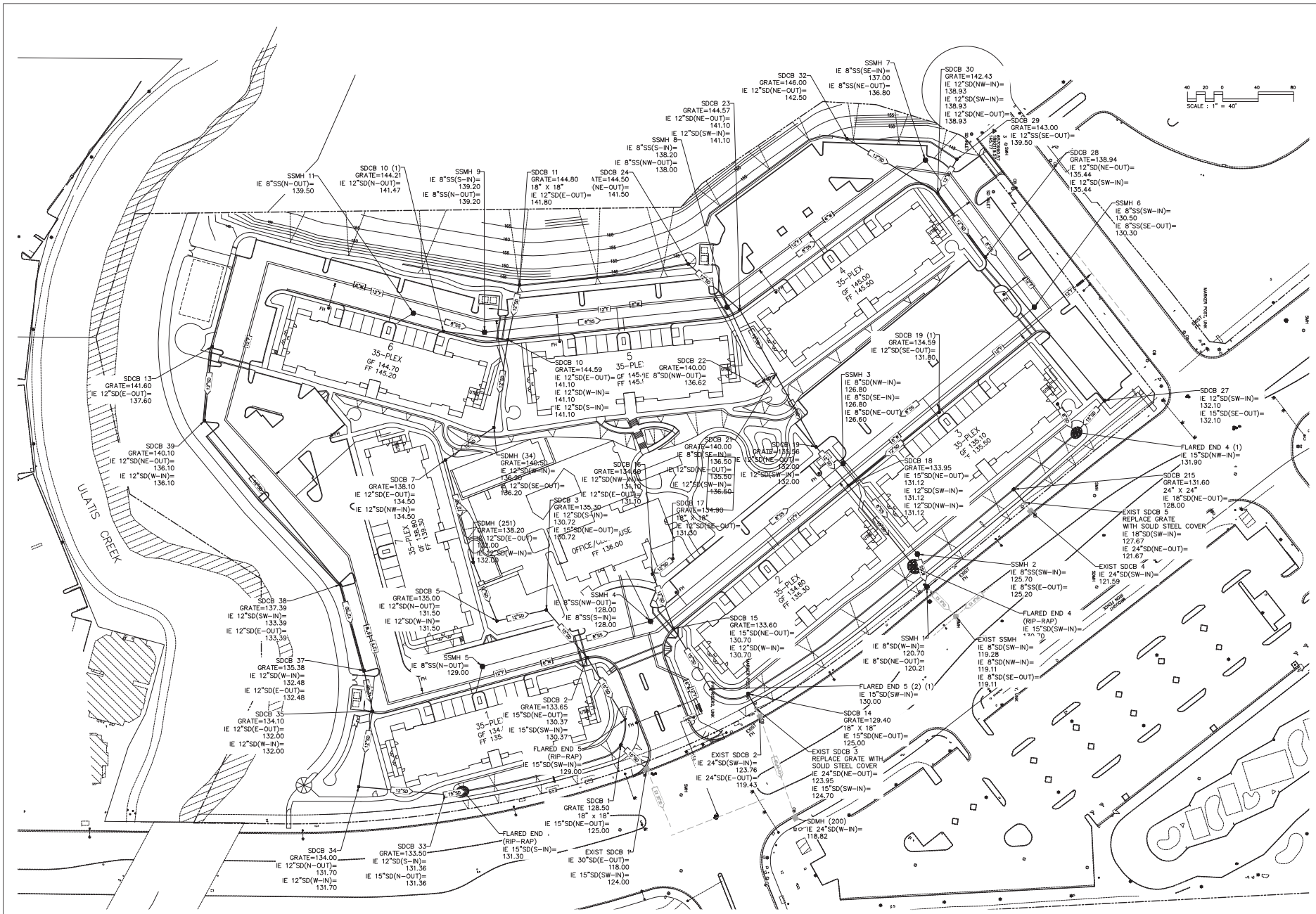
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REVISIONS NO.	DESCRIPTION	DATE

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ISSUE DATE: 11-13-2018
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PROJECT NO.: 20170820



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PROJECT NAME/LOCATION: CASA Del VISTA APARTMENTS
WACVILLE
CA

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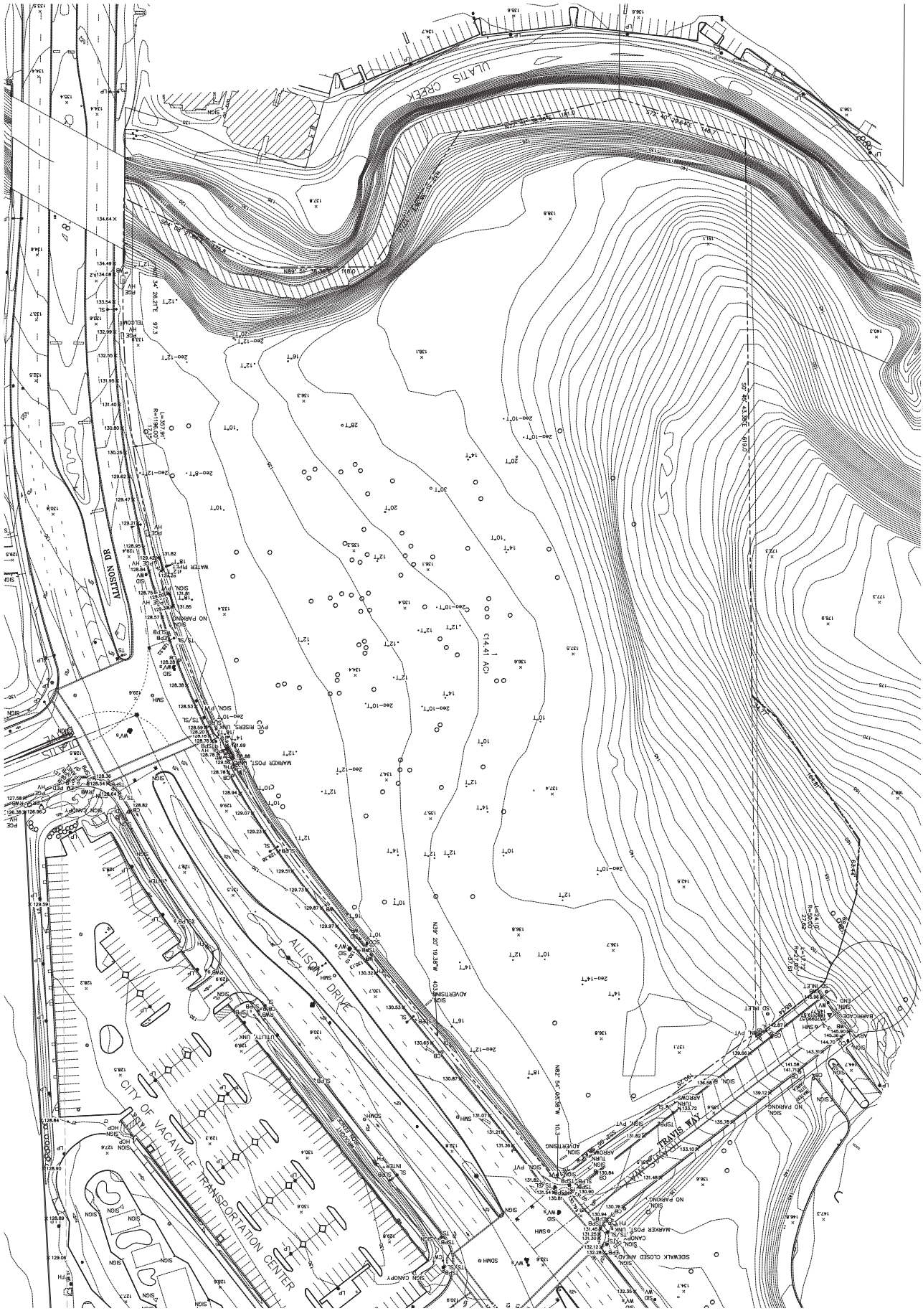
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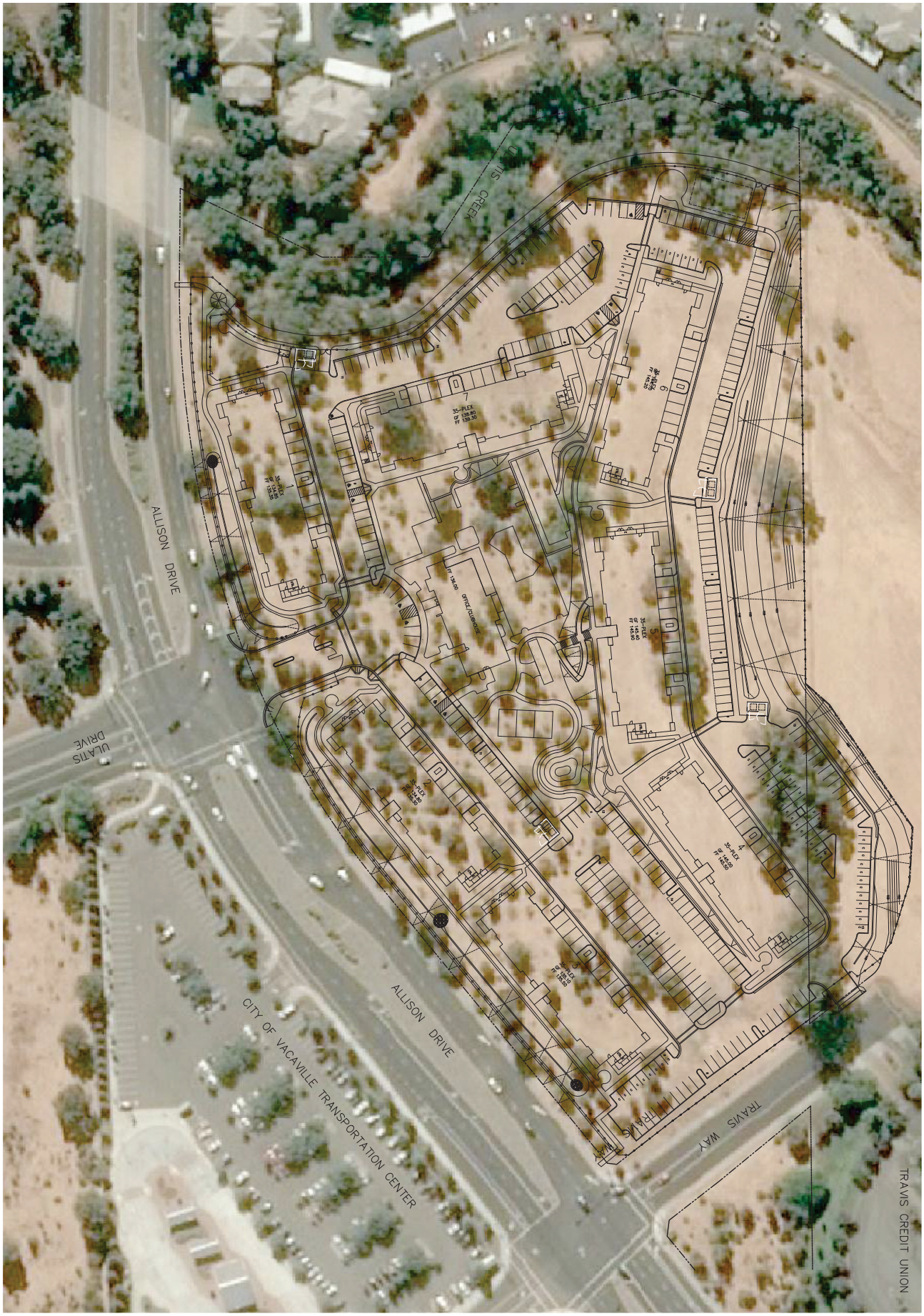
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TOPOGRAPHIC MAP

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PHILLIPPI ENGINEERING
CIVIL ENGINEERING - LAND SURVEYING
425 MERCHANT STREET VACAVILLE, CA 95688
P.O.BOX 6556 VACAVILLE, CA 95696
OFFICE (707) 451-6056 FAX (707) 451-6505

REGISTERED PROFESSIONAL ENGINEER TIMOTHY A. PHILLIPPI No. 33067 Exp. 12-31-19 CIVIL STATE OF CALIFORNIA



SCALE : 1" = 40'

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PROJECT NO.	20170820
DATE	JULY 25, 2018
SHEET NO.	6
OF	7

REVISIONS:

NO.	DESCRIPTION	DATE

DRAWING FILE: XR: 20170820TXL 1

PROJECT NAME/LOCATION:
CASA Dei VISTA APARTMENTS
VACAVILLE CA

DRAWING TITLE:
CONTEXTUAL MAP

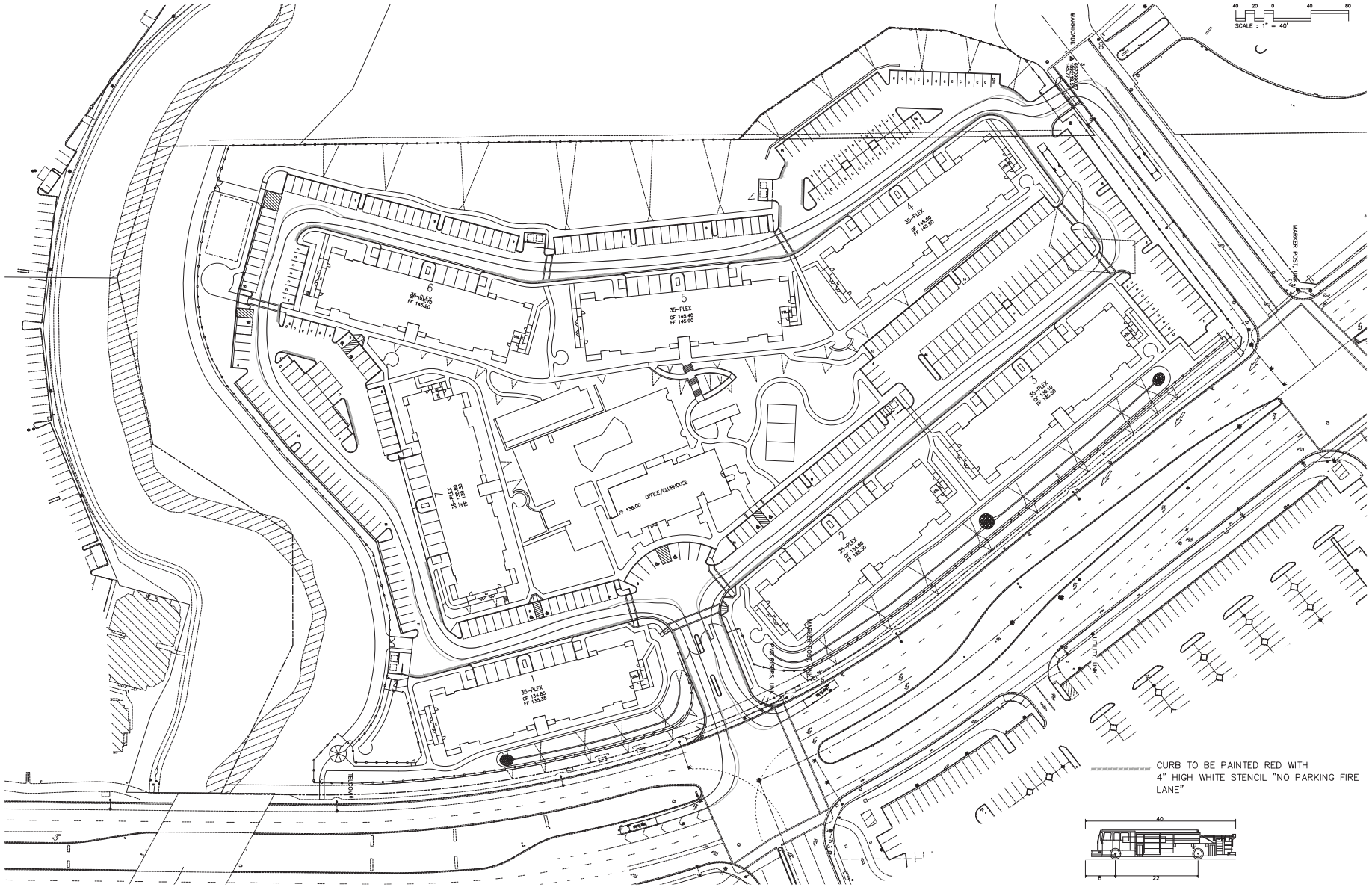
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REGISTERED PROFESSIONAL ENGINEER TIMOTHY A. PHILLIPPI No. 32067 Exp. 12-31-18 CIVIL STATE OF CALIFORNIA

ISSUE: AS NOTED

N



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SCALE: AS NOTED

PROJECT NAME/LOCATION: CASA Del VISTA APARTMENTS CA
VACAVILLE
DRAWING TITLE: FIRE TRUCK TURNING TEMPLATE

PHILLIPS ENGINEERING
CIVIL ENGINEERING • LAND SURVEYING
PHONE (707) 451-8006
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DESIGNED BY: ETV
DRAFTED BY: ETV
CHECKED BY: TAP

REVISIONS:	NO.	DESCRIPTION	DATE

DRAWING FILE:

XR: 20170820TM, T

ISSUE DATE: 11-13-2018
SHEET NO.: 7 OF 7
PROJECT NO.: 20170820



SCALE: 1" = 40' - 0"

0' 40' 160'

20' 80'

PRELIMINARY LANDSCAPE DESIGN NOTES

1. ALL PROPOSED LANDSCAPE WORK IS DESIGNED WITH AN INTENT TO BE SIMILAR TO ADJACENT WORK RECENTLY PROVIDED ALONG ALLISON DR. AND THE INTERMODAL TRANSPORTATION LOT ACROSS THE STREET.
2. ALL PROPOSED LANDSCAPE IMPROVEMENTS SHALL MEET CURRENT CITY OF VACAVILLE WATER CONSERVATION MODEL ORDINANCE.
3. ALL LANDSCAPED AREAS SHALL BE IRRIGATED USING AN AUTOMATIC IRRIGATION SYSTEM.
4. FENCING DESIGN SHALL MEET INTENT OF THE SURROUNDING DEVELOPMENT IN THE AREAS AND OR AS DEPICTED IN THIS LANDSCAPE DESIGN SUBMITTAL.
5. ALL EXISTING TREE MITIGATION REQUIREMENTS SHALL BE QUANTIFIED DURING IMPROVEMENT PLAN DOCUMENTAL AND AS PER CITY OF VACAVILLE TREE MITIGATION REQUIREMENTS.
6. STREET TREES ADJACENT TO THE DEVELOPMENT ARE DIAGRAMMATIC AND WILL BE ADJUSTED TO FIT EXISTING AND PROPOSED, UTILITIES LOCATIONS, AND DRIVEWAY ALIGNMENTS DURING THE IMPROVEMENT PLAN DOCUMENTATION.

CASA DEI VISTA APARTMENTS

KEY NOTES

GENERAL KEY NOTES

A	PARKING AREAS WITH COVERED PARKING. SEE CIVIL PLAN SHEETS
B	BICYCLE RACKS PER CITY OF VACAVILLE BUILDING CODE. SEE IMAGERY SHEET L2.
C	CLUBHOUSE
D	PLANTING AREAS– TRESS, SHRUBS, AND GROUND COVER.
E	TRASH ENCLOSURE.
F	SWIMMING POOL, WITH LAP LANES, (2) SHALLOW WADING AREAS, CONCRETE DECKING WITH PALM TREES, LOUNGERS, CABANAS AND DINING TABLES
G	15' X 10' RECTANGULAR SPA
H	OUTDOOR LOUNGE PATIO WITH FIRE TABLE AND OUTDOOR FURNITURE/TABLE TENNIS/FOOSBALL
I	COVERED OUTDOOR BAR WITH BUILT IN NG GAS BBQ AND SINK
J	OUTDOOR DINING AREA WITH NG BBQ'S.
K	TWO BOCCE BALL COURTS WITH SHADED SEATING AND STRING LIGHTING
L	HORSESHOE PIT/BENCHES/TABLES AND CHAIRS
M	MULTI SPORT COURT–1 COURT BASKETBALL, PICKLEBALL, ACTION TENNIS, VOLLEYBALL FULLY FENCED
N	COMMUNITY GARDEN AREA WITH RAISED BEDS, COMPOST BINS, AND D.G. SURFACING.
O	OPEN ACTIVE TURF AREA/VOLLEYBALL/CROQUET/BADMINTON
P	DOG PARK WITH SEATING AREAS, FENCED, GATED, AND TABLES AND CHAIRS FOR SEATING.
Q	SMALL TURF PASSIVE AREA. SOME AREAS MOUNDED FOR PLAY VALUE.
R	OBSERVATION DECK WITH BENCH SEATING
S	SMALL PATIO AREAS WITH TABLES/UMBRELLAS/GAME TABLES/AND NG BBQ
T	VEGETATIVE SWALE AREAS
U	VEHICULAR ENTRY GATE
V	VEHICULAR EXIT GATE
W	PEDESTRIAN GATE
X	PERIMETER 72' METAL FENCING. SEE DETAIL A SHEET L2.
Y	12' WIDE ASPHALT ACCESS TRAIL
Z	BIKE REPAIR STATION. SEE SHEET L2.

PRELIMINARY PLANT LIST AND LEGEND

SYMBOL	BOTANICAL NAME / COMMON NAME	MIN. SIZE	WATER USE	DESIGN USE
	CERCIS OCCIDENTALIS WESTERN REDBUD	15 GAL	LOW	NATURALIZED
	FREMONTODENDRON CALIFORNICUM FLANNEL BUSH	15 GAL	LOW	NATURALIZED
	KOELREUTERIA PANICULATA GOLDEN RAIN TREE	15 GAL	MOD	SUBORDINATE
	LAURUS NOBILIS SWEET BAY	15 GAL	LOW	EVERGREEN PATIO
	LAGERSTROEMIA INDICA NATCHEZ CRAPE MYRTLE	15 GAL	LOW	FLOWERING PATIO
	MAGNOLIA GRANDIFLORA 'LITTLE GEM' COMPACT SOUTHERN MAGNOLIA	15 GAL	MOD	EVERGREEN ACCENT
	PHOENIX DACTYLIFERA DATE PALM	18 BTF	MOD	ACCENT
	PINUS CANARIENSIS CANARY ISLAND PINE	15 GAL	LOW	EVERGREEN SCREEN
	PISTACIA CHINENSIS CHINESE PISTACH	15 GAL	LOW	SUBORDINATE
	PLATANUS ACERIFOLIA 'YARWOOD' LONDON PLANE TREE	15 GAL	MOD	STREET
	PYRUS CALLERYANA 'CHANTICLEER' CHANTICLEER PEAR	15 GAL	MOD	FLOWERING ACCENT
	QUERCUS WISLIZENEII INTERIOR LIVE OAK	15 GAL	LOW	NATURAL
	ULMUS WILSONIANA PROSPECTOR PROSPECTOR ELM	15 GAL	MOD	SHADE / STREET
	ZELKOVA SERRATA MUSASHINO COLUMNAR SAWLEAF ZELKOVA	15 GAL	MOD	VERTICAL ACCENT

SHRUBS

SYMBOL	BOTANICAL NAME / COMMON NAME	SIZE	WATER USE	REMARKS
	FOUNDATION SHRUBS EVERGREEN OR DECIDUOUS SHRUBS TO 4'-0". USED FOR 'TERRACING' OF PLANT MATERIAL, SEASONAL COLOR AND SOFTENING OF BUILDING EDGES AND FOUNDATION SHRUBS.			
	ARBUTUS U. COMPACTA COMPACT STRAWBERRY TREE	5 G	LOW	FULL SUN
	CHOISYA TERNATA MEXICAN ORANGE	5 G	LOW	FULL SUN/PART SHADE
	COTONEASTER PARNEYI PARNEYS COTONEASTER	5 G	MOD	FULL SUN
	GREVILLEA X 'NOELLII' NOELL GREVILLEA	5 G	LOW	FULL SUN
	JASMINUM MESNEYI PRIMROSE JASMINE	5 G	MOD	FULL SUN
	LOROPETALUM CHINENSE CHINESE FRINGE FLOWER	5 G	LOW	FULL SUN/PART SHADE
	NANDINA DOMESTICA 'COMPACTA' HEAVENLY BAMBOO	5 G	LOW	FULL SUN/PART SHADE/FULL SHADE
	RHAMNUS SAN BRUNO COFFEEBERRY	5 G	LOW	FULL SUN
	FOUNDATION, FILLERS AND HEDGE SHRUBS – EVERGREEN, SHRUBS TO 4'-0" USED FOR LOW HEDGES THAT CAN BE TRIMMED OR SHEARED.			
	AGAPANTHUS ORIENTALIS 'LILY OF THE NILE	1 G	MOD	FULL SUN
	[illegible] VIMINALIS 'LITTLE JOHN'	5 G	MOD	FULL SUN
	[illegible] MAHONIA SP.. OREGON GRAPE	5 G	LOW	FULL SUN/PART SHADE
	MYRTUS COMMUNIS 'COMPA... DWARF MYRTLE	5 G	MOD	FULL SUN/PART SHADE
	RHAPHIOLEPIS INDICA 'SPP. INDIA HAWTHORN	5 G	LOW	FULL SUN/PART SHADE
	ACCENT SHRUBS – USED TO CREATE VISUAL IMPACT, BECAUSE OF THERE SHAPE COLOR OR SIZE.			
	CALAMAGROSTIS, MUHLENBERGIA, ELEYMUS, GRASSES	1 G	LOW	FULL SUN
	CUPHEA HYSSOPIFOLIA FALSE HEATHER	5 G	MOD	FULL SUN/PART SHADE
	DIETES SPECIES FORTNIGHT LILY	1 G	MOD	FULL SUN/PART SHADE
	JUNIPER SPP. JUNIPER	5 G	LOW	FULL SUN
	SALVIA SPP. SAGE	1 G	LOW	FULL SUN
	SPECIALTY SHRUBS – LARGER BACKGROUND SHRUBS FOR SCREENING AND CREATING VISUAL INTEREST.			
	AGAVE SPP. AGAVE	20 G	LOW	FULL SUN
	ECHIUM FASTUOSUM PRIDE OF MADEIRA	5 G	MOD	FULL SUN
	FREMONTODENDRON CALIFORNICUM FLANNEL BUSH	5 G	LOW	FULL SUN
	FEIJOA SELLOWIANA PINEAPPLE GUAVA	5 G	MOD	FULL SUN
	PRUNUS CAROLINIANA 'MONUS' BRIGHT 'N TIGHT CAROLINA LAUREL	5 G	MOD	FULL SUN/PART SHADE
	GROUND COVER MATERIAL – SMALL SCALE DUE TO PROJECT TYPE, EVERGREEN OR PERENNIAL SHRUBS TO 24" HIGH. USED AS A FILLER BETWEEN SITE WORK EDGES AND FACER SHRUBS.			
	ACACIA REDOLENS 'LOW BOY' PROSTRATE ACACIA	1 G	LOW	48" O.C.
	CISTUS X SKANBERGII PINK ROCKROSE	1 G	LOW	24" O.C.
	COTONEASTER LOWFAST BEARBERRY COTONEASTER	1 G	LOW	36" O.C.
	HYPERICUM CALYCINUM AARONS BEARD	1 G	MOD	36" O.C.
	ROSA FLOWER CARPET (WHITE AND RED) FLOWER CARPET ROSE	2 G	MOD	36" O.C.
	TRACHELOSPERMUM JASMINOIDES STAR JASMINE	1 G	MOD	36" O.C.
	TURF TYPE DWARF FESCUE TURF	SOD	HIGH	
	BIOSWALE MATERIAL–NATIVE MOW FREE TURF, ELEYMUS, CAREX, JUNCUS SPP.	SOD	MOD	
	NON IRRIGATED HYDROSEEDED SLOPE–NATIVE GRASSES	HYDO SEED	LOW	

GUARDIAN capital

CASA DEI VISTA

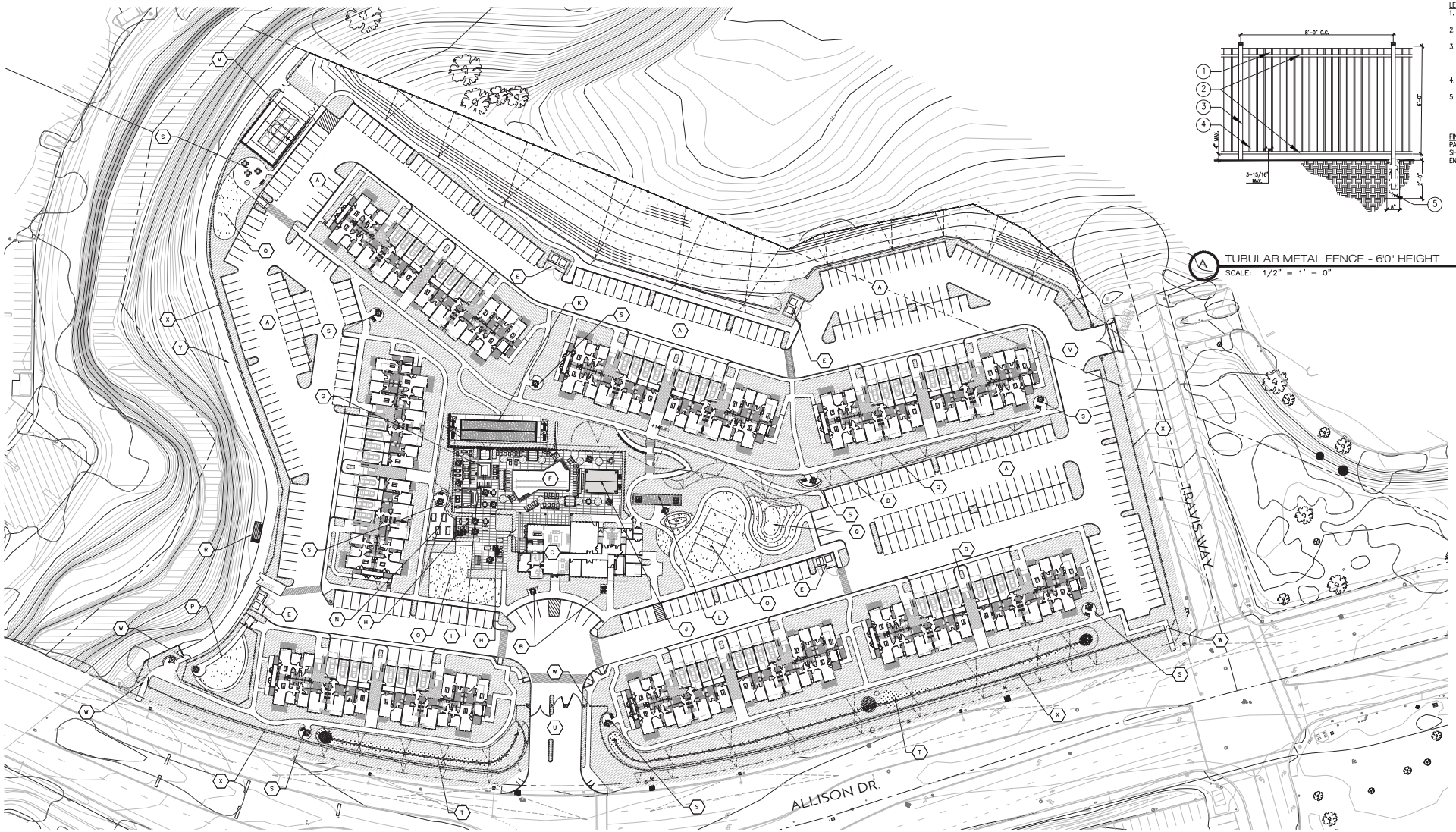
Vacaville, CA

PRELIMINARY LANDSCAPE PLAN

SHEET L1

FUHRMAN LEAMY LAND GROUP
DESIGN • SERVICE • SOLUTIONS
2140 PROFESSIONAL DRIVE, SUITE 115 ROSEVILLE, CA 95661

DATE: 11/09/2018
PROJECT: GIC.18013



LEGEND:
1. WELDED PANEL.
2. 1-1/2" SQ. RAILS - 16 Ga.
3. 2" SQ. POST - 11 Ga. WITH CAP. PLACE POSTS 8'-0" O.C. MAXIMUM.
4. 1/2" SQ. PICKET - 18 Ga.
5. 8" X 24" CONCRETE FOOTING, TYP. SLOPE TOP AWAY FROM POST TO PREVENT STANDING WATER.

FINISH:
PAINT ALL METAL WITH TWO COATS SHOP PRIMER AND ONE COAT ENAMEL PAINT. COLOR: BLACK.

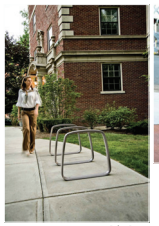
A TUBULAR METAL FENCE - 6'0" HEIGHT
SCALE: 1/2" = 1' - 0"

SCALE: 1" = 40' - 0"
0' 40' 160'
20' 80'

CASA DEI VISTA APARTMENTS

KEY NOTES

GENERAL KEY NOTES	
A	PARKING AREAS WITH COVERED PARKING. SEE CIVIL PLAN SHEETS
B	BICYCLE RACKS PER CITY OF VACAVILLE BUILDING CODE. SEE IMAGERY SHEET L2.
C	CLUBHOUSE
D	PLANTING AREAS- TRESS, SHRUBS, AND GROUND COVER.
E	TRASH ENCLOSURE.
F	SWIMMING POOL, WITH LAP LANES, (2) SHALLOW WADING AREAS, CONCRETE DECKING WITH PALM TREES, LOUNGERS, CABANAS AND DINING TABLES
G	15' X 10' RECTANGULAR SPA
H	OUTDOOR LOUNGE PATIO WITH FIRE TABLE AND OUTDOOR FURNITURE/TABLE TENNIS/FOOSBALL
I	COVERED OUTDOOR BAR WITH BUILT IN NG GAS BBQ AND SINK
J	OUTDOOR DINING AREA WITH NG BBQ'S.
K	TWO BOCCE BALL COURTS WITH SHADED SEATING AND STRING LIGHTING
L	HORSESHOE PIT/BENCHES/TABLES AND CHAIRS
M	MULTI SPORT COURT-½ COURT BASKETBALL, PICKLEBALL, ACTION TENNIS, VOLLEYBALL FULLY FENCED
N	COMMUNITY GARDEN AREA WITH RAISED BEDS, COMPOST BINS, AND D.G. SURFACING.
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S	SMALL PATIO AREAS WITH TABLES/UMBRELLAS/GAME TABLES/AND NG BBQ
T	VEGETATIVE SWALE AREAS
U	VEHICULAR ENTRY GATE
V	VEHICULAR EXIT GATE
W	PEDESTRIAN GATE
X	PERIMETER 72" METAL FENCING. SEE DETAIL A SHEET L2.
Y	12' WIDE ASPHALT ACCESS TRAIL
Z	BIKE REPAIR STATION. SEE SHEET L2.


Bike Rack


Bike Repair Station

GUARDIAN capital

CASA DEI VISTA
Vacaville, CA

PRELIMINARY LANDSCAPE SITE PLAN

SHEET L2

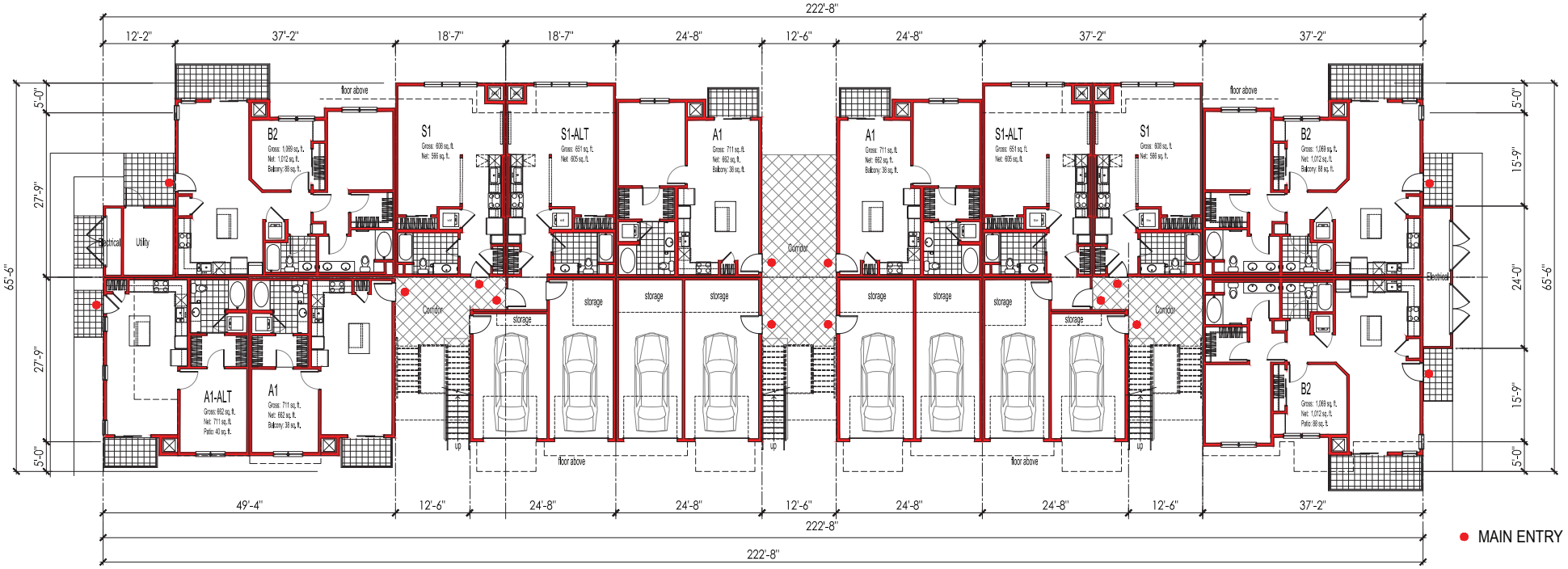
FUHRMAN LEAMY LAND GROUP
DESIGN • SERVICE • SOLUTIONS
2140 PROFESSIONAL DRIVE, SUITE 115 ROSEVILLE, CA 95661

DATE: 11/09/2018
PROJECT: GIC.18013

UNIT MATRIX:

UNIT	(UNIT TYPE)	NOS. OF UNIT/BLDG.	NET UNIT AREA (S.F.)*	BALCONY/ PATIO AREA (S.F.)	QUANTITY/ BLDG.	PERCENTAGE PER UNIT TYPE	TOTAL NET UNIT AREA (S.F.)*	TOTAL QUANTITY
S-1 (s)	(LIVING+1BA)	2 UNITS	566	-	4 UNITS	11%	3,962	28 UNITS
S-1 ALT (s)	(LIVING+1BA)	2 UNITS	605	-			4,235	
A-1 (s)	(1BR+1BA)	12 UNITS	662	38	14 UNITS	40%	4,634	98 UNITS
A-1 ALT (s)	(1BR+1BA)	2 UNITS	662	40			4,634	
B-1 (s)	(2BR+2BA)	6 UNITS	951	36	15 UNITS	43%	6,651	105 UNITS
B-1 ALT (s)	(2BR+2BA)	6 UNITS	981	36			6,867	
B-2 (s)	(2BR+2BA)	3 UNITS	1,012	88			7,084	
C-1	(3BR+2BA)	2 UNITS	1,268	40	2 UNITS	6%	8,876	14 UNITS
TOTAL:			6,707		35 UNITS	100%	46,949	245 UNITS

NOTES:
S1-ALT WITH GARAGE = 2 UNIT
A1 WITH OPT. GARAGE = 2 UNIT



FIRST FLOOR

scale: 1/8"=1'-0" (on 24"x36" sheet)

BUILDING - B / 35 PLEX
CONCEPTUAL FLOOR PLAN

A-2.1

MARKET RATE APARTMENTS

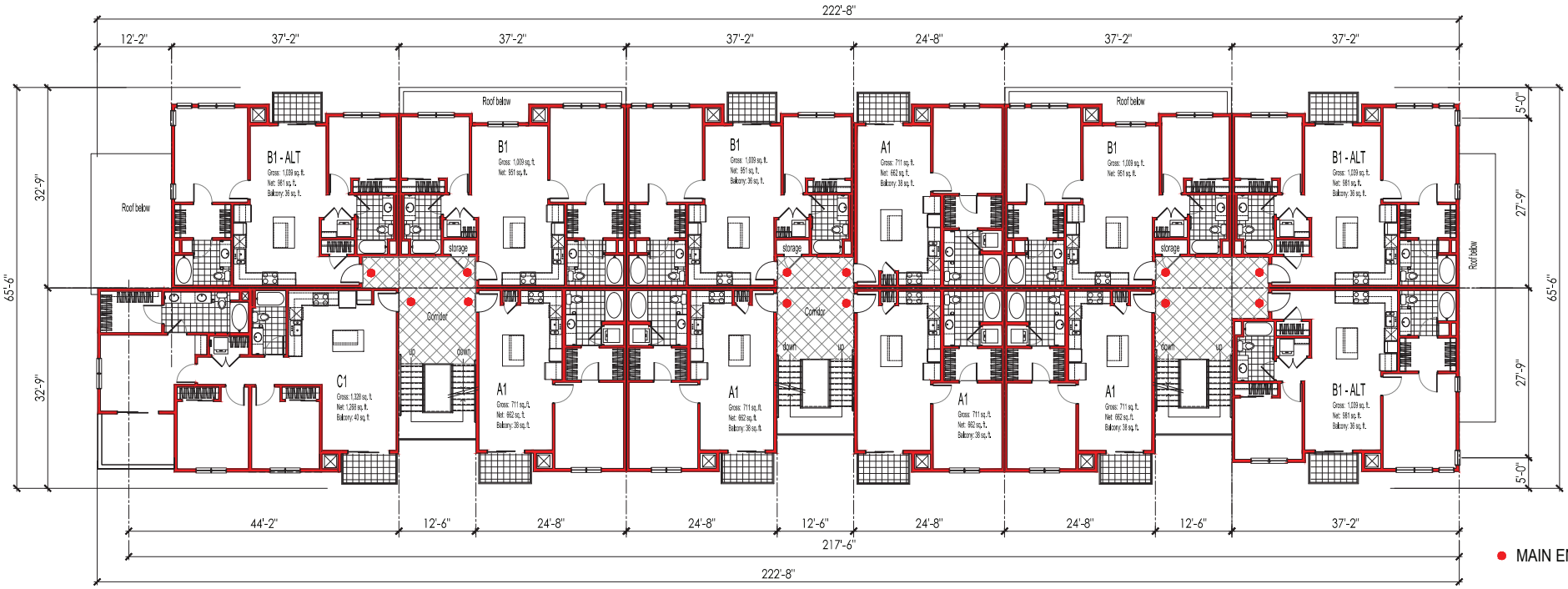
Vacaville, CA

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● MAIN ENTRY

SECOND FLOOR

0 4' 8' 16' 32'

scale: 1/8"=1'-0" (on 24"x36" sheet)

BUILDING - B / 35 PLEX
CONCEPTUAL FLOOR PLAN

A-2.2

MARKET RATE APARTMENTS

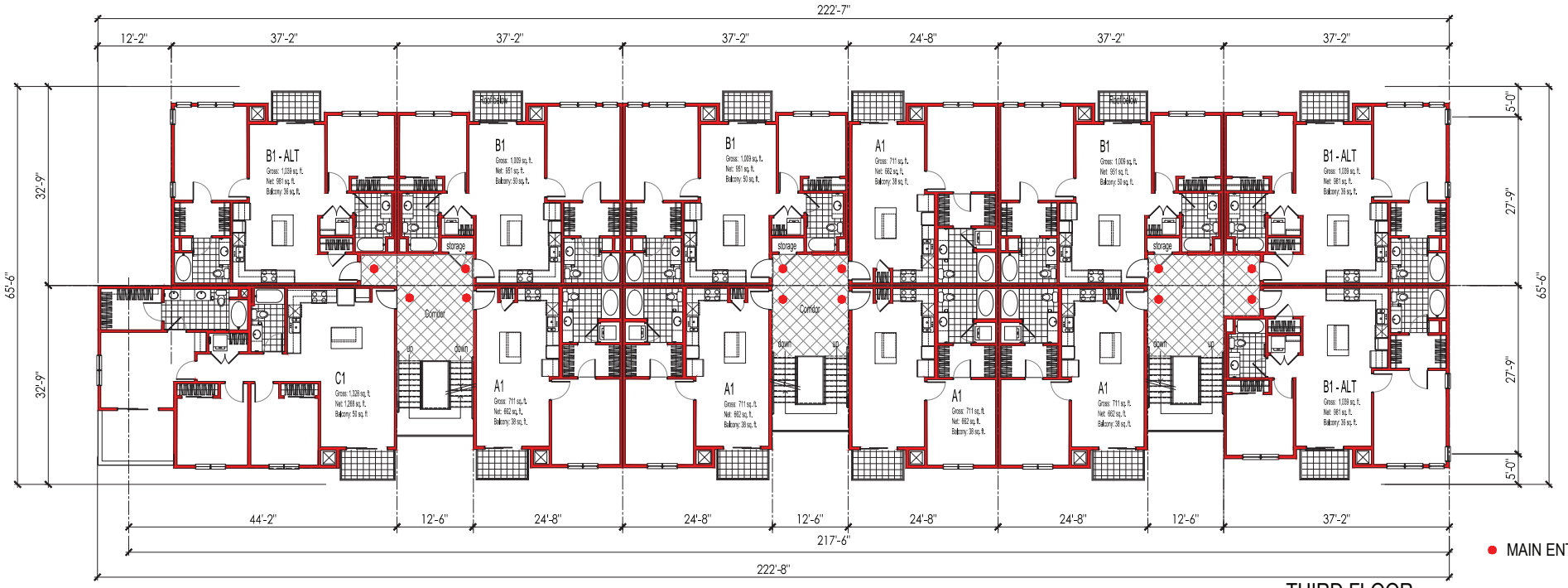
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scale: 1/8"=1'-0" (on 24"x36" sheet)

BUILDING - B / 35 PLEX
CONCEPTUAL FLOOR PLAN

A-2.3

MARKET RATE APARTMENTS

Vacaville, CA

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FRONT ELEVATION



STREET VIEW



RIGHT ELEVATION

35 PLEX
CONCEPTUAL EXTERIOR ELEVATION

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FRONT ELEVATION



STREET VIEW



RIGHT ELEVATION

35 PLEX
CONCEPTUAL EXTERIOR ELEVATION

A-3.1

MARKET RATE APARTMENTS

Vacaville, CA

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REAR ELEVATION



REAR VIEW



LEFT ELEVATION

35 PLEX
CONCEPTUAL EXTERIOR ELEVATION

A-3.2

MARKET RATE APARTMENTS

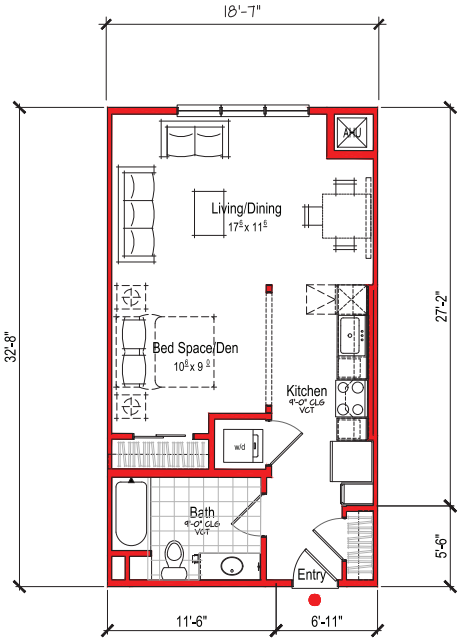
Vacaville, CA

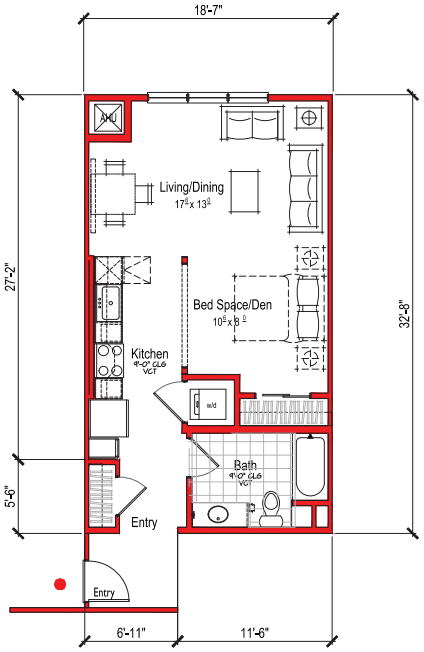
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UNIT S-1

GROSS AREA: 566 SQ.FT
NET AREA: 608 SQ.FT

UNIT S1-ALT

GROSS AREA: 651 SQ.FT
NET AREA: 605 SQ.FT

0 2' 4 8' 16'

scale: 1/4"=1'-0" (on 24"x36" sheet)

CONCEPTUAL FLOOR PLAN

A-4.1

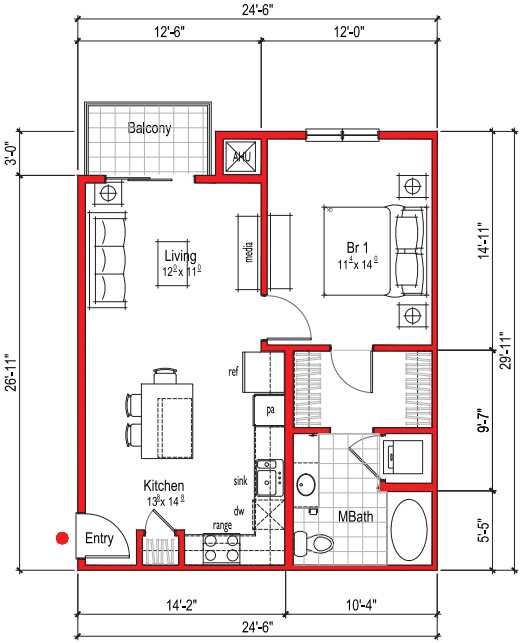
MARKET RATE APARTMENTS
Vacaville, CA

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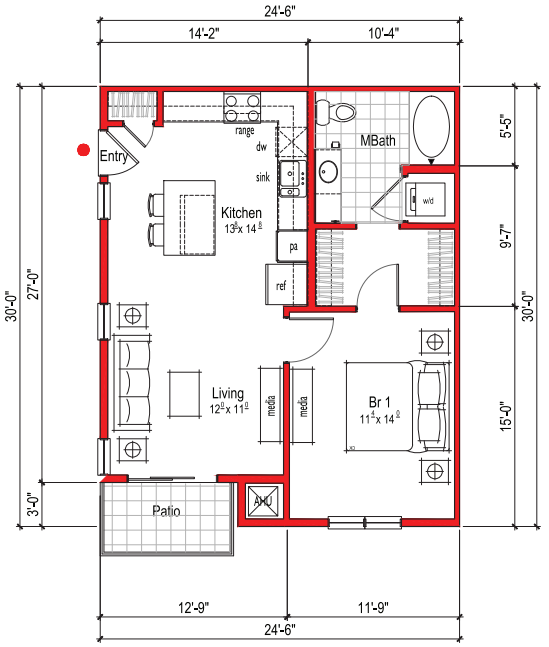
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UNIT A1

GROSS AREA: 711 SQ.FT
NET AREA: 662 SQ.FT
BALCONY: 38 SQ.FT



UNIT A1-ALT

GROSS AREA: 711 SQ.FT
NET AREA: 662 SQ.FT
PATIO: 40 SQ.FT

0 2' 4' 8' 16'
scale: 1/4"=1'-0" (on 24"x36" sheet)

CONCEPTUAL FLOOR PLAN

A-4.2

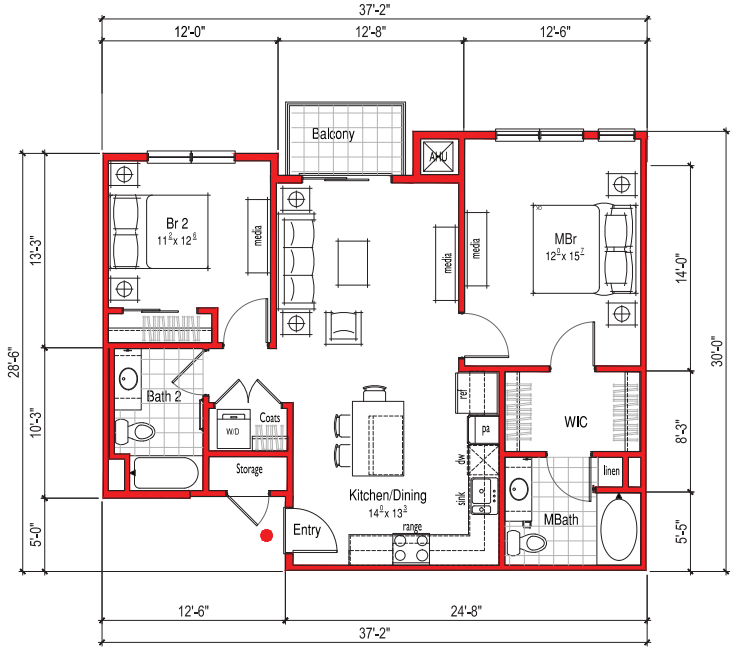
MARKET RATE APARTMENTS
Vacaville, CA

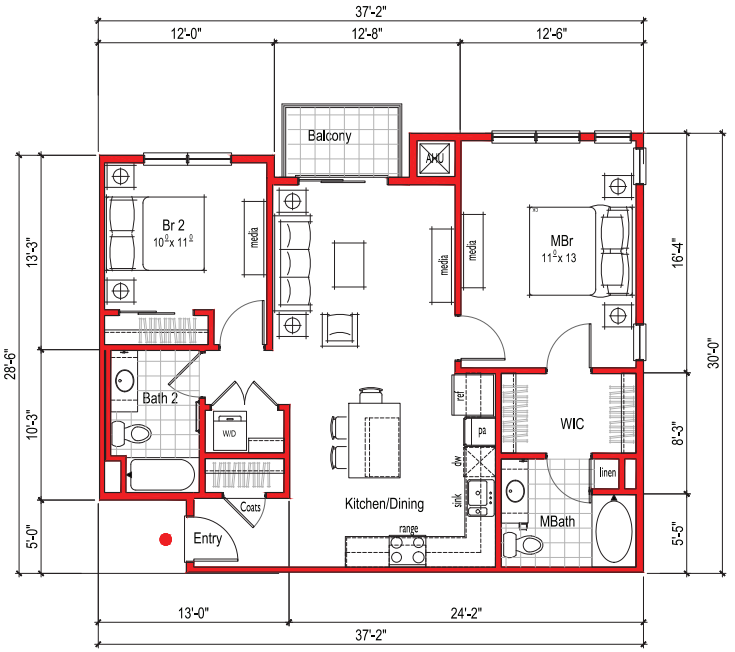
GUARDIAN capital

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UNIT B1

GROSS AREA: 1,009 SQ.FT
NET AREA: 951 SQ.FT
BALCONY: 36 SQ.FT

UNIT B1 - ALT

GROSS AREA: 1,039 SQ.FT
NET AREA: 981 SQ.FT
BALCONY: 36 SQ.FT



scale: 1/4"=1'-0" (on 24"x36" sheet)

GUARDIAN capital

CONCEPTUAL FLOOR PLAN

A-4.3

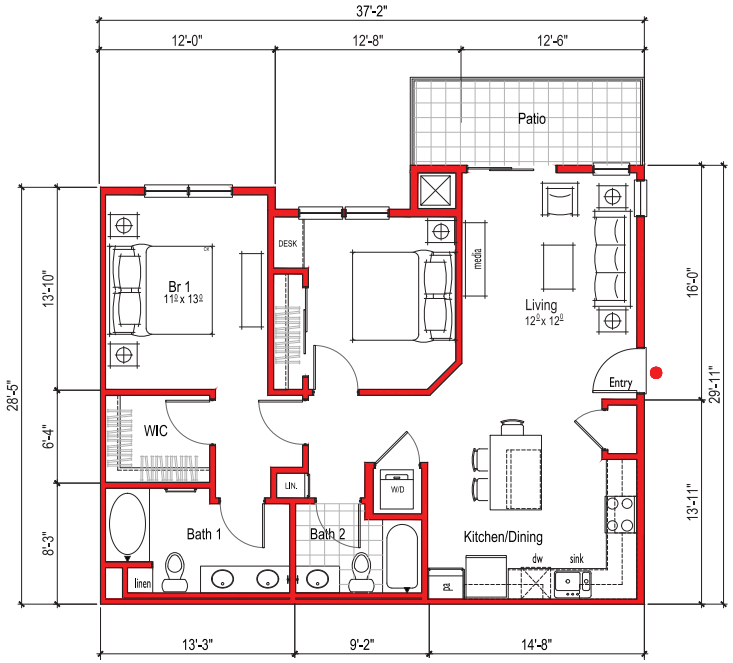
MARKET RATE APARTMENTS

Vacaville, CA

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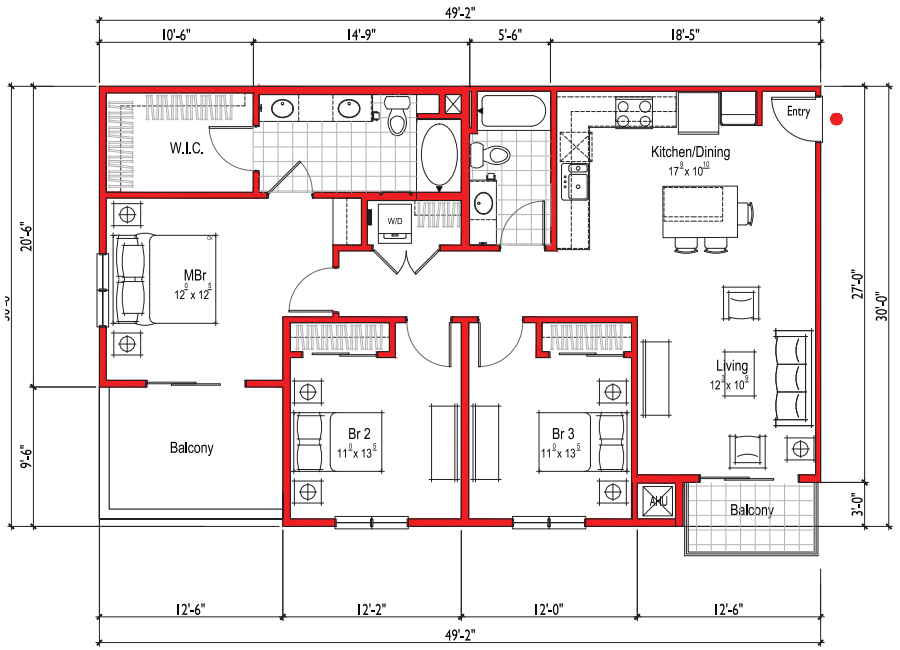
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UNIT B2

GROSS AREA: 1,069 SQ.FT
NET AREA: 1,012 SQ.FT
PATIO: 88 SQ.FT



UNIT C1

GROSS AREA: 1,328 SQ.FT
NET AREA: 1,268 SQ.FT
BALCONY: 40 SQ.FT

0 2' 4 8' 16'
scale: 1/4"=1'-0" (on 24"x36" sheet)

CONCEPTUAL FLOOR PLAN

A-4.4

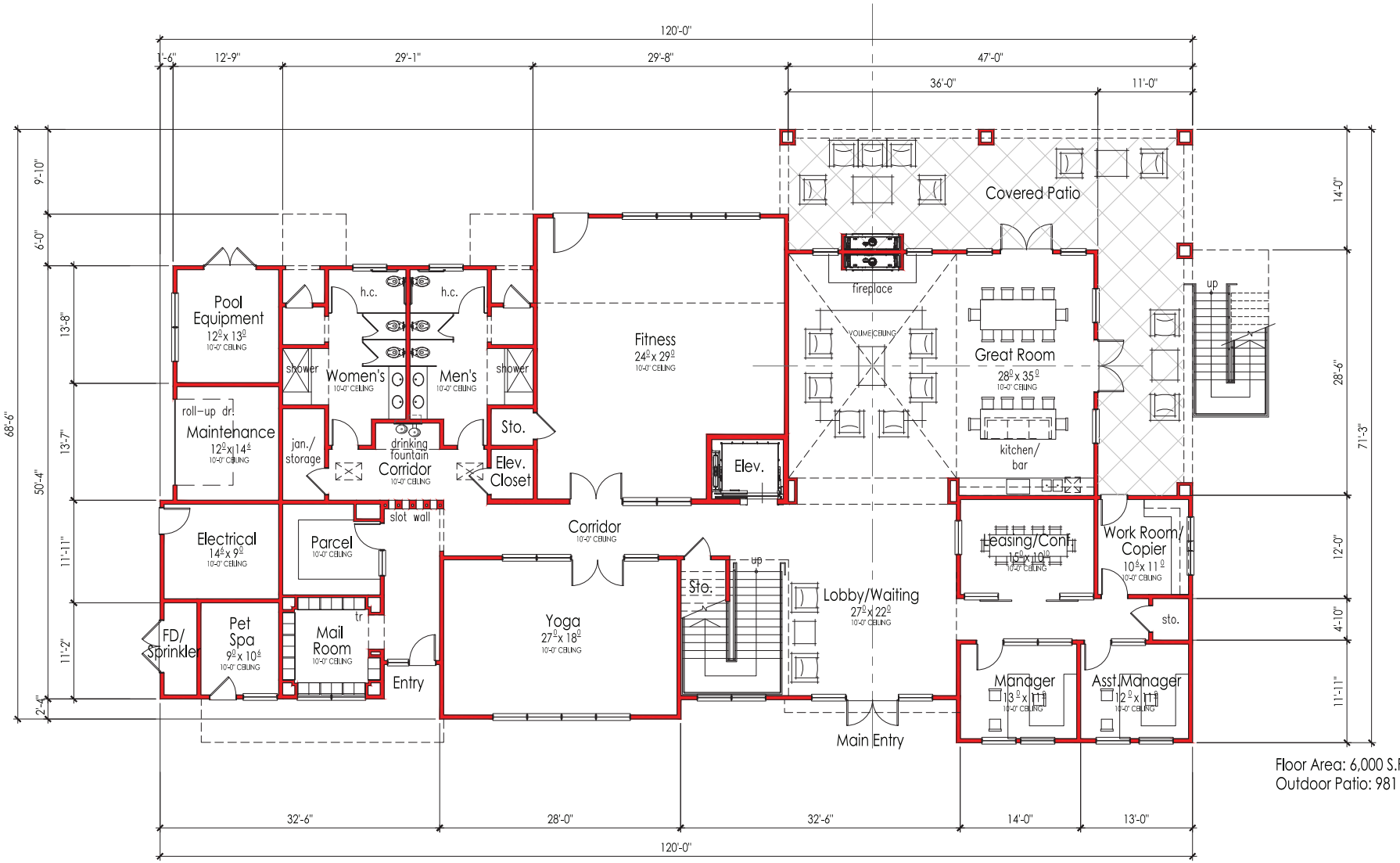
MARKET RATE APARTMENTS
Vacaville, CA

GUARDIAN capital

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Floor Area: 6,000 S.F.
Outdoor Patio: 981 S.F.

FIRST LEVEL CLUBHOUSE CONCEPTUAL FLOOR PLAN

GROSS AREA: +/-8,400 S.F.

A-5.0

MARKET RATE APARTMENTS

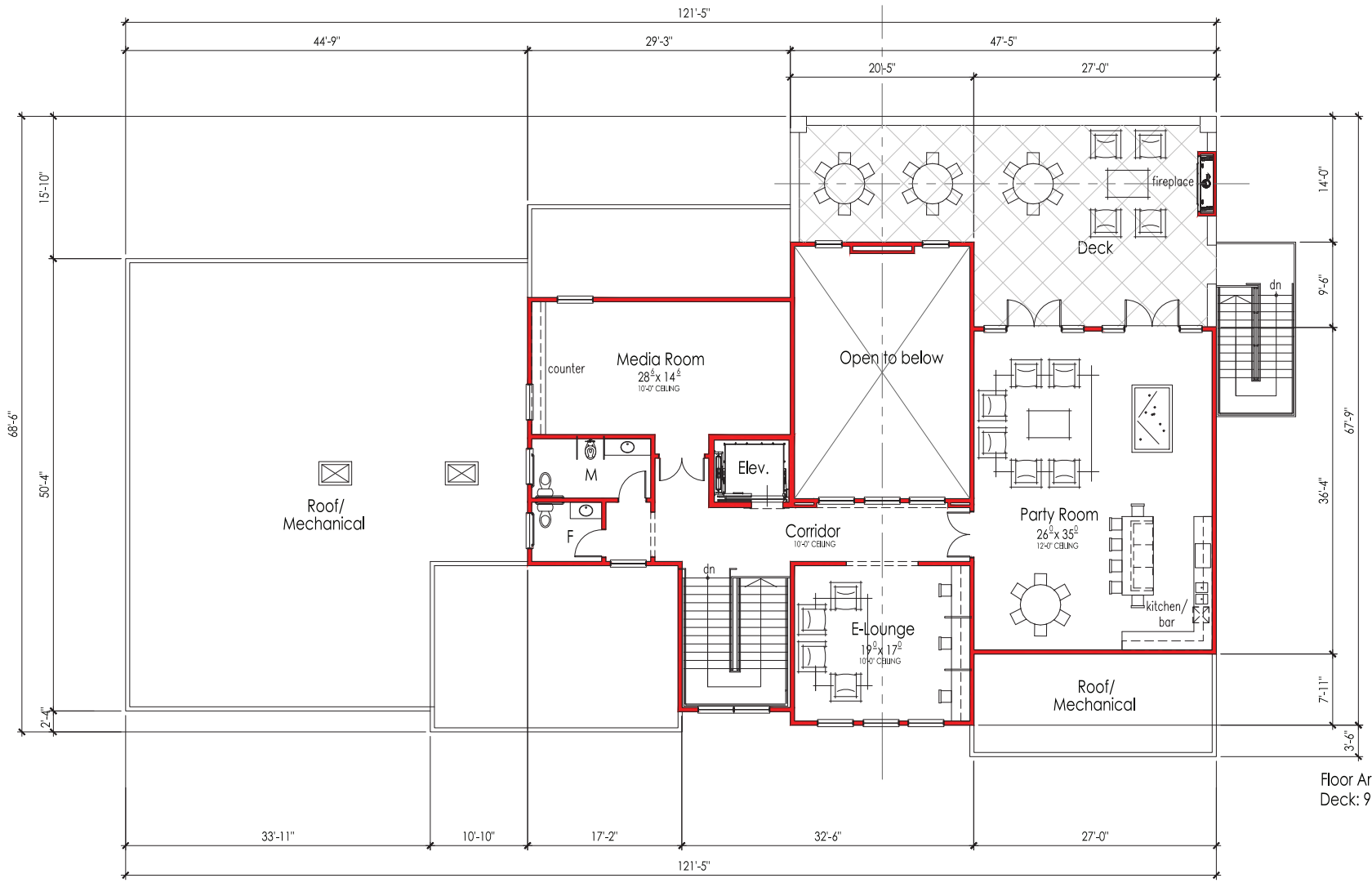
Vacaville, CA

GUARDIAN capital

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Floor Area: 2,400 S.F.
Deck: 918 S.F.

SECOND LEVEL CLUBHOUSE CONCEPTUAL FLOOR PLAN

GROSS AREA: +/-8,400 S.F.

A-5.1

MARKET RATE APARTMENTS

Vacaville, CA

GUARDIAN capital

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FRONT ELEVATION





PERSPECTIVE VIEWS

CLUBHOUSE CONCEPTUAL ELEVATION

A-5.2

MARKET RATE APARTMENTS

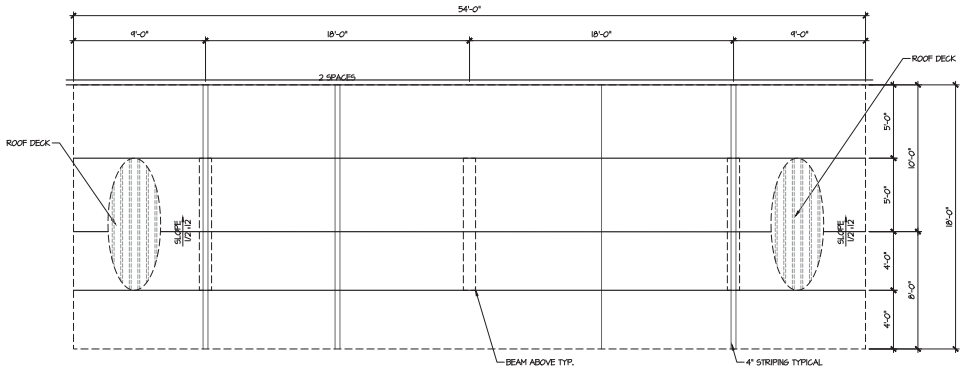
Vacaville, CA

GUARDIAN capital

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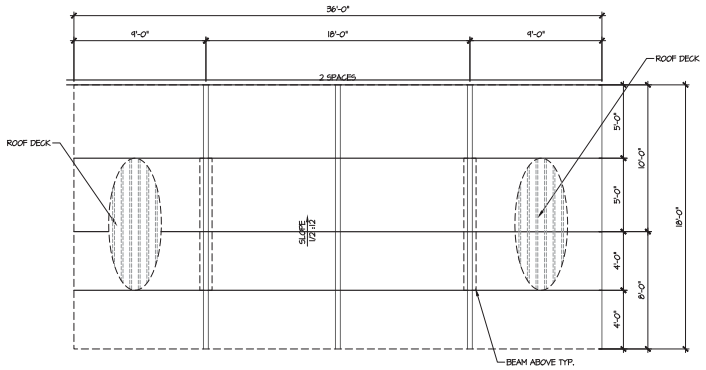
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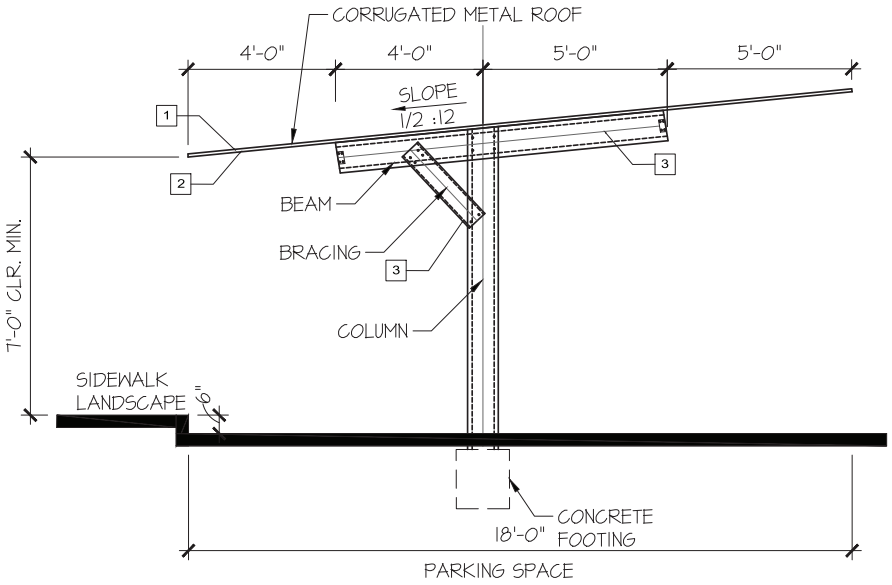
6 - Carport

SCALE: 1 1/4"=1'-0"



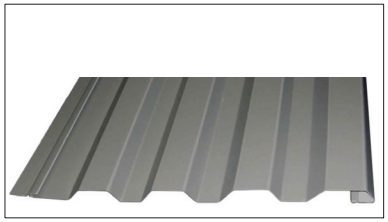
4 - Carport

SCALE: 1 1/4"=1'-0"



Sectional Elevation

SCALE: NOT TO SCALE



1 CORRUGATED METAL ROOF

DE6211 LIGHT BEIGE
OR APPROVED EQUAL

2 CORRUGATED METAL ROOF

WARM LIGHT DE5302
OR APPROVED EQUAL

3 FRAMING

CARPORT

A-6.0

MARKET RATE APARTMENTS

Vacaville, CA

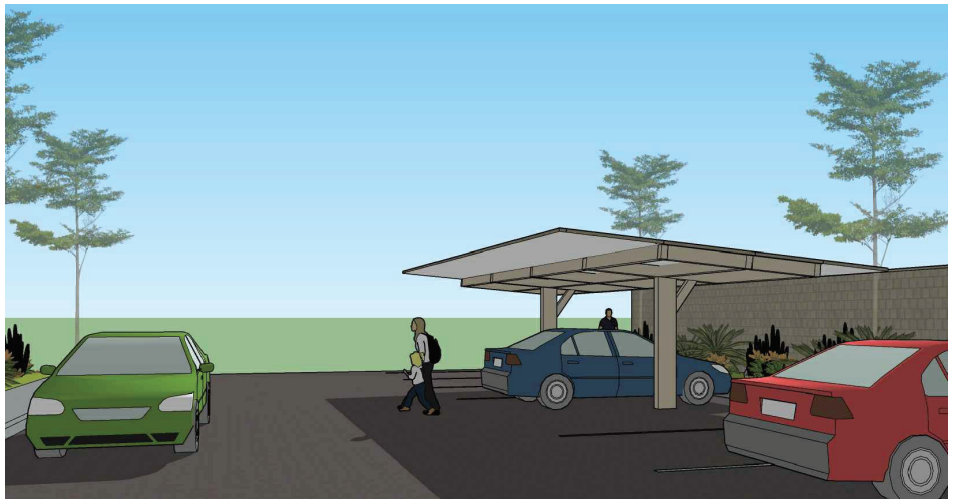
GUARDIAN capital

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CARPORT/VIGNETTES

A-6.1

MARKET RATE APARTMENTS

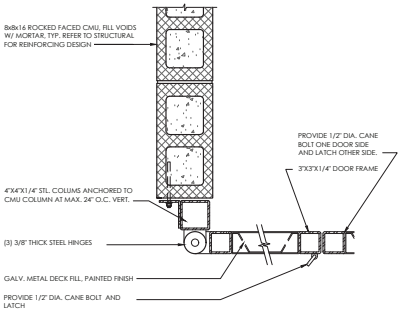
Vacaville, CA

GUARDIAN capital

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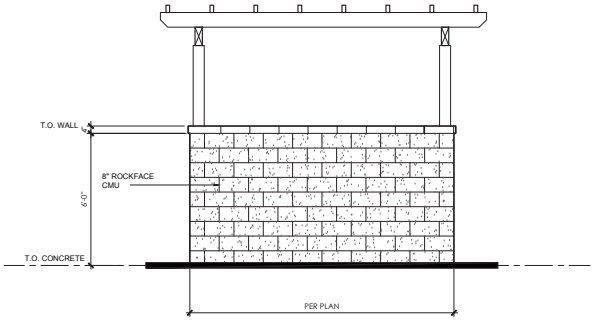
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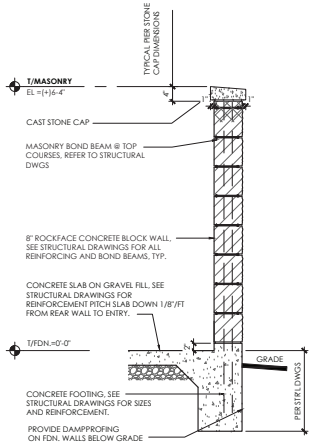
GATE HINGE DETAIL

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



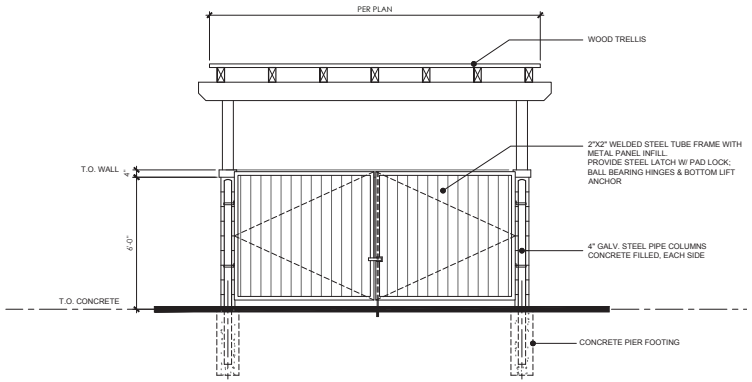
SIDE ELEVATION - 2

SCALE: 1/4"=1'-0"



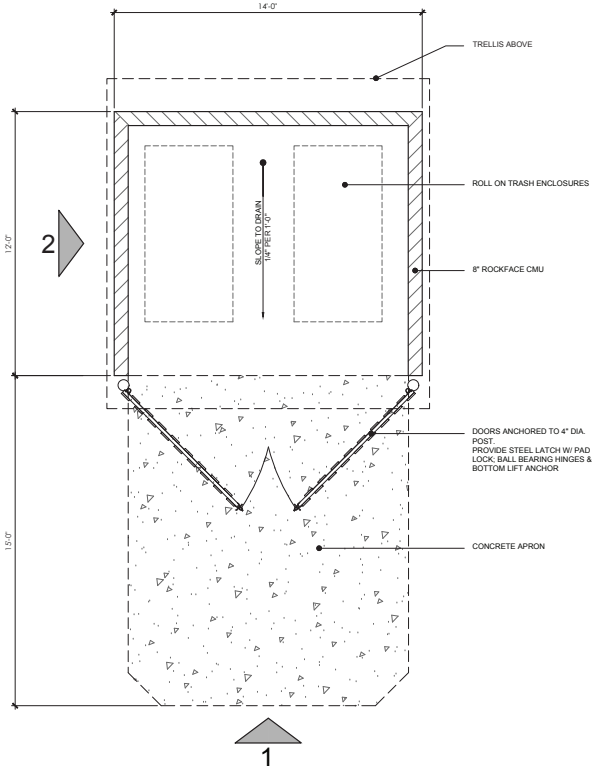
WALL SECTION

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



FRONT ELEVATION - 1

SCALE: 1/4"=1'-0"



FLOOR PLAN

SCALE: 1/4"=1'-0"

TRASH ENCLOSURE

A-7.0

MARKET RATE APARTMENTS

Vacaville, CA

NOVEMBER 8, 2018 | MR180090.00

GUARDIAN capital

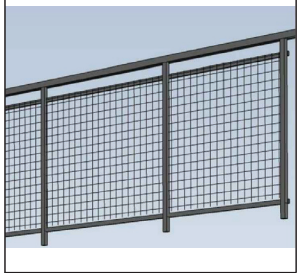
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FRONT ELEVATION
BUILDING - B /33PLEX/BUILDING A - 30PLEX (SIMILAR)

6	5	4	3	2	1
RAILING W/ 2"X2" WOVEN WIRE INFILL SCREEN, PAINT BLACK	NICHIHA (EMPIRE BLOCK) RENZIBOND-COOL CHARCOAL	BOAR ANCHOR DE6377 OR SIMILAR	BARNWOOD GRAY DET620 OR SIMILAR	SUMMER NIGHT DE5811 OR SIMILAR	CHALKY DEC793 OR SIMILAR
					
PATIO/BALCONY RAILING	FIBER CEMENT CLADDING	GARAGE / STUCCO ACCENT	STUCCO WALL ACCENT	STUCCO WALL ACCENT	STUCCO WALL

MATERIALS & COLOR BOARD

A-8.0
MARKET RATE APARTMENTS
Vacaville, CA

GUARDIAN capital

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ATTACHMENT 2

BIOLOGICAL ASSESSMENT

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MADRONE ECOLOGICAL CONSULTING

8421 Auburn Blvd.
Suite 248
Citrus Heights, CA 95610

www.madroneeco.com
(916) 822-3230

June 22, 2018

Mr. David Claveau
Guardian Investment Capital, LLC
5780 Fleet Street, #225
Carlsbad, California 92008

Subject: Reconnaissance-Level Biological Assessment for the Vacaville 15 Property, Vacaville, Solano County, California

Dear Mr. Claveau:

Per your request, Madrone Ecological Consulting (Madrone) conducted a reconnaissance-level biological assessment of the Vacaville 15 Property (Study Area). Madrone assessed the Study Area for the presence of wetlands including vernal pools, burrowing owls (and burrowing owl habitat), Swainson's hawks (and the presence of Swainson's hawk nesting/foraging habitat), elderberry shrubs, and other special, sensitive, or protected status species and habitats.

Project Area Location

The approximately 15-acre Study Area is located west of the Vacaville Cultural Center and Allison Drive in Vacaville, California. The Ulatis Creek corridor roughly defines the southern boundary. **Figure 1** is a vicinity map, and **Figure 2** shows the extent of the Study Area overlain on a National Agriculture Imagery Program (NAIP) aerial photo flown July 8, 2016.

Regulatory Setting

This section describes federal and state laws and policies that are relevant to this assessment of biological resources.

Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973 protects species that are federally listed as endangered or threatened with extinction. FESA prohibits the unauthorized "take" of listed species. Take includes harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such activities. Harm includes significant modifications or degradations of habitats that may cause death or injury to protected species by impairing their behavioral patterns. Harassment includes disruption of normal behavior patterns that may result in injury to or mortality of protected species. Civil or criminal penalties can be levied against persons convicted of unauthorized "take."

Federal Clean Water Act, Section 404

Section 404 of the Federal Clean Water Act requires that a Department of the Army permit be issued prior to the discharge of any dredged or fill material into waters of the United States, including wetlands. The U.S. Army Corps of Engineers (Corps) administers this program, with oversight from the U.S. Environmental Protection Agency. Waters of the United States include all navigable waters; interstate waters and wetlands; all intrastate waters and wetlands that could affect interstate or foreign commerce; impoundments of the above; tributaries of the above; territorial seas; and wetlands adjacent to the above.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase or barter, any native migratory bird, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR 21.11.). Likewise, Section 3513 of the California Fish & Game Code prohibits the "take or possession" of any migratory non-game bird identified under the MBTA. Therefore, activities that may result in the injury or mortality of native migratory birds, including eggs and nestlings, would be prohibited under the MBTA.

Bald and Golden Eagle Act

The Bald and Golden Eagle Protection Act prohibits anyone without a permit from "taking" bald or golden eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." "Take" could include interfering with nesting or foraging behavior and could include removal of a known nest.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires evaluations of project effects on biological resources. Determining the significance of those effects is guided by Appendix G of the CEQA guidelines. These evaluations must consider direct effects on a biological resource within the project site itself, indirect effects on adjacent resources, and cumulative effects within a larger area or region. Effects can be locally important but not significant according to CEQA if they would not substantially affect the regional population of the biological resource. Significant adverse impacts on biological resources would include the following:

- Substantial adverse effects on any species identified as candidate, sensitive, or special-status in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife (CDFW) or the U.S. Fish and Wildlife Service (USFWS) (these effects could be either direct or via habitat modification);
- Substantial adverse impacts to species designated by the California Department of Fish and Wildlife as Species of Special Concern;
- Substantial adverse effects on riparian habitat or other sensitive habitat identified in local or regional plans, policies, or regulations or by CDFW and USFWS;

- Substantial adverse effects on federally protected wetlands defined under Section 404 of the Clean Water Act (these effects include direct removal, filling, or hydrologic interruption of marshes, vernal pools, coastal wetlands, or other wetland types);
- Substantial interference with movements of native resident or migratory fish or wildlife species population, or with use of native wildlife nursery sites;
- Conflicts with local policies or ordinances protecting biological resources (e.g. tree preservation policies); and
- Conflict with provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan.

California Endangered Species Act

With limited exceptions, the California Endangered Species Act (CESA) of 1984 protects state-designated endangered and threatened species similar to FESA. For projects on private property (i.e., that for which a state agency is not a lead agency), CESA enables CDFW to authorize take of a listed species that is incidental to carrying out an otherwise lawful project that has been approved under CEQA (Fish & Game Code Section 2081).

Native Plant Protection Act

The Native Plant Protection Act (NPPA) was enacted in 1977 and allows the Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the NPPA. The NPPA prohibits take of endangered or rare native plants but includes some exceptions for agricultural and nursery operations; emergencies; and after properly notifying CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

Clean Water Act, Section 401

Section 401 of the Clean Water Act requires any applicant for a 404 permit to also obtain a water quality certification with the Regional Water Quality Control Board (RWQCB). This program is meant to protect these waters and wetlands by ensuring that waste discharged into them meets state water quality standards. Because the water quality certification program is triggered by the need for a Section 404 permit (and both programs are a part of the Clean Water Act), the definition of waters of the United States under Section 401 is the same as that used by the USACE under Section 404.

California Water Code, Porter-Cologne Act

The Porter Cologne Act, from Division 7 of the California Water Code, requires any person discharging waste or proposing to discharge waste that could affect the quality of waters of the state to file a report of waste discharge (RWD) with the RWQCB. The RWQCB can waive the filing of a report, but once a report is filed, the RWQCB must either waive or adopt water discharge requirements (WDRs). "Waters of the state" are defined as any surface water or groundwater, including saline waters, within the boundaries of the state.

California Fish and Game Code, Section 1600 – Streambed and Lake Alteration

The CDFW is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code, Section 1602, requires notification to CDFW of any proposed activity that may substantially modify a river, stream, or lake. Notification is required by any person, business, state or local government agency, or public utility that proposes an activity that will:

- substantially divert or obstruct the natural flow of any river, stream or lake;
- substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

For the purposes of Section 1602, rivers, streams and lakes must flow at least intermittently through a bed or channel.

The text above is based on how CDFW has historically asserted their jurisdiction; however, during recent conversations with CDFW, Madrone has been provided the following guidance for determining the limits of their jurisdiction, which in almost all cases exceeds the area that would be mapped utilizing the definition above.

> *CDFW needs to consider the following when determining jurisdiction: the fluvial geomorphology of the system, where water currently flows, or has flowed, over a given course during the historic hydrologic regime (can be subsurface flows), the maximal extent of the or expression of a stream on the landscape, the connectivity between the groundwater table and surrounding landscape (may include springs, swales, surface runoff source areas that are a source of water to a stream), the nexus between the stream and all life associated with the streams.*

If notification is required and CDFW believes the proposed activity is likely to result in adverse harm to the natural environment, it will require that the parties enter into a Lake or Streambed Alteration Agreement (LSAA).

California Fish and Game Code, Section 3503.5 - Raptor Nests

Section 3503.5 of the Fish and Game Code makes it unlawful to take, possess, or destroy hawks or owls, unless permitted to do so, or to destroy the nest or eggs of any hawk or owl.

Methodology

A record search of the California Natural Diversity Data Base (CNDDB) was performed prior to the field survey to list all recorded occurrences of special status species within a 5-mile radius of the Study Area. (**Attachment A**). **Figure 3** is an exhibit displaying all CNDDB occurrences within 5 miles of the Study Area. Additionally, historic aerial photography from 1968 to 2015 was reviewed to ascertain historic land

uses and to evaluate the potential presence of current or historical water features including wetlands and vernal pools.

Madrone senior biologist Matt Hirkala conducted a site visit on February 14, 2018, to determine if the Study Area supported potential wetlands or other waters of the U.S. or State (including vernal pools) or other sensitive habitats for special status species. Meandering transects were performed on foot throughout the Study Area to document current site conditions.

For the purposes of this report, special status species are defined as those species that are:

- listed as threatened or endangered, or proposed or candidates for listing by the U.S. Fish & Wildlife Service (USFWS) or National Marine Fisheries Service;
- listed as threatened or endangered and candidates for listing by CDFW;
- identified as Fully Protected species, species of special concern, or Watch List species by CDFW;
- plant species considered to be rare, threatened, or endangered in California by the (California Native Plant Society (CNPS) and CDFW [California Rare Plant Rank (CRPR) 1, 2, and 3]:
  - CRPR 1A: Plants presumed extinct.
  - CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere.
  - CRPR 2A: Plants extirpated in California, but common elsewhere.
  - CRPR 2B: Plants rare, threatened, or endangered in California, but more common elsewhere.
  - CRPR 3: Plants about which the CNPS needs more information – a review list.
- In addition, several species that do not have any regulatory status, but are tracked by the CNDDB, were included on the special-status species list.

Attachment A provides a list of special-status species that were evaluated based upon the above-described CNDDB query, including their listing status, habitat associations, and potential to occur in the Study Area. The following set of criteria was used to determine each species' potential for occurrence on the site:

- **Present**: Species occurs on the site based on CNDDB records, and/or was observed on the site during field surveys.
- **High:** The site is within the known range of the species and suitable habitat exists.
- **Moderate:** The site is within the known range of the species and very limited suitable habitat exists.
- **Low:** The site is within the known range of the species and there is marginally suitable habitat.
- **No Habitat Present:** The site does not contain suitable habitat for the species, or the site is outside the known range of the species.

Existing Site Conditions and Habitats Present

The Study Area is undeveloped and completely surrounded by residential/commercial developments. No habitable structures are present. The two habitat types observed include mixed riparian woodland and valley oak woodland (**Figure 4**).

Most of the parcel was an almond orchard from the 1990s to at least the1960s. It is currently fallow and reverting to a valley oak (*Quercus lobata*) woodland interspersed with occasional specimens of old almond trees (*Prunus dulcis*) – most of which are in poor condition. The understory and open areas are primarily comprised of rip-gut brome (*Bromus diandrus*), spring vetch (*Vicia villosa*), medusa-head grass (*Elymus caput-medusae*), and soft brome (*Bromus hordeaceus*). The southern portion supports mixed riparian woodland made up of valley oak, elderberry (*Sambucus nigra*), willows (*Salix* spp.), and Fremont's cottonwood (*Populus fremontii*).

Results/Recommendations

Aquatic Resources

The Study Area currently lacks wetlands including vernal pools; however, a segment of Ulatis Creek meanders through the southern edge of the parcel from east to west. If work is scheduled to occur near Ulatis Creek, we recommend that you have an Aquatic Resources Delineation performed to define the Corps' extent of jurisdiction under Section 404 of the Federal Clean Water Act (CWA). The installation of outfalls, bridges, or other structures in or near Ulatis Creek may require the issuance of a CWA permit from the Corps prior to project implementation. Similarly, authorizations may also be required from CDFW and/or RWQCB prior to the start of work in or near Ulatis Creek.

Nesting Birds

Raptors, including burrowing owls, and songbirds and their nests are protected by Section 3503.5 of the Fish and Game Code of California and by the Federal Migratory Bird Treaty Act. In general, nesting occurs from February/early March through late July/early August, depending upon the species and various environmental conditions.

No burrowing owls (*Athene cunicularia*) were observed during the site visit. Although several appropriately-sized ground squirrel burrows were identified, no evidence of burrowing owl use (whitewash, owl pellets, or molted feathers) was observed. Though the site contains appropriate nesting and foraging for habitat, it is of low quality due to the extensive commercial and residential development surrounding the Study Area. The nearest burrowing owl occurrence recorded by the CNDDB is approximately one mile to the northeast near the Nut Tree Airport.

Though the site contains numerous trees large enough to support raptor nests including those for Swainson's hawks (*Buteo swainsoni*), no active nests were observed. Several nests are present, but most appear to be too small to support large raptors. The open areas within the valley oak woodland provide marginal foraging habitat for Swainson's hawks and red-tailed hawks (*Buteo jamaicensis*); however, other raptors species including Cooper's hawks (*Accipiter cooperii*), sharp-shinned hawks (*Accipiter striatus*), and red-shoulder hawks (*Buteo lineatus*) favor woodland habitats and may utilize the site for breeding and foraging. The nesting and foraging habitats contained within the Study Area are of low quality due to the close proximity of highly developed lands surrounding the site.

We recommend that a pre-construction nesting bird/burrowing owl survey be conducted by a qualified biologist no more than 14 days prior to work (ground-disturbance or vegetation removal) during the

nesting season (February 1 through August 31). Burrowing owl surveys should be performed in accordance with the "Take Avoidance Surveys" methods listed in the *Staff Report on Burrowing Owl Mitigation*[1] (CDFW 2012). If the survey does not identify any nests or active owl burrows, no further mitigation would be recommended. However, if the survey identifies an active nest or burrow, the following mitigation measures are recommended:

> Avoid all nest sites located in or around the impact area while the nest is occupied with adults and/or eggs or young. The occupied nest should be monitored by a qualified wildlife biologist to determine when the nest is no longer used. Avoidance would include the establishment of a no disturbance buffer zone around the nest site. The size of the buffer zone is typically determined in consultation with CDFW; initial buffer zones are typically 100' for songbirds, 250' for burrowing owls, and 500' for other raptors. Highly visible temporary construction fencing should delineate the buffer zone.

Valley Elderberry Longhorn Beetle/Elderberry Shrubs

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*, VELB) is federally listed as threatened. Critical habitat was designated by the U.S. Fish and Wildlife Service (USFWS) on 8 August 1980 (45 Federal Register [FR] 52803). On 22 October 2012 the USFWS issued a proposed rule to remove the designation of the VELB as a threatened species; however, on 29 August 2014 the USFWS formally withdrew the proposed rule (79 FR 55879). The Study Area is not located within critical habitat for the VELB.

The VELB is associated exclusively with elderberry (*Sambucus* species) shrubs in the Central Valley and adjacent foothills during its entire 2-year life cycle. Adult VELB lay their eggs on elderberry stems. Upon hatching, larvae bore into the elderberry stems and feed upon the pith. They emerge through a round exit or emergence hole upon completion of this life stage. They are typically associated with elderberry stems and trunks that are greater than one inch in diameter at ground level. The USFWS considers all elderberry shrubs containing stems greater than one inch in diameter at ground level as potential VELB habitat. VELB most commonly occur in areas within, or near, some type of riparian corridor comprised of other woody plant species such as willows (*Salix* spp.), cottonwood (*Populus fremontii* ssp. *fremontii*), wild grape (*Vitis californica*), and box elder (*Acer negundo*).

Several elderberry shrubs were observed within the parcel. Except for one shrub situated south of Travis Way, all are located directly within the Ulatis Creek riparian corridor (**Figure 5**). Even though the solitary shrub near Travis Way is approximately 200 meters north of the Ulatis Creek riparian corridor, it may be classified as riparian for the purposes of determining mitigation. Lands south of Ulatis Creek were not surveyed due to access issues.

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

In accordance with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* [2] the USFWS recommends the development of proposed project designs that avoid riparian habitat and/or elderberry shrubs whenever possible. If elderberry shrubs occur on or within 50 meters (165 feet) of the project area, adverse effects to VELB may occur as a result of project implementation. If the project may affect VELB or its habitat, appropriate avoidance and minimization measures are recommended.

The USFWS recommends the following measures for incorporation into a proposed project to avoid and minimize effects to VELB and/or its habitat:

Fencing. All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible.

Avoidance area. Activities that may damage or kill an elderberry shrub (e.g., trenching, paving, etc.) may need an avoidance area of at least 6 meters (20 feet) from the drip-line, depending on the type of activity.

Worker education. A qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for non- compliance.

Construction monitoring. A qualified biologist will monitor the work area at project-appropriate intervals to assure that all avoidance and minimization measures are implemented. The amount and duration of monitoring will depend on the project specifics and should be discussed with the Service biologist.

Timing. As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB (March - July).

Trimming. Trimming may remove or destroy VELB eggs and/or larvae and may reduce the health and vigor of the elderberry shrub. In order to avoid and minimize adverse effects to VELB when trimming, trimming will occur between November and February and will avoid the removal of any branches or stems that are ≥ 1 inch in diameter. Measures to address regular and/or large-scale maintenance (trimming) should be established in consultation with the Service.

Chemical Usage. Herbicides will not be used within the drip-line of the shrub. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method.

Mowing. Mechanical weed removal within the drip-line of the shrub will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.

Erosion Control and Re-vegetation. Erosion control will be implemented, and the affected area will be re-vegetated with appropriate native plants.

If the project site is non-riparian and contains elderberry shrubs, the USFWS uses exit hole surveys to evaluate the site for potential occupancy – this standard may apply to the solitary elderberry shrub

[2] U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2017. *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus).* USFWS; Sacramento, California. 28 pp.

located near Travis Road, which displayed no exit holes. However, since all the remaining elderberry shrubs within the Vacaville 15 Study Area are considered riparian, and therefore potential VELB habitat, exit hole surveys are not essential, but may be conducted in order to assess the level and significance of adverse effects. The presence of exit holes in a shrub increases the likelihood that the shrub is occupied by VELB; however, a lack of exit holes does not preclude occupancy by the VELB. The extent of agency involvement in the elderberry shrub evaluation and potential VELB mitigation requirements will depend upon the final project design. If you decide to move forward with a project on the site we recommend early coordination between our office and your site planner in order to maximize efficiency of the regulatory processes.

We appreciate the opportunity to assist you with this project. If you have any questions or need additional information, please contact me at (916) 822-3230 or gfodge@madroneeco.com.

Sincerely,

Ginger E Fodge
Principal

Figures

Figure 1. Site and Vicinity

Figure 2. Study Area

Figure 3. CNDDB Occurrences of within 5 miles of the Study Area

Figure 4. Habitat Exhibit

Figure 5. Elderberry Shrub Exhibit

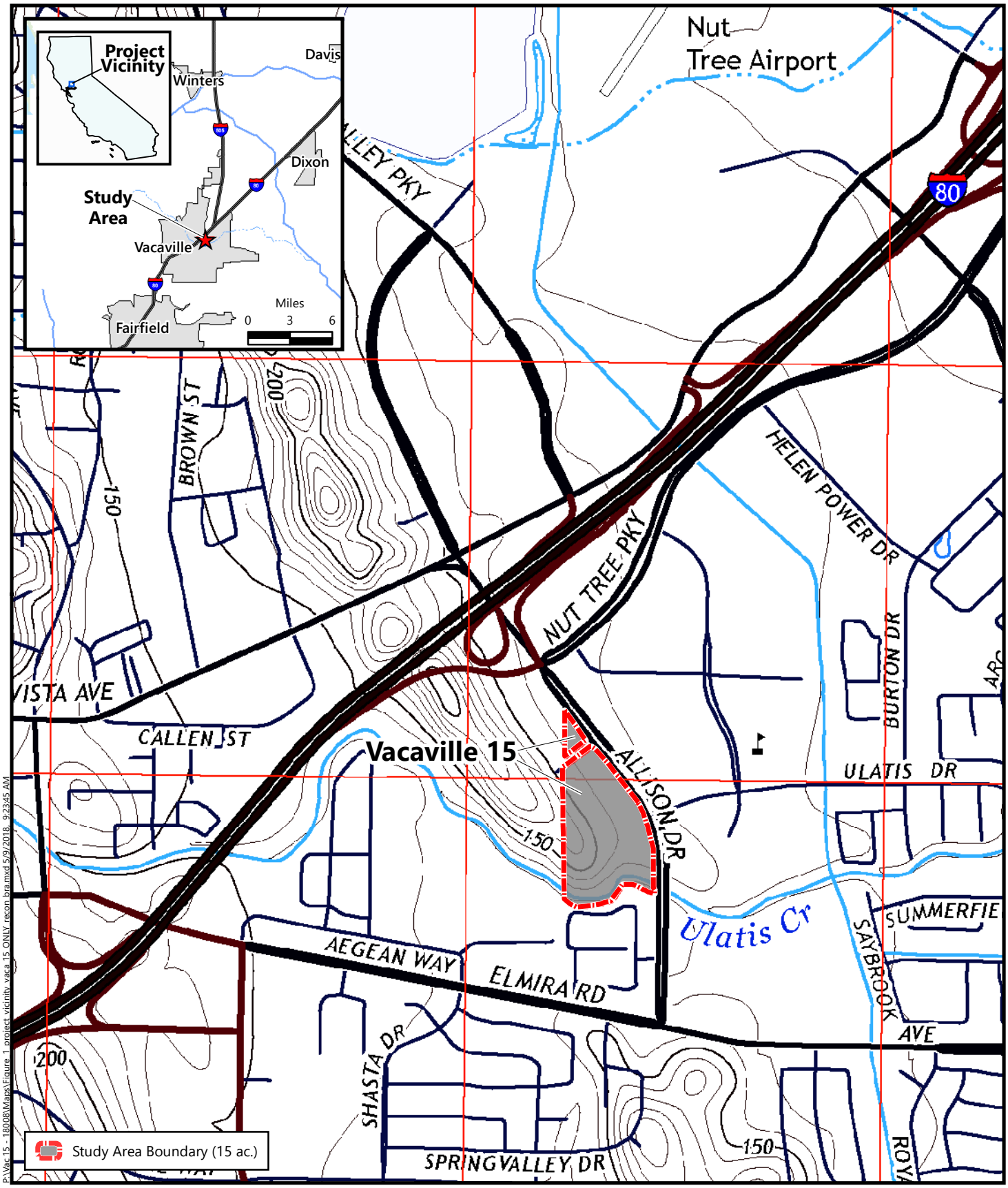


Figure 1
Site and Vicinity

Vacaville15
Solano County, California

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Source: United States Geologic Survey, 2016.
Rancho Los Putos Civil Land Grant, MDB&M
"Elmira, California" 7.5-Minute Topographic Quadrangle
Longitude -121.966194, Latitude 38.356434



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Figure 2
Study Area

Aerial Source: *USDA, National Agriculture Imagery Program,* 8 July 2016

Vacaville 15
Solano County, California

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Study Area
5-Mile Radius of Study Area

Amphibian/Reptile
- California Tiger Salamander
- Foothill Yellow-Legged Frog
- Western Pond Turtle

Birds
- Burrowing Owl
- Swainson's Hawk
- Tricolored Blackbird
- White-Tailed Kite

Invertebrates
- California Linderiella
- Valley Elderberry Longhorn Beetle
- Vernal Pool Fairy Shrimp
- Vernal Pool Tadpole Shrimp

Mammals
- American Badger
- Townsend's Big-Eared Bat

Plants
- Adobe-Lily
- Alkali Milk-Vetch
- Baker's Navarretia
- Bearded Popcornflower
- Brewer's Western Flax
- Brittlescale
- Carquinez Goldenbush
- Contra Costa Goldfields
- Dwarf Downingia
- Heartscale
- Legenere
- Pappose Tarplant
- Recurved Larkspur
- Round-Leaved Filaree
- Saline Clover
- San Joaquin Spearscale
- Suisun Marsh Aster
- Two-Fork Clover

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Source: *ESRI Maps*, 2018
CNDDB: *California Department of Fish and Wildlife*, February 2018

Figure 3
CNDDB Occurrences within 5 Miles of the Study Area

Vacaville 15
Solano County, California

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Figure 4
Habitat Exhibit

Aerial Source: *USDA, National Agriculture Imagery Program,* 8 July 2016

Vacaville 15
Solano County, California

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Figure 5
Elderberry Shrub Exhibit

Aerial Source: *USDA, National Agriculture Imagery Program,* 8 July 2016

Vacaville 15
Solano County, California

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Attachments

Attachment A. List of CNDDB Occurrences within 5 Miles of the Study Area

Attachment A

List of CNDDB Occurrences within 5 Miles of the Study Area

Table 1. Special-Status Species with Potential to Occur within the Vacaville 15 Study Area

Scientific Name (Common Name)	Federal Status	State Status	Habitat Requirements	Potential for Occurrence
Mammals				
Corynorhinus townsendii townsendii Townsend's big-eared bat	--	CSC, WBWG H	Roosts in caves and cave analogues, such as abandoned mines, buildings, bridges, rock crevices and large basal hollows of coast redwoods and giant sequoias. Extremely sensitive to human disturbance. (WBWG 2015).	**No Habitat Present.** No caves or cave analogues present on-site.
Taxidae taxus American badger	--	CSC	Open dry fields including grasslands and pastures.	**Low.** Marginal habitat is present, but the surrounding lands are intensely developed.
Plants				
Astragalus tener var. *tener* Alkali milk-vetch	--	CRPR 1B.2	Alkaline playas, wetlands, and vernal pools within valley and foothill grasslands. Also occurs in open, alkaline and seasonally moist meadows from 0 to 200 feet.	**No Habitat Present.** The site lacks wetlands, playas, and vernal pools.
Atriplex cordulata var. *cordulata* Heartscale	--	CRPR 1B.2	Grows in grasslands with sandy alkaline or saline soils.	**No Habitat Present.** The site lacks open grasslands.
Atriplex depressa Brittlescale	--	CRPR 1B.2	Meadows or grasslands with alkaline or saline clay soils.	**No Habitat Present.** The site lacks open grasslands.
California macrophylla Round-leaved filaree	--	CRPR 1B.2	Clay soils in cismontane woodland and valley and foothill grassland, from 50 feet to 4,000 feet with vertic clay soils. Occasionally grows on serpentine soils.	**Low.** The site represents marginal habitat, but the area was an active almond orchard between the 1960s (at least) to the 1990s.
Centromadia parryi ssp. *parryi* Pappose tarplant	--	CRPR 1B.2	Favors coastal prairie, meadows, seeps, coastal salt marshes, and valley/foothill grasslands often with alkaline or saline soils.	**No Habitat Present.** The site lacks coastal prairie, meadows, seeps, marshes, and grasslands.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Plants				
Delphinium recurvatum Recurved larkspur	--	CRPR 1B.2	Poorly drained, fine alkaline soils in grasslands or in valley saltbush or valley chenopod scrub.	**No Habitat Present.** The site lacks grasslands, valley saltbush or chenopod scrub.
Downingia pusilla Dwarf downingia	--	CRPR 2B.2	Vernal pools/seasonal wetlands.	**No Habitat Present.** No vernal pools or seasonal wetlands are present.
Extriplex joaquiniana San Joaquin spearscale	--	CRPR 1B.2	Found in seasonal alkali wetlands or alkali sink scrub.	**No Habitat Present.** No seasonal alkali wetlands or alkali sink scrub habitats are present.
Fritillaria pluriflora Adobe-lily	--	CRPR 1B.2	Chaparral, cismontane woodland, and valley and foothill grassland, often on clay soils. Usually associated with serpentine soils of the interior foothills.	**Low.** The site represents marginal habitat , but the area was an active almond orchard between the 1960s (at least) to the 1990s.
Hesperolinon breweri Brewer's western flax	--	CRPR 1B.2	Chaparral, cismontane woodland, valley and foothill grassland; often in rocky serpentine soil in serpentine chaparral and serpentine grasslands.	**Low.** The site represents marginal habitat , but the area was an active almond orchard between the 1960s (at least) to the 1990s.
Isocoma arguta Carquinez golden bush	--	CRPR 1B.1	Prefers foothill/valley grasslands with alkaline soils. Seems to favor low benches near drainages.	**No Habitat Present.** The site lacks grasslands.
Lasthenia conjugens Contra Costa goldfields	FE	CRPR 1B.1	Vernal pools or other seasonal wetlands.	**No Habitat Present.** No vernal pools or seasonal wetlands are present.
Legenere limosa Legenere	--	CRPR 1B.1	Vernal pools/seasonal wetlands.	**No Habitat Present.** No vernal pools or seasonal wetlands are present.
Navarretia leucocephala ssp. *bakeri* Baker's navarretia	--	CRPR 1B.1	Most commonly in vernal pools , but also on mud flats, edges of lakes.	**No Habitat Present.** No vernal pools, lakes or mud flats are present.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Plants				
Plagiobothrys hystriculus Bearded popcorn-flower	--	CRPR 1B.1	Vernal pools/seasonal wetlands.	**No Habitat Present.** The site lacks vernal pools/seasonal wetlands.
Symphyotrichum lentum Suisun Marsh aster	--	CRPR 1B.2	Fresh and salt water marshes, often associated with blackberries, cattails, and bulrush.	**No Habitat Present.** The site lacks marshes or swamps.
Trifolium amoenum Two-fork clover	FE	CRPR 1B.1	Valley grasslands, low wet swales, and riparian wetlands.	**No Habitat Present.** The site lacks valley grasslands, low wet swales, and riparian wetlands.
Trifolium hydrophilum Saline clover	--	CRPR 1B.2	Grows in salt marshes, swamps, and vernal pools with alkaline soils.	**No Habitat Present.** The site lacks salt marshes, swamps, and vernal pools.
Invertebrates				
Branchinecta lynchi Vernal pool fairy shrimp	FT	--	Vernal pools or other seasonal wetlands.	**No Habitat Present.** The site lacks vernal pools/seasonal wetlands.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT	--	Dependent upon elderberry plant as primary host species.	**High.** Numerous elderberry shrubs are present, mostly along Ulatis Creek.
Lepidurus packardi Vernal pool tadpole shrimp	FE	--	Vernal pools or other seasonal wetlands.	**No Habitat Present.** The site lacks vernal pools/seasonal wetlands.
Linderiella occidentalis California linderiella	--	--	Vernal pools or other seasonal wetlands.	**No Habitat Present.** The site lacks vernal pools/seasonal wetlands.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Amphibians				
Ambystoma californiense California tiger salamander	FT	CT	Breeds in ponds or other deeply ponded wetlands, and uses gopher holes and ground squirrel burrows in adjacent grasslands for upland refugia/foraging.	**No Habitat Present.** The site lacks the required wetlands to support breeding, and the site is completely surrounded by development and active paved roads. The nearest known population is located over 4 miles to the south.
Rana boylii Foothill yellow-legged frog	--	CCT, CSC	Breeds in permanent to semi-permanent aquatic habitat including lakes, ponds, marshes, creeks, and other drainages.	**No Habitat Present.** The Study Area are located outside of the known range of this species.
Reptiles				
Emys marmorata Western pond turtle	--	CSC	Ponds, rivers, streams, wetlands, and irrigation ditches with associated marsh habitat.	**High.** Ulatis Creek provides suitable habitat for this species.
Birds				
Agelaius tricolor Tricolored blackbird	USFWS BCC	CCE, CSC	Historically, most colonies were established in freshwater marshes dominated by cattails (*Typha spp.*) and bulrushes (*Scirpus* or *Schoenoplectus spp.*). More recently, they have also nested in introduced mustards (*Brassica spp.*), blackberries (*Rubus spp.*), thistles (*Circium spp.*), and mallows (*Malva spp.*) in fields.	**Low.** The thickets of Himalayan blackberry along Ulatis Creek provide marginal nesting habitat, but the surrounding lands are intensely developed.
Athene cunicularia Burrowing owl	USFWS BCC	CSC	Nests in abandoned ground squirrel burrows associated with open grassland habitats.	**Low.** Suitable foraging and nesting habitat are present, but the surrounding lands are intensely developed.
Buteo swainsoni Swainson's hawk	USFWS BCC	CT	Nests in large trees, preferably in riparian areas. Forages in fields, cropland, irrigated pasture, and grassland near large riparian corridors.	**Low.** Suitable foraging and nesting habitat are present, but the surrounding lands are intensely developed.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Birds				
Elanus leucurus White-tailed kite	--	CFP	Open grasslands, fields, and meadows are used for foraging. Isolated trees in close proximity to foraging habitat are used for perching and nesting.	**Low.** Suitable foraging and nesting habitat are present, but the surrounding lands are intensely developed.

Status Codes:

CCT - CDFW Candidate for Listing (Threatened)
CCE - CDFW Candidate for Listing (Endangered)
CE - CDFW Endangered
CFP - CDFW Fully Protected
CR - CDFW Rare
CRPR - California Rare Plant Rank
CSC - CDFW Species of Concern
CT - CDFW Threatened
FC - Candidate for Federal Listing
FD - Federally Delisted
FE - Federally Endangered
FPT - Proposed for Federal Listing (Threatened)
FPE - Proposed for Federal Listing (Endangered)
FT - Federally Threatened
USFWS BCC - Bird of Conservation Concern
WBWG M - Western Bat Working Group Medium Threat Rank
WBWG H - Western Bat Working Group High Threat Rank

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(916) 822-3230

January 15, 2019

Mr. Albert Enault, Associate Planner
Planning Division, City of Vacaville
650 Merchant Street
Vacaville, California 92008

Subject: Valley Elderberry Longhorn Beetle Technical Assistance for the Casa Dei Vista Apartments Project, Vacaville, Solano County, California

Dear Mr. Claveau:

This letter presents the results of technical assistance between Madrone Ecological Consulting (Madrone) and the U.S. Fish and Wildlife Service (USFWS) regarding the presence of elderberry shrubs on the Casa Dei Vista Apartments Project site (Project). The Project is located west of Allison Drive and north of Ulatis Creek in Vacaville, California.

As outlined in our letter to the Project applicant dated June 22, 2018 (**Attachment A**), a Madrone senior biologist conducted a site visit on February 14, 2018, to determine if the Project site supported potential wetlands or other waters of the U.S./State or other potential habitats for special-status species. Several elderberry shrubs (*Sambucus* sp.) were identified within the Project study area, all but one of which were associated with the Ulatis Creek riparian corridor. A subsequent site visit conducted on December 14, 2018, identified an additional elderberry shrub located in the interior of the Project immediately adjacent to Allison Drive.

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*, VELB) is federally listed as threatened and is associated exclusively with elderberry shrubs in the Central Valley and adjacent foothills during its entire 2-year life cycle. Adult VELB lay their eggs on elderberry stems. Upon hatching, larvae bore into the elderberry stems and feed upon the pith. They emerge through a round exit or emergence hole upon completion of this life stage. The USFWS considers all elderberry shrubs containing stems greater than or equal to one inch in diameter as potential VELB habitat.

In order to assess the Project's potential impacts to the elderberry shrubs, the drip lines for each shrub/shrub cluster were flagged and subsequently surveyed. The elderberry locations are shown on the attached exhibit prepared by Phillippi Engineering and numbered EB1 - EB8 (**Attachment B**). As shown in the exhibit, the Project would require the removal of the two shrubs located on the interior of the Project site (EB7, EB8), and would also involve construction of a trail adjacent to the riparian corridor of Ulatis Creek; portions of the trail would be within 20-feet of the drip lines of elderberry shrubs/clusters EB1 – EB6. During the December 14, 2018 site visit shrubs EB1, EB2, EB7, and EB8 were surveyed for the presence of exit holes; no exit holes were identified on these shrubs.

On December 18, 2018, I contacted Ms. Kellie Berry, Chief of the Sacramento Valley Division of the U.S. Fish and Wildlife Service, to discuss the need for a Section 10(a)(1)(B) permit for removal of the two isolated elderberry shrubs and/or for construction of the trail. We reviewed the guidance provided in the USFWS publication titled *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)*.[1] Ms. Berry determined that a Section 10(a)(1)(B) permit would not be required for removal of shrubs EB7 and EB8 due to the isolated nature of shrubs and the lack of exit holes. We also discussed incorporating avoidance and minimization measures from the framework document in order to avoid impacts to the elderberry shrubs (and therefore potential indirect impacts to VELB) within the riparian corridor during construction of the trail, as follows:

> **Fencing.** All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible.
>
> **Worker education.** Prior to any work on the trail, including grading or vegetation clearing, a qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for non- compliance.
>
> **Trimming.** In order to avoid and minimize adverse effects to VELB when trimming elderberry shrubs, trimming will occur between November and February and will avoid the removal of any branches or stems that are ≥ 1 inch in diameter. This requirement would apply to any future trimming that may be required for maintenance purposes.
>
> **Chemical Usage.** Herbicides will not be used within the drip-line of the shrub. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method.
>
> **Mowing.** Mechanical weed removal within the drip-line of the shrub(s) will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.
>
> **Erosion Control and Re-vegetation.** Erosion control will be implemented, and the affected area will be re-vegetated with appropriate native plants.
>
> **Construction monitoring.** A qualified biologist will monitor the work area during trail construction to assure that the above avoidance and minimization measures are implemented.

The majority of the elderberry shrubs in shrub clusters EB3 – EB6 are located downslope of the proposed trail on the bank of Ulatis Creek, and should not be impacted by construction activities. The measures outlined above should prevent adverse impacts to the elderberry shrubs, in particular the shrubs that are at the same elevation as the trail (EB1, EB2, and three shrubs within EB4). Based on implementation of these protective measures, Ms. Berry determined construction of the trail would not result in indirect impacts to VELB and therefore a Section 10(a)(1)(B) permit would not be required for the Project.

---

[1] U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2017. *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus).* USFWS; Sacramento, California. 28 pp.

If you have any questions or need additional information, please contact me at (916) 822-3230 or gfodge@madroneeco.com.

Sincerely,

Ginger E Fodge

Ginger E Fodge
Principal

cc: Mr. David Claveau
Guardian Investment Capital, LLC
5780 Fleet Street, #225
Carlsbad, California 92008

Attachments

Attachment A. Site Assessment Letter

Attachment B. Elderberry Locations Exhibit

Attachment A

Site Assessment Letter

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June 22, 2018

Mr. David Claveau
Guardian Investment Capital, LLC
5780 Fleet Street, #225
Carlsbad, California 92008

Subject: Reconnaissance-Level Biological Assessment for the Vacaville 15 Property, Vacaville, Solano County, California

Dear Mr. Claveau:

Per your request, Madrone Ecological Consulting (Madrone) conducted a reconnaissance-level biological assessment of the Vacaville 15 Property (Study Area). Madrone assessed the Study Area for the presence of wetlands including vernal pools, burrowing owls (and burrowing owl habitat), Swainson's hawks (and the presence of Swainson's hawk nesting/foraging habitat), elderberry shrubs, and other special, sensitive, or protected status species and habitats.

Project Area Location

The approximately 15-acre Study Area is located west of the Vacaville Cultural Center and Allison Drive in Vacaville, California. The Ulatis Creek corridor roughly defines the southern boundary. **Figure 1** is a vicinity map, and **Figure 2** shows the extent of the Study Area overlain on a National Agriculture Imagery Program (NAIP) aerial photo flown July 8, 2016.

Regulatory Setting

This section describes federal and state laws and policies that are relevant to this assessment of biological resources.

Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973 protects species that are federally listed as endangered or threatened with extinction. FESA prohibits the unauthorized "take" of listed species. Take includes harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such activities. Harm includes significant modifications or degradations of habitats that may cause death or injury to protected species by impairing their behavioral patterns. Harassment includes disruption of normal behavior patterns that may result in injury to or mortality of protected species. Civil or criminal penalties can be levied against persons convicted of unauthorized "take."

Federal Clean Water Act, Section 404

Section 404 of the Federal Clean Water Act requires that a Department of the Army permit be issued prior to the discharge of any dredged or fill material into waters of the United States, including wetlands. The U.S. Army Corps of Engineers (Corps) administers this program, with oversight from the U.S. Environmental Protection Agency. Waters of the United States include all navigable waters; interstate waters and wetlands; all intrastate waters and wetlands that could affect interstate or foreign commerce; impoundments of the above; tributaries of the above; territorial seas; and wetlands adjacent to the above.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase or barter, any native migratory bird, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR 21.11.). Likewise, Section 3513 of the California Fish & Game Code prohibits the "take or possession" of any migratory non-game bird identified under the MBTA. Therefore, activities that may result in the injury or mortality of native migratory birds, including eggs and nestlings, would be prohibited under the MBTA.

Bald and Golden Eagle Act

The Bald and Golden Eagle Protection Act prohibits anyone without a permit from "taking" bald or golden eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." "Take" could include interfering with nesting or foraging behavior and could include removal of a known nest.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires evaluations of project effects on biological resources. Determining the significance of those effects is guided by Appendix G of the CEQA guidelines. These evaluations must consider direct effects on a biological resource within the project site itself, indirect effects on adjacent resources, and cumulative effects within a larger area or region. Effects can be locally important but not significant according to CEQA if they would not substantially affect the regional population of the biological resource. Significant adverse impacts on biological resources would include the following:

- Substantial adverse effects on any species identified as candidate, sensitive, or special-status in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife (CDFW) or the U.S. Fish and Wildlife Service (USFWS) (these effects could be either direct or via habitat modification);
- Substantial adverse impacts to species designated by the California Department of Fish and Wildlife as Species of Special Concern;
- Substantial adverse effects on riparian habitat or other sensitive habitat identified in local or regional plans, policies, or regulations or by CDFW and USFWS;

- Substantial adverse effects on federally protected wetlands defined under Section 404 of the Clean Water Act (these effects include direct removal, filling, or hydrologic interruption of marshes, vernal pools, coastal wetlands, or other wetland types);
- Substantial interference with movements of native resident or migratory fish or wildlife species population, or with use of native wildlife nursery sites;
- Conflicts with local policies or ordinances protecting biological resources (e.g. tree preservation policies); and
- Conflict with provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan.

California Endangered Species Act

With limited exceptions, the California Endangered Species Act (CESA) of 1984 protects state-designated endangered and threatened species similar to FESA. For projects on private property (i.e., that for which a state agency is not a lead agency), CESA enables CDFW to authorize take of a listed species that is incidental to carrying out an otherwise lawful project that has been approved under CEQA (Fish & Game Code Section 2081).

Native Plant Protection Act

The Native Plant Protection Act (NPPA) was enacted in 1977 and allows the Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the NPPA. The NPPA prohibits take of endangered or rare native plants but includes some exceptions for agricultural and nursery operations; emergencies; and after properly notifying CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

Clean Water Act, Section 401

Section 401 of the Clean Water Act requires any applicant for a 404 permit to also obtain a water quality certification with the Regional Water Quality Control Board (RWQCB). This program is meant to protect these waters and wetlands by ensuring that waste discharged into them meets state water quality standards. Because the water quality certification program is triggered by the need for a Section 404 permit (and both programs are a part of the Clean Water Act), the definition of waters of the United States under Section 401 is the same as that used by the USACE under Section 404.

California Water Code, Porter-Cologne Act

The Porter Cologne Act, from Division 7 of the California Water Code, requires any person discharging waste or proposing to discharge waste that could affect the quality of waters of the state to file a report of waste discharge (RWD) with the RWQCB. The RWQCB can waive the filing of a report, but once a report is filed, the RWQCB must either waive or adopt water discharge requirements (WDRs). "Waters of the state" are defined as any surface water or groundwater, including saline waters, within the boundaries of the state.

California Fish and Game Code, Section 1600 – Streambed and Lake Alteration

The CDFW is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code, Section 1602, requires notification to CDFW of any proposed activity that may substantially modify a river, stream, or lake. Notification is required by any person, business, state or local government agency, or public utility that proposes an activity that will:

- substantially divert or obstruct the natural flow of any river, stream or lake;
- substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

For the purposes of Section 1602, rivers, streams and lakes must flow at least intermittently through a bed or channel.

The text above is based on how CDFW has historically asserted their jurisdiction; however, during recent conversations with CDFW, Madrone has been provided the following guidance for determining the limits of their jurisdiction, which in almost all cases exceeds the area that would be mapped utilizing the definition above.

> *CDFW needs to consider the following when determining jurisdiction: the fluvial geomorphology of the system, where water currently flows, or has flowed, over a given course during the historic hydrologic regime (can be subsurface flows), the maximal extent of the or expression of a stream on the landscape, the connectivity between the groundwater table and surrounding landscape (may include springs, swales, surface runoff source areas that are a source of water to a stream), the nexus between the stream and all life associated with the streams.*

If notification is required and CDFW believes the proposed activity is likely to result in adverse harm to the natural environment, it will require that the parties enter into a Lake or Streambed Alteration Agreement (LSAA).

California Fish and Game Code, Section 3503.5 - Raptor Nests

Section 3503.5 of the Fish and Game Code makes it unlawful to take, possess, or destroy hawks or owls, unless permitted to do so, or to destroy the nest or eggs of any hawk or owl.

Methodology

A record search of the California Natural Diversity Data Base (CNDDB) was performed prior to the field survey to list all recorded occurrences of special status species within a 5-mile radius of the Study Area. (**Attachment A**). **Figure 3** is an exhibit displaying all CNDDB occurrences within 5 miles of the Study Area. Additionally, historic aerial photography from 1968 to 2015 was reviewed to ascertain historic land

uses and to evaluate the potential presence of current or historical water features including wetlands and vernal pools.

Madrone senior biologist Matt Hirkala conducted a site visit on February 14, 2018, to determine if the Study Area supported potential wetlands or other waters of the U.S. or State (including vernal pools) or other sensitive habitats for special status species. Meandering transects were performed on foot throughout the Study Area to document current site conditions.

For the purposes of this report, special status species are defined as those species that are:

- listed as threatened or endangered, or proposed or candidates for listing by the U.S. Fish & Wildlife Service (USFWS) or National Marine Fisheries Service;
- listed as threatened or endangered and candidates for listing by CDFW;
- identified as Fully Protected species, species of special concern, or Watch List species by CDFW;
- plant species considered to be rare, threatened, or endangered in California by the (California Native Plant Society (CNPS) and CDFW [California Rare Plant Rank (CRPR) 1, 2, and 3]:
  - CRPR 1A: Plants presumed extinct.
  - CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere.
  - CRPR 2A: Plants extirpated in California, but common elsewhere.
  - CRPR 2B: Plants rare, threatened, or endangered in California, but more common elsewhere.
  - CRPR 3: Plants about which the CNPS needs more information – a review list.
- In addition, several species that do not have any regulatory status, but are tracked by the CNDDB, were included on the special-status species list.

Attachment A provides a list of special-status species that were evaluated based upon the above-described CNDDB query, including their listing status, habitat associations, and potential to occur in the Study Area. The following set of criteria was used to determine each species' potential for occurrence on the site:

- **Present**: Species occurs on the site based on CNDDB records, and/or was observed on the site during field surveys.
- **High:** The site is within the known range of the species and suitable habitat exists.
- **Moderate:** The site is within the known range of the species and very limited suitable habitat exists.
- **Low:** The site is within the known range of the species and there is marginally suitable habitat.
- **No Habitat Present:** The site does not contain suitable habitat for the species, or the site is outside the known range of the species.

Existing Site Conditions and Habitats Present

The Study Area is undeveloped and completely surrounded by residential/commercial developments. No habitable structures are present. The two habitat types observed include mixed riparian woodland and valley oak woodland (**Figure 4**).

Most of the parcel was an almond orchard from the 1990s to at least the1960s. It is currently fallow and reverting to a valley oak (*Quercus lobata*) woodland interspersed with occasional specimens of old almond trees (*Prunus dulcis*) – most of which are in poor condition. The understory and open areas are primarily comprised of rip-gut brome (*Bromus diandrus*), spring vetch (*Vicia villosa*), medusa-head grass (*Elymus caput-medusae*), and soft brome (*Bromus hordeaceus*). The southern portion supports mixed riparian woodland made up of valley oak, elderberry (*Sambucus nigra*), willows (*Salix* spp.), and Fremont's cottonwood (*Populus fremontii*).

Results/Recommendations

Aquatic Resources

The Study Area currently lacks wetlands including vernal pools; however, a segment of Ulatis Creek meanders through the southern edge of the parcel from east to west. If work is scheduled to occur near Ulatis Creek, we recommend that you have an Aquatic Resources Delineation performed to define the Corps' extent of jurisdiction under Section 404 of the Federal Clean Water Act (CWA). The installation of outfalls, bridges, or other structures in or near Ulatis Creek may require the issuance of a CWA permit from the Corps prior to project implementation. Similarly, authorizations may also be required from CDFW and/or RWQCB prior to the start of work in or near Ulatis Creek.

Nesting Birds

Raptors, including burrowing owls, and songbirds and their nests are protected by Section 3503.5 of the Fish and Game Code of California and by the Federal Migratory Bird Treaty Act. In general, nesting occurs from February/early March through late July/early August, depending upon the species and various environmental conditions.

No burrowing owls (*Athene cunicularia*) were observed during the site visit. Although several appropriately-sized ground squirrel burrows were identified, no evidence of burrowing owl use (whitewash, owl pellets, or molted feathers) was observed. Though the site contains appropriate nesting and foraging for habitat, it is of low quality due to the extensive commercial and residential development surrounding the Study Area. The nearest burrowing owl occurrence recorded by the CNDDB is approximately one mile to the northeast near the Nut Tree Airport.

Though the site contains numerous trees large enough to support raptor nests including those for Swainson's hawks (*Buteo swainsoni*), no active nests were observed. Several nests are present, but most appear to be too small to support large raptors. The open areas within the valley oak woodland provide marginal foraging habitat for Swainson's hawks and red-tailed hawks (*Buteo jamaicensis*); however, other raptors species including Cooper's hawks (*Accipiter cooperii*), sharp-shinned hawks (*Accipiter striatus*), and red-shoulder hawks (*Buteo lineatus*) favor woodland habitats and may utilize the site for breeding and foraging. The nesting and foraging habitats contained within the Study Area are of low quality due to the close proximity of highly developed lands surrounding the site.

We recommend that a pre-construction nesting bird/burrowing owl survey be conducted by a qualified biologist no more than 14 days prior to work (ground-disturbance or vegetation removal) during the

nesting season (February 1 through August 31). Burrowing owl surveys should be performed in accordance with the "Take Avoidance Surveys" methods listed in the *Staff Report on Burrowing Owl Mitigation*[1] (CDFW 2012). If the survey does not identify any nests or active owl burrows, no further mitigation would be recommended. However, if the survey identifies an active nest or burrow, the following mitigation measures are recommended:

> Avoid all nest sites located in or around the impact area while the nest is occupied with adults and/or eggs or young. The occupied nest should be monitored by a qualified wildlife biologist to determine when the nest is no longer used. Avoidance would include the establishment of a no disturbance buffer zone around the nest site. The size of the buffer zone is typically determined in consultation with CDFW; initial buffer zones are typically 100' for songbirds, 250' for burrowing owls, and 500' for other raptors. Highly visible temporary construction fencing should delineate the buffer zone.

Valley Elderberry Longhorn Beetle/Elderberry Shrubs

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*, VELB) is federally listed as threatened. Critical habitat was designated by the U.S. Fish and Wildlife Service (USFWS) on 8 August 1980 (45 Federal Register [FR] 52803). On 22 October 2012 the USFWS issued a proposed rule to remove the designation of the VELB as a threatened species; however, on 29 August 2014 the USFWS formally withdrew the proposed rule (79 FR 55879). The Study Area is not located within critical habitat for the VELB.

The VELB is associated exclusively with elderberry (*Sambucus* species) shrubs in the Central Valley and adjacent foothills during its entire 2-year life cycle. Adult VELB lay their eggs on elderberry stems. Upon hatching, larvae bore into the elderberry stems and feed upon the pith. They emerge through a round exit or emergence hole upon completion of this life stage. They are typically associated with elderberry stems and trunks that are greater than one inch in diameter at ground level. The USFWS considers all elderberry shrubs containing stems greater than one inch in diameter at ground level as potential VELB habitat. VELB most commonly occur in areas within, or near, some type of riparian corridor comprised of other woody plant species such as willows (*Salix* spp.), cottonwood (*Populus fremontii* ssp. *fremontii*), wild grape (*Vitis californica*), and box elder (*Acer negundo*).

Several elderberry shrubs were observed within the parcel. Except for one shrub situated south of Travis Way, all are located directly within the Ulatis Creek riparian corridor (**Figure 5**). Even though the solitary shrub near Travis Way is approximately 200 meters north of the Ulatis Creek riparian corridor, it may be classified as riparian for the purposes of determining mitigation. Lands south of Ulatis Creek were not surveyed due to access issues.

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

In accordance with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* [2] the USFWS recommends the development of proposed project designs that avoid riparian habitat and/or elderberry shrubs whenever possible. If elderberry shrubs occur on or within 50 meters (165 feet) of the project area, adverse effects to VELB may occur as a result of project implementation. If the project may affect VELB or its habitat, appropriate avoidance and minimization measures are recommended.

The USFWS recommends the following measures for incorporation into a proposed project to avoid and minimize effects to VELB and/or its habitat:

Fencing. All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible.

Avoidance area. Activities that may damage or kill an elderberry shrub (e.g., trenching, paving, etc.) may need an avoidance area of at least 6 meters (20 feet) from the drip-line, depending on the type of activity.

Worker education. A qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for non- compliance.

Construction monitoring. A qualified biologist will monitor the work area at project-appropriate intervals to assure that all avoidance and minimization measures are implemented. The amount and duration of monitoring will depend on the project specifics and should be discussed with the Service biologist.

Timing. As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB (March - July).

Trimming. Trimming may remove or destroy VELB eggs and/or larvae and may reduce the health and vigor of the elderberry shrub. In order to avoid and minimize adverse effects to VELB when trimming, trimming will occur between November and February and will avoid the removal of any branches or stems that are ≥ 1 inch in diameter. Measures to address regular and/or large-scale maintenance (trimming) should be established in consultation with the Service.

Chemical Usage. Herbicides will not be used within the drip-line of the shrub. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method.

Mowing. Mechanical weed removal within the drip-line of the shrub will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.

Erosion Control and Re-vegetation. Erosion control will be implemented, and the affected area will be re-vegetated with appropriate native plants.

If the project site is non-riparian and contains elderberry shrubs, the USFWS uses exit hole surveys to evaluate the site for potential occupancy – this standard may apply to the solitary elderberry shrub

[2] U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2017. *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus).* USFWS; Sacramento, California. 28 pp.

located near Travis Road, which displayed no exit holes. However, since all the remaining elderberry shrubs within the Vacaville 15 Study Area are considered riparian, and therefore potential VELB habitat, exit hole surveys are not essential, but may be conducted in order to assess the level and significance of adverse effects. The presence of exit holes in a shrub increases the likelihood that the shrub is occupied by VELB; however, a lack of exit holes does not preclude occupancy by the VELB. The extent of agency involvement in the elderberry shrub evaluation and potential VELB mitigation requirements will depend upon the final project design. If you decide to move forward with a project on the site we recommend early coordination between our office and your site planner in order to maximize efficiency of the regulatory processes.

We appreciate the opportunity to assist you with this project. If you have any questions or need additional information, please contact me at (916) 822-3230 or gfodge@madroneeco.com.

Sincerely,

Ginger E Fodge
Principal

Figures

Figure 1. Site and Vicinity

Figure 2. Study Area

Figure 3. CNDDB Occurrences of within 5 miles of the Study Area

Figure 4. Habitat Exhibit

Figure 5. Elderberry Shrub Exhibit

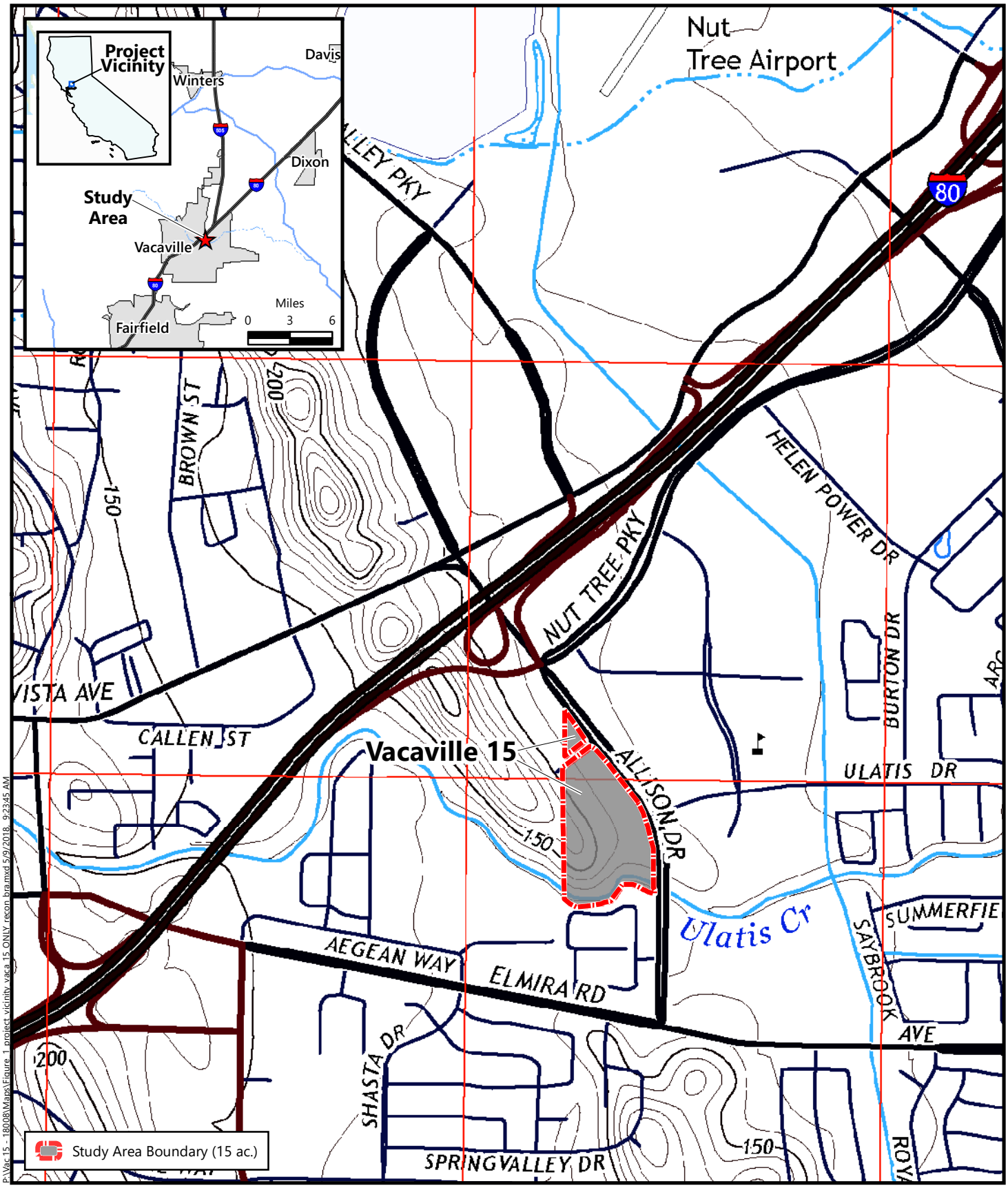


Figure 1
Site and Vicinity

Vacaville15
Solano County, California

MADRONE ECOLOGICAL CONSULTING

Source: United States Geologic Survey, 2016.
Rancho Los Putos Civil Land Grant, MDB&M
"Elmira, California" 7.5-Minute Topographic Quadrangle
Longitude -121.966194, Latitude 38.356434



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Feet
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Figure 2
Study Area

Aerial Source: *USDA, National Agriculture Imagery Program,* 8 July 2016

Vacaville 15
Solano County, California

MADRONE ECOLOGICAL CONSULTING

Study Area
5-Mile Radius of Study Area

Amphibian/Reptile
- California Tiger Salamander
- Foothill Yellow-Legged Frog
- Western Pond Turtle

Birds
- Burrowing Owl
- Swainson's Hawk
- Tricolored Blackbird
- White-Tailed Kite

Invertebrates
- California Linderiella
- Valley Elderberry Longhorn Beetle
- Vernal Pool Fairy Shrimp
- Vernal Pool Tadpole Shrimp

Mammals
- American Badger
- Townsend's Big-Eared Bat

Plants
- Adobe-Lily
- Alkali Milk-Vetch
- Baker's Navarretia
- Bearded Popcornflower
- Brewer's Western Flax
- Brittlescale
- Carquinez Goldenbush
- Contra Costa Goldfields
- Dwarf Downingia
- Heartscale
- Legenere
- Pappose Tarplant
- Recurved Larkspur
- Round-Leaved Filaree
- Saline Clover
- San Joaquin Spearscale
- Suisun Marsh Aster
- Two-Fork Clover

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Miles
0 1 2

Source: *ESRI Maps*, 2018
CNDDB: *California Department of Fish and Wildlife*, February 2018

Figure 3
CNDDB Occurrences within 5 Miles of the Study Area

Vacaville 15
Solano County, California

MADRONE ECOLOGICAL CONSULTING



Figure 4
Habitat Exhibit

Aerial Source: *USDA, National Agriculture Imagery Program,* 8 July 2016

Vacaville 15
Solano County, California

MADRONE ECOLOGICAL CONSULTING



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Figure 5
Elderberry Shrub Exhibit

Aerial Source: *USDA, National Agriculture Imagery Program,* 8 July 2016

Vacaville 15
Solano County, California

MADRONE ECOLOGICAL CONSULTING

Attachments

Attachment A. List of CNDDB Occurrences within 5 Miles of the Study Area

Attachment A

List of CNDDB Occurrences within 5 Miles of the Study Area

Table 1. Special-Status Species with Potential to Occur within the Vacaville 15 Study Area

Scientific Name (Common Name)	Federal Status	State Status	Habitat Requirements	Potential for Occurrence
Mammals				
Corynorhinus townsendii townsendii Townsend's big-eared bat	--	CSC, WBWG H	Roosts in caves and cave analogues, such as abandoned mines, buildings, bridges, rock crevices and large basal hollows of coast redwoods and giant sequoias. Extremely sensitive to human disturbance. (WBWG 2015).	**No Habitat Present.** No caves or cave analogues present on-site.
Taxidae taxus American badger	--	CSC	Open dry fields including grasslands and pastures.	**Low.** Marginal habitat is present, but the surrounding lands are intensely developed.
Plants				
Astragalus tener var. *tener* Alkali milk-vetch	--	CRPR 1B.2	Alkaline playas, wetlands, and vernal pools within valley and foothill grasslands. Also occurs in open, alkaline and seasonally moist meadows from 0 to 200 feet.	**No Habitat Present.** The site lacks wetlands, playas, and vernal pools.
Atriplex cordulata var. *cordulata* Heartscale	--	CRPR 1B.2	Grows in grasslands with sandy alkaline or saline soils.	**No Habitat Present.** The site lacks open grasslands.
Atriplex depressa Brittlescale	--	CRPR 1B.2	Meadows or grasslands with alkaline or saline clay soils.	**No Habitat Present.** The site lacks open grasslands.
California macrophylla Round-leaved filaree	--	CRPR 1B.2	Clay soils in cismontane woodland and valley and foothill grassland, from 50 feet to 4,000 feet with vertic clay soils. Occasionally grows on serpentine soils.	**Low.** The site represents marginal habitat, but the area was an active almond orchard between the 1960s (at least) to the 1990s.
Centromadia parryi ssp. *parryi* Pappose tarplant	--	CRPR 1B.2	Favors coastal prairie, meadows, seeps, coastal salt marshes, and valley/foothill grasslands often with alkaline or saline soils.	**No Habitat Present.** The site lacks coastal prairie, meadows, seeps, marshes, and grasslands.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Plants				
Delphinium recurvatum Recurved larkspur	--	CRPR 1B.2	Poorly drained, fine alkaline soils in grasslands or in valley saltbush or valley chenopod scrub.	**No Habitat Present.** The site lacks grasslands, valley saltbush or chenopod scrub.
Downingia pusilla Dwarf downingia	--	CRPR 2B.2	Vernal pools/seasonal wetlands.	**No Habitat Present.** No vernal pools or seasonal wetlands are present.
Extriplex joaquiniana San Joaquin spearscale	--	CRPR 1B.2	Found in seasonal alkali wetlands or alkali sink scrub.	**No Habitat Present.** No seasonal alkali wetlands or alkali sink scrub habitats are present.
Fritillaria pluriflora Adobe-lily	--	CRPR 1B.2	Chaparral, cismontane woodland, and valley and foothill grassland, often on clay soils. Usually associated with serpentine soils of the interior foothills.	**Low.** The site represents marginal habitat , but the area was an active almond orchard between the 1960s (at least) to the 1990s.
Hesperolinon breweri Brewer's western flax	--	CRPR 1B.2	Chaparral, cismontane woodland, valley and foothill grassland; often in rocky serpentine soil in serpentine chaparral and serpentine grasslands.	**Low.** The site represents marginal habitat , but the area was an active almond orchard between the 1960s (at least) to the 1990s.
Isocoma arguta Carquinez golden bush	--	CRPR 1B.1	Prefers foothill/valley grasslands with alkaline soils. Seems to favor low benches near drainages.	**No Habitat Present.** The site lacks grasslands.
Lasthenia conjugens Contra Costa goldfields	FE	CRPR 1B.1	Vernal pools or other seasonal wetlands.	**No Habitat Present.** No vernal pools or seasonal wetlands are present.
Legenere limosa Legenere	--	CRPR 1B.1	Vernal pools/seasonal wetlands.	**No Habitat Present.** No vernal pools or seasonal wetlands are present.
Navarretia leucocephala ssp. *bakeri* Baker's navarretia	--	CRPR 1B.1	Most commonly in vernal pools , but also on mud flats, edges of lakes.	**No Habitat Present.** No vernal pools, lakes or mud flats are present.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Plants				
Plagiobothrys hystriculus Bearded popcorn-flower	--	CRPR 1B.1	Vernal pools/seasonal wetlands.	**No Habitat Present.** The site lacks vernal pools/seasonal wetlands.
Symphyotrichum lentum Suisun Marsh aster	--	CRPR 1B.2	Fresh and salt water marshes, often associated with blackberries, cattails, and bulrush.	**No Habitat Present.** The site lacks marshes or swamps.
Trifolium amoenum Two-fork clover	FE	CRPR 1B.1	Valley grasslands, low wet swales, and riparian wetlands.	**No Habitat Present.** The site lacks valley grasslands, low wet swales, and riparian wetlands.
Trifolium hydrophilum Saline clover	--	CRPR 1B.2	Grows in salt marshes, swamps, and vernal pools with alkaline soils.	**No Habitat Present.** The site lacks salt marshes, swamps, and vernal pools.
Invertebrates				
Branchinecta lynchi Vernal pool fairy shrimp	FT	--	Vernal pools or other seasonal wetlands.	**No Habitat Present.** The site lacks vernal pools/seasonal wetlands.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT	--	Dependent upon elderberry plant as primary host species.	**High.** Numerous elderberry shrubs are present, mostly along Ulatis Creek.
Lepidurus packardi Vernal pool tadpole shrimp	FE	--	Vernal pools or other seasonal wetlands.	**No Habitat Present.** The site lacks vernal pools/seasonal wetlands.
Linderiella occidentalis California linderiella	--	--	Vernal pools or other seasonal wetlands.	**No Habitat Present.** The site lacks vernal pools/seasonal wetlands.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Amphibians				
Ambystoma californiense California tiger salamander	FT	CT	Breeds in ponds or other deeply ponded wetlands, and uses gopher holes and ground squirrel burrows in adjacent grasslands for upland refugia/foraging.	**No Habitat Present.** The site lacks the required wetlands to support breeding, and the site is completely surrounded by development and active paved roads. The nearest known population is located over 4 miles to the south.
Rana boylii Foothill yellow-legged frog	--	CCT, CSC	Breeds in permanent to semi-permanent aquatic habitat including lakes, ponds, marshes, creeks, and other drainages.	**No Habitat Present.** The Study Area are located outside of the known range of this species.
Reptiles				
Emys marmorata Western pond turtle	--	CSC	Ponds, rivers, streams, wetlands, and irrigation ditches with associated marsh habitat.	**High.** Ulatis Creek provides suitable habitat for this species.
Birds				
Agelaius tricolor Tricolored blackbird	USFWS BCC	CCE, CSC	Historically, most colonies were established in freshwater marshes dominated by cattails (*Typha spp.*) and bulrushes (*Scirpus* or *Schoenoplectus spp.*). More recently, they have also nested in introduced mustards (*Brassica spp.*), blackberries (*Rubus spp.*), thistles (*Circium spp.*), and mallows (*Malva spp.*) in fields.	**Low.** The thickets of Himalayan blackberry along Ulatis Creek provide marginal nesting habitat, but the surrounding lands are intensely developed.
Athene cunicularia Burrowing owl	USFWS BCC	CSC	Nests in abandoned ground squirrel burrows associated with open grassland habitats.	**Low.** Suitable foraging and nesting habitat are present, but the surrounding lands are intensely developed.
Buteo swainsoni Swainson's hawk	USFWS BCC	CT	Nests in large trees, preferably in riparian areas. Forages in fields, cropland, irrigated pasture, and grassland near large riparian corridors.	**Low.** Suitable foraging and nesting habitat are present, but the surrounding lands are intensely developed.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Birds				
Elanus leucurus White-tailed kite	--	CFP	Open grasslands, fields, and meadows are used for foraging. Isolated trees in close proximity to foraging habitat are used for perching and nesting.	**Low.** Suitable foraging and nesting habitat are present, but the surrounding lands are intensely developed.

Status Codes:

CCT - CDFW Candidate for Listing (Threatened)
CCE - CDFW Candidate for Listing (Endangered)
CE - CDFW Endangered
CFP - CDFW Fully Protected
CR - CDFW Rare
CRPR - California Rare Plant Rank
CSC - CDFW Species of Concern
CT - CDFW Threatened
FC - Candidate for Federal Listing
FD - Federally Delisted
FE - Federally Endangered
FPT - Proposed for Federal Listing (Threatened)
FPE - Proposed for Federal Listing (Endangered)
FT - Federally Threatened
USFWS BCC - Bird of Conservation Concern
WBWG M - Western Bat Working Group Medium Threat Rank
WBWG H - Western Bat Working Group High Threat Rank

Attachment B

Elderberry Locations Exhibit

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N

SCALE: 1"=100'

EB 1
EB 2
EB 3
EB 4
EB 5
EB 6
EB 7
EB 8

MULTI SPORT COURT
BOCCE BALL
POOL
SPA
HORSESHOE PIT
OFFICE/CLUBHOUSE

TRAVIS WAY
ULATIS CREEK
ALLISON DR
ULATIS DR

EXISTING ELDERBERRY DRIPLINE (TYP)
EXISTING ELDERBERRY DRIPLINE (TYP)

DWG FILE PATH: P:\20170820\Exhibits\Elderberry Location\20170820-Site & Elderberry Locations.dwg

PROJECT NAME/LOCATION:
CASA DEI VISTA APARTMENTS
ELDERBERRY LOCATIONS

ISSUE DATE:	01/15/2019
PROJECT NO.:	20170820
DRAFTED BY:	DAB

PHILLIPPI ENGINEERING
CIVIL ENGINEERING - LAND SURVEYING
425 MERCHANT STREET VACAVILLE, CA 95688
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OFFICE (707) 451-6556 FAX (707) 451-6555

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ATTACHMENT 3

ARBORIST REPORT

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ARBORIST REPORT
AND
TREE INVENTORY SUMMARY

VAC 15/APARTMENTS AT
ALLISON DRIVE PROJECT SITE
City of Vacaville, California

Prepared for:

Guardian Investment Capital, LLC
5780 Fleet Street, Suite 225
Carlsbad, California 92008

Prepared by:

Edwin E. Stirtz
International Society of Arboriculture
Certified Arborist WE-0510A
ISA Tree Risk Assessment Qualified
Member, American Society of Consulting Arborists

SIERRA NEVADA ARBORISTS
7425 W 4th Street
Rio Linda, California 95673

February 23, 2018

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B. Tree Inventory Exhibit

COPYRIGHT STATEMENT

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QUALIFICATION STATEMENT

Sierra Nevada Arborists is a fully insured, Rio Linda-based arboriculture consulting firm founded in January of 1998 by its Principal, Edwin E. Stirtz. Mr. Stirtz is an ISA Certified Arborist and is ISA Tree Risk Assessment Qualified. He is a member of the American Society of Consulting Arborists and International Society of Arboriculture. Mr. Stirtz possesses in excess of 30 years of experience in horticulture and arboriculture, both maintenance and construction, and has spent the last 23 years as a consulting and preservation specialist in the Sacramento and surrounding regions.

INTRODUCTION

Sierra Nevada Arborists is pleased to present this Arborist Report and Tree Inventory Summary for the trees located within and/or overhanging the property located at the Vac 15/Apartments at Allison Drive Project Site in the City of Vacaville, California. This Arborist Report and Tree Inventory Summary memorializes tree data obtained by Edwin E. Stirtz, ISA Certified Arborist WE-0510A, at the time of field reconnaissance and inventory efforts on February 14, 2018.

SCOPE OF INVENTORY EFFORT

The City of Vacaville Municipal Code, Supplemental Standards, Tree Preservation, Chapter 14.09.131 regulates trees on any public or private property within the City of Vacaville. The Code defines a "tree" as any live woody plant having one or more well-defined perennial stems with an aggregate circumference of 31 inches or more, when measured at 4½ feet above ground level.

METHODOLOGY

During field reconnaissance and inventory efforts, Edwin E. Stirtz of Sierra Nevada Arborists conducted a visual review from ground level of the trees within and/or overhanging the selected lots within the project area as depicted on the Earth View. The trees which met the defined criteria were identified in the field by affixing round tags with blue flagging to the tree trunks. The tree numbers utilized in this report and accompanying Tree Inventory Summary correspond to the tree tags which were affixed to the trees in the field, and those tree numbers or grouping of numbers were rough-plotted on the attached Tree Inventory Exhibit so that the precise vertical and horizontal location of the trees may be surveyed in the field by a licensed land surveyor and data for the trees (i.e. tree number, diameter, dripline and protected root zone radii) may be properly depicted on future development plans and Tree Location Exhibit.

At the time of field identification and inventory efforts specific data was gathered for each tagged tree including the tree's species, diameter measured at breast height ("DBH") and dripline radius ("DLR"). Utilizing this data the tree's overall structural condition and vigor were separately assessed ranging from "excellent"[1] to "poor" based upon the observed characteristics noted within the tree and the Arborist's best professional judgment. Ratings are subjective and are dependent upon both the structure and vigor of the tree. The vigor

[1] It is rare that a tree qualifies in an "excellent" category, and it should be noted that there were no trees observed within the project area which fell within the criteria of an "excellent" or "good" rating. A complete description of the terms and ratings utilized in this report and accompany inventory summary are found on pages 8-9.

rating considers factors such as the size, color and density of the foliage; the amount of deadwood within the canopy; bud viability; evidence of wound closure; and the presence or evidence of stress, disease, nutrient deficiency and insect infestation. The structural rating reflects the root crown/collar, trunk and branch configurations; canopy balance; the presence of included bark, weak crotches and other structural defects and decay and the potential for structural failure. Finally, notable characteristics were documented and recommendations on a tree-by-tree basis were made which logically followed the observed characteristics noted within the trees at the time of the field inventory effort. The recommendations are based on the assumption that the tree would be introduced into a developed environment and may require maintenance and/or may not be suitable for retention within a post-development setting.

SUMMARY OF INVENTORY EFFORT

Field reconnaissance and inventory efforts found 145 trees measuring 4 inches in diameter and larger measured at breast height within and/or overhanging the proposed project area. Composition of the 145 inventoried trees includes the following species and accompanying aggregate diameter inches:

SPECIES DIVERSIFICATION			
Black Walnut	=	1 tree	(7 aggregate diameter inches)
Brazilian Pepper	=	1 tree	(8 aggregate diameter inches)
California Black Walnut	=	1 tree	(23 aggregate diameter inches)
English Walnut	=	2 trees	(49 aggregate diameter inches)
Flowering Pear	=	1 tree	(10 aggregate diameter inches)
Pecan	=	13 trees	(130 aggregate diameter inches)
Valley Oak	=	126 trees	(1,413 aggregate diameter inches)
TOTALS	**=**	**145 trees**	**(1,640 aggregate diameter inches)**

The City of Vacaville Ordinance, Chapter 14.09.131, Supplemental Standards, Tree Preservation, Section 14.09.131.030, Section C, Exemptions, states:

"A tree removal permit is not required under the following circumstances:

1. Trees that do not meet the size specifications described in Section 14.09.131.020.E.[2] of this chapter;
2. Commercial fruit trees, almond trees, or grafted English walnut trees;
3. Trees planted, grown, or held for sale as part of a licensed nursery business or tree farm."

[2] For the purposes of this chapter, tree means any live woody plant having one or more well defined perennial stems with an aggregate circumference of 31" or more, when measured at 4½' above ground level.

Composition of the protected and non-protected trees is as follows:

PROTECTED / NON-PROTECTED TREES			
Total Protected Trees	=	68 trees	(1,018 x aggregate diameter inches)
Total Non-Protected Trees	=	77 trees	(622 aggregate diameter inches)
TOTAL	**=**	**145 trees**	**(1,640 aggregate diameter inches)**

Recommended Removals

At this time, two trees have been recommended for removal from the proposed project area due to the nature and extent of defects, compromised health, and/or structural instability noted at the time of field inventory efforts. If these trees were retained within the proposed project area it is our opinion that they may be hazardous depending upon their proximity to planned development activities. For reference, the trees which have been recommended for removal due to the severity of noted defects, compromised health and/or structural instability are highlighted in green within the accompanying Tree Inventory Summary and are briefly summarized as follows:

TREE #	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	CONDITIONAL ASSESSMENT	
						STRUCTURE	VIGOR
739	English Walnut	*(Juglans regia)*		17	16	Poor to fair	Poor
744	English Walnut	*(Juglans regia)*	8,11,13	32	18	Poor	Fair

CONSTRUCTION IMPACT ASSESSMENT

This Arborist Report and Tree Inventory Summary is intended to provide to Guardian Investment Capital, LLC, the City of Vacaville, and other members of the development team a detailed *pre-development review* of the species, size, and current structure and vigor of the trees within and/or overhanging the proposed project area. It is not an exhaustive review of the impacts which will be sustained from project implementation. At this early stage of the project specific root system and canopy impacts on a tree-by-tree basis cannot be definitively assessed until the site development, grading, and other improvement plans have been refined and finalized and data from the accompanying inventory summary (i.e., tree numbers, dripline radius, and root protection zones) is properly depicted on the plans.

Since trees are living organisms whose condition may change at any time a complete assessment of construction impacts and specific recommendations to help mitigate for the adverse impacts which may be sustained by the trees from contemplated construction activities cannot be made until the development plans have been refined and finalized. Once final plans have been developed for the site a qualified ISA Certified Arborist with special

expertise and demonstrated experience with construction projects in and among native and non-native trees should review those plans and provide a more detailed assessment of impacts, including identification of trees which may require removal to facilitate home construction and other contemplated site development activities. This review will be particularly important if structures and/or residential activities will fall within or near the fall zone of a tree which has been noted as exhibiting structural defects, questionable long-term longevity and/or a conditional rating which is less than "fair", and for trees which measure 16 inches and greater in diameter which will be retained within close proximity to development as trees of this size may pose a more significant hazard if a sudden limb shed and/or catastrophic failure should occur. In addition, the review should include an assessment of root system and canopy impacts which will be sustained by the trees which will be retained within the proposed development area, along with specific recommendations on a tree-by-tree basis to help reduce adverse impacts of construction on the retained trees. In the meantime, this report provides some pre-development recommendations which logically follow the observed characteristics noted in the trees at the time of the field inventory efforts, as well as General Protection Measures which should be utilized as a guideline for the protection of trees which may be retained within the development area. These recommendations will require modification and/or augmentation as development plans are refined and finalized.

GENERAL COMMENTS AND ARBORISTS' DISCLAIMER

The City of Vacaville regulates both the removal of "protected trees" and the encroachment of construction activities within their driplines. Therefore, a tree permit and/or additional development authorization should be obtained from the City of Vacaville prior to the removal of any trees within the proposed project area. All terms and conditions of the tree permit and/or other Conditions of Approval are the sole and exclusive responsibility of the project applicant. It should be noted that prior to final inspection written verification from an ISA Certified Arborist may be required certifying the approved removal activities and/or implementation of other Conditions of Approval outlined for the retained trees on the site. ***Sierra Nevada Arborists will not provide written Certification of Compliance unless we have been provided with a copy of the approved site development plans, applicable permits and/or Conditions of Approval, and are on site to monitor and observe regulated activities during the course of construction.*** Therefore, it will be necessary for the project applicant to notify Sierra Nevada Arborists well in advance (at least 72 hours prior notice) of any regulated activities which are scheduled to occur on site so that those activities can be properly monitored and documented for compliance certification.

Please bear in mind that implementation of the recommendations provided within this report will help to reduce adverse impacts of construction on the retained trees; however, implementation of any recommendations should not be viewed as a guarantee or warranty against the trees' ultimate demise and/or failure in the future. Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of the trees and ***attempt to reduce the risk of***

living near trees. Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. There are some inherent risks with trees that cannot be predicted with any degree of certainty, even by a skilled and experienced arborist. Entities who choose to construct homes on wooded property are accepting a certain level of risk from unpredictable tree related hazards such as toppling in storms, limbs falling and fires that may damage property at some time in the future. Since trees are living organisms their structure and vigor constantly change over time, and they are not immune to changes in site conditions or seasonal variations in the weather. Further, conditions are often hidden within the tree and/or below ground. Arborists and other tree care professionals cannot guarantee that a tree will be healthy and/or safe under all circumstances or for a specific period of time. Likewise remedial treatments cannot be guaranteed. Trees can be managed but they cannot be controlled. To develop land and live near trees is to accept some degree of risk and the only way to eliminate all risk associated with trees would be to eliminate all of the trees. ***An entity who develops land and builds a home with a tree in the vicinity should be aware of and inform their future residents of this Arborists' Disclaimer, and be further advised that the developer and the future residents assume the risk that a tree could at any time suffer a branch and/or limb failure, blow over in a storm and/or fail for no apparent reason which may cause bodily injury or property damage***. Sierra Nevada Arborists cannot predict acts of nature including, without limitation, storms of sufficient strength which can even take down a tree with a structurally sound and vigorous appearance.

Finally, the trees preserved within and/or overhanging the proposed project area will experience a physical environment different from the pre-development environment. As a result, tree health and structural stability should be regularly monitored. Occasional pruning, fertilization, mulch, pest management, replanting and/or irrigation may be required. In addition, ***provisions for monitoring both tree health and structural stability following construction must be made a priority***. As trees age, the likelihood of failure of branches or entire trees increases. Therefore, ***the future management plan must include an annual inspection*** by a qualified ISA Certified Arborist to keep abreast of the trees' changing condition(s) and to assess the trees' ongoing structural integrity and potential for hazard in a developed environment.

Thank you for allowing Sierra Nevada Arborists to assist you with this review. Please feel free to give me a call if you have any questions or require additional information and/or clarification.

Sincerely,



Edwin E. Stirtz
International Society of Arboriculture
Certified Arborist WE-0510A
ISA Tree Risk Assessment Qualified
Member, American Society of Consulting Arborists

ASSUMPTIONS AND LIMITING CONDITIONS

1. Any legal description provided to the consultant is assumed to be correct. Any titles and ownership to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.

2. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other governmental regulations.

3. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.

4. The consultant shall not be required to give a deposition and/or attend court by reason of this report unless subsequent contractual arrangements are made for in advance, including payment of an additional fee for such services according to our standard fee schedule, adjusted yearly, and terms of the subsequent contract of engagement.

5. Loss or alteration of any part of this report invalidates the entire report. Ownership of any documents produced passes to the Client only when all fess have been paid.

6. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior expressed written or verbal consent of the consultant.

7. Neither all nor any part of the contents of this report, nor copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales, or other media, without the prior expressed written or verbal consent of the consultant, particularly as to value conclusions, identity of the consultant, or any reference to any professional society or institute or to any initialed designation conferred upon the consultant as stated in his qualifications.

8. This report and any values expressed herein represent the opinion of the consultant and the consultant's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.

9. Sketches, diagrams, graphs, drawings and photographs within this report are intended as visual aids and are not necessarily to scale and should not be construed as engineering or architectural reports or surveys. The reproduction of information generated by other consultants is for coordination and ease of

reference. Inclusion of such information does not constitute a representation by the consultant as to the sufficiency or accuracy of the information.

10. Unless expressed otherwise: 1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2) the inspection is limited to visual examination of accessible items without laboratory analysis, dissection, excavation, probing or coring, unless otherwise stated.

11. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in the future.

12. This report is based on the observations and opinions of Edwin E. Stirtz, and does not provide guarantees regarding the future performance, health, vigor, structural stability or safety of the plants described herein. Neither this author nor Sierra Nevada Arborists has assumed any responsibility for liability associated with the trees on or adjacent to this Project Site, their future demise and/or any damage which may result therefrom.

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13. The information contained within this report is true to the best of the author's knowledge and experience as of the date it was prepared; however, certain conditions may exist which only a comprehensive, scientific, investigation might reveal which should be performed by other consulting professionals.

14. The legal description, dimensions, and areas herein are assumed to be correct. No responsibility is assumed for matters that are legal in nature.

15. Any changes to an established tree's environment can cause its decline, death and/or structural failure.

DEFINITIONS

Tree Number:	Corresponds to aluminum tag attached to the tree.
Species Identification:	Scientific and common species name.
Diameter ("DBH"):	This is the trunk diameter measured at breast height (industry standard 4.5 feet above ground level).
Dripline radius ("DLR"):	A radius equal to the horizontal distance from the trunk of the tree to the end of the farthest most branch tip prior to any cutting. When depicted on a map, the dripline will appear as an irregularly shaped circle that follows the contour of the tree's branches as seen from overhead.
Protected Zone:	A circle equal to the largest radius of a protected tree's dripline plus 1 foot.
Root Crown:	Assessment of the root crown/collar area located at the base of the trunk of the tree at soil level.
Trunk:	Assessment of the tree's main trunk from ground level generally to the point of the primary crotch structure.
Limbs:	Assessment of both smaller and larger branching, generally from primary crotch structure to branch tips.
Foliage:	Tree's leaves.
Overall Condition:	Describes overall condition of the tree in terms of structure and vigor.
Recommendation:	Pre-development recommendations based upon observed characteristics noted at the time of the field inventory effort.
Obscured:	Occasionally some portion of the tree may be obscured from visual inspection due to the presence of dense vegetation which, during the course of inspection for the arborist report, prevented a complete evaluation of the tree. In these cases, if the tree is to be retained on site the vegetation should be removed to allow for a complete assessment of the tree prior to making final decisions regarding the suitability for retention.

TREE CONDITION RATING CRITERIA

RATING TERM	ROOT CROWN	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR
Good	No apparent injuries, decay, cavities or evidence of hollowing; no anchoring roots exposed; no indications of infestation or disease	No apparent injuries, decay, cavities or evidence of hollowing; no codominant attachments or multiple trunk attachments are observed; no indications of infestation or disease	No apparent injuries, decay, cavities or evidence of hollowing; below average amount of dead limbs or twigs; no major limb failures or included bark; callus growth is vigorous	Leaf size, color and density are typical for the species; buds are normal in size, viable, abundant and uniform throughout the canopy; annual seasonal growth increments are average or above average; no insect or disease infestations/ infections evident	No apparent structural defects; no weak crotches; no excessively weighted branches and no significant cavities or decay	Tree appears healthy and has little or no significant deadwood; foliage is normal and healthy
Fair	Small to moderate injuries, decay, cavities or hollowing may be evident but are not currently affecting the overall structure; some evidence of infestation or disease may be present but is not currently affecting the tree's structure	Small to moderate injuries, decay, cavities or hollowing may be evident; codominant branching or multiple trunk attachments or minor bark inclusion may be observed; some infestation or disease may be present but not currently affecting the tree's structure	Small to moderate injuries, decay or cavities may be present; average or above average dead limbs or twigs may be present; some limb failures or bark inclusion observed; callus growth is average	Leaf size, color and density are typical or slightly below typical for the species; buds are normal or slightly sparse with potentially varied viability, abundance and distribution throughout the canopy; annual seasonal growth increments are average or slightly below average; minor insect or disease infestation/infection may be present	Minor structural problems such as weak crotches, minor wounds and/or cavities or moderate amount of excessive weight; non-critical structural defects which can be mitigated through pruning, cabling or bracing	Tree appears stressed or partially damaged; minimal vegetative growth since previous season; moderate amount of deadwood, abnormal foliage and minor lesions or cambium dieback
Poor	Moderate to severe injuries, decay, cavities or hollowing may be evident and are affecting the overall structure; presence of infestation or disease may be significant and affecting the tree's structure	Moderate to severe injuries, decay, cavities or hollowing may be evident and are affecting the tree's structure; presence of infestation or disease may be significant and affecting the tree's structure	Severe injuries, decay or cavities may be present; major deadwood, twig dieback, limb failures or bark inclusion observed; callus growth is below average	Leaf size, color and density are obviously abnormal; buds are obviously abnormal or absent; annual seasonal growth is well below average for the species; insect or disease problems may be severe	Obvious major structural problems which cannot be corrected with mitigation; potential for major limb, trunk or root system failure is high; significant decay or dieback may be present	Tree health is declining; no new vegetative growth; large amounts of deadwood; foliage is severely abnormal

The ratings "good to fair" and "fair to poor" are used to describe trees that fall between the described major categories and have elements of both

GENERAL PROTECTION GUIDELINES FOR TREES PLANNED FOR PRESERVATION

Great care must be exercised when work is conducted upon or around protected trees. The purpose of these General Protection Measures is to provide guidelines to protect the health of the affected protected trees. These guidelines apply to all encroachments into the protected zone of a protected tree, and may be incorporated into tree permits and/or other Conditions of Approval as deemed appropriate by the applicable governing body.

- A circle with a radius measurement from the trunk of the tree to the tip of its longest limb, plus one foot, shall constitute the critical root zone protection area of each protected tree. Limbs must not be cut back in order to change the dripline. The area beneath the dripline is a critical portion of the root zone and defines the minimum protected area of each protected tree. Removing limbs that make up the dripline does not change the protected area.

- Any protected trees on site which require pruning shall be pruned by an ISA Certified Arborist prior to the start of construction work. All pruning shall be in accordance with the American National Standards Institute (ANSI) A300 pruning standards, ANSI Standard 2133.1-2000 regarding safety practices, and the International Society of Arboriculture (ISA) "Tree Pruning Guidelines" and Best Management Practices.

- Prior to initiating construction, temporary protective fencing shall be installed at least one foot outside the root protection zone of the protected trees in order to avoid damage to the tree canopies and root systems. Fencing shall be installed in accordance with the approved fencing plan prior to the commencement of any grading operations or such other time as determined by the review body. The developer shall contact the Project Arborist and the Planning Department for an inspection of the fencing prior to commencing construction activities on site.

- Signs shall be installed on the protective fence in four (4) equidistant locations around each individual protected tree. The size of each sign must be a minimum of two (2) feet by two (2) feet and must contain the following language:

  WARNING: THIS FENCE SHALL NOT BE REMOVED OR RELOCATED WITHOUT WRITTEN AUTHORIZATION FROM THE CITY OF VACAVILLE.

  Once approval has been obtained by the City of Vacaville protective fencing shall remain in place throughout the entire construction period and shall not be removed, relocated, taken down or otherwise modified in whole or in part without prior written authorization from the Agency, or as deemed necessary by the Project Arborist to facilitate approved activities within the root protection zone.

- Any removal of paving or structures (i.e. demolition) that occurs within the dripline of a protected tree shall be done under the direct supervision of the Project Arborist. To the maximum extent feasible, demolition work within the dripline protection area of the protected tree shall be performed by hand. If the Project Arborist determines that it is not feasible to perform some portion(s) of this work by hand, then the smallest/lightest weight equipment that will adequately perform the demolition work shall be used.

- No signs, ropes, cables (except those which may be installed by an ISA Certified Arborist to provide limb support) or any other items shall be attached to the protected trees. Small metallic numbering tags for the purpose of identification in preparing tree reports and inventories shall be allowed.

- No vehicles, construction equipment, mobile homes/office, supplies, materials or facilities shall be driven, parked, stockpiled or located within the driplines of protected trees.

- Drainage patterns on the site shall not be modified so that water collects, stands or is diverted across the dripline of any protected tree.

- No trenching shall be allowed within the driplines of protected trees, except as specifically approved by the Planning Department as set forth in the project's Conditions of Approval and/or approved tree permit. If it is absolutely necessary to install underground utilities within the dripline of a protected tree the utility line within the protected zone shall be "bored and jacked" or performed utilizing hand tools to avoid root injury under the direct supervision of the Project Arborist.

- Grading within the protected zone of a protected tree shall be minimized. Cuts within the protected zone shall be maintained at less than 20% of the critical root zone area. Grade cuts shall be monitored by the Project Arborist. Any damaged roots encountered shall be root pruned and properly treated as deemed necessary by the Project Arborist.

- Minor roots less than one (1) inch in diameter encountered during approved excavation and/or grading activities may be cut, but damaged roots shall be traced back and cleanly cut behind any split, cracked or damaged area as deemed necessary by the Project Arborist.

- Major roots greater than one (1) inch in diameter encountered during approved excavation and/or grading activities may not be cut without approval of the Project Arborist. Depending upon the type of improvement being proposed, bridging techniques or a new site design may need to be employed to protect the roots and the tree.

- Cut faces, which will be exposed for more than 2-3 days, shall be covered with dense burlap fabric and watered to maintain soil moisture at least on a daily basis (or possibly more frequently during summer months). If any native ground surface fabric within the protected zone must be removed for any reason, it shall be replaced within forty-eight (48) hours.

- If fills exceed 1 foot in depth up to 20% of the critical root zone area, aeration systems may serve to mitigate the presence of the fill materials as determined by the Project Arborist.

- When fill materials are deemed necessary on two or three sides of a tree it is critical to provide for drainage away from the critical root zone area of the tree (particularly when considering heavy winter rainfalls). Overland releases and subterranean drains dug outside the critical root zone area and tied directly to the main storm drain system are two options.

- In cases where a permit has been approved for construction of a retaining wall(s) within the protected zone of a protected tree the applicant will be required to provide for immediate protection of exposed roots from moisture loss during the time prior to completion of the wall. The retaining wall within the protected zone of the protected tree shall be constructed within seventy-two (72) hours after completion of grading within the root protection zone.

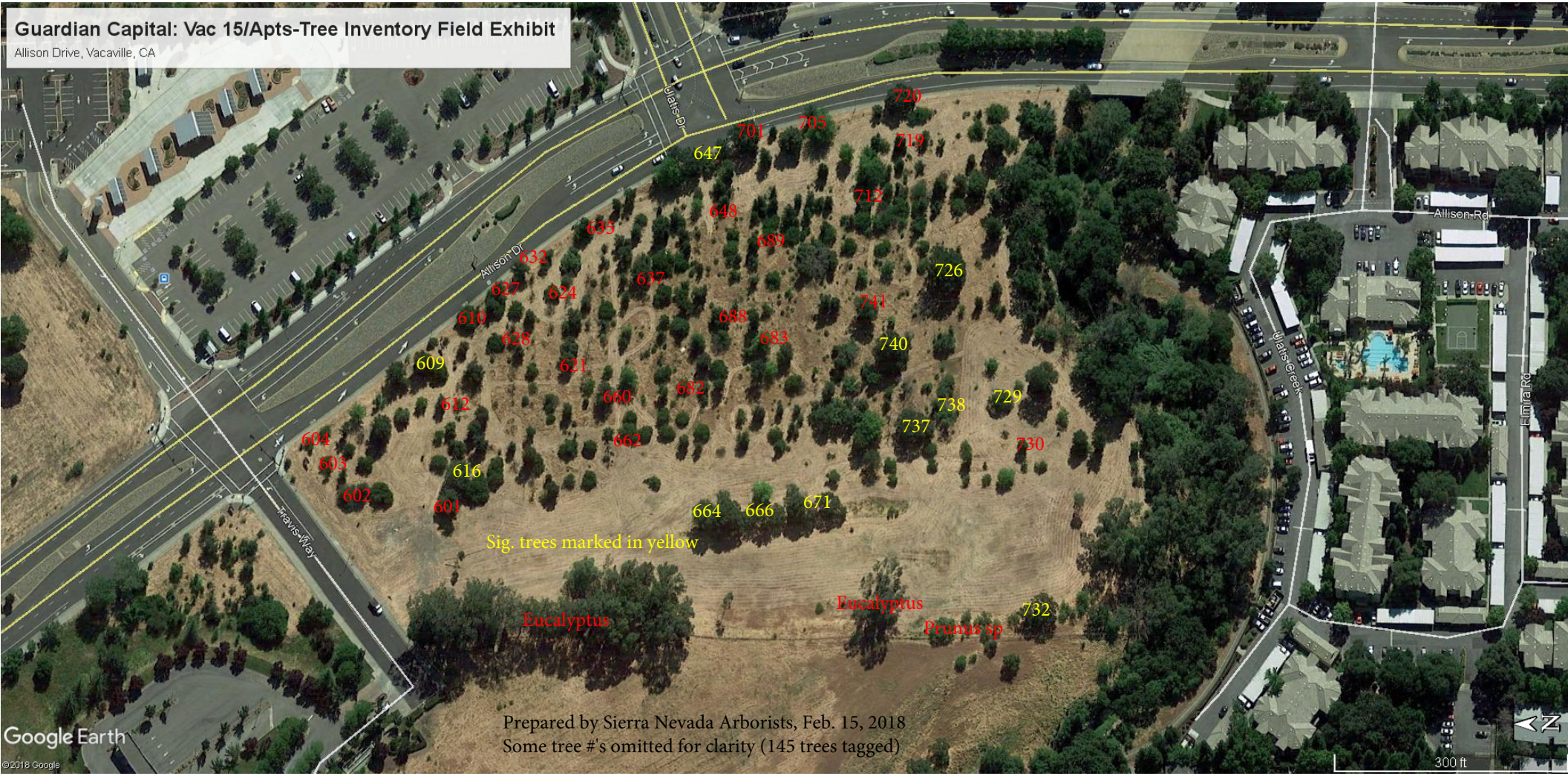
- The construction of impervious surfaces within the dripline of a protected tree shall be minimized. When necessary, a piped aeration system shall be installed under the direct supervision of the Project Arborist.

- Preservation devices such as aeration systems, tree wells, drains, special paving and cabling systems must be installed in conformance with approved plans and certified by the Project Arborist.

- No sprinkler or irrigation system shall be installed in such a manner that sprays water or requires trenching within the dripline of a protected tree. An above ground drip irrigation system is recommended. An independent low-flow drip irrigation system may be used for establishing drought-tolerant plants within the protected zone of a protected tree. Irrigation shall be gradually reduced and discontinued after a two (2) year period.

- All portions of permanent fencing that will encroach into the protected zone of a protected tree shall be constructed using posts set no closer than ten (10) feet on center. Posts shall be spaced in such a manner as to maximize the separation between the tree trunks and the posts in order to reduce impacts to the tree(s).

- Landscaping beneath native oak trees may include non-plant materials such as bark mulch, wood chips, boulders, etc. Planting live material under protected native oak trees is generally discouraged, and is not recommended within six (6) feet of the trunk of a native oak tree with a diameter a breast height (DBH) of eighteen (18) inches or less, or within ten (10) feet of the trunk of a native oak tree with a DBH of more than eighteen (18) inches. The only plant species which shall be planted within the dripline of native oak trees are those which are tolerant of the natural, semi-arid environs of the tree(s).


Guardian Capital: Vac 15/Apts-Tree Inventory Field Exhibit
Allison Drive, Vacaville, CA
Allison Dr
Ulatis Dr
Travis Way
Allison Rd
Ulatis Creek
Elmira Rd
720
701
705
719
647
712
648
635
689
632
726
637
627
624
741
610
688
628
683
740
609
621
682
612
660
738
729
737
604
662
730
603
616
602
601
664
666
671
732
Sig. trees marked in yellow
Eucalyptus
Eucalyptus
Prunus sp
Prepared by Sierra Nevada Arborists, Feb. 15, 2018
Some tree #'s omitted for clarity (145 trees tagged)
Google Earth
©2018 Google
300 ft

GUARDIAN INVESTMENT CAPITAL, LLC
Vac 15/Apartments at Allison Drive Project Site
City of Vacaville, California
TREE INVENTORY SUMMARY

TREE #	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	PRO-TECTED	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	MAINTENANCE RECOMMENDATIONS
							RT CR	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR		
601	Valley Oak	*(Quercus lobata)*		16	18	X	Fair	Poor	Poor to fair	Dormant	Poor	Fair	Out of balance to the south; slightly above average amount of deadwood.	None at this time.
602	Valley Oak	*(Quercus lobata)*		8	9		Fair	Fair	Fair	Dormant	Fair	Fair		None at this time.
603	Valley Oak	*(Quercus lobata)*		6	8		Fair	Fair	Fair	Dormant	Fair	Fair		None at this time.
604	Valley Oak	*(Quercus lobata)*		6	8		Fair	Fair	Fair	Dormant	Fair	Fair		None at this time.
605	Pecan	*(Carya illinoinensis)*		8	12		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
606	Valley Oak	*(Quercus lobata)*		14	16	X	Fair	Poor to fair	Fair	Dormant	Poor to fair	Fair	Measured 3' above grade; forks 4'-5' above grade; inherently weak primary crotch with included bark; additional weak attachments; slightly above average amount of deadwood.	None at this time.
607	Valley Oak	*(Quercus lobata)*		6	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly out of balance to the north; slightly above average amount of deadwood.	None at this time.
608	Valley Oak	*(Quercus lobata)*		6	6		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
609	Valley Oak	*(Quercus lobata)*	11,11	22	15	X	Fair	Poor to fair	Fair	Dormant	Poor to fair	Fair	Forks 3' above grade with inherently weak primary crotch with included bark; above average amount of deadwood.	None at this time.
610	Valley Oak	*(Quercus lobata)*		15	20	X	Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Callusing trunk wound, west side, due to rubbing injury from adjacent tree; weak attachment; above average amount of deadwood.	None at this time.
611	Valley Oak	*(Quercus lobata)*	6,7	13	11	X	Fair	Fair	Fair	Dormant	Fair	Fair	Forks 1' above grade; weak attachments.	None at this time.
612	Valley Oak	*(Quercus lobata)*		8	9		Fair	Fair	Fair	Dormant	Fair	Fair	Measured 3' above grade; forks 3.5' above grade; slightly above average amount of deadwood.	None at this time.
613	Valley Oak	*(Quercus lobata)*		8	11		Fair	Fair	Fair	Dormant	Fair	Fair		None at this time.
614	Valley Oak	*(Quercus lobata)*		6	7		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
615	Valley Oak	*(Quercus lobata)*		11	12	X	Fair	Fair	Fair	Dormant	Fair	Fair	Above average amount of deadwood.	None at this time.
616	Valley Oak	*(Quercus lobata)*		18	20	X	Fair	Fair	Fair	Dormant	Fair	Fair	Measured 2' above grade; forks 3'-4' above grade; weak attachments; above average amount of deadwood.	None at this time.
617	Valley Oak	*(Quercus lobata)*		10	15	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly out of balance to the south; slightly above average amount of deadwood.	None at this time.

GUARDIAN INVESTMENT CAPITAL, LLC
Vac 15/Apartments at Allison Drive Project Site
City of Vacaville, California
TREE INVENTORY SUMMARY

TREE #	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	PRO-TECTED	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	MAINTENANCE RECOMMENDATIONS
							RT CR	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR		
618	Valley Oak	*(Quercus lobata)*		6	7		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
619	Valley Oak	*(Quercus lobata)*		11	13	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
620	Valley Oak	*(Quercus lobata)*	5,5,6	16	7	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
621	Valley Oak	*(Quercus lobata)*		7	9		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
622	Valley Oak	*(Quercus lobata)*		11	16	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly out of balance to the southeast; slightly above average amount of deadwood.	None at this time.
623	Valley Oak	*(Quercus lobata)*		12	17	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
624	Valley Oak	*(Quercus lobata)*		14	19	X	Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Suppressed; out of balance to the south; slightly above average amount of deadwood.	None at this time.
625	Valley Oak	*(Quercus lobata)*		10	10	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
626	Valley Oak	*(Quercus lobata)*		7	12		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
627	Valley Oak	*(Quercus lobata)*		7	11		Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Out of balance to the south; slightly above average amount of deadwood.	None at this time.
628	Valley Oak	*(Quercus lobata)*		12	17	X	Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Out of balance to the north; above average amount of deadwood.	None at this time.
629	Valley Oak	*(Quercus lobata)*	5,7	12	15	X	Fair	Fair	Fair	Dormant	Fair	Fair	Forks 1' above grade; weak attachments; above average amount of deadwood.	None at this time.
630	Valley Oak	*(Quercus lobata)*		6	6		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
631	Valley Oak	*(Quercus lobata)*		13	15	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
632	Valley Oak	*(Quercus lobata)*		6	6		Fair	Fair	Fair	Dormant	Fair	Fair	Measured 3' above grade; slightly above average amount of deadwood.	None at this time.
633	Valley Oak	*(Quercus lobata)*		6	7		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
634	Valley Oak	*(Quercus lobata)*	4,5	9	6		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.

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TREE INVENTORY SUMMARY

TREE #	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	PRO-TECTED	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	MAINTENANCE RECOMMENDATIONS
							RT CR	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR		
635	Flowering Pear	*(Pyrus calleryana)*		10	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
636	Valley Oak	*(Quercus lobata)*		8	9		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
637	Valley Oak	*(Quercus lobata)*		9	11		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
638	Valley Oak	*(Quercus lobata)*	4,5	9	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
639	Valley Oak	*(Quercus lobata)*		7	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
640	Valley Oak	*(Quercus lobata)*		8	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
641	Valley Oak	*(Quercus lobata)*		10	12	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
642	Valley Oak	*(Quercus lobata)*		6	6		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
643	Valley Oak	*(Quercus lobata)*		6	5		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
644	Pecan	*(Carya illinoinensis)*		6	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
645	Pecan	*(Carya illinoinensis)*		13	16		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
646	Valley Oak	*(Quercus lobata)*		14	19	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
647	Valley Oak	*(Quercus lobata)*	9,13	22	15	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
648	Pecan	*(Carya illinoinensis)*		8	7		Fair	Fair	Fair	Dormant	Fair	Fair		None at this time.
649	Valley Oak	*(Quercus lobata)*		6	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
650	Valley Oak	*(Quercus lobata)*	3,5	8	5		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
651	Valley Oak	*(Quercus lobata)*		13	13	X	Fair	Fair	Fair	Dormant	Fair	Fair	Measured 2' above grade; forks 3.5' above grade with inherently weak primary crotch; slightly above average amount of deadwood.	None at this time.
652	Valley Oak	*(Quercus lobata)*	4,5	9	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.

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TREE INVENTORY SUMMARY

TREE #	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	PRO-TECTED	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	MAINTENANCE RECOMMENDATIONS
							RT CR	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR		
653	Valley Oak	*(Quercus lobata)*	5,6,7	18	12	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
654	Valley Oak	*(Quercus lobata)*	4,6	10	11	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
655	Valley Oak	*(Quercus lobata)*		11	14	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
656	Valley Oak	*(Quercus lobata)*		7	9		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
657	Valley Oak	*(Quercus lobata)*		8	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
658	Valley Oak	*(Quercus lobata)*		6	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
659	Valley Oak	*(Quercus lobata)*		6	6		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
660	Pecan	*(Carya illinoinensis)*		9	12		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
661	Valley Oak	*(Quercus lobata)*		7	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
662	Valley Oak	*(Quercus lobata)*		11	17	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
663	Valley Oak	*(Quercus lobata)*		7	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
664	Valley Oak	*(Quercus lobata)*		17	20	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
665	Valley Oak	*(Quercus lobata)*		7	13		Fair	Fair	Fair	Dormant	Fair	Fair	Out of balance to the northeast; slightly above average amount of deadwood.	None at this time.
666	Valley Oak	*(Quercus lobata)*		27	29	X	Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Forks 8' above grade; inherently weak crotches with included bark; additional weak attachments; above average amount of deadwood.	None at this time.
667	Valley Oak	*(Quercus lobata)*		13	17	X	Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Lower trunk has a bow 3'-5' above grade to the northwest; weak attachments; above average amount of deadwood.	None at this time.
668	Valley Oak	*(Quercus lobata)*		14	17	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
669	Valley Oak	*(Quercus lobata)*		11	13	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.

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TREE INVENTORY SUMMARY

TREE #	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	PRO-TECTED	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	MAINTENANCE RECOMMENDATIONS
							RT CR	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR		
670	Pecan	*(Carya illinoinensis)*		10	13		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
671	Valley Oak	*(Quercus lobata)*		17	19	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
672	Valley Oak	*(Quercus lobata)*		13	15	X	Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Measured 1' above grade; forks 3'-5' above grade; weak attachments; lower trunk has a minor bow 3'-6' above grade; slightly above average amount of deadwood.	None at this time.
673	Valley Oak	*(Quercus lobata)*		16	16	X	Fair	Fair	Fair	Dormant	Fair	Fair	Measured 3' above grade; forks 4'-5' above grade; weak attachments; above average amount of deadwood.	None at this time.
674	Valley Oak	*(Quercus lobata)*		7	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
675	Valley Oak	*(Quercus lobata)*	5,6,8	19	13	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
676	Valley Oak	*(Quercus lobata)*		10	12	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
677	Pecan	*(Carya illinoinensis)*	8,8	16	15		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
678	Valley Oak	*(Quercus lobata)*		7	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
679	Brazilian Pepper	*(Schinus terebinthifolius)*		8	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
680	Valley Oak	*(Quercus lobata)*		11	16	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
681	Valley Oak	*(Quercus lobata)*	5,6	11	13	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
682	Valley Oak	*(Quercus lobata)*	6,6	12	9	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
683	Valley Oak	*(Quercus lobata)*	7,9	16	14	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
684	Pecan	*(Carya illinoinensis)*	4,5	9	9		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
685	Valley Oak	*(Quercus lobata)*		11	15	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
686	Valley Oak	*(Quercus lobata)*		6	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.

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TREE INVENTORY SUMMARY

TREE #	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	PRO-TECTED	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	MAINTENANCE RECOMMENDATIONS
							RT CR	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR		
687	Valley Oak	*(Quercus lobata)*		7	11		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
688	Pecan	*(Carya illinoinensis)*		10	12		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
689	Valley Oak	*(Quercus lobata)*	5,9	14	12	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
690	Valley Oak	*(Quercus lobata)*		6	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
691	Valley Oak	*(Quercus lobata)*		6	7		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
692	Valley Oak	*(Quercus lobata)*		6	6		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
693	Valley Oak	*(Quercus lobata)*		10	13	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
694	Valley Oak	*(Quercus lobata)*		7	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
695	Valley Oak	*(Quercus lobata)*		7	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
696	Valley Oak	*(Quercus lobata)*		6	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
697	Valley Oak	*(Quercus lobata)*		7	9		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
698	Valley Oak	*(Quercus lobata)*		6	6		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
699	Valley Oak	*(Quercus lobata)*		6	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
700	Valley Oak	*(Quercus lobata)*	7,8	15	13	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
701	Valley Oak	*(Quercus lobata)*		13	15	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
702	Valley Oak	*(Quercus lobata)*	14,15	29	23	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
703	Valley Oak	*(Quercus lobata)*	5,7	12	10	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.

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TREE #	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	PRO-TECTED	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	MAINTENANCE RECOMMENDATIONS
							RT CR	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR		
704	Valley Oak	*(Quercus lobata)*		15	19	X	Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Large lateral emanates 3' above grade toward the south at the point of some type of old injury; slightly above average amount of deadwood.	None at this time.
705	Valley Oak	*(Quercus lobata)*		9	13		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
706	Pecan	*(Carya illinoinensis)*		13	17		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
707	Pecan	*(Carya illinoinensis)*	4,5,5	14	9		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
708	Valley Oak	*(Quercus lobata)*	5,6	11	10	X	Fair	Fair	Fair	Dormant	Fair	Fair	Root collars are slightly detached; slightly above average amount of deadwood.	None at this time.
709	Valley Oak	*(Quercus lobata)*		10	19	X	Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Suppressed; out of balance to the southwest; slightly above average amount of deadwood.	None at this time.
710	Pecan	*(Carya illinoinensis)*		8	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
711	Valley Oak	*(Quercus lobata)*		6	7		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
712	Valley Oak	*(Quercus lobata)*		6	7		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
713	Valley Oak	*(Quercus lobata)*		6	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
714	Valley Oak	*(Quercus lobata)*		7	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
715	Valley Oak	*(Quercus lobata)*		9	14		Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Suppressed; out of balance to the south; slightly above average amount of deadwood.	None at this time.
716	Valley Oak	*(Quercus lobata)*	6,8,9	23	15	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
717	Valley Oak	*(Quercus lobata)*		17	21	X	Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Measured 1' above grade; forks 2'-3' above grade with inherently weak primary crotch with included bark; above average amount of deadwood.	None at this time.
718	Valley Oak	*(Quercus lobata)*		7	11		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.

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TREE #	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	PRO-TECTED	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	MAINTENANCE RECOMMENDATIONS
							RT CR	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR		
719	Valley Oak	*(Quercus lobata)*	6,6	12	8	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
720	Valley Oak	*(Quercus lobata)*	6,11,12	29	21	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
721	Valley Oak	*(Quercus lobata)*	4,6	10	7	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
722	Valley Oak	*(Quercus lobata)*	4,6	10	10	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
723	Black Walnut	*(Juglans nigra)*		7	9		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
724	Valley Oak	*(Quercus lobata)*		10	12	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
725	Valley Oak	*(Quercus lobata)*		14	15	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
726	Valley Oak	*(Quercus lobata)*		24	28	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
727	Valley Oak	*(Quercus lobata)*		8	9		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
728	Valley Oak	*(Quercus lobata)*	4,5	9	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
729	Valley Oak	*(Quercus lobata)*	14,14	28	21	X	Fair	Fair	Fair	Dormant	Fair	Fair	Forks 3' above grade; slightly above average amount of deadwood.	None at this time.
730	Valley Oak	*(Quercus lobata)*		10	12	X	Fair	Fair	Fair	Dormant	Fair	Fair	Leans east; slightly above average amount of deadwood.	None at this time.
731	Valley Oak	*(Quercus lobata)*		11	14	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
732	Valley Oak	*(Quercus lobata)*		18	20	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
733	Valley Oak	*(Quercus lobata)*		9	13		Fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Measured 2' above grade; suppressed; out of balance to the north; slightly above average amount of deadwood.	None at this time.
734	Valley Oak	*(Quercus lobata)*		8	13		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
735	Pecan	*(Carya illinoinensis)*		6	6		Fair	Fair	Fair	Dormant	Fair	Fair		None at this time.
736	Valley Oak	*(Quercus lobata)*	8,8	16	10	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.

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TREE #	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	PRO-TECTED	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	MAINTENANCE RECOMMENDATIONS
							RT CR	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR		
737	Valley Oak	*(Quercus lobata)*		22	24	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
738	California Black Walnut	*(Juglans californica)*	5,5,6,7	23	12	X	Poor to fair	Poor to fair	Poor to fair	Dormant	Poor to fair	Fair	Callusing basal lower trunk wounds, various locations; minor decay; weak attachments; above average amount of deadwood.	None at this time.
739	English Walnut	*(Juglans regia)*		17	16		Poor to fair	Poor	Poor	Dormant	Poor to fair	Poor	Measured 1' above grade; poor bud swell. Tree appears to be about 80% dead.	***Recommend removal due to nature and extent of noted defects***
740	Valley Oak	*(Quercus lobata)*		31	25	X	Poor to fair	Poor	Poor to fair	Dormant	Poor to fair	Fair	Measured 1' above grade; forks 2'-4' above grade with inherently weak primary crotches with included bark; above average amount of deadwood.	None at this time.
741	Valley Oak	*(Quercus lobata)*		14	19	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
742	Valley Oak	*(Quercus lobata)*	5,5	10	9	X	Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
743	Valley Oak	*(Quercus lobata)*		9	10		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.
744	English Walnut	*(Juglans regia)*	8,11,13	32	18		Poor to fair	Poor	Poor to fair	Dormant	Poor	Fair	Callusing basal lower trunk wounds, various locations; moderate decay evident; several failures in the upper canopy; above average amount of deadwood; poor bud formation. Tree appears to be 80% dead.	***Recommend removal due to nature and extent of noted defects***
745	Valley Oak	*(Quercus lobata)*	4,5	9	8		Fair	Fair	Fair	Dormant	Fair	Fair	Slightly above average amount of deadwood.	None at this time.

TOTAL INVENTORIED TREES = 145 trees (1,640 aggregate diameter inches)
TOTAL PROTECTED TREES = 68 trees (1,018 aggregate diameter inches)
TOTAL NON-PROTECTED TREES = 77 trees (622 aggregate diameter inches)
TOTAL RECOMMENDED REMOVALS = 2 trees (49 aggregate diameter inches)

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ATTACHMENT 4

GEOTECHNICAL EXPLORATION REPORT

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GEOTECHNICAL EXPLORATION REPORT
on
PROPOSED MULTI-FAMILY DEVELOPMENTS
at
Phase 1: Casa Dei Vista Apartments on Allison Drive
Phase 2: Future Multi-Family Project on Harbison Drive
Vacaville, California
for
GUARDIAN INVESTMENT CAPITAL, LLC



By

KC ENGINEERING COMPANY

Project No. VV4567

3 October 2018

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KC ENGINEERING COMPANY
A SUBSIDIARY OF MATERIALS TESTING, INC.

Project No. VV4567
3 October 2018

Guardian Investment Capital, LLC
1120 Fairfield Avenue
Roseville, CA 95678
c/o Rich Alexander

Subject: Proposed Multi-Family Developments
Phase 1 – Casa Dei Vista Apartments on Allison Drive
Phase 2 – Future Multi-Family Project on Harbison Drive
Vacaville, California
GEOTECHNICAL EXPLORATION REPORT

Dear Mr. Alexander:

In accordance with your authorization, **KC ENGINEERING COMPANY** has explored the geotechnical conditions of the surface and subsurface soils of two proposed multi-family development projects in Vacaville, California. Phase 1 is currently planned as Casa Dei Vista Apartments and is located on the northwest corner of Ulatis Creek and Allison Drive. Phase 2 is a future multi-family project located on the northwest corner of Harbison Drive and Ulatis Drive.

The accompanying report presents our conclusions and recommendations based on our exploration. Our findings indicate that both of the proposed multi-family projects are geotechnically feasible for construction on the subject sites provided the recommendations of this report are carefully followed and are incorporated into the project plans and specifications.

Should you have any questions relating to the contents of this report or should you require additional information, please contact our office at your convenience.

REGISTERED PROFESSIONAL ENGINEER
DAVID V. CYMANSKI
GE 2585
EXP. 6-30-20
GEOTECHNICAL
STATE OF CALIFORNIA

Respectfully Submitted,
KC ENGINEERING COMPANY

David V. Cymanski, G.E.
Principal Engineer

Copies: 3 mail, email to Client & Phillippi

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- Typical Fill Slope & Subdrain Detail
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GEOTECHNICAL EXPLORATION

Purpose and Scope

The purpose of the geotechnical exploration for the two proposed multi-family projects in Vacaville, California was to determine the surface and subsurface soil conditions at the subject sites. Based on the results of the exploration, geotechnical criteria were established for the grading of the sites, the design of foundations, slabs-on-grade, retaining walls, pavements, drainage, and the construction of other related facilities on the property.

In accordance with your authorization, our exploration services included the following tasks:

a. A review of available geotechnical and geologic literature concerning the site and vicinity;
b. Site reconnaissance by the Geotechnical Engineer to observe and map surface conditions;
c. Drilling and logging of four supplemental exploratory test borings and sampling of the subsurface soils;
d. Laboratory testing of the samples obtained to determine their classification and engineering characteristics;
e. Analysis of the data and formulation of conclusions and recommendations; and
f. Preparation of this written report.

Site Location and Description

The two proposed multi-family projects are located at the intersection of Allison Drive and Ulatis Drive in Vacaville, California as shown on Figure 1, “Aerial Vicinity Map”. The two projects will be developed in two phases and are described separately below.

The Phase 1 site is bounded on the north by Travis Way, on the east by Allison Drive, on the south by Ulatis Creek, and on the west by an undeveloped uphill field. The site is undeveloped and contains numerous small to mature trees. Google Earth aerial images dating back to 1993 indicate that the site was formerly an orchard. An old asphalt driveway enters the site from the north. The topography of the site is shown on Figure 2, “Site Plan” and generally consists of an upsloping hillside on the west and relatively flat terrain on the central to eastern portion of the property. The Ulatis Creek bank on the south is approximately 23 feet in vertical height on the east and 28 feet on the west, with variable slope inclinations of about 1H:1V to 2.5H:1V. The steeper sections are located on the west near the hillside ridge and on the central portion of the property. Relatively level mid-slope benches with homeless encampments are present near the eastern and central locations. The creek bank is generally covered with dense weeds, bushes and small to large mature trees. Sandstone bedrock is exposed near the toe of creek on the western end. We

should note that evidence of past shallow sloughing and erosion were evident primarily on the lower flanks of the creek bank.

The Phase 2 site is bounded on the north by a driveway and Walmart, on the east by Harbison Drive, on the south by Ulatis Drive and on the east by the Vacaville Transportation Center and Allison Drive. The site is relatively flat and covered in dense weeds with numerous scattered small to larger mature trees. Google Earth aerial images dating back to 1993 indicate that the site was formerly an orchard and that a residence and a number of sheds/barns were located on the north central portion of the site.

The above descriptions are based on a reconnaissance of the site by our Geotechnical Engineer, a review of a Google Earth aerial images dating from 1993 to 2018, and a review of the site layout and grading plans for the Phase 1 Casa Dei Vista project by Phillippi Engineering, dated 9/11/18. The 2018 Google Aerial image was used as the basis for our "Aerial Vicinity Map" included as Figure 1. The Grading Plan for Casa Dei Vista and the Google aerial image from the ACE Quality Control report were used as the basis for our Site Plans includes as Figures 2 and 3 in the Appendix of this report.

Proposed Construction

The proposed construction for the two multi-family projects are planned to occur in two or more phases. Currently, the Phase 1 site west of Allison Drive is planned to be developed with six separate apartment buildings and an office/clubhouse. The apartment buildings are expected to be two or three-stories in height and constructed of conventional wood framing. The office clubhouse will likely be one-story. The structures are planned to be supported on post-tensioned slab foundations. A swimming pool and other common area sports related improvements are planned. Additional site improvements are planned to consist of underground utilities, streets, parking lots, pathways, retaining walls, lighting, garbage enclosures, landscaping and storm-water bio-filtration swales or basins. Grading for the Casa Dei Vista development is planned to consist of various cuts and fills of 20 feet or less to establish pad and pavement grades. The western side of the site will require a cut slope up to 22 feet high. Cuts and fills are expected for the building pads and eastern portion of the site.

The Phase 2 site west of Harbison Drive is expected to have a similar apartment and office/ clubhouse layout with similar site improvements. Grading is expected to have cuts and fills of 5 vertical feet or less.

Report Review

The geotechnical conditions of the site were originally explored by ACE Quality Control as presented in their Geotechnical Engineering Study report dated 6/19/18. Their investigation included the drilling of 13 exploratory borings across the two project sites. The boring logs and lab testing indicate that the site materials generally consist of alluvial sands and clays within the upper 51.5 feet. Groundwater was not encountered in any of their borings. Their Exploration Logs and lab results are included in the Appendix of this report.

We were then retained by the property ownership group to review the ACE report, perform supplemental field and lab explorations, and then prepare this updated Geotechnical Exploration Report. Additionally, we were retained to perform a stability evaluation of the adjacent Ulatis Creek bank on the south side of the Casa Dei Vista project. Our supplemental exploration and stability evaluation is presented in our report "Ulatis Creek Stable Top of Bank Evaluation" dated 8/4/18, included in the Appendix of this report for completeness. In summary, we determined and confirmed a setback distance from the top of bank as shown on the Phillippi plans dated 9/11/18.

Field Exploration

As noted above, the site was recently explored by ACE with 13 borings scattered across the projects. Our supplemental field exploration was performed on 7/27/18 and 8/3/18 and included a reconnaissance of the site and the drilling of 4 additional exploratory borings. All of the approximate boring locations are shown on Figures 2 and 3. Representative bulk samples of the near surface soils were also obtained for lab testing.

The ACE and KCE borings were drilled to varying depths ranging up to 51.5 feet below grade. Our borings were drilled with a Mobile B-24 rig using a power-driven, 4-inch diameter continuous flight solid augers. Visual classifications were made from the auger cuttings and the samples in the field. As the drilling proceeded, relatively undisturbed tube samples were obtained by driving a 3-inch O.D., California Modified split-tube sampler, containing thin brass liners, into the boring bottom in accordance with ASTM D3550. Disturbed samples were also obtained by driving a 2-inch O.D., split-barrel SPT sampler into the boring bottom in accordance with ASTM D1586. The samplers were driven into the in-situ soils under the impact of a 140 pound hammer having a free fall of 30 inches. The number of blows required to advance the sampler 12 inches into the soil were adjusted to the standard penetration resistance (N-Value). The raw blow counts obtained using the California sampler were corrected to equivalent N-Values using Burmister's (1948) energy and diameter correction formula. When the sampler was withdrawn from the boring bottom, the brass liners containing the relatively undisturbed samples were removed, examined for identification purposes, labeled and sealed to preserve the natural or in-situ moisture content.

The samples were then transported to our laboratory for testing. Classifications made in the field were verified in the laboratory after further examination and testing. The stratification of the soils, descriptions, location of undisturbed soil samples and standard penetration resistance are shown on the respective "Log of Test Boring" contained within the Appendix. The ACE boring logs are also included in the Appendix of this report.

Laboratory Testing

Limited lab testing of the site materials were performed by ACE and included, moisture density, sieve analysis, Atterberg Limits and R-value. Their results were reviewed and are included herein. Our supplemental laboratory testing program was directed towards providing sufficient information for the determination of the engineering characteristics of the site soils so that the recommendations outlined in this report could be formulated. The laboratory test results are presented in the Appendix.

Moisture content and dry density tests (ASTM D2937) were performed on representative relatively undisturbed soil samples in order to determine the consistency of the soil and the moisture variation throughout the explored soil profile as well as estimate the compressibility of the underlying soils.

The strength parameters of the foundation soils were determined from unconfined compression tests (ATSTM D2166) and direct shear tests (ATSTM D3080) performed on selected relatively undisturbed soil samples. Standard field penetration resistance (N-Values) and pocket penetrometer readings also assisted in the determination of strength and bearing capacity. The test results, standard penetration resistances readings and penetrometer readings are recorded on the respective "Log of Test Boring".

In order to assist in the identification and classification of the subsurface soils, sieve analysis and hydrometer tests (ASTM D6913) (ASTM D422) and Atterberg Limits tests (ASTM D4318) were performed on selected soil samples. Composite samples of the expected building pad soils were obtained for Plasticity Index and hydrometer testing. The results were used to estimate the expansion potential of the near surface soils and for post-tension slab design.

Representative composite bulk samples of the near-surface pad soils were obtained for each site and tested to evaluate the presence and concentration of water-soluble sulfates in accordance with ASTM C1580. These test results were used to identify the corrosion potential of the soils to at or below grade concrete. Additional corrosivity indicator tests were performed including soil pH, minimum resistivity and chlorides.

Subsurface Conditions

The boring logs and lab testing by ACE and KCE indicate that the site materials generally consist of alluvial sands and clays within the upper 51.5 feet. The upper 1 to 2 feet at both sites were found to be generally soft to stiff and moderately to highly expansive silty and sandy clay, and clayey sands. Variable layers of medium dense to dense clayey sands and stiff to very stiff silt and clay layers were found to the maximum depth explored of 51.5 feet.

Along the creek bank, Boring 1 revealed the upper 11 feet to consist of very stiff to hard sandy clay, underlain by hard sandy silt to a depth of 25 feet below grade. The hard silt is underlain by highly weathered siltstone bedrock. Boring 2 revealed very stiff clayey silt to 5 feet, underlain by medium dense silty sand to 12 feet, underlain by dense silty sand to 20 feet, further underlain by very dense/cemented clayey sandy gravels of the Tehama Formation. Boring 3 revealed stiff to very stiff clayey silt to 17 feet, underlain by highly weathered siltstone bedrock. Boring 4 revealed firm silt to 1.5 feet, underlain by very dense gravelly sand of the Tehama Formation to 10 feet, further underlain by highly weathered sandstone bedrock.

Groundwater was not encountered in any of the borings at the time of drilling. Fluctuations in the groundwater conditions can occur with variations in seasonal rainfall, irrigation on the site and adjacent parcels, and variations in subsurface stratification.

A more thorough description and stratification of the soils encountered along with the results of the laboratory tests are presented on the respective ACE and KCE boring logs in the Appendix. The approximate locations of the borings are shown on Figures 2 and 3.

Soil Corrosivity

Representative composite bulk samples of the near surface soil (0 to 3 feet) for the two sites were collected and transported to Sunland Analytical in Rancho Cordova for soil corrosivity testing. For the Phase 1 site the testing indicates a sulfate content of 1 ppm (mg/kg), a chloride content of 3.9 ppm, a minimum resistivity of 2,200 ohm-cm, and a soil pH level of 6.17. For the Phase 2 site the testing indicates a sulfate content of 2.4 ppm (mg/kg), a chloride content of 9.4 ppm, a minimum resistivity of 1,720 ohm-cm, and a soil pH level of 6.16.

It is noted that the sulfate test results indicate “low” or “S0” sulfate exposure to concrete as identified in the Durability Requirements, Section 1904 of the 2016 California Building Code, and Tables 19.3.1.1 of ACI 318-14 Building Code Requirements for Structural Concrete. No cement type restriction is required, however, we do recommend that a Type II cement be utilized in concrete mixes for additional sulfate and corrosion resistance.

The Caltrans Corrosion Guidelines[1] defines a corrosive site as one where the soil and/or water has a sulfate concentration of 2,000 ppm or more, a chloride concentration of 500 ppm or more, a pH of 5.5 or less, and a minimum resistivity less than 1,000 ohm-cm. Based on these criteria, the soils at the site are not considered to have a severe corrosion potential to buried metal.

KC Engineering Company is not a corrosion engineering firm. Therefore, to further define the soil corrosion potential and interpret the above test results, or to design cathodic protection or grounding systems, a licensed Corrosion Engineer should be consulted.

Site Geology

According to the Preliminary Geologic Map of the Lodi Quadrangle[2], the geologic deposits underlying the Phase 1 site is mapped in a transitional area with the Miocene-aged Neroly Sandstone on the far west, the Pliocene-aged Tehama Formation on the main ridge and eastern hillside, and Holocene-aged alluvial fan deposits on the flat eastern portions of the site. The Phase 2 site is wholly mapped as Holocene-aged alluvial fan deposits. A portion of the Lodi Quadrangle is included as Figure 4, "Geologic Map". The sandstone and Tehama Formation bedrock bedding is shown to have a northwesterly strike and a northeasterly dip ranging from 33 to 35 degrees. The alluvial fan deposits consist of poorly sorted, moderately to poorly bedded sand, gravel, silt, and clay deposited in gently sloping alluvial fans. The subsurface deposits encountered during our exploration resemble the mapped deposits.

Geo-Hazards

Seismicity & Ground Motion Analysis

Neither of the two sites are located within an Alquist-Priolo Earthquake Fault Zone[3]. There are no known active faults crossing the sites as mapped and/or recognized by the State of California. However, Vacaville is located in a seismically-active region and earthquake related ground shaking should be expected during the design life of structures constructed on the sites. The California Geological Survey has defined an active fault as one that has had surface displacement in the last 11,000 years, or has experienced earthquakes in recorded history.

[1] California Department of Transportation Corrosion and Structural Concrete Field Investigation Branch, Materials Engineering and Testing Services, *Corrosion Guidelines*, Version 2.1, January 2015.
[2] T.E. Dawson, 2009, *Preliminary Geologic Map of the Lodi 30' x 60' Quadrangle, California*, California Geological Survey
[3] Parish, J.G., 2018 *Earthquake Fault Zones*, California Geological Survey, Special Publication 42, Revised 2018.

Based on our review of the Fault Activity Map of California[4] and the USGS National Seismic Hazard Maps-Source Parameters[5], the nearest active faults are the Great Valley/Vaca Fault Zone, the Cordelia and Green Valley Faults, located approximately 0.9 miles southwest, 9 miles southwest and 11 miles southwest of the sites, respectively.

The 2016 CBC specifies that the potential for liquefaction and soil strength loss should be evaluated, where applicable, for the Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration with an adjustment for site class effects in accordance with American Society of Civil Engineer (ASCE 7-10)[6]. The MCE_G is peak ground acceleration is based on the geometric mean peak ground acceleration with a 2 percent probability of exceedance in 50 years. The MCE_G peak ground acceleration with adjustment for site class effects (PGA_M) was calculated to be 0.653g for Phase 1 site using a Site Class C, and 0.648g for Phase 2 site using a Site Class D based on the United States Geological Survey web-based seismic design tool with a site coefficient (F_{PGA}) of 1.0.

Structures at the site should be designed to withstand the anticipated ground accelerations. Based on the USGS Seismic Design Maps[7] website and ASCE 7-10, the 2016 CBC earthquake design values are as follows. The summary USGS seismic reports are included in the Appendix.

Site Class for Phase 1 Site: C
Design Spectral Response Accelerations: S_{DS} = 1.174g; S_{D1} = 0.521g

Site Class for Phase 2 Site: D
Design Spectral Response Accelerations: S_{DS} = 1.166g; S_{D1} = 0.597g

Fault Rupture

The sites are not located within an Alquist-Priolo Earthquake Fault Zone. Based on our review of geologic maps, no known active or inactive faults cross or project toward the subject sites. In addition, no evidence of active faulting was visible on the sites during our site reconnaissance. Therefore, it is our opinion that there is no potential for fault-related surface rupture at the subject sites.

[4] Jennings, C.W. and Bryant, W.A., 2010, *Fault Activity Map of California*, California Geological Survey Geologic Data Map No. 6, scale 1:750,000
[5] U.S. Geological Survey, 2008 National Seismic Hazards Maps – Source Parameters, accessed 10/3/18, from USGS web site: https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/query_main.cfm
[6] American Society of Civil Engineer (ASCE), 2010, Minimum Design Loads for Buildings and Other Structures, Standard 7-10.
[7] http://earthquake.usgs.gov/designmaps/us/application.php, accessed 10/2/18 & 10/3/18

Landsliding

The Phase 1 site is relatively flat, except for the western uphill slope and the southern bank of Ulatis Creek. Slope instabilities were not observed on the western hillside, nor are any landslides shown on published geologic maps. The southern creek bank does have evidence of past shallow sliding, slumps and erosion. The stability and stable top of bank determination of Ulatis Creek bank is noted below. The Phase 2 site is relatively flat and not subject to seismically induced landsliding.

Stable Top of Bank

As part of our geotechnical exploration, we performed an analysis to determine the stable top of bank along Ulatis Creek and a minimum building setback. The findings of our evaluation and analysis are included in our letter "Ulatis Creek Stable Top of Bank Evaluation", dated 8/4/18 included in the Appendix of this report. In summary, we determined that the stable top of bank is located about 16 feet back from the current top of bank. We concluded that the stable top of bank shown on the Casa De Vista plans by Phillippi dated 9/11/18 is appropriate for the proposed development.

Liquefaction

Soil liquefaction is a phenomenon in which loose and saturated cohesionless soils are subject to a temporary, but essentially total loss of shear strength, due to pore pressure build-up under the reversing cyclic shear stresses associated with earthquakes. Soils typically found most susceptible to liquefaction are saturated and loose, fine to medium grained sand having a uniform particle range and less than 35% fines passing the No. 200 sieve, and a corrected standard penetration blow count $(N_1)_{60}$ less than 30. According to Special Publication 117A by the California Geological Survey, the assessment of hazards associated with potential liquefaction of soil deposits at a site must consider translational site instability (i.e. lateral spreading, etc.) and more localized hazards such as bearing failure and settlement. The acceptable factor of safety against liquefaction is recommended in SP117 to be 1.3 or greater.

The data used for evaluating liquefaction potential of the subsurface soils consisted of the in-situ Standard Penetration Resistance values $(N_1)_{60}$ values, the unit weights, gradations, in-situ moisture contents, the groundwater level, and the location of the site to the nearest active fault and the predicted ground surface acceleration. Based on our field and laboratory data, the subsurface sand deposits were found to be medium dense to dense. Groundwater was not found within the upper 50 feet for the two projects. Therefore, it is our opinion that the subsurface deposits are not considered to be liquefiable.

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

General

From a geotechnical point of view, the proposed multi-family residential developments and associated improvements are considered to be feasible for construction on the subject sites provided the recommendations presented in this report are incorporated into the project plans and specifications.

All grading and foundation plans for the development should be reviewed by ***KC ENGINEERING CO.*** prior to contract bidding or submittal to governmental agencies to ensure that the geotechnical recommendations contained herein are incorporated and utilized in design.

KC ENGINEERING CO. should be notified at least two working days prior to site clearing, grading, and/or foundation operations on the property. This will give the Soil Engineer ample time to discuss the geotechnical characteristics of the site that may be encountered in the field.

Field observation and testing during the grading and/or foundation operations shall be provided by representatives of ***KC ENGINEERING CO.*** to enable them to form an opinion regarding the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the specification requirements. Any work related to the grading and/or foundation operations performed without the full knowledge and under the direct observation of the Soil Engineer will render the recommendations of this report invalid.

Geotechnical Considerations

The primary geotechnical considerations for the sites are the presence of near-surface moderate to highly expansive silty and sandy clay materials, the proposed differential cut and fill transition building pads, and the stability of the proposed cut slopes and Ulatis Creek bank.

The site's near surface soils are considered moderately to highly expansive and prone to heave and shrink movements with changes in moisture content and, consequently, must be carefully considered in the design of grading, foundations, drainage, and landscaping. In addition, the proposed pad grading may result in fills and cuts of variable thicknesses which will require mitigative grading to provide uniform support and to minimize potential settlement. Specific grading recommendations are provided herein. Due to the expansive soil conditions and expected variable pad conditions, we recommend that the multi-family residential structures, as well as the office/clubhouse or other related structures be supported by thickened post-tensioned slab foundation systems as recommended in the "Foundation" section of this report.

Alternatively, the proposed building pad soils could be lime treated to mitigate the expansive nature of the materials, as well as to provide a structural fill pad. Specific recommendations are presented in the "Grading" section of this report. The structures could then be supported by a well-reinforced conventional spread footing and slab floor foundation systems. The recommendations provided in the following sections will minimize the detrimental effects of expansive soil movement. Specific grading, drainage and foundation recommendations are provided herein.

Considering that the multi-family structures are planned to be built well beyond the established top of bank setback, no further foundation mitigation is required. We should note that bio-swales should not be constructed at the top of the Ulatis Creek bank. Pavements and/or other improvements constructed within the established setback zone can be expected to require additional maintenance, such as crack sealing and/or replacement during the life of the project.

Demolition

The numerous trees, old pavements and remnants of old ranch house or structure foundations, septic tanks and leach field will need to be removed from the site prior to grading. Underground utilities may also be present. Demolition should include the complete removal of all surface and subsurface structures and pipelines. This may include foundations, concrete flat work, wooden power poles, septic tanks, tree stumps, concrete rubble, debris, septic tanks and deleterious material. It is vital that ***KC ENGINEERING CO.***, intermittently observe the demolition operations and be notified in ample time to ensure that subsurface structures are not covered.

Excavations made by the removal of any structure should be left open by the demolition contractor for backfill in accordance with the requirements for engineered fill. The removal of any underground structures should be done under the observation of the Soil Engineer to assure adequacy of the removal and that subsoils are left in proper condition for placement of engineered fills. Any soil exposed by the demolition operations, which are deemed soft or unsuitable by the Soil Engineer, shall be excavated as uncompacted fill soil and be removed as required by the Soil Engineer during grading. The demolition operation should be approved by the Soil Engineer prior to commencing grading operations. Any resulting excavations should be properly backfilled with engineered fill under the observation of the Soil Engineer. Should the location of any localized excavation be found to underlie any structure, backfill should be compacted to a minimum relative compaction of 95% or the excavation widened to extend 5 feet beyond the footprint of the structure and backfilled to the specifications for engineered fill as recommended in the "Grading" section herein.

Grading

Grading activities may be performed during the rainy season, however, achieving proper compaction may be difficult due to excessive moisture; and delays will occur. Grading performed during the dry months will minimize the occurrence of the above problems.

After demolition, the surface of the site in areas to be graded should be stripped to remove all existing surface vegetation and/or other deleterious materials. During stripping all roots, root balls and organics should be completely removed. It is estimated that stripping depths of 2 inches may be necessary depending on actual conditions at the time of development. Any material that is deemed to be topsoil and requiring stripping may not be used as engineered fill but may be stockpiled and used later for landscaping purposes. Where any loose or soft soils are encountered they must be over-excavated to undisturbed native ground. Excavated soil materials may be used as engineered fill with the approval of the Soils Engineer provided they do not contain organics.

After stripping and clearing, the exposed surface soils should be over-excavated 12 inches and then the exposed material scarified to a depth of 12 inches, moisture conditioned as necessary to 3 or more percent above optimum moisture content by thorough mixing to a uniform moisture content, followed by compacting to a minimum of 90% relative compaction as determined by ASTM D1557. The site may then be filled to the desired finished grades by placing engineered fill in lifts of 8 inches in uncompacted thickness and compacting to a minimum relative compaction of 90% at 3% or more above optimum in accordance with the aforementioned test procedure. All soils encountered during our investigation would be suitable for use as engineered fill when placed and compacted as recommended.

Where transition cut/fill lots are planned, we recommend that the cut portion of the pad be over-excavated 2 feet and the exposed bottom be scarified, moisture conditioned, compacted and filled to design grade as noted above. In areas where fill exceeds 5 vertical feet, we recommend that the fills below the upper 5 feet be compacted to a minimum of 95%. In no case, should a building pad have more than 5 feet of differential fill materials across the footprint.

As discussed above, the building pads may be alternatively lime treated where conventional footing foundations are desired. In this case, we recommended that the upper 3 feet of the building pads and adjacent concrete flatwork comprise the on-site materials modified with high calcium quicklime. It is noted that the structural fill must extend at least 5 feet beyond the building footprint and to the edge of surrounding flatwork, whichever is greater.

The lime treatment should consist of a 5% mixture by dry weight with high-calcium quicklime meeting ASTM C 977. Based on a unit weight of 110 p.c.f., a minimum spread rate of 8.25 p.s.f.

is recommended for the 18-inch mixing depth. In the pavement areas, the upper 12 inches of subgrade may also be lime treated with a minimum spread rate of 5.5 p.s.f. The lime treated soils should be compacted to at least 95% relative compaction of the maximum wet density at a moisture content at least 3% above optimum. The lime treatment must be performed by a qualified soil stabilization contractor in general conformance with Caltrans Standard Specification Section 24. The product specification and quality control test results must be provided to us by the contractor for review and acceptance prior to the treatment operations. The lime should be spread and mixed with equipment capable of providing relatively uniform conditions and allowed to mellow overnight. The lime treated sections must be mixed again the following day prior to compaction which must be performed within 24 hours after final mixing. After compaction, it is important to moist cure the lime treated soils until placement of the subsequent slab subbase materials (i.e. do not let pad dry out and desiccate).

Should select import material be used to establish the upper 3 feet of the structural fill pads or be required for general fill, the import material should be approved by the Soil Engineer before it is brought to the site. Caltrans Class 2 aggregate base is an approved import. Where select import soil is used within the upper 36 inches of the pad, it should meet the following requirements:

a. Have an R-Value of not less than 25;
b. Have a Plasticity Index not higher than 12;
c. Not more than 15% passing the No. 200 sieve;
d. No rocks larger than 3 inches in maximum size;

The fill materials shall be placed in uniform lifts of not more than 8 to 12 inches in uncompacted thickness depending on size and weight of equipment used. Each layer shall be spread evenly and shall be thoroughly blade mixed during the spreading to obtain uniformity of material in each layer. Before compaction begins, the fill shall be brought to a water content that will permit proper compaction by either (a) aerating the material if it is too wet, or (b) spraying the material with water if it is too dry.

Compaction shall be by footed rollers or other types of acceptable compacting rollers. Rollers shall be of such design that they will be able to compact the fill to the specified density. Rolling shall be accomplished while the fill material is within the specified moisture content range. Rolling of each layer shall be continuous over its entire area and the roller shall make sufficient trips to ensure that the required density has been obtained. No ponding or jetting shall be permitted.

The standard test used to define maximum densities and optimum moisture content of all compaction work shall be the Laboratory Test procedure ASTM D1557 and field tests shall be

expressed as a relative compaction in terms of the maximum dry density and optimum moisture content obtained in the laboratory by the foregoing standard procedure. Field density and moisture tests shall be made in each compacted layer by the Soil Engineer in accordance with ASTM D6938, respectively. When footed rollers are used for compaction, the density and moisture tests shall be taken in the compacted material below the surface disturbed by the roller. When these tests indicate that the compaction requirements for any layer of fill, or portion thereof, have not been met, the particular layer, or portion thereof, shall be reworked until the compaction requirements have been met.

Slopes

Should any fill slope grading be required, we recommend that the toe of fill slopes be properly keyed into competent material before filling. Keyways are required for any fill slope to be placed on existing grade with a gradient of 6H:1V or steeper. Prior to placement of fill slopes and after stripping of vegetation, a toe of slope keyway must be constructed into competent soil materials prior to placement of engineered fill as required by the 2016 CBC Appendix J. A toe key excavation should be placed at the base of all such fills. This key should be a minimum of 12 feet in width, cut into competent non-yielding material a minimum of 2 vertical feet, and sloped into the hillside at a gradient of no less than 5%. Subsequent keyed benches should be excavated as the fill progresses upslope. Subdrainage in keyways will also be required. A Typical Fill Slope & Subdrain Detail is presented in the Appendix.

Unsupported cut slopes should not be steeper than 2.5H:1V (horizontal to vertical). Fill slopes should not be steeper than 2H:1V and must be compacted as the filling operation progresses upslope, and include over-constructing the fill slope face and cutting back the looser surface soils to a firm and adequately compacted designed slope grade. Track-walking of slope surfaces does not provide adequate soil densities and is an unacceptable method of slope compaction.

Cut and fill slopes in soil may experience severe erosion when grading is halted during rainy weather. Before work is stopped, a positive gradient away from the slopes must be established to carry the surface runoff water away from the slopes to areas where erosion and sediment can be controlled. After the completion of the slope grading, erosion protection and hydro-seeding must be provided on all soil surfaces. Slope planting, preferably with deep-rooted native plants requiring minimal irrigation, should be completed on all exposed surfaces of cut and fill slopes. Graded slopes should not be left exposed through a winter season without the completion of erosion control measures and slope planting.

Surface & Subsurface Drainage

A very important factor affecting the performance of structures and pavements is the proper design, implementation, and maintenance of surface drainage, as well as maintaining uniform moisture conditions around the structures. Ponded water will cause swelling and/or loss of soil strength and may also seep under structures. Should surface water be allowed to seep under the structures, differential foundation movement resulting in structural damage and/or standing water under the slab will occur. This may cause dampness to the floor which may result in mildew, staining, and/or warping of floor coverings. To minimize the potential for the above problems, dampproofing and waterproofing should be provided as required by Section 1805 of the 2016 CBC. In addition, the following surface drainage measures are recommended and must be maintained by the property owner in perpetuity:

a) Positive building pad slopes and surface drainage must be provided by the project Civil Engineer to remove all storm water from the pad and to prevent storm and/or irrigation water from ponding adjacent to the structure foundations. The finished pad grade around the structures should be compacted and sloped 5% away from the exterior foundations and as required in Section 1804.4 of the 2016 CBC and directed to catch basins or swales that discharge to a suitable outlet.

b) Enclosed or trapped planter areas adjacent to the structure foundations should be avoided if possible. Where enclosed planter areas are constructed, these areas must be provided with adequate measures to drain surface water (irrigation and rainfall) away from the foundation. Positive surface gradients and/or controlled drainage area inlets should be provided. Care should be taken to adequately slope surface grades away from the structure foundations and into area inlets. Drainage area inlets should be piped to a suitable discharge facility.

c) Adequate measures for storm water discharge from the roof gutter downspouts must be provided by the project Civil Engineer and maintained by the property owners at all times, such that no water is allowed to pond next to the structure. Closed pipe discharge lines should be connected to downspouts and discharged into a suitable drainage facility.

d) Site drainage should be designed by the project Civil Engineer. Civil engineering, hydraulic engineering, and surveying expertise is necessary to design proper surface drainage to assure that the flow of water is directed away from the foundations.

e) Over-irrigation of plants is a common source of water migrating beneath a structure. Consequently, the amount of irrigation should not be any more than the amount

necessary to support growth of the plants. Foliage requiring little irrigation (drip system) is recommended for the areas immediately adjacent to the structures.

f) Landscape mounds or concrete flatwork should not be constructed to block or obstruct the surface drainage paths. The Landscape Architect or other landscaper should be made aware of these landscaping recommendations and should implement them as designed. The surface drainage facilities should be constructed by the contractor as designed by the Civil Engineer.

With respect to any proposed bio-retention swales or basins, we anticipate that bio-swales will be located relatively close to the proposed structures. We recommend a minimum separation of 10 horizontal feet where possible. The bottom of the swales should be sloped away from the structure foundation. In addition, we recommend that a subsurface drain be provided below the select treatment soils at the low side of the swale/basin. The subdrain should be connected to the nearest storm drain catch basin. A 4 inch SDR35 perforated pipe surrounded by Caltrans Class 2 Permeable Material should be provided to discharge collected water into the nearest catch basin. An impermeable liner may also be required in the bottom of the swales. Additional details can be provided when plans are available.

Foundations

Provided that the upper 3 feet of the building pad soils are lime treated or constructed with select import as recommended in the "Grading" section, the proposed structures may be supported by utilizing a deepened, well-reinforced and inter-connected spread footing foundation system with a slab floor. Alternatively, uniformly thickened post tension slab foundations may be utilized without lime treatment. Recommendation for both system are provided below.

Continuous Spread Footing

Continuous spread footings for the buildings should be utilized around the perimeter of the structure and for all interior bearing and shear walls and be a minimum of 1.5 feet wide. All interior and exterior column footings should be interconnected to the perimeter with reinforced concrete tie-beams. Isolated footings should not be utilized unless connected with reinforced tie-beams. The continuous and pad/column footings should extend a minimum depth of 24 inches below the interior slab subgrade soil elevation. The tie beams should extend to a minimum depth of 18 inches below the interior soil pad grade. The recommended design allowable bearing pressure for footings is 2,000 p.s.f. due to dead plus live loads. This value may be increased one-third for transient wind and seismic loads.

All foundations must be adequately reinforced to provide structural continuity and resist the anticipated loads as determined by the project Structural Engineer. The final footing design and reinforcement should be determined by the project Structural Engineer. However, continuous footings and tie-beams are recommended to be reinforced with a minimum of four No. 6 bars, two at the top and two near the bottom of the footing. Additional reinforcement will be as required by the structural engineer and in accordance with structural building code requirements. Foundations designed in accordance with the above criteria are expected to experience a total settlement of less than 1 inch with less than 1/2 of an inch of differential settlement across the footprint.

To accommodate lateral building loads, the passive resistance of the foundation soil can be utilized. The passive soil pressures can be assumed to act against the front face of the footing below a depth of 1 foot below the ground surface. It is recommended that a passive pressure equivalent to that of a fluid weighing 200 p.c.f. be used. For design purposes, an allowable friction coefficient of 0.32 can be assumed at the base of the spread footings. These two modes of resistance should not be added unless the frictional component is reduced by 50 percent since the mobilization of the passive resistance requires some horizontal movement, effectively reducing the frictional resistance.

Post-Tensioned Slab

Post-tensioned slabs for the structures should be a minimum of 10 inches in thickness (for uniform thickness slabs) and designed using the following criteria which is based on the design method of the "Standard Requirements for Design of Shallow Post-Tensioned Concrete Foundations on Expansive Soils", dated May 2008, Third Edition, prepared by the Post Tensioning Institute:

Edge Moisture Variation Distance:		
e_m (Edge Lift)	=	4.4 feet
e_m (Center Lift)	=	7.8 feet
Differential Movement:		
y_m (Edge Lift)	=	1.75 inches
y_m (Center Lift)	=	-1.25 inches
Estimated Differential Settlement:	=	0.5 inches

In addition to the recommendations and guidelines in the Third Edition by the PTI, the following recommendations should also be incorporated into the design and construction for the above structural mat foundation systems:

a) An allowable bearing capacity of 1,000 p.s.f. may be utilized and may be increased by one-third to resist short-term wind and seismic loading.

b) To resist lateral loading, a coefficient of friction between the perimeter concrete thickened edge and the soil of 0.30 may be used.

c) All areas to receive slabs should be thoroughly soaked prior to placing the underslab components. This work should be performed under the observation of the Soil Engineer and approved prior to vapor barrier and concrete placement.

d) The reinforcement and/or cables shall be placed in the center of the slab unless otherwise designated by the Structural Engineer.

e) A vapor retarder membrane should be installed between the prepared building pad and the interior slab to minimize moisture condensation under the floor coverings and/or upward vapor transmission. The vapor barrier membrane should be a minimum 15-mil extruded polyolefin plastic that complies with ASTM E1745 Class A and have a permeance of less than 0.01 perms per ASTM E96 or ASTM F1249. It is noted that polyethylene films (visqueen) do not meet these specifications. The vapor barrier must be adequately lapped and taped/sealed at penetrations and seems in accordance with ASTM E1643 and the manufacturer's specifications. The vapor retarder must be placed continuously across the slab area.

f) The slabs should be thickened a minimum of 12 inches wide at the edges and extend below interior pad grade at least 4 inches to create frictional resistance for lateral loading, to provide additional edge rigidity, and to minimize moisture infiltration under the slab.

g) Water vapor migrating to the surface of the concrete can adversely affect floor covering adhesives. Provisions should be provided in the concrete mix design to minimize moisture emissions. This should include the selection of a water-cement ratio which inhibits water permeation (0.45 max). Additional suitable admixtures to limit water transmission may also be utilized. The slabs should not be subjected to rainfall or cleaning water prior to placement of the floor coverings. In addition, we recommend that a Type II cement be utilized in the concrete mix to provide an additional protection against sulfate attack.

h) Exterior porches, garages and attached covered patios areas should also be designed as part of the same post-tension foundation system.

i) We recommend that appropriate provisions be provided by the Structural Engineer and Contractor to minimize slab cracking, such as curing measures and/or admixtures to minimize concrete shrinkage and curling. American Concrete Institute methods and guidelines of curing, such as wet curing or membrane curing, are recommended to minimize drying shrinkage cracking.

j) The foundation plans, specifications, calculations and concrete mix designs should be provided to the Structural Engineer and us for review prior to construction to ensure conformance with the above recommendations.

Slab-on-Grade Construction

Interior slabs where footings are used and exterior concrete slabs, including sidewalks, driveways, non-structural detached patios and general flatwork will likely experience some cracking due to finishing, curing methods, drying shrinkage, as well as moisture variations and related soil movements within the underlying clay soils. To reduce the potential cracking of the slabs-on-grade, the following recommendations are made:

a) It is important to moist cure the lime treated soils on the building pad until placement of the subsequent materials. All areas to receive slabs should be thoroughly wetted and soaked to seal any desiccation or shrinkage cracks prior to placing concrete. This work should be done under the observation of the Soil Engineer.

b) Slabs should be underlain by a vapor barrier and a minimum of 4 inches of Caltrans Class II Aggregate Base placed and compacted to a minimum of 90% between the finished subgrade and the slabs to serve as subbase support.

c) Interior and exterior slabs should be a minimum of 5 inches thick and reinforced with a minimum of No. 4 rebar spaced 18 inches center to center, each way. The actual slab thickness and reinforcement should be determined by the project Structural Engineer in accordance with the structural requirements and the anticipated loading conditions. The reinforcement shall be placed in the center of the slab unless otherwise designated by the design engineer.

d) A vapor retarder membrane should be installed between the prepared building pad aggregate base and the interior slabs to minimize moisture condensation under the floor coverings and/or upward vapor transmission. The vapor barrier membrane should be a minimum 15-mil extruded polyolefin plastic that complies with ASTM E1745 Class A and have a permeance of less than 0.01 perms per ASTM E96 or ASTM F1249. It is noted that polyethylene films (visqueen) do not meet

these specifications. The vapor barrier must be adequately lapped and taped/sealed at penetrations and seems in accordance with ASTM E1643 and the manufacturer's specifications. The vapor retarder must be placed continuously across the slab area.

e) Water vapor migrating to the surface of the concrete can adversely affect floor covering adhesives. Provisions should be provided in the concrete mix design to minimize moisture emissions. This should include the selection of a water-cement ratio which inhibits water permeation (0.45 max) and/or the addition of suitable admixtures to limit water transmission. We also recommend the use of Type II cement for additional corrosion resistance.

f) Slabs for driveways, and exterior flatwork should be placed structurally independent of the foundations. Driveway/pavement slab recommendations are presented in the "Pavement" section of the report. A 30-pound felt strip, expansion joint material, or other positive separator should be provided around the edge of all floating slabs to prevent bonding to the foundation. However, rebar doweling is recommended to minimize vertical movements between exterior slabs and building foundations. Doweling details should be determined by the Structural Engineer.

g) To minimize moisture infiltration under exterior slabs and to add edge rigidity, we recommend that slabs be thickened at the edges to extend below the aggregate base layer to the soil subgrade for a minimum width of 6 inches.

h) Slabs should be provided with crack control saw cut joints or tool joints to allow for expansion and contraction of the concrete. In general, contraction joints should be spaced no more than 20 times the slab thickness in each direction. The layout of the joints should be determined by the project Structural Engineer and/or Architect.

i) We recommend that appropriate provisions be provided by the Structural Engineer and Contractor to minimize slab cracking, such as curing measures and/or admixtures to minimize concrete drying-shrinkage and curling. American Concrete Institute methods and guidelines of curing, such as wet curing or membrane curing, are recommended to minimize drying shrinkage cracking.

Pavement Areas

The driveways and parking areas will be paved with either asphalt concrete (AC) or Portland cement concrete (PCC) surfaces. Recommendations for these pavement surfaces are presented below. We emphasize that the performance of the pavement is critically dependent upon adequate and uniform compaction of the subgrade soils, as well as engineered fill and utility trench backfill within the limits of pavements. Pavements will typically have poor performance and shorter life where water is allowed to migrate into the aggregate base and subgrade soils. The main sources of water into pavement materials are landscape planters constructed within or adjacent to pavement areas. Where this is planned, it is suggested to extend the curbs into the soil subgrade at least 2 inches. The construction of all pavements should conform to the requirements set forth by the latest Standard Specifications of the Department of Transportation of the State of California (Caltrans) and/or the City of Vacaville.

R-Value: Composite bulk samples were obtained by ACE of the near surface soils within the planned parking lot and driveways. The samples were tested in accordance with the California Test Method 301 to determine the R-Value for the site soils. R-Values of 4 and 6.5 were determined for the sample as shown in the Appendix. Due to variations in the surface clay materials on site, we recommend a maximum R-value of 5 for design.

Preparation of Subgrade: After underground utilities have been placed in the areas to receive pavement and removal of excess material has been completed, the upper 12 inches of the subgrade soil shall be scarified, moisture conditioned and compacted to a minimum relative compaction of 95% at a moisture content at 3% or more above optimum in accordance with the grading recommendations specified in this report. As recommended in the "Grading" section above, the upper 12 inches of the subgrade may alternatively be lime treated. Prior to placement of aggregate baserock, it is recommended that the subgrade be proof rolled and observed for deflection by the Soils Engineer. Should deflection and/or pumping conditions be encountered, stabilization recommendations will be provided based on field conditions. Geotextile fabric is required to be placed over the subgrade per section CS 7-03 in the City of Vacaville Standards, except where lime treatment is performed.

Aggregate Base: All aggregate base material placed subsequently should also be compacted to a minimum relative compaction of 95% based on the ASTM Test Procedure D1557. Aggregate base should meet the minimum requirements of Caltrans ¾" Class 2 per Section 26 and be crushed and angular. The recommended aggregate base thicknesses for asphalt concrete pavements are noted in the table below. The minimum aggregate base thickness for Portland cement concrete PCC roadway pavements is 6 compacted inches.

Asphalt Concrete: Asphalt concrete shall conform with Section 39 of Caltrans Standard Specifications and shall be per the City Standards. Based on an R-Value of 5, and a range of traffic indices provided by the City Table DS 3-1, the recommended pavement sections were calculated in accordance with Topic 608 of the California Department of Transportation Highway Design Manual. Should the pavement areas subgrade soils be lime treated, we are providing an alternate section based on a minimum R-value of 25. The appropriate traffic index (TI) and any minimum pavement sections should be determined by the Civil Engineer in conformance with the City of Vacaville.

Traffic Condition	**Traffic Index (TI)**	**Asphalt Concrete (inches)**	**Class II Aggregate Base[1] (inches)**
Parking Stalls	4.5	3.0 3.0	8.0 5.0*
Drive Isles/Lanes	6.0	4.0 4.0	11.5 7.5*
Collector	8.0	4.5 4.5	18.5 13.0*
Arterial	10.0	6.0 6.0	23.5 16.5*

NOTES:

(1) Minimum R-Value = 78

(2) All layers in compacted thickness to CalTrans Standard Specifications.

* Lime Treated Subgrade (R-Value = 25 min)

Portland Cement Concrete: Where PCC pavement areas are utilized, such as for drive isles and truck areas or at trash enclosures, the concrete should be poured on the compacted aggregate base layer described above of 6 inches. The concrete section should be designed by the project Civil or Structural Engineer per Chapter 620 of the Highway Design Manual or City Standards. We recommend a minimum of 6 inches thick PCC reinforced with a minimum of No. 4 rebar spaced at 16 inches on center, each way, underlain by 6 inches of compacted Class 2 aggregate base. Additional reinforcement may be required by the Structural Engineer. Pavement joints shall be per the HDM and City Standards.

Retaining Walls

Any retaining walls that are to be incorporated into the project should be designed to resist lateral pressures exerted from a media having an equivalent fluid weight as follows:

Gradient of Back Slope	Equivalent Fluid Weight (p.c.f.)			Coefficient of Friction
	Unrestrained Condition (Active)	Restrained Condition (At Rest)	Passive Resistance	
Horizontal	50	65	200	0.32
2:1	70	85	200	0.32

It should be noted that the effects of any surcharge or compaction loads behind the walls must be accounted for in the design of the walls. In addition, an earthquake load of 13.5 pcf applied at 1/3H where H = wall height, from the bottom of the wall is applicable. Restrained conditions should be used where framing or other structural members rests on top or is connected to the top of walls.

Retaining walls may be founded on continuous spread footings per the criteria in the "Foundation section above. The above criteria are based on fully drained conditions. In order to achieve fully-drained conditions, a drainage filter blanket should be placed behind the wall. The blanket should be a minimum of 12 inches thick and should extend to within 12 inches of the surface and be capped with compacted soil. If the excavated area behind the wall exceeds 12 inches, the entire excavated space behind the 12-inch blanket should consist of compacted engineered fill or blanket material. The gravel drainage blanket material may consist of either granular crushed rock or drain pipe fully encapsulated in geotextile filter fabric (Mirafi 140N or equivalent) or Class II permeable material that meets CalTrans Specification, Section 68. A 4-inch diameter SDR35 perforated drain pipe should be installed in the bottom of the drainage blanket and should be underlain by 4 inches of filter type material. Piping with a minimum gradient of 2% shall be provided to discharge water that collects behind the walls to an adequately controlled discharge system away from the structure foundations.

If mechanically stabilized earth, segmental retaining walls such as Keystone walls are utilized, the design and construction of these proposed flexible modular retaining wall systems should conform to the recommendations of the manufacturer and/or Keystone Retaining Wall Systems or the National Concrete Masonry Association (NCMA). The following soil parameters would be applicable for design using on-site soil materials within the reinforced, retained and bearing zones: φ = 28 degrees, c = 0 p.s.f., γ = 110 p.c.f. The wall backfill within the reinforced zone may consist of the on-site soil materials provided it has a maximum Liquid Limit of 40 and a maximum Plasticity Index of 20. The wall embedment should conform to the recommendations by Keystone or NCMA.

Swimming Pool

The pool walls should be designed to resist a lateral soil pressure exerted from a media having an equivalent fluid weight of 80 p.c.f. In addition, the pool shell should be designed to be as rigid and uniform as possible.

A gravel blanket consisting of an eight (8) inch thick layer of clean gravel, under the pool shell is recommended. A hydrostatic relief valve should be installed in the bottom of the pool shell to prevent damage during future maintenance. The gravel should be placed as high up the pool wall as practical. A perforated pipe should be placed in the lowest section of the gravel and be discharge to daylight or a sump.

It is recommended that the pool deck/flatwork adjacent to the pool areas be reinforced, as designed by the project structural engineer, and cantilevered over the pool bond beam in lieu of the standard coping. This will eliminate construction expansion joints between the pool coping and deck slab, which is a continuing maintenance problem. A watertight seal should be placed beneath the concrete slab at the contact with the pool bond beam.

The surrounding concrete flatwork (pool decking) should have positive surface drainage and be provided with an adequate number of surface drains and conduit system to remove surface runoff from rainfall and pool splash. In addition, all concrete flatwork should be provided with construction joints at regular intervals to provide for expansion and contraction of the slab components. Slab-on-grade recommendations are provided above.

The Soil Engineer should review the pool plans and calculations prior to construction and observe the pool excavation at the completion of excavating activities.

General Construction Requirements

Utility trenches extending underneath all traffic areas must be backfilled with native or import soil materials and compacted to relative compaction of 90% to within 12 inches of the subgrade. The upper 12 inches should be compacted to 95% relative compaction in accordance with Laboratory Test Procedure ASTM D1557. Backfilling and compaction of these trenches must also meet the requirements set forth by the City of Vacaville, Department of Public Works.
Applicable safety standards require that trenches in excess of 5 feet must be properly shored or that the walls of the trench slope back to provide safety for installation of lines. If trench wall sloping is performed, the inclination should vary with the soil type and applicable OSHA Safety Standards. The soils at the site are considered to be Type B, except where groundwater is encountered Type C should be used.

With respect to state-of-the-art construction or local requirements, utility lines are generally bedded with granular materials. These materials can convey surface or subsurface water beneath the structures. It is, therefore, recommended that all utility trenches which possess the potential to transport water be sealed with a compacted impervious cohesive soil material or lean concrete where the trench enters/exits the building perimeter. This impervious seal should extend a minimum of 2 feet away from the building perimeter.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. It should be noted that it is the responsibility of the owner or his representative to notify ***KC ENGINEERING CO.***, in writing, a minimum of two working days before any clearing, grading, or foundation excavation operations can commence at the site.

2. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings and from a reconnaissance of the site. Should any variations or undesirable conditions be encountered during the development of the site, ***KC ENGINEERING CO.***, will provide supplemental recommendations as dictated by the field conditions.

3. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are brought to the attention of the Architect and Engineer for the project and incorporated into the plans and that the necessary steps are taken to see that the Contractor and Subcontractors carry out such recommendations in the field.

4. At the present date, the findings of this report are valid for the property investigated. With the passage of time, significant changes in the conditions of a property can occur due to natural processes or works of man on this or adjacent properties. In addition, legislation or the broadening of knowledge may result in changes in applicable standards. Changes outside of our control may render this report invalid, wholly or partially. Therefore, this report should not be considered valid after a period of two (2) years without our review, nor should it be used, or is it applicable, for any properties other than those investigated.

5. Not withstanding, all the foregoing applicable codes must be adhered to at all times.

APPENDIX

Aerial Vicinity Map

Site Plans

Geologic Map

Log of Test Borings

Subsurface Exploration Legend

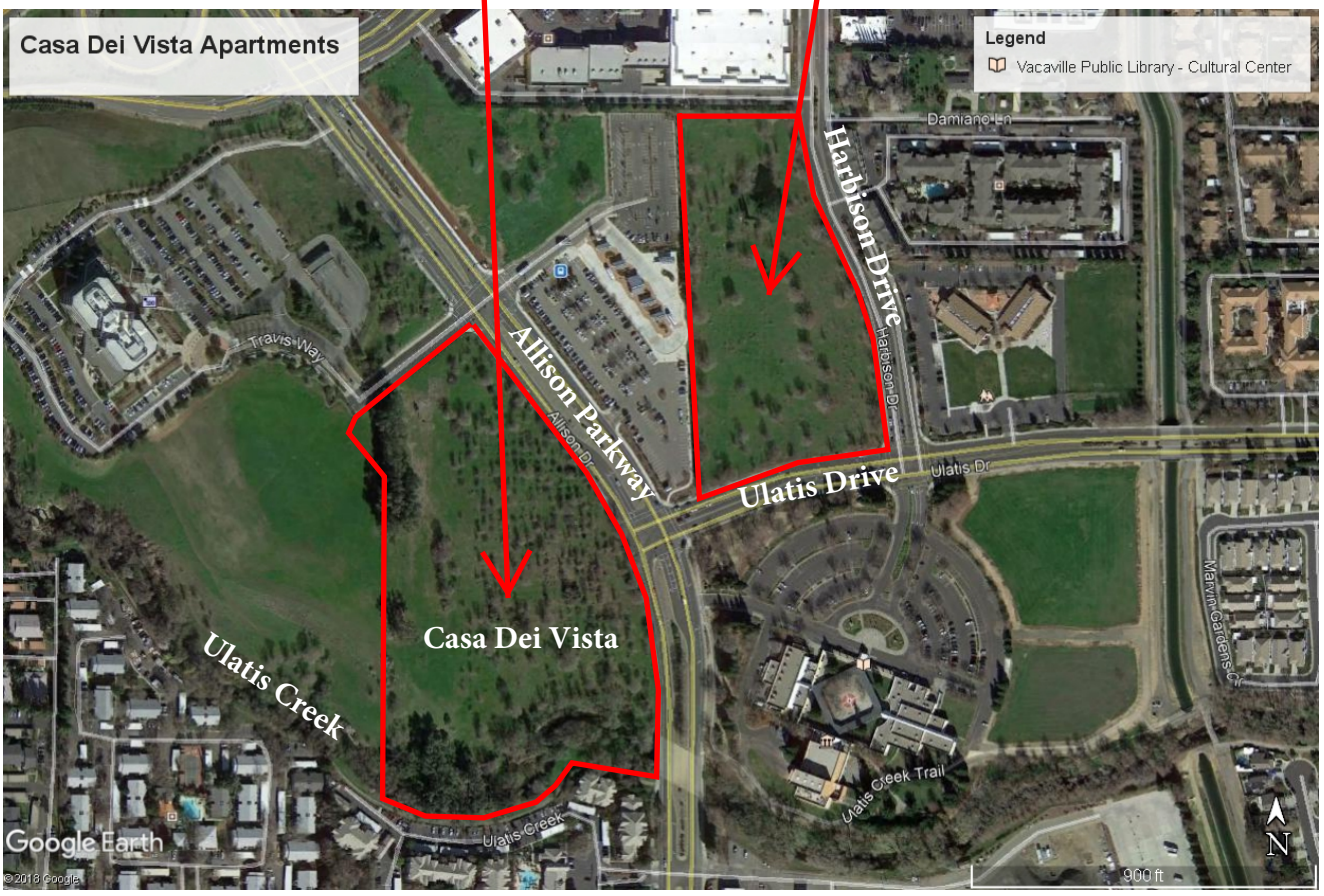
Laboratory Test Results

Ulatis Creek Stable Top of Bank Evaluation Report

Typical Fill Slope & Subdrain Details

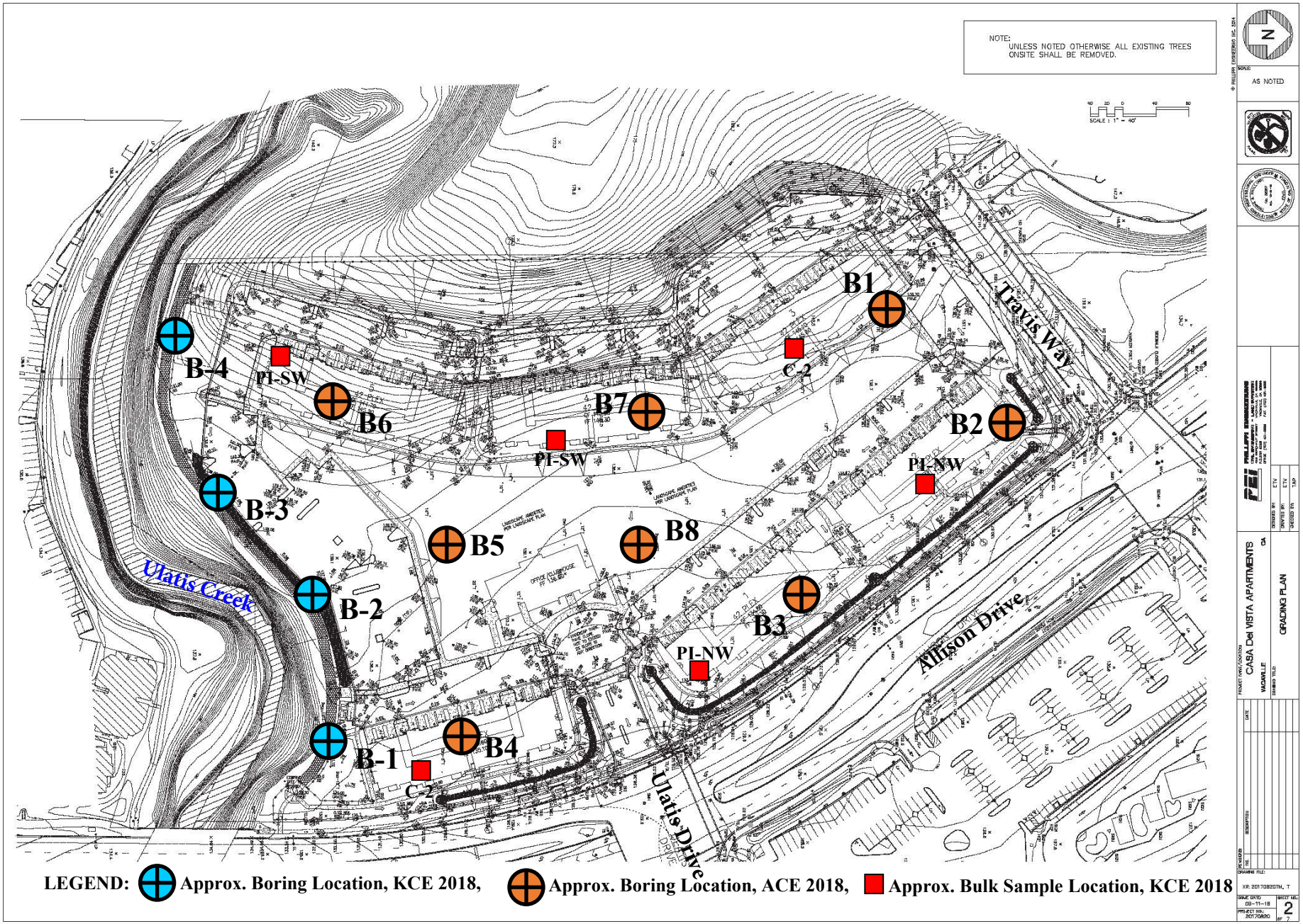
USGS Seismic Design Map Report





KC ENGINEERING COMPANY
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707.447.4025

Project No. VV4567
Proposed Multi-Family Developments
Allison Dr.& Ulatis Dr., Vacaville, CA
Figure 1 – AERIAL VICINITY MAP



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Project No. VV4567
Proposed Multi-Family Development, Phase 1
Casa Dei Vista Apartments
Allison Drive, Vacaville, California
Figure 2 – SITE PLAN



NOTES:

■ **Approx. Bulk Sample Location KCE 2018**

Locations of explorations (shown as ⊗ **B11 , R2**) are approximate. Base map accessed 6/5/2018.

ACE Quality Control
1830 Vernon Street, Suite 7
Roseville, CA 95678
Phone: 916-778-0950

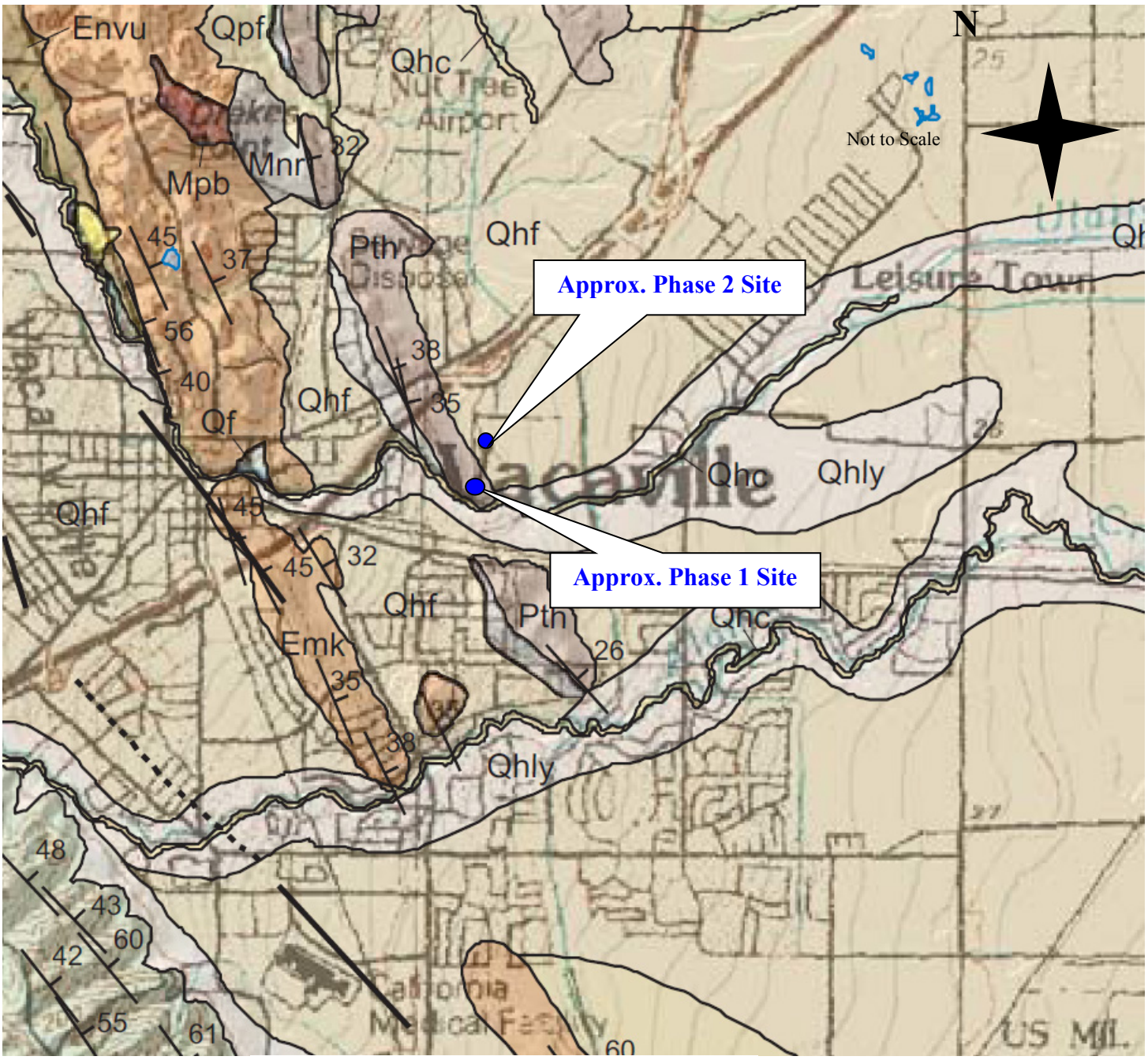
EXPLORATIONS MAP SITE 2

Proposed Allison Drive Apartments
Allison Drive
Vacaville, California

ACE JOB NO.
10-18054G

DATE
6/12/2018

FIGURE
3



PRELIMINARY GEOLOGIC MAP OF
THE LODI 30' x 60' QUADRANGLE, CALIFORNIA

Compiled by
Timothy E. Dawson
2009

Pth	Tehama Formation	Mnr	Neroly Sandstone	Qhf	Holocene alluvial fan deposits	Qhly	Latest Holocene fan levee deposits

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Allison Dr. & Ulatis Dr., Vacaville, CA
Figure 4 – GEOLOGIC MAP

LOG OF TEST BORING
BORING NO.: 1

PROJECT: Proposed Casa Dei Vista Apartments
CLIENT: Gaurdian Investment Capital, LLC
LOCATION: Stable Top of Bank Along Ulatis Creek
DRILLER: Hillside Drilling
DRILL RIG: Mobile B-24
DEPTH TO WATER: INITIAL ▽ :

PROJECT NO.: VV4567
DATE: 07/27/18
ELEVATION: n/a
LOGGED BY: DVC
BORING DIAMETER: 4"
FINAL ▼ : AFTER: hrs.

DEPTH	SAMPLE NO.	SAMPLER	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	SOIL CLASSIFICATION	CONVERTED SPT BLOW COUNT (BLOWS/FT.)	DRY DENSITY (PCF)	MOISTURE CONTENT (PERCENT)	Qp (t.s.f.) Penetrometer	ADDITIONAL TESTS AND REMARKS (LL, PI, UCC, ø&c, Gradation)
0				Brown Fine Sandy CLAY; dry to moist, very stiff.	CL					
5	1-1					28	104.0	12.5	4.5	
				Light Brown Fine Sandy SILT; moist, hard.	ML					
10	1-2					33	115.0	10.9		
15	1-3					50-5"				<No.200=91%
20	1-4			As Above.		41	109.8	13.5		UCC=10,525 psf
25				Very Hard @ 25'. Light Brown SILTSTONE; highly weathered, friable.	Rx					

This information pertains only to this boring and is not necessarily indicitive of the whole site.

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Figure 5

LOG OF TEST BORING
BORING NO.: 1

PROJECT: Proposed Casa Dei Vista Apartments
CLIENT: Gaurdian Investment Capital, LLC
LOCATION: Stable Top of Bank Along Ulatis Creek
DRILLER: Hillside Drilling
DRILL RIG: Mobile B-24
DEPTH TO WATER: INITIAL ▽ :

PROJECT NO.: VV4567
DATE: 07/27/18
ELEVATION: n/a
LOGGED BY: DVC
BORING DIAMETER: 4"
FINAL ▼ : AFTER: hrs.

DEPTH	SAMPLE NO.	SAMPLER	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	SOIL CLASSIFICATION	CONVERTED SPT BLOW COUNT (BLOWS/FT.)	DRY DENSITY (PCF)	MOISTURE CONTENT (PERCENT)	Qp (t.s.f.) Penetrometer	ADDITIONAL TESTS AND REMARKS (LL, PI, UCC, ø&c, Gradation)
	1-5			Boring Terminated @ 29'. No Groundwater Encountered.		50-4"				
30										
35										
40										
45										
50										
55										

This information pertains only to this boring and is not necessarily indicitive of the whole site.

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Figure 5

LOG OF TEST BORING
BORING NO.: 2

PROJECT: Proposed Casa Dei Vista Apartments
CLIENT: Gaurdian Investment Capital, LLC
LOCATION: Stable Top of Bank Along Ulatis Creek
DRILLER: Hillside Drilling
DRILL RIG: Mobile B-24
DEPTH TO WATER: INITIAL ▽ :

PROJECT NO.: VV4567
DATE: 07/27/18
ELEVATION: n/a
LOGGED BY: DVC
BORING DIAMETER: 4"
FINAL ▼ : AFTER: hrs.

DEPTH	SAMPLE NO.	SAMPLER	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	SOIL CLASSIFICATION	CONVERTED SPT BLOW COUNT (BLOWS/FT.)	DRY DENSITY (PCF)	MOISTURE CONTENT (PERCENT)	Qp (t.s.f.) Penetrometer	ADDITIONAL TESTS AND REMARKS (LL, PI, UCC, ø&c, Gradation)
0				Brown Clayey SILT; dry to moist, firm to very stiff.	ML					
5				Brown Silty SAND; moist, medium dense, fine grained.	SM					
	2-1					13	88.0	5.2		ϕ=32.8° c=290 psf
10				Brown Silty SAND; moist, dense, fine grained.	SM					
15	2-2					38	112.9	7.5		<No.200=33%
20				Brown & Gray Clayey Sandy GRAVELS; moist, very dense. (Tehama Formation)	GP					
	2-3					50-2"				
25				Boring Terminated @ 22' 2". No Groundwater Encountered.						

This information pertains only to this boring and is not necessarily indicitive of the whole site.

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Figure 6

LOG OF TEST BORING
BORING NO.: 3

PROJECT: Proposed Casa Dei Vista Apartments
CLIENT: Gaurdian Investment Capital, LLC
LOCATION: Stable Top of Bank Along Ulatis Creek
DRILLER: Hillside Drilling
DRILL RIG: Mobile B-24
DEPTH TO WATER: INITIAL ▽ :

PROJECT NO.: VV4567
DATE: 07/27/18
ELEVATION: n/a
LOGGED BY: DVC
BORING DIAMETER: 4"
FINAL ▼ : AFTER: hrs.

DEPTH	SAMPLE NO.	SAMPLER	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	SOIL CLASSIFICATION	CONVERTED SPT BLOW COUNT (BLOWS/FT.)	DRY DENSITY (PCF)	MOISTURE CONTENT (PERCENT)	Qp (t.s.f.) Penetrometer	ADDITIONAL TESTS AND REMARKS (LL, PI, UCC, ø&c, Gradation)
0				Brown Clayey SILT; dry to moist, firm to stiff.	ML					
	3-1					28	108.2	12.5		
5										
					ML					
10	3-2			As Above, very stiff.		17				<No.200=87%
15										
				Light Brown SILTSTONE; highly weathered, friable.	Rx					
	3-3					50-6½"	109.5	14.4		
20				Boring Terminated @ 19'. No Groundwater Encountered.						
25										

This information pertains only to this boring and is not necessarily indicitive of the whole site.

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Figure 7

LOG OF TEST BORING
BORING NO.: 4

PROJECT: Proposed Casa Dei Vista Apartments
CLIENT: Gaurdian Investment Capital, LLC
LOCATION: Stable Top of Bank Along Ulatis Creek
DRILLER: Hillside Drilling
DRILL RIG: Mobile B-24
DEPTH TO WATER: INITIAL ▽ :

PROJECT NO.: VV4567
DATE: 07/27/18
ELEVATION: n/a
LOGGED BY: DVC
BORING DIAMETER: 4"
FINAL ▼ : AFTER: hrs.

DEPTH	SAMPLE NO.	SAMPLER	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	SOIL CLASSIFICATION	CONVERTED SPT BLOW COUNT (BLOWS/FT.)	DRY DENSITY (PCF)	MOISTURE CONTENT (PERCENT)	Qp (t.s.f.) Penetrometer	ADDITIONAL TESTS AND REMARKS (LL, PI, UCC, ø&c, Gradation)
0				Brown SILT; dry, firm.	ML					
				Brown & Gray Gravelly SAND; moist, hard. (Tehama Formation)	SP					
	4-1					50-6"	120.6	8.7		
5										
10				Light Brown Sandstone; highly weathered, friable.	Rx					
	4-2					50-4"				
15										
20	4-3			As Above.		50-4"				
				Boring Terminated 20.5'. No Groundwater Encountered.						
25										

This information pertains only to this boring and is not necessarily indicitive of the whole site.

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Figure 8

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			SYMBOLS		TYPICAL NAMES
COARSE GRAINED SOILS More than half of material is retained on the No. 200 Sieve	GRAVEL More than half of coarse fraction is larger than No. 4 sieve	Clean gravels (<5% fines)	GW		Well graded gravels, gravel-sand mixtures, little or no fines (Cu>4 & 1≤Cc≤3)
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines (Cu < 4 and/or 1>Cc>3)
		Gravel with fines (>12% fines)	GM		Silty gravels and gravel-sand-silt mixtures (PI<4 or below "A" line)
			GC		Clayey gravels and gravel-sand-clay mixtures (PI>7 & on or above "A" line)
	SAND Half or more of the coarse fraction is smaller than No. 4 sieve	Clean sands (<5% fines)	SW		Well graded sands, gravelly sands, little or no fines (Cu>6 & 1≤Cc≤3)
			SP		Poorly graded sands, gravelly sands, little or no fines (Cu<6 and/or 1>Cc>3)
		Sand with fines (>12% fines)	SM		Silty sands and gravel-sand-silt mixtures (PI<4 or below "A" line)
			SC		Clayey sands and gravel-sand-clay mixtures (PI>7 & on or above "A" line)
FINE GRAINED SOILS Half or more of the material passes the No. 200 Sieve	SILTS AND CLAYS Liquid Limit is less than 50%		ML		Inorganic silts with gravel and sand having slight plasticity (PI<4 or below "A" line)
			CL		Inorganic clays of low to med. plasticity with gravel and sand (PI>7 & on or above "A" line)
			OL		Organic silts and clays of low plasticity
	SILTS AND CLAYS Liquid Limit is 50% or more		MH		Inorganic elastic silts (PI below "A" line)
			CH		Inorganic clays of high plasticity, fat clays (PI on or above "A" line)
			OH		Organic silts and clays of medium to high plasticity
HIGHLY ORGANIC SOILS			Pt		Peat and other highly organic soils

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8798 Airport Road, Redding, CA 96002

SAMPLER AND LAB TESTING LEGEND

- Auger
- Bulk Sample, taken from auger cuttings
- California Sampler
- Bulk/Grab Sample
- Pitcher
- Standard Penetration Test
- Shelby Tube
- No Recovery

LL=Liquid Limit (%)
PI=Plasticity Index
¦ =Friction Angle
C=Cohesion
UCC=Unconfined Compression
R value=Resistance Value
Consol=Consolidation Test

SOIL GRAIN SIZE

U.S. STANDARD SIEVE OPENINGS

		#200		#40		#10		#4	¾"		3"		12"
CLAY	SILT	SAND							GRAVEL			COBBLES	BOULDERS
		FINE		MEDIUM		COARSE			FINE		COARSE		
	0.002		0.075		0.425		2.00	4.75		19.0		75	300

SOIL GRAIN SIZE IN MILLIMETERS

RELATIVE DENSITY (Coarse-grained soils)

SANDS & GRAVELS	BLOWS/FOOT[1]
Very Loose	0 – 4
Loose	4 – 10
Medium Dense	10 – 30
Dense	30 – 50
Very Dense	> 50

CONSISTENCY (Fine-grained soils)

SILTS & CLAYS	STRENGTH[2]	BLOWS/FOOT[1]
Very Soft	< 500	0 – 2
Soft	500 – 1,000	2 – 4
Firm	1,000 – 2,000	4 – 8
Stiff	2,000 – 4,000	8 – 15
Very Stiff	4,000 – 8,000	15 – 30
Hard	> 8,000	>30

1 – Number of blows of 140 pound hammer falling 30 inches to drive a 2-inch O.D. split spoon sampler (ASTM D1586)
2 – Unconfined compressive strength in lb/ft^2 as determined by lab testing or approximated by the standard penetration test (ASTM D1586) or pocket penetrometer.

WEATHERING (Bedrock)

Fresh	No visible sign of decomposition or discoloration; rings under hammer impact
Slightly weathered	Slight discoloration inwards from open fractures; little or no effect on normal cementation; otherwise similar to Fresh
Moderately weathered	Discoloration throughout; weaker minerals decomposed; strength somewhat less than fresh rock but cores can not be broken by hand or scraped with knife; texture preserved; cementation little to not affected; fractures may contain filling
Highly weathered	Most minerals somewhat decomposed; specimens can be broken by hand with effort or shaved with knife; texture becoming indistinct but fabric preserved; faint fractures
Completely weathered	Minerals decomposed to soil but fabric and structure preserved; specimens can be easily crumbled or penetrated

STRENGTH (Bedrock)

Plastic	Very low strength
Friable	Crumbles easily by rubbing with fingers
Weak	An unfractured specimen will crumble under light hammer blows
Moderately strong	Specimen will withstand a few heavy hammer blows before breaking
Strong	Specimen will withstand a few heavy ringing blows and will yield with difficulty only dust and small flying fragments
Very strong	Specimen will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments

BEDDING (Bedrock) SPACING (inches)

Very thickly bedded	> 48
Thickly bedded	24 to 48
Thin bedded	2.5 to 24
Very thin bedded	5/8 to 2.5
Laminated	1/8 to 5/8
Thinly laminated	<1/8

FRACTURING (Bedrock) SPACING (inches)

Very little fractured	> 48
Occasionally fractured	12 to 48
Moderately fractured	6 to 12
Closely fractured	1 to 6
Intensely fractured	5/8 to 1
Crushed	<5/8

ACE Quality Control

1830 Vernon Street, Suite 7
Roseville, California 95678
Phone: (916) 778-0950
www.ACEqc.com

EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-1
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Tan brown, moist, dense, silty SAND with gravel SM	1		1	ST		66	GWT not encountered	39						
		5	2	ST		66		48						
		10	3	ST		33		74						
Dark tan, moist, very dense, well graded GRAVEL GW	2													
Light tan, moist, very dense, cemented, silty SAND SM	3	15	4	ST		66		64						
Boring completed at depth of approximately 16 feet below egs. No free groundwater was encountered during our exploration. Boring was backfilled with cuttings.		20												

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-2
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Tan brown, moist, loose, silty/clayey fine grained SAND SM	1		1	ST		66	GWT not encountered	4	82	8.5				
Tan, moist, loose, poorly graded clean SAND SP	2	5	2	ST		33		8						
		10	3	ST		33		8						
Tan, moist, dense, silty SAND with gravel SM	3	15	4	ST		66		40						
Boring completed at depth of approximately 16.5 feet below egs. No free groundwater was encountered during our exploration. Boring was backfilled with cuttings.		20												

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-3
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4", 2.0"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, medium stiff, silty/sandy CLAY CL	1		1	ST	100	GWT not encountered	7	94	20.2				
Tan, moist, medium dense, silty SAND SM	2	5	2	MC	100		20						
		10	3	MC	66		21						
Brown, moist, medium dense, silty/clayey SAND SM	3	15	4	MC	66		30						
Tan, moist, medium dense, SILT ML	4	20	5	MC	66		28						
Boring completed at depth of approximately 21.5 feet below egs. No free groundwater was encountered. Boring was backfilled with neat cement.													

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-4
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Dark brown, moist, stiff, silty CLAY CL	1		1	ST		100	GWT not encountered	12			77			
Tan brown, moist, medium dense, silty SAND with gravel SM	2	5	2	MC		100		16						
Brown, moist, very stiff, sandy CLAY CL	3	10	3	MC		66		19			64			
		15	4	MC		66		14						
Brown, moist, medium dense, poorly graded fine grained SAND SP	4	20	5	MC		66		27						
Boring completed at depth of approximately 21.5 feet below egs. No free groundwater was encountered. Boring was backfilled with neat cement.														

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Sample Type:

ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:

At Drilling
After Drilling

Layer Lines:

Layer lines are approximate and in-situ the transition may be gradual

Boring Method:

HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-5
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, loose to medium dense, silty SAND SM	1		1	ST		33	GWT not encountered	3	88	15.2				
		5	2	ST		33		9						
		10	3	ST		66		12						
Tan, moist, dense, sandy SILT ML	2	15	4	ST		66		40						
	3													
Boring completed at depth of approximately 16.5 feet below egs. No free groundwaer was encountered. Boring was backfilled with cuttings.		20												

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-6
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Red brown, moist, medium dense to very dense, silty SAND with gravel SM	1		1	ST		33	GWT not encountered	16						
		5	2	ST		33		56						
		10	3	ST		66		89/9"						
Auger refusal encountered at a depth of approximately 13.5 feet below egs. No free groundwaer was encountered. Boring was backfilled with cuttings.		15												
		20												

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Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

ACE Quality Control

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-7
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, loose to medium dense, silty fine grained SAND SM	1		1	ST	100	GWT not encountered	4						
		5	2	ST	100		10						
		10	3	ST	66		19						
Orange with black, moist, very dense, silty SAND with gravel SM	2	15	4	ST	66		75/11"						
Boring completed at depth of approximately 16.5. No free groundwater was encountered. Boring was backfilled with grout.		20											

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Users\Dillon Stemberger\Desktop\SUPERLOGS\LOGS\Allison Drive Apartments.log Date: 6/19/2018

ACE Quality Control

1830 Vernon Street, Suite 7
Roseville, California 95678
Phone: (916) 778-0950
www.ACEqc.com

EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-8
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown to light brown, moist, loose to medium dense, sandy CLAY CL	1		1	ST		100	GWT not encountered	5			85.2			
		5	2	ST		33		13				43	25	P.I = 18
Brown, moist, medium dense, silty SAND SM	2	10	3	ST		66		11						
Boring completed at depth of approximately 10.5 feet below egs. No free groundwater was encountered. Boring was backfilled with cuttings.		15												
		20												

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Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

ACE Quality Control

1830 Vernon Street, Suite 7
Roseville, California 95678
Phone: (916) 778-0950
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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-9
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Black brown, moist, medium stiff to stiff, sandy CLAY CL	1		1	ST		100	GWT not encountered	9	104	20.5	74			
Tan, moist, medium dense, silty/clayey SAND SM	2	5	2	ST		33		26						
Tan, moist, very stiff to hard, cemented SILT ML	3	10	3	ST		66		52			88			
Brown, moist, dense, silty fine grained SAND with gravel SM	4	15	4	ST				48						
		20	5	ST				31						
Boring completed at depth of approximately 21.5 feet below egs. No free groundwater was encountered. Boring was backfilled with neat cement.														

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Users\Dillon Stemberger\Desktop\SUPERLOGS\LOGS\Allison Drive Apartments.log Date: 6/19/2018

ACE Quality Control

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Roseville, California 95678
Phone: (916) 778-0950
www.ACEqc.com

EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-10
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Black brown to tan brown, moist, medium stiff to stiff, sandy CLAY CL	1		1	ST	33	GWT not encountered	12				37	20	P.I = 18
		5	2	ST	100		13						
Tan brown, moist, medium dense, silty/clayey SAND SM	2	10	3	ST	100		17						
		15	4	ST	66		16						
		20	5	ST	100		15						
Tan, moist, dense to very dense, silty SAND with gravel SM	3												

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Users\Dillon Stemberger\Desktop\SUPERLOGS\LOGS\Allison Drive Apartments.log Date: 6/13/2018

ACE Quality Control

1830 Vernon Street, Suite 7
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www.ACEqc.com

EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-10
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Tan, moist, dense to very dense, silty SAND with gravel SM	3		6	ST	100		50/3"						
		30	7	ST	66		38						
Tan with red to orange, moist, very dense, silty fine grained SAND SM	4	35	8	ST	66		67						
		40	9	ST	66		84/11"						
		45	10	ST	33		67			49			

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Users\Dillon Stemberger\Desktop\SUPERLOGS\LOGS\Allison Drive Apartments.log Date: 6/13/2018

ACE Quality Control

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-10
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Tan with red to orange, moist, very dense, silty fine grained SAND SM	4		11	ST		100		62						
Boring completed at depth of approximately 51.5 feet below egs. No free groundwater was encountered. Boring was backfilled with neat cement.		55 60 65 70												

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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ACE Quality Control

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Roseville, California 95678
Phone: (916) 778-0950
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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-11
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, loose to medium dense, silty SAND SM	1		1	ST	100	GWT not encountered	10						
		5	2	ST	100		7						
Brown, moist, medium stiff, sandy SILT ML	2	10	3	ST	100		11						
Tan, moist, dense to very dense, silty SAND with gravel SM	3												
		15	4	ST	100		10						
Orange brown, moist, silty fine grained poorly graded SAND SP	4												
		20	5	ST	100		10						
Boring completed at depth of approximately 21.5 feet below egs. No free groundwater was encountered. Boring was backfilled with neat cement.													

Sample Type:

ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:

At Drilling
After Drilling

Layer Lines:

Layer lines are approximate and in-situ the transition may be gradual

Boring Method:

HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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ACE Quality Control

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-12
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, medium dense, silty SAND SM	1		1	ST		100	GWT not encountered	16						
		5	2	ST		100		14						
Brown, moist, medium stiff, sandy CLAY CL	2	10	3	ST		100		11						
Boring completed at depth of approximately 11.5 feet below egs. No free groundwater was encountered. Boring was backfilled with cuttings.		15												
		20												

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Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

ACE Quality Control

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Phone: (916) 778-0950
www.ACEqc.com

EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-13
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, medium dense, silty SAND SM	1		1	ST		100	GWT not encountered	16						
		5	2	ST		100		14						
Brown, moist, medium stiff, sandy CLAY CL	2	10	3	ST		100		11						
Boring completed at depth of approximately 11.5 feet below egs. No free groundwater was encountered. Boring was backfilled with cuttings.		15												
		20												

Date: 6/13/2018
File: C:\Users\Dillon Stemberger\Desktop\SUPERLOGS\LOGS\Allison Drive Apartments.log
SuperLog CivilTech Software, USA www.civiltech.com

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

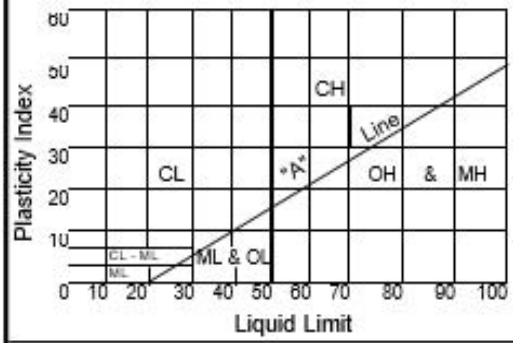
Layer Lines:
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Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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UNIFIED SOIL CLASSIFICATION

PT	OH	CH	MH	OL	CL	ML	SC	SM	SP	SW	GC	CM	GP	GW
Highly organic soils	Silts and Clays (Liquid Limit > 50)			Silts and Clays (Liquid Limit < 50)			Sands with fines > 12% fines		Clean sands < 5% fines		Gravels with fines > 12% Fines		Clean gravels < 5% fines	
							Sands - more than 50% of coarse fraction is smaller than No. 4 sieve.				Gravels - more than 50% of coarse fraction is larger than No. 4 sieve.			
Fine grained soils (more than 50% is smaller than No. 200 sieve)							Coarse grained soils (more than 50% is larger than No. 200 sieve)							



LABORATORY CLASSIFICATION CRITERIA

GW and SW-$C_u = \frac{D_{60}}{D_{10}}$ greater than 4 for GW & 6 for SW; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 & 3

GP and SP - Clean gravel or sand not meeting requirements for GW and SW.

GM and SM - Atterberg limits below "A" line or P.I. less than 4.

GC and SC - Atterberg limits above "A" line with P.I. greater than 7.

Fines (silt or clay)	Fine Sand	Medium Sand	Coarse Sand	Fine Gravel	Coarse Gravel	Cobbles	Boulders
Sieve sizes	> # 200	> # 40	> # 10	> # 4	> 3/4"	> 3"	> 10"

Classification of earth materials shown on this sheet is based on field inspection and should not be construed to imply laboratory analysis so stated.

MATERIAL SYMBOLS

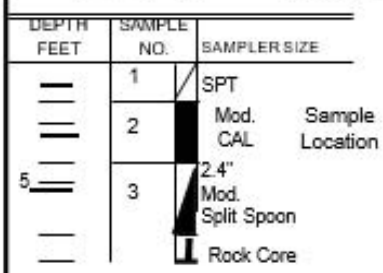
- Gravel
- Peat or organic matter
- Sand
- Fill Material
- Silt
- Shale
- Clay
- Sandstone
- Sandy Clay or clayey sand
- Limestone
- Sandy silt or silty Sand
- Metamorphic rock
- Silty clay or clayey silt
- Igneous rock

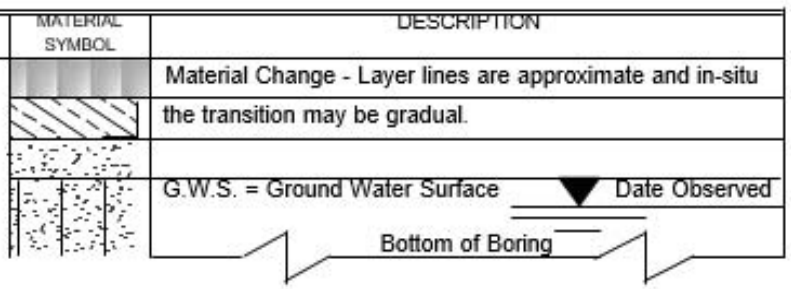
RELATIVE DENSITY / CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

No. of Blows	Granular	No. of Blows	Cohesive
0 - 4	Very Loose	< 2	Very Soft
5 - 10	Loose	3 - 4	Soft
11 - 20	Semicompact	5 - 8	Medium Stiff
21 - 30	Medium Dense	9 - 15	Stiff
31 - 50	Dense	16 - 30	Very Stiff
> 50	Very Dense	> 30	Hard

Where the standard penetration test has not been performed, consistencies shown on the logs are estimated and given in parenthesis, (e.g., Very Stiff).





LEGEND FOR EXPLORATIONS LOGS

Materials Testing, Inc.

8798 Airport Road
Redding, California 96002
(530) 222-1116, fax 222-1611

865 Cotting Lane, Suite A
Vacaville, California 95688
(707) 447-4025, fax 447-4143

Client: Guardian Investment Capital, LLC
1120 Fairfield Avenue
Roseville, CA 95678

Client No.: VV4567-001
Report No.: 0300-001
Date: 08/16/18

Project: Proposed Casa Dei Vista Apartments
Southwest Corner of Allison Drive & Travis Way
Vacaville, California

Submitted by: KC Engineering

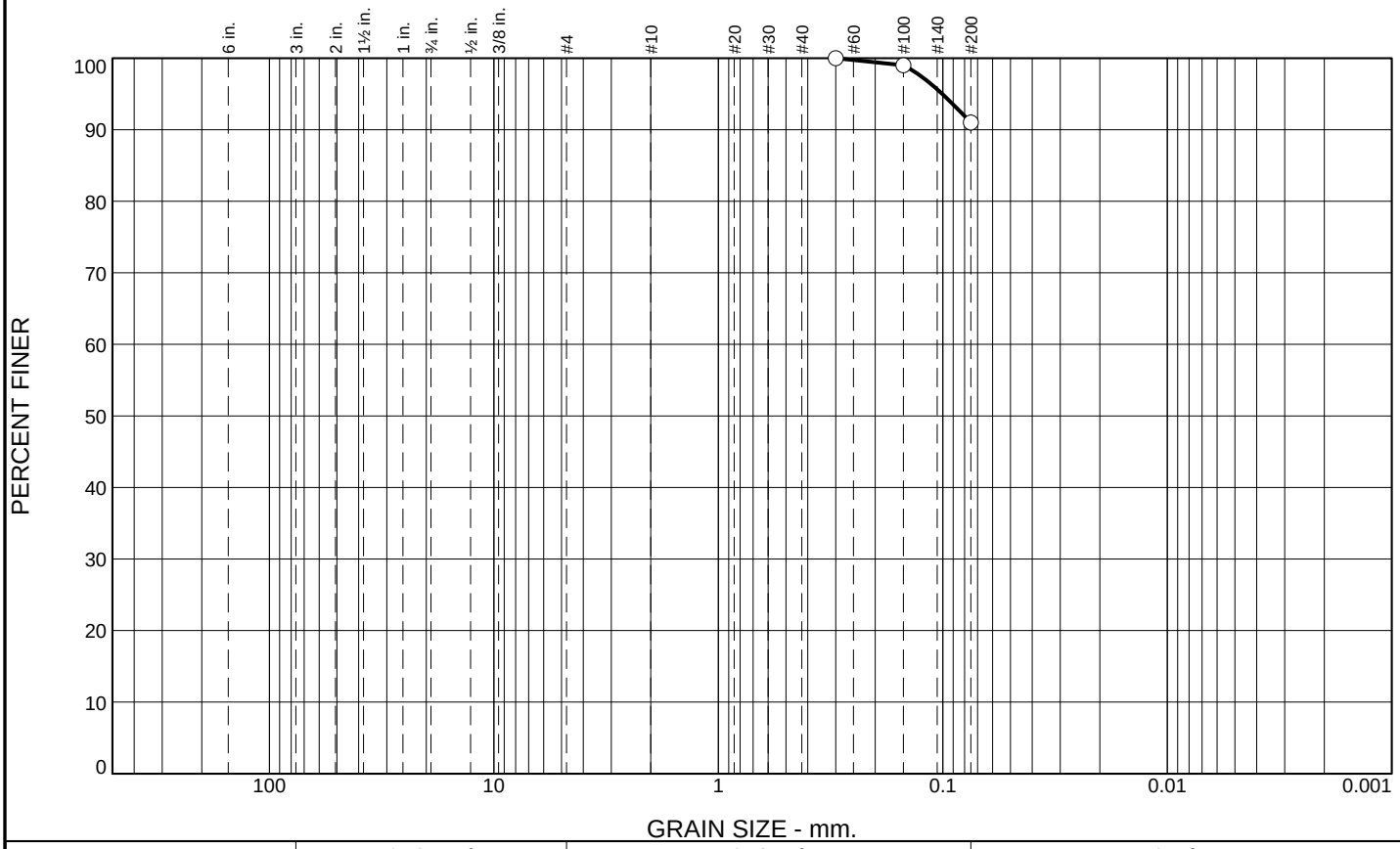
Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937) and Liquid Limit, Plastic Limit & Plasticity Index of Soils (ASTM D4318)

Sample #	Description	Dry Density p.c.f.	Moisture Content %	Liquid Limit	Plastic Limit	Plastic Index
1-1 @ 4.5’	Brown Fine Sandy Clay (visual)	104.0	12.5	---	---	---
1-2 @ 9.5’	Light Brown Sandy Silt (visual)	115.0	10.9	---	---	---
1-4 @ 28.5’	Light Brown Sandy Silt (visual)	109.8	13.5	---	---	---
2-1 @ 8.0’	Brown Silty Sand (visual)	88.0	5.2	---	---	---
2-2 @ 15.0’	Brown Silty Sand (visual)	112.9	7.5	---	---	---
3-1 @ 4.0’	Brown Clayey Silt (visual)	108.2	12.5	---	---	---
3-3 @ 18.5’	Light Brown Silt (visual)	109.5	14.4	---	---	---
4-1 @ 4.0’	Brown Gravely Sand (visual)	120.6	8.7	---	---	---

Notes:

Tested by Ricky Mathews & Dakota Blankenship.
The samples were tested according to the referenced standard test procedures and relate only to the items inspected or tested.
Results are not transferable and shall not be reproduced, except in full, without written permission from MTI.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	9	91	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#50	100		
#100	99		
#200	91		

* (no specification provided)

Material Description

Light Brown Silt (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

Materials tested in accordance with ASTM D6913.

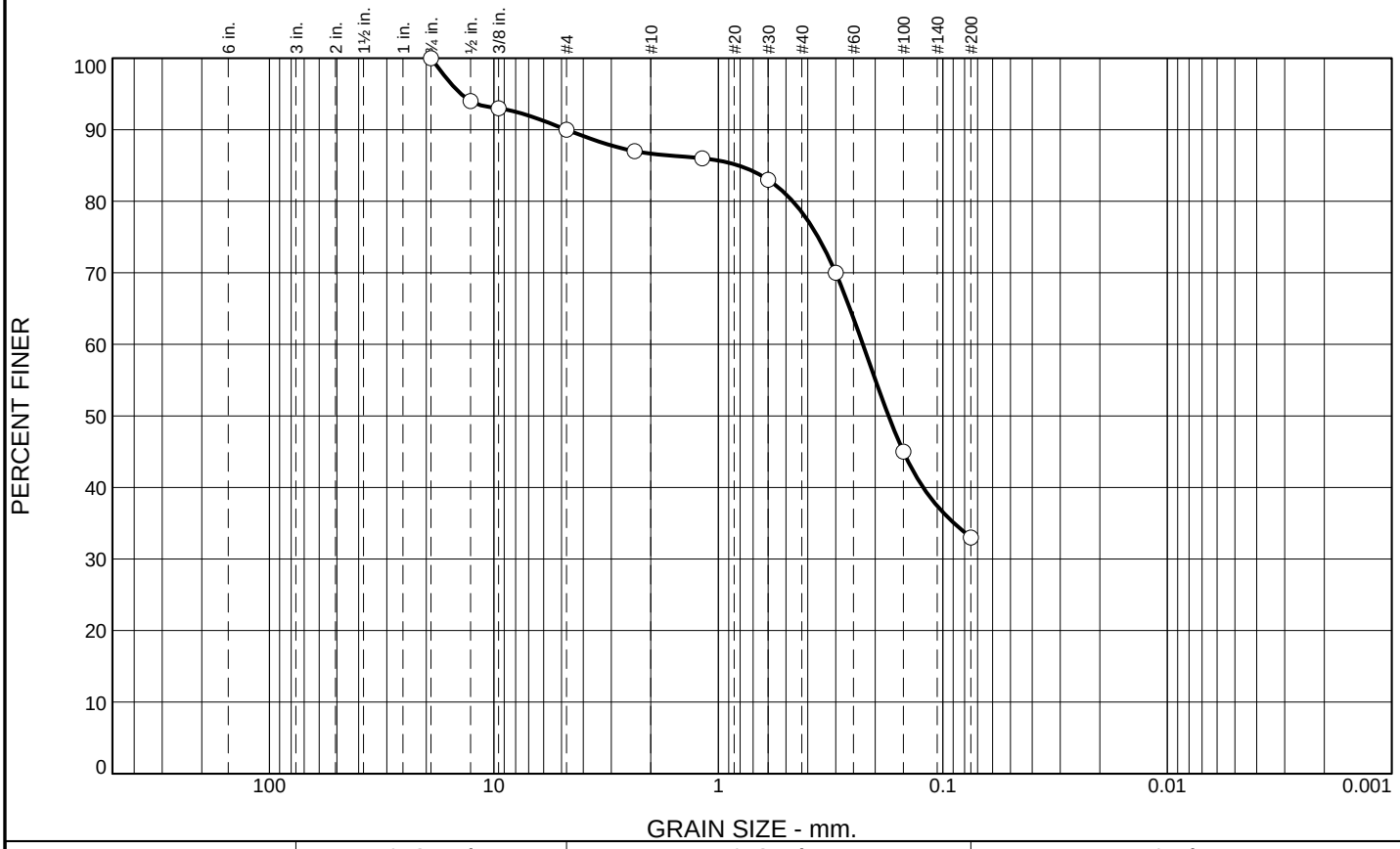
Location: 1-3
Sample Number: 3 **Depth:** 14.5' **Date:** 08/16/18

Materials Testing, Inc.

Client: Guardian Investment Capital, LLC
Project: Proposed Casa Dei Vista Apartments
Southwest Corner of Allison Drive & Travis Way, Vacaville, CA
Project No: VV4567-001 **Figure** 0300-002

Tested By: Ricky Mathews

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	10	3	9	45	33	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100		
1/2"	94		
3/8"	93		
#4	90		
#8	87		
#16	86		
#30	83		
#50	70		
#100	45		
#200	33		

* (no specification provided)

Material Description

Brown Silty Sand (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 4.7500 D_{85}= 0.8132 D_{60}= 0.2273
D_{50}= 0.1747 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Materials tested in accordance with ASTM D6913.

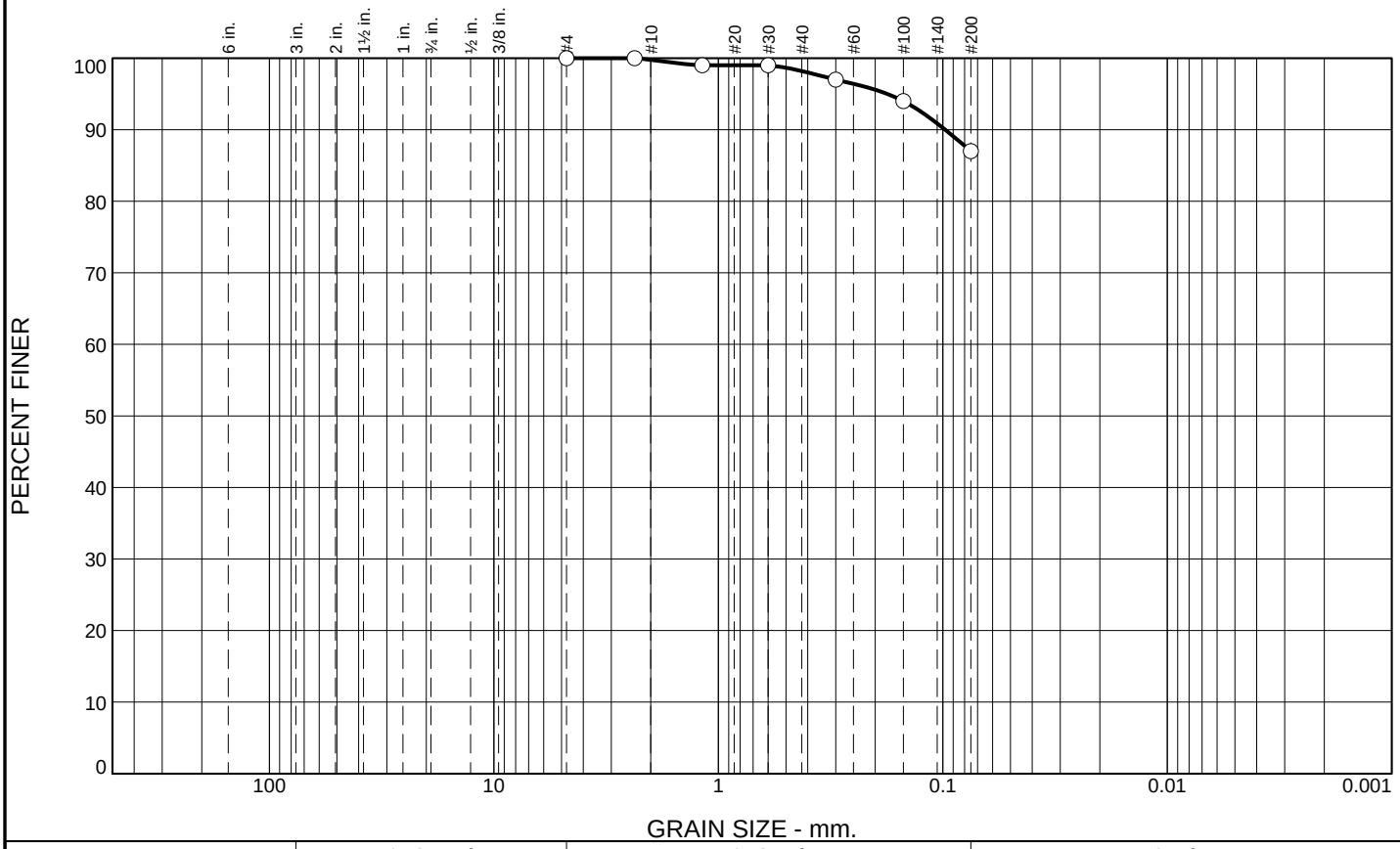
Location: 2-2
Sample Number: 6 **Depth:** 15.0' **Date:** 08/16/18

Materials Testing, Inc.

Client: Guardian Investment Capital, LLC
Project: Proposed Casa Dei Vista Apartments
Southwest Corner of Allison Drive & Travis Way, Vacaville, CA
Project No: VV4567-001 **Figure** 0300-003

Tested By: Ricky Mathews

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	2	11	87	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100		
#8	100		
#16	99		
#30	99		
#50	97		
#100	94		
#200	87		

* (no specification provided)

Material Description

Brown Silt (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.0976 D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

Materials tested in accordance with ASTM D6913.

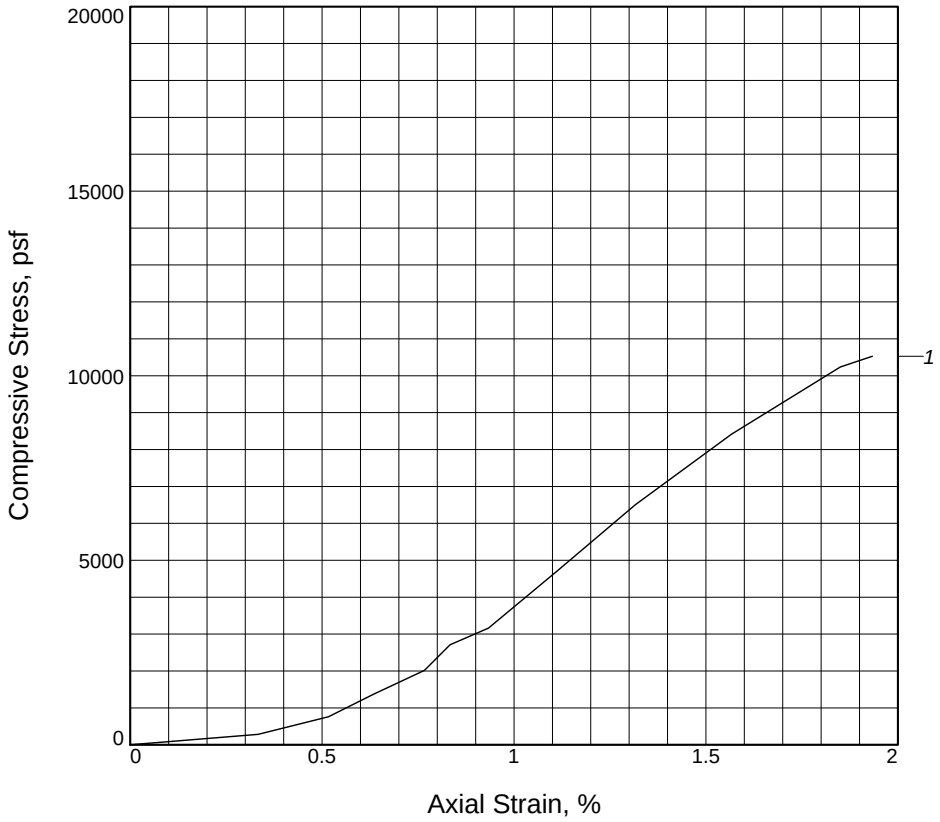
Location: 3-2
Sample Number: 8 **Depth:** 9-10.0' **Date:** 08/16/18

Materials Testing, Inc.

Client: Guardian Investment Capital, LLC
Project: Proposed Casa Dei Vista Apartments
Southwest Corner of Allison Drive & Travis Way, Vacaville, CA
Project No: VV4567-001 **Figure** 0300-004

Tested By: Ricky Mathews

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	10525			
Undrained shear strength, psf	5263			
Failure strain, %	1.9			
Strain rate, in./min.	N/A			
Water content, %	13.5			
Wet density, pcf	124.6			
Dry density, pcf	109.8			
Saturation, %	65.9			
Void ratio	0.5634			
Specimen diameter, in.	2.41			
Specimen height, in.	6.00			
Height/diameter ratio	2.49			

Description: Light Brown Sandy Silt (visual)

LL =	**PL =**	**PI =**	**GS=** 2.75	**Type:** Tube

Project No.: VV4567-001
Date Sampled: 07/27/18

Remarks:
Materials tested in accordance with ASTM D2166.
Material exceeds Load Dial Capacity - No Failure.
08/16/18

Figure 0300-005

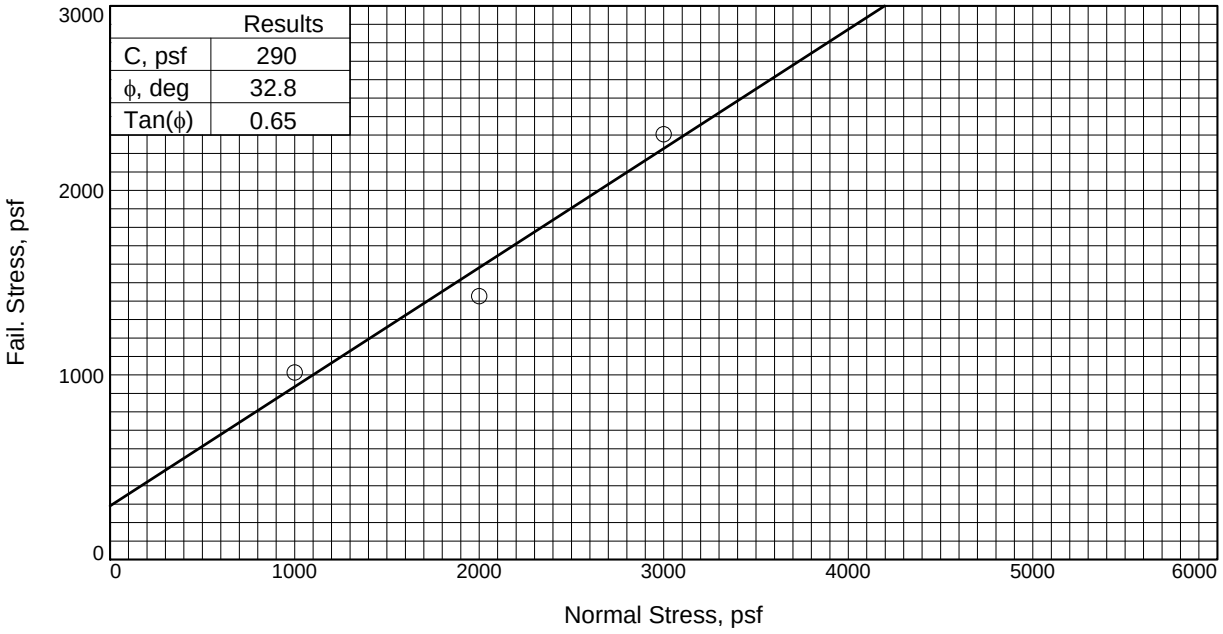
Client: Guardian Investment Capital, LLC

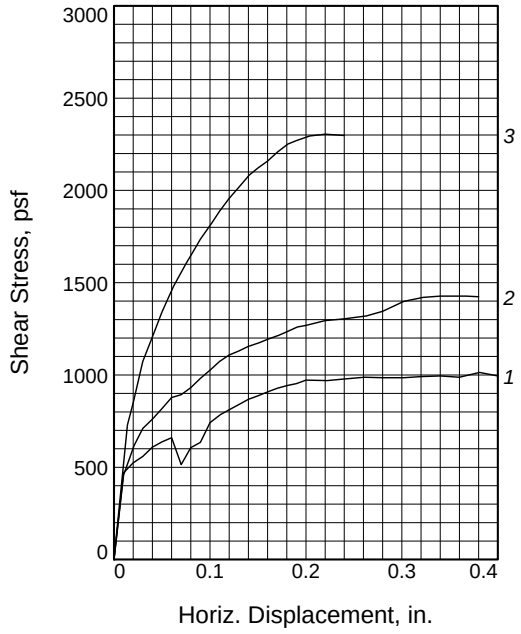
Project: Proposed Casa Dei Vista Apartments
Southwest Corner of Allison Drive & Travis Way, Vacaville, CA

Location: 1-4
Sample Number: 4 **Depth:** 28.5'

Materials Testing, Inc.

Tested By: Dakota Blankenship





Sample No.		1	2	3
Initial	Water Content, %	5.2	5.2	5.2
	Dry Density, pcf	85.4	87.2	91.5
	Saturation, %	15.0	15.6	17.4
	Void Ratio	0.9017	0.8624	0.7744
	Diameter, in.	2.41	2.41	2.41
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	27.4	25.9	23.9
	Dry Density, pcf	83.1	79.7	85.8
	Saturation, %	74.7	65.0	69.8
	Void Ratio	0.9533	1.0364	0.8924
	Diameter, in.	2.41	2.41	2.41
	Height, in.	1.03	1.09	1.07
Normal Stress, psf		1000	2000	3000
Fail. Stress, psf		1013	1427	2304
Displacement, in.		0.38	0.34	0.22
Ult. Stress, psf				
Displacement, in.				
Strain rate, in./min.		0.002	0.002	0.002

Sample Type: Tube
Description: Brown Silty Sand (visual)

Specific Gravity= 2.60
Remarks: DIRECT SHEAR TEST REPORT
Materials tested in accordance with ASTM D3080.
08/16/18

Figure 0300-006

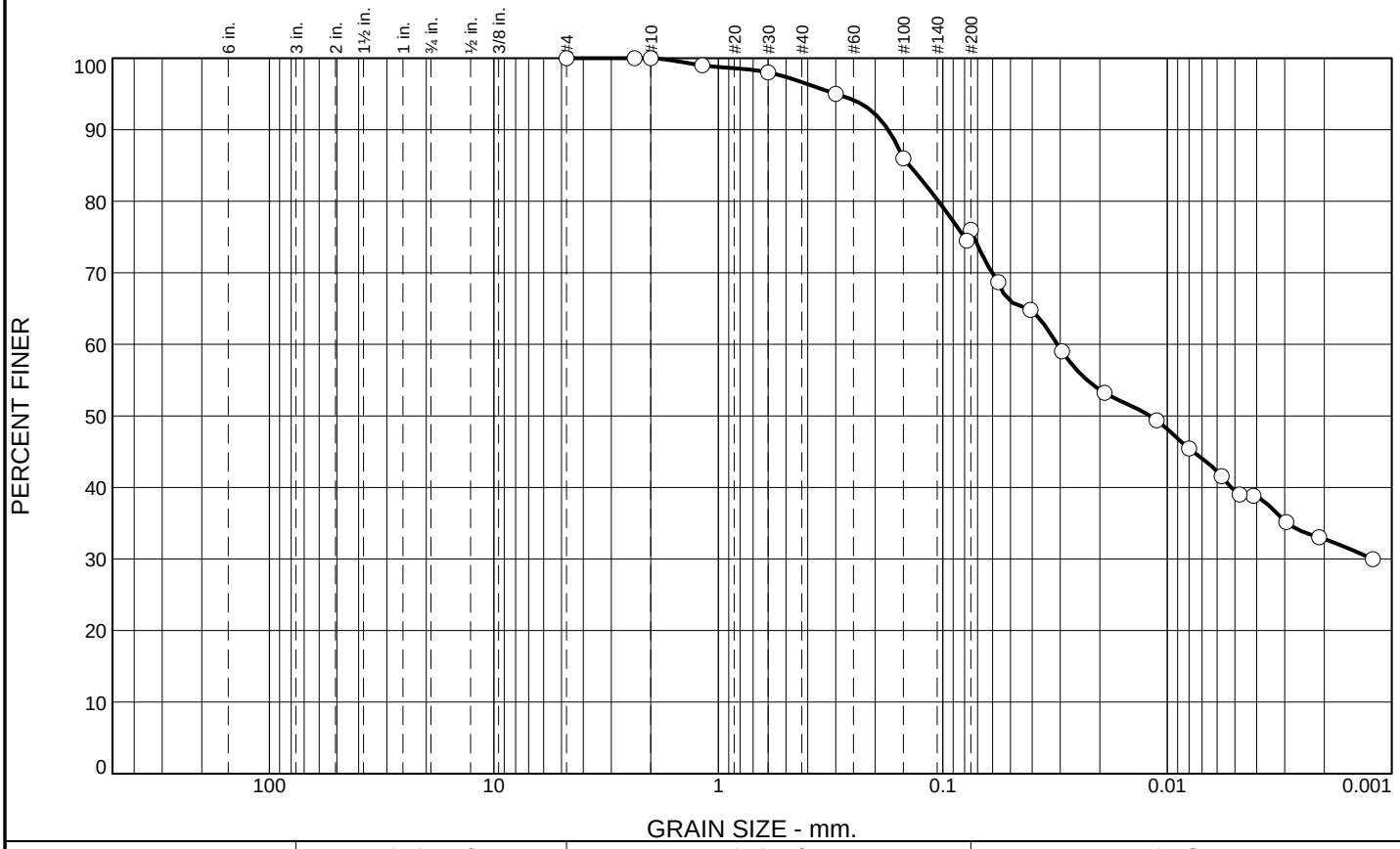
Client: Guardian Investment Capital, LLC

Project: Proposed Casa Dei Vista Apartments
Southwest Corner of Allison Drive & Travis Way, Vacaville, CA
Location: 2-1
Sample Number: 5 **Depth:** 7.5'
Proj. No.: VV4567-001 **Date Sampled:** 07/27/18

Materials Testing, Inc.

Tested By: Cindy Gooden

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	3	21	37	39

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100		
#8	100		
#10	100		
#16	99		
#30	98		
#50	95		
#100	86		
#200	76		

* (no specification provided)

Material Description

Brown Clay with Sand

Atterberg Limits

PL= 18 LL= 41 PI= 23

Coefficients

D_{90}= 0.1753 D_{85}= 0.1407 D_{60}= 0.0309
D_{50}= 0.0119 D_{30}= 0.0012 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(16)

Remarks

Materials tested in accordance with ASTM D422.
SpG - 2.460 (ASTM D854)

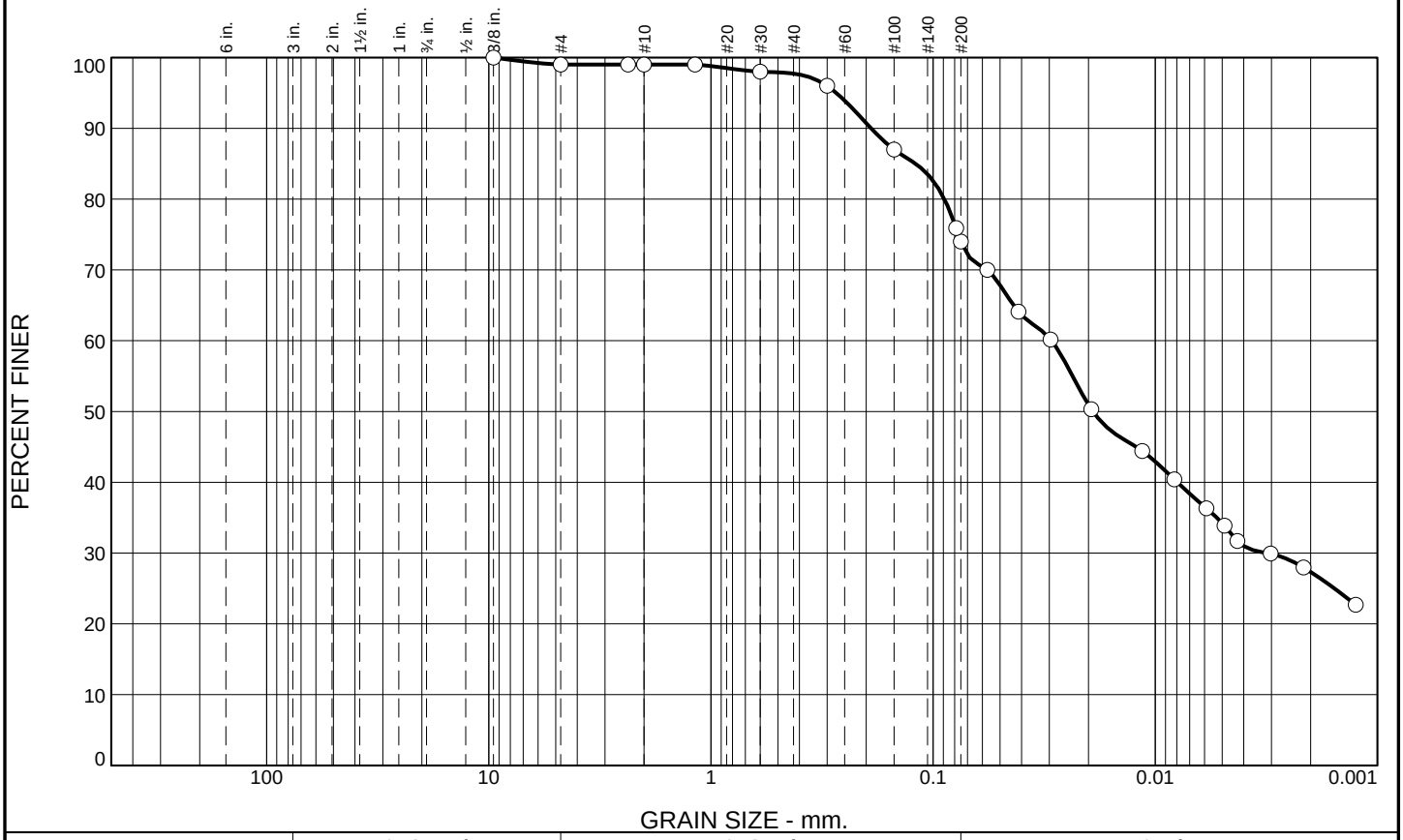
Location: SW
Sample Number: 3 **Depth:** 0-3.0' **Date:** 08/17/18

Materials Testing, Inc.

Client: Guardian Investment Capital, LLC
Project: Proposed Casa Dei Vista Apartments
Southwest Corner of Allison Drive & Travis Way, Vacaville, CA
Project No: VV4567-002 **Figure** 0300-001

Tested By: John Hubbard

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	0	1	24	40	34

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100		
#4	99		
#8	99		
#10	99		
#16	99		
#30	98		
#50	96		
#100	87		
#200	74		

* (no specification provided)

Material Description

Brown Clay with Sand

Atterberg Limits

PL= 19 LL= 34 PI= 15

Coefficients

D_{90}= 0.1903 D_{85}= 0.1200 D_{60}= 0.0293
D_{50}= 0.0191 D_{30}= 0.0031 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(10)

Remarks

Materials tested in accordance with ASTM D422.
SpG = 2.460 (ASTM D854)

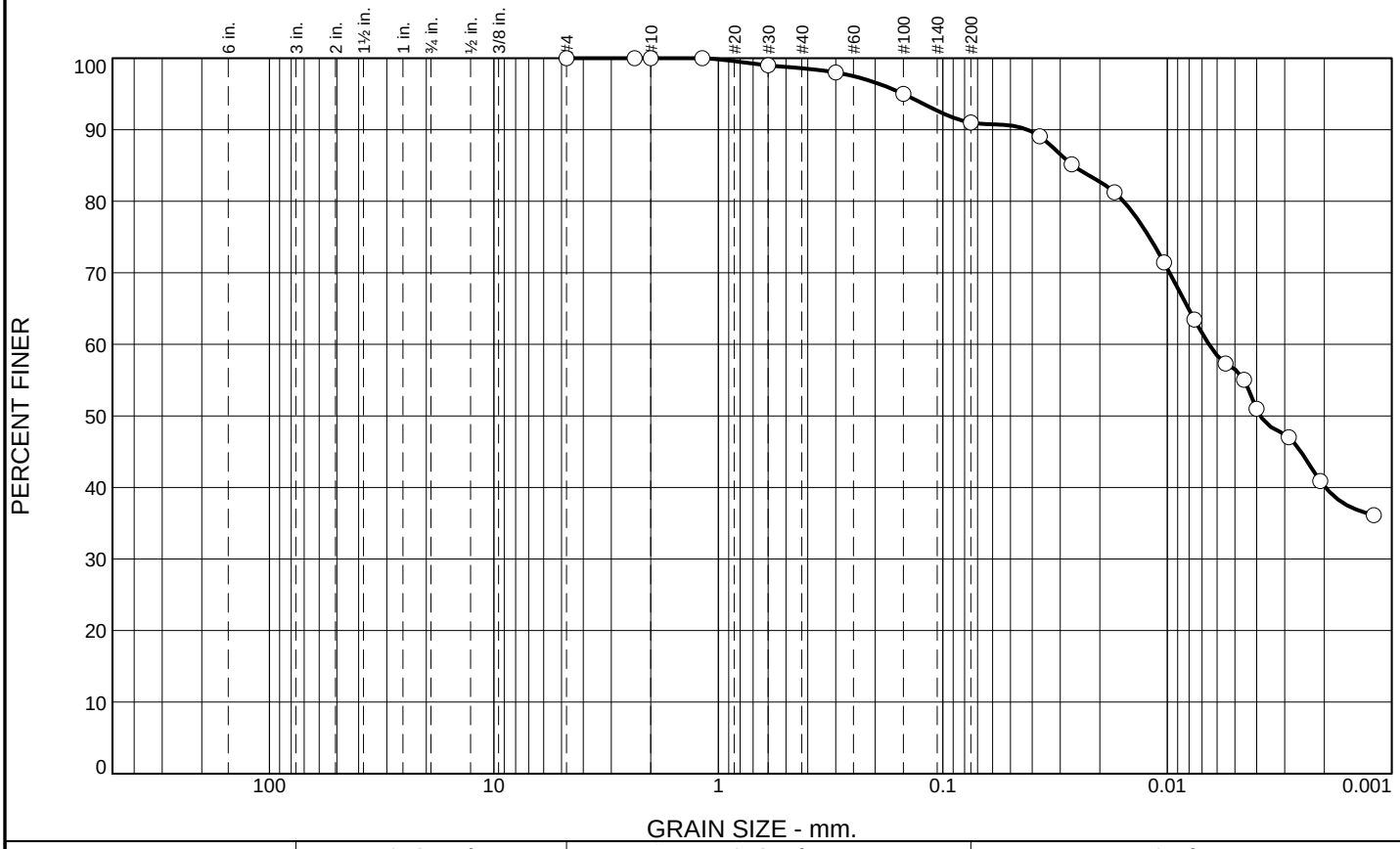
Location: NW
Sample Number: 4 **Depth:** 0-2.0' **Date:** 08/17/18

Materials Testing, Inc.

Client: Guardian Investment Capital, LLC
Project: Proposed Casa Dei Vista Apartments
Southwest Corner of Allison Drive & Travis Way, Vacaville, CA
Project No: VV4567-002 **Figure** 0300-002

Tested By: John Hubbard

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	1	8	34	57

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100		
#8	100		
#10	100		
#16	100		
#30	99		
#50	98		
#100	95		
#200	91		

* (no specification provided)

Material Description

Brown Clay

Atterberg Limits

PL= 22 LL= 48 PI= 26

Coefficients

D_{90}= 0.0420 D_{85}= 0.0263 D_{60}= 0.0065
D_{50}= 0.0039 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(26)

Remarks

Materials tested in accordance with ASTM D422.
SpG = 2.460 (ASTM D854)

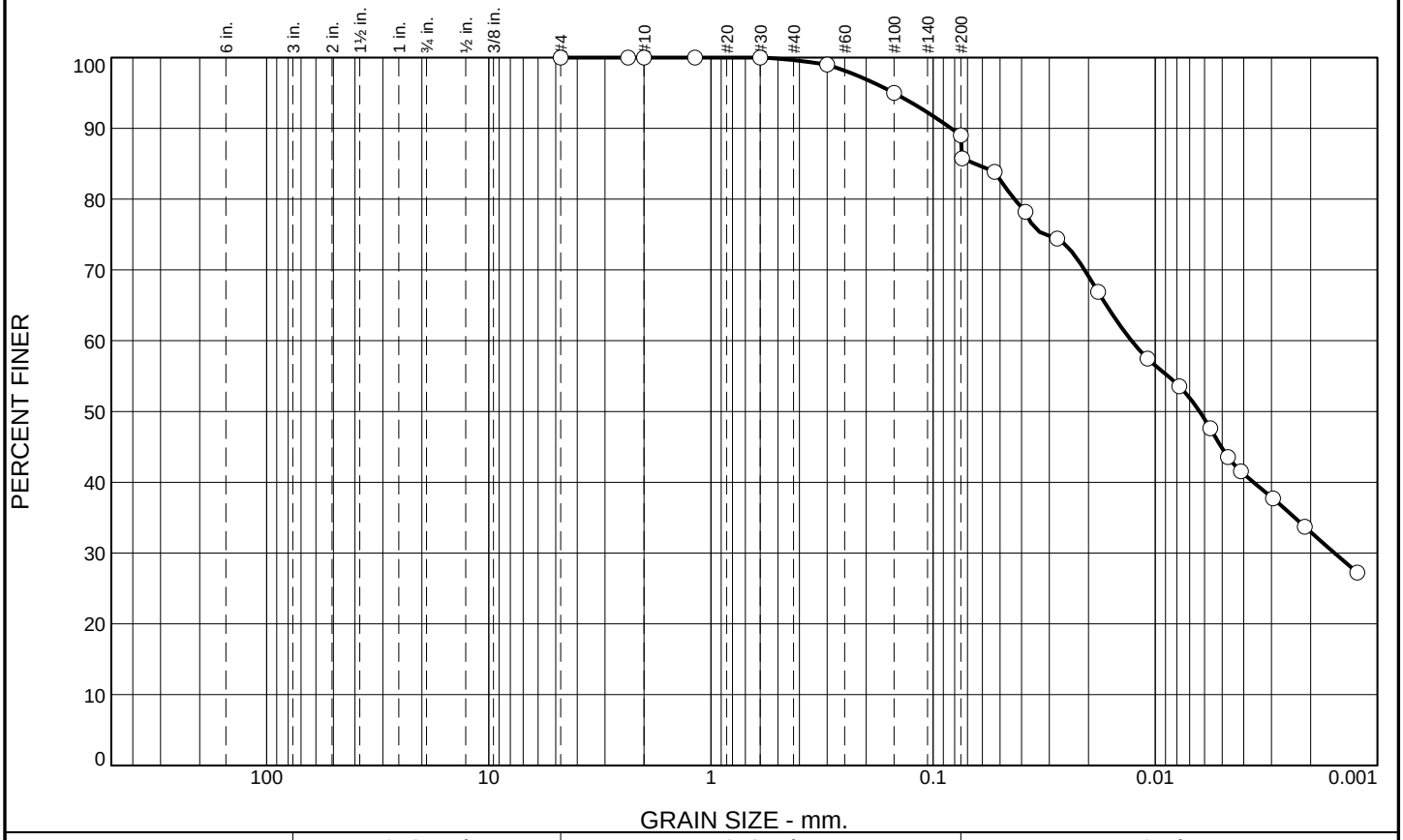
Location: NE
Sample Number: 5 **Depth:** 0-2.0' **Date:** 08/17/18

Materials Testing, Inc.

Client: Guardian Investment Capital, LLC
Project: Proposed Casa Dei Vista Apartments
Southwest Corner of Allison Drive & Travis Way, Vacaville, CA
Project No: VV4567-002 **Figure** 0300-003

Tested By: John Hubbard

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	11	44	45

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100		
#8	100		
#10	100		
#16	100		
#30	100		
#50	99		
#100	95		
#200	89		

* (no specification provided)

Material Description

Brown Clay

Atterberg Limits

PL= 22 LL= 41 PI= 19

Coefficients

D_{90}= 0.0830 D_{85}= 0.0649 D_{60}= 0.0128
D_{50}= 0.0063 D_{30}= 0.0016 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(18)

Remarks

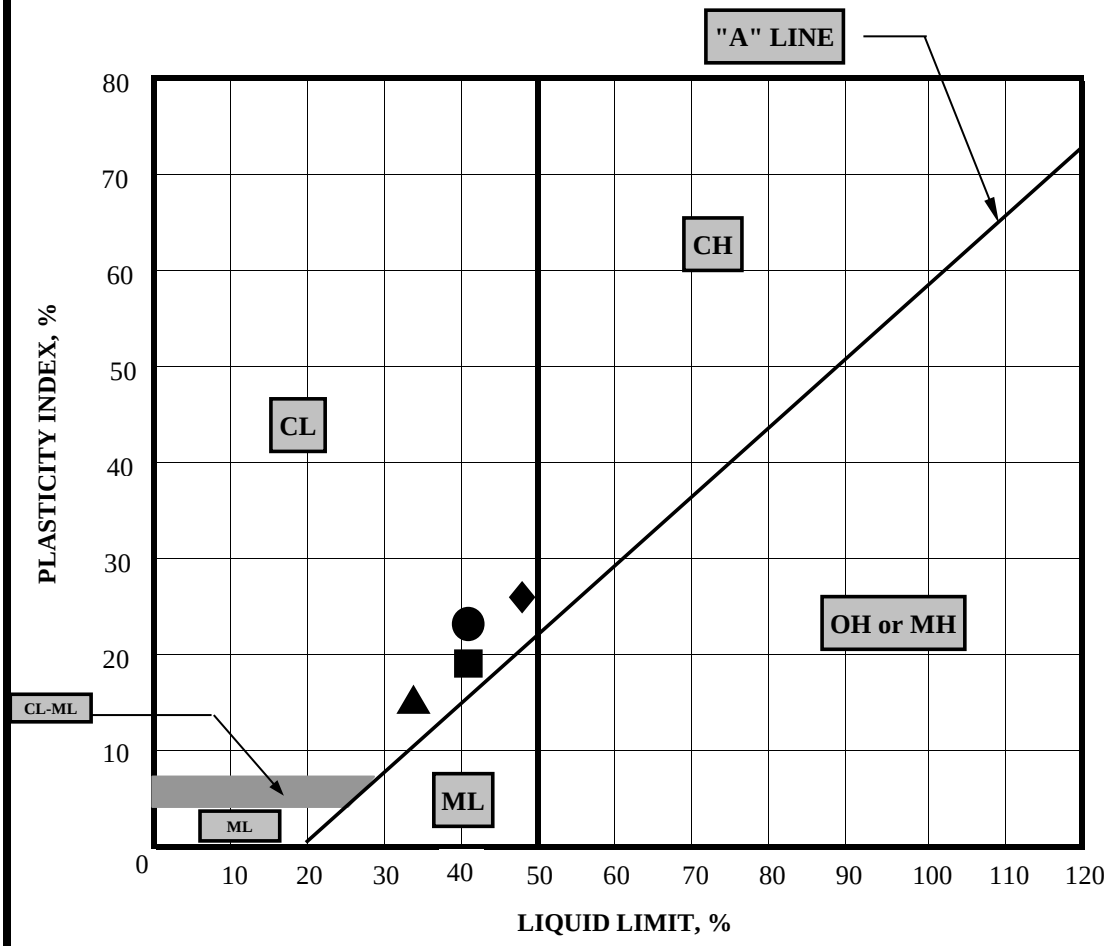
Materials tested in accordance with ASTM D422.
SpG = 2.460 (ASTM D854)

Location: SE
Sample Number: 6 **Depth:** 0-3.0' **Date:** 08/17/18

Materials Testing, Inc.

Client: Guardian Investment Capital, LLC
Project: Proposed Casa Dei Vista Apartments
Southwest Corner of Allison Drive & Travis Way, Vacaville, CA
Project No: VV4567-002 **Figure** 0300-004

Tested By: John Hubbard



KEY SYMBOL	SAMPLE NUMBER	DEPTH	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, LL, %	PLASTIC LIMIT, PL, %	PLASTICITY INDEX, PI, %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
●	SW	0-3.0'	N/A	41	18	23	N/A	CL
▲	NW	0-2.0'	N/A	34	19	15	N/A	CL
◆	NE	0-2.0'	N/A	48	22	26	N/A	CL
■	SE	0-3.0	N/A	41	22	19	N/A	CL

Note: Atterberg Limits tested in accordance with ASTM D4318.

Materials Testing, Inc.

PLASTICITY CHART AND DATA

Proposed Casa Dei Vista Apartments
SW Corner of Allison Dr. & Travis Way, Vacaville, CA

Client No:	Date:	Report No:
VV4567-002	8/17/2018	0300-005

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 08/10/2018
Date Submitted 08/06/2018

To: David Cymanski
K.C. Engineering
865 Cotting Lane Suite A
Vacaville, CA 95688

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : VV4567 Site ID : C-1 @ 0-2 FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 77750-162504.

EVALUATION FOR SOIL CORROSION

Soil pH	6.16		
Minimum Resistivity	1.72 ohm-cm (x1000)		
Chloride	9.4 ppm	0.00094	%
Sulfate-SO4	2.4ppm	0.00024	%

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate-SO4 ASTM C1580, Chloride CA DOT Test #422m

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 08/10/2018
Date Submitted 08/06/2018

To: David Cymanski
K.C. Engineering
865 Cotting Lane Suite A
Vacaville, CA 95688

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : VV4567 Site ID : C-2 @ 0-3 FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 77750-162503.

EVALUATION FOR SOIL CORROSION

Soil pH	6.17		
Minimum Resistivity	2.20 ohm-cm (x1000)		
Chloride	3.9 ppm	0.00039	%
Sulfate-SO4	1.0ppm	0.00010	%

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate-SO4 ASTM C1580, Chloride CA DOT Test #422m

R-Value Lab Data by ACE

LABORATORY TESTING

Samples retrieved during the field exploration were taken to the soil mechanics laboratory for further observation by the project geotechnical engineer and were classified in accordance with the Unified Soil Classification System (USCS) described in Appendix B. At that time, the field descriptions were confirmed or modified as necessary and an applicable laboratory testing program was formulated to determine engineering properties of the subsurface materials.

Soil mechanics laboratory tests were performed on soil samples recovered from the test borings to further determine the physical and engineering properties of the soils. These tests included gradation (ASTM D422), Atterberg limits, R-value (CalTrans Test Method CTM 301), dry density, and natural moisture content (ASTM D 2216). The results of these tests are shown on the Test Borings Logs at the depth that each sample was recovered or on the following table. The laboratory test results were used for the geotechnical engineering analyses, and the development of engineering, earthwork, and construction recommendations.

A Resistance ("R") Value test (CTM 301) was performed on a representative sample of the near surface soil by an associate soils mechanics laboratory to determine the soil sample's resistance to repetitive loading characteristics. The results of this test are tabulated on the following table.

SAMPLE: R-1 Casa Dei Vista, Phase 1
DESCRIPTION: Brown Silty Sandy Clay

SPECIMEN	A	B	C
MOISTURE AT TEST %	18.0	19.1	20.2
DRY DENSITY AT TEST, pcf	120.0	120.1	120.0
EXUDATION PRESSURE, psi	639	407	236
RESISTANCE VALUE	22	10	5
"R" VALUE AT 300 PSI EXUDATION PRESSURE	6.5		

SAMPLE: R-2 Multi-Family, Phase 2
DESCRIPTION: Brown Silty Sandy Clay

SPECIMEN	A	B	C
MOISTURE AT TEST %	17.7	18.8	19.9
DRY DENSITY AT TEST, pcf	120.4	120.4	120.3
EXUDATION PRESSURE, psi	671	509	299
RESISTANCE VALUE	15	7	4
"R" VALUE AT 300 PSI EXUDATION PRESSURE	4		

865 Cotting Lane, Suite A
Vacaville, California 95688
(707) 447-4025, fax 447-4143

8798 Airport Road
Redding, California 96002
(530) 222-0832, fax 222-1611

KC ENGINEERING COMPANY
A SUBSIDIARY OF MATERIALS TESTING, INC.
www.mti-kcgeotech.com

Project No. VV4567
4 August 2018

Guardian Investment Capital, LLC
1120 Fairfield Avenue
Roseville, CA 95678
c/o Rich Alexander

Subject: Proposed Casa Dei Vista Apartments
NW Corner of Allison Drive and Ulatis Creek
Vacaville, California
ULATIS CREEK STABLE TOP OF BANK EVALUATION

Reference: Geotechnical Engineering Study
By ACE Quality Control, dated 6/19/18

Dear Mr. Alexander:

At your request, **KC ENGINEERING COMPANY** has performed a geotechnical evaluation to determine the stable top of bank on the northern side of Ulatis Creek for the subject project.

We understand that the proposed project will include construction of multi-family apartment structures, an office/clubhouse, underground utilities and asphalt paved driveways and parking lots. The Grading Improvement Plans by Phillippi Engineering indicate that a 12 feet wide aggregate base maintenance road will be located adjacent to the existing top of creek bank, followed by an asphalt parking lot and then the apartment buildings. The southern Buildings 5, 6 and 7 are planned to be 132 feet, 68 feet and 66 feet, respectively, away from the existing top of creek bank.

Geotechnical Exploration

The geotechnical conditions of the site were originally investigated by ACE Quality Control as presented in the referenced report. The ACE investigation included the drilling eight borings across the project for the proposed development.

We were recently retained to provide an updated geotechnical report for the project and to evaluate the stable top of bank per City requirements. As part of our evaluation, we drilled four supplemental borings along Ulatis Creek within 5 feet of the existing top of creek bank. The location of our borings are shown on Figure 1, “Site Plan”, included in the Appendix of this letter.

The boring logs are also attached herein. Boring 1 revealed the upper 11 feet to consist of very stiff to hard sandy clay, underlain by hard sandy silt to a depth of 25 feet below grade. The hard silt is underlain by highly weathered siltstone bedrock. Boring 2 revealed very stiff clayey silt to 5 feet, underlain by medium dense silty sand to 12 feet, underlain by dense silty sand to 20 feet, further underlain by very dense/cemented clayey sandy gravels of the Tehama Formation. Boring 3 revealed stiff to very stiff clayey silt to 17 feet, underlain by highly weathered siltstone bedrock. Boring 4 revealed firm silt to 1.5 feet, underlain by very dense gravelly sand of the Tehama Formation to 10 feet, further underlain by highly weathered sandstone bedrock. Groundwater was not encountered in any of the borings at the time of drilling.

In addition, we performed a reconnaissance of the creek bank to observe current conditions. The creek bank is approximately 23 feet in vertical height on the east and 28 feet on the west, with variable slope inclinations of about 1H:1V to 2.5H:1V. The steeper sections are located on the west near the hillside ridge and on the central portion of the property. Relatively level mid-slope benches with homeless encampments are present near the eastern and central locations. The creek bank is generally covered with dense weeds, bushes and small to large mature trees. Sandstone bedrock is exposed near the toe of creek on the western end. We should note that evidence of past shallow sloughing and erosion were evident primarily on the lower flanks of the creek bank.

Creek Bank Stability Analysis

The purpose of the analysis is to determine the stable top of bank to provide a safe setback to the proposed improvements and building structures. Phillippi Engineering performed an analysis of the existing topography and then drawing a 2H:1V projection up from the toe of the creek. Their analysis and cross-sections are presented on Figure 1, “Site Plan”. Phillippi then prepared a revised development layout, attached herein as Figure 2, showing the stable top of bank based on the 2H:1V toe projection. Figure 2 also shows a 40 feet setback, and a 12 feet wide aggregate base access and maintenance road near the top of bank.

Our geotechnical evaluation included reviewing the three cross-sections prepared by Phillippi that represent the northern creek bank. We generally concur with the 2H:1V projection analysis. Due to the steeper bank topography and the deeper soil deposits encountered in Borings 1 and 2, we determined that cross-section 2 was the critical section to be analyzed. A global slope stability analysis was performed on this section as discussed below.

To evaluate the identified critical cross-section 2, we performed a slope stability analysis to determine the factor of safety (FOS) in its current condition, as well as where the long-term adequate FOS of 1.5 is located. The computer program SLIDE version 6.039 by RocScience was utilized to perform the limit equilibrium stability analysis. A number of methods were performed to analyze the slopes including the Bishop simplified, Janbu Corrected, Spencers, Army Corps of

Engineers, and Morgenstern-Price. It is noted that a minimum factor of safety of 1.5 is considered acceptable for long-term global slope stability.

We entered the creek bank geometry, groundwater level and the expected lower-bound shear strength properties for an effective stress stability analysis. The effective strength values and unit weights utilized are presented on the slope stability plots included in the Appendix. The stability analysis calculations indicate a FOS of 1.47 in its current condition. The location of a potential creek bank failure with a FOS of 1.5 and greater is shown on the attached summary plot at 10 feet beyond the existing top of bank. This closer than the 2H:1V projection determined by Phillippi at 16 feet beyond the existing top of bank.

Conclusions & Recommendations

Based on our exploration, reconnaissance and slope stability analysis, we concur with the stable top of creek bank identified by Phillippi. Our analysis indicates that the stable top of bank is actually closer to the creek bank than identified by Phillippi. In our opinion, the revised project improvement and building layout plan as shown on Figure 2 provides an adequate and safe setback from the existing top of creek bank.

Should additional criteria or analysis be required, please call or email.

Respectfully Submitted,
KC ENGINEERING COMPANY



David V. Cymanski, G.E.
Principal Engineer

Copies: 1 email to Client & Phillippi

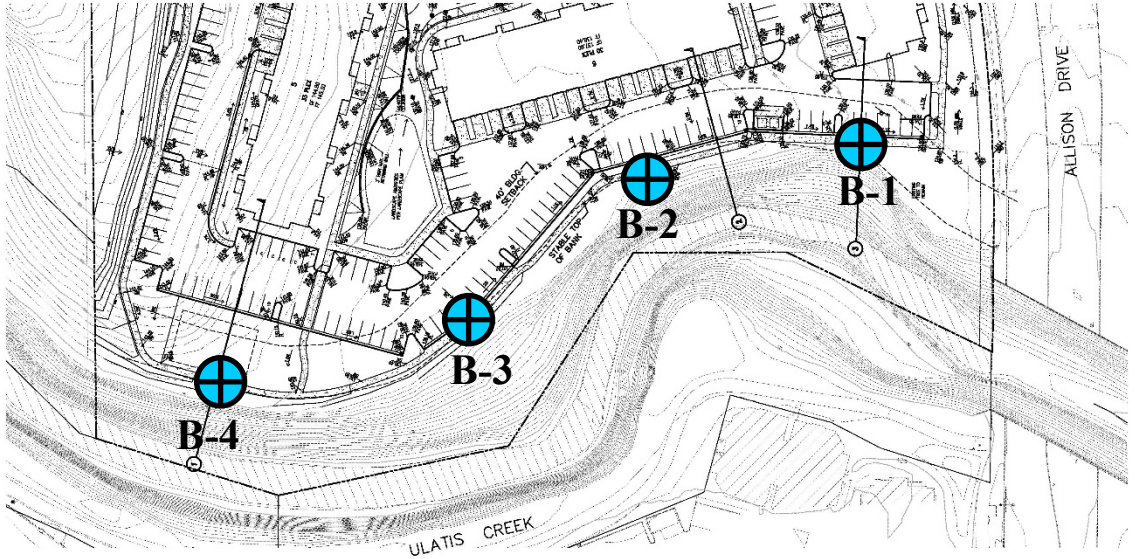
APPENDIX

Site Plan

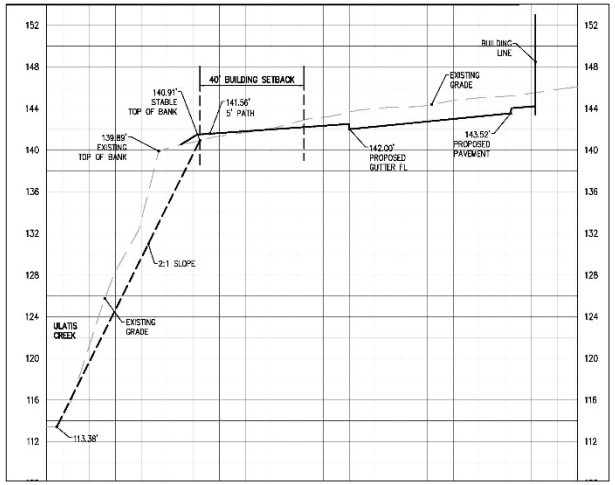
Revised Site Layout

Boring Logs

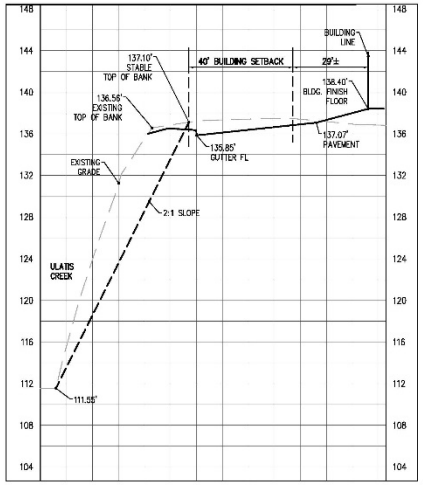
Slope Stability Analysis Summary Plot



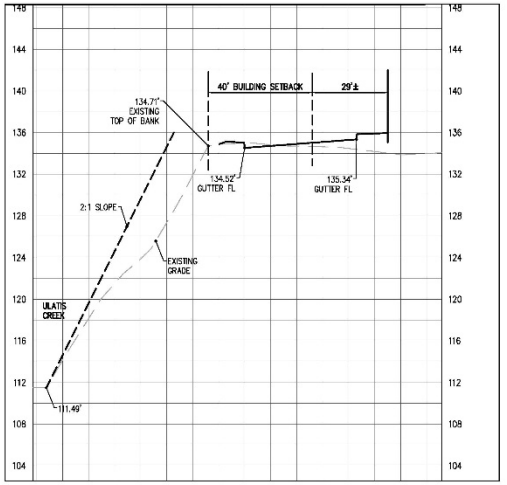
CASA Dei VISTA APARTMENTS
STABLE TOP OF BANK SECTIONS



1 CREEK SECTION
SCALE: 1"=20' HORIZ. 1"=5' VER.



2 CREEK SECTION
SCALE: 1"=20' HORIZ. 1"=5' VER.



3 CREEK SECTION
SCALE: 1"=20' HORIZ. 1"=5' VER.

07-06-2018 20170820 CREEK STB EXHIBIT

PHILLIPPI ENGINEERING

LEGEND

Approximate Boring Location

KC ENGINEERING COMPANY
865 Cotting Lane, Suite A
Vacaville, CA 95688
707-447-4025

Project No. VV4567
Proposed Casa Dei Vista Apartments
Allison Drive, Vacaville, California
Figure 1 – SITE PLAN

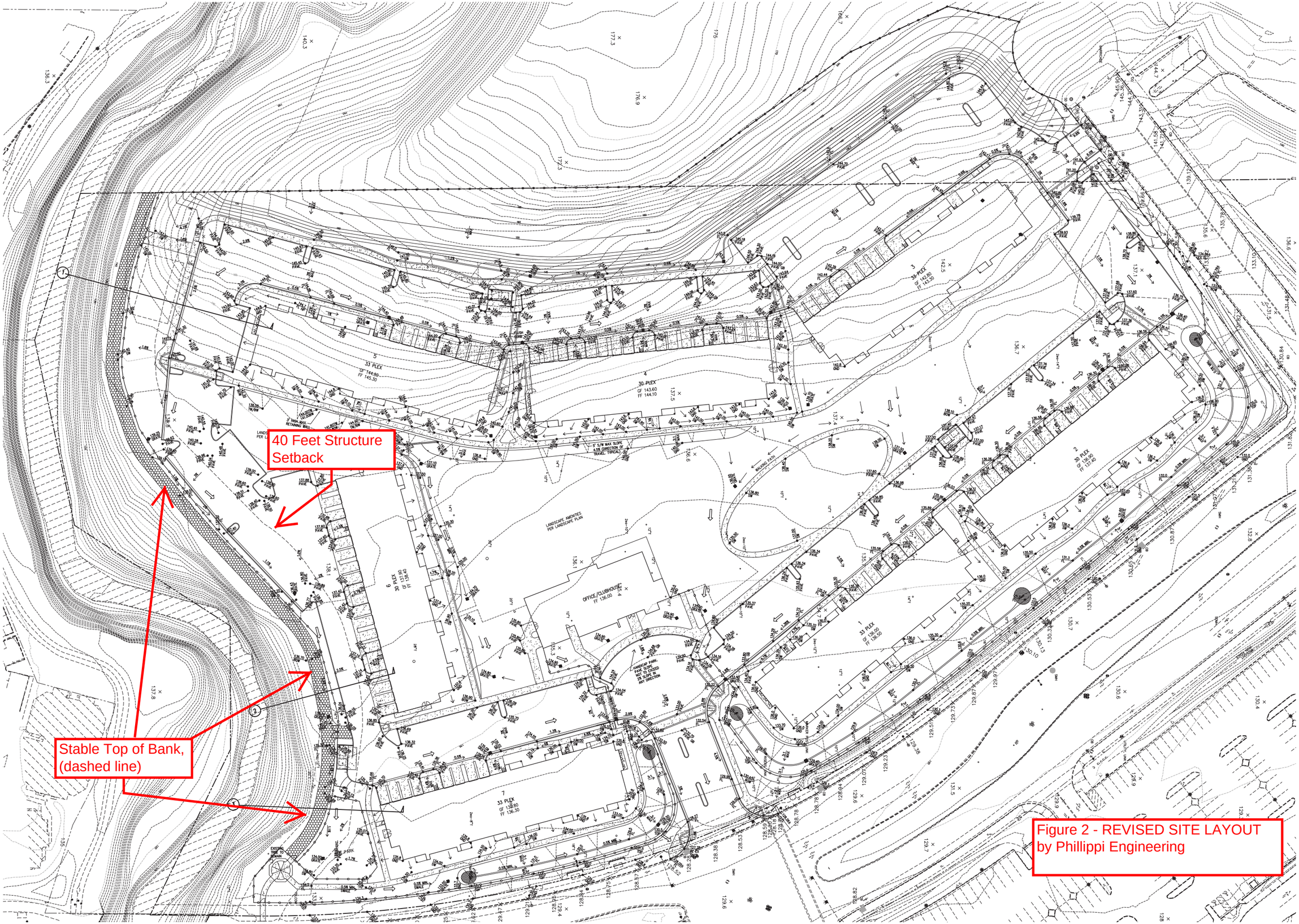


Figure 2 - REVISED SITE LAYOUT by Phillippi Engineering

LOG OF TEST BORING
BORING NO.: 1

PROJECT: Proposed Casa Dei Vista Apartments
CLIENT: Gaurdian Investment Capital, LLC
LOCATION: Stable Top of Bank Along Ulatis Creek
DRILLER: Hillside Drilling
DRILL RIG: Mobile B-24
DEPTH TO WATER: INITIAL ▽ :

PROJECT NO.: VV4567
DATE: 07/27/18
ELEVATION: n/a
LOGGED BY: DVC
BORING DIAMETER: 4"
FINAL ▼ : AFTER: hrs.

DEPTH	SAMPLE NO.	SAMPLER	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	SOIL CLASSIFICATION	CONVERTED SPT BLOW COUNT (BLOWS/FT.)	DRY DENSITY (PCF)	MOISTURE CONTENT (PERCENT)	Qu (t.s.f.) Penetrometer	ADDITIONAL TESTS AND REMARKS (LL, PI, UCC, ø&c, Gradation)
0				Brown Fine Sandy CLAY; dry to moist, very stiff.	CL					
5	1-1					28			4.5	
10	1-2			As Above, hard.		33				
				Light Brown Fine Sandy SILT; moist, hard.	ML					
15	1-3					50-5"				
20	1-4			As Above.		41				
25				Very Hard @ 25'. Light Brown SILTSTONE; highly weathered, friable.	Rx					

This information pertains only to this boring and is not necessarily indicitive of the whole site.

KC ENGINEERING CO.

Figure 3

LOG OF TEST BORING
BORING NO.: 1

PROJECT: Proposed Casa Dei Vista Apartments
CLIENT: Gaurdian Investment Capital, LLC
LOCATION: Stable Top of Bank Along Ulatis Creek
DRILLER: Hillside Drilling
DRILL RIG: Mobile B-24
DEPTH TO WATER: INITIAL ▽ :

PROJECT NO.: VV4567
DATE: 07/27/18
ELEVATION: n/a
LOGGED BY: DVC
BORING DIAMETER: 4"
FINAL ▼ : AFTER: hrs.

DEPTH	SAMPLE NO.	SAMPLER	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	SOIL CLASSIFICATION	CONVERTED SPT BLOW COUNT (BLOWS/FT.)	DRY DENSITY (PCF)	MOISTURE CONTENT (PERCENT)	Qu (t.s.f.) Penetrometer	ADDITIONAL TESTS AND REMARKS (LL, PI, UCC, ø&c, Gradation)
	1-5			Boring Terminated @ 29'. No Groundwater Encountered.		50-4"				
30										
35										
40										
45										
50										
55										

This information pertains only to this boring and is not necessarily indicitive of the whole site.

KC ENGINEERING CO.

Figure 3

LOG OF TEST BORING
BORING NO.: 2

PROJECT: Proposed Casa Dei Vista Apartments
CLIENT: Gaurdian Investment Capital, LLC
LOCATION: Stable Top of Bank Along Ulatis Creek
DRILLER: Hillside Drilling
DRILL RIG: Mobile B-24
DEPTH TO WATER: INITIAL ▽ :

PROJECT NO.: VV4567
DATE: 07/27/18
ELEVATION: n/a
LOGGED BY: DVC
BORING DIAMETER: 4"
FINAL ▼ : AFTER: hrs.

DEPTH	SAMPLE NO.	SAMPLER	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	SOIL CLASSIFICATION	CONVERTED SPT BLOW COUNT (BLOWS/FT.)	DRY DENSITY (PCF)	MOISTURE CONTENT (PERCENT)	Qu (t.s.f.) Penetrometer	ADDITIONAL TESTS AND REMARKS (LL, PI, UCC, ø&c, Gradation)
0				Brown Clayey SILT; dry to moist, firm to very stiff.	ML					
5				Brown Silty SAND; moist, medium dense, fine grained.	SM					
	2-1					13				
10				Brown Silty SAND; moist, dense, fine grained.	SM					
15	2-2					38				
20				Brown & Gray Clayey Sandy GRAVELS; moist, very dense. (Tehama Formation)	GP					
	2-3					50-2"				
25				Boring Terminated @ 22' 2". No Groundwater Encountered.						

This information pertains only to this boring and is not necessarily indicitive of the whole site.

KC ENGINEERING CO.

Figure 4

LOG OF TEST BORING
BORING NO.: 3

PROJECT: Proposed Casa Dei Vista Apartments
CLIENT: Gaurdian Investment Capital, LLC
LOCATION: Stable Top of Bank Along Ulatis Creek
DRILLER: Hillside Drilling
DRILL RIG: Mobile B-24
DEPTH TO WATER: INITIAL ▽ :

PROJECT NO.: VV4567
DATE: 07/27/18
ELEVATION: n/a
LOGGED BY: DVC
BORING DIAMETER: 4"
FINAL ▼ : AFTER: hrs.

DEPTH	SAMPLE NO.	SAMPLER	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	SOIL CLASSIFICATION	CONVERTED SPT BLOW COUNT (BLOWS/FT.)	DRY DENSITY (PCF)	MOISTURE CONTENT (PERCENT)	Qu (t.s.f.) Penetrometer	ADDITIONAL TESTS AND REMARKS (LL, PI, UCC, ø&c, Gradation)
0				Brown Clayey SILT; dry to moist, firm to stiff.	ML					
5	3-1					28				
10	3-2			As Above, very stiff.	CL-ML	17				
15				Light Brown SILTSTONE; highly weathered, friable.	Rx					
	3-3					50-6½"				
20				Boring Terminated @ 19'. No Groundwater Encountered.						
25										

This information pertains only to this boring and is not necessarily indicitive of the whole site.

KC ENGINEERING CO.

Figure 5

LOG OF TEST BORING
BORING NO.: 4

PROJECT: Proposed Casa Dei Vista Apartments
CLIENT: Gaurdian Investment Capital, LLC
LOCATION: Stable Top of Bank Along Ulatis Creek
DRILLER: Hillside Drilling
DRILL RIG: Mobile B-24
DEPTH TO WATER: INITIAL ▽ :

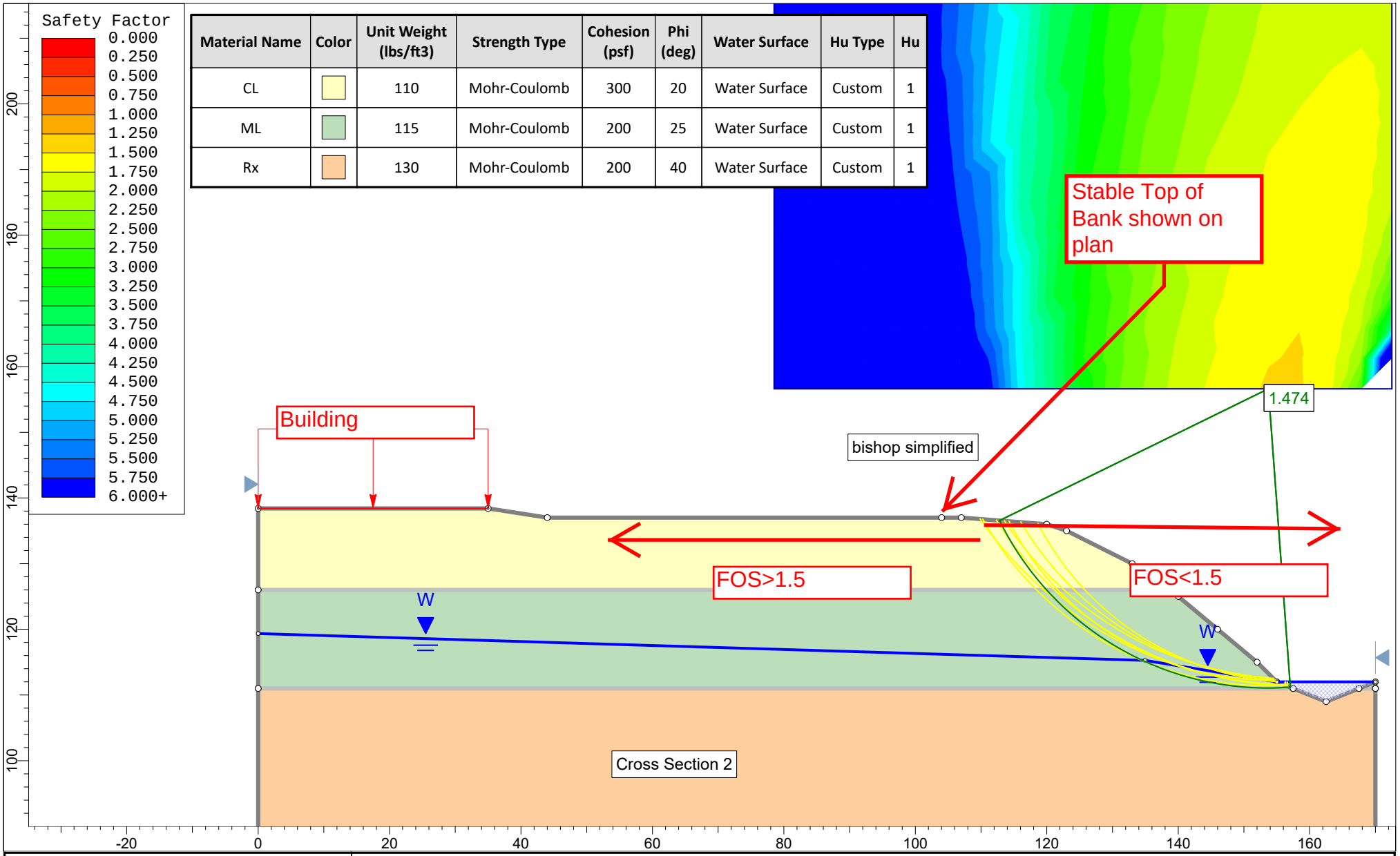
PROJECT NO.: VV4567
DATE: 07/27/18
ELEVATION: n/a
LOGGED BY: DVC
BORING DIAMETER: 4"
FINAL ▼ : AFTER: hrs.

DEPTH	SAMPLE NO.	SAMPLER	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	SOIL CLASSIFICATION	CONVERTED SPT BLOW COUNT (BLOWS/FT.)	DRY DENSITY (PCF)	MOISTURE CONTENT (PERCENT)	Qu (t.s.f.) Penetrometer	ADDITIONAL TESTS AND REMARKS (LL, PI, UCC, ø&c, Gradation)
0				Brown SILT; dry, firm.	ML					
				Brown & Gray Gravelly SAND; moist, hard. (Tehama Formation)	SP					
	4-1					50-6"				
5										
10				Light Brown Sandstone; highly weathered, friable.	Rx					
	4-2					50-4"				
15										
20	4-3			As Above.		50-4"				
				Boring Terminated 20.5'. No Groundwater Encountered.						
25										

This information pertains only to this boring and is not necessarily indicitive of the whole site.

KC ENGINEERING CO.

Figure 6

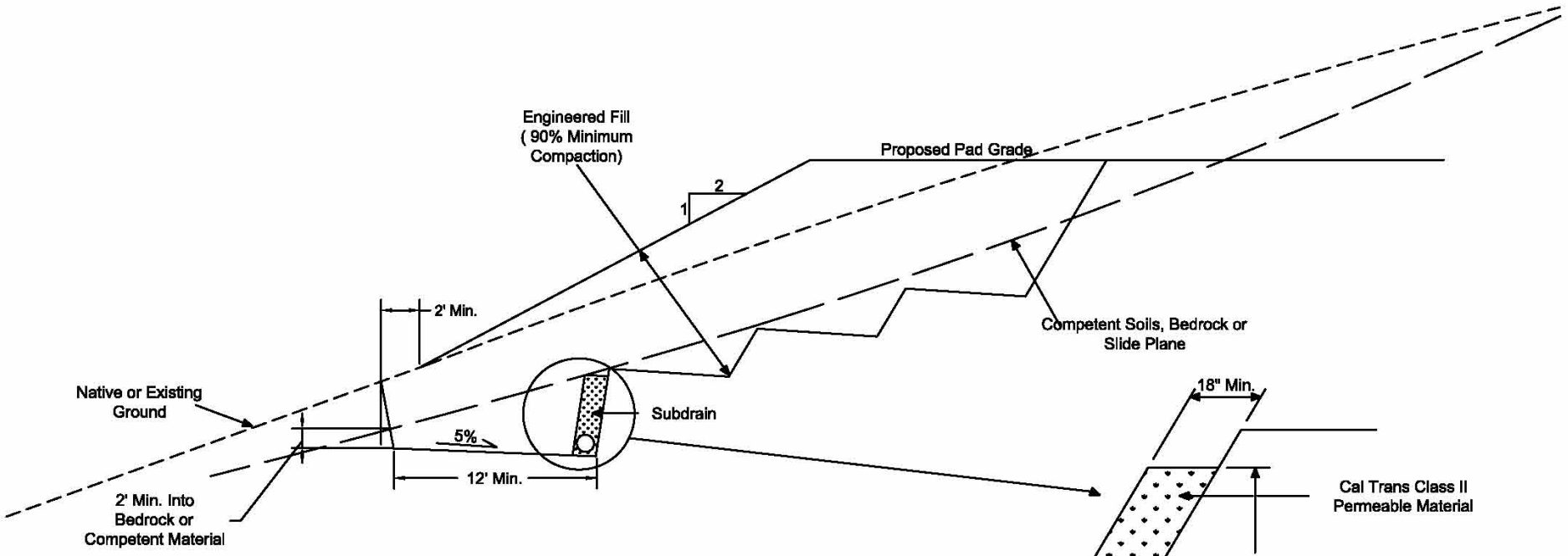


rocscience	Project	VV4567	
	Analysis Description	Slope Stability Analysis	
	Drawn By: ALK	Scale: 1:242	Company: KC Engineering Co.
	Date: 8/3/2018		File Name: Slide1.slim

SLIDEINTERPRET 6.039

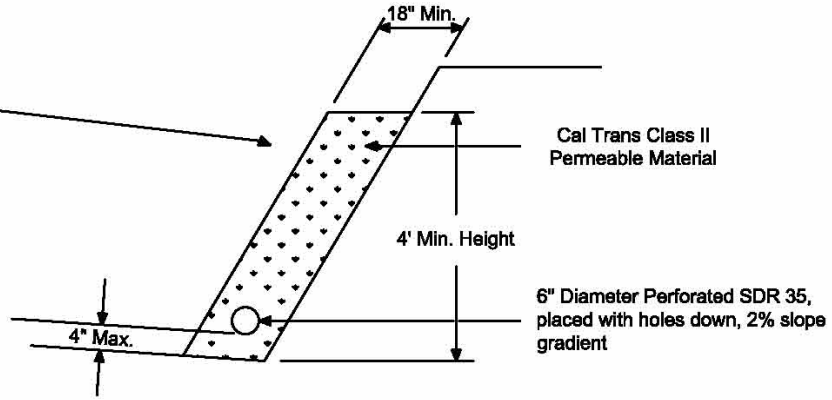
TYPICAL FILL SLOPE & SUBDRAIN DETAILS

(Not to Scale)



NOTES:

1. This is a typical cross-section for fill slope construction. Significant variations may be encountered during grading.
2. Dimensions of keyways and benches are subject to approval in the field by the Soil Engineer and Geologist.
3. The number and location of subdrains will be determined by the Soil Engineer and Geologist in the field.



SUBDRAIN DETAIL

KC ENGINEERING COMPANY
865 Cotting Lane, Suite A
Vacaville, CA 95688

Proposed Hillside Fill Slope
TYPICAL FILL SLOPE, KEYWAY, BENCHING & SUBDRAIN DETAILS

USGS Design Maps Summary Report

User–Specified Input

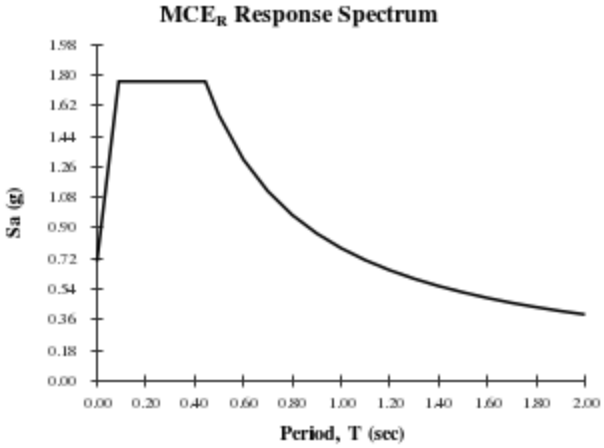
Report Title	Casa Dei Vista, Allison Dr, Vacaville Tue October 2, 2018 22:01:00 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	38.3563°N, 121.966°W
Site Soil Classification	Site Class C – "Very Dense Soil and Soft Rock"
Risk Category	I/II/III

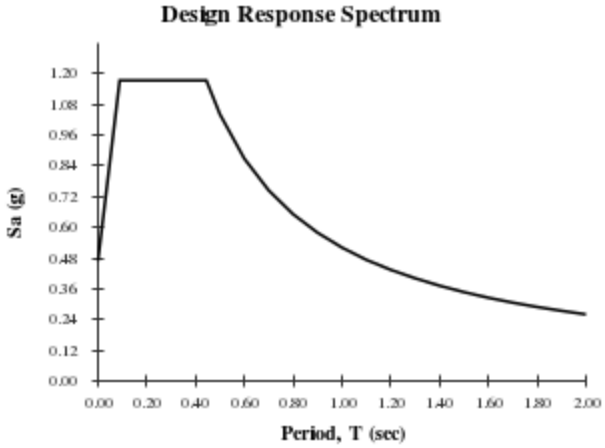


USGS–Provided Output

S_S =	1.761 g	S_{MS} =	1.761 g	S_{DS} =	1.174 g
S_1 =	0.601 g	S_{M1} =	0.781 g	S_{D1} =	0.521 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





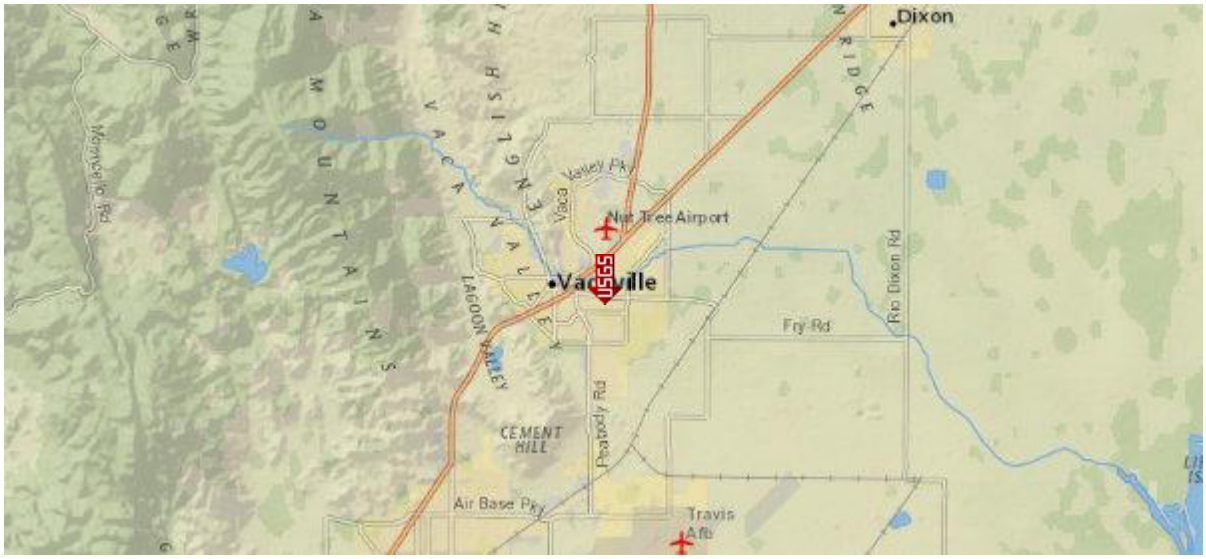
For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.

USGS Design Maps Summary Report

User–Specified Input

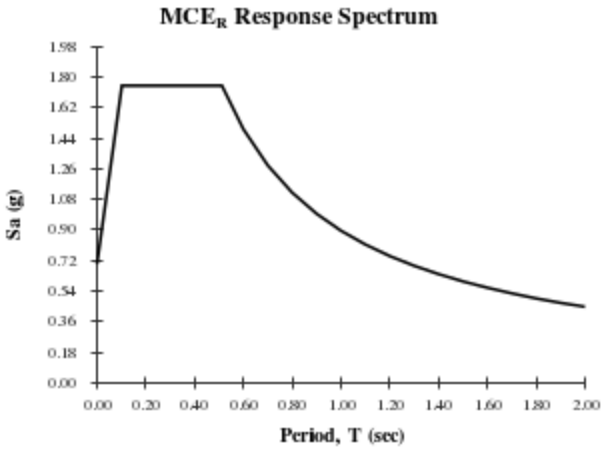
Report Title	Multi-Family, Phase 2, Harbison Dr., Vacaville Wed October 3, 2018 21:18:05 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	38.3584°N, 121.9636°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

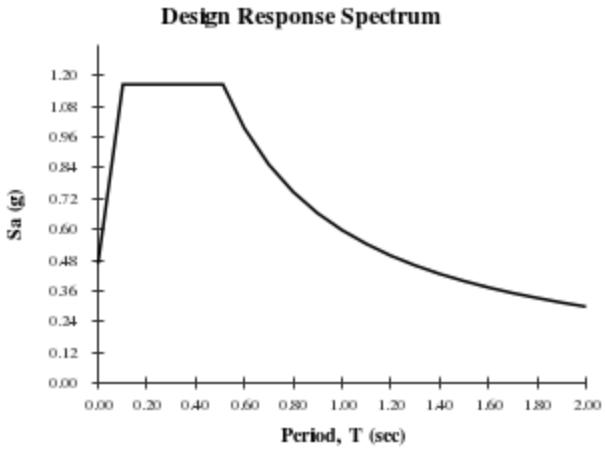


USGS–Provided Output

S_S =	1.748 g	S_{MS} =	1.748 g	S_{DS} =	1.166 g
S_1 =	0.597 g	S_{M1} =	0.895 g	S_{D1} =	0.597 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.

GEOTECHNICAL ENGINEERING STUDY
PROPOSED ALLISON DRIVE APARTMENTS
ALLISON DRIVE NEAR ULATIS DRIVE
VACAVILLE, CALIFORNIA



JUNE 19, 2018

PREPARED FOR:
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c/o Mr. Rich Alexander
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Prepared By:
ACE QUALITY CONTROL
Project No. 10-18054G

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STATE OF CALIFORNIA

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Principal Geotechnical Engineer /
Engineering Geologist

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GEOTECHNICAL ENGINEERING STUDY

PROPOSED ALLISON DRIVE APARTMENTS
ALLISON DRIVE NEAR ULATIS DRIVE
VACAVILLE, CALIFORNIA

INTRODUCTION

PURPOSE AND SCOPE OF STUDY

This report presents the results of our Geotechnical Engineering Study for the proposed Multi Family development to be located at the above referenced site, comprised of APNs 0131-030-860, 0131-030-650, 0131-030-670, 0131-030-660, and 0131-030-840 as shown on the appended Location Plan (Figure 1, Appendix A). The purpose of the study was to evaluate the general conditions of the earth materials at the site in order to provide conclusions and recommendations related to the geotechnical aspects of the project as discussed in our proposal / agreement dated February 27, 2018.

The scope of our work included exploring the general subsurface conditions, performing soil mechanics laboratory tests, and determining soil parameters for earth grading, foundation design, lateral resistance, floor slab-on-grade and pavement support, and expansive soil conditions, structural pavement support and material thicknesses, and evaluating potential for soil liquefaction. Site specific geologic hazards assessment is not a part of our scope of work for this study

The attached Appendices contain further information including graphic presentations (Location Plan and Map of Explorations -- Appendix A); field exploration procedures, legend and logs of subsurface explorations (Appendix B); laboratory testing and procedures used (Appendix C); and, Guide Specifications for Earthwork (Appendix D).

PROPOSED PROJECT INFORMATION

The subject site is located in the northern area of the City of Vacaville in the County of Solano. The subject site area is indicated to be approximately 850,000 sq. ft. (19.50 +/- acres) and comprised of two mostly rectangular shaped sites comprised of APNs 0131-030-860, 0131-030-650, 0131-030-670, 0131-

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030-660, and 0131-030-840. For clarity purposes, the subject site will be divided into two areas and referenced as site 1 and site 2. Site 1 consists of APNs 0131-030-860 and 0131-030-840. Site 2 consists of APNs 0131-030-660, 0131-030-670, and 0131-030-650. The **Site Vicinity Map** (Appendix A, Figure 1) shows the approximate location of the subject site. Site 1 is located on the western side of Allison Drive, bordered to the south by Ulatis Creek and Riveroaks Apartments Complex, to the north by Travis Way, and to the west by an undeveloped parcel. Site 2 is located on the western side of Harbison Drive, bordered to the south by Ulatis Drive, north by Damiano Road, and the west by Vacaville Transportation Center.

The project will include removing vegetation (including designated trees) that are in the proposed new construction areas and constructing new, multi-story, wood frame, apartment buildings, paved parking areas, and paved access drives. Overall finished grade elevation changes are expected to be approximately 3 to 5 feet, but the grading plans were not available for review at the time of this report preparation.

FINDINGS

SITE DESCRIPTION

We performed our field exploration on May 17 and 18, 2018. At that time both site 1 and 2 were vacant and unimproved. The surfaces of the two sites were covered with native grasses/weeds and isolated to relatively dense trees. Google Earth indicates site 1 surface sloped down about 30 feet from the western side of the site easterly to Allison Drive. Ulatis Creek borders the southern side of site 1. Site two's ground surface was relatively flat with a slight downhill gradient easterly towards Harbison Drive. Regionally, the land sloped down westerly towards the Sacramento Valley.

GENERALIZED EARTH MATERIAL CONDITIONS

The exploratory borings on site one (refer to Figure 2, Appendix B) are numbered B1 through B8; and, on site two (Figure 3, Appendix B), B9 through B13.

As shown on the exploratory borings logs for site one the subsurface earth material conditions varied. In Borings B3, B4, B9, and B10 the uppermost layer was found to be brown to black, medium stiff to stiff, moist, silty / sandy CLAY (Unified Soil Classification: CL) to a depth ranging from approximately three feet to eight feet below the existing ground surface (egs). Underlying this uppermost soil layer in Boring

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B3, was found alternating layers of tan to brown, medium dense to very dense, moist, silty SAND (Unified SM) and tan, moist, medium dense SILT (ML) to a maximum explored depth of approximately 21½ feet below egs. Beneath the uppermost CLAY layer in Boring B4 was found to be alternating layers of tan brown, moist, medium dense, silty SAND (SM) and brown, moist, very stiff, silty / sandy CLAY (CL) to a maximum explored depth of approximately 21½ feet below egs. Underlying the uppermost CLAY layer in Boring B9 was found to be alternating layers of tan to brown, medium dense to dense, moist, clayey silty SAND (SM) to a maximum explored depth of approximately 21½ feet below egs. Beneath the uppermost CLAY layer in Boring B10 was found to be layers of tan to tan with red and orange, moist, medium dense to very dense, silty SAND with gravel (SM) and SILT (ML) to the maximum depth explored of about 51½ feet below egs.

In all of the other exploratory borings on site one as well as those on site two, the uppermost earth materials were discovered to be interlayered tan brown to brown, moist, loose to very dense, silty SAND (SM) and SILT (ML) to varying depths of approximately 4 to 14 feet below egs.

Since the earth material profile is generalized, the reader is advised to consult the Explorations Logs contained in Appendix B, if the earth material conditions at a specific depth and location are desired. The logs contain a more detailed earth material description regarding color, earth material type, and Unified Soil Classification System (USCS) symbol.

It should be noted that earth material conditions cannot be fully determined by exploratory borings and earth material sampling. Hence, unexpected earth material conditions might be encountered during construction. If earth material deposits are encountered during construction which vary substantially from materials encountered during the investigation, then appropriate recommendations will be needed during construction. Therefore, we suggest a contingency fund for additional expenditures that might have to be made due to unforeseen conditions.

GROUNDWATER

Observations of groundwater conditions were made during the excavation of the exploratory borings at the time of field exploration. No free groundwater was observed in the explorations.

Groundwater levels can fluctuate on a seasonal basis due to changes in precipitation, irrigation, pumping, etc. Based on site topography and the time period our investigation was performed, groundwater levels

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might change. However, excavations below perched groundwater (if encountered) might be impacted by seepage; therefore, we recommend grading and utility excavations be performed during dry-season when groundwater levels are lowest.

GENERALIZED GEOLOGY

The site is located within California's Great Valley Geomorphic Province, a geologically young, large, flat-lying alluvial plain in the central portion of California. It is 40 to 60 miles (60 to 100 km) wide and stretches approximately 450 miles (720 km) from north-northwest to south-southeast, inland from and parallel to the Pacific Ocean Coast Ranges to the west and Sierra Nevada Mountains to the east. The Great Valley has been filled with hundreds to thousands of feet of eroded sediments, ranging in age from Pleistocene to Holocene.

Based on our review of readily available published geologic literature/maps (CGS Geologic Map "Preliminary Geologic Map of the Sacramento 30' X 60' Quadrangle, California", 2011; scale 1:100,000) the site is mapped to be underlain by Quaternary alluvium deposits which is consistent with the earth materials discovered in the explorations. The total thickness of the formation was not determined and is beyond the scope of this study.

SITE SPECIFIC GEOLOGIC ASSESSMENT

Not a part of this study.

PRIMARY SEISMIC HAZARDS

Fault Rupture

Fault rupture hazards are important near active faults and tend to reoccur along the surface traces of previous fault movements. The sites are not located within an Alquist-Priolo Special Studies Zone and the potential for fault rupture, damage from fault displacement, or fault movement directly below the sites is considered to be very low. However, the sites are located within an area where shaking from earthquake generated ground motion waves should be considered likely.

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Seismic Shaking

The mapped and design spectral response accelerations in the table below presents seismic design criteria for the subject project sites obtained from the United States Geological Survey (USGS) website (http://earthquake.usgs.gov/designmaps/us/application.php) with the USGS Seismic Design Maps application. The values are based on data provided by the 2008 USGS National Seismic Hazard Mapping Project and are for use with the 2016 California Building Code (CBC). The values for spectral response accelerations reference with a risk category of I or II or III.

Mapped and Design Spectral Accelerations	
Description	**Value**
Site Soil Classification[1] / Seismic Design Category[2]	D / D
Site Latitude / Longitude	38.357°N / 121.966°W
S_S - Spectral Acceleration for a Short Period	1.760 g
S_1 - Spectral Acceleration for a 1-Second Period	0.601 g
S_{MS} - MCE_R, 5% damped Spectral Acceleration for a Short Period	1.760 g
S_{M1} - MCE_R, Spectral Acceleration for a 1-Second Period	0.901 g
S_{DS} - design, 5% damped, Spectral Acceleration for a Short Period	1.173 g
S_{D1} - design, 5% damped, Spectral Accel. for a 1-Second Period	0.601 g

[1] The *2016 CBC* requires a site soil profile determination extending to a depth of 100 feet for site soil classification. Explorations extended to a maximum depth of about 51½ feet, and this seismic site class definition considers similar material continues below the maximum depth of the deepest subsurface exploration.
[2] In general accordance with the 2016 CBC (refers to *ASCE 7-10*) Seismic Design Category is based on short & 1-sec period response acceleration parameters (S_{DS} & S_{D1}, respectively) and corresponding Risk Category.

Liquefaction and Seismic Settlement Evaluation

Liquefaction occurs when saturated fine-grained sands and/or silts lose their physical strength temporarily during earthquake induced shaking and behave as a liquid. This is due to loss of point-to-point grain contact and transfer of normal stress to the pore water. Liquefaction potential varies with water level, soil type, material gradation, relative density, and probable intensity and duration of ground shaking. Saturated and loose fine sands/silts were not encountered in our explorations.

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The California Geological Survey (CGS) has designated certain areas within California as potential liquefaction hazard zones. These are areas considered at risk of liquefaction-related ground failure during a seismic event based upon mapped surficial deposits and the depth to the areal groundwater table. The project sites are not currently mapped for potential liquefaction hazard by the CGS (refer to CGS website: (http://gmw.consrv.ca.gov/shmp/html/pdf_maps_no.html). Based on the information discussed above, it is our opinion that the overall potential for liquefaction at the sites is low if a seismic event should occur.

Earthquake Induced Landsliding

Based on information available on the California Geological Survey (CGS) website the subject site is not currently within a State of California Seismic Hazard Zone for seismically induced landsliding. In addition, the main site area is relatively flat-lying. Therefore, seismically induced and/or other landslides are not considered a significant hazard at the site.

Tsunamis and Seiche Evaluation

The overall subject site is not located near large bodies of water. Subject site one varies from approximately 150 feet to 130 feet above MSL. Subject site two is approximately 120 feet above MSL. Based on the geometry of the site, the potential for tsunami damage or damage caused by oscillatory waves (Seiche) is not considered likely at the site.

CONCLUSIONS AND DISCUSSIONS

SITE SUITABILITY AND GEOTECHNICAL CONSIDERATIONS

From a geotechnical standpoint, the site is considered suitable for the proposed construction provided the conclusions and recommendations presented in this report are incorporated into the design and construction of the project.

Geotechnical considerations that were evaluated by our office are discussed in the following sections of this report.

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BEARING CAPABILITY

Field and laboratory tests show that the affirmed undisturbed, native earth materials encountered at the boring locations are competent for support of the proposed construction. Any loose, wet, soft soils or disturbed soils (including undocumented fill) that are present at the time of construction are not considered stable and should not be utilized to directly support new structural elements without first being overexcavated and then reworked as engineered fill (if deemed suitable); or, placed outside the proposed improvements.

Engineered fill, composed of approved materials placed and compacted according to the following recommendations, are considered competent for support of low to moderate loading increases.

GROUNDWATER

As previously mentioned, no free groundwater was encountered during our subsurface investigation. It is our opinion that areal groundwater should not have significant impact on the proposed design or construction. However, groundwater levels at the site might be higher during the winter and spring months, especially in low lying areas and intermittent swales. Depending on the depth of utilities, there might be some impact on trenching during those seasons. In addition, if the uppermost soils should become saturated, then this condition could impede or delay grading operations.

COMPRESSIBLE AND EXPANSIVE SOILS

Compressible materials consisting of surficial organic material, loose soils, undocumented fills, debris, rubble, rubbish, etc., are considered unsuitable materials for support of proposed structures and pavements. Such materials can differentially move. We consider that all loose/undocumented fill and/or disturbed soil materials that might be encountered during the earthwork construction should be removed. Those earth materials deemed suitable for re-use as engineered fill could be stockpiled. If the unsuitable materials are not removed, then special foundation systems should be designed to account for the potential settlements. In addition, in areas where loose, wet soils are removed as well as areas where trees have been or will be cleared, remedial grading will also be required to remove the loose soils and to ensure the removal of the entire tree root systems.

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The project sites contained areas of varying thicknesses of slightly to moderately plastic CLAY (Unified Soil Classification: CL) that is considered to have at least moderately expansive potential. This clay was found in several areas at the surface of both subject site one and two. If grading operations place rough pad grade within two feet of this clay material, then techniques to mitigate the potential for expansion would be recommended.

A preventative measure would be to assure that at least two feet of non-expansive soil is beneath the rough pad grade, and then utilizing conventional reinforced spread footings. Mitigation measures for the potentially expansive clay soil in permanent building areas could also include deepened reinforced footings and slab-on-grade, and moisture conditioning the subgrade soil; or lime treating the subgrade soil; or, install a post-tensioned (P-T) slab-on-ground or mat foundation system; or, install cast-in-drilled hole (CIDH) piers that penetrate through the active zone of the clay soil in conjunction with either raised wooden floors or free-floating slab-on-grade and lime treated subgrade soil beneath the slab. Recommendations for the above alternatives (overexcavation/replacement, lime treating and deepened footings, mat slab-on-ground, and for reinforced spread footings supported on non-expansive soil, etc.) are presented below. If design criteria for other mitigation or preventative measures are desired, then please contact our office.

MATERIALS SUITABILITY

On-site soils similar to those encountered in the test borings are generally considered suitable for re-use as engineered fill provided the materials are processed to remove excessive moisture, rubble, rubbish, oversize materials, significant organic matter, highly plastic soil, if discovered, (as determined by an ACE field representative) or any other substance deemed unsuitable. The uppermost CLAY (CL) that was discovered in numerous borings on the surface of both subject sites, and any material with similar classification and gradation, is not considered suitable for reuse as engineered fill without being treated.

POTENTIAL EXCAVATION DIFFICULTIES

It is anticipated that the soil materials at the site can be readily moved by conventional earth moving equipment.

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POTENTIAL SLOPE STABILITY

The surface of the site is relatively flat-lying. No landslides, slumps, or other indications of slope instabilities were observed in the site area during our field reconnaissance. The potential for slope instability is considered to be very low.

FOUNDATION TYPE

A number of possible foundation alternatives are available to support the proposed buildings. Due to the relatively low to moderate loads anticipated and in accordance with current construction practices, the foundation system considered appropriate for the structures at this site is one consisting of either conventional spread footings supported in non-expansive native and/or engineered fill; or, spread footings underlain with lime treated subgrade soil. The most appropriate preventative/mitigation technique would be dependent upon the final grading of the project site and possibly on a lot by lot basis. Criteria for each of these options are discussed below.

RECOMMENDATIONS

Due to variability of the native clay material encountered during our subsurface investigation (both in extent and plasticity), we recommend each lot be evaluated and site-specific recommendations be developed based on the soil conditions found during and/or or after grading is completed. This evaluation might require additional site-specific subsurface exploration, soil mechanics laboratory testing, and further geotechnical engineering analysis/report.

EARTHWORK

General

Earthwork specifications which may be used as a guide in the preparation of contract documents for site preparation / grading are included in Appendix D. However, recommendations in the text of this report supersede those presented in Appendix D. **The conclusions and recommendations contained in this report should be incorporated into the guide specifications.** All recommendations could require modifications based on conditions encountered during grading. In addition, changes in the locations of the proposed structures and pavements could also necessitate modifications to the recommendations

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provided herein. Recommendations for the design and construction of the proposed structures and associated improvements are included below.

Site Clearing and Stripping

We recommend the building pads and pavement areas should be cleared of all obstructions or unsuitable materials, including all undocumented fill and/or loose, wet or disturbed soil, rubble, rubbish, vegetation, and any buried utility lines to be removed. Any foundations, pavements, cisterns, septic tanks, leach fields, water wells, etcetera that might be encountered and are to be abandoned should be removed. The excavated unstable soils could be evaluated for reuse as engineered fill. The resulting subgrades of excavation(s) should be prepared and filled to planned project subgrade level with engineered fill as discussed in the following sections.

The building pads and pavement areas should be cleared of all obstructions or unsuitable materials, including ***all undocumented fill and/or loose, wet or disturbed soil***, rubble, rubbish, vegetation, and any buried utility lines to be removed. Tree root bowls due to tree removal should be cleared of all large roots and loose soils. Any cisterns, septic tanks, leach fields, water wells, etcetera that might be encountered and are to be abandoned should be removed.

Excavations resulting from the removal of unsuitable materials and/or loose soils should be cleared to expose firm, stable material and backfilled with approved earth materials compacted to the requirements given below under compaction. Utilities that extend into the construction area and are scheduled to be abandoned should be properly capped at the perimeter of the construction zone or moved as directed in the plans. The surface of the resulting excavations should be scarified to a depth of 8 inches and recompacted to 90 percent relative compaction per ASTM D1557 at moisture content as determined by ACE's field representative based upon the compaction characteristics of the earth material (typically between one to three percent above optimum moisture content).

Building pads are considered to extend laterally away from (outside of) all perimeter foundation/building edges at least five (5) feet in plan view. The pavement area is considered to extend at least three (3) feet beyond the perimeter edges of the structural pavement section.

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In conjunction with clearing, the building pads and pavement areas should be stripped to sufficient depth to remove all organic laden topsoil. The actual stripping depth should be determined by our representative at the time of construction. The cleared and stripped materials should be removed from the site or stockpiled for possible use as landscape materials.

Subgrade Preparation

Conventional Spread Footing Option

If conventional spread footings are desired to support the structures, then we recommend the clay soil exposed in the subgrade be over excavated to at least two (2) feet below planned subgrade in the building areas. The resulting over excavation should be backfilled either with engineered fill, as discussed below, or with CLSM.

Clay Subgrade Lime Treatment Option

If conventional spread footings are desired for supporting the structures wherever subgrade soil is found to be potentially expansive, then we recommend the spread footings be at least 18-inches or 24-inches deep for one- or two-story buildings, respectively, and the uppermost 18 inches of subgrade soil beneath *any* slabs-on-ground and pavement be treated with lime, to mitigate the effects of potentially expansive subgrade soil. For preliminary planning purposes only, we suggest four percent (4%) lime. We recommend that representative samples of the actual lime to be used and the subgrade soils to be treated be obtained just after completion of the clearing and stripping and tests run to confirm lime quantity needed. If guide specifications for lime treatment are desired, then please contact our office.

General

Once the construction areas have been cleared, any unsuitable soils over-excavated or treated, and any other excavations made, then subgrades that will receive engineered fill, that are to be left at existing grade, or that represent final subgrades achieved by excavation should be scarified to at least 8 inches. Suitability of soils exposed in the bottom of all subgrades should be verified by an ACE special inspector during site grading. Upon favorable review, exposed subgrades should be scarified and recompacted (in-place) an additional 8 inches and/or prior to placing engineered fill materials to planned rough pad grade. The loosened soils should be uniformly moisture conditioned as determined by ACE's field representative based upon the compaction characteristics of the earth material (typically 1 to 3 percent over optimum)

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and compacted to at least 90 percent relative compaction per ASTM D 1557; in pavement subgrade areas, to at least 95 percent in the upper twelve inches. ACE's special inspector should observe the recompacted subgrades be proof-rolled with very heavy construction equipment (e.g., loaded water truck) in order to verify subgrade soil stability. Inability to achieve the stated moisture content, compaction, or instability of the subgrade materials could be used as further criteria for the removal of loose, wet or soft soils, or for the need of special stabilizing measures.

If unanticipated unsuitable materials are encountered at subgrade such that they are unstable and/or proper compaction cannot be obtained, then mitigation measures, such as over excavations to remove such material, would be recommended. In addition, construction equipment on saturated soils could destabilize the earth materials, sometimes to several feet of depth, which might necessitate further over excavation and/or special stabilization.

An ACE special inspector should observe and approve the bottom of all overexcavations to confirm adequate conditions have been reached and should observe and approve the scarification, moisture conditioning and recompaction of the excavated surfaces.

Material for Fill

All fill materials should be inorganic soils free of vegetation, debris, and fragments larger than three inches in size. Pea gravel or other similar non-cementitious, poorly-graded materials should not be used as fill or backfill without the prior approval of the geotechnical engineer. Approved imported materials or onsite fill materials may be used as fill material for general site grading, foundation backfill, foundation areas, trench backfill, slab areas, and pavement areas, provided they meet the following criteria.

Soils from any source (on-site or off-site) for use as engineered fill material within the proposed improvement areas should conform to low volume change materials as indicated as follows:

Gradation	Percent Finer by Weight (ASTM C 136)
3"	100
No. 4 Sieve	25 - 100
No. 200 Sieve	5 - 25

- Liquid Limit ..... 30 (max)

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- Plasticity Index ..... 15 (max)
- Maximum expansive index* ..... 30 (max)

*ASTM D 4829

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Fill lifts should not exceed eight inches in loose thickness.

All fill materials that are pre-approved by this firm at least 48 hours in advance of grading are considered suitable for use as fill. Earth materials from any source to be used for engineered fill should be observed by our representative and samples obtained for laboratory testing (if required) at least four days prior to any materials used for engineered fill.

In areas proposed for general fill not proposed to support improvements (e.g., buildings and pavements) the materials to be re-used as engineered fill three feet or more below soil subgrade level should have an Expansion Index not exceeding 50 (EI<50); not more than 35 percent passing a #200 sieve; do not contain rocks or lumps greater than 8 inches in greatest dimension with not more than 35 percent larger than 4 inches; and, which are pre-approved by this firm.

Fill Placement and Compaction

Materials for engineered fill should be spread and compacted in lifts not exceeding 8 inches in uncompacted thickness. Engineered fill placed at the site and subgrades requiring recompaction should be uniformly compacted to at least 90 percent relative compaction in building areas, and to at least 95 percent relative compaction in the upper 12-inches of pavement and flatwork areas, as determined by ASTM Test Designation D 1557, or to the method as might be determined by an ACE special inspector. The moisture content of engineered fill materials should be determined by ACE's field representative based upon the compaction characteristics of the earth material (typically 1 to 3 percent over optimum). ACE should continuously observe and test the grading and earthwork operations for this project. Such observations and tests are essential to identify field conditions that differ from those predicted by this investigation, to adjust these recommendations to actual field conditions encountered, and to verify that the grading is in overall accordance with the recommendations presented in this report.

If construction proceeds during or shortly after the wet winter months, it may require time to dry the on-site soils since their moisture content will probably be appreciably above the optimum. In addition, if

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subgrade soils are wet at the time of construction, they could be rutted, loosened or otherwise disturbed to several feet of depth by the construction equipment and require additional over-excavation and/or stabilization.

Construction occurring in later summer or early fall (subsequent to on-site earth materials becoming dry) may require substantial amounts of water to be added during earthwork operations to enable the appropriate moisture content and compaction to be achieved.

Upon completion of filling and grading, care should be taken to maintain the subgrade moisture content prior to construction of foundations, exterior flatwork/slabs and pavements. Construction traffic over the completed subgrade should be avoided in order to prevent disturbance of subgrade soils. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. If the subgrade consisting of engineered fill should become desiccated, saturated, or disturbed, the affected material should be removed, or these materials should be scarified, moisture conditioned, and recompacted prior to construction.

The geotechnical engineer should be retained during the earthwork construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation, backfilling of excavations to the completed subgrade, placement and compaction of engineered fills, proof-rolling, backfilling of utility trenches, etc.

Trench Backfill

Utility trenches should be backfilled with mechanically compacted fill placed in lifts not exceeding 8 inches in uncompacted thickness. Water content of the fill material should be adjusted (typically 1 to 3 percent over optimum) during the trench backfilling operations to obtain compaction. If on-site soil or import engineered fill is used, then the material should be compacted to at least 90 percent relative compaction. Imported sand could also be used for bedding and shading backfill in trenches provided the sand is compacted to at least 95 percent relative compaction.

Utility trenches should be plugged with lean concrete wherever the utility line passes beneath the perimeters of the structures. The plug should be at least one foot on either side of the perimeter of the building perimeter foundation and extend from the bottom of the building foundation to the bottom of the trench.

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Finish Grading and Drainage

On-site soils are considered moderately susceptible to erosion where drainage concentrations occur. Concentrated flowing water should be either dissipated or channeled to appropriate discharge facilities. Appropriate erosion control measures should be provided, where applicable, by the general civil engineer on his grading and/or winterization plan.

Positive surface gradients should be provided adjacent to the buildings and within pavement areas to direct surface water away from the buildings and pavement for at least ten feet and toward suitable discharge facilities. Ponding of surface water should not be allowed adjacent to the buildings or pavement nor on top of pavement. Positive drainage should be provided during construction and maintained throughout the life of the buildings. Infiltration of water into utility trenches or foundation excavations should be prevented during construction. Backfill against foundations, exterior walls, and in utility and sprinkler line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration. We recommend a horizontal setback distance of at least 10 feet from the perimeter of any building and the high-water elevation of the nearest storm-water retention.

Downspouts, roof drains or scuppers should discharge into splash blocks or extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Sprinkler systems should not be installed within 5 feet of foundation walls. Landscaped irrigation adjacent to the foundation system should be minimized or eliminated.

All grades must provide effective drainage away from the building during and after construction. The ground surface should be sloped at least 2 percent down for soil, at least 1 percent for pavement, and away from the structures for at least of 10 feet beyond the perimeter of the buildings or pavement. Water permitted to pond next to the building can result in greater soil movements than those discussed in this report. These greater movements can result in unacceptable differential floor slab movements, cracked slabs and walls, and roof leaks. Estimated movements described in this report are based on effective drainage for the life of the structure and cannot be relied upon if effective drainage is not maintained.

After building construction and landscaping, we recommend verifying final grades to document that effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted as necessary, as part of the structure's maintenance program.

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Slopes

Permanent excavation and embankment slopes up to 10 feet of height in soil should be graded at an inclination of 2 horizontal to 1 vertical (2h: 1v) or flatter. The crowns of all slopes should be constructed so that surface run-off water is not allowed to flow over the faces of the slopes. All cut slopes should be observed during grading by the Engineering Geologist to determine if any adverse defects are present. If defects are observed, then additional study and/or recommendations would be made at that time.

For construction slopes, the individual contractor(s) is/are responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. Excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

Earthwork Construction Considerations

At the time of our study, moisture contents of the surface and near-surface native soils ranged from approximately 8.5 percent to 20.5 percent. Based on these moisture contents, some moisture conditioning will likely be needed for the project. The soils may need to be dried by aeration during wet weather conditions, or a chemical treatment, such as cement, lime, or kiln dust, may be needed to stabilize the soil; or, wetted during the dry season. Subgrade conditions may require a rock protective mat covering of exposed subgrades in order to limit disturbance of the site soils as well as provide a stable base for construction equipment.

Although the exposed subgrades are anticipated to be relatively stable upon initial exposure, on site soils may pump and unstable subgrade conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. The use of light construction equipment would aid in reducing subgrade disturbance. The use of remotely operated equipment, such as a backhoe, would be beneficial to perform cuts and reduce subgrade disturbance. If unstable subgrade conditions develop, then stabilization measures will need to be employed. Upon completion of filling and grading, care should be taken to maintain the subgrade moisture content prior to construction of the floor slabs and pavements. Construction traffic over the completed subgrades should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. If the subgrade should become desiccated, saturated, or

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disturbed, the affected material should be removed, or these materials should be scarified, moisture conditioned, and recompacted prior to floor slab and pavement construction.

We anticipate that site grading for concrete foundations, slab construction, pavements and utility trenches can be performed with conventional earthmoving equipment. We emphasize the contractor is responsible for designing and constructing stable, temporary excavations (including utility trenches) as required to maintain stability of both the excavation sides and bottom and should be in accordance with OSHA excavation and trench safety standards.

We recommend that the earthwork portion of this project be completed during extended periods of dry weather if possible. If earthwork is completed during the wet season (typically November through May) it may be necessary to take extra precautionary measures to protect subgrade soils. Wet season earthwork may require additional mitigation measures beyond that which would be expected during the drier summer and fall months. This could include diversion of surface runoff around exposed soils and draining of ponded water on the site. Once subgrades are established, it may be necessary to protect the exposed subgrade soils from construction traffic.

If unstable subgrade conditions develop during construction, suitable methods of stabilization will be dependent upon factors such as schedule, weather, size of area to be stabilized, and the nature of the instability. If soil stabilization is needed, ACE should be consulted to evaluate the situation as needed.

Construction Observation

As previously discussed, variations in subsurface conditions are possible and may be encountered during construction. In order to permit correlation between the preliminary subsurface data obtained during this investigation and the actual subsurface conditions encountered during construction, as well as affirm substantial conformance with the plans and specifications, a representative of this firm should be present during all phases of the site earthwork to make tests and observations of the site preparation, selection of satisfactory fill materials, proof-rolling, placement and compaction of controlled compacted fills, backfilling of excavations to the completed subgrade, etc. Additionally, if lime treatment is needed, then our representative should perform observations during mixing, remixing and compaction.

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Any site earthwork performed without the presence of our representative will be entirely at the grading contractor's and/or owner's risk and no responsibility for such operations will be accepted by our firm. Sufficient notification **(at least 48 hours)** is necessary to assure that our work will coincide with the construction schedule.

We emphasize the importance of ACE's presence during the observation and testing of the grading operations. ACE's observation of the subsurface soil conditions, especially under the loads imposed by construction equipment, is considered an extension of our investigation, particularly within those areas away from the test borings.

Guide Specifications

Earthwork guide specifications which may be used as a guide in the preparation of contract documents for site grading are included in Appendix D. **The conclusions and recommendations contained in this report should be incorporated into the guide specifications.**

CRITERIA FOR FOUNDATION DESIGN

General

An important factor in soils supporting structural improvements is a change in moisture content. The following is predicated on the soil moisture beneath and within five feet of the building perimeters, slabs and pavements being maintained in a uniform condition during and after construction. Please be advised that over watering or under watering, types of plants (trees should be at least the distance away from the improvement equal to their maximum height), altering site drainage, and etc., might be detrimental to the foundation, slabs, and/or pavements. We suggest that automatic timing devices be utilized on irrigation systems; however, provision should be made to interrupt the normal watering cycle during and following periods of rainfall.

Foundation Design Criteria

Conventional Spread Footings

Based on the field and laboratory information for this study, we recommend that the proposed buildings and any retaining walls (up to 5 feet high) be supported upon isolated and/or continuous spread footings

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that extend at least 12- or 18-inches below the building pad bearing soil surface or lowest abutting soil grade for one- or two-story structures, respectively. All foundations beneath each structure should be founded on at least two feet of native, undisturbed, non-expansive soil and / or engineered fill. ACE's geotechnical engineer or his representative should observe earth material conditions exposed in foundation excavations in order to confirm the adequacy for structural foundation bearing, confirm the appropriateness of these recommendations, and to allow for an opportunity to provide additional recommendations if deemed necessary. If the earth material conditions encountered differ significantly from those presented in this report, then supplemental recommendations will be required.

Foundation dimensions and reinforcement should be based on allowable soil bearing value of 2,000 pounds per square foot (psf) for spread footings of at least 12-inches in width penetrating into and embedded below rough pad bearing ***soil*** grade at least 12- or 18-inches for one- or two-story structures (or equivalent), respectively, when supported by at least two feet of undisturbed native non-expansive soil and/or engineered fill.

Spread Footings Supported on Clay Soil

If grading operations expose expansive clay soil in the building pad subgrade, then a possible mitigation technique could include lime treatment and then using conventional spread footings. Alternatively, mitigation could be with deepened spread footings that extend at least 18- or 24-inches below the building pad soil surface or lowest abutting soil grade for the proposed one- or two-story buildings, respectively. Subgrade clay soils should be maintained with moisture contents of 2 to 4 percent over optimum moisture, as affirmed by the Geotechnical Engineer, within 24 hours of concrete placement. The footings should be at least 8 inches in width. At a minimum, the footings supported on native clay should be reinforced with at least four number 4 bars – two at the top and two at the bottom. The deepened foundations may be designed for an allowable axial soil bearing pressure of 2,500 pounds per square foot for dead plus live load, with a one-third increase for any transient load (including wind or seismic).

All footings located adjacent to utility trenches should have their bearing surfaces below an imaginary one horizontal to one vertical plane projected upward from the bottom edge of the trench.

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General Foundation Considerations

The weight of foundation concrete below grade may be neglected in sizing computations. We recommend that all spread foundations be reinforced as required by the structural designer to provide structural continuity, to permit strong spanning of local irregularities, and to be rigid enough to accommodate potential differential movements estimated on the order of one-half inch over 20 linear feet.

Based on the conditions observed at the site, the structure settlement is expected to be on the order of one inch for static compression and one-half inch for differential settlement. Static compression is anticipated to occur during building construction.

Dynamic settlement due to an earthquake event is not expected to adversely affect the proposed improvements. The foundation settlement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the foundations, the thickness of compacted fill, and the quality of the earthwork operations. We estimate that total and differential settlements should not exceed the predicted values, provided that the foundations are designed and constructed as recommended herein, and essentially no changes occur in water contents of foundation soils. Additional foundation movements could occur if water from any source infiltrates the foundation soils; therefore, proper drainage should be provided in the final design and during construction. All foundations should be designed by the project structural engineer.

The allowable foundation bearing pressures apply to dead loads plus design live load conditions. The design bearing pressure may be increased by one-third when considering total loads that include wind or seismic conditions. The weight of the foundation concrete below grade may be neglected in dead load computations.

Foundations should be proportioned to reduce differential foundation movement. Proportioning on the basis of equal total settlement is recommended; however, proportioning to relative constant dead-load pressure will reduce differential settlement between adjacent foundations. Additional foundation movements could occur if water, from any source, saturates the foundation soils; therefore, proper drainage should be provided during construction and in the final design.

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The foundation excavations should be clean (i.e., free of all loose slough) and moist prior to placing steel and concrete. Foundation excavations should be maintained at moisture contents of between 1 to 3 percent over optimum moisture content for native non-expansive soil just prior to foundation concrete placement. The concrete for the foundation should not be placed against a dry excavation surface.

The base of all foundation excavations should be free of water, loose soil, and gravel prior to placing concrete. Concrete should be placed soon after excavating and placement of engineered fill (and lime treatment, if needed) to reduce bearing soil disturbance. Should the soils at bearing level become excessively dry, disturbed, or saturated, the affected soil should be removed prior to placing concrete. In addition, as previously described unsuitable soils should be completely removed from any proposed construction areas prior to construction.

Spread footing excavations that are deeper than the planned bottoms of the footing excavations could be filled to the planned footing bottom elevation with either footing concrete or Controlled Low-Strength Material (CLSM) per section 1803.5.9 of the 2016 CBC, with approval of the Geotechnical Engineer. The CLSM should have at least 400 psi compressive strength at 28 days. The allowable foundation bearing pressures apply to dead loads plus design live load conditions. The design bearing pressure may be increased by one-third when considering total loads that include short duration wind or seismic conditions. The weight of the foundation concrete below grade may be neglected in dead load computations.

Concrete should not be chuted against the excavation sidewalls. For excavations over five feet deep concrete should be pumped or placed by means of a tremie or elephant's trunk to avoid aggregate segregation and earth contamination. Rebar should be properly supported with proper clearances maintained during concrete placement. The concrete should be properly vibrated to mitigate formation of voids and to promote bonding of the concrete to steel reinforcing. These recommendations are predicated upon ACE's representative observing the bearing materials as well as the manner of concrete placement.

Foundation Setback

The bottoms of utility trenches placed along the perimeter of the foundation should be above an imaginary plane that projects at a 30-degree angle down from horizontal from the lowest outermost edge of the foundation. Where trenches pass through the plane the trench should be installed perpendicular to the face

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of the foundation for at least the distance of the depth of the foundation. Alternatively, the foundation could be deepened to attain the recommended setback.

Foundations planned within or adjacent to slope areas should be deepened to provide sufficient horizontal distance from the bottom, outer edge of the foundations to daylight. The distance should be equal to half the slope height or five (5) feet, whichever is greater. Foundation details under the influence of this recommendation should be forwarded along with the structural load information to the geotechnical engineer for review.

Foundation Lateral Resistance

Foundations placed in approved bearing materials (excludes undocumented fill) may be designed using a coefficient of friction of 0.34 for approved granular soils. A design passive resistance value of 325 pounds per square foot per foot (psf/ft) of depth (with a maximum value of 1500 pounds per square foot) for engineered fill comprised of pre-approved imported granular soil and / undisturbed, native, non -expansive soil. Foundations in native clay soil may be designed using a lateral adhesion resistance value of 350 pounds per square foot (total lateral resistance equals the lateral adhesion value times the contact area of the footing with soil) and a design passive resistance value of 105 pounds per square foot per foot (psf/ft) of depth (with a maximum value of 1000 psf). For clay or silt (Unified Soil Classification System: CL, CH, ML, MH) in no case should the lateral sliding resistance exceed one-half the dead load. If both friction and passive pressures are combined, then the smaller value should be halved.

The sides of the excavations for the foundations should be nearly vertical and the concrete should be placed neat against these vertical faces for the passive earth pressure values to be valid. If the loaded side is sloped or benched in the soil, and then backfilled with engineered fill, the nominal passive pressure is reduced to the soil resistance pressure.

Slab-On-Grade Floor Support

On most project sites, the site mass grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade soils may be disturbed due to utility excavations, construction traffic, desiccation, rainfall, etc. As a result, the floor slab subgrade soils may not be suitable for placement of base rock and concrete and corrective action will be required.

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We recommend the engineered fill underlying the floor slabs be rough graded and then thoroughly proof rolled with a loaded tandem axle dump truck or water truck prior to final grading and placement of base rock. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the affected material as engineered fill.

A building pad comprised of engineered fill or native undisturbed medium dense to very dense soil and constructed in accordance with the criteria contained within the above "Earthwork" section is considered suitable for support of the slab-on-ground foundation of the buildings without further treatment. The subgrade soils should be maintained at 1 to 3 percent above the compaction moisture content in the upper 12 inches. In all cases the floor slab should not be placed on a dry subgrade. In all cases the floor slab should not be placed on a dry subgrade.

A building pad comprised of native clay soil constructed in accordance with the criteria contained within the above "Earthwork" section is considered suitable for support of the slab-on-ground foundation of the buildings without further treatment. The subgrade soils should be maintained at 2 to 4 percent above the compaction moisture content in the upper 12 inches. In all cases the floor slab should not be placed on a dry subgrade. In all cases the floor slab should not be placed on a dry subgrade.

Building floor slab design, thickness and reinforcement should be as required by the structural designer, based on a soil modulus of subgrade reaction estimated at 100 psi/in for engineered fill/recompacted non-expansive native soil. We suggest that slabs-on-grade supported on engineered fill / native granular soils should be at least of 4-inches thick for light duty use. The exterior ground surface should be at least 6 inches below the top of the floor slab. We emphasize that all surfaces should slope to drain away from all sides of the building.

Slabs-on-grade subject to light vehicle traffic should be at least six inches thick, or as per the project structural engineer, and have at least a six-inch thick layer of Class 2 aggregate base compacted to at least 95 percent relative compaction placed beneath the slabs. If elastic design is utilized for designing slabs-on-grade founded on at least a six-inch thick layer of Class 2 aggregate base compacted to at least 95 percent relative compaction, the design k value may be increased to 125 pci. We suggest the reinforcement could consist of at least #3 reinforcing bars placed on maximum 18-inch centers at mid-slab height. The

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modulus was provided based on the slab being supported on 6 inches or more of compacted aggregate base and estimates obtained from NAVFAC 7.1 design charts. This value is for a small loaded area (1 sq. foot or less) such as for small truck wheel loads or point loads and should be adjusted for larger loaded areas. Slabs subjected to heavier loads may require thicker slab sections and/or increased reinforcement. The slabs should be separated from the foundations supporting the structures to allow for differential movements between the two elements.

We are not experts regarding measures for mitigating (or preventing) moisture intrusion into building's first floor slab(s)-on-grade. If such should be desired, then an expert regarding moisture intrusion should be consulted.

We suggest the following measures for mitigating (not preventing) moisture intrusion into moisture sensitive interior floor slab(s). The floor slabs should be underlain by a 4-inch thick layer of crushed washed rock which is intended to serve as a capillary mitigating moisture break and to provide uniform slab support. Gradation of this material should be such that 100 percent will pass a 1-inch sieve and 0 to 5 percent passes the No. 4 sieve. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder. At a minimum, we recommend in areas where it is desired to reduce floor dampness where moisture-sensitive coverings are anticipated, construction should have a suitable waterproof vapor retarder (at least 15 mils thick polyethylene vapor retarder sheeting, Raven Industries "VaporBlock 15, Stego Industries 15 mil "StegoWrap" or W.R. Meadows Sealtight 15 mil "Perminator") incorporated into the floor slab design. The water vapor retarder should be decay resistant material complying with ASTM E96 not exceeding 0.04 perms, ASTM E154 and ASTM E1745 Class A. The vapor barrier should be placed between the concrete slab and the compacted granular aggregate subbase material. The water vapor retarder (vapor barrier) should be installed in accordance with ASTM Specification E 1643-94 or the manufacturer's recommendations, whichever is more stringent. If maximum two-inches of clean sand should be placed above the vapor retarder (not recommended), then we recommend a moisture barrier be placed against the outer face of the perimeter foundation. Please note that the sand can be a conduit for water beneath the slab. In addition, the sand can form boils/pockets in the slab concrete. If proposed floor areas or coverings are considered especially sensitive to moisture emissions, additional recommendations from a specialty consultant should be obtained. If desired, further resistance to moisture vapor intrusion could be achieved with proper curing of the concrete, adding a sealant to the mix (e.g., Moxie), having a

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mix design with low slump (e.g., 2 to 4 inches), low water/cement ratio (we suggest not greater than 0.48), and high strength (we suggest at least 3000 psi).

The structural engineer/Architect and slab installation contractor should refer to ACI 302 and ACI 360 for procedures and cautions regarding the use and placement of a vapor barrier. In areas of exposed concrete, control joints should be saw-cut into the slab after concrete placement in accordance with ACI Design Manual, Section 302.1R-37 8.3.12 (tooled control joints are not recommended). To control the width of cracking, continuous slab reinforcement should be considered in exposed concrete slabs.

Positive separations and/or isolation joints should be provided between slabs and all foundations, columns or utility lines to allow independent movement. Interior trench backfill placed beneath slabs should be compacted in accordance with recommendations outlined in the Earthwork section of this report and Appendix D. Other design and construction considerations, as outlined in the ACI Design Manual, Section 302.1R are recommended.

Exterior Flatwork

To reduce the potential for distress to exterior flatwork caused by differential movement of subgrade soils, we recommend that such flatwork be installed with crack-control joints at appropriate spacing as designed by the project architect. Flatwork, which should be installed with crack control joints, includes driveways, sidewalks, and architectural features. All subgrades should be prepared according to the earthwork recommendations previously given before placing concrete. Positive drainage should be established and maintained adjacent to all flatwork.

FLEXIBLE PAVEMENT SECTION ALTERNATIVES

We understand that asphalt concrete (AC) pavement is proposed for the new paved entry / interior drive isles and parking lot. Curb, gutter, driveway and sidewalk areas are expected to be constructed of Portland cement concrete. A Resistance ("R") Value test per CTM 301 was performed on a representative sample of the site soil. The R-value result by exudation was 7 (results tabulated in Appendix C and was used with the CalTrans Design Method for Flexible Pavements and the traffic indices (T.I.) indicated below. A factor of safety per CalTrans was not applied. The Traffic Index selected for the final pavement design should be based upon the CalTrans "Highway Design Manual" (HDM) - latest revision and/or edition - including consideration of the vehicular traffic anticipated, number of repetitions, etc., - as determined by your

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general civil engineer or per regulatory agency requirements. Recommended pavement sections are on the following table:

DESIGN TRAFFIC INDEX	RECOMMENDED PAVEMENT SECTION ALTERNATIVES Inches (Feet)			
	Asphalt Concrete (AC) (Type B)	Aggregate Base (AB) (Class 2*)	Portland Cement Concrete**	Aggregate Base (Class 2*)
5.0	2" (0.15')	10" (0.85')	4" (0.35')	5" (0.40')
6.0	2" (0.15') 3" (.35')	12" (1.10') 10" (.85')	4" (0.35')	6" (0.50')
7.0	2" (0.15') 3" (.35')	14" (1.15') 12" (1.0')	5" (0.40')	7" (0.60')

(* Caltrans Class 2 aggregate base (AB). ** Portland Cement Concrete (PCC) should have a modulus of rupture of at least 600 psi)

The preliminary sections above should be reviewed and approved by the owner, his civil engineer, and the governing authorities prior to construction. In addition, other recommendations for the stated traffic indices are available, if needed. The total thickness of most sections would closely approximate those given. Thinner sections than those recommended could result in increased maintenance and/or shorter pavement life. If desired, please contact this office for further analysis.

Asphalt concrete paved areas should be designed, constructed, and maintained in accordance with, for example, the recommendations of the Asphalt Institute, CalTrans Highway Design Manual, or other widely recognized authority. Concrete paved areas should be designed and constructed in accordance with the recommendations of the American Concrete Institute or other widely recognized authority, particularly with regard to thickened edges, joints, and drainage.

Materials and compaction requirements within the structural sections should conform to the applicable provisions of the CalTrans Standard Specifications (latest edition) including at least 95 percent relative

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compaction of at least the uppermost twelve inches of subgrade materials. Asphalt concrete pavement should conform to the specifications of Type A or B per section 39, and aggregate base should conform to the specifications of Class II per Section 26 of the referenced specifications.

Concrete pavements could be reinforced with nominal rebar, such as at least #4 bars spaced no greater than 24 inches, on center, both ways, placed at above mid-slab height, but with proper concrete cover, as designed by the pavement engineer. Alternatively, concrete pavements can be unreinforced provided they are constructed with expansion/contraction and/or construction joints spaced no greater than 24 times the pavement thickness, both ways, in nearly square patterns, and are detailed in general accordance with ACI Guidelines. Doweling of concrete pavements at critical pathways is also recommended.

We recommend that reinforced concrete pads be provided for truck pad areas – especially at least 30 feet in front of and beneath trash receptacles. The trash collection trucks should be parked on the rigid concrete pavement when the trash receptacles are lifted. The concrete pads should be at least 5 inches thick and properly reinforced. Thickened edges should be used along outside edges of concrete pavements. Edge thickness should be at least 2 inches thicker than concrete pavement thickness and taper to the actual concrete pavement thickness 36 inches inward from the edge. Integral curbs may be used in lieu of thickened edges.

The above pavement section alternatives were calculated on the basis that a comparable soil type to that tested would constitute the final subgrade of the pavement. ACE should be retained to observe final subgrade soil(s) exposed to affirm that the soil is comparable to that tested. Where differing earth materials are encountered they should be tested to affirm that they will also provide the same or better support for pavement sections similar to those above.

The above sections should be used for preliminary design and planning purposes only. We recommend representative subgrade sample(s) be obtained and additional "R" Value test(s) be performed on actual earth materials exposed once pavements have been pioneered. These additional test results may then be used to evaluate pavement sections for construction. It is possible that significant variations in pavement sections (vs. those listed above) could result if the resulting test(s) is/are different than that used for this study.

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Adequate drainage systems should be provided to prevent both surface and subsurface saturation of the subgrade soils. As a design option, a subdrain system beneath and along the edges of the pavements might be considered. The purpose of the system would be to mitigate saturation and loss of strength/stability of the subgrade soils. Subdrains should be especially considered beneath valley drains, if utilized for the project. As an alternate to edge drains (especially around landscape planters), barrier curbing that extends to at least four inches into the soil subgrade below the bottom of the aggregate base layer could be considered to limit infiltration of water beneath the adjacent pavement. Drainage inlets should be perforated (weep holes installed) at the level of the aggregate base layer. A layer of geotextile fabric should be placed on the outside of the drain inlet over the weep holes to reduce the potential for migration or piping of fines through the holes.

Base course or pavement materials should not be placed when the subgrade surface is wet. Surface drainage should be provided away from the edge of paved areas to minimize lateral moisture transmission into the subgrade.

Pavement Construction Considerations

On most project sites, the site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrades may become disturbed due to utility excavations, construction traffic, rainfall, etc. As a result, the pavement subgrade may not be suitable for placement of aggregate base and pavement. We recommend the area underlying the pavement be rough graded and proof-rolled prior to placement of aggregate base material. Particular attention should be paid to high traffic areas and utility trenches that were backfilled. Areas where disturbance has occurred and materials are unsuitable, they should be removed and replaced with compacted structural fill.

The aggregate base should be uniformly moisture-conditioned and compacted to at least 95 percent relative compaction (modified proctor) in accordance with this report. Base course or pavement materials should not be placed when the surface is wet. Surface drainage should be provided away from the edge of paved areas to minimize lateral moisture transmission into the subgrade.

Minimizing subgrade saturation is an important factor in maintaining subgrade strength. Water allowed to pond on or adjacent to pavements could saturate the subgrade and cause premature pavement deterioration. The pavement should be sloped to provide rapid surface drainage, and positive surface

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drainage should be maintained away from the edge of the paved areas. Design alternatives which could reduce the risk of subgrade saturation and improve long-term pavement performance include crowning the pavement subgrades to drain toward the edges, rather than to the center of the pavement areas; and installing surface drains next to any areas where surface water could pond. Properly designed and constructed subsurface drainage will reduce the time subgrade soils are saturated and can also improve subgrade strength and performance. In areas where there will be irrigation adjacent to pavements, we recommend the owner consider installing perimeter drains for the pavements.

Preventative maintenance should be planned and provided for through an on-going pavement management program in order to enhance future pavement performance. Preventative maintenance activities are intended to slow the rate of pavement deterioration, and to preserve the pavement investment.

Subdrainage

Subdrains might be needed to control subsurface water that might become perched in top and/or fill soils. Each case should be evaluated by the Geotechnical Engineer so that he could make appropriate mitigation recommendations.

LIMITATIONS

The analysis and recommendations submitted in this report are based in part upon the data from the exploratory borings at the indicated locations and in part on information provided by the client. The nature and extent of subsurface variations between the test borings across the site (or due to the modifying effects of weather and/or man) may not become evident until further exploration or during construction. If variations then appear evident, then the conclusions, opinions, and recommendations in this report shall be considered invalid, unless

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the variations are reviewed and the conclusions, opinions, and recommendations are modified or approved in writing.

This report was prepared in order to assist the client in the evaluation of the site and to assist the architect and/or engineer in the design of the improvements. This firm should be provided the opportunity for a general review of final plans and specifications to determine that the recommendations of this report have been properly interpreted and implemented in the plans and specifications.

In the event that there are any significant changes in the project as described herein, then the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions and recommendations modified or verified in writing.

This report is issued for the client's use only. In addition, it is his responsibility to ensure that the information and recommendations contained herein are called to the attention of the designer for the project; and, that necessary steps are taken to implement the recommendations during construction.

The findings in this report were developed on the date(s) indicated. Changes in the conditions of the property can occur with the passage of time, whether they are due to natural processes or the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or from the broadening of knowledge. Accordingly, the findings in this report might be invalidated, wholly or partially, by changes outside of our control. Therefore, this report and the findings on which it is based are subject to our review at the onset of and during construction, or within two years, whichever first occurs.

The scope of services of this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria, etc.) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential of such contamination or pollution, other studies should be undertaken.

No warranties, either expressed or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that any changes in the nature, design, or location of the project as outlined in this report are planned, the conclusion and recommendations contained

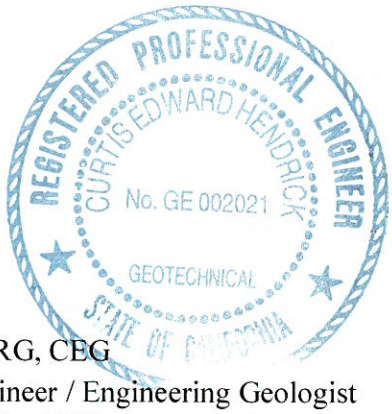
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in this report shall not be considered valid unless ACE reviews the changes, and either verifies or modifies the conclusions of this report in writing.

This report is applicable only for the project and site studied, and should not be used for design and/or construction on any other site.

We appreciate this opportunity to be of service on this project. If you have any questions regarding this report, then please do not hesitate to contact us.

Sincerely;
ACE Quality Control



Mr. Dillon Stemberger, EIT
Staff Engineer
EIT No. 160693

Mr. Ed Hendrick, PE, GE, RG, CEG
Principal Geotechnical Engineer / Engineering Geologist
GE No. GE002021 / CEG No. 1052

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APPENDIX A

GRAPHIC PRESENTATIONS

VICINITY MAP

EXPLORATIONS MAP



NOTES:

Location of site (outlined in red) is approximate. Source for base map: Imagery from Google Earth 2018©.

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VICINITY MAP
Proposed Allison Drive Apartments
Allison Drive
Vacaville, California

ACE JOB NO.	10-18054G
DATE	6/12/2018
FIGURE	1



NOTES:

Locations of explorations (shown as ⊗ **B1 , R1**) are approximate. Base map accessed 6/5/2018.

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EXPLORATIONS MAP SITE 1
Proposed Allison Drive Apartments
Allison Drive
Vacaville, California

ACE JOB NO.	10-18054G
DATE	6/12/2018
FIGURE	2



NOTES:

Locations of explorations (shown as ⊗ **B11 , R2**) are approximate. Base map accessed 6/5/2018.

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EXPLORATIONS MAP SITE 2
Proposed Allison Drive Apartments
Allison Drive
Vacaville, California

ACE JOB NO.
10-18054G

DATE
6/12/2018

FIGURE
3

APPENDIX B

FIELD EXPLORATION METHODS

LOGS OF SUBSURFACE EXPLORATIONS

LEGEND

FIELD EXPLORATION METHODS

Field exploration included a general geotechnical engineering reconnaissance within the study area, as well as the excavation of subsurface explorations (exploratory borings) at the approximate locations shown on the Explorations Map, Figure 2, Appendix A. Exploration locations were located in the field by estimating from the existing site features shown on an aerial photo. The exploration locations should only be considered accurate to the degree implied by the means and methods used to define them. The explorations were conducted in order to assess the geometry and geotechnical characteristics of subsurface geologic deposits at the site.

The explorations were accomplished, and the soil sampling/logging performed by, a Staff Engineer under the direct supervision of a Geotechnical Engineer. The borings were advanced with a 4-inch outer-diameter continuous flight helical solid stem augers powered by a CME 45 truck mounted drill rig. Relatively undisturbed soil samples were recovered from the borings at selected intervals by a 1.4-inch inner-diameter "standard penetration" sampler advanced with an automatic hammer driving a 140 lb. hammer freely falling 30 inches (standard 350-foot/lb. striking force). The number of blows of the hammer required to drive the samplers each 6-inch to 18-inch interval of each drive is denoted as the penetration resistance or "blow count" and provides a field estimate of soil consistency/relative density. Blow counts shown on the logs have not been corrected/converted. Selected undisturbed samples were retained in moisture-proof containers for laboratory testing and reference.

Samples of the subsurface soil deposits were obtained from the test borings for use in laboratory testing to determine the engineering properties and geotechnical design parameters to be used for future site improvements. The samples were tagged for identification, sealed to reduce moisture loss, and taken to our laboratory for further examination, testing, and classification. A bulk soil sample was recovered directly from excavation cuttings of anticipated pavement subgrade soil and placed in a plastic sample bag. Soil samples were then transported to ACE's laboratory for further testing. Field descriptions within the test borings logs have been modified, where appropriate, to reflect laboratory test results. Upon completion of drilling the test borings were backfilled from final test boring depth up to original ground surface with excavated soils.

Soils were logged in the field by a Staff Engineer and were field classified based on the Unified Soil Classification System (ASTM D2487) by color, gradation, texture, type, etc., on the basis of visual observation of samples and auger cuttings. Groundwater observations were made in the borings during and after drilling. Exploration logs prepared for each of the test borings provide soil descriptions and field sample depths. The exploration borings logs are included in this Appendix B which also contains the Explorations Log Legend. These logs include visual classifications of the materials encountered during drilling as well as the field engineer's interpretation of the subsurface conditions between samples. Final logs included with this report represent the engineer's interpretation of the field logs and include modifications based on laboratory observation and tests of the samples.

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-1
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Tan brown, moist, dense, silty SAND with gravel SM	1		1	ST		66	GWT not encountered	39						
		5	2	ST		66		48						
		10	3	ST		33		74						
Dark tan, moist, very dense, well graded GRAVEL GW	2													
Light tan, moist, very dense, cemented, silty SAND SM	3	15	4	ST		66		64						
Boring completed at depth of approximately 16 feet below egs. No free groundwater was encountered during our exploration. Boring was backfilled with cuttings.		20												

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Users\Dillon Stemberger\Desktop\SUPERLOGS\LOGS\Allison Drive Apartments.log Date: 6/13/2018

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-2
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Tan brown, moist, loose, silty/clayey fine grained SAND SM	1		1	ST	66	GWT not encountered	4	82	8.5				
Tan, moist, loose, poorly graded clean SAND SP	2	5	2	ST	33		8						
		10	3	ST	33		8						
Tan, moist, dense, silty SAND with gravel SM	3	15	4	ST	66		40						
Boring completed at depth of approximately 16.5 feet below egs. No free groundwater was encountered during our exploration. Boring was backfilled with cuttings.		20											

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-3
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4", 2.0"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, medium stiff, silty/sandy CLAY CL	1		1	ST	100	GWT not encountered	7	94	20.2				
Tan, moist, medium dense, silty SAND SM	2	5	2	MC	100		20						
		10	3	MC	66		21						
Brown, moist, medium dense, silty/clayey SAND SM	3	15	4	MC	66		30						
Tan, moist, medium dense, SILT ML	4	20	5	MC	66		28						
Boring completed at depth of approximately 21.5 feet below egs. No free groundwater was encountered. Boring was backfilled with neat cement.													

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-4
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Dark brown, moist, stiff, silty CLAY CL	1		1	ST	100	GWT not encountered	12			77			
Tan brown, moist, medium dense, silty SAND with gravel SM	2	5	2	MC	100		16						
Brown, moist, very stiff, sandy CLAY CL	3	10	3	MC	66		19			64			
		15	4	MC	66		14						
Brown, moist, medium dense, poorly graded fine grained SAND SP	4	20	5	MC	66		27						
Boring completed at depth of approximately 21.5 feet below egs. No free groundwater was encountered. Boring was backfilled with neat cement.													

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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Roseville, California 95678
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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-5
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, loose to medium dense, silty SAND SM	1	5	1	ST	33	GWT not encountered	3	88	15.2				
			2	ST	33		9						
		10	3	ST	66		12						
Tan, moist, dense, sandy SILT ML	2	15	4	ST	66		40						
Boring completed at depth of approximately 16.5 feet below egs. No free groundwaer was encountered. Boring was backfilled with cuttings.	3	20											

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-6
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Red brown, moist, medium dense to very dense, silty SAND with gravel SM	1		1	ST		33	GWT not encountered	16						
		5	2	ST		33		56						
		10	3	ST		66		89/9"						
Auger refusal encountered at a depth of approximately 13.5 feet below egs. No free groundwaer was encountered. Boring was backfilled with cuttings.		15												
		20												

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Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-7
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/17/18
Date Completed 5/17/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, loose to medium dense, silty fine grained SAND SM	1		1	ST		100	GWT not encountered	4						
		5	2	ST		100		10						
		10	3	ST		66		19						
Orange with black, moist, very dense, silty SAND with gravel SM	2	15	4	ST		66		75/11"						
Boring completed at depth of approximately 16.5. No free groundwater was encountered. Boring was backfilled with grout.		20												

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-8
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown to light brown, moist, loose to medium dense, sandy CLAY CL	1		1	ST		100	GWT not encountered	5			85.2			
		5	2	ST		33		13				43	25	P.I = 18
Brown, moist, medium dense, silty SAND SM	2	10	3	ST		66		11						
Boring completed at depth of approximately 10.5 feet below egs. No free groundwater was encountered. Boring was backfilled with cuttings.		15												
		20												

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Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-9
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Black brown, moist, medium stiff to stiff, sandy CLAY CL	1		1	ST	100	GWT not encountered	9	104	20.5	74			
Tan, moist, medium dense, silty/clayey SAND SM	2	5	2	ST	33		26						
Tan, moist, very stiff to hard, cemented SILT ML	3	10	3	ST	66		52			88			
Brown, moist, dense, silty fine grained SAND with gravel SM	4	15	4	ST			48						
		20	5	ST			31						
Boring completed at depth of approximately 21.5 feet below egs. No free groundwater was encountered. Boring was backfilled with neat cement.													

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-10
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Black brown to tan brown, moist, medium stiff to stiff, sandy CLAY CL	1		1	ST	33	GWT not encountered	12				37	20	P.I = 18
		5	2	ST	100		13						
Tan brown, moist, medium dense, silty/clayey SAND SM	2	10	3	ST	100		17						
		15	4	ST	66		16						
		20	5	ST	100		15						
Tan, moist, dense to very dense, silty SAND with gravel SM	3												

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-10
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Tan, moist, dense to very dense, silty SAND with gravel SM	3		6	ST		100		50/3"						
		30	7	ST		66		38						
Tan with red to orange, moist, very dense, silty fine grained SAND SM	4	35	8	ST		66		67						
		40	9	ST		66		84/11"						
		45	10	ST		33		67			49			

Date: 6/13/2018 File: C:\Users\Dillon Stemberger\Desktop\SUPERLOGS\LOGS\Allison Drive Apartments.log
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Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-10
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Tan with red to orange, moist, very dense, silty fine grained SAND SM	4		11	ST		100		62						
Boring completed at depth of approximately 51.5 feet below egs. No free groundwater was encountered. Boring was backfilled with neat cement.		55												
		60												
		65												
		70												

Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-11
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, loose to medium dense, silty SAND SM	1		1	ST	100	GWT not encountered	10						
		5	2	ST	100		7						
Brown, moist, medium stiff, sandy SILT ML	2	10	3	ST	100		11						
Tan, moist, dense to very dense, silty SAND with gravel SM	3	15	4	ST	100		10						
Orange brown, moist, silty fine grained poorly graded SAND SP	4	20	5	ST	100		10						
Boring completed at depth of approximately 21.5 feet below egs. No free groundwater was encountered. Boring was backfilled with neat cement.													

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Sample Type:

ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:

At Drilling
After Drilling

Layer Lines:

Layer lines are approximate and in-situ the transition may be gradual

Boring Method:

HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-12
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics	Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, medium dense, silty SAND SM	1		1	ST		100	GWT not encountered	16						
		5	2	ST		100		14						
Brown, moist, medium stiff, sandy CLAY CL	2	10	3	ST		100		11						
Boring completed at depth of approximately 11.5 feet below egs. No free groundwater was encountered. Boring was backfilled with cuttings.		15												
		20												

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Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

Layer Lines:
Layer lines are approximate and in-situ the transition may be gradual

Boring Method:
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
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EXPLORATION LOG

CLIENT Gaurdian Investment Capital LLC
PROJECT NAME Allison Drive Apartments
PROJECT LOCATION Allison Drive near Ulatis Drive
Vacaville, California

BORING # B-13
JOB NO. 10-18054G
DRAWN BY DS
APPROVED BY EH

DRILLING and SAMPLING INFO

Date Started 5/18/18
Date Completed 5/18/18
Driller Cal Nev
Staff Engineer Stemberger
Boring Method 4" O.D SSA

Hammer Wt. (140 lbs.) 140 Automatic
Hammer Drop (30") 30"
Spoon Sampler ID (in.) 1.4"

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION: EGS	Stratum	Depth Scale	Sample No.	Sample Type	Sample Graphics Recovery (%)	Groundwater	Penetration Test (blows per foot)	Dry Density (pcf)	Moisture Content (%)	Pass No. 200 Sieve (%)	Liquid Limit (LL)	Plastic Limit (PL)	Remarks
Brown, moist, medium dense, silty SAND SM	1	5	1	ST	100	GWT not encountered	16						
			2	ST	100		14						
Brown, moist, medium stiff, sandy CLAY CL	2	10	3	ST	100		11						
Boring completed at depth of approximately 11.5 feet below egs. No free groundwater was encountered. Boring was backfilled with cuttings.		15											
		20											

Date: 6/13/2018
File: C:\Users\Dillon Stemberger\Desktop\SUPERLOGS\LOGS\Allison Drive Apartmetns.log
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Sample Type:
ST - Standard Split Spoon
MC - Mod. Calif. SS (2.0" ID)
GS - Grab Sample
RC - Rock Core
AT - AMS Tube (2" ID)
CT - 3" OD Split Spoon

Depth of Ground Water:
At Drilling
After Drilling

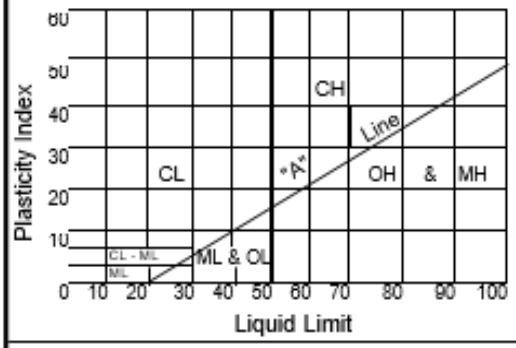
Layer Lines:
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Boring Method:
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CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling
CC - Continuous Core

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UNIFIED SOIL CLASSIFICATION

PT	OH	CH	MH	OL	CL	ML	SC	SM	SP	SW	GC	CM	GP	GW
Highly organic soils	Silts and Clays (Liquid Limit > 50)			Silts and Clays (Liquid Limit < 50)			Sands with fines > 12% fines		Clean sands < 5% fines		Gravels with fines > 12% Fines		Clean gravels < 5% fines	
							Sands - more than 50% of coarse fraction is smaller than No. 4 sieve.				Gravels - more than 50% of coarse fraction is larger than No. 4 sieve.			
Fine grained soils (more than 50% is smaller than No. 200 sieve)							Coarse grained soils (more than 50% is larger than No. 200 sieve)							



LABORATORY CLASSIFICATION CRITERIA

GW and SW-$C_u = \frac{D_{60}}{D_{10}}$ greater than 4 for GW & 6 for SW; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 & 3

GP and SP - Clean gravel or sand not meeting requirements for GW and SW.

GM and SM - Atterberg limits below "A" line or P.I. less than 4.

GC and SC - Atterberg limits above "A" line with P.I. greater than 7.

Fines (silt or clay)	Fine Sand	Medium Sand	Coarse Sand	Fine Gravel	Coarse Gravel	Cobbles	Boulders
Sieve sizes	> # 200	> # 40	> # 10	> # 4	> 3/4"	> 3"	> 10"

Classification of earth materials shown on this sheet is based on field inspection and should not be construed to imply laboratory analysis so stated.

MATERIAL SYMBOLS

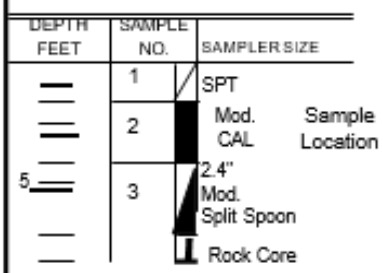
- Gravel
- Peat or organic matter
- Sand
- Fill Material
- Silt
- Shale
- Clay
- Sandstone
- Sandy Clay or clayey sand
- Limestone
- Sandy silt or silty Sand
- Metamorphic rock
- Silty clay or clayey silt
- Igneous rock

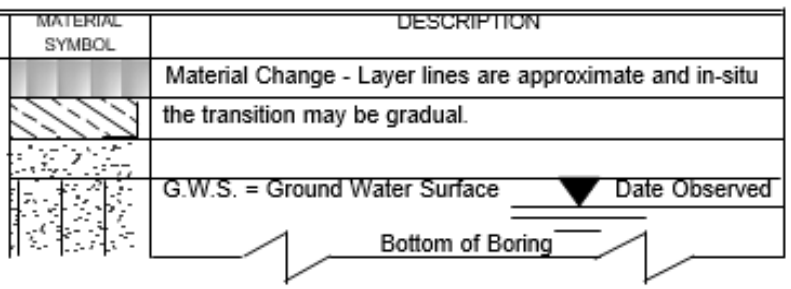
RELATIVE DENSITY / CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

No. of Blows	Granular	No. of Blows	Cohesive
0 - 4	Very Loose	< 2	Very Soft
5 - 10	Loose	3 - 4	Soft
11 - 20	Semicompact	5 - 8	Medium Stiff
21 - 30	Medium Dense	9 - 15	Stiff
31 - 50	Dense	16 - 30	Very Stiff
> 50	Very Dense	> 30	Hard

Where the standard penetration test has not been performed, consistencies shown on the logs are estimated and given in parenthesis, (e.g., Very Stiff).





LEGEND FOR EXPLORATIONS LOGS

APPENDIX C

LABORATORY TESTING

Samples retrieved during the field exploration were taken to the soil mechanics laboratory for further observation by the project geotechnical engineer and were classified in accordance with the Unified Soil Classification System (USCS) described in Appendix B. At that time, the field descriptions were confirmed or modified as necessary and an applicable laboratory testing program was formulated to determine engineering properties of the subsurface materials.

Soil mechanics laboratory tests were performed on soil samples recovered from the test borings to further determine the physical and engineering properties of the soils. These tests included gradation (ASTM D422), Atterberg limits, R-value (CalTrans Test Method CTM 301), dry density, and natural moisture content (ASTM D 2216). The results of these tests are shown on the Test Borings Logs at the depth that each sample was recovered or on the following table. The laboratory test results were used for the geotechnical engineering analyses, and the development of engineering, earthwork, and construction recommendations.

A Resistance ("R") Value test (CTM 301) was performed on a representative sample of the near surface soil by an associate soils mechanics laboratory to determine the soil sample's resistance to repetitive loading characteristics. The results of this test are tabulated on the following table.

SAMPLE: R-1
DESCRIPTION: Brown Silty Sandy Clay

SPECIMEN	A	B	C
MOISTURE AT TEST %	18.0	19.1	20.2
DRY DENSITY AT TEST, pcf	120.0	120.1	120.0
EXUDATION PRESSURE, psi	639	407	236
RESISTANCE VALUE	22	10	5
"R" VALUE AT 300 PSI EXUDATION PRESSURE	6.5		

SAMPLE: R-2
DESCRIPTION: Brown Silty Sandy Clay

SPECIMEN	A	B	C
MOISTURE AT TEST %	17.7	18.8	19.9
DRY DENSITY AT TEST, pcf	120.4	120.4	120.3
EXUDATION PRESSURE, psi	671	509	299
RESISTANCE VALUE	15	7	4
"R" VALUE AT 300 PSI EXUDATION PRESSURE	4		

APPENDIX D

GUIDE SPECIFICATIONS FOR EARTHWORK

A. General Description

1. This item shall consist of all clearing and grubbing, removal of existing obstructions, preparation of the land to be filled, filling the land, spreading, compaction and control of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the lines, grades and slopes as shown on the accepted plans.

2. The Geotechnical Engineer is not responsible for determining line, grade elevations or slope gradients. The property owner or his representative shall designate the party that will be responsible for those items of work.

B. Geotechnical Report

1. The Geotechnical Report has been prepared for this project by ACE Quality Control, Roseville, California, (916-742-5096). This report was for design purposes only and may not be sufficient to prepare an accurate bid. A copy of the report is available for review at **ACE's** office.

2. Contents of these guide specifications shall be integrated with the Geotechnical Report of which they are a part and shall not be used as a self-contained document. Where a conflict occurs between these guide specifications and the conclusions and recommendations contained in the report, then the conclusions and recommendations shall take precedence and these guide specifications adjusted accordingly.

C. Site Preparation

1. Clearing Area(s) to be Filled: All trees, brush, logs, rubbish and other debris shall be removed and disposed of so as to leave the areas that have been disturbed with a neat appearance. Underground structures shall be removed or may be crushed in place upon approval by the Geotechnical Engineer. Excavations and depressions resulting from the removal of the above items shall be cleaned out to firm undisturbed soil and backfilled with suitable materials in accordance with the specifications contained herein. Stockpiles of clean soil may be reused as filled material provided the soil is free of significant vegetation, debris, rubble and rubbish and is approved by the Geotechnical Engineer.

2. Surfaces upon which fill is to be placed, as well as subgrades of building pad(s) left at existing grade, shall have all organic material removed; or, with permission of the Geotechnical Engineer, closes cut and remove vegetation and thoroughly disc and blend the remaining nominal organics into the upper soil. Discing must be thorough enough so that no concentrations of organics remain, which may require re-discing or cross-discing several times.

3. Organic laden material removed per paragraph C.2. above, may be used as fill in landscaped areas provided that the material shall not extend closer than ten (10) feet to any structure, shall not exceed two (2) feet in thickness or be used where the material could, in the opinion of the Geotechnical Engineer, create a slope stability problem, and shall be compacted to at least eighty-two (82) percent relative compaction per ASTM Test Designation D 1557. Alternatively, the organic laden material may be hauled off-site and suitably disposed of.

4. Upon completion of the organic removal, exposed surface shall be plowed or scarified to a depth of at least six (6) inches, and until the surface is free from ruts, hummocks, or other uneven features which would tend to prevent uniform compaction by the equipment to be used. Where vegetation has been close cut and removed and remaining organics blended with the upper soil, further scarifying may not be necessary. Where fills are to be placed on hill slopes, scarifying shall be to depths adequate to provide bond between fill and fill foundation. Where considered necessary by the Geotechnical Engineer, (typically where the slope ratio of the original ground is steeper than five (5) horizontal to one (1) vertical), the ground surface shall be stepped or benched to achieve this bond. Vertical dimension of the required benches shall be as determined by the Geotechnical Engineer, based upon location, degree and condition of the hill slope.

5. After the foundation for the fill has been cleared and scarified, it shall be disced or bladed until it is uniform and free from large clods, uniformly moisture conditioned to the range specified by the Geotechnical Engineer, and compacted to not less than [refer to report -- if not recommended, use 90] percent of maximum dry density as determined by ASTM D 1557, or to such other density as may be determined appropriate for the materials and conditions and acceptable to the Geotechnical Engineer and the owner or his representative.

D. Fill Materials

1. Materials for fill shall consist of material approved by the Geotechnical Engineer.

2. The materials used for fill shall be free from organic matter and other deleterious substances and shall not contain rocks, clods, lumps or cobbles exceeding four (4) inches in greatest dimension with not more than fifteen (15) percent larger than two and one-half (2-1/2) inches.

3. Imported materials to be used for fill shall be non-expansive [typically, have a plasticity index not exceeding twelve (12)], shall be of maximum one (1) inch size, and shall be tested and approved by the Geotechnical Engineer prior to commencement of grading and before being imported to the site.

4. The Contractor shall notify the Geotechnical Engineer at least four (4) working days in advance of the Contractor's intention to import soil; shall designate the borrow area; and, shall permit the Geotechnical Engineer to sample the borrow area for the purposes of examining the material and performing the appropriate tests to evaluate the quality and compaction characteristics of the soil. Compaction requirements for the material shall be based upon the characteristics of the material as determined by the Geotechnical Engineer.

E. Placement of Fill

1. The selected fill material shall be placed in level, uniform layers (lifts) which, when compacted, shall not exceed six (6) inches in thickness. Water shall be added to the fill or the fill allowed to dry as necessary to obtain fill moisture content at which compaction as specified can be achieved. Each layer shall be thoroughly mixed during the spreading to obtain uniformity of moisture in each layer.

2. The fill material shall be compacted within the appropriate moisture content range (typically optimum to slightly above the optimum) as determined by the Geotechnical Engineer for the soil(s) being used.

3. Each layer of fill shall be compacted to not less than [refer to report; if not recommended, use 90] percent of maximum dry density as determined by ASTM Test Designation D 1557. Compaction equipment shall be of such design that it will be able to compact the fill to the specified density.

Compaction shall be accomplished while the fill material is within the specified moisture content range. Compaction of each layer shall be continuous over its entire area and the compaction equipment shall make sufficient trips to insure that the required density has been obtained. No ponding or jetting is permitted.

4. If work has been interrupted for any reason, the Geotechnical Engineer shall be notified by the contractor at least two (2) working days prior to the intended resumption of grading.

F. Geotechnical Engineer

1. Owner is retaining Geotechnical Engineer to make observations and tests to determine general compliance with Plans and Specifications, to verify expected or unexpected variations in subsurface conditions, and to give assistance in appropriate decisions. Cost of Geotechnical Engineer will be borne by the Owner, except costs incurred for re-tests and/or re-observations caused by failure of the Contractor to meet specified requirements will be paid by the Owner and back charged to Contractor.

G. Observation and Testing

1. Field density tests shall be made by the Geotechnical Engineer or his representative of the compaction of each layer of fill. Density tests shall be taken in the compacted material below any surfaces disturbed by the construction equipment. When these tests indicate that the density of any layer of fill or portion thereof is below the required density or moisture content, the particular layer or portion shall be reworked until the required density or moisture content has been obtained.

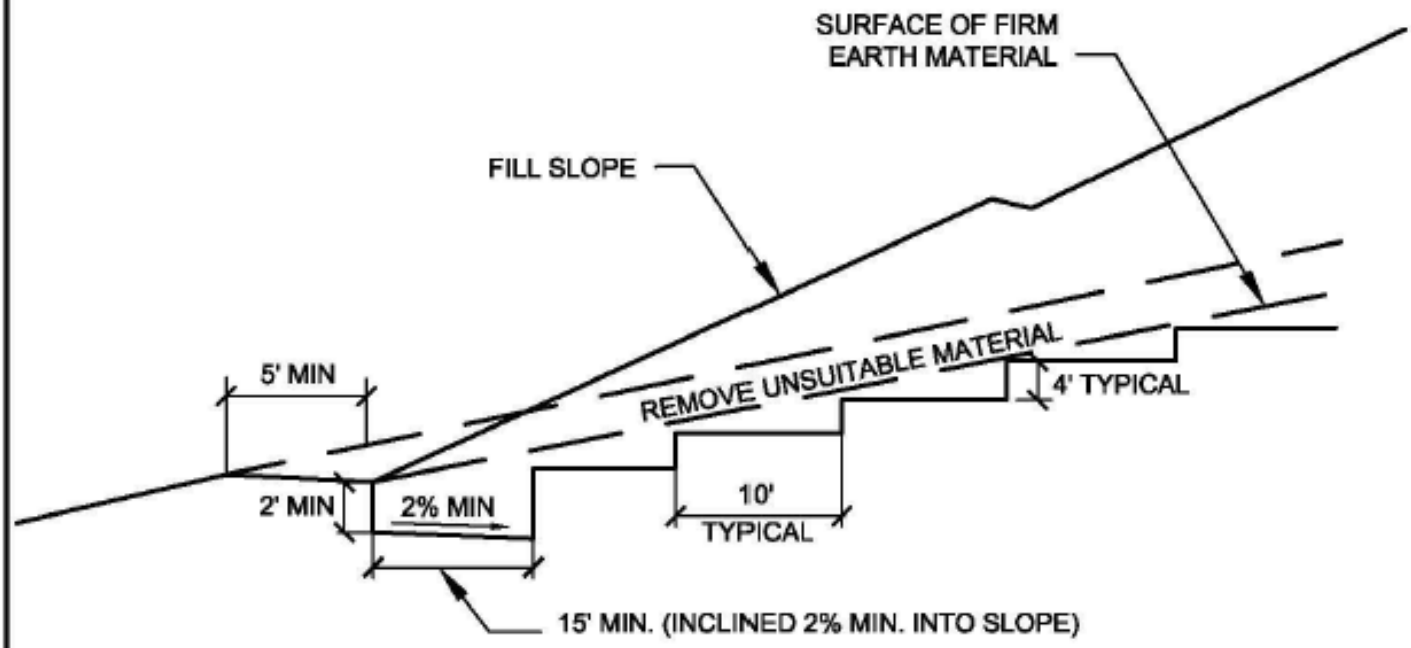
2. All aspects of the site earthwork shall be observed and tested as deemed necessary by the Geotechnical Engineer or his representative so that he can render a professional opinion of the completed fill for substantial compliance with plans and specifications and design concepts. The grading contractor shall give the Geotechnical Engineer at least two (2) working days' notice prior to beginning any site earthwork to allow proper scheduling of the work.

H. Seasonal Limits

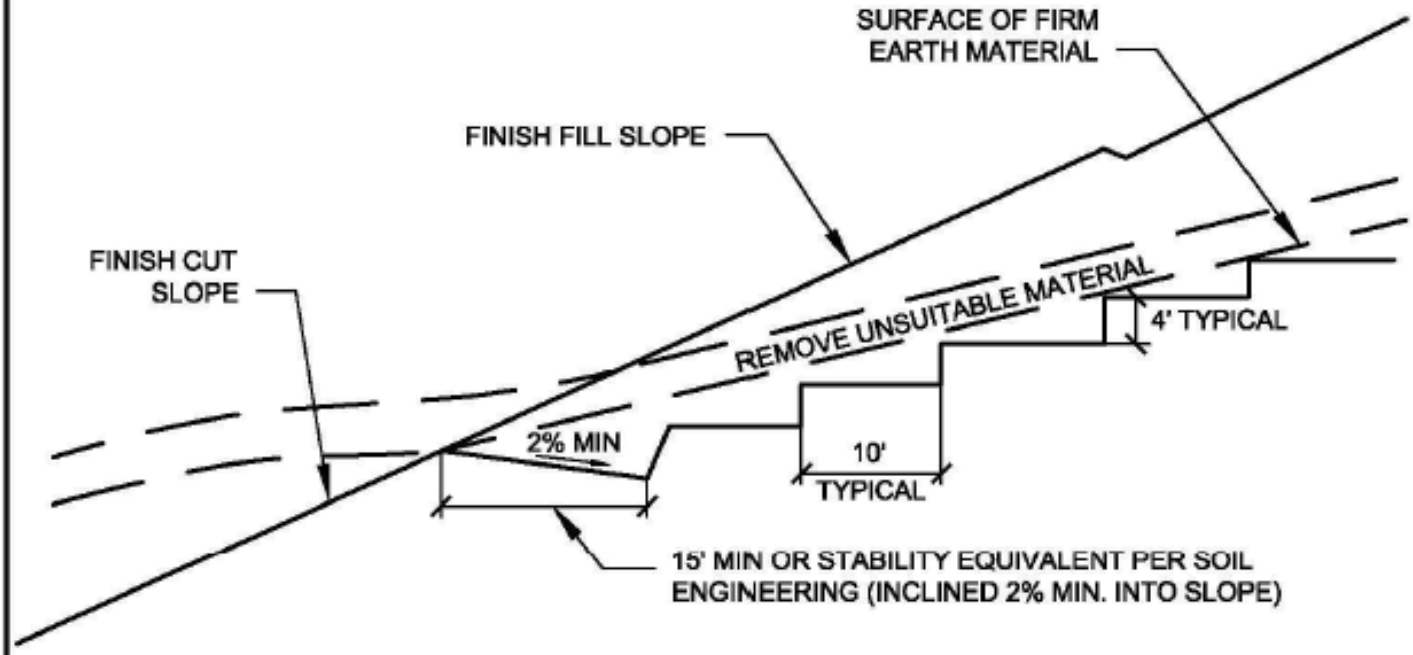
1. No fill material shall be placed, spread or compacted during unfavorable weather conditions. When work is interrupted by heavy rain, fill operations shall not be resumed until the Geotechnical Engineer or his representative indicates that the moisture content and density of the previously placed fill are as specified.

GRADING DETAILS
(on following pages)

BENCHING FILL OVER NATURAL

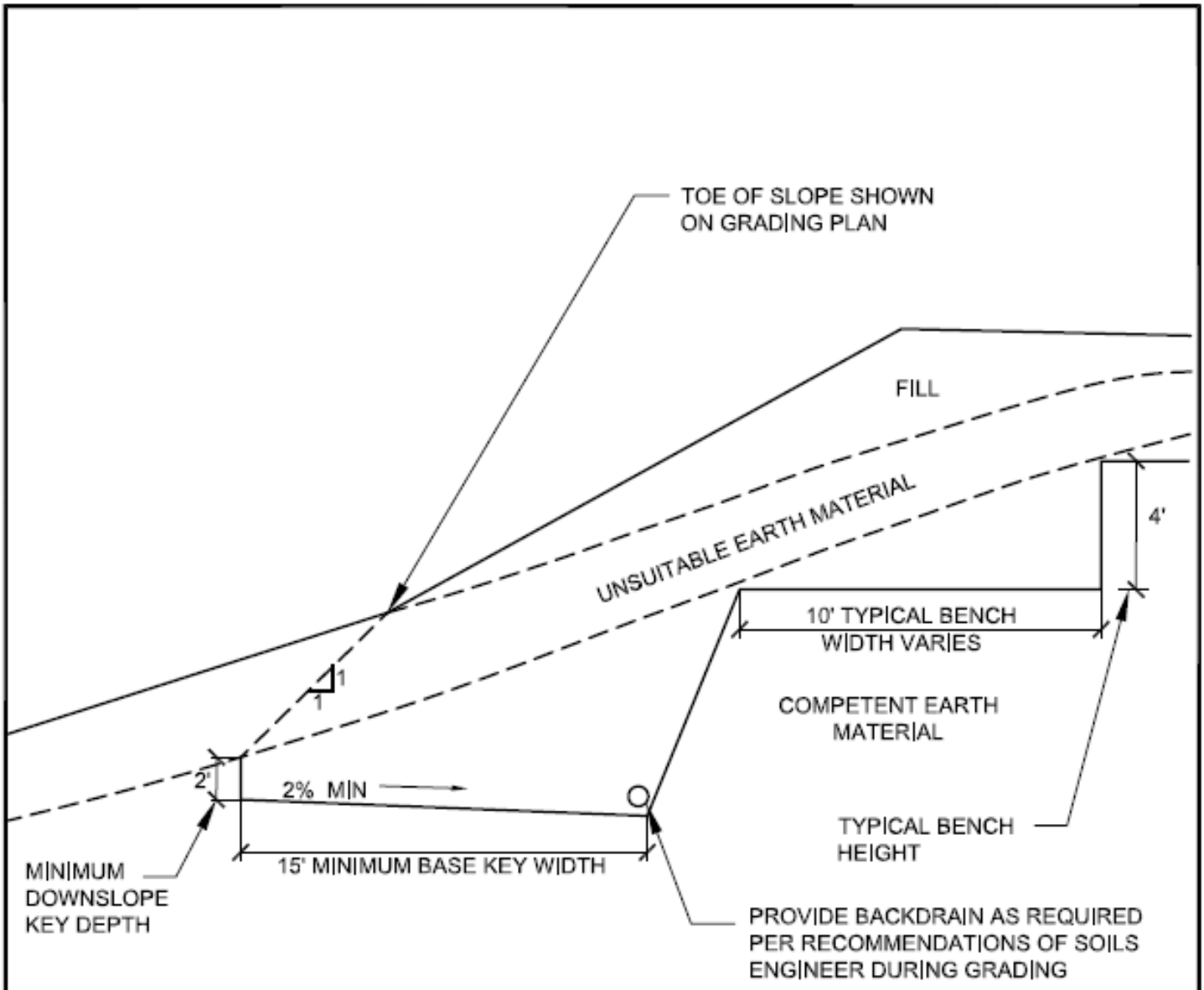


BENCHING FILL OVER CUT



NOT TO SCALE

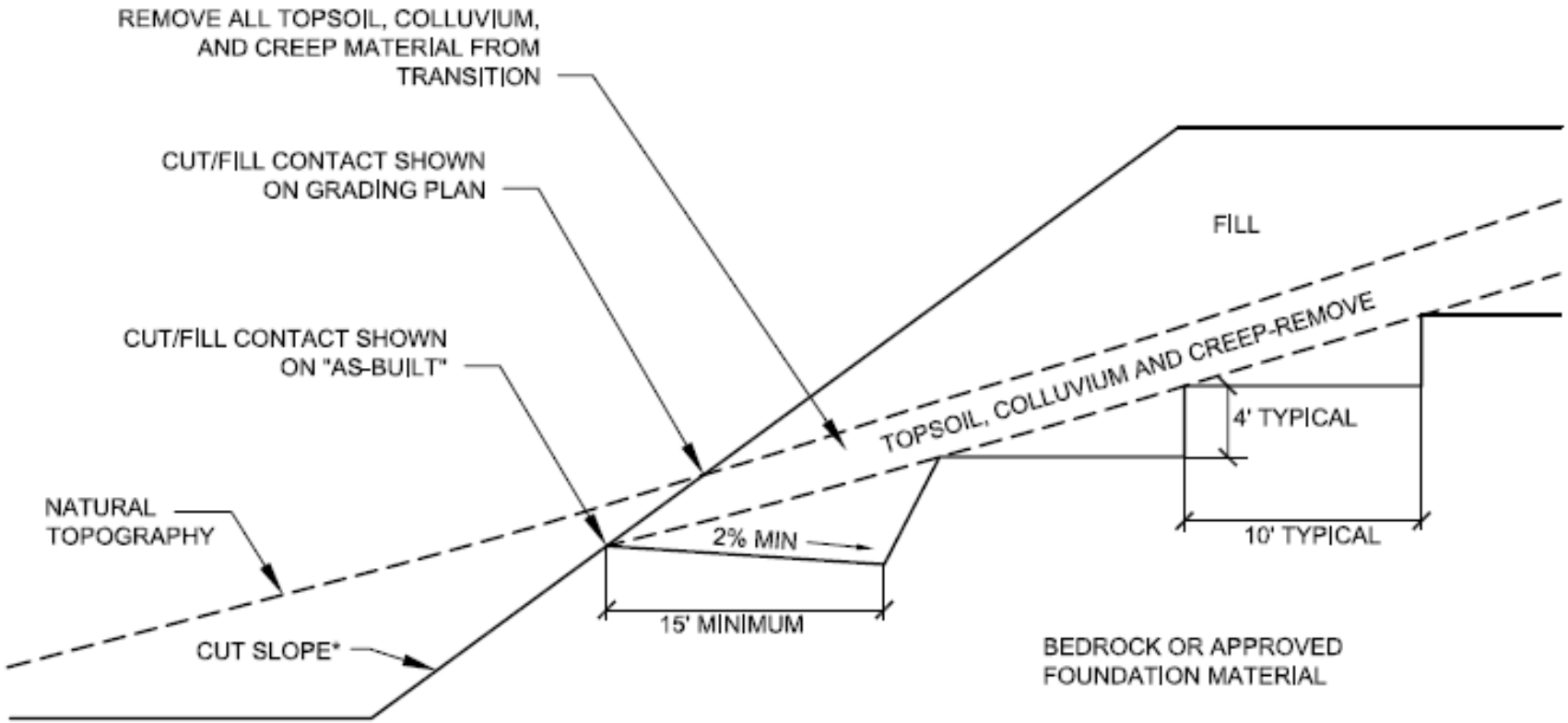
BENCHING FOR COMPACTED FILL DETAIL



WHERE NATURAL SLOPE GRADIENT IS 5:1 OR LESS, BENCHING IS NOT NECESSARY. FILL IS NOT TO BE PLACED ON COMPRESSIBLE OR UNSUITABLE MATERIAL.

NOT TO SCALE

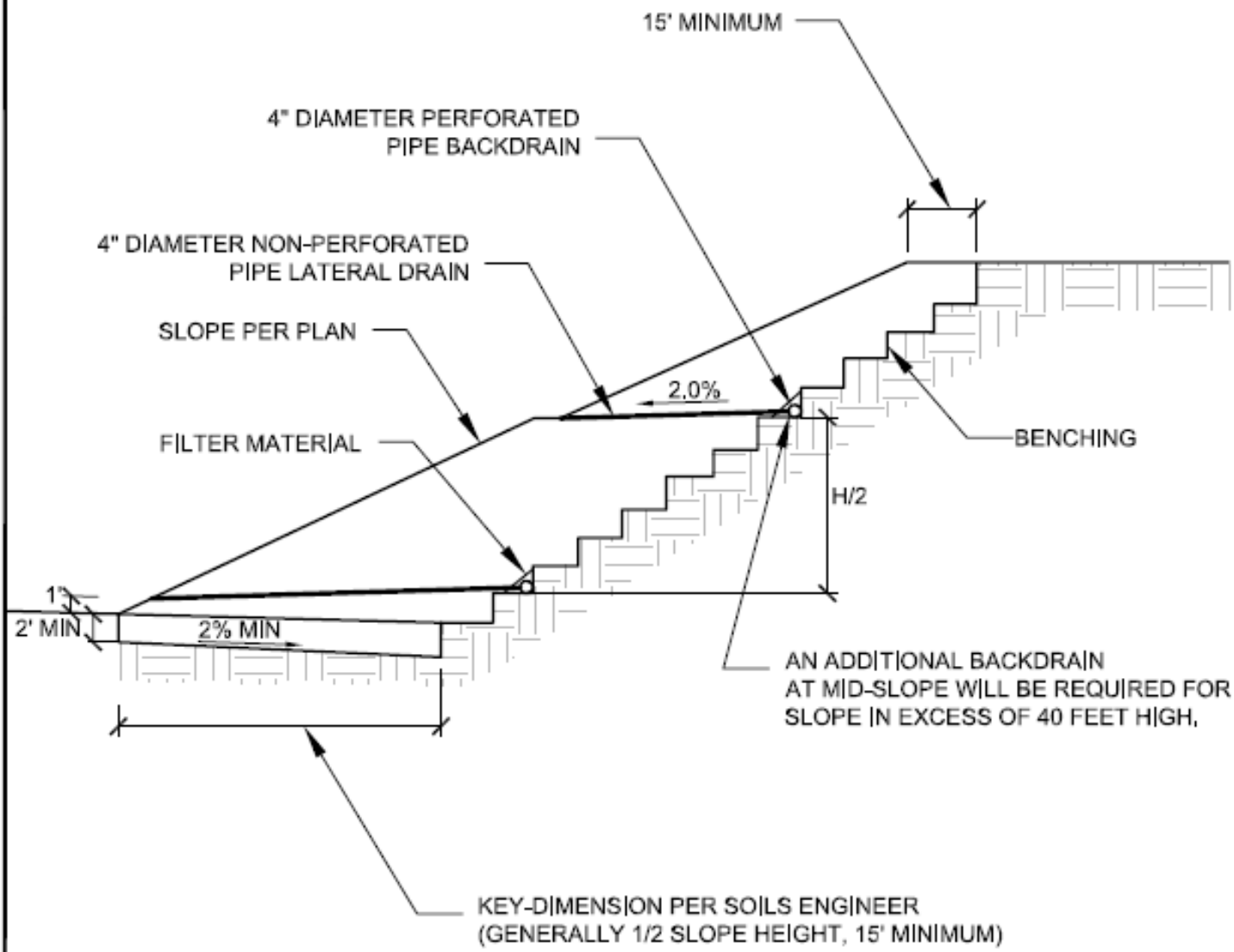
FILL SLOPE ABOVE NATURAL GROUND DETAIL



*NOTE: CUT SLOPE PORTION SHOULD BE MADE PRIOR TO PLACEMENT OF FILL

NOT TO SCALE

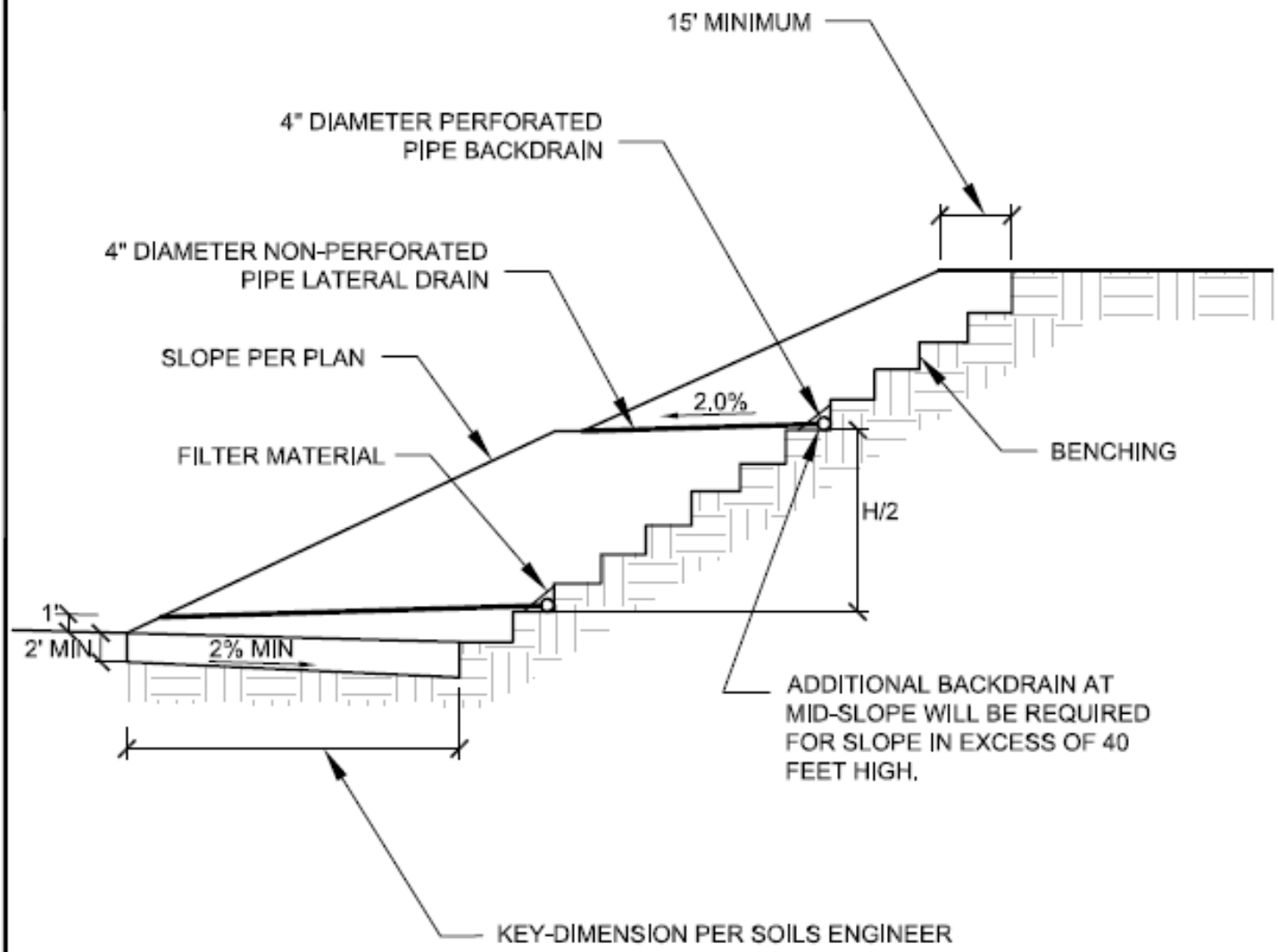
FILL SLOPE ABOVE CUT SLOPE DETAIL



DIMENSIONS ARE MINIMUM RECOMMENDED

NOT TO SCALE

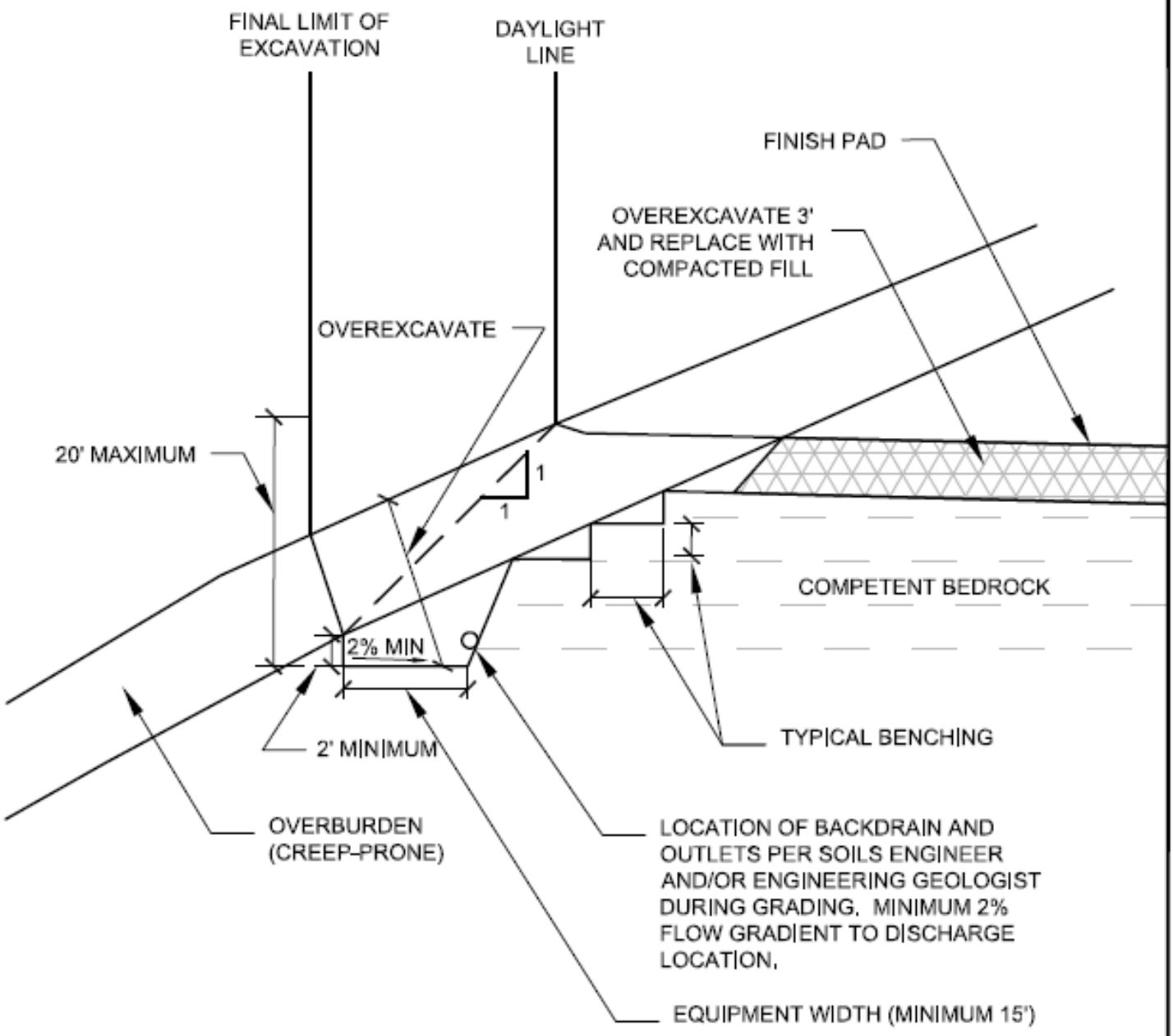
TYPICAL SLOPE STABILIZATION FILL DETAIL



DIMENSIONS ARE MINIMUM RECOMMENDED

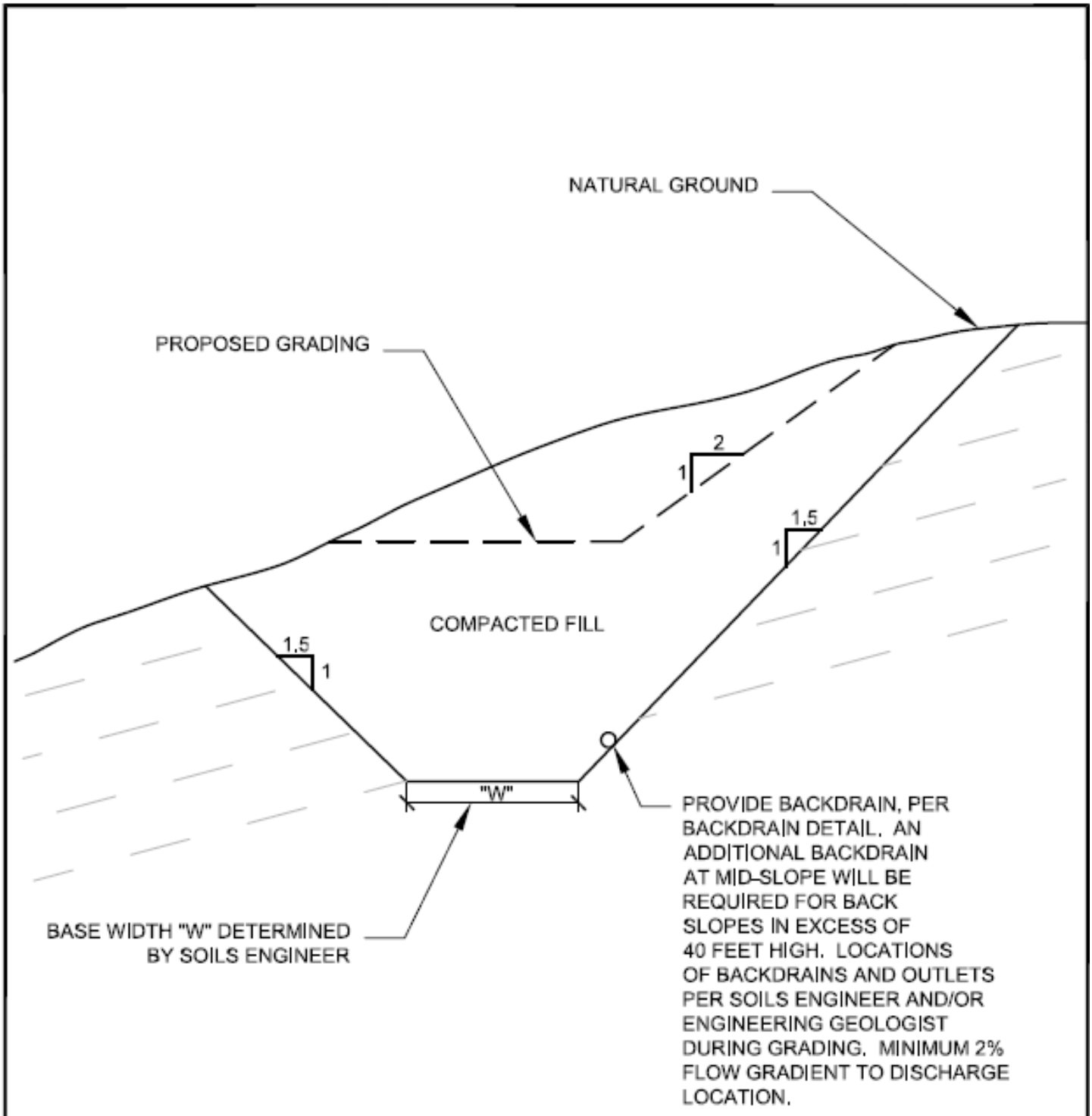
NOT TO SCALE

TYPICAL BUTTRESS FILL DETAIL



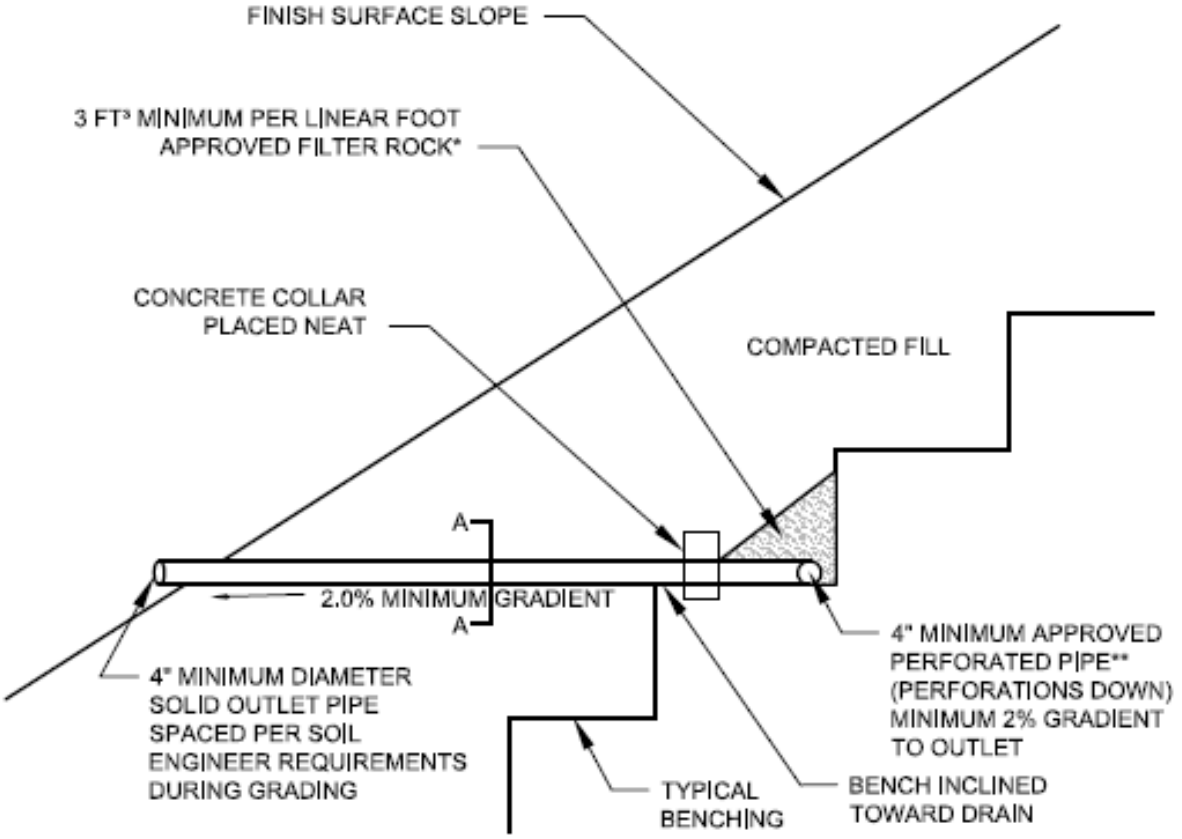
NOT TO SCALE

DAYLIGHT SHEAR KEY DETAIL

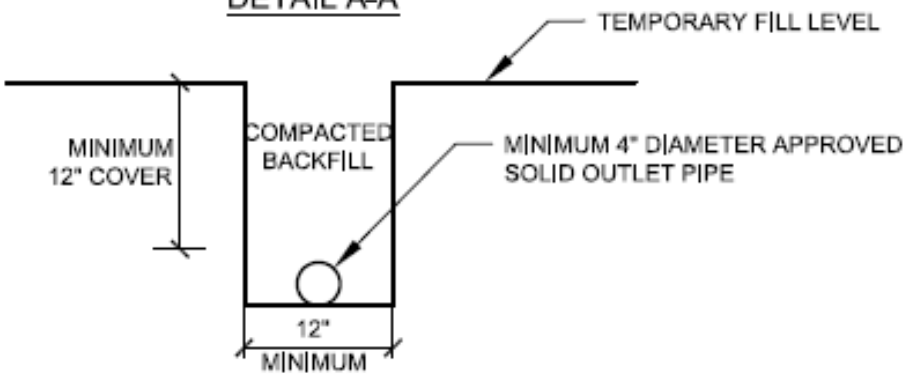


NOT TO SCALE

TYPICAL SHEAR KEY DETAIL



DETAIL A-A



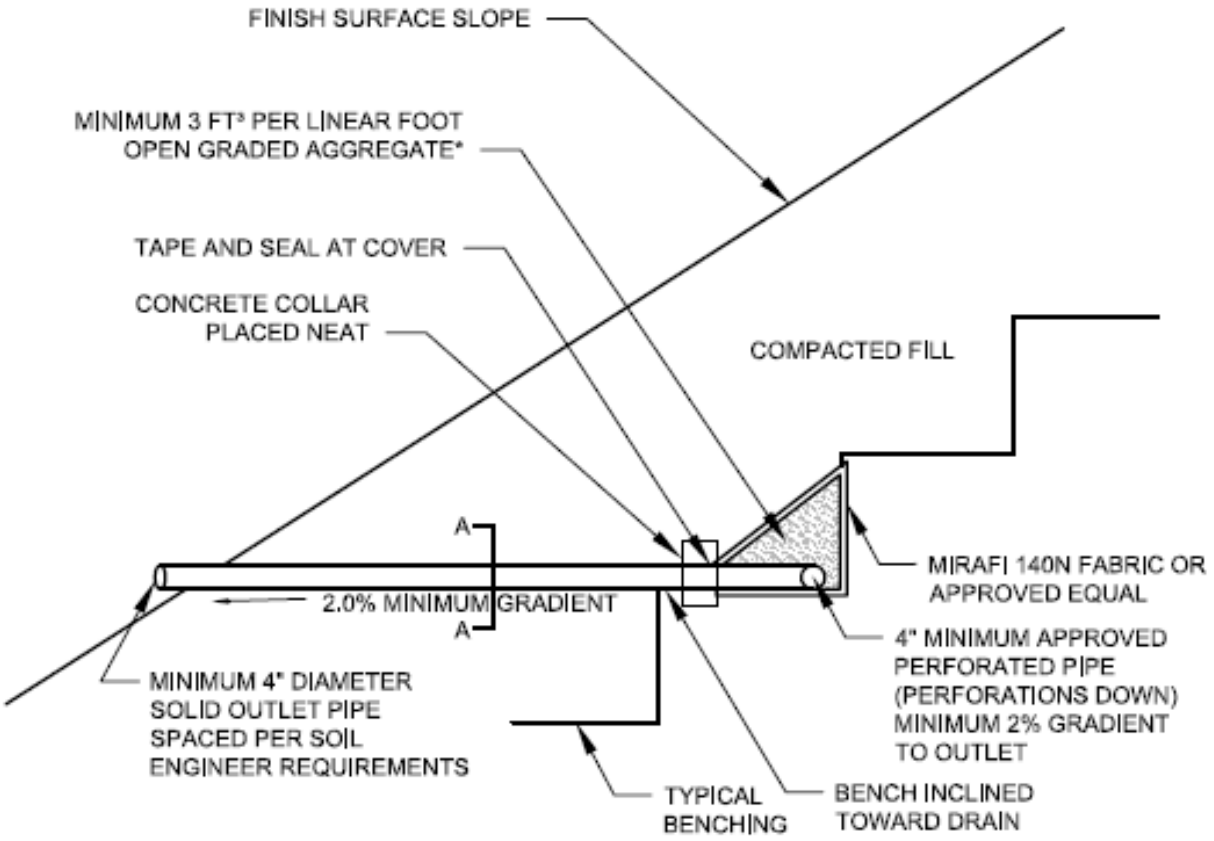
**APPROVED PIPE TYPE:
SCHEDULE 40 POLYVINYL CHLORIDE
(P.V.C.) OR APPROVED EQUAL.
MINIMUM CRUSH STRENGTH 1000 PSI

*FILTER ROCK TO MEET FOLLOWING
SPECIFICATIONS OR APPROVED EQUAL:

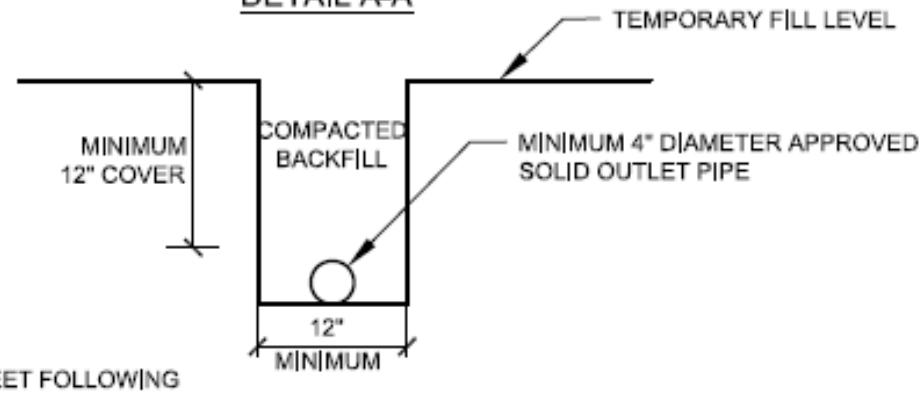
SIEVE SIZE	PERCENTAGE PASSING
1"	100
¾"	90-100
⅜"	40-100
NO. 4	25-40
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

NOT TO SCALE

TYPICAL BACKDRAIN DETAIL



DETAIL A-A

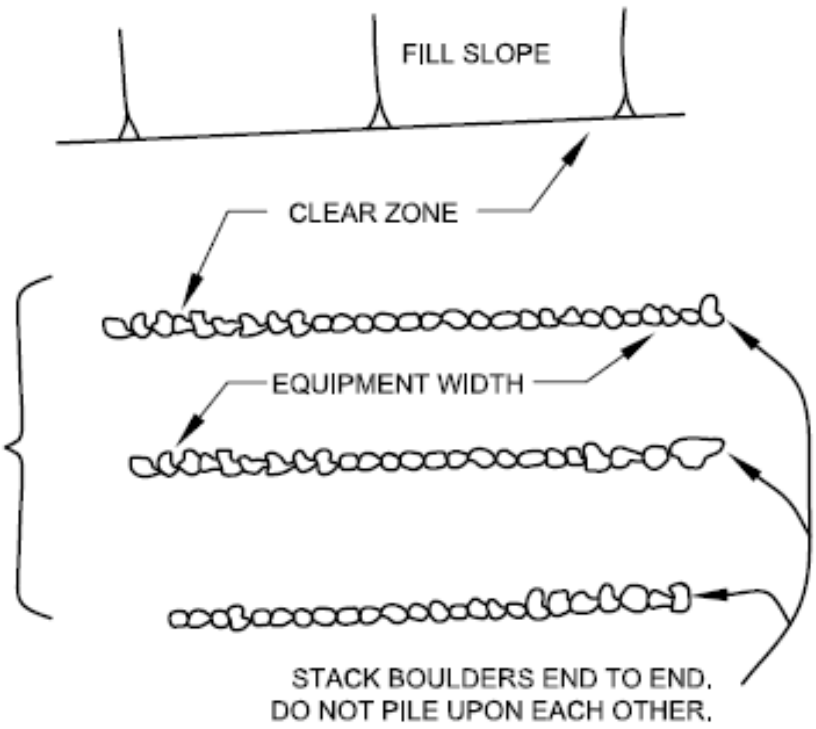


*NOTE: AGGREGATE TO MEET FOLLOWING SPECIFICATIONS OR APPROVED EQUAL:

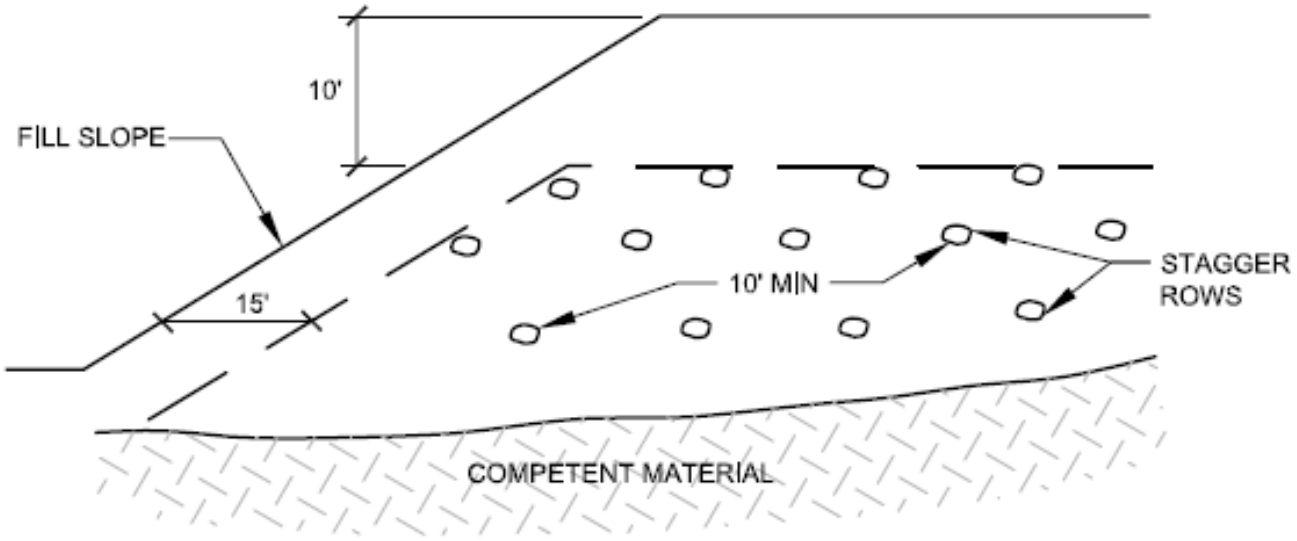
SIEVE SIZE	PERCENTAGE PASSING
1 ½"	100
1"	5-40
¾"	0-17
⅜"	0-7
NO. 200	0-3

NOT TO SCALE

BACKDRAIN DETAIL (GEOFRABIC)

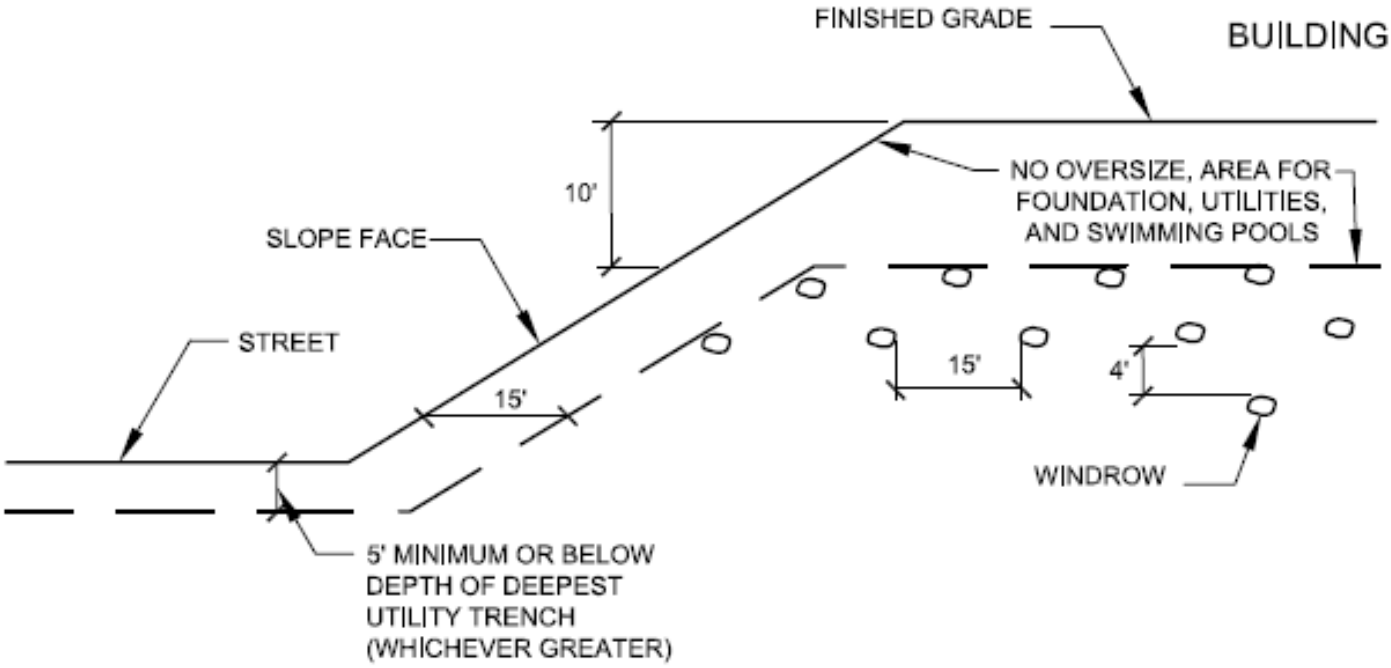


SOIL SHALL BE PUSHED OVER ROCKS AND FLOODED INTO VOIDS, COMPACT AROUND AND OVER EACH WINDROW.

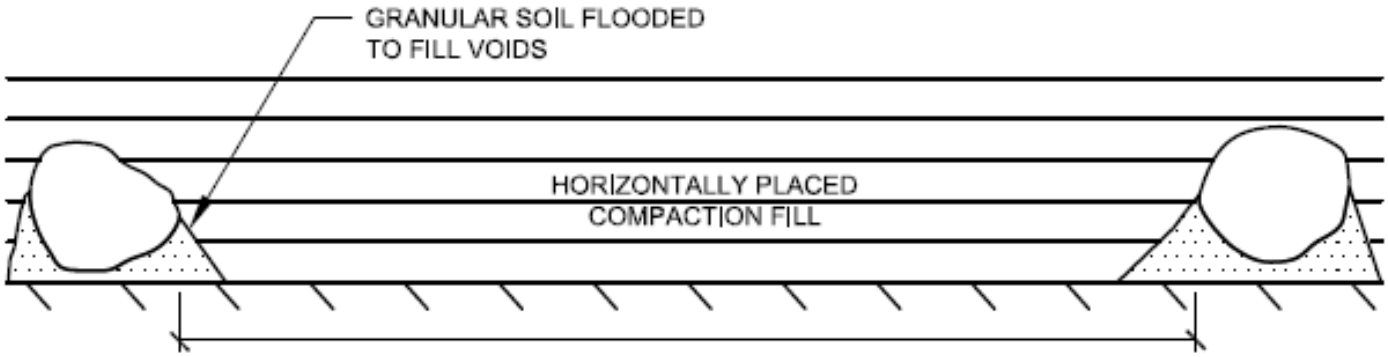


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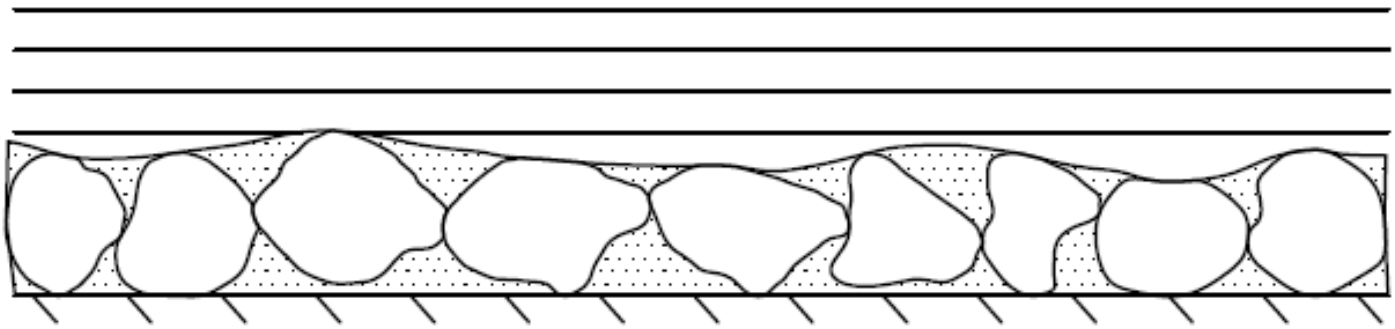
ROCK DISPOSAL DETAIL



TYPICAL WINDROW DETAIL (EDGE VIEW)



PROFILE VIEW

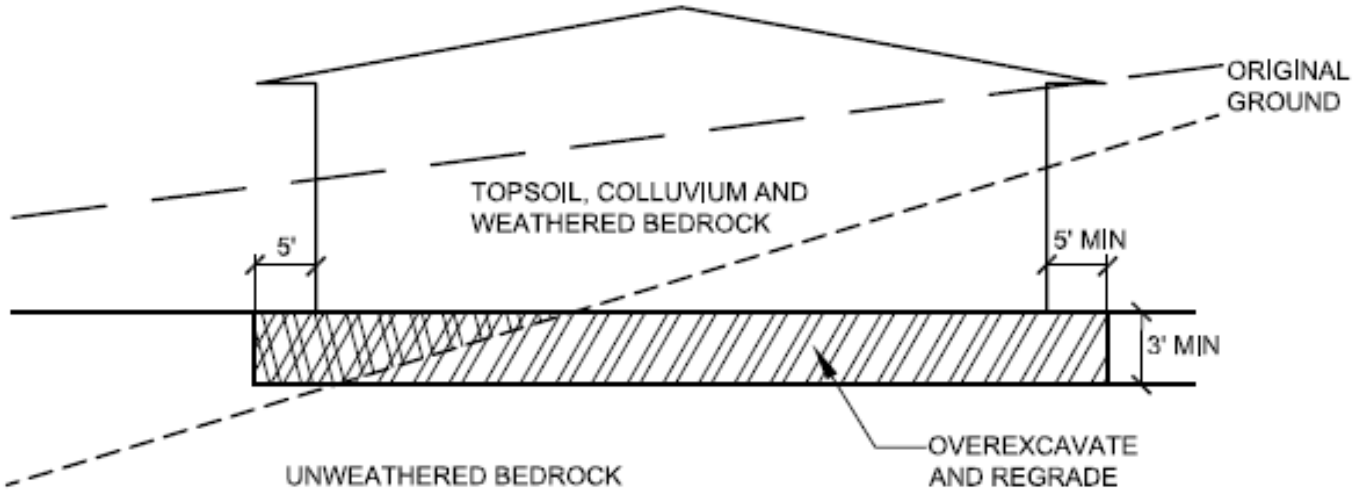


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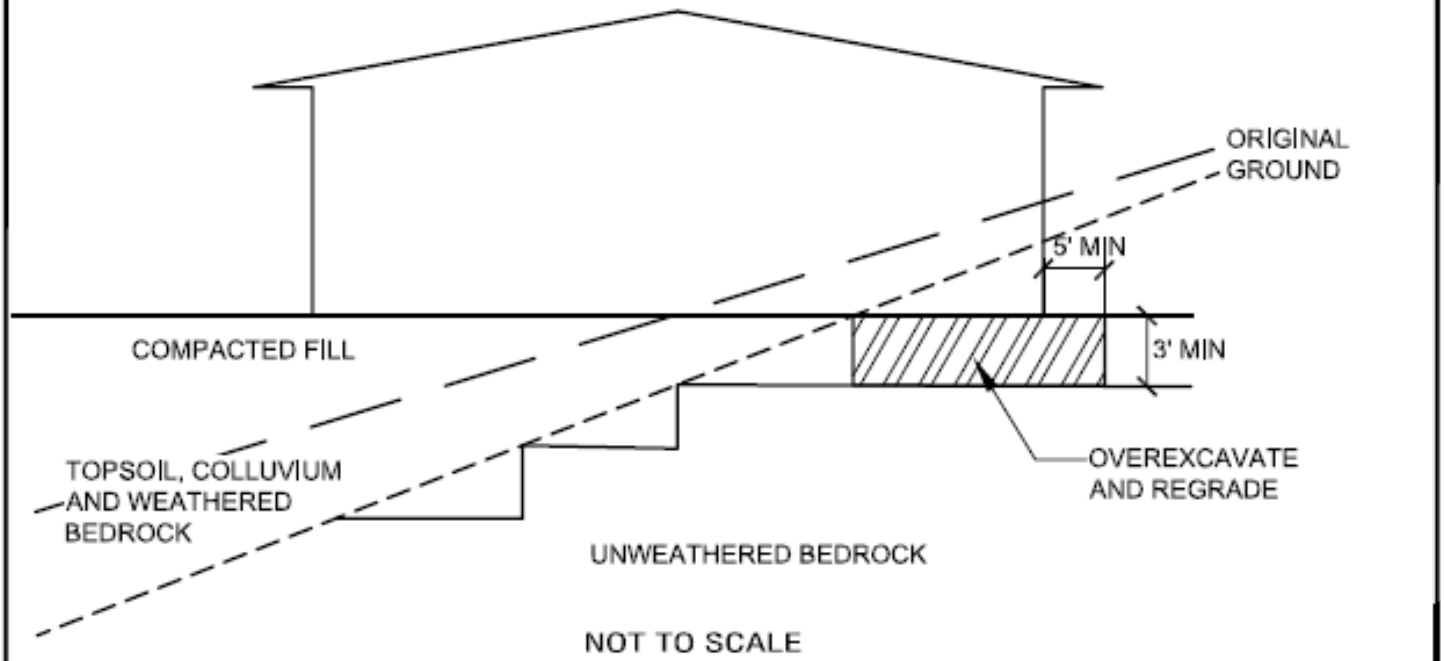
ROCK DISPOSAL DETAIL

GENERAL GRADING RECOMMENDATIONS

CUT LOT

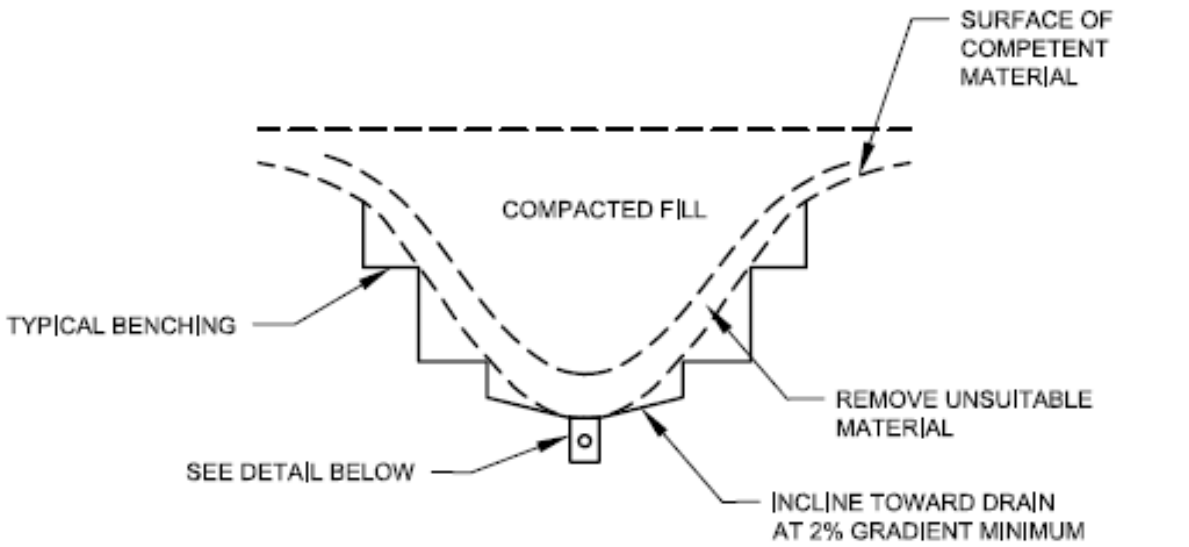


CUT/FILL LOT (TRANSITION)

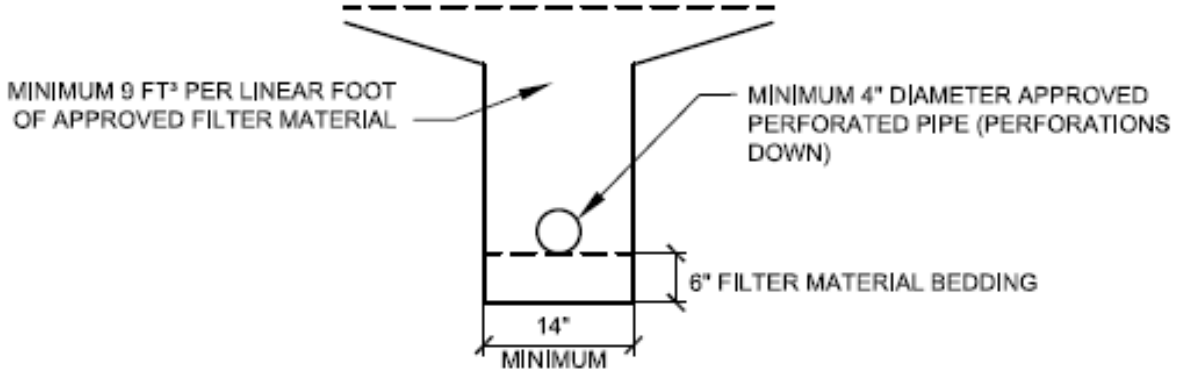


NOT TO SCALE

TRANSITION LOT DETAIL



DETAIL



FILTER MATERIAL TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUAL:

SIEVE SIZE	PERCENTAGE PASSING
1"	100
¾"	90-100
⅜"	40-100
NO. 4	25-40
NO. 30	18-33
NO. 8	5-15
NO. 50	0-7
NO. 200	0-3

APPROVED PIPE TO BE SCHEDULE 40 POLY-VINYL-CHLORIDE (P.V.C.) OR APPROVED EQUAL. MINIMUM CRUSH STRENGTH 1000 psi

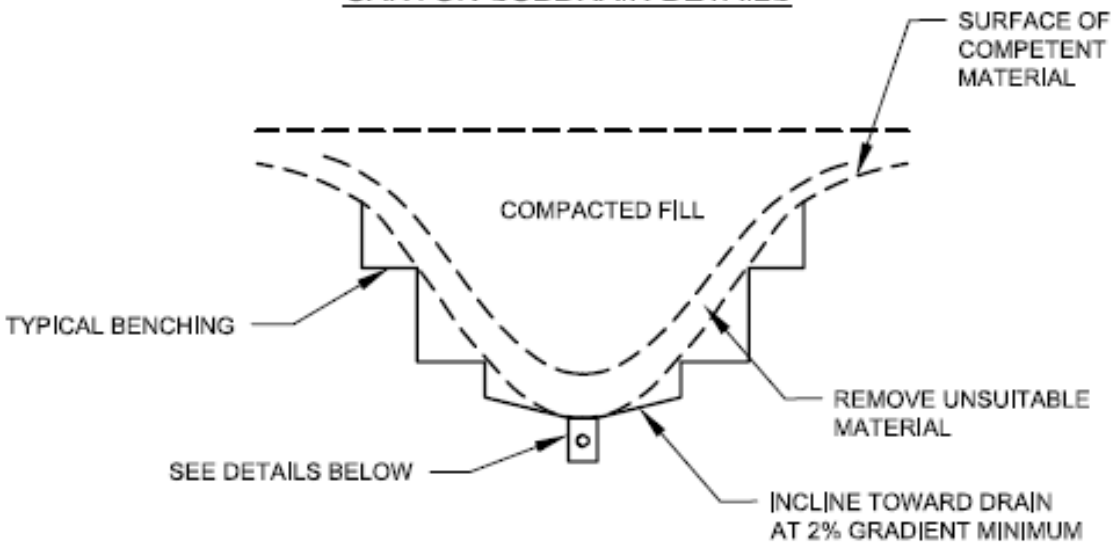
PIPE DIAMETER TO MEET THE FOLLOWING CRITERIA, SUBJECT TO FIELD REVIEW BASED ON ACTUAL GEOTECHNICAL CONDITIONS ENCOUNTERED DURING GRADING

LENGTH OF RUN	PIPE DIAMETER
INITIAL 500'	4"
500' TO 1500'	6"
> 1500'	8"

NOT TO SCALE

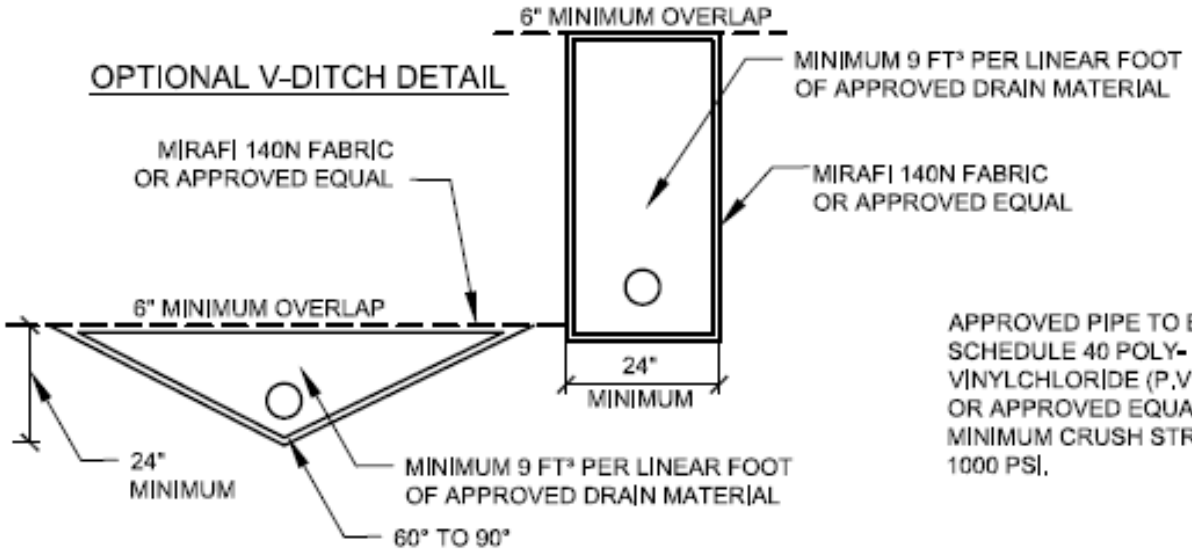
TYPICAL CANYON SUBDRAIN DETAIL

CANYON SUBDRAIN DETAILS



TRENCH DETAILS

OPTIONAL V-DITCH DETAIL



APPROVED PIPE TO BE SCHEDULE 40 POLY-VINYLCHLORIDE (P.V.C.) OR APPROVED EQUAL. MINIMUM CRUSH STRENGTH 1000 PSI.

DRAIN MATERIAL TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUAL:

SIEVE SIZE	PERCENTAGE PASSING
1 ½"	88-100
1"	5-40
¾"	0-17
⅜"	0-7
NO. 200	0-3

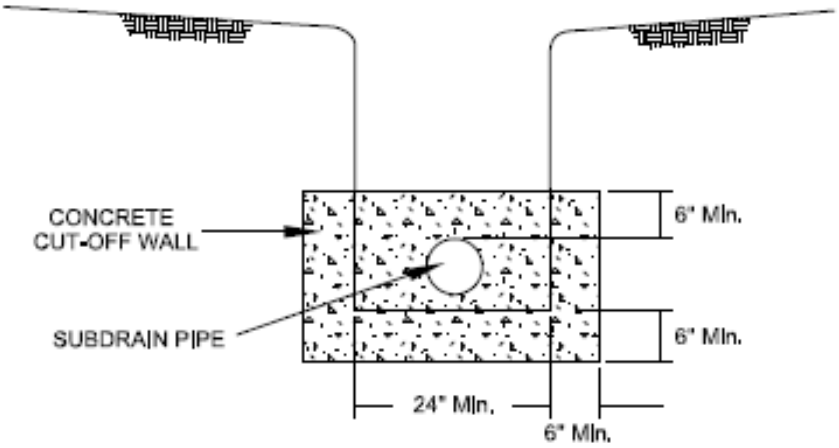
PIPE DIAMETER TO MEET THE FOLLOWING CRITERIA, SUBJECT TO FIELD REVIEW BASED ON ACTUAL GEOTECHNICAL CONDITIONS ENCOUNTERED DURING GRADING

LENGTH OF RUN	PIPE DIAMETER
INITIAL 500'	4"
500' TO 1500'	6"
> 1500'	8"

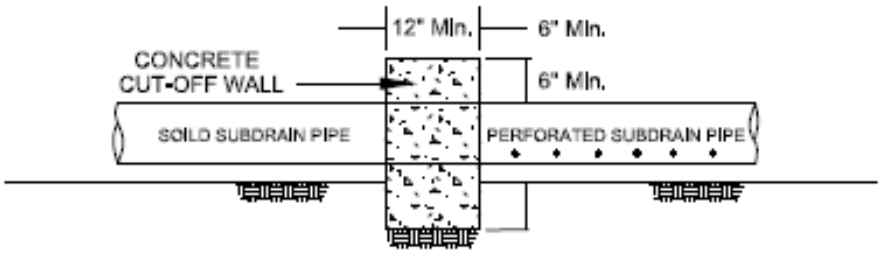
NOT TO SCALE

GEOFABRIC SUBDRAIN

FRONT VIEW



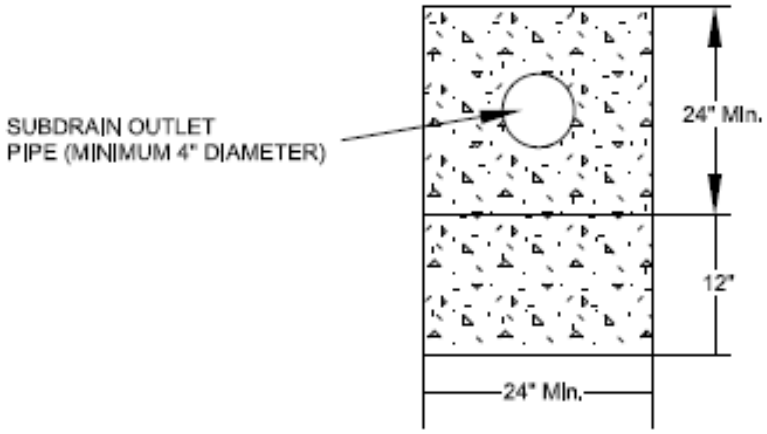
SIDE VIEW



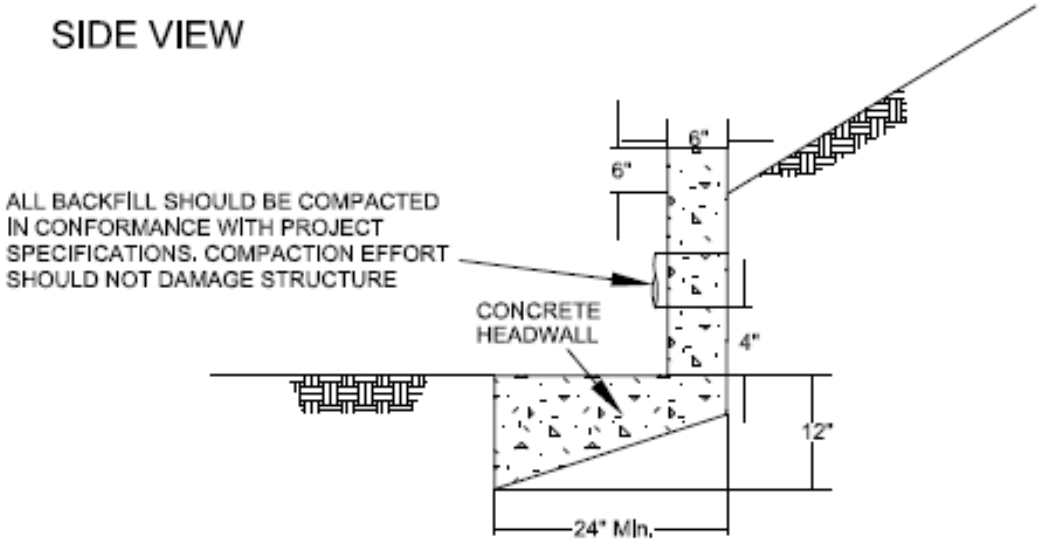
NOT TO SCALE

RECOMMENDED SUBDRAIN CUT-OFF WALL

FRONT VIEW



SIDE VIEW



NOTE: HEADWALL SHOULD OUTLET AT TOE OF SLOPE
OR INTO CONTROLLED SURFACE DRAINAGE DEVICE

ALL DISCHARGE SHOULD BE CONTROLLED

THIS DETAIL IS A MINIMUM DESIGN AND MAY BE
MODIFIED DEPENDING UPON ENCOUNTERED
CONDITIONS AND LOCAL REQUIREMENTS

NOT TO SCALE

TYPICAL SUBDRAIN OUTLET HEADWALL DETAIL

ATTACHMENT 5

CULTURAL RESOURCES REPORT

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HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942
619.462.1515 tel
619.462.0552 fax
www.**helixepi**.com

August 2, 2018 GCR-01

Mr. Rich Alexander
Guardian Investment Capital LLC
5780 Fleet Street, Suite 225
Carlsbad, CA 92008

Subject: **Cultural Resource Assessment for the Proposed Allison Drive Apartments, City of Vacaville, California**

Dear Mr. Alexander:

This letter report presents the results of a cultural resources assessment conducted by HELIX Environmental Planning, Inc. (HELIX) for the proposed development of an apartment complex on Allison Drive in the City of Vacaville, California.

Cultural resources investigations conducted in support of this project are subject to provisions of the California Environmental Quality Act (CEQA), as defined by Section 15064.5 of the CEQA Guidelines, with the City of Vacaville Community Development Department (City) acting as the Lead Agency. This letter report documents HELIX's efforts to assess the potential of ground disturbances associated with this project to affect cultural resources that meet the criteria of significance under CEQA. This assessment is based on the results of an archival records search, Native American coordination, and an intensive pedestrian survey of the proposed project area.

Project Area Description

The project area consists of two undeveloped parcels, APN 0131-030-840 and APN 0131-030-860, measuring a total of 14.91 acres in Vacaville, Solano County, California (Figure 1). The project area is bordered on the north and east by Allison Drive, on the south by Ulatis Creek, and on the west by undeveloped parcel APN 0131-020-540 (Figure 2). The northern portion of the project area is bisected by Travis Way.

Setting

Environmental Setting

The project area is located within incorporated City of Vacaville limits, on the Ulatis Creek floodplain and on the toe slope of an alluvial fan. The banks of Ulatis Creek, which is adjacent to the southern boundary of the project area, retains a stand of live oaks (*Quercus* spp.) and willow (Salix spp.). The remainder of the project area is dotted with oaks and non-native trees and shrubs. Prior to urban development the area would have been home to black bear (*Ursus americanus*), black-tailed deer (*Odocoileus hemionus*),

mountain lion (*Puma concolor*), and possibly tule elk (*Cervus elaphus nannodes*) and pronghorn antelope (*Antilocapra americana*).

The project area is dominated by soil assigned to the Yolo series, a silty clay loam (Soil Survey Staff 2017). Yolo series soils, which typically occur adjacent to stream channels and as levee and floodplain deposits, date to between 1,000 and 2,000 years before present (BP). Scher (2012) conducted a detailed analysis of stratigraphic, radiocarbon, and obsidian hydration evidence to identify and define soil sequences and produce a refined landform surface age map of the Vacaville area. Her research determined that Yolo series soils have a high potential for containing buried Late Holocene archaeological sites.

Prehistoric Setting

As is the case for archaeological research in many areas of the state, the various classification schemes and chronologies used by researchers when addressing the prehistory of Central California often conflict with one another. Most recently, Rosenthal et al. (2007) have framed an overview of past research in the area by applying modern radiocarbon curves to Fredrickson's (1974) period scheme (Table 1). The following summary of local cultural history is based on this revised chronological framework.

Table 1

Temporal Periods and Chronological Sequence

Temporal Period	Chronological Sequence	Date Range
Late Pleistocene	Paleo-Indian Period	~13,500 to 10,500 BP
Early Holocene	Lower Archaic Period	10,500 to 7,500 BP
Middle Holocene	Middle Archaic Period	7,500 to 2,500 BP
Late Holocene	Upper Archaic Period	2,500 to 850 BP
Late Holocene	Emergent Period	850 to Historic Era

Paleo-Indian Period (~13,500 to 10,500 Years Before Present [BP])

There is no evidence of Late Pleistocene occupation in the immediate region, although the southern portion of the Central Valley shows evidence in the form of isolated, basally thinned and fluted projectile points found on the surface of remnant Pleistocene landscape features. With few exceptions these points have been found as isolates in undatable surface contexts, and therefore have been associated with the Paleo-Indian period solely on the basis of their morphological similarity to securely dated Clovis projectile points from the Great Plains and Southwest regions (Dillon 2002:115). Potential Paleo-Indian finds from the general region include a fluted point found in the Sacramento Valley, in Tehama County near Thomas Creek (Dillon 2002). Local archaeological deposits associated with the late Pleistocene, if they exist, were likely destroyed or buried by a significant period of alluvial deposition that began about 9050 cal BP (Rosenthal et al. 2007).

Lower Archaic Period (10,500 to 7,500 BP)

The Lower Archaic period in the region has been mainly represented by isolated finds, including heavy stemmed dart or spear points and flaked stone crescents that are often found in association with

groundstone tools. The period was marked by high residential mobility, although the density of groundstone and expedient cobble-core tools at some sites suggest that they represent frequently visited camps in a settlement system structured around repetitive seasonal movement (Rosenthal et al. 2007). In contrast to the common interpretation that large game hunting was the focus of Lower Archaic economies, this seasonal round appears to have targeted grassland-savanna resources, particularly acorns and wild cucumbers. Seeds and nuts were processed with millingslabs and handstones.

Obsidian from Lower Archaic period sites has been sourced to both the North Coast Ranges and Eastern Sierra sources, suggesting that regional interaction spheres were well established by this time (Rosenthal et al. 2007). At CA-CCO-696, a Los Vaqueros site located approximately 5 miles west of the project area, a large-stemmed projectile point of Napa Valley obsidian was dated to 7,300 BP. At nearby CA-CCO-637, the earliest documented grave in west-central California was dated to 8520 BP (6570 cal B.C.). No comparable assemblage has been found in the San Francisco Bay area, although it shares characteristics with the Borax Lake pattern of the southern North Coast ranges (Meyer and Rosenthal 1997).

Middle Archaic Period (7,500 to 2,500 BP)

The beginning of the Middle Holocene saw a substantial shift to warmer, drier conditions, with rising sea levels pushing inland to form the wetland habitats associated with the Sacramento-San Joaquin Delta. Subsistence increasingly emphasized upland plant resources. Mortars and pestles appeared as early as 4050 cal B.C., and expedient cobble tools were common. Projectile points associated with the Middle Archaic period include notched, stemmed, thick-leaf, and narrow concave base dart forms manufactured from obsidian from North Coast Ranges and Eastern Sierra (Rosenthal et al. 2007), although in Solano County obsidian from northern Napa Valley was used almost exclusively (Whitaker 2008). A few shell ornaments and beads recovered from burials suggest that social stratification began to develop during this period.

The latter half of the Middle Archaic (ca. 4000-2000 BP) represented “the end of generalized, and often highly mobile, Early Holocene lifeways and the beginning of more specialized and intensive California hunter-gatherer-fishers known from ethnographic times” (Stevens et al. 2009:1). In the lower Sacramento Valley this period is associated with the Windmiller culture, which was marked by distinctive extended burials with grave offerings, extensive long-distance trade, and adaptations that were less mobile and more specialized than previous cultures, probably representing the first intensive acorn economies in the state (Rosenthal et al. 2007; Stevens et al. 2009). The mortuary pattern that is a primary marker of the Windmiller culture has not been discovered in Solano County, however (Whitaker 2008).

The decrease in residential mobility and increase of base camp-type settlements during the late Middle Archaic implies a shift from a forager strategy (where populations are highly mobile, making frequent residential moves to opportunistically exploit a series of resource “patches”) to a logistically organized collector strategy (where logistically organized food procurement parties travel from a central base camp to harvest and process specific resources)(Binford 1980). The specialized tool assemblages, nonutilitarian objects, trade goods, and types of plant and animal remains that appear during the Middle Archaic period point to the longer-term residential settlements associated with collector strategies (Rosenthal et al. 2007).

Upper Archaic Period (2,500 to 850 BP)

The climate of the prehistoric late Holocene approximated that of today, with cooler and moister conditions than the middle Holocene but drier than the early Holocene.

The Upper Archaic period saw a decrease in residential mobility and the establishment of fixed, permanent or semi-permanent villages. The high proportion of mortars and pestles to projectile points underscores the increased reliance on plant resources, and particularly small seeds, during this period (Meyer and Rosenthal 1997). Bedrock milling stations appear in the archaeological record by at least 1,300 BP, although at the valley margins, handstones and millingslabs were commonly used to process acorns and pine nuts (Rosenthal et al. 2007). Bone tools, wands, tubes, and ornaments are common in sites dating to this period, as are manufactured goods such as saucer- and saddle-shaped *Olivella* beads and *Haliotis* ornaments (Rosenthal et al. 2007). The uniformity of these manufactured goods suggest some level of standardized or mass production, and imply an increased reliance on exchange relationships.

Emergent Period (850 to Historic Era)

The stable climate that began during the Upper Archaic continued through the Emergent period. The most significant technological advancement during this period was the adoption of the bow and arrow, which replaced the atlatl and dart between about A.D. 1000 and 1300. Territorial boundaries became well established, and increased social complexity is suggested by a wider variation in burial types and furnishings. Cremation, which was reserved for high-status individuals during the beginning of the period, eventually became widespread (Rosenthal et al. 2007).

Emergent period subsistence shows an increasing emphasis on grassland-savanna small seeds with less reliance on upland nuts and berries, although the use of bedrock milling features continued. Obsidian use, including the importation of obsidian cobbles, flake blanks, and finished formal tools, also increased during the period. This obsidian was imported exclusively from Napa Valley – Patterson and DeGeorgey (2014) argue that high-quality toolstone may have been directly inaccessible to local populations due to well-developed territorial systems, and that this resulted in the development of a complex interregional exchange system.

Ethnographic Setting

The project area is located in the southern portion of the lands historically occupied by the Patwin, a series of linguistically and culturally related tribelets that spoke dialects of Wintuan, a language of the Penutian language family (Kroeber 1925; Johnson 1978). Patwin territory extended from Suisun Bay north past the Sutter Buttes, between the foothills of the Coastal Range on the west and the Sacramento River on the east. Patwin villages in the vicinity of the project area included *Liwai*, *Putato*, *Soneto*, *Tolenas*, and *Ululato* (Johnson 1978: Figure 1). Ethnographic evidence indicates that *Ululato* was located somewhere along Ulatis Creek in the present city of Vacaville, although its exact location remains unknown (Johnson 1978; Powers 1877:218).

The Patwin were organized into tribelets consisting of a primary village, generally established in a river valley, and several smaller satellite villages. Each village was overseen by a chief who attained his office through paternal descent, and was responsible for ceremonial and economic activities such as dances,

harvests, and communal hunts (McKern 1922). Some of these villages were remarkably large, particularly when they were situated along streams or other reliable sources of water. In the late 1800s Powers (1877:219) cited anecdotal evidence of Patwin villages that exceeded one thousand inhabitants, and he observed that "at Vacaville great numbers of bones have been discovered in various excavations."

Families shared round or elliptical earth-covered, semisubterranean structures that were often greater than 20 feet in diameter. A large dance house was typically built on the north or south edge of each village, a menstrual hut was constructed on the opposite side of the village from the dance house, and a sweat lodge was placed to the east or west of the dance house with its door facing the dance house (McKern 1923). The dead were buried, usually in a cemetery at one end of the village.

The Patwin economy was one of subsistence fishing, hunting, and collecting plant foods. Like other tribes in the region the Patwin relied on acorns as a staple food. Oak groves were owned communally by the tribelet. Additional dietary plants included buckeye, manzanita, juniper berries, pine nuts, black berries, wild grapes, brodiaea bulbs, and tule roots. Seeds were harvested from sunflower, alfalfa, clover, bunchgrass, and wild oat. Large game included tule elk, deer, pronghorn, and bear, while grasshoppers, quail, and rabbits were hunted communally by burning grassland and encircling the prey with large nets. Fish and waterfowl were also important components of the Patwin diet (Johnson 1978:355-357).

Patwin ceremonial life was structured around the Kuksu Cult, a region-wide religious system. The cult was centered on one or more secret societies into which young men were initiated. Once instructed in the religious practices, members were able to achieve greater status within the community. The Kuksu religion was particularly elaborate among the Patwin, who shared basic aspects with their neighbors but also recognized the 'ghost' and Hesi forms, each with emphasis on different characteristics of ceremonialism and spirit helpers (Johnson 1978:353). Matters of ceremonial and religious practice were predominantly undertaken by shamans who conducted cures for various physical and spiritual ailments, although women could also be trained to provide cures for natural and spiritual sickness, including witchcraft.

The Patwin had extensive contacts with Franciscan missionaries starting in the late 1700s, since many Patwin were brought to the San Francisco, San Jose, and Sonoma missions around San Francisco Bay. While mission life did give the Patwin some skills needed to survive in a rapidly changing world, considerable amounts of traditional cultural knowledge were lost during this era, largely due to population decimation brought on by diseases for which the people had no immunity.

Historical Setting

The following historical background is excerpted and adapted from the Solano County website (Solano County 2017) and the Vacaville General Plan (City of Vacaville 2015):

In 1835, the Mexican government commissioned Commandante General Mariano Guadalupe Vallejo to colonize the lands north of San Francisco Bay as a buffer against the Russians at Fort Ross. Mexican control of the area lasted until June 14, 1846 when the California Republic was established. However, the California Republic and its Bear Flag were short lived, and the American flag was raised in California on July 7, 1846. The area that became Solano County continued as part of the Sonoma territory for three

years under the American government. The boundaries of Solano County were set on February 18, 1850 by the first elected legislature of the territory of California, making Solano County one of the original 27 counties (Solano County 2017).

Solano County derives its name indirectly from that of the Franciscan missionary, Father Francisco Solano, whose name was given in baptism to the chief of one of the local tribes. Before receiving the name Solano, the chief was called Sem Yeto, which signifies "brave or fierce hand." At the request of General Vallejo, the county was named for Chief Solano, who at one time ruled over most of the land and tribes between the Petaluma Creek and the Sacramento River (Solano County 2017).

In 1942 Juan Manuel Vaca and Juan Felipe Peña traveled from Pueblo Los Angeles to Sonoma to look for desirable land and to build homes. They were granted a deed for the Los Putos land grant, and built adobe homes about two miles southwest of the present city of Vacaville. Within a few years Vaca and Peña were grazing as many as 2000 head of cattle on the rancho. The Peña Adobe was listed on the National Register of Historic Places in 1972, and can still be seen in Peña Adobe Park in Vacaville (Hoover et al. 1990).

The town of Vacaville was established in 1851, and by the end of that year had a population of 580. During the mid to late 19th century, livestock and wheat production were the county's principal economic products. The completion of nearby railroads in the late 1860s provided a way for ranchers to get their crops to market, but by the 1880s the higher cost of rail transport coupled with increased competition led to the decline of the area's wheat industry. Solano County farmers shifted their emphasis to orchard crops, a move which was facilitated by the ease of access provided by the railroads. By the 1890s, Vaca Valley and the foothills of the Vaca Mountains were covered with orchards encompassing almost all of the available non-irrigated land, and in 1892, Vacaville was formally incorporated.

After peaking in the mid-1910s, fruit production in the Vacaville area declined due to drought and soil depletion, competition during the Great Depression, and overproduction for the World War I war effort. In the mid-20th century, new employers arrived in the area, resulting in explosive growth in Vacaville. The now defunct Basic Vegetable Products company located a 1,000-worker onion dehydrating facility in Vacaville, and in 1942, Suisun Air Base (now Travis Air Force Base) was established just to the south of Vacaville (City of Vacaville 2015).

Archival Records Search

On July 18, 2018, an archival records search in support of the proposed project was conducted at the Northwest Information Center (NWIC) of the California Historical Resources Information System, located at Sonoma State University. The records search addressed the project area and a 0.5-mile radius around the project area. Sources of information included previous survey and cultural resources files; the National Register of Historic Places (NRHP); the California Register of Historical Resources (CRHR); the Office of Historic Preservation (OHP) Archaeological Determinations of Eligibility; the OHP Directory of Properties in the Historic Property Data File; and historical topographic maps and aerial photographs.

The records search identified 27 studies that have previously been conducted within 0.5 mile of the project area (Table 2). None of the studies addressed the project area itself.

Table 2
PREVIOUS STUDIES WITHIN 0.5 MILE OF THE PROJECT AREA

Report Number	Year	Author	Title
S-000106	1974	Fredrickson, David A.	An Archaeological Reconnaissance of the Nut Tree Airport, Vacaville, Solano County, California
S-005104	1977	Hellen, Joan E.	An Archeological-Historical Survey for the City of Vacaville: Economic Development Agency Drought Relief Project
S-005122	1978	Chavez, David	Cultural Resources Evaluation for the Cal-Com Property, Vacaville, Solano County, California
S-005122a	1978	Barker, Leo R.	Historic Site Inventory, the Patton Ranch, Solano County, California
S-005156	1965	Treganza, Adan E., Robert L. Edwards, and Thomas F. King	Archeological Survey and Excavation along the Tehama-Colusa Canal, Central California
S-010063	1988	Orlons, Robert I	The Archaeological Evaluation of a Parcel at Nut Tree Road and Summerfield Drive, Vacaville, Solano County, California
S-018034	1996	Mears, Trent	An Archaeological Study of Approximately 5.5 Acres at the Proposed Mediterranean Villa Development (Nut Tree Road, Ulatis and Summerfield Drives), Vacaville, Solano County, California
S-024586	2001	Kelley, John	Cultural Resources Study for a Portion of the City of Vacaville's Corporation Yard, Vacaville, Solano County, California
S-026300	2002	Self, William, Kimberly Popetz, and Ward Hill	Historic Property Survey Report, I-80 Nut Tree Overcrossing Project, City of Vacaville, Solano County, California (04-SOL-80 KP 28.36) Nut Tree O/C Project EA 44310k
S-027651	2003	William Self Associates, Kimberly Popetz, and Ward Hill	Historic Property Survey Report, I-80 Nut Tree Overcrossing Project, City of Vacaville, Solano County, California (04-SOL-80 KP28.36), Nut Tree O/C Project EA 443100
S-027652	2003	William Self Associates, Inc.	Finding of No Adverse Effect, 1-80 Nut Tree Overcrossing Project, City of Vacaville, Solano County, California: 04-SOL-80 KP 28.36 Nut Tree O/C Project EA 443100
S-028917	2004	Environmental Science Associates	Ulatis Creek Bike Path, Cultural Resources Report
S-029303	2004	Holman, Miley Paul	Cultural Resources Study For The Humphrey Property, Vacaville, Solano County, California
S-031002	2005	Bonner, Wayne H.	Cultural Resource Records Search Results and Site Visit for Cingular Telecommunications Facility Candidate NB- 134-01 (Vacaville Corp. Yard), 1001 Allison Drive, Vacaville, Solano County, California
S-031181	2003	Scantlebury, Meg, and Alisa Reynolds	Historic Property Survey Report, Ulatis Creek Bridge Replacement Project, I-80, Solano County, 04-SOL-80 KP 41.8/43.8 (PM 26/27.2), EA 04-4C0880
S-032221	2006	Coleman, Jason A.	Cultural Resources Construction Monitoring Report for the Nut Tree Family Park Project, City of Vacaville, Solano County, California
S-036141	2009	Whitaker, Adrian, and Phil Kaijankoski	Archaeological Survey Report for the PG&E Vacaville Grid Control Center, Allison Road Line, Vacaville, Solano County, California
S-036286	2008	Whitaker, Adrian	Historic Property Survey Report for Vacaville Intermodal Station Project, Vacaville, Solano County, California; 04-SOL-0-VAC, CML-5094 (048); EA# 04-925-310L
S-037217	2010	Wills, Carrie D.	Section 106 Cultural Resources Assessment, William J. Carroll Government Center, Vacaville, Solano County, California
S-037751	2010	Waechter, Sharon A.	Cultural Resources Inventory for the Vaca Valley Hospital Expansion Project, Vacaville, Solano County, California
S-037994	2010	Kaijankoski, Philip, and Naomi Scher	Geoarchaeological Addendum to the Cultural Resources Inventory for the Vaca Valley Hospital Expansion Project, Vacaville, Solano County, California
S-044393	2013	DeGeorgey, Alex	Cultural Resources Constraints Report: HPRS Elmira Road, Vacaville
S-045222	2014	Anderson, Katherine	Cultural Resources Inventory and Evaluation Report of the Nut Tree Airport Runway Improvement Project, Solano County, CA
S-045222a	2012	Baxter, R. Scott	Nut Tree Airport Master Plan Update Project, Solano County, CA
S-046573	2015	Scheeline, Megan	Archaeological Survey Report for the FI-210 Wildland Fire Cause and Determination Class and Multi-Agency Drill, Vacaville, CA

Report Number	Year	Author	Title
S-048930	2014	Crull, Scott	The History and Archaeology of the Vaca Valley Railroad; the Associated Company Towns and Remnant Landmarks in Solano and Yolo Counties: 1869-1992, Along with the Historical Townsite of the Tancred Colony
S-048993	2014	Stevens, Nathan, and Jack Meyer	Archaeological Survey Report for the Interstate-80 Express Lanes Project from Red Top Road to I-505 in Solano County

The records search determined that no previously recorded cultural resources are located within the project area, although three resources are located within 0.5 mile of the project area:

- **P-48-000560** is the Nut Tree property, including a farm and a commercial building, and the Harbison House, a single family property. The resource was recorded in 2002 by W. Hill. It is located approximately 900 meters north of the project area.
- **P-48-000748** is the Ulatis Creek Bridge (Bridge #23-0052R/L, Map Reference No. 3). Recorded in 2003 by Meg Scantlebury of Caltrans, the bridge is approximately 800 meters west of the project area.
- **P-48-001025** is a historic district encompassing a railroad route that was initially associated with the Vaca Valley Railroad, and later with the Vaca Valley and Clear Lake Railroad, the Southern Pacific Railroad, and the Union Pacific Railroad. Portions of the district were recorded in 2014 by Scott Crull, and in 2017 by M. Webb and P. Allgaier of ECORP Consulting, Inc. This linear district runs east to west, approximately 250 meters south of the project area.

Historic aerial photographs and topographic maps show that the project area's two parcels were undeveloped until about 1950, and then held orchards until at least 2000. The same photographs and maps show that the course of Ulatis Creek has remained unchanged since at least 1908.

Native American Coordination

On June 27, 2018, HELIX requested that the Native American Heritage Commission (NAHC) conduct a search of their Sacred Lands File for the presence of Native American sacred sites or human remains in the vicinity of the proposed project area. A written response received from the NAHC on July 10, 2018, stated that the Sacred Lands File failed to indicate the presence of Native American cultural resources in the immediate project area.

On July 12, 2018, HELIX sent letters to three Native American contacts that recommended by the NAHC as potential sources of information related to cultural resources in the vicinity of the project area:

- Anthony Roberts, Chairman, Yocha Dehe Wintun Nation
- Gene Whitehouse, Chairman, United Auburn Indian Community of the Auburn Rancheria
- Charlie Wright, Chairman, Cortina Rancheria - Kletsel Dehe Band of Wintun Indians

The letters advised the tribes and specific individuals of the proposed project and requested information regarding cultural resources in the immediate area, as well as any feedback or concerns related to the proposed project. To date, no responses have been received from any of the contacts.

Archaeological Survey

On July 13, 2018, HELIX Senior Archaeologist Clarus Backes, RPA, conducted an intensive pedestrian survey to characterize any prehistoric or historic-era archaeological resources located within the project area. The survey consisted of a pedestrian walk-over of the entire project area in parallel transects spaced at 15-meter intervals. During the survey the ground surface was examined for the presence of historic-era artifacts (e.g., metal, glass, ceramics), prehistoric artifacts (e.g., flaked stone tools, tool-making debris), and other features that might represent human activity that took place more than 50 years ago.

The entire 14.91-acre project area was fully surveyed for archaeological resources. Survey conditions throughout the project area were very poor, with thick dry grass impairing the visibility of over 90 percent of the ground surface (Figures 3 and 4). During the survey particular attention was paid to rodent holes, small road cuts at the perimeter of the project area, and other exposed soil, and small boot and trowel scrapes were made periodically in an effort to improve surface visibility.

The project area is generally flat, although its southern portion drops slightly as it approaches Ulatis Creek, and an approximately 15-foot rise marks much of the project area's western boundary. A fence runs along the length of this rise. A few low mounds and shallow depressions are also present, but these appear to represent man-made disturbances such as push-piles and borrow pits. Oaks and non-native trees and shrubs are interspersed throughout the property. No exposed bedrock was visible, although low-lying bedrock may have been obscured by the thick grass cover. The native soil is grayish brown silt loam with occasional fine angular to subangular gravel, which is consistent with Yolo series soils (Soil Survey Staff 2017).

The ground surface throughout the project area, to the extent that it was visible, has been moderately disturbed by vehicle traffic and other human activity. The entire area is covered by a sparse scatter of modern debris, including plastic and glass fragments, concrete and brick fragments, discarded telephone poles, and undifferentiated metal debris. Several active homeless encampments are also present in the area.

No archaeological resources were seen on the surface of the project area. All observed cultural materials appear to be less than 50 years old, or are nondiagnostic fragments that cannot be assigned to a specific date range.

Conclusions and Recommendations

The records search determined that no previously recorded cultural resources are located within the project area boundaries, and no archaeological resources were encountered during the survey. The effectiveness of the survey was compromised, however, by the heavy vegetation cover and poor ground visibility.

Ethnographic evidence indicates that large Patwin villages were concentrated along perennial streams in the area, and the village of *Ululato* is known to have been located somewhere along Ulatis Creek within the present city of Vacaville, although its exact location remains unknown. Further, Yolo series soils, such as those found in the project area, have been shown to have a high potential for containing buried

Late Holocene archaeological sites. Based on these findings the project area should be considered to have a high potential for retaining intact archaeological deposits, particularly at depths of two feet or more (i.e., below the depth that would normally be disturbed by routine disking or plowing).

Recommendations

Worker Training Program

Prior to the initiation of construction or ground-disturbing activities HELIX recommends that all construction personnel be trained in the protection of cultural resources, the recognition of buried cultural remains, and the notification procedures to be followed upon the discovery of archaeological materials, including Native American burials. The training should be presented by an archaeologist who meets the Secretary of Interior's Standards for Prehistoric and Historic Archaeology, and should include recognition of both prehistoric and historic resources. Personnel should be instructed that unauthorized collection or disturbance of artifacts or other cultural materials is illegal, and that violators will be subject to prosecution under the appropriate state and federal laws. Supervisors should also be briefed on the consequences of intentional or inadvertent damage to cultural resources.

Inadvertent Discoveries

In the event that cultural resources are exposed during ground-disturbing activities, construction activities (e.g., grading, grubbing, or vegetation clearing) should be halted in the immediate vicinity of the discovery. An archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards should then be retained to evaluate the find's significance under CEQA. If the discovery proves to be significant, additional work, such as data recovery excavation, may be warranted and should be discussed in consultation with the City.

Discovery of Human Remains

Although there is no evidence to suggest the presence of human remains in the project area, their discovery is always a possibility during a project. If such an event did occur, the specific procedures outlined by the NAHC, in accordance with Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the Public Resources Code, must be followed:

1. All excavation activities within 60 feet of the remains will immediately stop, and the area will be protected with flagging or by posting a monitor or construction worker to ensure that no additional disturbance occurs.
2. The project owner or their authorized representative will contact the County Coroner.
3. The coroner will have two working days to examine the remains after being notified in accordance with HSC 7050.5. If the coroner determines that the remains are Native American and are not subject to the coroner's authority, the coroner will notify NAHC of the discovery within 24 hours.
4. NAHC will immediately notify the Most Likely Descendant (MLD), who will have 48 hours after being granted access to the location of the remains to inspect them and make recommendations for their treatment. Work will be suspended in the area of the find until the City approves the proposed treatment of human remains.

Subsurface construction activities such as trenching and grading associated with the project have the potential to damage or destroy previously undiscovered historical resources, resulting in a potentially significant impact. With implementation of the recommendations proposed above, potential impacts to previously undiscovered historical resources would be reduced to a less than significant level.

Sincerely,



Clarus J. Backes, Jr., RPA
Senior Archaeologist
HELIX Environmental Planning, Inc.

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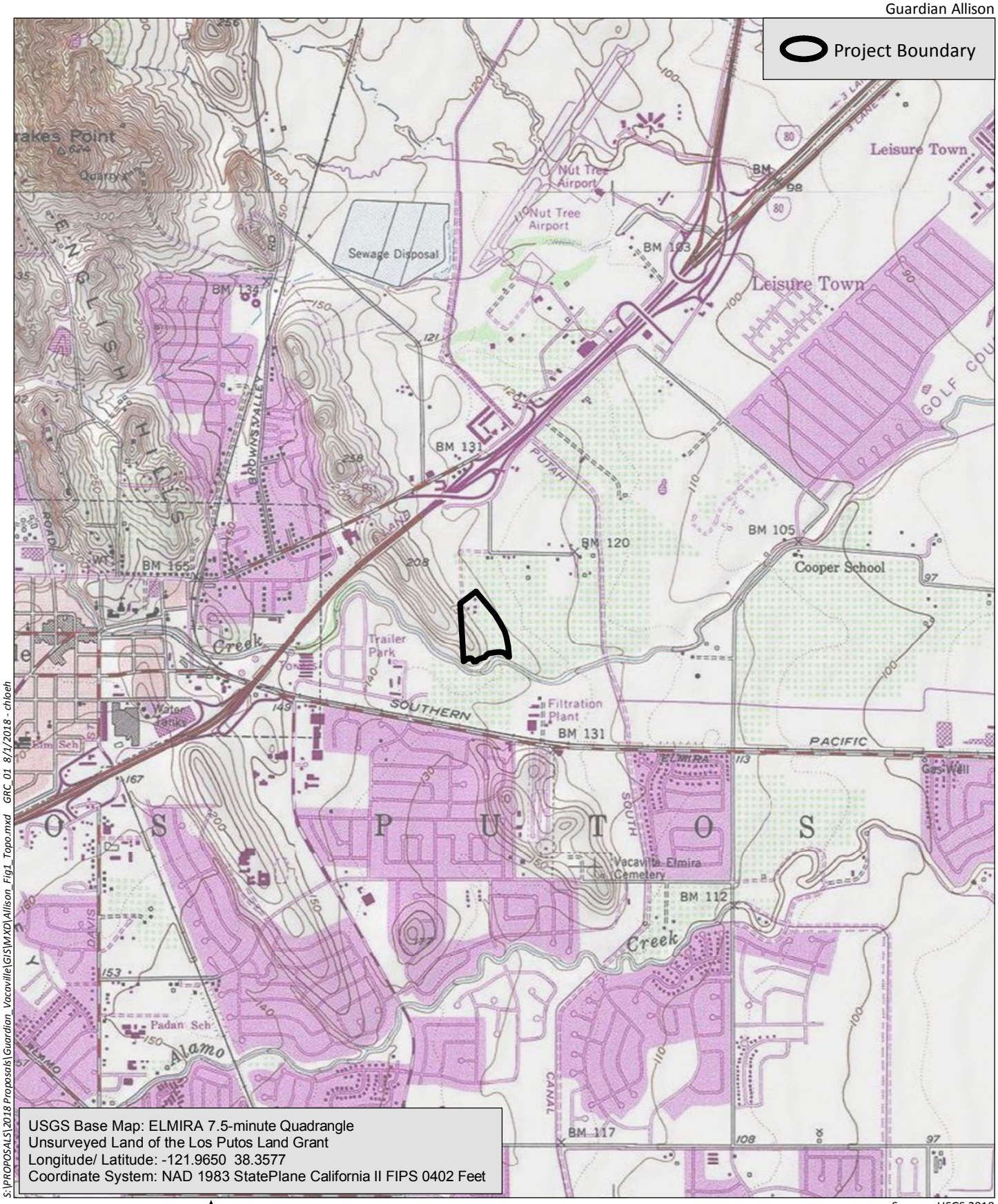
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Attachments:

Figure 1. 7.5-minute Topographic Map.
Figure 2. Regional Location and Aerial Map.
Figure 3. Project area overview, looking east.
Figure 4. Project area overview, looking south.



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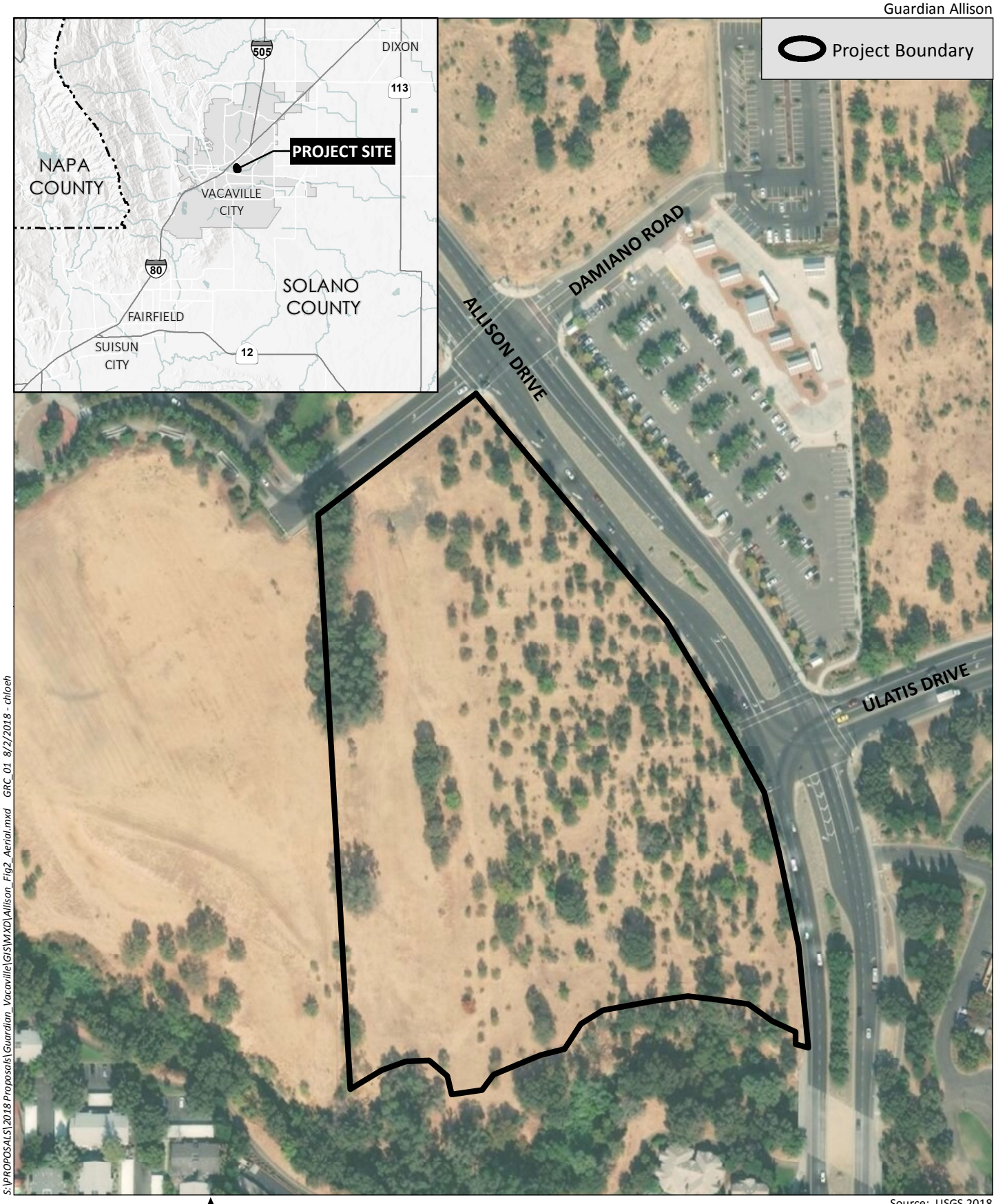
Source: USGS 2018

HELIX Environmental Planning

USGS 7.5-minute Topography Map

Figure 1

Guardian Allison



S:\PROPOSALS\2018 Proposals\Guardian_Vacaville\GIS\MXD\Allison_Fig2_Aerial.mxd GRC_01 8/2/2018 - chloeh

0 200 Feet

Source: USGS 2018

HELIX Environmental Planning

Regional Location & Aerial Map

Figure 2



Figure 3. Project area overview, looking east.



Figure 3. Project area overview, looking south.

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ATTACHMENT 6

CALEEMOD AIR QUALITY CALCULATIONS

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Casa Dei Vista Apartments (File No. 18-200

Yolo/Solano AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	245.00	Dwelling Unit	14.41	337,043.00	701

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	6.8	**Precipitation Freq (Days)**	55
Climate Zone	4			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

On-road Fugitive Dust - 100% of roadways assumed to be paved.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	240.00
tblConstructionPhase	NumDays	300.00	540.00
tblConstructionPhase	NumDays	30.00	20.00
tblConstructionPhase	NumDays	20.00	24.00
tblConstructionPhase	NumDays	10.00	5.00
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00

tblFireplaces	FireplaceWoodMass	4,558.40	0.00
tblFireplaces	NumberGas	134.75	0.00
tblFireplaces	NumberNoFireplace	24.50	0.00
tblFireplaces	NumberWood	85.75	0.00
tblGrading	AcresOfGrading	140.00	10.97
tblLandUse	LandUseSquareFeet	245,000.00	337,043.00
tblLandUse	LotAcreage	6.45	14.41
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00

tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblRoadDust	RoadPercentPave	94	100
tblTripsAndVMT	VendorTripNumber	26.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	3.00
tblTripsAndVMT	WorkerTripNumber	35.00	28.00
tblTripsAndVMT	WorkerTripNumber	35.00	28.00
tblWoodstoves	NumberCatalytic	12.25	0.00
tblWoodstoves	NumberNoncatalytic	12.25	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	4,558.40	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					
2019	0.3685	3.4497	2.6945	4.8600e-003	0.1559	0.1760	0.3319	0.0618	0.1633	0.2251	0.0000	433.4656	433.4656	0.1088	0.0000	436.1855
2020	0.9522	3.3078	3.6240	6.7300e-003	0.1772	0.1816	0.3588	0.0471	0.1703	0.2174	0.0000	589.1456	589.1456	0.1164	0.0000	592.0557
2021	1.8865	2.1920	2.6282	4.9900e-003	0.1405	0.1161	0.2566	0.0374	0.1092	0.1466	0.0000	436.8876	436.8876	0.0811	0.0000	438.9151
Maximum	**1.8865**	**3.4497**	**3.6240**	**6.7300e-003**	**0.1772**	**0.1816**	**0.3588**	**0.0618**	**0.1703**	**0.2251**	**0.0000**	**589.1456**	**589.1456**	**0.1164**	**0.0000**	**592.0557**

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					
2019	0.3685	3.4497	2.6945	4.8600e-003	0.1064	0.1760	0.2824	0.0362	0.1633	0.1995	0.0000	433.4651	433.4651	0.1088	0.0000	436.1851
2020	0.9522	3.3078	3.6240	6.7300e-003	0.1772	0.1816	0.3588	0.0471	0.1703	0.2174	0.0000	589.1451	589.1451	0.1164	0.0000	592.0552
2021	1.8865	2.1920	2.6282	4.9900e-003	0.1405	0.1161	0.2566	0.0374	0.1092	0.1466	0.0000	436.8872	436.8872	0.0811	0.0000	438.9147
Maximum	**1.8865**	**3.4497**	**3.6240**	**6.7300e-003**	**0.1772**	**0.1816**	**0.3588**	**0.0471**	**0.1703**	**0.2174**	**0.0000**	**589.1451**	**589.1451**	**0.1164**	**0.0000**	**592.0552**

Casa Dei Vista Apartments (File No. 18-200 - Yolo/Solano AQMD Air District, Annual

	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**	**10.45**	**0.00**	**5.22**	**17.51**	**0.00**	**4.35**	**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	**5-31-2019**	**8-30-2019**	1.8033	1.8033
2	**8-31-2019**	**11-29-2019**	1.5339	1.5339
3	**11-30-2019**	**2-28-2020**	0.9457	0.9457
4	**2-29-2020**	**5-30-2020**	0.9246	0.9246
5	**5-31-2020**	**8-30-2020**	0.9240	0.9240
6	**8-31-2020**	**11-29-2020**	1.2604	1.2604
7	**11-30-2020**	**2-27-2021**	1.4832	1.4832
8	**2-28-2021**	**5-30-2021**	1.4829	1.4829
9	**5-31-2021**	**8-30-2021**	1.4822	1.4822
10	**8-31-2021**	**9-30-2021**	0.1772	0.1772
		Highest	1.8033	1.8033

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	1.5825	0.0210	1.8231	1.0000e-004		0.0101	0.0101		0.0101	0.0101	0.0000	2.9716	2.9716	2.8800e-003	0.0000	3.0436
Energy	0.0114	0.0975	0.0415	6.2000e-004		7.8900e-003	7.8900e-003		7.8900e-003	7.8900e-003	0.0000	407.1945	407.1945	0.0155	4.8200e-003	409.0186
Mobile	0.5328	3.8554	5.6716	0.0227	1.5771	0.0202	1.5973	0.4245	0.0190	0.4435	0.0000	2,094.1813	2,094.1813	0.1099	0.0000	2,096.9282
Waste						0.0000	0.0000		0.0000	0.0000	22.8771	0.0000	22.8771	1.3520	0.0000	56.6770
Water						0.0000	0.0000		0.0000	0.0000	5.0642	35.3738	40.4381	0.5218	0.0126	57.2403
Total	**2.1267**	**3.9740**	**7.5362**	**0.0234**	**1.5771**	**0.0381**	**1.6152**	**0.4245**	**0.0369**	**0.4614**	**27.9413**	**2,539.7212**	**2,567.6625**	**2.0020**	**0.0174**	**2,622.9077**

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	1.5825	0.0210	1.8231	1.0000e-004		0.0101	0.0101		0.0101	0.0101	0.0000	2.9716	2.9716	2.8800e-003	0.0000	3.0436
Energy	0.0114	0.0975	0.0415	6.2000e-004		7.8900e-003	7.8900e-003		7.8900e-003	7.8900e-003	0.0000	407.1945	407.1945	0.0155	4.8200e-003	409.0186
Mobile	0.5037	3.6100	5.0994	0.0200	1.3636	0.0178	1.3814	0.3671	0.0167	0.3838	0.0000	1,842.5401	1,842.5401	0.1019	0.0000	1,845.0878
Waste						0.0000	0.0000		0.0000	0.0000	22.8771	0.0000	22.8771	1.3520	0.0000	56.6770
Water						0.0000	0.0000		0.0000	0.0000	4.0514	29.7233	33.7747	0.4175	0.0101	47.2221
Total	**2.0976**	**3.7286**	**6.9640**	**0.0207**	**1.3636**	**0.0357**	**1.3993**	**0.3671**	**0.0347**	**0.4017**	**26.9285**	**2,282.4295**	**2,309.3580**	**1.8897**	**0.0149**	**2,361.0491**

	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	**1.37**	**6.18**	**7.59**	**11.67**	**13.54**	**6.22**	**13.37**	**13.54**	**6.04**	**12.94**	**3.62**	**10.13**	**10.06**	**5.61**	**14.40**	**9.98**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/31/2019	6/6/2019	5	5	
2	Rough Grading	Grading	6/10/2019	7/5/2019	5	20	
3	Wet/Dry Utilities	Trenching	6/24/2019	9/13/2019	5	60	
4	Building Construction	Building Construction	8/19/2019	9/10/2021	5	540	
5	Paving	Paving	9/16/2019	10/17/2019	5	24	
6	Architectural Coating	Architectural Coating	10/12/2020	9/10/2021	5	240	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 682,512; Residential Outdoor: 227,504; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Rough Grading	Excavators	3	8.00	158	0.38
Rough Grading	Graders	2	8.00	187	0.41
Rough Grading	Rubber Tired Dozers	1	8.00	247	0.40
Rough Grading	Scrapers	6	8.00	367	0.48
Rough Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Wet/Dry Utilities	Rubber Tired Dozers	1	8.00	247	0.40
Wet/Dry Utilities	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Pavers	1	8.00	130	0.42
Building Construction	Paving Equipment	2	8.00	132	0.36
Building Construction	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Air Compressors	1	6.00	78	0.48
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	6	8.00	80	0.38
Paving	Rubber Tired Dozers	1	8.00	247	0.40
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Site Preparation	5	3.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Rough Grading	14	28.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Rough Grading	14	28.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Wet/Dry Utilities	3	8.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	11	176.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	11	28.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	35.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2019

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					0.0151	0.0000	0.0151	8.2800e-003	0.0000	8.2800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.1600e-003	0.0536	0.0337	5.0000e-005		3.0300e-003	3.0300e-003		2.7900e-003	2.7900e-003	0.0000	4.7074	4.7074	1.4900e-003	0.0000	4.7446
Total	**5.1600e-003**	**0.0536**	**0.0337**	**5.0000e-005**	**0.0151**	**3.0300e-003**	**0.0181**	**8.2800e-003**	**2.7900e-003**	**0.0111**	**0.0000**	**4.7074**	**4.7074**	**1.4900e-003**	**0.0000**	**4.7446**

3.2 Site Preparation - 2019

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-005	2.0000e-005	2.0000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0520	0.0520	0.0000	0.0000	0.0520
Total	**3.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0520**	**0.0520**	**0.0000**	**0.0000**	**0.0520**

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					5.8700e-003	0.0000	5.8700e-003	3.2300e-003	0.0000	3.2300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.1600e-003	0.0536	0.0337	5.0000e-005		3.0300e-003	3.0300e-003		2.7900e-003	2.7900e-003	0.0000	4.7074	4.7074	1.4900e-003	0.0000	4.7446
Total	**5.1600e-003**	**0.0536**	**0.0337**	**5.0000e-005**	**5.8700e-003**	**3.0300e-003**	**8.9000e-003**	**3.2300e-003**	**2.7900e-003**	**6.0200e-003**	**0.0000**	**4.7074**	**4.7074**	**1.4900e-003**	**0.0000**	**4.7446**

3.2 Site Preparation - 2019

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-005	2.0000e-005	2.0000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0520	0.0520	0.0000	0.0000	0.0520
Total	**3.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0520**	**0.0520**	**0.0000**	**0.0000**	**0.0520**

3.3 Rough Grading - 2019

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					0.0660	0.0000	0.0660	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0975	1.1544	0.7072	1.3400e-003		0.0475	0.0475		0.0437	0.0437	0.0000	120.7284	120.7284	0.0382	0.0000	121.6834
Total	**0.0975**	**1.1544**	**0.7072**	**1.3400e-003**	**0.0660**	**0.0475**	**0.1135**	**0.0337**	**0.0437**	**0.0774**	**0.0000**	**120.7284**	**120.7284**	**0.0382**	**0.0000**	**121.6834**

3.3 Rough Grading - 2019

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	2.1300e-003	1.4900e-003	0.0151	4.0000e-005	7.6800e-003	3.0000e-005	7.7100e-003	1.9700e-003	3.0000e-005	2.0000e-003	0.0000	3.8789	3.8789	1.1000e-004	0.0000	3.8816
Total	**2.1300e-003**	**1.4900e-003**	**0.0151**	**4.0000e-005**	**7.6800e-003**	**3.0000e-005**	**7.7100e-003**	**1.9700e-003**	**3.0000e-005**	**2.0000e-003**	**0.0000**	**3.8789**	**3.8789**	**1.1000e-004**	**0.0000**	**3.8816**

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					0.0258	0.0000	0.0258	0.0132	0.0000	0.0132	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0975	1.1544	0.7072	1.3400e-003		0.0475	0.0475		0.0437	0.0437	0.0000	120.7283	120.7283	0.0382	0.0000	121.6832
Total	**0.0975**	**1.1544**	**0.7072**	**1.3400e-003**	**0.0258**	**0.0475**	**0.0732**	**0.0132**	**0.0437**	**0.0568**	**0.0000**	**120.7283**	**120.7283**	**0.0382**	**0.0000**	**121.6832**

3.3 Rough Grading - 2019

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	2.1300e-003	1.4900e-003	0.0151	4.0000e-005	7.6800e-003	3.0000e-005	7.7100e-003	1.9700e-003	3.0000e-005	2.0000e-003	0.0000	3.8789	3.8789	1.1000e-004	0.0000	3.8816
Total	**2.1300e-003**	**1.4900e-003**	**0.0151**	**4.0000e-005**	**7.6800e-003**	**3.0000e-005**	**7.7100e-003**	**1.9700e-003**	**3.0000e-005**	**2.0000e-003**	**0.0000**	**3.8789**	**3.8789**	**1.1000e-004**	**0.0000**	**3.8816**

3.4 Wet/Dry Utilities - 2019

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	0.0480	0.5025	0.2667	4.4000e-004		0.0270	0.0270		0.0249	0.0249	0.0000	39.7486	39.7486	0.0126	0.0000	40.0630
Total	**0.0480**	**0.5025**	**0.2667**	**4.4000e-004**		**0.0270**	**0.0270**		**0.0249**	**0.0249**	**0.0000**	**39.7486**	**39.7486**	**0.0126**	**0.0000**	**40.0630**

3.4 Wet/Dry Utilities - 2019

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	9.1000e-004	6.4000e-004	6.4600e-003	2.0000e-005	1.7700e-003	1.0000e-005	1.7800e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.6624	1.6624	5.0000e-005	0.0000	1.6635
Total	**9.1000e-004**	**6.4000e-004**	**6.4600e-003**	**2.0000e-005**	**1.7700e-003**	**1.0000e-005**	**1.7800e-003**	**4.7000e-004**	**1.0000e-005**	**4.8000e-004**	**0.0000**	**1.6624**	**1.6624**	**5.0000e-005**	**0.0000**	**1.6635**

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	0.0480	0.5025	0.2667	4.4000e-004		0.0270	0.0270		0.0249	0.0249	0.0000	39.7486	39.7486	0.0126	0.0000	40.0630
Total	**0.0480**	**0.5025**	**0.2667**	**4.4000e-004**		**0.0270**	**0.0270**		**0.0249**	**0.0249**	**0.0000**	**39.7486**	**39.7486**	**0.0126**	**0.0000**	**40.0630**

3.4 Wet/Dry Utilities - 2019

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	9.1000e-004	6.4000e-004	6.4600e-003	2.0000e-005	1.7700e-003	1.0000e-005	1.7800e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.6624	1.6624	5.0000e-005	0.0000	1.6635
Total	**9.1000e-004**	**6.4000e-004**	**6.4600e-003**	**2.0000e-005**	**1.7700e-003**	**1.0000e-005**	**1.7800e-003**	**4.7000e-004**	**1.0000e-005**	**4.8000e-004**	**0.0000**	**1.6624**	**1.6624**	**5.0000e-005**	**0.0000**	**1.6635**

3.5 Building Construction - 2019

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	0.1393	1.2936	1.1202	1.8000e-003		0.0742	0.0742		0.0695	0.0695	0.0000	158.1577	158.1577	0.0417	0.0000	159.2012
Total	**0.1393**	**1.2936**	**1.1202**	**1.8000e-003**		**0.0742**	**0.0742**		**0.0695**	**0.0695**	**0.0000**	**158.1577**	**158.1577**	**0.0417**	**0.0000**	**159.2012**

3.5 Building Construction - 2019

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	0.0325	0.0228	0.2297	6.5000e-004	0.0628	4.5000e-004	0.0633	0.0167	4.2000e-004	0.0171	0.0000	59.1250	59.1250	1.6500e-003	0.0000	59.1663
Total	**0.0325**	**0.0228**	**0.2297**	**6.5000e-004**	**0.0628**	**4.5000e-004**	**0.0633**	**0.0167**	**4.2000e-004**	**0.0171**	**0.0000**	**59.1250**	**59.1250**	**1.6500e-003**	**0.0000**	**59.1663**

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	0.1393	1.2936	1.1202	1.8000e-003		0.0742	0.0742		0.0695	0.0695	0.0000	158.1575	158.1575	0.0417	0.0000	159.2010
Total	**0.1393**	**1.2936**	**1.1202**	**1.8000e-003**		**0.0742**	**0.0742**		**0.0695**	**0.0695**	**0.0000**	**158.1575**	**158.1575**	**0.0417**	**0.0000**	**159.2010**

3.5 Building Construction - 2019

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	0.0325	0.0228	0.2297	6.5000e-004	0.0628	4.5000e-004	0.0633	0.0167	4.2000e-004	0.0171	0.0000	59.1250	59.1250	1.6500e-003	0.0000	59.1663
Total	**0.0325**	**0.0228**	**0.2297**	**6.5000e-004**	**0.0628**	**4.5000e-004**	**0.0633**	**0.0167**	**4.2000e-004**	**0.0171**	**0.0000**	**59.1250**	**59.1250**	**1.6500e-003**	**0.0000**	**59.1663**

3.5 Building Construction - 2020

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	0.3425	3.2013	2.9895	4.8500e-003		0.1770	0.1770		0.1658	0.1658	0.0000	420.0108	420.0108	0.1117	0.0000	422.8042
Total	**0.3425**	**3.2013**	**2.9895**	**4.8500e-003**		**0.1770**	**0.1770**		**0.1658**	**0.1658**	**0.0000**	**420.0108**	**420.0108**	**0.1117**	**0.0000**	**422.8042**

3.5 Building Construction - 2020

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	0.0806	0.0544	0.5556	1.7100e-003	0.1697	1.2000e-003	0.1708	0.0451	1.1000e-003	0.0462	0.0000	154.6760	154.6760	3.9100e-003	0.0000	154.7738
Total	**0.0806**	**0.0544**	**0.5556**	**1.7100e-003**	**0.1697**	**1.2000e-003**	**0.1708**	**0.0451**	**1.1000e-003**	**0.0462**	**0.0000**	**154.6760**	**154.6760**	**3.9100e-003**	**0.0000**	**154.7738**

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	0.3425	3.2013	2.9895	4.8500e-003		0.1770	0.1770		0.1658	0.1658	0.0000	420.0103	420.0103	0.1117	0.0000	422.8037
Total	**0.3425**	**3.2013**	**2.9895**	**4.8500e-003**		**0.1770**	**0.1770**		**0.1658**	**0.1658**	**0.0000**	**420.0103**	**420.0103**	**0.1117**	**0.0000**	**422.8037**

3.5 Building Construction - 2020

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	0.0806	0.0544	0.5556	1.7100e-003	0.1697	1.2000e-003	0.1708	0.0451	1.1000e-003	0.0462	0.0000	154.6760	154.6760	3.9100e-003	0.0000	154.7738
Total	**0.0806**	**0.0544**	**0.5556**	**1.7100e-003**	**0.1697**	**1.2000e-003**	**0.1708**	**0.0451**	**1.1000e-003**	**0.0462**	**0.0000**	**154.6760**	**154.6760**	**3.9100e-003**	**0.0000**	**154.7738**

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	0.2143	2.0135	2.0440	3.3500e-003		0.1066	0.1066		0.0998	0.0998	0.0000	290.1462	290.1462	0.0766	0.0000	292.0615
Total	**0.2143**	**2.0135**	**2.0440**	**3.3500e-003**		**0.1066**	**0.1066**		**0.0998**	**0.0998**	**0.0000**	**290.1462**	**290.1462**	**0.0766**	**0.0000**	**292.0615**

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	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	0.0517	0.0336	0.3502	1.1400e-003	0.1172	8.0000e-004	0.1180	0.0312	7.4000e-004	0.0319	0.0000	103.1264	103.1264	2.4200e-003	0.0000	103.1869
Total	**0.0517**	**0.0336**	**0.3502**	**1.1400e-003**	**0.1172**	**8.0000e-004**	**0.1180**	**0.0312**	**7.4000e-004**	**0.0319**	**0.0000**	**103.1264**	**103.1264**	**2.4200e-003**	**0.0000**	**103.1869**

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	0.2143	2.0135	2.0440	3.3500e-003		0.1066	0.1066		0.0998	0.0998	0.0000	290.1458	290.1458	0.0766	0.0000	292.0612
Total	**0.2143**	**2.0135**	**2.0440**	**3.3500e-003**		**0.1066**	**0.1066**		**0.0998**	**0.0998**	**0.0000**	**290.1458**	**290.1458**	**0.0766**	**0.0000**	**292.0612**

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	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	0.0517	0.0336	0.3502	1.1400e-003	0.1172	8.0000e-004	0.1180	0.0312	7.4000e-004	0.0319	0.0000	103.1264	103.1264	2.4200e-003	0.0000	103.1869
Total	**0.0517**	**0.0336**	**0.3502**	**1.1400e-003**	**0.1172**	**8.0000e-004**	**0.1180**	**0.0312**	**7.4000e-004**	**0.0319**	**0.0000**	**103.1264**	**103.1264**	**2.4200e-003**	**0.0000**	**103.1869**

3.6 Paving - 2019

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	0.0417	0.4199	0.3062	4.8000e-004		0.0237	0.0237		0.0220	0.0220	0.0000	43.0780	43.0780	0.0129	0.0000	43.4010
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0417**	**0.4199**	**0.3062**	**4.8000e-004**		**0.0237**	**0.0237**		**0.0220**	**0.0220**	**0.0000**	**43.0780**	**43.0780**	**0.0129**	**0.0000**	**43.4010**

3.6 Paving - 2019

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	1.2800e-003	9.0000e-004	9.0400e-003	3.0000e-005	2.4700e-003	2.0000e-005	2.4900e-003	6.6000e-004	2.0000e-005	6.7000e-004	0.0000	2.3273	2.3273	7.0000e-005	0.0000	2.3290
Total	**1.2800e-003**	**9.0000e-004**	**9.0400e-003**	**3.0000e-005**	**2.4700e-003**	**2.0000e-005**	**2.4900e-003**	**6.6000e-004**	**2.0000e-005**	**6.7000e-004**	**0.0000**	**2.3273**	**2.3273**	**7.0000e-005**	**0.0000**	**2.3290**

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	0.0417	0.4199	0.3062	4.8000e-004		0.0237	0.0237		0.0220	0.0220	0.0000	43.0780	43.0780	0.0129	0.0000	43.4009
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0417**	**0.4199**	**0.3062**	**4.8000e-004**		**0.0237**	**0.0237**		**0.0220**	**0.0220**	**0.0000**	**43.0780**	**43.0780**	**0.0129**	**0.0000**	**43.4009**

3.6 Paving - 2019

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	1.2800e-003	9.0000e-004	9.0400e-003	3.0000e-005	2.4700e-003	2.0000e-005	2.4900e-003	6.6000e-004	2.0000e-005	6.7000e-004	0.0000	2.3273	2.3273	7.0000e-005	0.0000	2.3290
Total	**1.2800e-003**	**9.0000e-004**	**9.0400e-003**	**3.0000e-005**	**2.4700e-003**	**2.0000e-005**	**2.4900e-003**	**6.6000e-004**	**2.0000e-005**	**6.7000e-004**	**0.0000**	**2.3273**	**2.3273**	**7.0000e-005**	**0.0000**	**2.3290**

3.7 Architectural Coating - 2020

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	0.5185					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.1400e-003	0.0497	0.0540	9.0000e-005		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	7.5321	7.5321	5.8000e-004	0.0000	7.5467
Total	**0.5256**	**0.0497**	**0.0540**	**9.0000e-005**		**3.2700e-003**	**3.2700e-003**		**3.2700e-003**	**3.2700e-003**	**0.0000**	**7.5321**	**7.5321**	**5.8000e-004**	**0.0000**	**7.5467**

3.7 Architectural Coating - 2020

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	3.6100e-003	2.4400e-003	0.0249	8.0000e-005	7.6000e-003	5.0000e-005	7.6500e-003	2.0200e-003	5.0000e-005	2.0700e-003	0.0000	6.9267	6.9267	1.8000e-004	0.0000	6.9311
Total	**3.6100e-003**	**2.4400e-003**	**0.0249**	**8.0000e-005**	**7.6000e-003**	**5.0000e-005**	**7.6500e-003**	**2.0200e-003**	**5.0000e-005**	**2.0700e-003**	**0.0000**	**6.9267**	**6.9267**	**1.8000e-004**	**0.0000**	**6.9311**

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	0.5185					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.1400e-003	0.0497	0.0540	9.0000e-005		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	7.5321	7.5321	5.8000e-004	0.0000	7.5467
Total	**0.5256**	**0.0497**	**0.0540**	**9.0000e-005**		**3.2700e-003**	**3.2700e-003**		**3.2700e-003**	**3.2700e-003**	**0.0000**	**7.5321**	**7.5321**	**5.8000e-004**	**0.0000**	**7.5467**

3.7 Architectural Coating - 2020

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	3.6100e-003	2.4400e-003	0.0249	8.0000e-005	7.6000e-003	5.0000e-005	7.6500e-003	2.0200e-003	5.0000e-005	2.0700e-003	0.0000	6.9267	6.9267	1.8000e-004	0.0000	6.9311
Total	**3.6100e-003**	**2.4400e-003**	**0.0249**	**8.0000e-005**	**7.6000e-003**	**5.0000e-005**	**7.6500e-003**	**2.0200e-003**	**5.0000e-005**	**2.0700e-003**	**0.0000**	**6.9267**	**6.9267**	**1.8000e-004**	**0.0000**	**6.9311**

3.7 Architectural Coating - 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					
Archit. Coating	1.5905					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0198	0.1382	0.1645	2.7000e-004		8.5200e-003	8.5200e-003		8.5200e-003	8.5200e-003	0.0000	23.1070	23.1070	1.5900e-003	0.0000	23.1466
Total	**1.6103**	**0.1382**	**0.1645**	**2.7000e-004**		**8.5200e-003**	**8.5200e-003**		**8.5200e-003**	**8.5200e-003**	**0.0000**	**23.1070**	**23.1070**	**1.5900e-003**	**0.0000**	**23.1466**

3.7 Architectural Coating - 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	0.0103	6.6800e-003	0.0696	2.3000e-004	0.0233	1.6000e-004	0.0235	6.2000e-003	1.5000e-004	6.3500e-003	0.0000	20.5081	20.5081	4.8000e-004	0.0000	20.5201
Total	**0.0103**	**6.6800e-003**	**0.0696**	**2.3000e-004**	**0.0233**	**1.6000e-004**	**0.0235**	**6.2000e-003**	**1.5000e-004**	**6.3500e-003**	**0.0000**	**20.5081**	**20.5081**	**4.8000e-004**	**0.0000**	**20.5201**

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	1.5905					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0198	0.1382	0.1645	2.7000e-004		8.5200e-003	8.5200e-003		8.5200e-003	8.5200e-003	0.0000	23.1069	23.1069	1.5900e-003	0.0000	23.1466
Total	**1.6103**	**0.1382**	**0.1645**	**2.7000e-004**		**8.5200e-003**	**8.5200e-003**		**8.5200e-003**	**8.5200e-003**	**0.0000**	**23.1069**	**23.1069**	**1.5900e-003**	**0.0000**	**23.1466**

3.7 Architectural Coating - 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	0.0103	6.6800e-003	0.0696	2.3000e-004	0.0233	1.6000e-004	0.0235	6.2000e-003	1.5000e-004	6.3500e-003	0.0000	20.5081	20.5081	4.8000e-004	0.0000	20.5201
Total	**0.0103**	**6.6800e-003**	**0.0696**	**2.3000e-004**	**0.0233**	**1.6000e-004**	**0.0235**	**6.2000e-003**	**1.5000e-004**	**6.3500e-003**	**0.0000**	**20.5081**	**20.5081**	**4.8000e-004**	**0.0000**	**20.5201**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

	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	0.5037	3.6100	5.0994	0.0200	1.3636	0.0178	1.3814	0.3671	0.0167	0.3838	0.0000	1,842.5401	1,842.5401	0.1019	0.0000	1,845.0878
Unmitigated	0.5328	3.8554	5.6716	0.0227	1.5771	0.0202	1.5973	0.4245	0.0190	0.4435	0.0000	2,094.1813	2,094.1813	0.1099	0.0000	2,096.9282

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,629.25	1,565.55	1435.70	4,179,131	3,613,299
Total	1,629.25	1,565.55	1,435.70	4,179,131	3,613,299

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
Apartments Mid Rise	10.00	5.00	7.00	46.00	13.00	41.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.520277	0.038864	0.193543	0.118146	0.022917	0.005635	0.034518	0.053912	0.001336	0.002070	0.007104	0.000691	0.000987

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	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	294.2412	294.2412	0.0133	2.7500e-003	295.3941
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	294.2412	294.2412	0.0133	2.7500e-003	295.3941
NaturalGas Mitigated	0.0114	0.0975	0.0415	6.2000e-004		7.8900e-003	7.8900e-003		7.8900e-003	7.8900e-003	0.0000	112.9533	112.9533	2.1600e-003	2.0700e-003	113.6245
NaturalGas Unmitigated	0.0114	0.0975	0.0415	6.2000e-004		7.8900e-003	7.8900e-003		7.8900e-003	7.8900e-003	0.0000	112.9533	112.9533	2.1600e-003	2.0700e-003	113.6245

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					
Apartments Mid Rise	2.11667e+006	0.0114	0.0975	0.0415	6.2000e-004		7.8900e-003	7.8900e-003		7.8900e-003	7.8900e-003	0.0000	112.9533	112.9533	2.1600e-003	2.0700e-003	113.6245
Total		**0.0114**	**0.0975**	**0.0415**	**6.2000e-004**		**7.8900e-003**	**7.8900e-003**		**7.8900e-003**	**7.8900e-003**	**0.0000**	**112.9533**	**112.9533**	**2.1600e-003**	**2.0700e-003**	**113.6245**

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					
Apartments Mid Rise	2.11667e+006	0.0114	0.0975	0.0415	6.2000e-004		7.8900e-003	7.8900e-003		7.8900e-003	7.8900e-003	0.0000	112.9533	112.9533	2.1600e-003	2.0700e-003	113.6245
Total		**0.0114**	**0.0975**	**0.0415**	**6.2000e-004**		**7.8900e-003**	**7.8900e-003**		**7.8900e-003**	**7.8900e-003**	**0.0000**	**112.9533**	**112.9533**	**2.1600e-003**	**2.0700e-003**	**113.6245**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.01145e+006	294.2412	0.0133	2.7500e-003	295.3941
Total		**294.2412**	**0.0133**	**2.7500e-003**	**295.3941**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.01145e+006	294.2412	0.0133	2.7500e-003	295.3941
Total		**294.2412**	**0.0133**	**2.7500e-003**	**295.3941**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

	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	1.5825	0.0210	1.8231	1.0000e-004		0.0101	0.0101		0.0101	0.0101	0.0000	2.9716	2.9716	2.8800e-003	0.0000	3.0436
Unmitigated	1.5825	0.0210	1.8231	1.0000e-004		0.0101	0.0101		0.0101	0.0101	0.0000	2.9716	2.9716	2.8800e-003	0.0000	3.0436

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	0.2109					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.3163					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	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
Landscaping	0.0552	0.0210	1.8231	1.0000e-004		0.0101	0.0101		0.0101	0.0101	0.0000	2.9716	2.9716	2.8800e-003	0.0000	3.0436
Total	**1.5825**	**0.0210**	**1.8231**	**1.0000e-004**		**0.0101**	**0.0101**		**0.0101**	**0.0101**	**0.0000**	**2.9716**	**2.9716**	**2.8800e-003**	**0.0000**	**3.0436**

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	0.2109					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.3163					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	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
Landscaping	0.0552	0.0210	1.8231	1.0000e-004		0.0101	0.0101		0.0101	0.0101	0.0000	2.9716	2.9716	2.8800e-003	0.0000	3.0436
Total	**1.5825**	**0.0210**	**1.8231**	**1.0000e-004**		**0.0101**	**0.0101**		**0.0101**	**0.0101**	**0.0000**	**2.9716**	**2.9716**	**2.8800e-003**	**0.0000**	**3.0436**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	33.7747	0.4175	0.0101	47.2221
Unmitigated	40.4381	0.5218	0.0126	57.2403

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	15.9627 / 10.0635	40.4381	0.5218	0.0126	57.2403
Total		**40.4381**	**0.5218**	**0.0126**	**57.2403**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	12.7702 / 9.44959	33.7747	0.4175	0.0101	47.2221
Total		**33.7747**	**0.4175**	**0.0101**	**47.2221**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	22.8771	1.3520	0.0000	56.6770
Unmitigated	22.8771	1.3520	0.0000	56.6770

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	112.7	22.8771	1.3520	0.0000	56.6770
Total		**22.8771**	**1.3520**	**0.0000**	**56.6770**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	112.7	22.8771	1.3520	0.0000	56.6770
Total		**22.8771**	**1.3520**	**0.0000**	**56.6770**

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

Casa Dei Vista Apartments (File No. 18-200

Yolo/Solano AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	245.00	Dwelling Unit	14.41	337,043.00	701

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	6.8	**Precipitation Freq (Days)**	55
Climate Zone	4			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

On-road Fugitive Dust - 100% of roadways assumed to be paved.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	240.00
tblConstructionPhase	NumDays	300.00	540.00
tblConstructionPhase	NumDays	30.00	20.00
tblConstructionPhase	NumDays	20.00	24.00
tblConstructionPhase	NumDays	10.00	5.00
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00

tblFireplaces	FireplaceWoodMass	4,558.40	0.00
tblFireplaces	NumberGas	134.75	0.00
tblFireplaces	NumberNoFireplace	24.50	0.00
tblFireplaces	NumberWood	85.75	0.00
tblGrading	AcresOfGrading	140.00	10.97
tblLandUse	LandUseSquareFeet	245,000.00	337,043.00
tblLandUse	LotAcreage	6.45	14.41
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00

tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblRoadDust	RoadPercentPave	94	100
tblTripsAndVMT	VendorTripNumber	26.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	3.00
tblTripsAndVMT	WorkerTripNumber	35.00	28.00
tblTripsAndVMT	WorkerTripNumber	35.00	28.00
tblWoodstoves	NumberCatalytic	12.25	0.00
tblWoodstoves	NumberNoncatalytic	12.25	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	4,558.40	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					
2019	11.6245	132.3391	81.5822	0.1545	7.4608	5.6514	13.1122	3.5930	5.1993	8.7923	0.0000	15,304.9665	15,304.9665	4.6877	0.0000	15,422.1584
2020	21.2675	26.5670	30.4832	0.0572	1.6051	1.4733	3.0784	0.4258	1.3870	1.8127	0.0000	5,528.6574	5,528.6574	1.0056	0.0000	5,553.7967
2021	20.9372	24.1746	29.7346	0.0566	1.6051	1.2826	2.8877	0.4258	1.2069	1.6327	0.0000	5,468.6668	5,468.6668	0.9915	0.0000	5,493.4553
Maximum	**21.2675**	**132.3391**	**81.5822**	**0.1545**	**7.4608**	**5.6514**	**13.1122**	**3.5930**	**5.1993**	**8.7923**	**0.0000**	**15,304.9665**	**15,304.9665**	**4.6877**	**0.0000**	**15,422.1584**

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					
2019	11.6245	132.3391	81.5822	0.1545	3.4325	5.6514	9.0839	1.5355	5.1993	6.7347	0.0000	15,304.9665	15,304.9665	4.6877	0.0000	15,422.1584
2020	21.2675	26.5670	30.4832	0.0572	1.6051	1.4733	3.0784	0.4258	1.3870	1.8127	0.0000	5,528.6574	5,528.6574	1.0056	0.0000	5,553.7967
2021	20.9372	24.1746	29.7346	0.0566	1.6051	1.2826	2.8877	0.4258	1.2069	1.6327	0.0000	5,468.6668	5,468.6668	0.9915	0.0000	5,493.4553
Maximum	**21.2675**	**132.3391**	**81.5822**	**0.1545**	**3.4325**	**5.6514**	**9.0839**	**1.5355**	**5.1993**	**6.7347**	**0.0000**	**15,304.9665**	**15,304.9665**	**4.6877**	**0.0000**	**15,422.1584**

Casa Dei Vista Apartments (File No. 18-200 - Yolo/Solano AQMD Air District, Summer

	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	37.75	0.00	21.11	46.29	0.00	16.81	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	8.9821	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117	0.0000	36.3953	36.3953	0.0353	0.0000	37.2771
Energy	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993
Mobile	3.5817	21.0878	34.5246	0.1358	9.1579	0.1124	9.2704	2.4582	0.1058	2.5640		13,809.9731	13,809.9731	0.6792		13,826.9522
Total	**12.6263**	**21.8561**	**55.0088**	**0.1403**	**9.1579**	**0.2673**	**9.4252**	**2.4582**	**0.2607**	**2.7189**	**0.0000**	**14,528.6134**	**14,528.6134**	**0.7275**	**0.0125**	**14,550.5286**

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	8.9821	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117	0.0000	36.3953	36.3953	0.0353	0.0000	37.2771
Energy	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993
Mobile	3.4132	19.8042	30.7548	0.1194	7.9180	0.0991	8.0171	2.1254	0.0932	2.2186		12,147.8394	12,147.8394	0.6270		12,163.5154
Total	**12.4578**	**20.5725**	**51.2389**	**0.1239**	**7.9180**	**0.2540**	**8.1719**	**2.1254**	**0.2481**	**2.3735**	**0.0000**	**12,866.4798**	**12,866.4798**	**0.6754**	**0.0125**	**12,887.0918**

	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	**1.33**	**5.87**	**6.85**	**11.68**	**13.54**	**4.99**	**13.30**	**13.54**	**4.82**	**12.70**	**0.00**	**11.44**	**11.44**	**7.17**	**0.00**	**11.43**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/31/2019	6/6/2019	5	5	
2	Rough Grading	Grading	6/10/2019	7/5/2019	5	20	
3	Wet/Dry Utilities	Trenching	6/24/2019	9/13/2019	5	60	
4	Building Construction	Building Construction	8/19/2019	9/10/2021	5	540	
5	Paving	Paving	9/16/2019	10/17/2019	5	24	
6	Architectural Coating	Architectural Coating	10/12/2020	9/10/2021	5	240	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 682,512; Residential Outdoor: 227,504; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Rough Grading	Excavators	3	8.00	158	0.38
Rough Grading	Graders	2	8.00	187	0.41
Rough Grading	Rubber Tired Dozers	1	8.00	247	0.40
Rough Grading	Scrapers	6	8.00	367	0.48
Rough Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Wet/Dry Utilities	Rubber Tired Dozers	1	8.00	247	0.40
Wet/Dry Utilities	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Pavers	1	8.00	130	0.42
Building Construction	Paving Equipment	2	8.00	132	0.36
Building Construction	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Air Compressors	1	6.00	78	0.48
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	6	8.00	80	0.38
Paving	Rubber Tired Dozers	1	8.00	247	0.40
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Site Preparation	5	3.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Rough Grading	14	28.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Rough Grading	14	28.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Wet/Dry Utilities	3	8.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	11	176.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	11	28.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	35.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2019

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					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102			0.0000			0.0000
Off-Road	2.0658	21.4239	13.4948	0.0210		1.2129	1.2129		1.1159	1.1159		2,075.5959	2,075.5959	0.6567		2,092.0133
Total	**2.0658**	**21.4239**	**13.4948**	**0.0210**	**6.0221**	**1.2129**	**7.2350**	**3.3102**	**1.1159**	**4.4261**		**2,075.5959**	**2,075.5959**	**0.6567**		**2,092.0133**

3.2 Site Preparation - 2019

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	0.0130	7.1700e-003	0.0923	2.5000e-004	0.0228	1.6000e-004	0.0230	6.0500e-003	1.5000e-004	6.2000e-003		25.1449	25.1449	7.1000e-004		25.1625
Total	**0.0130**	**7.1700e-003**	**0.0923**	**2.5000e-004**	**0.0228**	**1.6000e-004**	**0.0230**	**6.0500e-003**	**1.5000e-004**	**6.2000e-003**		**25.1449**	**25.1449**	**7.1000e-004**		**25.1625**

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					2.3486	0.0000	2.3486	1.2910	0.0000	1.2910			0.0000			0.0000
Off-Road	2.0658	21.4239	13.4948	0.0210		1.2129	1.2129		1.1159	1.1159	0.0000	2,075.5959	2,075.5959	0.6567		2,092.0133
Total	**2.0658**	**21.4239**	**13.4948**	**0.0210**	**2.3486**	**1.2129**	**3.5615**	**1.2910**	**1.1159**	**2.4069**	**0.0000**	**2,075.5959**	**2,075.5959**	**0.6567**		**2,092.0133**

3.2 Site Preparation - 2019

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	0.0130	7.1700e-003	0.0923	2.5000e-004	0.0228	1.6000e-004	0.0230	6.0500e-003	1.5000e-004	6.2000e-003		25.1449	25.1449	7.1000e-004		25.1625
Total	**0.0130**	**7.1700e-003**	**0.0923**	**2.5000e-004**	**0.0228**	**1.6000e-004**	**0.0230**	**6.0500e-003**	**1.5000e-004**	**6.2000e-003**		**25.1449**	**25.1449**	**7.1000e-004**		**25.1625**

3.3 Rough Grading - 2019

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					6.6038	0.0000	6.6038	3.3730	0.0000	3.3730			0.0000			0.0000
Off-Road	9.7474	115.4370	70.7237	0.1344		4.7471	4.7471		4.3674	4.3674		13,308.0302	13,308.0302	4.2105		13,413.2932
Total	**9.7474**	**115.4370**	**70.7237**	**0.1344**	**6.6038**	**4.7471**	**11.3509**	**3.3730**	**4.3674**	**7.7404**		**13,308.0302**	**13,308.0302**	**4.2105**		**13,413.2932**

3.3 Rough Grading - 2019

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	0.2423	0.1338	1.7229	4.7100e-003	0.7962	2.9800e-003	0.7992	0.2039	2.7500e-003	0.2066		469.3711	469.3711	0.0132		469.7007
Total	**0.2423**	**0.1338**	**1.7229**	**4.7100e-003**	**0.7962**	**2.9800e-003**	**0.7992**	**0.2039**	**2.7500e-003**	**0.2066**		**469.3711**	**469.3711**	**0.0132**		**469.7007**

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					2.5755	0.0000	2.5755	1.3155	0.0000	1.3155			0.0000			0.0000
Off-Road	9.7474	115.4370	70.7237	0.1344		4.7471	4.7471		4.3674	4.3674	0.0000	13,308.0302	13,308.0302	4.2105		13,413.2932
Total	**9.7474**	**115.4370**	**70.7237**	**0.1344**	**2.5755**	**4.7471**	**7.3226**	**1.3155**	**4.3674**	**5.6829**	**0.0000**	**13,308.0302**	**13,308.0302**	**4.2105**		**13,413.2932**

3.3 Rough Grading - 2019

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	0.2423	0.1338	1.7229	4.7100e-003	0.7962	2.9800e-003	0.7992	0.2039	2.7500e-003	0.2066		469.3711	469.3711	0.0132		469.7007
Total	**0.2423**	**0.1338**	**1.7229**	**4.7100e-003**	**0.7962**	**2.9800e-003**	**0.7992**	**0.2039**	**2.7500e-003**	**0.2066**		**469.3711**	**469.3711**	**0.0132**		**469.7007**

3.4 Wet/Dry Utilities - 2019

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	1.6002	16.7492	8.8895	0.0147		0.9008	0.9008		0.8288	0.8288		1,460.5122	1,460.5122	0.4621		1,472.0645
Total	**1.6002**	**16.7492**	**8.8895**	**0.0147**		**0.9008**	**0.9008**		**0.8288**	**0.8288**		**1,460.5122**	**1,460.5122**	**0.4621**		**1,472.0645**

3.4 Wet/Dry Utilities - 2019

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	0.0346	0.0191	0.2461	6.7000e-004	0.0609	4.3000e-004	0.0613	0.0161	3.9000e-004	0.0165		67.0530	67.0530	1.8800e-003		67.1001
Total	**0.0346**	**0.0191**	**0.2461**	**6.7000e-004**	**0.0609**	**4.3000e-004**	**0.0613**	**0.0161**	**3.9000e-004**	**0.0165**		**67.0530**	**67.0530**	**1.8800e-003**		**67.1001**

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	1.6002	16.7492	8.8895	0.0147		0.9008	0.9008		0.8288	0.8288	0.0000	1,460.5122	1,460.5122	0.4621		1,472.0645
Total	**1.6002**	**16.7492**	**8.8895**	**0.0147**		**0.9008**	**0.9008**		**0.8288**	**0.8288**	**0.0000**	**1,460.5122**	**1,460.5122**	**0.4621**		**1,472.0645**

3.4 Wet/Dry Utilities - 2019

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	0.0346	0.0191	0.2461	6.7000e-004	0.0609	4.3000e-004	0.0613	0.0161	3.9000e-004	0.0165		67.0530	67.0530	1.8800e-003		67.1001
Total	**0.0346**	**0.0191**	**0.2461**	**6.7000e-004**	**0.0609**	**4.3000e-004**	**0.0613**	**0.0161**	**3.9000e-004**	**0.0165**		**67.0530**	**67.0530**	**1.8800e-003**		**67.1001**

3.5 Building Construction - 2019

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	2.8711	26.6713	23.0975	0.0371		1.5303	1.5303		1.4339	1.4339		3,594.6178	3,594.6178	0.9487		3,618.3349
Total	**2.8711**	**26.6713**	**23.0975**	**0.0371**		**1.5303**	**1.5303**		**1.4339**	**1.4339**		**3,594.6178**	**3,594.6178**	**0.9487**		**3,618.3349**

3.5 Building Construction - 2019

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	0.7615	0.4205	5.4149	0.0148	1.3388	9.3600e-003	1.3482	0.3551	8.6300e-003	0.3638		1,475.1663	1,475.1663	0.0414		1,476.2022
Total	**0.7615**	**0.4205**	**5.4149**	**0.0148**	**1.3388**	**9.3600e-003**	**1.3482**	**0.3551**	**8.6300e-003**	**0.3638**		**1,475.1663**	**1,475.1663**	**0.0414**		**1,476.2022**

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	2.8711	26.6713	23.0975	0.0371		1.5303	1.5303		1.4339	1.4339	0.0000	3,594.6178	3,594.6178	0.9487		3,618.3349
Total	**2.8711**	**26.6713**	**23.0975**	**0.0371**		**1.5303**	**1.5303**		**1.4339**	**1.4339**	**0.0000**	**3,594.6178**	**3,594.6178**	**0.9487**		**3,618.3349**

3.5 Building Construction - 2019

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	0.7615	0.4205	5.4149	0.0148	1.3388	9.3600e-003	1.3482	0.3551	8.6300e-003	0.3638		1,475.1663	1,475.1663	0.0414		1,476.2022
Total	**0.7615**	**0.4205**	**5.4149**	**0.0148**	**1.3388**	**9.3600e-003**	**1.3482**	**0.3551**	**8.6300e-003**	**0.3638**		**1,475.1663**	**1,475.1663**	**0.0414**		**1,476.2022**

3.5 Building Construction - 2020

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	2.6141	24.4370	22.8208	0.0371		1.3514	1.3514		1.2659	1.2659		3,534.2191	3,534.2191	0.9402		3,557.7236
Total	**2.6141**	**24.4370**	**22.8208**	**0.0371**		**1.3514**	**1.3514**		**1.2659**	**1.2659**		**3,534.2191**	**3,534.2191**	**0.9402**		**3,557.7236**

3.5 Building Construction - 2020

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	0.6977	0.3721	4.8637	0.0143	1.3388	9.1400e-003	1.3480	0.3551	8.4300e-003	0.3636		1,428.8450	1,428.8450	0.0364		1,429.7541
Total	**0.6977**	**0.3721**	**4.8637**	**0.0143**	**1.3388**	**9.1400e-003**	**1.3480**	**0.3551**	**8.4300e-003**	**0.3636**		**1,428.8450**	**1,428.8450**	**0.0364**		**1,429.7541**

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	2.6141	24.4370	22.8208	0.0371		1.3514	1.3514		1.2659	1.2659	0.0000	3,534.2191	3,534.2191	0.9402		3,557.7236
Total	**2.6141**	**24.4370**	**22.8208**	**0.0371**		**1.3514**	**1.3514**		**1.2659**	**1.2659**	**0.0000**	**3,534.2191**	**3,534.2191**	**0.9402**		**3,557.7236**

3.5 Building Construction - 2020

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	0.6977	0.3721	4.8637	0.0143	1.3388	9.1400e-003	1.3480	0.3551	8.4300e-003	0.3636		1,428.8450	1,428.8450	0.0364		1,429.7541
Total	**0.6977**	**0.3721**	**4.8637**	**0.0143**	**1.3388**	**9.1400e-003**	**1.3480**	**0.3551**	**8.4300e-003**	**0.3636**		**1,428.8450**	**1,428.8450**	**0.0364**		**1,429.7541**

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	2.3674	22.2488	22.5851	0.0371		1.1779	1.1779		1.1030	1.1030		3,534.0486	3,534.0486	0.9332		3,557.3783
Total	**2.3674**	**22.2488**	**22.5851**	**0.0371**		**1.1779**	**1.1779**		**1.1030**	**1.1030**		**3,534.0486**	**3,534.0486**	**0.9332**		**3,557.3783**

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	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	0.6474	0.3327	4.4475	0.0138	1.3388	8.8800e-003	1.3477	0.3551	8.1800e-003	0.3633		1,378.9476	1,378.9476	0.0326		1,379.7617
Total	**0.6474**	**0.3327**	**4.4475**	**0.0138**	**1.3388**	**8.8800e-003**	**1.3477**	**0.3551**	**8.1800e-003**	**0.3633**		**1,378.9476**	**1,378.9476**	**0.0326**		**1,379.7617**

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	2.3674	22.2488	22.5851	0.0371		1.1779	1.1779		1.1030	1.1030	0.0000	3,534.0486	3,534.0486	0.9332		3,557.3783
Total	**2.3674**	**22.2488**	**22.5851**	**0.0371**		**1.1779**	**1.1779**		**1.1030**	**1.1030**	**0.0000**	**3,534.0486**	**3,534.0486**	**0.9332**		**3,557.3783**

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	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	0.6474	0.3327	4.4475	0.0138	1.3388	8.8800e-003	1.3477	0.3551	8.1800e-003	0.3633		1,378.9476	1,378.9476	0.0326		1,379.7617
Total	**0.6474**	**0.3327**	**4.4475**	**0.0138**	**1.3388**	**8.8800e-003**	**1.3477**	**0.3551**	**8.1800e-003**	**0.3633**		**1,378.9476**	**1,378.9476**	**0.0326**		**1,379.7617**

3.6 Paving - 2019

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	3.4739	34.9928	25.5177	0.0401		1.9784	1.9784		1.8304	1.8304		3,957.1159	3,957.1159	1.1867		3,986.7837
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.4739**	**34.9928**	**25.5177**	**0.0401**		**1.9784**	**1.9784**		**1.8304**	**1.8304**		**3,957.1159**	**3,957.1159**	**1.1867**		**3,986.7837**

3.6 Paving - 2019

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	0.1212	0.0669	0.8615	2.3600e-003	0.2130	1.4900e-003	0.2145	0.0565	1.3700e-003	0.0579		234.6856	234.6856	6.5900e-003		234.8504
Total	**0.1212**	**0.0669**	**0.8615**	**2.3600e-003**	**0.2130**	**1.4900e-003**	**0.2145**	**0.0565**	**1.3700e-003**	**0.0579**		**234.6856**	**234.6856**	**6.5900e-003**		**234.8504**

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	3.4739	34.9928	25.5177	0.0401		1.9784	1.9784		1.8304	1.8304	0.0000	3,957.1159	3,957.1159	1.1867		3,986.7837
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.4739**	**34.9928**	**25.5177**	**0.0401**		**1.9784**	**1.9784**		**1.8304**	**1.8304**	**0.0000**	**3,957.1159**	**3,957.1159**	**1.1867**		**3,986.7837**

3.6 Paving - 2019

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	0.1212	0.0669	0.8615	2.3600e-003	0.2130	1.4900e-003	0.2145	0.0565	1.3700e-003	0.0579		234.6856	234.6856	6.5900e-003		234.8504
Total	**0.1212**	**0.0669**	**0.8615**	**2.3600e-003**	**0.2130**	**1.4900e-003**	**0.2145**	**0.0565**	**1.3700e-003**	**0.0579**		**234.6856**	**234.6856**	**6.5900e-003**		**234.8504**

3.7 Architectural Coating - 2020

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	17.5747					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**17.8169**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

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	0.1388	0.0740	0.9672	2.8500e-003	0.2662	1.8200e-003	0.2681	0.0706	1.6800e-003	0.0723		284.1453	284.1453	7.2300e-003		284.3261
Total	**0.1388**	**0.0740**	**0.9672**	**2.8500e-003**	**0.2662**	**1.8200e-003**	**0.2681**	**0.0706**	**1.6800e-003**	**0.0723**		**284.1453**	**284.1453**	**7.2300e-003**		**284.3261**

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	17.5747					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**17.8169**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

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	0.1388	0.0740	0.9672	2.8500e-003	0.2662	1.8200e-003	0.2681	0.0706	1.6800e-003	0.0723		284.1453	284.1453	7.2300e-003		284.3261
Total	**0.1388**	**0.0740**	**0.9672**	**2.8500e-003**	**0.2662**	**1.8200e-003**	**0.2681**	**0.0706**	**1.6800e-003**	**0.0723**		**284.1453**	**284.1453**	**7.2300e-003**		**284.3261**

3.7 Architectural Coating - 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					
Archit. Coating	17.5747					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**17.7936**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.7 Architectural Coating - 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	0.1288	0.0662	0.8845	2.7500e-003	0.2662	1.7700e-003	0.2680	0.0706	1.6300e-003	0.0723		274.2225	274.2225	6.4800e-003		274.3844
Total	**0.1288**	**0.0662**	**0.8845**	**2.7500e-003**	**0.2662**	**1.7700e-003**	**0.2680**	**0.0706**	**1.6300e-003**	**0.0723**		**274.2225**	**274.2225**	**6.4800e-003**		**274.3844**

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	17.5747					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**17.7936**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.7 Architectural Coating - 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	0.1288	0.0662	0.8845	2.7500e-003	0.2662	1.7700e-003	0.2680	0.0706	1.6300e-003	0.0723		274.2225	274.2225	6.4800e-003		274.3844
Total	**0.1288**	**0.0662**	**0.8845**	**2.7500e-003**	**0.2662**	**1.7700e-003**	**0.2680**	**0.0706**	**1.6300e-003**	**0.0723**		**274.2225**	**274.2225**	**6.4800e-003**		**274.3844**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

	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	3.4132	19.8042	30.7548	0.1194	7.9180	0.0991	8.0171	2.1254	0.0932	2.2186		12,147.8394	12,147.8394	0.6270		12,163.5154
Unmitigated	3.5817	21.0878	34.5246	0.1358	9.1579	0.1124	9.2704	2.4582	0.1058	2.5640		13,809.9731	13,809.9731	0.6792		13,826.9522

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,629.25	1,565.55	1435.70	4,179,131	3,613,299
Total	1,629.25	1,565.55	1,435.70	4,179,131	3,613,299

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
Apartments Mid Rise	10.00	5.00	7.00	46.00	13.00	41.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.520277	0.038864	0.193543	0.118146	0.022917	0.005635	0.034518	0.053912	0.001336	0.002070	0.007104	0.000691	0.000987

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	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	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993
NaturalGas Unmitigated	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993

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					
Apartments Mid Rise	5799.08	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993
Total		**0.0625**	**0.5344**	**0.2274**	**3.4100e-003**		**0.0432**	**0.0432**		**0.0432**	**0.0432**		**682.2450**	**682.2450**	**0.0131**	**0.0125**	**686.2993**

5.2 Energy by Land Use - NaturalGas

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					
Apartments Mid Rise	5.79908	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993
Total		**0.0625**	**0.5344**	**0.2274**	**3.4100e-003**		**0.0432**	**0.0432**		**0.0432**	**0.0432**		**682.2450**	**682.2450**	**0.0131**	**0.0125**	**686.2993**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

	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	8.9821	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117	0.0000	36.3953	36.3953	0.0353	0.0000	37.2771
Unmitigated	8.9821	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117	0.0000	36.3953	36.3953	0.0353	0.0000	37.2771

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	1.1556					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.2127					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.6138	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117		36.3953	36.3953	0.0353		37.2771
Total	**8.9821**	**0.2338**	**20.2567**	**1.0700e-003**		**0.1117**	**0.1117**		**0.1117**	**0.1117**	**0.0000**	**36.3953**	**36.3953**	**0.0353**	**0.0000**	**37.2771**

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	1.1556					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.2127					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.6138	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117		36.3953	36.3953	0.0353		37.2771
Total	**8.9821**	**0.2338**	**20.2567**	**1.0700e-003**		**0.1117**	**0.1117**		**0.1117**	**0.1117**	**0.0000**	**36.3953**	**36.3953**	**0.0353**	**0.0000**	**37.2771**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

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

Casa Dei Vista Apartments (File No. 18-200

Yolo/Solano AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	245.00	Dwelling Unit	14.41	337,043.00	701

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	6.8	**Precipitation Freq (Days)**	55
Climate Zone	4			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

On-road Fugitive Dust - 100% of roadways assumed to be paved.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	240.00
tblConstructionPhase	NumDays	300.00	540.00
tblConstructionPhase	NumDays	30.00	20.00
tblConstructionPhase	NumDays	20.00	24.00
tblConstructionPhase	NumDays	10.00	5.00
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00

tblFireplaces	FireplaceWoodMass	4,558.40	0.00
tblFireplaces	NumberGas	134.75	0.00
tblFireplaces	NumberNoFireplace	24.50	0.00
tblFireplaces	NumberWood	85.75	0.00
tblGrading	AcresOfGrading	140.00	10.97
tblLandUse	LandUseSquareFeet	245,000.00	337,043.00
tblLandUse	LotAcreage	6.45	14.41
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	HaulingPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	VendorPercentPave	94.00	100.00

tblOnRoadDust	VendorPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblRoadDust	RoadPercentPave	94	100
tblTripsAndVMT	VendorTripNumber	26.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	3.00
tblTripsAndVMT	WorkerTripNumber	35.00	28.00
tblTripsAndVMT	WorkerTripNumber	35.00	28.00
tblWoodstoves	NumberCatalytic	12.25	0.00
tblWoodstoves	NumberNoncatalytic	12.25	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	4,558.40	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					
2019	11.6098	132.3789	81.3858	0.1539	7.4608	5.6514	13.1122	3.5930	5.1993	8.7923	0.0000	15,244.9729	15,244.9729	4.6863	0.0000	15,362.1296
2020	21.2226	26.6825	29.8700	0.0553	1.6051	1.4733	3.0784	0.4258	1.3870	1.8127	0.0000	5,336.9726	5,336.9726	1.0012	0.0000	5,362.0033
2021	20.8960	24.2777	29.1530	0.0548	1.6051	1.2826	2.8877	0.4258	1.2069	1.6327	0.0000	5,283.7010	5,283.7010	0.9876	0.0000	5,308.3901
Maximum	**21.2226**	**132.3789**	**81.3858**	**0.1539**	**7.4608**	**5.6514**	**13.1122**	**3.5930**	**5.1993**	**8.7923**	**0.0000**	**15,244.9729**	**15,244.9729**	**4.6863**	**0.0000**	**15,362.1296**

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					
2019	11.6098	132.3789	81.3858	0.1539	3.4325	5.6514	9.0839	1.5355	5.1993	6.7347	0.0000	15,244.9729	15,244.9729	4.6863	0.0000	15,362.1296
2020	21.2226	26.6825	29.8700	0.0553	1.6051	1.4733	3.0784	0.4258	1.3870	1.8127	0.0000	5,336.9726	5,336.9726	1.0012	0.0000	5,362.0033
2021	20.8960	24.2777	29.1530	0.0548	1.6051	1.2826	2.8877	0.4258	1.2069	1.6327	0.0000	5,283.7010	5,283.7010	0.9876	0.0000	5,308.3901
Maximum	**21.2226**	**132.3789**	**81.3858**	**0.1539**	**3.4325**	**5.6514**	**9.0839**	**1.5355**	**5.1993**	**6.7347**	**0.0000**	**15,244.9729**	**15,244.9729**	**4.6863**	**0.0000**	**15,362.1296**

	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**	**37.75**	**0.00**	**21.11**	**46.29**	**0.00**	**16.81**	**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	8.9821	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117	0.0000	36.3953	36.3953	0.0353	0.0000	37.2771
Energy	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993
Mobile	2.9046	21.9806	33.7636	0.1248	9.1579	0.1147	9.2726	2.4582	0.1080	2.5662		12,701.5385	12,701.5385	0.7091		12,719.2659
Total	**11.9492**	**22.7489**	**54.2478**	**0.1293**	**9.1579**	**0.2696**	**9.4275**	**2.4582**	**0.2628**	**2.7211**	**0.0000**	**13,420.1788**	**13,420.1788**	**0.7575**	**0.0125**	**13,442.8422**

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	8.9821	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117	0.0000	36.3953	36.3953	0.0353	0.0000	37.2771
Energy	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993
Mobile	2.7390	20.5409	30.5637	0.1097	7.9180	0.1014	8.0193	2.1254	0.0954	2.2208		11,166.2398	11,166.2398	0.6600		11,182.7385
Total	**11.7836**	**21.3092**	**51.0478**	**0.1142**	**7.9180**	**0.2562**	**8.1742**	**2.1254**	**0.2503**	**2.3757**	**0.0000**	**11,884.8802**	**11,884.8802**	**0.7083**	**0.0125**	**11,906.3148**

	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	**1.39**	**6.33**	**5.90**	**11.68**	**13.54**	**4.95**	**13.29**	**13.54**	**4.78**	**12.69**	**0.00**	**11.44**	**11.44**	**6.49**	**0.00**	**11.43**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/31/2019	6/6/2019	5	5	
2	Rough Grading	Grading	6/10/2019	7/5/2019	5	20	
3	Wet/Dry Utilities	Trenching	6/24/2019	9/13/2019	5	60	
4	Building Construction	Building Construction	8/19/2019	9/10/2021	5	540	
5	Paving	Paving	9/16/2019	10/17/2019	5	24	
6	Architectural Coating	Architectural Coating	10/12/2020	9/10/2021	5	240	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 682,512; Residential Outdoor: 227,504; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Rough Grading	Excavators	3	8.00	158	0.38
Rough Grading	Graders	2	8.00	187	0.41
Rough Grading	Rubber Tired Dozers	1	8.00	247	0.40
Rough Grading	Scrapers	6	8.00	367	0.48
Rough Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Wet/Dry Utilities	Rubber Tired Dozers	1	8.00	247	0.40
Wet/Dry Utilities	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Pavers	1	8.00	130	0.42
Building Construction	Paving Equipment	2	8.00	132	0.36
Building Construction	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Air Compressors	1	6.00	78	0.48
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	6	8.00	80	0.38
Paving	Rubber Tired Dozers	1	8.00	247	0.40
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Site Preparation	5	3.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Rough Grading	14	28.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Rough Grading	14	28.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Wet/Dry Utilities	3	8.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	11	176.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	11	28.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	35.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2019

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					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102			0.0000			0.0000
Off-Road	2.0658	21.4239	13.4948	0.0210		1.2129	1.2129		1.1159	1.1159		2,075.5959	2,075.5959	0.6567		2,092.0133
Total	**2.0658**	**21.4239**	**13.4948**	**0.0210**	**6.0221**	**1.2129**	**7.2350**	**3.3102**	**1.1159**	**4.4261**		**2,075.5959**	**2,075.5959**	**0.6567**		**2,092.0133**

3.2 Site Preparation - 2019

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	0.0123	9.0300e-003	0.0831	2.2000e-004	0.0228	1.6000e-004	0.0230	6.0500e-003	1.5000e-004	6.2000e-003		22.3327	22.3327	6.4000e-004		22.3487
Total	**0.0123**	**9.0300e-003**	**0.0831**	**2.2000e-004**	**0.0228**	**1.6000e-004**	**0.0230**	**6.0500e-003**	**1.5000e-004**	**6.2000e-003**		**22.3327**	**22.3327**	**6.4000e-004**		**22.3487**

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					2.3486	0.0000	2.3486	1.2910	0.0000	1.2910			0.0000			0.0000
Off-Road	2.0658	21.4239	13.4948	0.0210		1.2129	1.2129		1.1159	1.1159	0.0000	2,075.5959	2,075.5959	0.6567		2,092.0133
Total	**2.0658**	**21.4239**	**13.4948**	**0.0210**	**2.3486**	**1.2129**	**3.5615**	**1.2910**	**1.1159**	**2.4069**	**0.0000**	**2,075.5959**	**2,075.5959**	**0.6567**		**2,092.0133**

3.2 Site Preparation - 2019

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	0.0123	9.0300e-003	0.0831	2.2000e-004	0.0228	1.6000e-004	0.0230	6.0500e-003	1.5000e-004	6.2000e-003		22.3327	22.3327	6.4000e-004		22.3487
Total	**0.0123**	**9.0300e-003**	**0.0831**	**2.2000e-004**	**0.0228**	**1.6000e-004**	**0.0230**	**6.0500e-003**	**1.5000e-004**	**6.2000e-003**		**22.3327**	**22.3327**	**6.4000e-004**		**22.3487**

3.3 Rough Grading - 2019

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					6.6038	0.0000	6.6038	3.3730	0.0000	3.3730			0.0000			0.0000
Off-Road	9.7474	115.4370	70.7237	0.1344		4.7471	4.7471		4.3674	4.3674		13,308.0302	13,308.0302	4.2105		13,413.2932
Total	**9.7474**	**115.4370**	**70.7237**	**0.1344**	**6.6038**	**4.7471**	**11.3509**	**3.3730**	**4.3674**	**7.7404**		**13,308.0302**	**13,308.0302**	**4.2105**		**13,413.2932**

3.3 Rough Grading - 2019

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	0.2294	0.1686	1.5511	4.1900e-003	0.7962	2.9800e-003	0.7992	0.2039	2.7500e-003	0.2066		416.8767	416.8767	0.0120		417.1755
Total	**0.2294**	**0.1686**	**1.5511**	**4.1900e-003**	**0.7962**	**2.9800e-003**	**0.7992**	**0.2039**	**2.7500e-003**	**0.2066**		**416.8767**	**416.8767**	**0.0120**		**417.1755**

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					2.5755	0.0000	2.5755	1.3155	0.0000	1.3155			0.0000			0.0000
Off-Road	9.7474	115.4370	70.7237	0.1344		4.7471	4.7471		4.3674	4.3674	0.0000	13,308.0302	13,308.0302	4.2105		13,413.2932
Total	**9.7474**	**115.4370**	**70.7237**	**0.1344**	**2.5755**	**4.7471**	**7.3226**	**1.3155**	**4.3674**	**5.6829**	**0.0000**	**13,308.0302**	**13,308.0302**	**4.2105**		**13,413.2932**

3.3 Rough Grading - 2019

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	0.2294	0.1686	1.5511	4.1900e-003	0.7962	2.9800e-003	0.7992	0.2039	2.7500e-003	0.2066		416.8767	416.8767	0.0120		417.1755
Total	**0.2294**	**0.1686**	**1.5511**	**4.1900e-003**	**0.7962**	**2.9800e-003**	**0.7992**	**0.2039**	**2.7500e-003**	**0.2066**		**416.8767**	**416.8767**	**0.0120**		**417.1755**

3.4 Wet/Dry Utilities - 2019

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	1.6002	16.7492	8.8895	0.0147		0.9008	0.9008		0.8288	0.8288		1,460.5122	1,460.5122	0.4621		1,472.0645
Total	**1.6002**	**16.7492**	**8.8895**	**0.0147**		**0.9008**	**0.9008**		**0.8288**	**0.8288**		**1,460.5122**	**1,460.5122**	**0.4621**		**1,472.0645**

3.4 Wet/Dry Utilities - 2019

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	0.0328	0.0241	0.2216	6.0000e-004	0.0609	4.3000e-004	0.0613	0.0161	3.9000e-004	0.0165		59.5538	59.5538	1.7100e-003		59.5965
Total	**0.0328**	**0.0241**	**0.2216**	**6.0000e-004**	**0.0609**	**4.3000e-004**	**0.0613**	**0.0161**	**3.9000e-004**	**0.0165**		**59.5538**	**59.5538**	**1.7100e-003**		**59.5965**

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	1.6002	16.7492	8.8895	0.0147		0.9008	0.9008		0.8288	0.8288	0.0000	1,460.5122	1,460.5122	0.4621		1,472.0645
Total	**1.6002**	**16.7492**	**8.8895**	**0.0147**		**0.9008**	**0.9008**		**0.8288**	**0.8288**	**0.0000**	**1,460.5122**	**1,460.5122**	**0.4621**		**1,472.0645**

3.4 Wet/Dry Utilities - 2019

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	0.0328	0.0241	0.2216	6.0000e-004	0.0609	4.3000e-004	0.0613	0.0161	3.9000e-004	0.0165		59.5538	59.5538	1.7100e-003		59.5965
Total	**0.0328**	**0.0241**	**0.2216**	**6.0000e-004**	**0.0609**	**4.3000e-004**	**0.0613**	**0.0161**	**3.9000e-004**	**0.0165**		**59.5538**	**59.5538**	**1.7100e-003**		**59.5965**

3.5 Building Construction - 2019

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	2.8711	26.6713	23.0975	0.0371		1.5303	1.5303		1.4339	1.4339		3,594.6178	3,594.6178	0.9487		3,618.3349
Total	**2.8711**	**26.6713**	**23.0975**	**0.0371**		**1.5303**	**1.5303**		**1.4339**	**1.4339**		**3,594.6178**	**3,594.6178**	**0.9487**		**3,618.3349**

3.5 Building Construction - 2019

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	0.7210	0.5299	4.8748	0.0132	1.3388	9.3600e-003	1.3482	0.3551	8.6300e-003	0.3638		1,310.1840	1,310.1840	0.0376		1,311.1230
Total	**0.7210**	**0.5299**	**4.8748**	**0.0132**	**1.3388**	**9.3600e-003**	**1.3482**	**0.3551**	**8.6300e-003**	**0.3638**		**1,310.1840**	**1,310.1840**	**0.0376**		**1,311.1230**

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	2.8711	26.6713	23.0975	0.0371		1.5303	1.5303		1.4339	1.4339	0.0000	3,594.6178	3,594.6178	0.9487		3,618.3349
Total	**2.8711**	**26.6713**	**23.0975**	**0.0371**		**1.5303**	**1.5303**		**1.4339**	**1.4339**	**0.0000**	**3,594.6178**	**3,594.6178**	**0.9487**		**3,618.3349**

3.5 Building Construction - 2019

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	0.7210	0.5299	4.8748	0.0132	1.3388	9.3600e-003	1.3482	0.3551	8.6300e-003	0.3638		1,310.1840	1,310.1840	0.0376		1,311.1230
Total	**0.7210**	**0.5299**	**4.8748**	**0.0132**	**1.3388**	**9.3600e-003**	**1.3482**	**0.3551**	**8.6300e-003**	**0.3638**		**1,310.1840**	**1,310.1840**	**0.0376**		**1,311.1230**

3.5 Building Construction - 2020

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	2.6141	24.4370	22.8208	0.0371		1.3514	1.3514		1.2659	1.2659		3,534.2191	3,534.2191	0.9402		3,557.7236
Total	**2.6141**	**24.4370**	**22.8208**	**0.0371**		**1.3514**	**1.3514**		**1.2659**	**1.2659**		**3,534.2191**	**3,534.2191**	**0.9402**		**3,557.7236**

3.5 Building Construction - 2020

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	0.6603	0.4685	4.3523	0.0127	1.3388	9.1400e-003	1.3480	0.3551	8.4300e-003	0.3636		1,268.9562	1,268.9562	0.0327		1,269.7748
Total	**0.6603**	**0.4685**	**4.3523**	**0.0127**	**1.3388**	**9.1400e-003**	**1.3480**	**0.3551**	**8.4300e-003**	**0.3636**		**1,268.9562**	**1,268.9562**	**0.0327**		**1,269.7748**

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	2.6141	24.4370	22.8208	0.0371		1.3514	1.3514		1.2659	1.2659	0.0000	3,534.2191	3,534.2191	0.9402		3,557.7236
Total	**2.6141**	**24.4370**	**22.8208**	**0.0371**		**1.3514**	**1.3514**		**1.2659**	**1.2659**	**0.0000**	**3,534.2191**	**3,534.2191**	**0.9402**		**3,557.7236**

3.5 Building Construction - 2020

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	0.6603	0.4685	4.3523	0.0127	1.3388	9.1400e-003	1.3480	0.3551	8.4300e-003	0.3636		1,268.9562	1,268.9562	0.0327		1,269.7748
Total	**0.6603**	**0.4685**	**4.3523**	**0.0127**	**1.3388**	**9.1400e-003**	**1.3480**	**0.3551**	**8.4300e-003**	**0.3636**		**1,268.9562**	**1,268.9562**	**0.0327**		**1,269.7748**

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	2.3674	22.2488	22.5851	0.0371		1.1779	1.1779		1.1030	1.1030		3,534.0486	3,534.0486	0.9332		3,557.3783
Total	**2.3674**	**22.2488**	**22.5851**	**0.0371**		**1.1779**	**1.1779**		**1.1030**	**1.1030**		**3,534.0486**	**3,534.0486**	**0.9332**		**3,557.3783**

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	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	0.6131	0.4187	3.9624	0.0123	1.3388	8.8800e-003	1.3477	0.3551	8.1800e-003	0.3633		1,224.6633	1,224.6633	0.0293		1,225.3945
Total	**0.6131**	**0.4187**	**3.9624**	**0.0123**	**1.3388**	**8.8800e-003**	**1.3477**	**0.3551**	**8.1800e-003**	**0.3633**		**1,224.6633**	**1,224.6633**	**0.0293**		**1,225.3945**

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	2.3674	22.2488	22.5851	0.0371		1.1779	1.1779		1.1030	1.1030	0.0000	3,534.0486	3,534.0486	0.9332		3,557.3783
Total	**2.3674**	**22.2488**	**22.5851**	**0.0371**		**1.1779**	**1.1779**		**1.1030**	**1.1030**	**0.0000**	**3,534.0486**	**3,534.0486**	**0.9332**		**3,557.3783**

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	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	0.6131	0.4187	3.9624	0.0123	1.3388	8.8800e-003	1.3477	0.3551	8.1800e-003	0.3633		1,224.6633	1,224.6633	0.0293		1,225.3945
Total	**0.6131**	**0.4187**	**3.9624**	**0.0123**	**1.3388**	**8.8800e-003**	**1.3477**	**0.3551**	**8.1800e-003**	**0.3633**		**1,224.6633**	**1,224.6633**	**0.0293**		**1,225.3945**

3.6 Paving - 2019

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	3.4739	34.9928	25.5177	0.0401		1.9784	1.9784		1.8304	1.8304		3,957.1159	3,957.1159	1.1867		3,986.7837
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.4739**	**34.9928**	**25.5177**	**0.0401**		**1.9784**	**1.9784**		**1.8304**	**1.8304**		**3,957.1159**	**3,957.1159**	**1.1867**		**3,986.7837**

3.6 Paving - 2019

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	0.1147	0.0843	0.7755	2.0900e-003	0.2130	1.4900e-003	0.2145	0.0565	1.3700e-003	0.0579		208.4384	208.4384	5.9800e-003		208.5878
Total	**0.1147**	**0.0843**	**0.7755**	**2.0900e-003**	**0.2130**	**1.4900e-003**	**0.2145**	**0.0565**	**1.3700e-003**	**0.0579**		**208.4384**	**208.4384**	**5.9800e-003**		**208.5878**

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	3.4739	34.9928	25.5177	0.0401		1.9784	1.9784		1.8304	1.8304	0.0000	3,957.1159	3,957.1159	1.1867		3,986.7837
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.4739**	**34.9928**	**25.5177**	**0.0401**		**1.9784**	**1.9784**		**1.8304**	**1.8304**	**0.0000**	**3,957.1159**	**3,957.1159**	**1.1867**		**3,986.7837**

3.6 Paving - 2019

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	0.1147	0.0843	0.7755	2.0900e-003	0.2130	1.4900e-003	0.2145	0.0565	1.3700e-003	0.0579		208.4384	208.4384	5.9800e-003		208.5878
Total	**0.1147**	**0.0843**	**0.7755**	**2.0900e-003**	**0.2130**	**1.4900e-003**	**0.2145**	**0.0565**	**1.3700e-003**	**0.0579**		**208.4384**	**208.4384**	**5.9800e-003**		**208.5878**

3.7 Architectural Coating - 2020

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	17.5747					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**17.8169**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

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	0.1313	0.0932	0.8655	2.5300e-003	0.2662	1.8200e-003	0.2681	0.0706	1.6800e-003	0.0723		252.3493	252.3493	6.5100e-003		252.5120
Total	**0.1313**	**0.0932**	**0.8655**	**2.5300e-003**	**0.2662**	**1.8200e-003**	**0.2681**	**0.0706**	**1.6800e-003**	**0.0723**		**252.3493**	**252.3493**	**6.5100e-003**		**252.5120**

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	17.5747					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**17.8169**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

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	0.1313	0.0932	0.8655	2.5300e-003	0.2662	1.8200e-003	0.2681	0.0706	1.6800e-003	0.0723		252.3493	252.3493	6.5100e-003		252.5120
Total	**0.1313**	**0.0932**	**0.8655**	**2.5300e-003**	**0.2662**	**1.8200e-003**	**0.2681**	**0.0706**	**1.6800e-003**	**0.0723**		**252.3493**	**252.3493**	**6.5100e-003**		**252.5120**

3.7 Architectural Coating - 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					
Archit. Coating	17.5747					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**17.7936**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.7 Architectural Coating - 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	0.1219	0.0833	0.7880	2.4400e-003	0.2662	1.7700e-003	0.2680	0.0706	1.6300e-003	0.0723		243.5410	243.5410	5.8200e-003		243.6864
Total	**0.1219**	**0.0833**	**0.7880**	**2.4400e-003**	**0.2662**	**1.7700e-003**	**0.2680**	**0.0706**	**1.6300e-003**	**0.0723**		**243.5410**	**243.5410**	**5.8200e-003**		**243.6864**

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	17.5747					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**17.7936**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.7 Architectural Coating - 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	0.1219	0.0833	0.7880	2.4400e-003	0.2662	1.7700e-003	0.2680	0.0706	1.6300e-003	0.0723		243.5410	243.5410	5.8200e-003		243.6864
Total	**0.1219**	**0.0833**	**0.7880**	**2.4400e-003**	**0.2662**	**1.7700e-003**	**0.2680**	**0.0706**	**1.6300e-003**	**0.0723**		**243.5410**	**243.5410**	**5.8200e-003**		**243.6864**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

	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	2.7390	20.5409	30.5637	0.1097	7.9180	0.1014	8.0193	2.1254	0.0954	2.2208		11,166.2398	11,166.2398	0.6600		11,182.7385
Unmitigated	2.9046	21.9806	33.7636	0.1248	9.1579	0.1147	9.2726	2.4582	0.1080	2.5662		12,701.5385	12,701.5385	0.7091		12,719.2659

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,629.25	1,565.55	1435.70	4,179,131	3,613,299
Total	1,629.25	1,565.55	1,435.70	4,179,131	3,613,299

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
Apartments Mid Rise	10.00	5.00	7.00	46.00	13.00	41.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.520277	0.038864	0.193543	0.118146	0.022917	0.005635	0.034518	0.053912	0.001336	0.002070	0.007104	0.000691	0.000987

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	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	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993
NaturalGas Unmitigated	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993

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					
Apartments Mid Rise	5799.08	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993
Total		**0.0625**	**0.5344**	**0.2274**	**3.4100e-003**		**0.0432**	**0.0432**		**0.0432**	**0.0432**		**682.2450**	**682.2450**	**0.0131**	**0.0125**	**686.2993**

5.2 Energy by Land Use - NaturalGas

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					
Apartments Mid Rise	5.79908	0.0625	0.5344	0.2274	3.4100e-003		0.0432	0.0432		0.0432	0.0432		682.2450	682.2450	0.0131	0.0125	686.2993
Total		**0.0625**	**0.5344**	**0.2274**	**3.4100e-003**		**0.0432**	**0.0432**		**0.0432**	**0.0432**		**682.2450**	**682.2450**	**0.0131**	**0.0125**	**686.2993**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

	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	8.9821	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117	0.0000	36.3953	36.3953	0.0353	0.0000	37.2771
Unmitigated	8.9821	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117	0.0000	36.3953	36.3953	0.0353	0.0000	37.2771

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	1.1556					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.2127					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.6138	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117		36.3953	36.3953	0.0353		37.2771
Total	**8.9821**	**0.2338**	**20.2567**	**1.0700e-003**		**0.1117**	**0.1117**		**0.1117**	**0.1117**	**0.0000**	**36.3953**	**36.3953**	**0.0353**	**0.0000**	**37.2771**

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	1.1556					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.2127					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.6138	0.2338	20.2567	1.0700e-003		0.1117	0.1117		0.1117	0.1117		36.3953	36.3953	0.0353		37.2771
Total	**8.9821**	**0.2338**	**20.2567**	**1.0700e-003**		**0.1117**	**0.1117**		**0.1117**	**0.1117**	**0.0000**	**36.3953**	**36.3953**	**0.0353**	**0.0000**	**37.2771**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

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

Casa Dei Vista Apartments (File No. 18-200

Yolo/Solano AQMD Air District, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rough Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wet/Dry Utilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Air Compressors	Diesel	No Change	0	2	No Change	0.00
Excavators	Diesel	No Change	0	3	No Change	0.00
Cranes	Diesel	No Change	0	1	No Change	0.00
Forklifts	Diesel	No Change	0	3	No Change	0.00
Graders	Diesel	No Change	0	2	No Change	0.00
Pavers	Diesel	No Change	0	2	No Change	0.00
Rollers	Diesel	No Change	0	6	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	4	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	10	No Change	0.00
Generator Sets	Diesel	No Change	0	1	No Change	0.00
Paving Equipment	Diesel	No Change	0	4	No Change	0.00
Scrapers	Diesel	No Change	0	6	No Change	0.00
Welders	Diesel	No Change	0	1	No Change	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Unmitigated tons/yr						Unmitigated mt/yr					
Air Compressors	3.01500E-002	2.09880E-001	2.40610E-001	3.90000E-004	1.33300E-002	1.33300E-002	0.00000E+000	3.37030E+001	3.37030E+001	2.43000E-003	0.00000E+000	3.37636E+001
Cranes	1.06060E-001	1.25693E+000	4.96800E-001	1.36000E-003	5.18700E-002	4.77200E-002	0.00000E+000	1.20236E+002	1.20236E+002	3.87300E-002	0.00000E+000	1.21204E+002
Excavators	7.82000E-003	8.04600E-002	9.79000E-002	1.50000E-004	3.88000E-003	3.57000E-003	0.00000E+000	1.39106E+001	1.39106E+001	4.40000E-003	0.00000E+000	1.40206E+001
Forklifts	1.14980E-001	1.03787E+000	9.54670E-001	1.24000E-003	7.68100E-002	7.06700E-002	0.00000E+000	1.09210E+002	1.09210E+002	3.51800E-002	0.00000E+000	1.10090E+002
Generator Sets	1.06160E-001	9.25460E-001	9.99460E-001	1.78000E-003	5.18400E-002	5.18400E-002	0.00000E+000	1.52606E+002	1.52606E+002	8.52000E-003	0.00000E+000	1.52819E+002
Graders	9.73000E-003	1.31590E-001	3.67600E-002	1.30000E-004	4.22000E-003	3.89000E-003	0.00000E+000	1.19318E+001	1.19318E+001	3.78000E-003	0.00000E+000	1.20262E+001
Pavers	7.41000E-002	7.92040E-001	8.18110E-001	1.33000E-003	3.85000E-002	3.54200E-002	0.00000E+000	1.17014E+002	1.17014E+002	3.76700E-002	0.00000E+000	1.17956E+002
Paving Equipment	1.14880E-001	1.18526E+000	1.42934E+000	2.30000E-003	5.89500E-002	5.42300E-002	0.00000E+000	2.02814E+002	2.02814E+002	6.52800E-002	0.00000E+000	2.04446E+002
Rollers	1.63100E-002	1.61340E-001	1.37320E-001	1.90000E-004	1.06100E-002	9.76000E-003	0.00000E+000	1.69618E+001	1.69618E+001	5.37000E-003	0.00000E+000	1.70960E+001
Rubber Tired Dozers	6.18400E-002	6.58060E-001	2.33480E-001	4.60000E-004	3.20900E-002	2.95200E-002	0.00000E+000	4.17993E+001	4.17993E+001	1.32200E-002	0.00000E+000	4.21299E+001
Scrapers	6.39200E-002	7.74830E-001	4.83690E-001	9.10000E-004	3.03600E-002	2.79300E-002	0.00000E+000	8.16365E+001	8.16365E+001	2.58300E-002	0.00000E+000	8.22823E+001
Tractors/Loaders/ Backhoes	1.18400E-001	1.19160E+000	1.28327E+000	1.75000E-003	7.55100E-002	6.94700E-002	0.00000E+000	1.54573E+002	1.54573E+002	4.96500E-002	0.00000E+000	1.55814E+002
Welders	9.08800E-002	4.21180E-001	4.74680E-001	6.90000E-004	2.29200E-002	2.29200E-002	0.00000E+000	5.08196E+001	5.08196E+001	7.39000E-003	0.00000E+000	5.10043E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Mitigated tons/yr						Mitigated mt/yr					
Air Compressors	3.01500E-002	2.09880E-001	2.40610E-001	3.90000E-004	1.33300E-002	1.33300E-002	0.00000E+000	3.37029E+001	3.37029E+001	2.43000E-003	0.00000E+000	3.37636E+001
Cranes	1.06060E-001	1.25693E+000	4.96800E-001	1.36000E-003	5.18700E-002	4.77200E-002	0.00000E+000	1.20236E+002	1.20236E+002	3.87300E-002	0.00000E+000	1.21204E+002
Excavators	7.82000E-003	8.04600E-002	9.79000E-002	1.50000E-004	3.88000E-003	3.57000E-003	0.00000E+000	1.39105E+001	1.39105E+001	4.40000E-003	0.00000E+000	1.40206E+001
Forklifts	1.14980E-001	1.03787E+000	9.54670E-001	1.24000E-003	7.68100E-002	7.06700E-002	0.00000E+000	1.09210E+002	1.09210E+002	3.51800E-002	0.00000E+000	1.10090E+002
Generator Sets	1.06160E-001	9.25460E-001	9.99460E-001	1.78000E-003	5.18400E-002	5.18400E-002	0.00000E+000	1.52606E+002	1.52606E+002	8.52000E-003	0.00000E+000	1.52819E+002
Graders	9.73000E-003	1.31590E-001	3.67600E-002	1.30000E-004	4.22000E-003	3.89000E-003	0.00000E+000	1.19318E+001	1.19318E+001	3.78000E-003	0.00000E+000	1.20262E+001
Pavers	7.41000E-002	7.92040E-001	8.18110E-001	1.33000E-003	3.85000E-002	3.54200E-002	0.00000E+000	1.17014E+002	1.17014E+002	3.76700E-002	0.00000E+000	1.17956E+002
Paving Equipment	1.14880E-001	1.18526E+000	1.42934E+000	2.30000E-003	5.89500E-002	5.42300E-002	0.00000E+000	2.02814E+002	2.02814E+002	6.52800E-002	0.00000E+000	2.04446E+002
Rollers	1.63100E-002	1.61340E-001	1.37320E-001	1.90000E-004	1.06100E-002	9.76000E-003	0.00000E+000	1.69618E+001	1.69618E+001	5.37000E-003	0.00000E+000	1.70960E+001
Rubber Tired Dozers	6.18400E-002	6.58060E-001	2.33480E-001	4.60000E-004	3.20900E-002	2.95200E-002	0.00000E+000	4.17993E+001	4.17993E+001	1.32200E-002	0.00000E+000	4.21299E+001
Scrapers	6.39200E-002	7.74830E-001	4.83690E-001	9.10000E-004	3.03600E-002	2.79300E-002	0.00000E+000	8.16364E+001	8.16364E+001	2.58300E-002	0.00000E+000	8.22822E+001
Tractors/Loaders/Backhoes	1.18400E-001	1.19160E+000	1.28326E+000	1.75000E-003	7.55100E-002	6.94700E-002	0.00000E+000	1.54573E+002	1.54573E+002	4.96500E-002	0.00000E+000	1.55814E+002
Welders	9.08800E-002	4.21180E-001	4.74680E-001	6.90000E-004	2.29200E-002	2.29200E-002	0.00000E+000	5.08195E+001	5.08195E+001	7.39000E-003	0.00000E+000	5.10042E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.18684E-006	1.18684E-006	0.00000E+000	0.00000E+000	1.18471E-006
Cranes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.24755E-006	1.24755E-006	0.00000E+000	0.00000E+000	1.23758E-006
Excavators	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.43776E-006	1.43776E-006	0.00000E+000	0.00000E+000	1.42647E-006
Forklifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.19037E-006	1.19037E-006	0.00000E+000	0.00000E+000	1.18086E-006
Generator Sets	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.17951E-006	1.17951E-006	0.00000E+000	0.00000E+000	1.17786E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.67619E-006	1.67619E-006	0.00000E+000	0.00000E+000	8.31521E-007
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.19643E-006	1.19643E-006	0.00000E+000	0.00000E+000	1.18688E-006
Paving Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.18335E-006	1.18335E-006	0.00000E+000	0.00000E+000	1.17390E-006
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.17912E-006	1.17912E-006	0.00000E+000	0.00000E+000	1.16986E-006
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.19619E-006	1.19619E-006	0.00000E+000	0.00000E+000	1.18680E-006
Scrapers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.22494E-006	1.22494E-006	0.00000E+000	0.00000E+000	1.21533E-006
Tractors/Loaders/Backhoes	0.00000E+000	0.00000E+000	7.79259E-006	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.16450E-006	1.16450E-006	0.00000E+000	0.00000E+000	1.21940E-006
Welders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.18065E-006	1.18065E-006	0.00000E+000	0.00000E+000	1.17637E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
No	Replace Ground Cover of Area Disturbed	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
Yes	Water Exposed Area	PM10 Reduction	61.00	PM2.5 Reduction	61.00	Frequency (per day)	3.00

No	Unpaved Road Mitigation	Moisture Content %	0.50	Vehicle Speed (mph)	15.00		
No	Clean Paved Road	% PM Reduction	0.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Architectural Coating	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	Roads	1.96	0.20	1.96	0.20	0.00	0.00
Building Construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Roads	22.15	2.26	22.15	2.26	0.00	0.00
Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Roads	0.16	0.02	0.16	0.02	0.00	0.00
Rough Grading	Fugitive Dust	0.07	0.03	0.03	0.01	0.61	0.61
Rough Grading	Roads	0.52	0.05	0.52	0.05	0.00	0.00
Site Preparation	Fugitive Dust	0.02	0.01	0.01	0.00	0.61	0.61
Site Preparation	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Wet/Dry Utilities	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Wet/Dry Utilities	Roads	0.11	0.01	0.11	0.01	0.00	0.00

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	5.46	6.37	10.09	12.04	11.76	11.76	0.00	12.02	12.02	7.25	0.00	12.01
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	20.00	15.97	16.48	19.99	19.90	17.50
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting: Urban

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value
Yes	Land Use	Increase Density	0.00	22.30		
No	Land Use	Increase Diversity	-0.01	0.13		
No	Land Use	Improve Walkability Design	0.00			
No	Land Use	Improve Destination Accessibility	0.00			
No	Land Use	Increase Transit Accessibility	0.25			
No	Land Use	Integrate Below Market Rate Housing	0.00			
	Land Use	Land Use SubTotal	0.14			

No	Neighborhood Enhancements	Improve Pedestrian Network				
No	Neighborhood Enhancements	Provide Traffic Calming Measures				
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.00			
No	Parking Policy Pricing	Limit Parking Supply	0.00			
No	Parking Policy Pricing	Unbundle Parking Costs	0.00			
No	Parking Policy Pricing	On-street Market Pricing	0.00			
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00			
No	Transit Improvements	Expand Transit Network	0.00			
No	Transit Improvements	Increase Transit Frequency	0.00			
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.14			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"	7.70			
No	Commute	Workplace Parking Charge				
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	
No	Commute	Provide Ride Sharing Program	15.00			
	Commute	Commute Subtotal	0.00			

No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.14			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
Yes	Use Low VOC Paint (Residential Interior)	100.00
Yes	Use Low VOC Paint (Residential Exterior)	100.00
No	Use Low VOC Paint (Non-residential Interior)	150.00
No	Use Low VOC Paint (Non-residential Exterior)	150.00
No	Use Low VOC Paint (Parking)	150.00
No	% Electric Lawnmower	0.00
No	% Electric Leafblower	0.00
No	% Electric Chainsaw	0.00

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Exceed Title 24		
Yes	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy	0.00	0.00
No	Use Reclaimed Water	0.00	0.00
No	Use Grey Water	0.00	
Yes	Install low-flow bathroom faucet	32.00	
Yes	Install low-flow Kitchen faucet	18.00	
Yes	Install low-flow Toilet	20.00	
Yes	Install low-flow Shower	20.00	
No	Turf Reduction	0.00	
Yes	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape	0.00	0.00

Solid Waste Mitigation

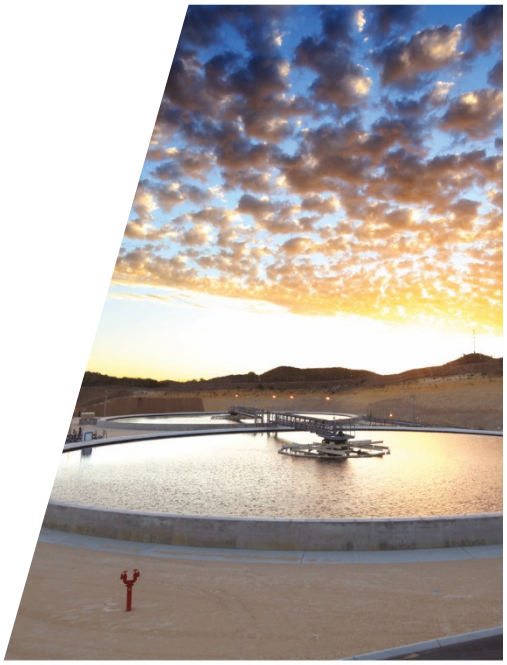
Mitigation Measures	Input Value

Institute Recycling and Composting Services Percent Reduction in Waste Disposed	

ATTACHMENT 7

TRAFFIC IMPACT STUDY

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Casa Del Vista Apartments

Traffic Impact Study

City of Vacaville

Final Version

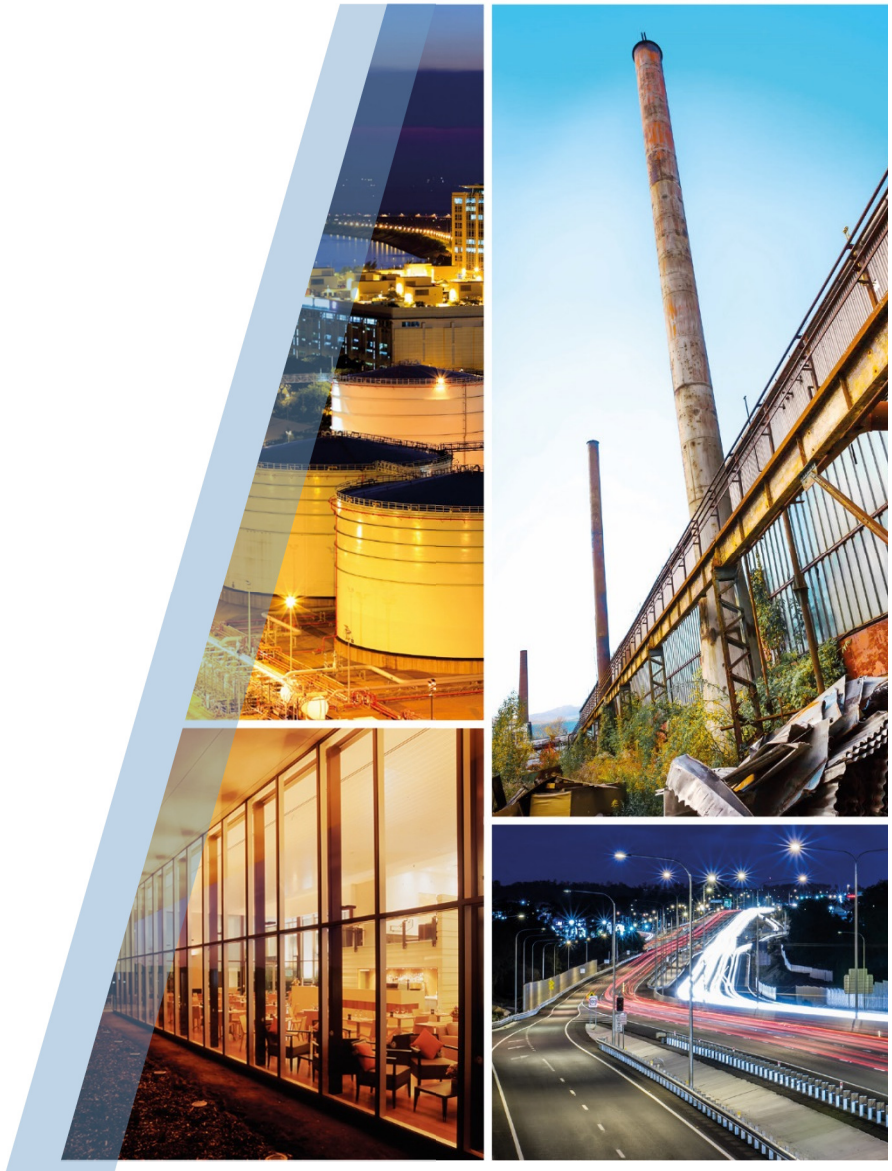


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Appendix A Turn Movement Counts
Appendix B Synchro Outputs
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1. Introduction

The City of Vacaville has retained GHD to provide a Traffic Impact Study (TIS) for the proposed Casa Del Vista Apartment Project (Project). The proposed Project will be located on an approximately 14.91 acre site at the southwest corner of the intersection of Travis Way and Allison Drive. Due to roadways and natural barriers, there are only 11.86 acres of buildable site area. The Project will consist of 252 dwelling units and 395 parking spaces.

The intent of this traffic impact study is to provide a traffic analysis for the proposed Project and determine the impacts attributed to the Project.

In addition to documenting the traffic operations of the *Existing* conditions within the Project vicinity, this traffic analysis evaluates the following scenarios:

- *Existing Plus Project* conditions
- *Short Term* conditions
- *Short Term Plus Project* conditions
- *Cumulative* conditions
- *Cumulative Plus Project* conditions

Existing conditions analyze the existing traffic operations at the study locations using Year 2018 peak hour turning movement counts and intersection configurations.

Existing Plus Project conditions analyze the *Existing* conditions with the proposed Project. Trips generated by the proposed Project are superimposed on the existing traffic counts and existing intersection configurations remain the same.

Short Term conditions analyze the scenario that exists following approximately ten years of development within the City of Vacaville. The ten years of growth was determined with a straight line interpolation between *Existing* and *Cumulative* traffic volumes.

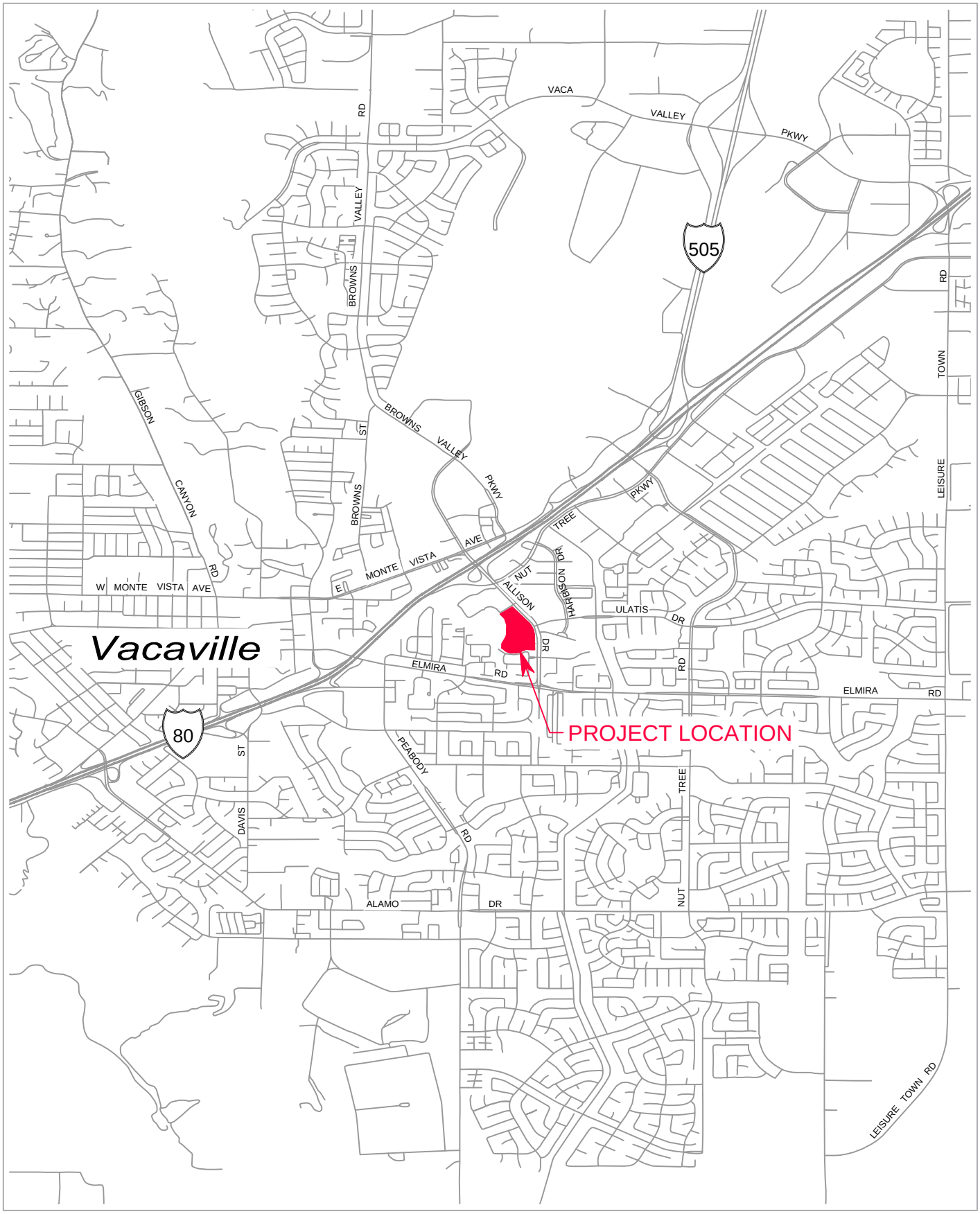
Short Term Plus Project conditions analyze the scenario in which traffic impacts associated with the Project are investigated in comparison to the *Short Term No Project* conditions.

Cumulative conditions analyze the scenario that exists following approximately 20 years of development within the City of Vacaville. The *Cumulative No Project* conditions evaluate traffic operations in Year 2035 excluding the proposed Project. The traffic volumes for Year 2035 were forecasted using the Vacaville Travel Demand Model (TDM) (provided by City Staff).

Cumulative Plus Project conditions analyze the scenario in which traffic impacts associated with the Project are investigated in comparison to the *Cumulative No Projects* conditions.

The above traffic scenarios are described in further detail and evaluated in subsequent sections of this report.

Figure 1 presents the Study Area Map.



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STUDY AREA MAP

Project No. **11145001**
Report No. **001**
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FIGURE 1

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2. Project Setting

The following section provides an overview of the project setting, transportation setting, and study intersections. The surrounding land uses include, but are not limited to, residential, commercial, & office buildings. The Vacaville Transportation Center is located across Allison Drive.

2.1 Transportation Setting

The following roadways provide primary circulation within the City of Vacaville and vicinity of the proposed Project.

Allison Drive is a major north-south 4-lane arterial roadway that traverses Vacaville between Browns Valley Parkway and Elmira Road. Within the study area, Allison Drive has a posted speed of 35 MPH.

E. Monte Vista Avenue is a major east-west arterial roadway that traverses Vacaville between Alamo Drive and Vaca Valley Parkway. E. Monte Vista Avenue is two lanes wide east of County Airport Road and four lanes wide west of County Airport Road. Within the study area, E. Monte Vista Avenue has a posted speed of 30 MPH.

Elmira Drive is a major east-west arterial roadway that traverses Vacaville between Leisure Town Road and the Interstate 80 under crossing. Elmira Drive is 4 lanes wide to the east of Allison Drive and 6 lanes wide to the west of Allison Drive. Within the study area, Elmira Drive has a posted speed of 40 MPH.

Ulatis Drive is an east-west 4-lane collector that traverses Vacaville between Leisure Town Road and Allison Drive. Within the study area, Ulatis Drive has a posted speed of 35 MPH when school is not in session.

2.1.1 Study Intersections

The following five (5) intersections were identified in coordination with the City of Vacaville staff for analysis:

1. Allison Drive & E. Monte Vista Avenue
2. Allison Drive & Travis Way
3. Allison Drive & Ulatis Drive
4. Allison Drive & Elmira Road
5. Ulatis Drive & Harbison Drive

2.2 Data Collection and Analysis

Weekday AM and PM peak hour intersection turning movement counts were collected at the five study intersections by GHD on Thursday, June 21st, 2018. No known special events were occurring in the area at the time of the traffic counts. Counts were obtained in the absence of inclement weather. Due to counts conducted during the summer time when area schools were not in session, intersection counts collected at nearby intersections while schools were in session (collected March 2016) were compared to counts taken while schools were not in session. This showed that the AM

peak hour counts were approximately 12% low and were adjusted accordingly. The PM peak hour counts were approximately 5% low and were adjusted accordingly.

Figure 2 presents the existing intersection lane geometrics and traffic controls. Figure 3 presents the existing weekday AM and PM peak hour volumes.

3. Level of Service Methodologies and Guidelines

The following section presents a summary of the general level of service (LOS) methodologies and guidelines used in the analysis of intersections.

3.1 General LOS Methodologies

Intersection level of service (LOS) was calculated for all control types (e.g. signalization, stop sign controlled) using the *Synchro 10.0* (Trafficware) integrated computer software program. LOS determinations are presented on a letter grade scale from "A" to "F", whereby LOS "A" represents "free-flow" conditions and LOS "F" represents over capacity conditions.

3.1.1 Intersection LOS Methodologies

For signalized intersections, intersection delays and LOS are average values for all intersection movements. Table 3.1 (page 7) presents the delay-based LOS criteria for different types of intersection control.

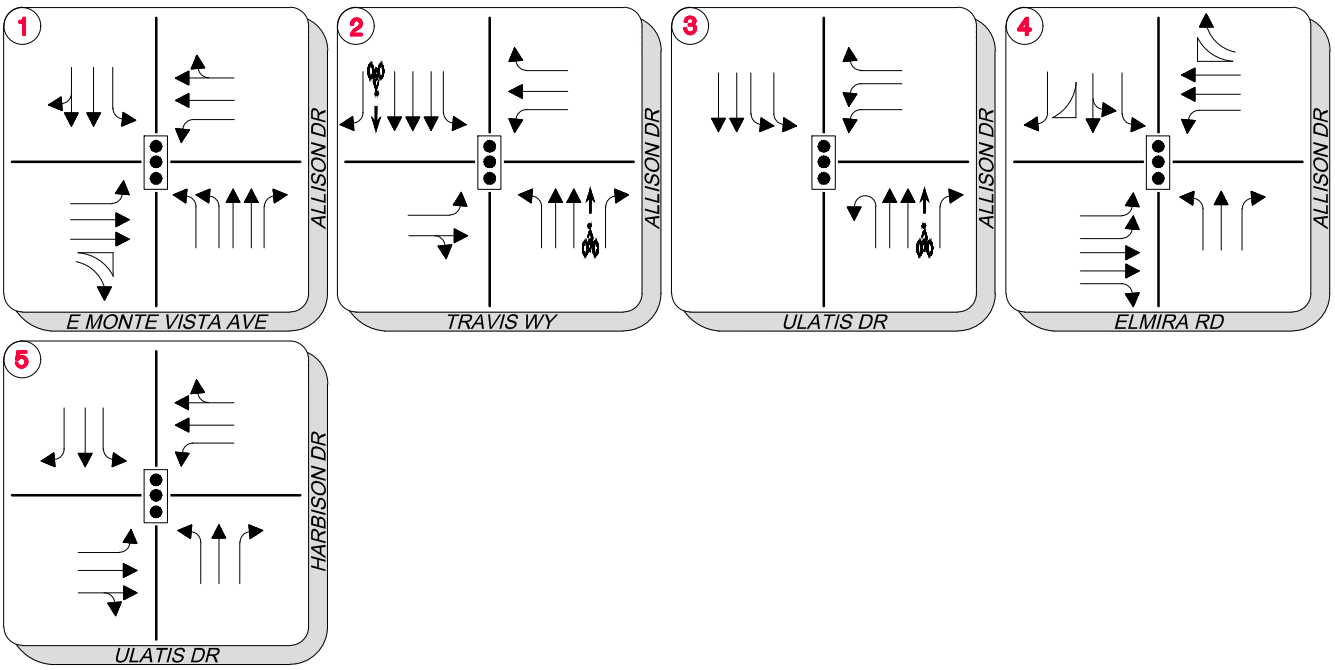
3.2 Agency LOS Guidelines and Policies

3.2.1 City of Vacaville LOS Guidelines

The City of Vacaville General Plan, adopted in August 2015, has the following policies relating to level of service and traffic congestion:

- **Policy TR-P3.1** Endeavor to maintain LOS C as the LOS goal at all intersections and interchanges to facilitate the safe and efficient movement of people, goods, and services. Strive to design improvements to provide a LOS goal of C, based on the City's most recent 20+ year traffic forecast including signalized and unsignalized intersections.
- **Policy TR-P3.2** At signalized and all-way stop control intersections, LOS mid-D shall be the LOS significance threshold. At two-way stop control intersections, LOS D shall be the LOS significance threshold.

Consistent with City policy and the General Plan, this study will consider LOS "Mid-D" (less than 45 seconds of delay) as the standard acceptable threshold for the intersection service levels, as all intersections are within City jurisdiction.

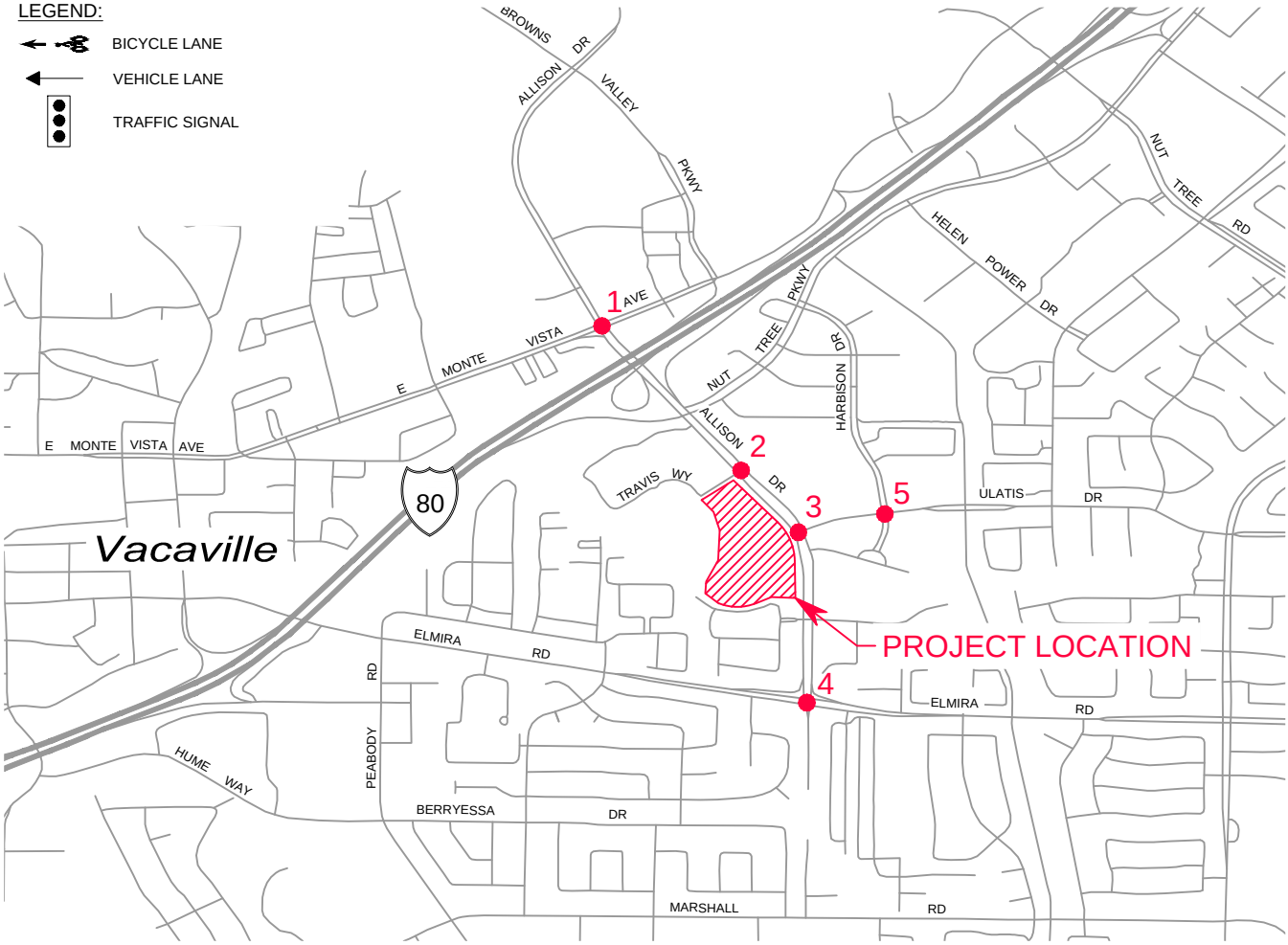


LEGEND:

BICYCLE LANE

VEHICLE LANE

TRAFFIC SIGNAL



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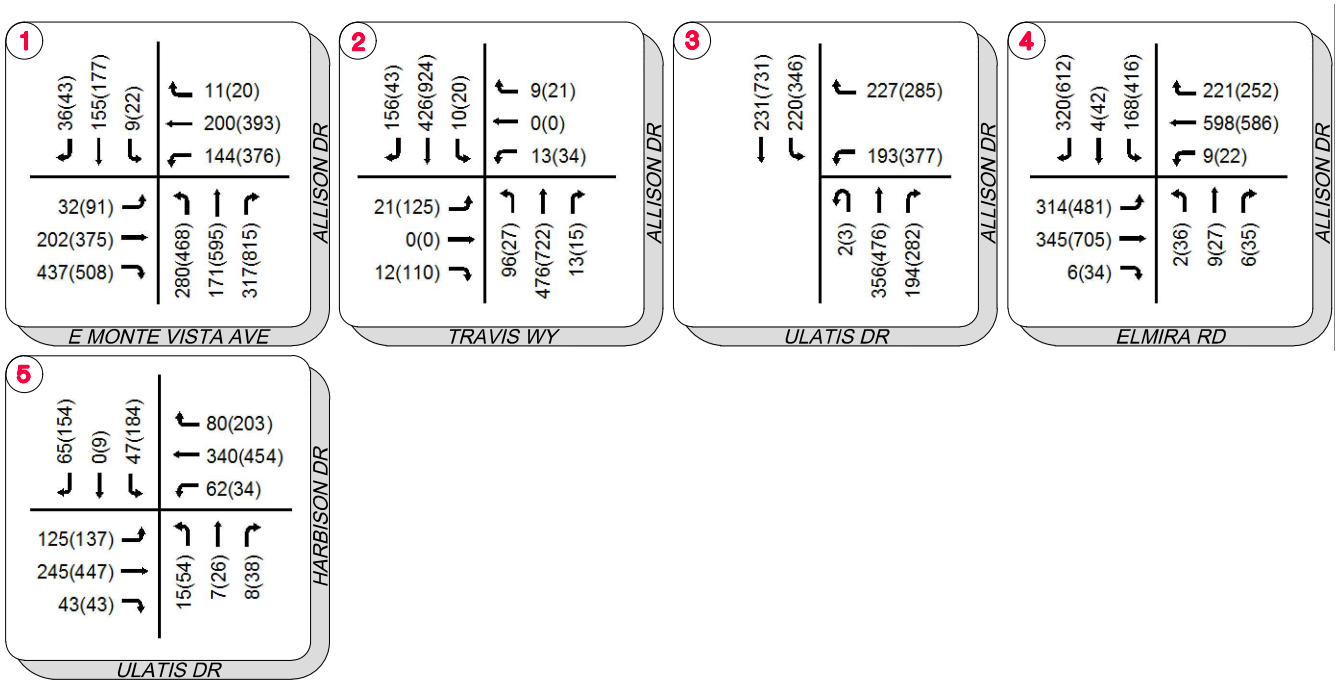
EXISTING LANE
GEOMETRICS AND CONTROL

Project No. **11145001**
Report No. **001**
Date **August 2018**

FIGURE 2

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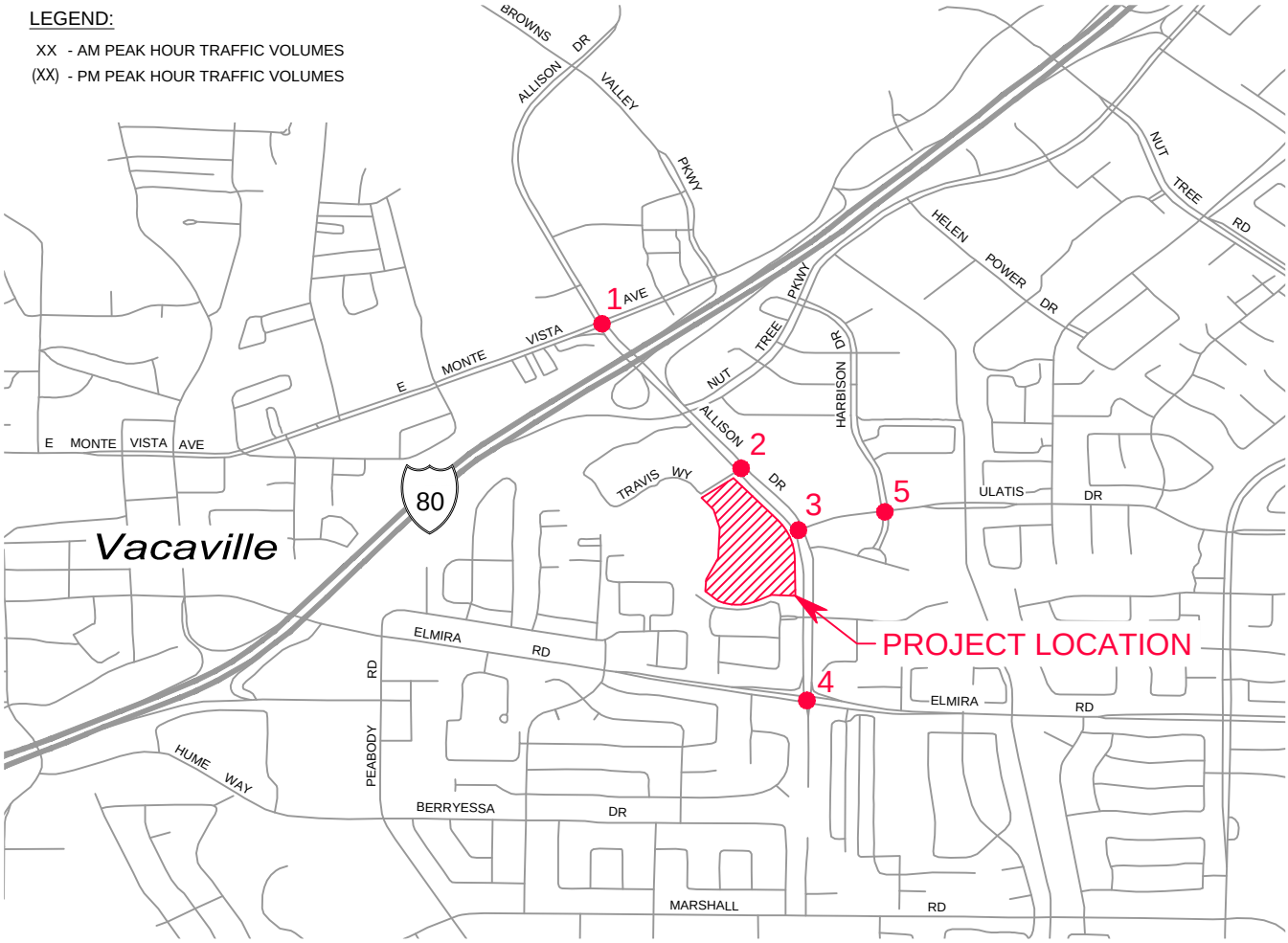
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LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES



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EXISTING
PEAK HOUR TRAFFIC VOLUMES

Project No. **11145001**
Report No. **001**
Date **August 2018**

FIGURE 3

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Table 3.1 – Level of Service (LOS) Criteria for Intersections

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle (sec)	
				Signalized/ Roundabouts	Unsignalized/ All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	< 10.0	< 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10 and ≤ 20.0	>10 and ≤ 15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>20 and ≤ 35.0	>15 and ≤ 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35 and ≤ 55.0	>25 and ≤ 35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55 and ≤ 80.0	>35 and ≤ 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 80.0	> 50.0

References: Highway Capacity Manual 6th Edition

3.3 Intersection Operation Analysis Software

The Synchro 10 (Trafficware) software suite was used to implement the LOS analysis for signalized intersections analyzed within this study. All study intersections were analyzed as signalized intersections. No non-standard geometrics were found at any of the study intersections.

3.4 Significance Thresholds

The following thresholds of significance are used to determine if the proposed Project causes a significant impact and requires mitigation:

3.4.1 Signalized Intersections

- The Project causes the intersection's acceptable LOS to decline to an unacceptable LOS; or
- The Project increases the average delay for all approaches by more than 5 seconds per vehicle at an intersection that has an unacceptable LOS without the Project.

3.5 Technical Analysis Parameters

This TIS provides evaluation of traffic operating conditions by incorporating appropriate heavy vehicle adjustment factors, peak hour factors, and signal timings and reports the resulting intersection delays and LOS as estimated using *Synchro 10.0*. The following section describes all technical parameters incorporated into intersection analysis.

Table 3.2 presents technical parameters which were applied to study intersections during the analysis.

Table 3.2 – Intersection LOS: Technical Analysis Parameters

Technical Parameters[1, 2, 3]	Assumption
% Trucks	Intersection Overall, based on Exisiting Counts, min. 2%
PHF for Existing & Short Term	Intersection Overall, based on Exisiting Counts
PHF for Future Conditions	Intersection Overall, 0.92 or higher
Signal Timings	Based on City's timing plans
Grade	2% or less at all intersections

Notes:

1) Parameters apply to all study intersection unless specifically indicated otherwise

2) All parameters are same for existing as well as 2035 conditions

3) Computer software defaults will be used for all parameters not listed

4. Existing Conditions

The *Existing* conditions is the analysis scenario in which current operations at study locations are analyzed and establishes the baseline traffic conditions.

4.1 Intersection Operations

Existing weekday AM and PM peak hour intersection traffic operations were quantified utilizing the existing traffic volumes, signal timings, and intersection lane geometrics and control. Table 4.1 presents intersection operations for the *Existing* conditions.

Table 4.1 – Existing Intersection Operations

#	Intersection	Control Type[1]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	Allison Dr & E. Monte Vista Ave	Signal	mid-D	21.7	C	36.3	mid-D
2	Allison Dr & Travis Way	Signal	mid-D	6.7	A	9.4	A
3	Allison Dr & Ulatis Dr	Signal	mid-D	12.0	B	13.4	B
4	Allison Dr & Elmira Rd	Signal	mid-D	17.8	B	28.5	C
5	Ulatis Dr & Harbison Dr	Signal	mid-D	16.1	B	23.4	C

Notes:
1. LOS = Delay based on average of all approaches for Signal

As presented in Table 4.1, all study intersections are currently found to operate at or above the threshold LOS.

5. Project Description

For analysis purposes, the proposed Project will be completed in a single phase. The term "Project", as used in this report, refers to the development as follows:

- Location: Approximately 14.91 acre site located at the southwestern corner of the intersection of Travis Way and Allison Drive.
- Land Use Quantities
    - 252 Dwelling Units of Multifamily Residential Housing
- Project Driveways
    - One Full-Access Driveway at Allison Drive & Ulatis Drive (added as the eastbound approach)
    - One Exit-Only Driveway along Travis Way

5.1 Project Trip Generation

Project trip generation forecasts were derived using the Institute of Transportation Engineers (ITE) *Trip Generation Manual 10th Edition* fitted-curve equations. Table 5.1 presents a summary of the land use and quantities for the proposed project, along with the corresponding ITE land use code from which trip generation characteristics were established.

Table 5.1 – Proposed Project Trip Generation

Land Use Category (ITE Code)	Unit[1]	Daily Trip Rate/Unit[2]	AM Peak Hour Trip Rate/Unit			PM Peak Hour Trip Rate/Unit		
			Total	In %	Out %	Total	In %	Out %
Multifamily Housing (220)	DU	7.40	0.46	23%	77%	0.53	63%	37%
Casa Del Vista	**Quantity (Units)**	**Daily Trips**	**AM Peak Hour Trips**			**PM Peak Hour Trips**		
			Total	**In**	**Out**	**Total**	**In**	**Out**
Apartments	252	1,864	115	27	88	134	84	50
Net New Project Trips		**1,864**	**115**	**27**	**88**	**134**	**84**	**50**

Notes:
1. DU = dwelling unit
2. Trip rates based on ITE Trip Generation Manual 10th edition fitted-curve equations

As presented in Table 5.1, the proposed project is projected to generate 115 AM and 134 PM weekday peak hour trips within the study area.

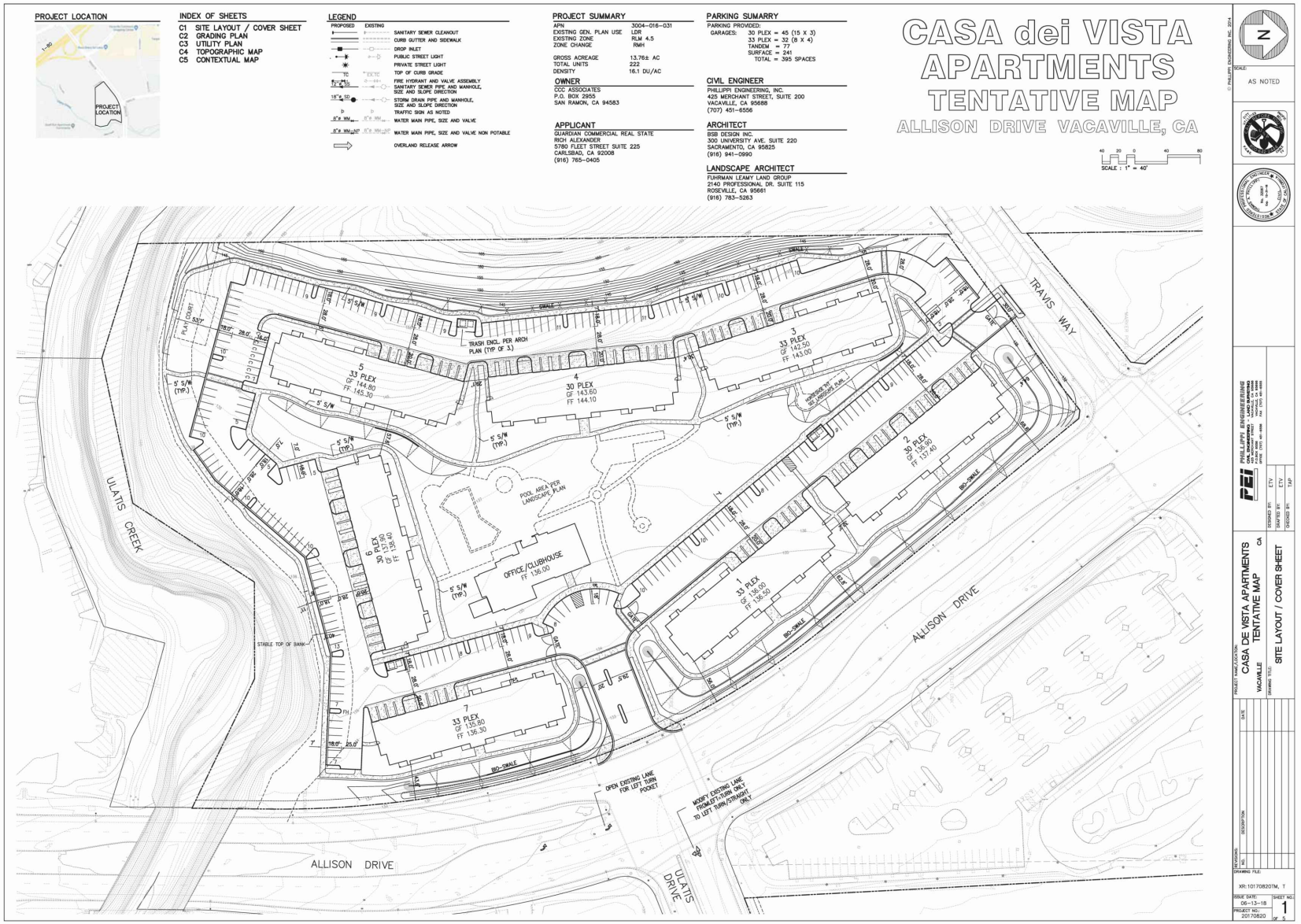
5.2 Project Trip Distribution

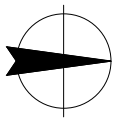
The Project directional trip distribution and specific assignment of project-generated trips were established based on an understanding of existing and projected future traffic flows and travel patterns within the vicinity of the Project Site.

5.3 Project Site Access

Access to the project site is provided via two (2) driveways. The first driveway is located on the southerly side of Travis Way, approximately 155 feet west of the intersection of Travis Way and Allison Drive. The second driveway is to be added as the western leg of the intersection of Ulatis Drive and Allison Drive. The Project driveways are analyzed in a later section.

Figure 4 presents the detailed Project Site Plan. Figure 5 presents the Project Trip Distribution.





City of Vacaville
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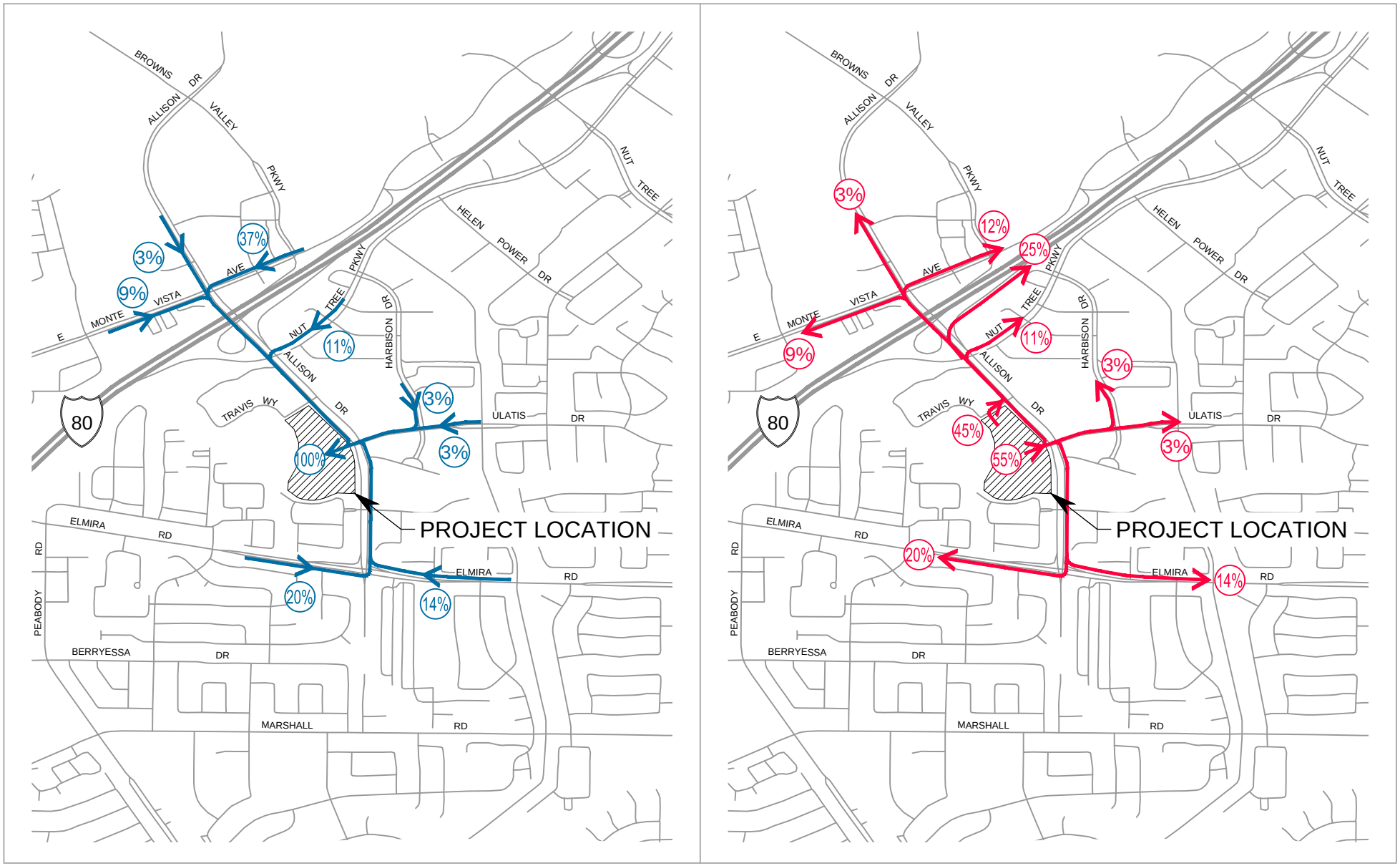
PROJECT SITE PLAN

Project No. **11145001**
Report No. **001**
Date **AUGUST 2018**

FIGURE 4

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LEGEND:

0% ⟷ INBOUND TRIP DISTRIBUTION

0% ⟷ OUTBOUND TRIP DISTRIBUTION

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TRIP DISTRIBUTION

Project No. **11145001**
Report No. **001**
Date **August 2018**

FIGURE 5

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6. Alternative Transportation Modes

The following section presents the existing alternative transportation modes.

6.1 Pedestrian Facilities

Existing conditions indicate the presence of continuous concrete sidewalks provided along both sides of all study roadways, with the exception of a gap in the sidewalk on the westerly side of Allison Drive between Nut Tree Parkway and E. Monte Vista Avenue. Marked crosswalks are provided at all study intersections. The intersection of Ulatis Drive & Harbison is marked as a school crossing.

6.2 Bicycle Facilities

Existing conditions indicate the presence of bicycle facilities along both sides of Allison Drive between Nut Tree Parkway and Elmira Road. The southbound bike lane along Allison Drive becomes a bike boulevard between Travis Way and Ulatis Drive. Class II bike lane facilities are present along eastbound Ulatis Drive between Allison Drive and Arcadia Drive and along westbound Ulatis Drive between Harbison Drive and Arcadia Drive.

6.3 Transit Facilities

Existing transit services are provided primarily by Vacaville City Coach which has 6 fixed routes throughout Vacaville. The Project site is located directly across from the Vacaville Transportation Center, which is a central location for routes 1,3,4,5, and 6. The Transportation Center is also a stop for Fairfield and Suisun Transit (FAST) and Yolobus, making it a primary transit location for the region.

7. Existing Plus Project Conditions

The *Existing Plus Project* conditions is the analysis scenario in which traffic impacts associated with the proposed Project are investigated in comparison to the *Existing* conditions.

7.1 Intersection Operations

Existing Plus Project weekday AM and PM peak hour intersection traffic operations were quantified by superimposing traffic generated by the proposed Project onto *Existing* conditions.

Table 7.1 presents a summary of the *Existing Plus Project* study intersection LOS conditions.

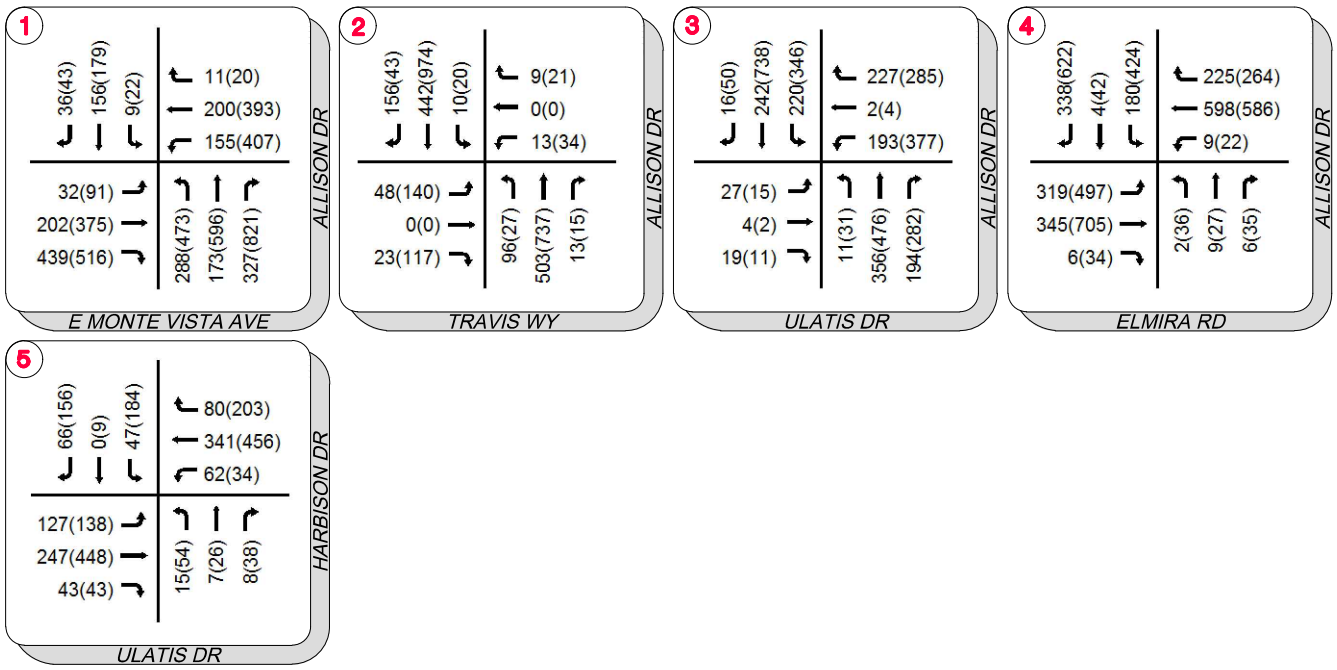
Table 7.1 – Existing Plus Project Intersection Level of Service

#	Intersection	Control Type[1]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	Allison Dr & E. Monte Vista Ave	Signal	mid-D	22.3	C	38.0	mid-D
2	Allison Dr & Travis Way	Signal	mid-D	8.2	A	9.7	A
3	Allison Dr & Ulatis Dr	Signal	mid-D	17.2	B	18.9	B
4	Allison Dr & Elmira Rd	Signal	mid-D	18.1	B	28.9	C
5	Ulatis Dr & Harbison Dr	Signal	mid-D	16.1	B	23.4	C

Notes:
1. LOS = Delay based on average of all approaches for Signal

As presented in Table 7.1, all study intersections are projected to operate at or above the threshold LOS.

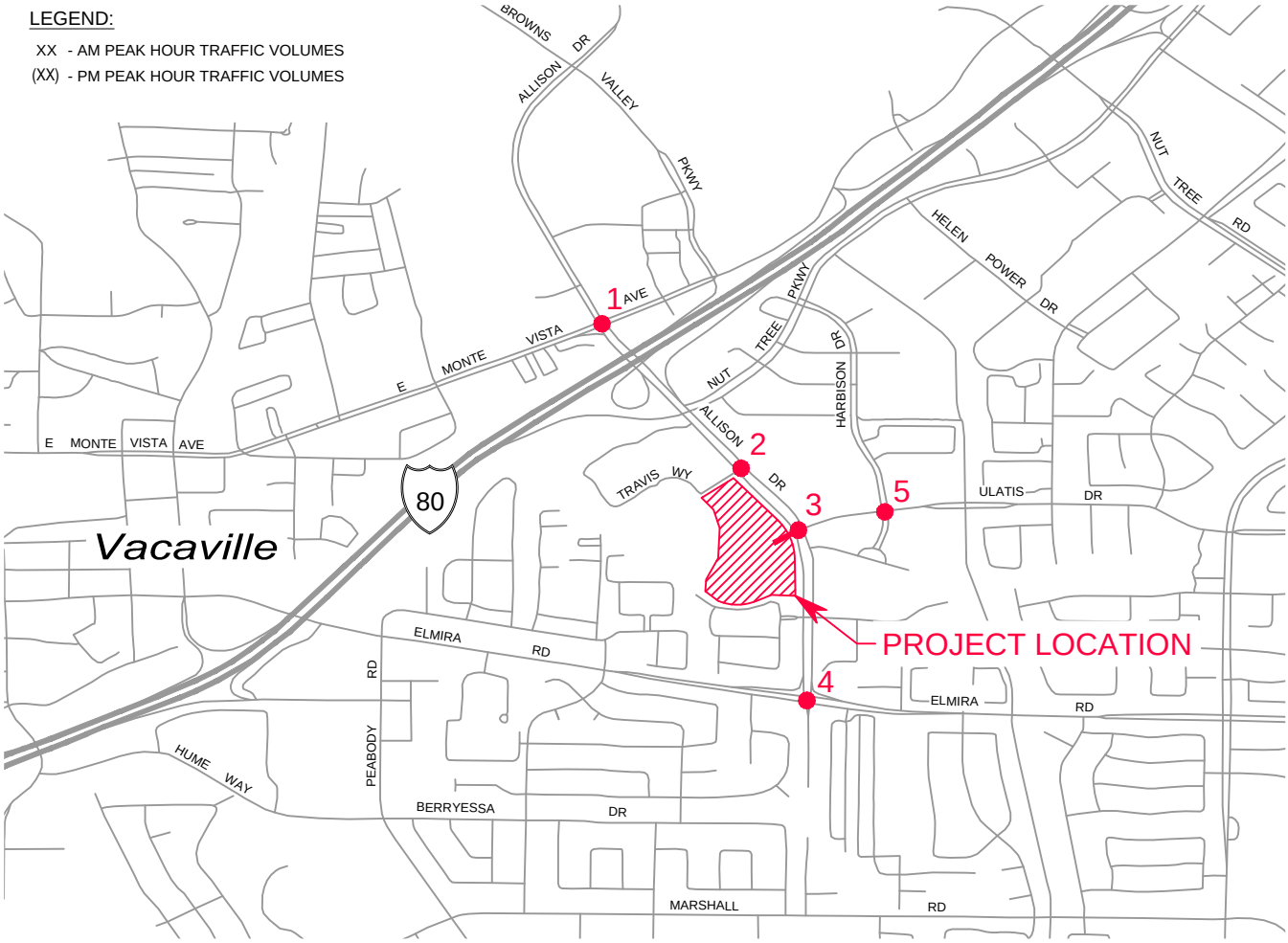
Figure 6 presents the *Existing Plus Project* intersection traffic volumes.



LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES



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City of Vacaville
CASA DEL VISTA APARTMENTS TIS

EXISTING PLUS PROJECT
PEAK HOUR TRAFFIC VOLUMES

Project No. **11145001**
Report No. **001**
Date **August 2018**

FIGURE 6

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8. Short Term Conditions

Short Term conditions were simulated by superimposing traffic generated by ten years of growth onto the *Existing* intersections and traffic volumes. The ten years of growth was determined by a straight line interpolation between *Existing* and *Cumulative* traffic volumes.

8.1 Intersection Operations

Table 8.1 presents a summary of the *Short Term No Project* study intersection LOS conditions.

Table 8.1 – Short Term No Project Intersection Level of Service

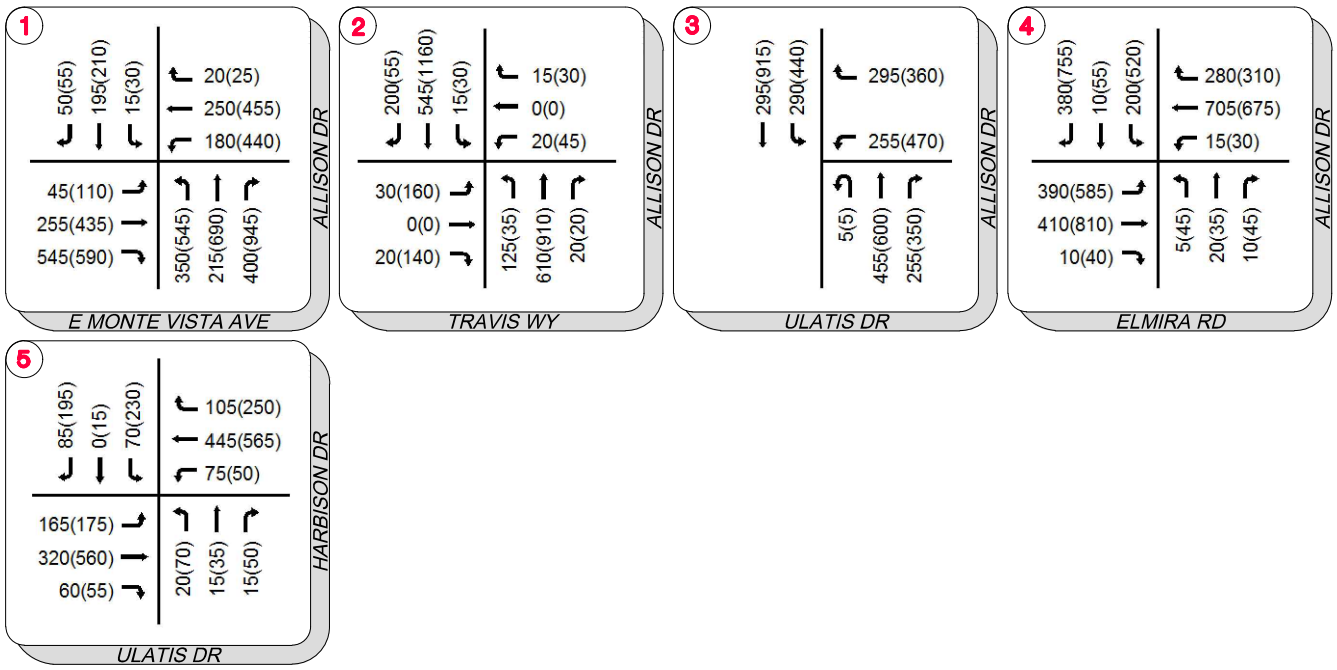
#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	***Allison Dr & E. Monte Vista Ave***	***Signal***	***mid-D***	24.7	C	***57.0***	***E***
2	Allison Dr & Travis Way	Signal	mid-D	8.4	A	13.4	B
3	Allison Dr & Ulatis Dr	Signal	mid-D	13.7	B	15.4	B
4	***Allison Dr & Elmira Rd***	***Signal***	***mid-D***	21.6	C	***48.4***	***D***
5	Ulatis Dr & Harbison Dr	Signal	mid-D	19.8	B	31.2	C

Notes:
1. LOS = Delay based on average of all approaches for Signal
*2. **Bold** = Unacceptable Conditions*

As presented in Table 8.1, all study intersections, except the following, are projected to operate at or above the threshold LOS:

- Intersection 1 – Allison Drive & E. Monte Vista Avenue
- Intersection 4 – Allison Drive & Elmira Road

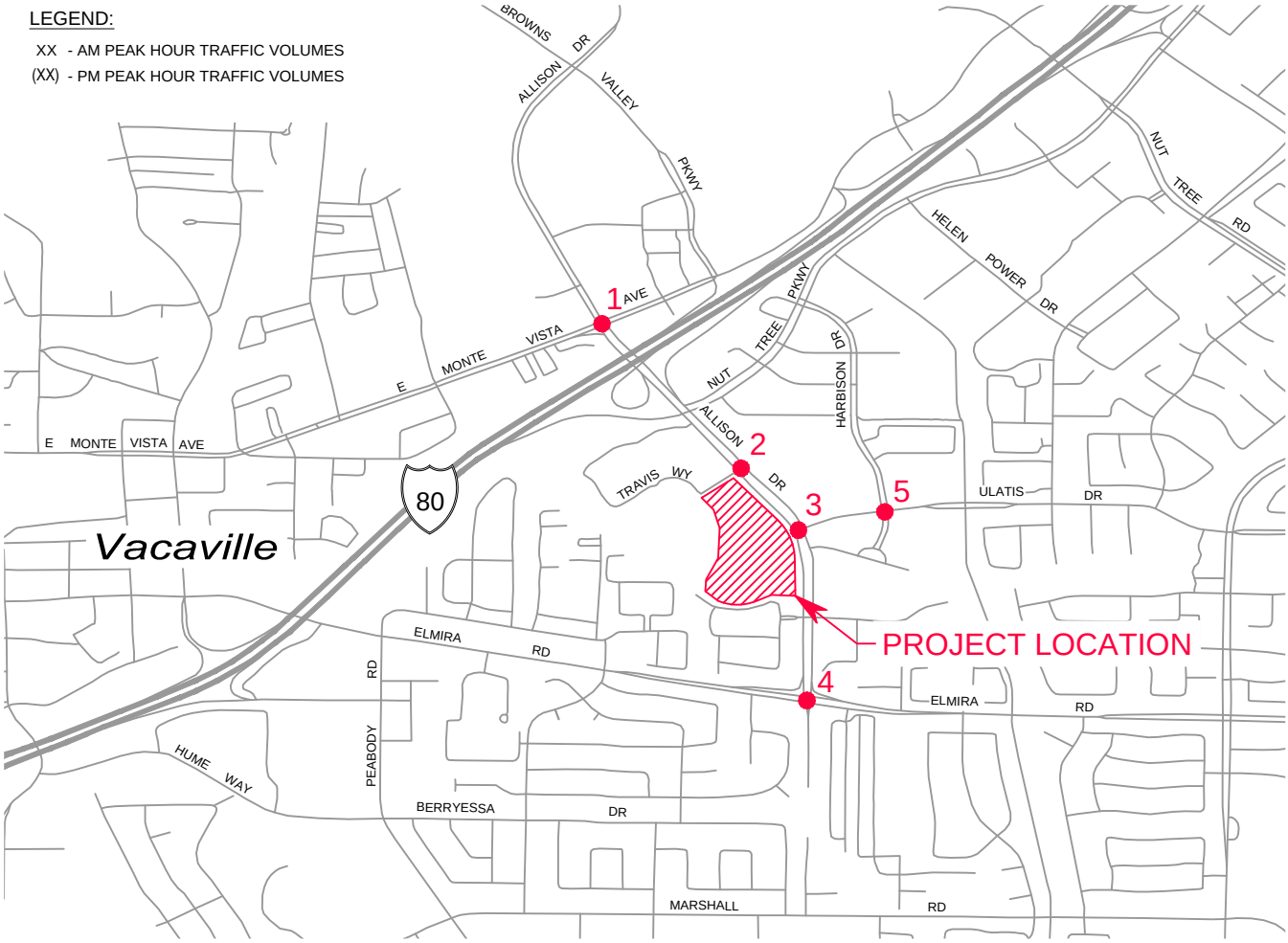
Figure 7 presents the *Short Term No Project* weekday AM and PM peak hour traffic volumes.



LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES



N

GHD

City of Vacaville
CASA DEL VISTA APARTMENTS TIS

SHORT TERM CONDITIONS
PEAK HOUR TRAFFIC VOLUMES

Project No. **11145001**
Report No. **001**
Date **August 2018**

FIGURE 7

Filename: K:\PRJ\2532\T2532\T2532TG001.dwg Plot Date: 27 August 2018 - 3:17 PM

Source:

9. Short Term Plus Project Conditions

Short Term Plus Project conditions were simulated by superimposing traffic generated by the Project onto the *Short Term No Project* intersections traffic volumes.

9.1 Intersection Operations

Table 9.1 presents a summary of the *Short Term Plus Project* study intersection LOS conditions.

Table 9.1 – Short Term Plus Project Intersection Level of Service

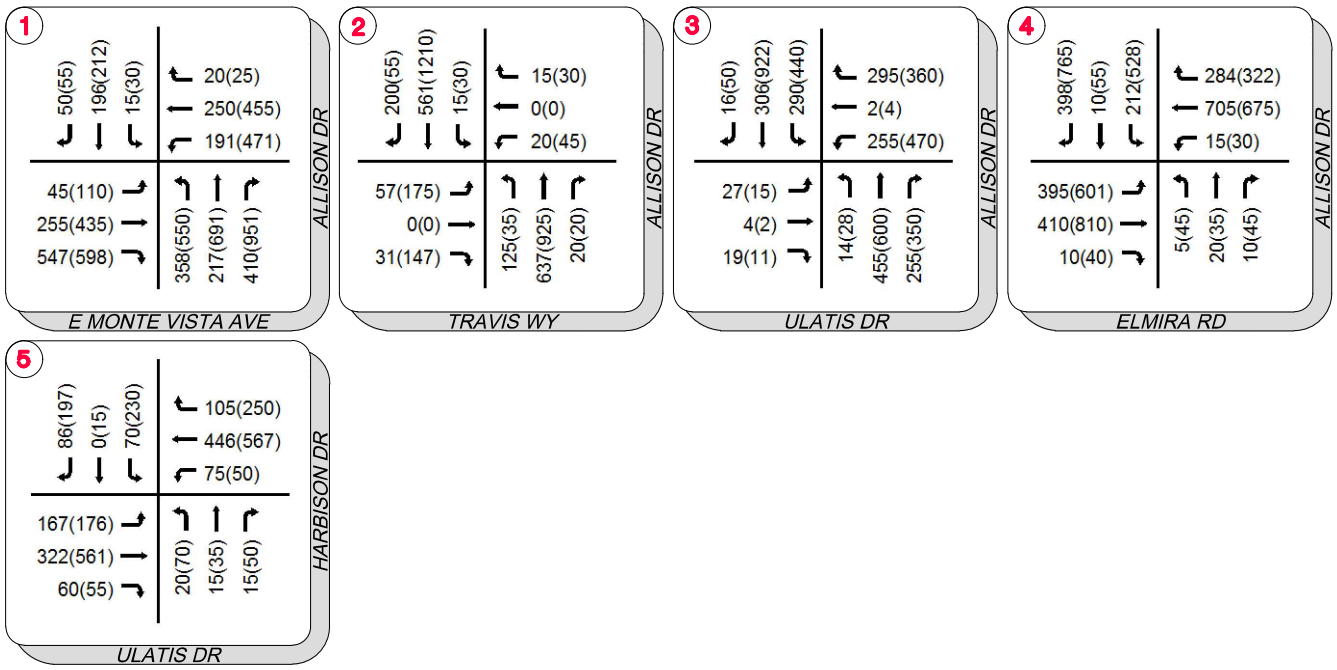
#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	***Allison Dr & E. Monte Vista Ave***	***Signal***	***mid-D***	25.6	C	***58.4***	***E***
2	Allison Dr & Travis Way	Signal	mid-D	9.1	A	13.9	B
3	Allison Dr & Ulatis Dr	Signal	mid-D	19.2	B	21.3	C
4	***Allison Dr & Elmira Rd***	***Signal***	***mid-D***	21.8	C	***50.4***	***D***
5	Ulatis Dr & Harbison Dr	Signal	mid-D	19.9	B	31.3	C

Notes:
1. LOS = Delay based on average of all approaches for Signal
*2. **Bold** = Unacceptable Conditions*

As presented in Table 9.1, all study intersections, except the following, are projected to operate at or above the threshold LOS:

- Intersection 1 – Allison Drive & E. Monte Vista Avenue
- Intersection 4 – Allison Drive & Elmira Road

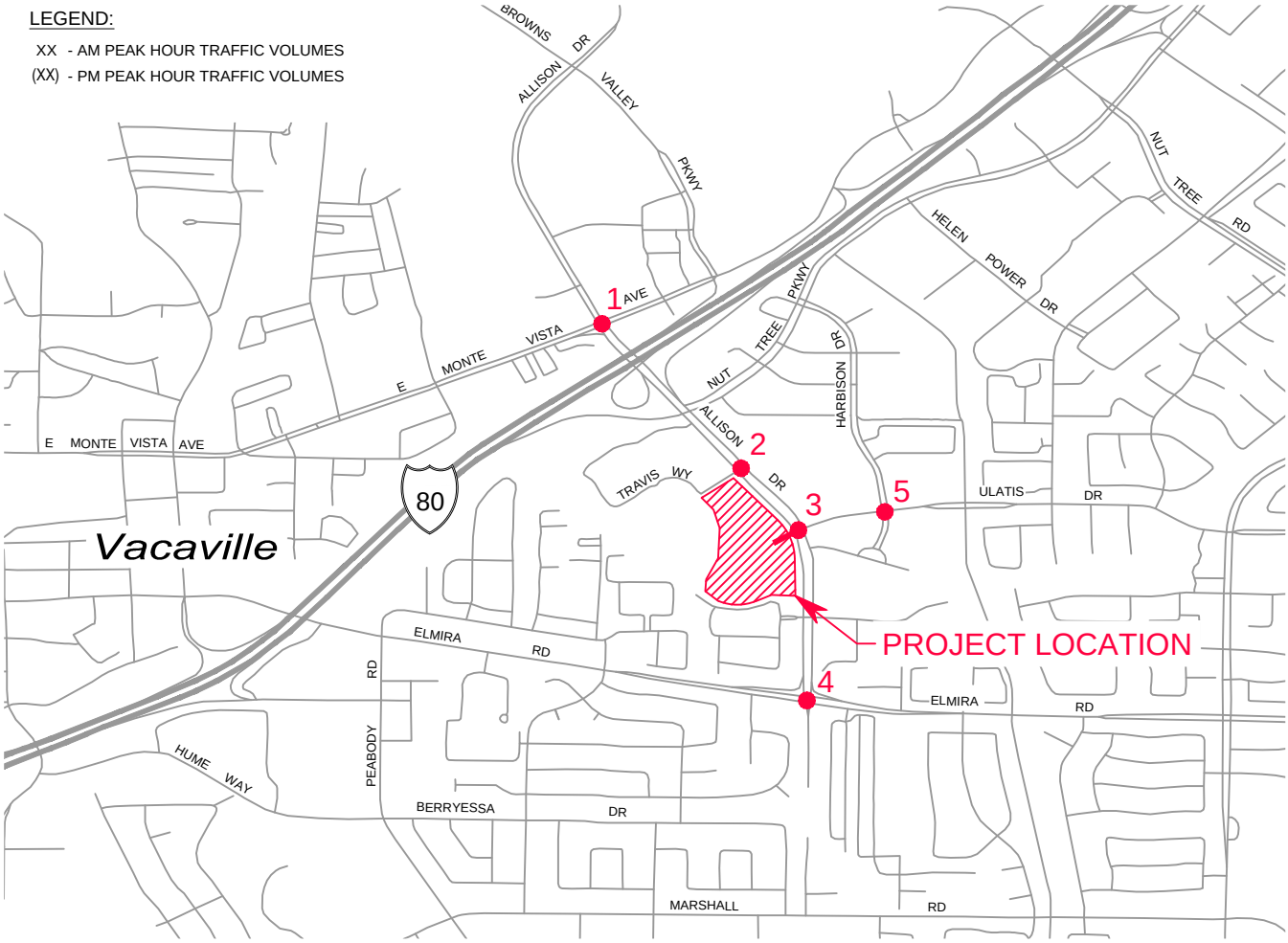
Figure 8 presents the *Short Term Plus Project* weekday AM and PM peak hour traffic volumes.



LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES



N

GHD

City of Vacaville
CASA DEL VISTA APARTMENTS TIS

SHORT TERM PLUS PROJECT
PEAK HOUR TRAFFIC VOLUMES

Project No. **11145001**
Report No. **001**
Date **August 2018**

FIGURE 8

10. Cumulative (Year 2035) Conditions

Cumulative conditions analyze the scenario that exists following approximately 17 years of development in the City of Vacaville (City). *Cumulative* conditions represent the long term, future year scenarios used in the evaluation of traffic operations.

Cumulative weekday AM and PM peak hour intersection traffic operations were quantified using the City's Travel Demand Model (TDM). The City's TDM provides AM and PM peak hour outputs in Cube modeling software for the Existing scenario and the Year 2035 Cumulative/General Plan model scenario.

10.1 Intersection Operations

Table 10.1 presents a summary of the *Cumulative No Project* study intersection LOS conditions.

Table 10.1 – Cumulative No Project Intersection Level of Service

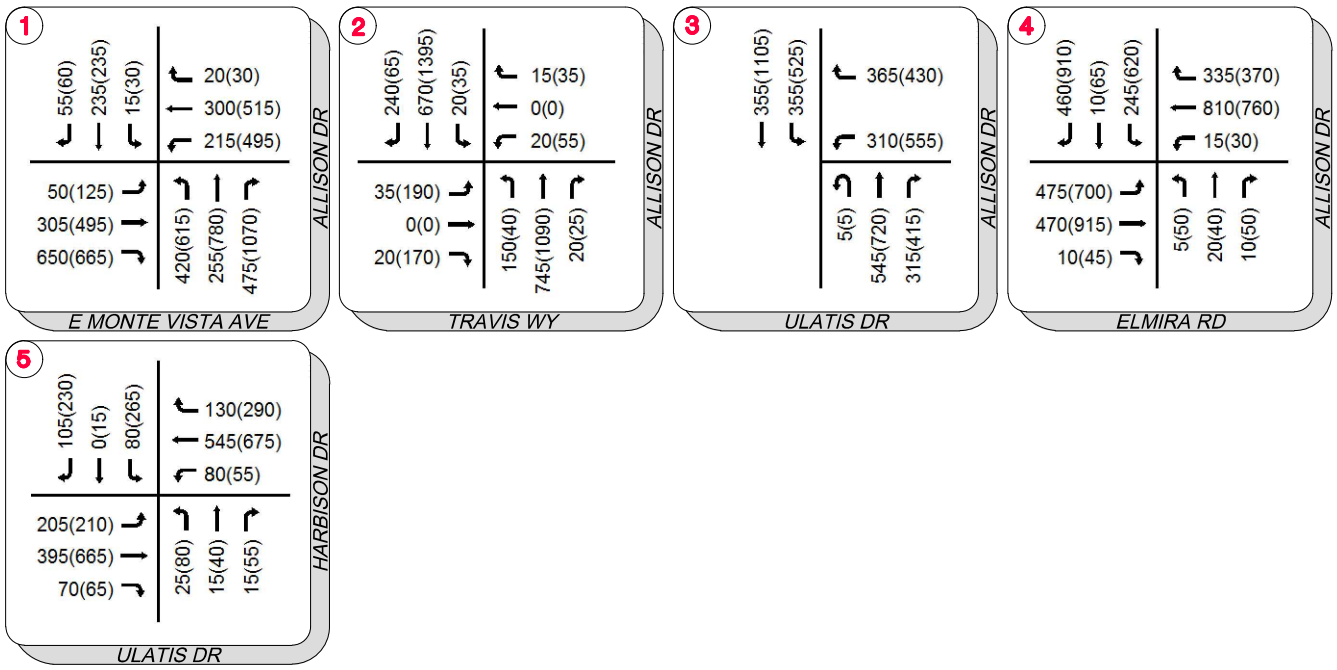
#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	***Allison Dr & E. Monte Vista Ave***	***Signal***	***mid-D***	35.2	mid-D	***73.9***	***E***
2	Allison Dr & Travis Way	Signal	mid-D	8.7	A	17.7	B
3	Allison Dr & Ulatis Dr	Signal	mid-D	14.2	B	18.4	B
4	***Allison Dr & Elmira Rd***	***Signal***	***mid-D***	23.6	C	***75.0***	***E***
5	Ulatis Dr & Harbison Dr	Signal	mid-D	20.1	C	42.8	mid-D

Notes:
1. LOS = Delay based on average of all approaches for Signal
*2. **Bold** = Unacceptable Conditions*

As presented in Table 10.1, all study intersections, except the following, are projected to operate at or above the threshold LOS:

- Intersection 1 – Allison Drive & E. Monte Vista Avenue
- Intersection 4 – Allison Drive & Elmira Road

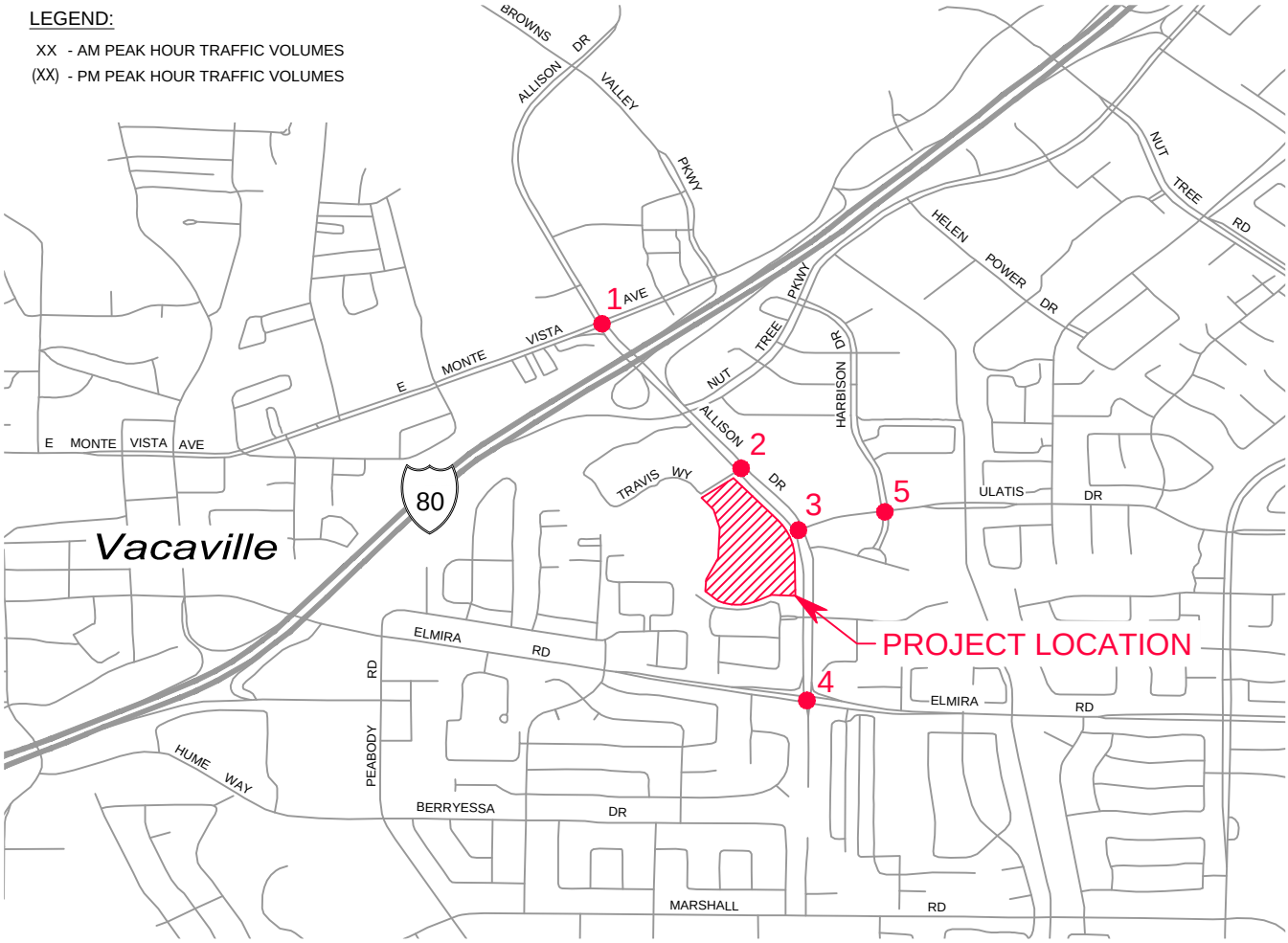
Figure 9 presents the *Cumulative No Project* weekday AM and PM peak hour traffic volumes.



LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES



N

GHD

City of Vacaville
CASA DEL VISTA APARTMENTS TIS

CUMULATIVE
PEAK HOUR TRAFFIC VOLUMES

Project No. **11145001**
Report No. **001**
Date **August 2018**

FIGURE 9

Filename: K:\PRJ\2532\T2532\T2532TG001.dwg Plot Date: 27 August 2018 - 3:20 PM

Source:

11. Cumulative Plus Project Conditions

Cumulative Plus Project conditions were simulated by superimposing traffic generated by full build-out of the proposed Project onto *Cumulative No Project* traffic volumes.

11.1 Cumulative Plus Project Intersection Operations

Table 11.1 presents a summary of the *Cumulative Plus Project* study intersection LOS conditions.

Table 11.1 Cumulative Plus Project Intersection Level of Service

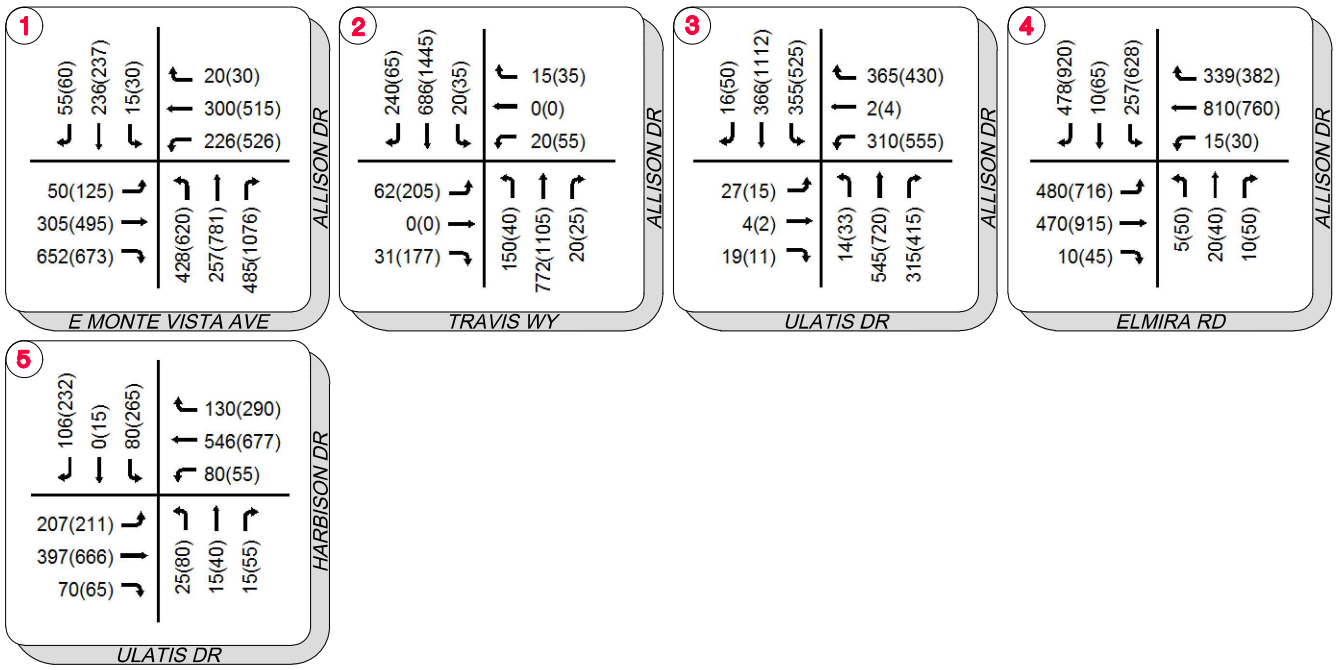
#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	***Allison Dr & E. Monte Vista Ave***	***Signal***	***mid-D***	36.0	mid-D	***78.5***	***E***
2	Allison Dr & Travis Way	Signal	mid-D	9.3	A	18.7	B
3	Allison Dr & Ulatis Dr	Signal	mid-D	25.3	C	24.4	C
4	***Allison Dr & Elmira Rd***	***Signal***	***mid-D***	23.8	C	***77.9***	***E***
5	Ulatis Dr & Harbison Dr	Signal	mid-D	20.2	C	42.9	mid-D

Notes:
1. LOS = Delay based on average of all approaches for Signal
*2. **Bold** = Unacceptable Conditions*

As presented in Table 11.1, all study intersections, except the following, are projected to operate at or above the threshold LOS:

- Intersection 1 – Allison Drive & E. Monte Vista Avenue
- Intersection 4 – Allison Drive & Elmira Road

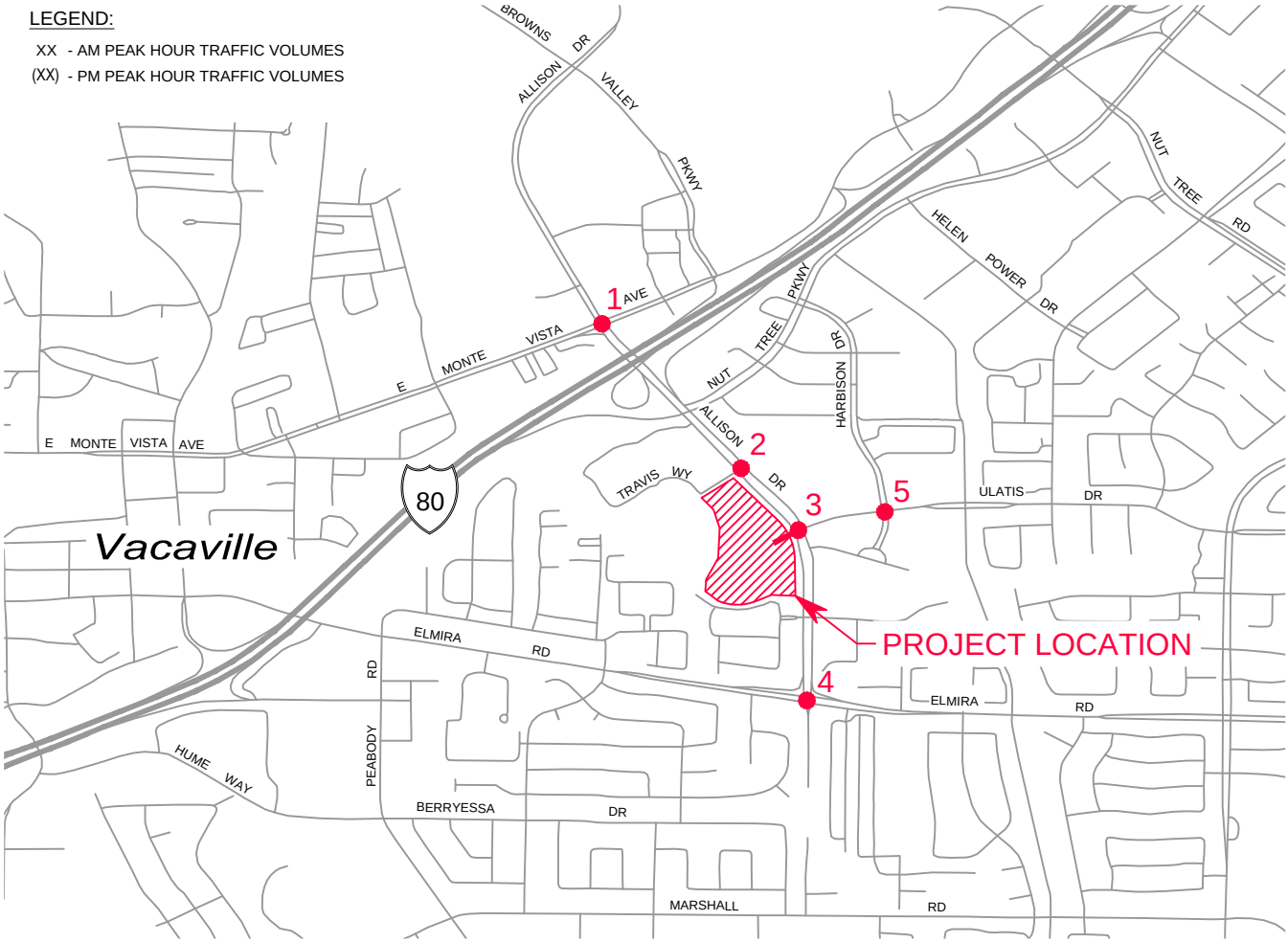
Figure 10 presents the *Cumulative Plus Project* AM and PM peak hour traffic volumes.



LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES



N

GHD

City of Vacaville
CASA DEL VISTA APARTMENTS TIS

CUMULATIVE PLUS PROJECT
PEAK HOUR TRAFFIC VOLUMES

Project No. **11145001**
Report No. **001**
Date **August 2018**

FIGURE 10

Filename: K:\PRJ\2532\T2532\T2532TG001.dwg Plot Date: 13 September 2018 - 6:39 PM

Source:

12. Project Driveway Analysis

Access to/from the project site is provided via two (2) driveways. The main entrance is expected to provide access for both tenants and visitors, while the side access will be utilized only by tenants and as an exit only. The main entrance is located at the intersection of Ulatis Drive and Allison Drive, and has a wide enough driveway to allow two vehicles to be stopped side by side to allow easier access for tenants while visitors are using the call box. The main driveway has a depth that will allow for a queue of 3 vehicles. Based on past experience at a similar development, this should provide for appropriate queueing at the main entrance.

The northbound left turn on Allison Drive to the main entrance is approximately 170 feet. Current 95th percentile queues are approximately 25 feet for both the AM and PM peak hours. The projected 95th percentile queue for Cumulative Plus Project conditions are 25 and 50 feet for the AM and PM peak hours, respectively. There is adequate storage for the addition of the project.

13. Project Impacts and Proposed Improvements

This section presents recommended project-related mitigation measures at the study intersections, developed based on the findings from the analyses presented in the prior sections of this report. The mitigations are provided for *Existing, Short Term,* and *Cumulative* conditions separately, so it may be possible that the same mitigations at one location are applicable to both conditions.

13.1 Impact Significance Criteria

The following thresholds of significance are used to determine if the proposed Project causes a significant impact and requires mitigation:

13.1.1 Signalized Intersection

- The Project causes the intersection's acceptable LOS to decline to an unacceptable LOS; or
- The Project increases the average delay for the all approaches by more than 5 seconds per vehicle at an intersection that has an unacceptable LOS without the Project.

13.2 Existing Plus Project Impacts

All of the study intersections are projected to operate at or above the threshold LOS in the *Existing* and *Existing Plus Project* scenarios. Therefore, no significant impacts are identified and no mitigations are required.

13.3 Short Term Plus Project Impacts

Table 13.1 presents the intersections projected to operate at unacceptable levels of service under *Short Term Plus Project* conditions.

Table 13.1 – Short Term Plus Project Significant Impacts

PM Peak Hour									
#	Intersection	Control Type	Target LOS	Short Term LOS[1]	Short Term Plus Project LOS[1]	Short Term Delay (D1)	Short Term Plus Project Delay (D2)	Delay Increase (D2-D1)	Significant Impact?
1	Allison Dr & E. Monte Vista Ave	Signal	mid-D	E	E	57.0	58.4	1.4	No
4	Allison Dr & Elmira Rd	Signal	mid-D	D	D	48.4	50.4	2.0	No

Notes:

1. LOS = Delay based on average of all approaches for Signal

As presented in Table 13.1 none of the impacts in the *Short Term Plus Project* conditions are significant, therefore no mitigations are required.

13.4 Cumulative Plus Project Impacts

Table 13.2 presents the intersections projected to operate at unacceptable levels of service under *Cumulative Plus Project* conditions.

Table 13.2 – Cumulative Plus Project Significant Impacts

PM Peak Hour									
#	Intersection	Control Type	Target LOS	Cumulative LOS[1]	Cumulative Plus Project LOS[1]	Cumulative Delay (D1)	Cumulative Plus Project Delay (D2)	Delay Increase (D2-D1)	Significant Impact?
1	Allison Dr & E. Monte Vista Ave	Signal	mid-D	E	E	73.9	78.5	4.6	No
4	Allison Dr & Elmira Rd	Signal	mid-D	E	E	75.0	77.9	2.9	No

Notes:

1. LOS = Delay based on average of all approaches for Signal

As presented in Table 13.2 no significant impacts are identified under the *Cumulative Plus Project* conditions. Therefore, no mitigations are recommended.

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

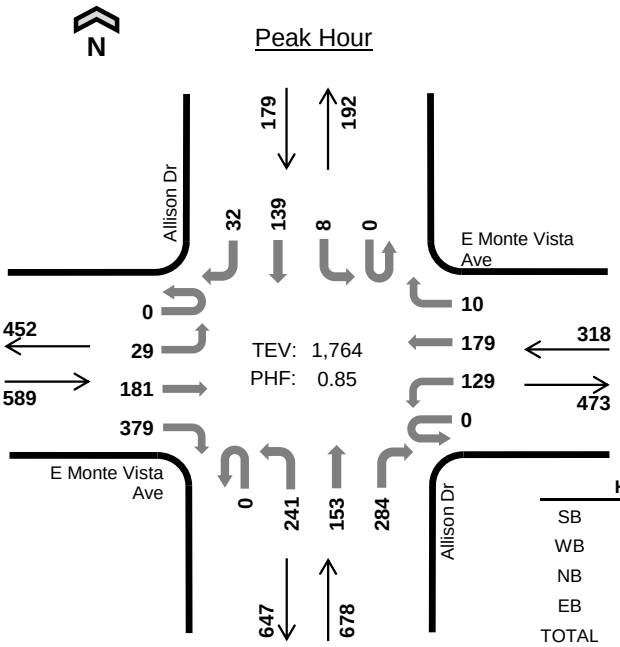
Todd Tregenza, AICP
Todd.Tregenza@ghd.com
916.865.0935

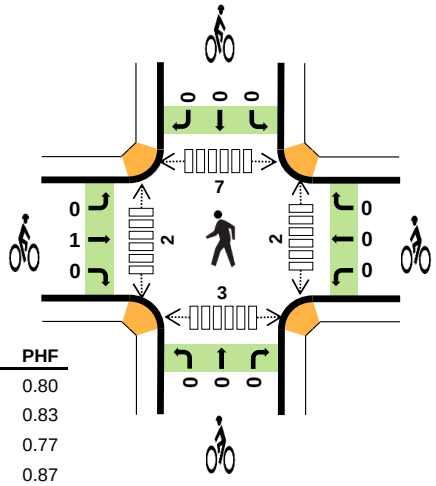
Zach Stinger, EIT
Zachary.Stinger@ghd.com
916.918.0637

www.ghd.com

Allison Dr
E Monte Vista Ave

Date: 06-21-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
SB	0.6%	0.80
WB	2.5%	0.83
NB	1.8%	0.77
EB	2.2%	0.87
TOTAL	1.9%	0.85

Peak-Hour Count Summaries

Interval Start		Allison Dr Southbound				E Monte Vista Ave Westbound				Allison Dr Northbound				E Monte Vista Ave Eastbound				5-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
8:00 AM		0	1	15	2	0	7	13	**2**	0	28	12	26	0	2	11	30	149	0
8:05 AM		0	**2**	8	**4**	0	11	14	0	0	14	13	10	0	2	17	32	127	0
8:10 AM		0	1	7	**4**	0	11	16	1	0	18	7	15	0	2	18	32	132	0
8:15 AM		0	0	12	1	0	4	7	0	0	19	14	17	0	4	11	32	121	0
8:20 AM		0	0	16	3	0	8	11	1	0	20	10	22	0	3	10	28	132	0
8:25 AM		0	0	7	**4**	0	14	18	1	0	15	14	25	0	0	13	18	129	0
8:30 AM		0	**2**	9	2	0	8	11	1	0	20	14	27	0	1	8	**44**	147	0
8:35 AM		0	0	11	1	0	**16**	20	0	0	18	11	23	0	**6**	7	36	149	0
8:40 AM		0	1	14	2	0	6	19	**2**	0	8	10	28	0	4	**27**	37	158	0
8:45 AM		0	0	**22**	3	0	15	11	0	0	27	13	26	0	2	20	26	165	0
8:50 AM		0	1	10	3	0	15	**25**	1	0	**32**	15	32	0	1	20	31	186	0
8:55 AM		0	0	8	3	0	14	14	1	0	22	**20**	**33**	0	2	19	33	169	**1,764**
Peak Hour	**All**	**0**	**8**	**139**	**32**	**0**	**129**	**179**	**10**	**0**	**241**	**153**	**284**	**0**	**29**	**181**	**379**	**1,764**	0
	HV	**0**	**0**	**1**	**0**	**0**	**4**	**4**	**0**	**0**	**1**	**4**	**7**	**0**	**0**	**6**	**7**	**34**	0
	HV%	**-**	**0%**	**1%**	**0%**	**-**	**3%**	**2%**	**0%**	**-**	**0%**	**3%**	**2%**	**-**	**0%**	**3%**	**2%**	**2%**	0

Note: For all two-hour count summary, see next page.

Two-Hour Count Summaries

Interval Start	Allison Dr (Southbound)				E Monte Vista Ave (Westbound)				Allison Dr (Northbound)				E Monte Vista Ave (Eastbound)				5-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	7	1	0	9	6	0	0	6	6	14	0	3	6	18	77	0
7:05 AM	0	0	6	2	0	12	9	2	0	11	6	22	0	1	9	23	103	0
7:10 AM	0	0	7	2	0	5	7	2	0	11	20	15	0	0	12	22	103	0
7:15 AM	0	0	12	1	0	8	8	0	0	8	11	20	0	2	10	16	96	0
7:20 AM	0	0	8	1	0	8	7	1	0	9	8	26	0	1	14	18	101	0
7:25 AM	0	0	15	1	0	15	11	1	0	10	6	28	0	0	9	20	116	0
7:30 AM	0	0	4	2	0	2	12	0	0	17	6	21	0	2	18	32	116	0
7:35 AM	0	0	13	2	0	6	17	0	0	19	10	29	0	0	8	31	135	0
7:40 AM	0	0	10	1	0	17	13	1	0	17	7	33	0	3	11	23	136	0
7:45 AM	0	0	14	3	0	12	18	1	0	19	10	20	0	2	16	21	136	0
7:50 AM	0	0	15	2	0	13	14	1	0	13	18	29	0	4	21	28	158	0
7:55 AM	0	0	8	0	0	10	13	1	0	25	16	31	0	2	10	27	143	1,420
8:00 AM	0	1	15	2	0	7	13	2	0	28	12	26	0	2	11	30	149	1,492
8:05 AM	0	2	8	4	0	11	14	0	0	14	13	10	0	2	17	32	127	1,516
8:10 AM	0	1	7	4	0	11	16	1	0	18	7	15	0	2	18	32	132	1,545
8:15 AM	0	0	12	1	0	4	7	0	0	19	14	17	0	4	11	32	121	1,570
8:20 AM	0	0	16	3	0	8	11	1	0	20	10	22	0	3	10	28	132	1,601
8:25 AM	0	0	7	4	0	14	18	1	0	15	14	25	0	0	13	18	129	1,614
8:30 AM	0	2	9	2	0	8	11	1	0	20	14	27	0	1	8	44	147	1,645
8:35 AM	0	0	11	1	0	16	20	0	0	18	11	23	0	6	7	36	149	1,659
8:40 AM	0	1	14	2	0	6	19	2	0	8	10	28	0	4	27	37	158	1,681
8:45 AM	0	0	22	3	0	15	11	0	0	27	13	26	0	2	20	26	165	1,710
8:50 AM	0	1	10	3	0	15	25	1	0	32	15	32	0	1	20	31	186	1,738
8:55 AM	0	0	8	3	0	14	14	1	0	22	20	33	0	2	19	33	169	1,764
Count Total	0	9	258	50	0	246	314	20	0	406	277	572	0	49	325	658	3,184	0
Peak Hour All	**0**	**8**	**139**	**32**	**0**	**129**	**179**	**10**	**0**	**241**	**153**	**284**	**0**	**29**	**181**	**379**	**1,764**	**0**
Peak Hour HV	**0**	**0**	**1**	**0**	**0**	**4**	**4**	**0**	**0**	**1**	**4**	**7**	**0**	**0**	**6**	**7**	**34**	**0**
Peak Hour HV%	**-**	**0%**	**1%**	**0%**	**-**	**3%**	**2%**	**0%**	**-**	**0%**	**3%**	**2%**	**-**	**0%**	**3%**	**2%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	SB	WB	NB	EB	Total	SB	WB	NB	EB	Total	North	East	South	West	Total
7:00 AM	1	0	2	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:05 AM	1	1	1	3	*6*	0	0	0	0	*0*	0	1	0	0	*1*
7:10 AM	0	2	2	1	*5*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	1	0	2	1	*4*	0	0	1	0	*1*	0	0	2	0	*2*
7:20 AM	0	0	2	2	*4*	0	0	0	1	*1*	0	0	0	0	*0*
7:25 AM	0	2	0	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	0	0	1	0	*1*	0	0	0	0	*0*	0	1	0	0	*1*
7:35 AM	1	2	0	3	*6*	0	0	0	0	*0*	0	0	2	0	*2*
7:40 AM	0	1	1	2	*4*	0	0	0	0	*0*	1	0	0	0	*1*
7:45 AM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:50 AM	0	2	2	0	*4*	0	0	0	0	*0*	0	0	1	0	*1*
7:55 AM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:05 AM	0	2	2	3	*7*	0	0	0	0	*0*	0	0	0	0	*0*
8:10 AM	0	2	1	1	*4*	0	0	0	0	*0*	0	0	0	0	*0*
8:15 AM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	1	0	*1*
8:20 AM	1	0	1	0	*2*	0	0	0	0	*0*	1	0	0	0	*1*
8:25 AM	0	0	2	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	0	0	2	0	*2*	0	0	0	0	*0*	3	1	0	0	*4*
8:35 AM	0	1	1	3	*5*	0	0	0	0	*0*	0	0	0	0	*0*
8:40 AM	0	2	1	0	*3*	0	0	0	0	*0*	2	0	2	1	*5*
8:45 AM	0	0	1	1	*2*	0	0	0	1	*1*	0	1	0	1	*2*
8:50 AM	0	1	0	2	*3*	0	0	0	0	*0*	1	0	0	0	*1*
8:55 AM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	5	19	25	27	*76*	0	0	1	2	*3*	8	4	8	2	*22*
Peak Hour	**1**	**8**	**12**	**13**	***34***	**0**	**0**	**0**	**1**	***1***	**7**	**2**	**3**	**2**	***14***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Allison Dr				E Monte Vista Ave				Allison Dr				E Monte Vista Ave				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	3	0
7:05 AM	0	0	0	1	0	1	0	0	0	0	0	1	0	0	1	2	6	0
7:10 AM	0	0	0	0	0	0	2	0	0	0	1	1	0	0	1	0	5	0
7:15 AM	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	1	4	0
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	4	0
7:25 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	3	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
7:35 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	2	1	6	0
7:40 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2	4	0
7:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
7:50 AM	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	4	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	42
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	41
8:05 AM	0	0	0	0	0	1	1	0	0	0	0	2	0	0	2	1	7	42
8:10 AM	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	1	4	41
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	38
8:20 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	36
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	35
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	36
8:35 AM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	2	5	35
8:40 AM	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	3	34
8:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2	35
8:50 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	3	34
8:55 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	34
Count Total	0	0	4	1	0	8	10	1	0	2	8	15	0	0	11	16	76	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**4**	**4**	**0**	**0**	**1**	**4**	**7**	**0**	**0**	**6**	**7**	**34**	**0**

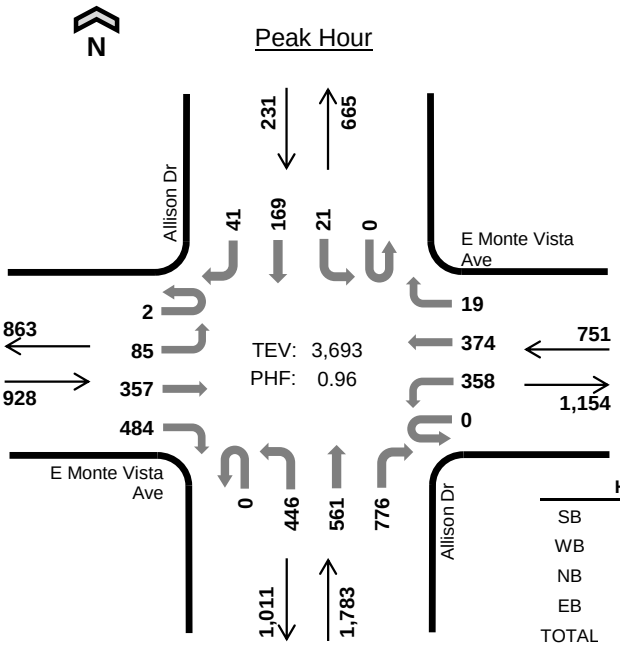
Two-Hour Count Summaries - Bikes

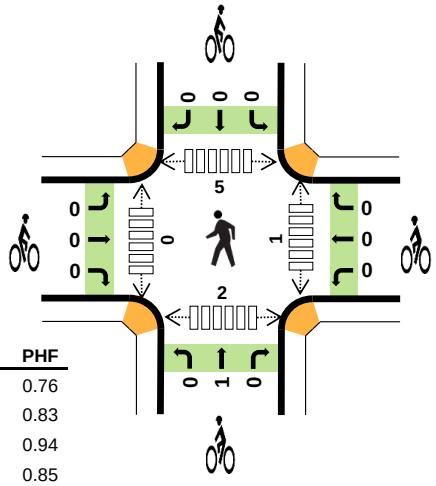
Interval Start	Allison Dr			E Monte Vista Ave			Allison Dr			E Monte Vista Ave			5-min Total	Rolling One Hour
	Southbound			Westbound			Northbound			Eastbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:20 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	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	0
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:40 AM	0	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	1	0	1	1
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	0	0	0	0	0	1	0	0	2	0	3	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Allison Dr
E Monte Vista Ave

Date: 06-21-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
SB	1.3%	0.76
WB	0.7%	0.83
NB	0.1%	0.94
EB	0.6%	0.85
TOTAL	0.4%	0.96

Peak-Hour Count Summaries

Interval Start		Allison Dr Southbound				E Monte Vista Ave Westbound				Allison Dr Northbound				E Monte Vista Ave Eastbound				5-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
5:00 PM		0	**4**	9	1	0	25	26	0	0	35	52	67	**2**	9	34	**50**	314	0
5:05 PM		0	1	12	3	0	31	18	1	0	44	51	63	0	6	32	**50**	312	0
5:10 PM		0	1	13	**8**	0	34	28	1	0	45	50	66	0	5	**43**	41	335	0
5:15 PM		0	2	20	5	0	30	40	1	0	37	31	63	0	4	20	46	299	0
5:20 PM		0	2	**21**	4	0	18	26	0	0	33	57	70	0	9	33	47	320	0
5:25 PM		0	0	19	3	0	**38**	31	1	0	37	41	68	0	5	15	41	299	0
5:30 PM		0	1	14	5	0	22	25	2	0	**47**	**58**	61	0	5	35	38	313	0
5:35 PM		0	2	14	1	0	34	**47**	2	0	31	34	60	0	**13**	22	39	299	0
5:40 PM		0	1	16	2	0	25	18	2	0	35	57	66	0	8	28	35	293	0
5:45 PM		0	1	6	2	0	32	40	**4**	0	38	41	58	0	8	29	35	294	0
5:50 PM		0	2	17	4	0	36	40	2	0	28	45	57	0	5	34	24	294	0
5:55 PM		0	**4**	8	3	0	33	35	3	0	36	44	**77**	0	8	32	38	321	**3,693**
Peak Hour	**All**	**0**	**21**	**169**	**41**	**0**	**358**	**374**	**19**	**0**	**446**	**561**	**776**	**2**	**85**	**357**	**484**	**3,693**	0
	HV	**0**	**1**	**2**	**0**	**0**	**3**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**2**	**3**	**16**	0
	HV%	**-**	**5%**	**1%**	**0%**	**-**	**1%**	**1%**	**0%**	**-**	**0%**	**0%**	**0%**	**0%**	**1%**	**1%**	**1%**	**0%**	0

Note: For all two-hour count summary, see next page.

Two-Hour Count Summaries

Interval Start	Allison Dr				E Monte Vista Ave				Allison Dr				E Monte Vista Ave				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	3	10	1	0	28	30	2	0	44	34	60	0	6	20	48	286	0
4:05 PM	0	2	12	4	0	35	37	6	0	29	32	67	0	5	24	43	296	0
4:10 PM	0	0	15	3	0	15	31	1	0	30	35	64	0	7	25	42	268	0
4:15 PM	0	5	4	3	0	35	40	3	0	46	37	64	0	4	30	30	301	0
4:20 PM	0	0	22	3	0	44	37	2	0	35	31	61	0	3	12	52	302	0
4:25 PM	0	2	4	3	0	36	41	1	0	25	25	53	0	5	28	41	264	0
4:30 PM	0	1	8	2	0	30	37	2	0	40	41	52	0	5	15	46	279	0
4:35 PM	0	4	10	1	0	23	37	1	0	53	38	56	0	4	24	41	292	0
4:40 PM	0	1	20	3	0	27	25	0	0	36	44	56	0	3	28	41	284	0
4:45 PM	0	2	8	4	1	33	24	2	0	36	33	69	0	12	24	31	279	0
4:50 PM	0	3	17	0	0	32	30	2	0	39	33	55	0	8	23	32	274	0
4:55 PM	0	0	8	5	0	37	33	4	0	23	44	59	0	8	22	44	287	3,412
5:00 PM	0	4	9	1	0	25	26	0	0	35	52	67	2	9	34	50	314	3,440
5:05 PM	0	1	12	3	0	31	18	1	0	44	51	63	0	6	32	50	312	3,456
5:10 PM	0	1	13	8	0	34	28	1	0	45	50	66	0	5	43	41	335	3,523
5:15 PM	0	2	20	5	0	30	40	1	0	37	31	63	0	4	20	46	299	3,521
5:20 PM	0	2	21	4	0	18	26	0	0	33	57	70	0	9	33	47	320	3,539
5:25 PM	0	0	19	3	0	38	31	1	0	37	41	68	0	5	15	41	299	3,574
5:30 PM	0	1	14	5	0	22	25	2	0	47	58	61	0	5	35	38	313	3,608
5:35 PM	0	2	14	1	0	34	47	2	0	31	34	60	0	13	22	39	299	3,615
5:40 PM	0	1	16	2	0	25	18	2	0	35	57	66	0	8	28	35	293	3,624
5:45 PM	0	1	6	2	0	32	40	4	0	38	41	58	0	8	29	35	294	3,639
5:50 PM	0	2	17	4	0	36	40	2	0	28	45	57	0	5	34	24	294	3,659
5:55 PM	0	4	8	3	0	33	35	3	0	36	44	77	0	8	32	38	321	3,693
Count Total	0	44	307	73	1	733	776	45	0	882	988	1,492	2	155	632	975	7,105	0
Peak Hour All	**0**	**21**	**169**	**41**	**0**	**358**	**374**	**19**	**0**	**446**	**561**	**776**	**2**	**85**	**357**	**484**	**3,693**	**0**
Peak Hour HV	**0**	**1**	**2**	**0**	**0**	**3**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**2**	**3**	**16**	**0**
Peak Hour HV%	**-**	**5%**	**1%**	**0%**	**-**	**1%**	**1%**	**0%**	**-**	**0%**	**0%**	**0%**	**0%**	**1%**	**1%**	**1%**	**0%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	SB	WB	NB	EB	Total	SB	WB	NB	EB	Total	North	East	South	West	Total
4:00 PM	0	1	2	0	*3*	0	0	0	0	*0*	1	2	1	0	*4*
4:05 PM	1	0	1	0	*2*	0	0	0	0	*0*	1	0	0	0	*1*
4:10 PM	0	2	1	2	*5*	0	0	0	0	*0*	1	0	1	0	*2*
4:15 PM	0	0	2	2	*4*	0	0	0	0	*0*	0	0	0	0	*0*
4:20 PM	0	3	0	0	*3*	0	0	0	0	*0*	0	1	2	0	*3*
4:25 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	2	0	*3*
4:30 PM	0	0	1	1	*2*	0	1	0	0	*1*	0	0	0	0	*0*
4:35 PM	0	0	0	1	*1*	0	0	0	0	*0*	3	0	0	0	*3*
4:40 PM	0	2	0	2	*4*	0	0	0	0	*0*	2	0	0	0	*2*
4:45 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:50 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:55 PM	0	1	0	0	*1*	0	0	0	0	*0*	1	0	0	0	*1*
5:00 PM	0	0	0	1	*1*	0	0	0	0	*0*	1	0	0	0	*1*
5:05 PM	0	0	0	2	*2*	0	0	0	0	*0*	1	0	0	0	*1*
5:10 PM	0	2	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	2	0	1	0	*3*	0	0	0	0	*0*	1	0	2	0	*3*
5:20 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:25 PM	0	1	1	1	*3*	0	0	0	0	*0*	1	0	0	0	*1*
5:30 PM	1	0	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:35 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	0	0	*1*
5:40 PM	0	2	0	1	*3*	0	0	1	0	*1*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:50 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	0	0	*1*
5:55 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	4	15	9	14	*42*	0	1	1	0	*2*	15	4	8	0	*27*
Peak Hour	**3**	**5**	**2**	**6**	***16***	**0**	**0**	**1**	**0**	***1***	**5**	**1**	**2**	**0**	***8***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Allison Dr				E Monte Vista Ave				Allison Dr				E Monte Vista Ave				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	3	0
4:05 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0
4:10 PM	0	0	0	0	0	1	1	0	0	1	0	0	0	0	1	1	5	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	4	0
4:20 PM	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	3	0
4:25 PM	0	0	0	0	0	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	1	0	0	0	0	1	0	2	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:40 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	4	0
4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	26
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	24
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	24
5:10 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	21
5:15 PM	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	3	20
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
5:25 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	3	20
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	20
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
5:40 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	3	18
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
Count Total	0	1	3	0	0	7	7	1	0	3	2	4	0	1	7	6	42	0
Peak Hour	**0**	**1**	**2**	**0**	**0**	**3**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**2**	**3**	**16**	**0**

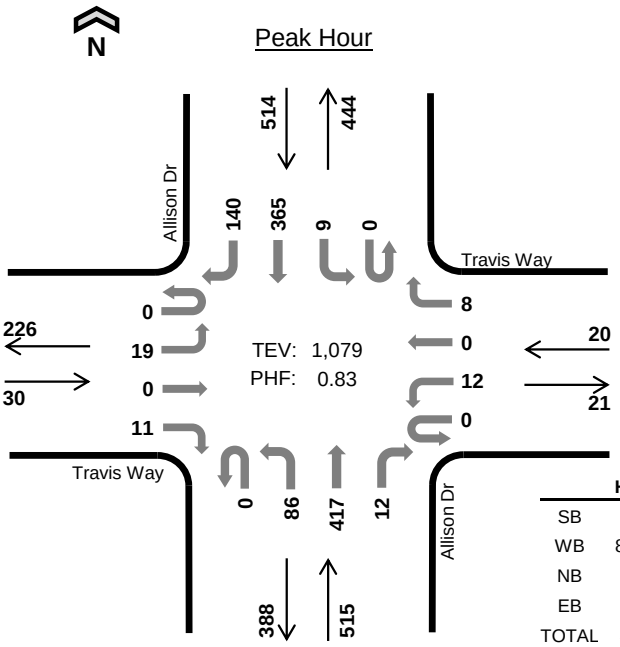
Two-Hour Count Summaries - Bikes

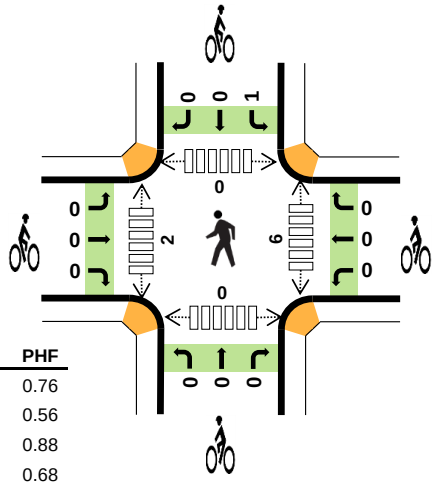
Interval Start	Allison Dr			E Monte Vista Ave			Allison Dr			E Monte Vista Ave			5-min Total	Rolling One Hour
	Southbound			Westbound			Northbound			Eastbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	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	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	0	0	1	0	0	1	0	0	0	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Allison Dr
Travis Way

Date: 06-21-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:55 AM to 8:55 AM





	HV %:	PHF
SB	2.7%	0.76
WB	80.0%	0.56
NB	3.7%	0.88
EB	0.0%	0.68
TOTAL	4.5%	0.83

Peak-Hour Count Summaries

Interval Start		Allison Dr Southbound				Travis Way Westbound				Allison Dr Northbound				Travis Way Eastbound				5-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:55 AM		0	**3**	30	10	0	1	0	0	0	7	**45**	1	0	**5**	0	0	102	0
8:00 AM		0	0	31	5	0	**4**	0	**3**	0	3	41	0	0	1	0	0	88	0
8:05 AM		0	0	26	11	0	0	0	1	0	5	23	0	0	1	0	2	69	0
8:10 AM		0	1	27	14	0	0	0	0	0	3	32	1	0	1	0	0	79	0
8:15 AM		0	0	14	15	0	1	0	0	0	10	34	2	0	2	0	0	78	0
8:20 AM		0	0	27	**21**	0	1	0	1	0	11	37	2	0	1	0	1	102	0
8:25 AM		0	2	23	11	0	0	0	1	0	**13**	38	0	0	1	0	0	89	0
8:30 AM		0	0	24	10	0	3	0	1	0	5	24	1	0	0	0	1	69	0
8:35 AM		0	1	33	6	0	0	0	0	0	4	32	0	0	1	0	2	79	0
8:40 AM		0	0	48	12	0	0	0	1	0	9	31	1	0	2	0	1	105	0
8:45 AM		0	2	**50**	13	0	1	0	0	0	7	35	1	0	0	0	**3**	112	0
8:50 AM		0	0	32	12	0	1	0	0	0	9	**45**	**3**	0	4	0	1	107	**1,079**
Peak Hour	**All**	**0**	**9**	**365**	**140**	**0**	**12**	**0**	**8**	**0**	**86**	**417**	**12**	**0**	**19**	**0**	**11**	**1,079**	0
	HV	**0**	**6**	**8**	**0**	**0**	**11**	**0**	**5**	**0**	**0**	**9**	**10**	**0**	**0**	**0**	**0**	**49**	0
	HV%	**-**	**67%**	**2%**	**0%**	**-**	**92%**	**-**	**63%**	**-**	**0%**	**2%**	**83%**	**-**	**0%**	**-**	**0%**	**5%**	0

Note: For all two-hour count summary, see next page.

Two-Hour Count Summaries

Interval Start	Allison Dr (Southbound)				Travis Way (Westbound)				Allison Dr (Northbound)				Travis Way (Eastbound)				5-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	5	24	2	0	4	0	3	0	1	22	1	0	0	0	0	62	0
7:05 AM	0	4	19	5	0	1	0	2	0	0	29	1	0	1	0	1	63	0
7:10 AM	0	4	17	1	0	1	0	2	0	3	25	3	0	1	0	1	58	0
7:15 AM	0	1	16	2	0	1	0	4	0	1	23	3	0	2	0	0	53	0
7:20 AM	0	0	16	6	0	0	0	0	0	1	28	1	0	1	0	0	53	0
7:25 AM	0	0	22	7	0	0	0	1	0	2	29	0	0	1	0	1	63	0
7:30 AM	0	2	17	6	0	3	0	1	0	0	35	0	0	2	0	0	66	0
7:35 AM	0	0	25	3	0	0	0	1	0	4	33	0	0	0	0	2	68	0
7:40 AM	0	1	32	7	0	0	0	1	0	4	38	1	0	0	0	0	84	0
7:45 AM	0	0	28	19	0	1	0	0	0	4	38	2	0	2	0	0	94	0
7:50 AM	0	0	30	20	0	1	0	0	1	6	34	0	0	1	0	0	93	0
7:55 AM	0	3	30	10	0	1	0	0	0	7	45	1	0	5	0	0	102	859
8:00 AM	0	0	31	5	0	4	0	3	0	3	41	0	0	1	0	0	88	885
8:05 AM	0	0	26	11	0	0	0	1	0	5	23	0	0	1	0	2	69	891
8:10 AM	0	1	27	14	0	0	0	0	0	3	32	1	0	1	0	0	79	912
8:15 AM	0	0	14	15	0	1	0	0	0	10	34	2	0	2	0	0	78	937
8:20 AM	0	0	27	21	0	1	0	1	0	11	37	2	0	1	0	1	102	986
8:25 AM	0	2	23	11	0	0	0	1	0	13	38	0	0	1	0	0	89	1,012
8:30 AM	0	0	24	10	0	3	0	1	0	5	24	1	0	0	0	1	69	1,015
8:35 AM	0	1	33	6	0	0	0	0	0	4	32	0	0	1	0	2	79	1,026
8:40 AM	0	0	48	12	0	0	0	1	0	9	31	1	0	2	0	1	105	1,047
8:45 AM	0	2	50	13	0	1	0	0	0	7	35	1	0	0	0	3	112	1,065
8:50 AM	0	0	32	12	0	1	0	0	0	9	45	3	0	4	0	1	107	1,079
8:55 AM	0	0	41	5	0	0	0	0	0	2	24	0	0	2	0	2	76	1,053
Count Total	0	26	652	223	0	24	0	23	1	114	775	24	0	32	0	18	1,912	0
Peak Hour All	**0**	**9**	**365**	**140**	**0**	**12**	**0**	**8**	**0**	**86**	**417**	**12**	**0**	**19**	**0**	**11**	**1,079**	**0**
Peak Hour HV	**0**	**6**	**8**	**0**	**0**	**11**	**0**	**5**	**0**	**0**	**9**	**10**	**0**	**0**	**0**	**0**	**49**	**0**
Peak Hour HV%	**-**	**67%**	**2%**	**0%**	**-**	**92%**	**-**	**63%**	**-**	**0%**	**2%**	**83%**	**-**	**0%**	**-**	**0%**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	SB	WB	NB	EB	Total	SB	WB	NB	EB	Total	North	East	South	West	Total
7:00 AM	1	6	0	0	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:05 AM	2	1	0	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:10 AM	2	1	3	0	*6*	0	0	1	0	*1*	0	0	0	0	*0*
7:15 AM	1	2	2	0	*5*	0	0	0	0	*0*	0	1	0	0	*1*
7:20 AM	1	0	1	0	*2*	0	0	0	0	*0*	0	1	0	0	*1*
7:25 AM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	0	4	2	0	*6*	0	0	1	0	*1*	0	1	0	0	*1*
7:35 AM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:40 AM	2	0	1	0	*3*	0	0	0	0	*0*	0	1	0	0	*1*
7:45 AM	0	1	2	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:50 AM	0	0	1	0	*1*	0	0	0	0	*0*	1	0	0	0	*1*
7:55 AM	3	0	1	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	2	7	0	0	*9*	0	0	0	0	*0*	0	1	0	1	*2*
8:05 AM	2	0	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:10 AM	1	0	3	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
8:15 AM	0	1	1	0	*2*	1	0	0	0	*1*	0	0	0	0	*0*
8:20 AM	0	1	4	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
8:25 AM	1	0	4	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	0	4	0	0	*4*	0	0	0	0	*0*	0	1	0	0	*1*
8:35 AM	3	0	0	0	*3*	0	0	0	0	*0*	0	1	0	0	*1*
8:40 AM	0	1	2	0	*3*	0	0	0	0	*0*	0	1	0	0	*1*
8:45 AM	2	1	1	0	*4*	0	0	0	0	*0*	0	0	0	1	*1*
8:50 AM	0	1	3	0	*4*	0	0	0	0	*0*	0	2	0	0	*2*
8:55 AM	0	0	0	0	*0*	0	0	0	0	*0*	1	2	0	1	*4*
Count Total	24	31	32	0	*87*	1	0	2	0	*3*	2	12	0	3	*17*
Peak Hour	**14**	**16**	**19**	**0**	***49***	**1**	**0**	**0**	**0**	***1***	**0**	**6**	**0**	**2**	***8***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Allison Dr				Travis Way				Allison Dr				Travis Way				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	0	0	4	0	2	0	0	0	0	0	0	0	0	7	0
7:05 AM	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0
7:10 AM	0	2	0	0	0	0	0	1	0	0	1	2	0	0	0	0	6	0
7:15 AM	0	0	1	0	0	1	0	1	0	0	0	2	0	0	0	0	5	0
7:20 AM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
7:25 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	3	0	1	0	0	2	0	0	0	0	0	6	0
7:35 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:40 AM	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0
7:45 AM	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	3	0
7:50 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
7:55 AM	0	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	4	42
8:00 AM	0	0	2	0	0	4	0	3	0	0	0	0	0	0	0	0	9	44
8:05 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	43
8:10 AM	0	1	0	0	0	0	0	0	0	0	2	1	0	0	0	0	4	41
8:15 AM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	2	38
8:20 AM	0	0	0	0	0	1	0	0	0	0	2	2	0	0	0	0	5	41
8:25 AM	0	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0	5	45
8:30 AM	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	4	43
8:35 AM	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	45
8:40 AM	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	3	45
8:45 AM	0	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0	4	46
8:50 AM	0	0	0	0	0	1	0	0	0	0	0	3	0	0	0	0	4	49
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
Count Total	0	11	13	0	0	20	0	11	0	0	15	17	0	0	0	0	87	0
Peak Hour	**0**	**6**	**8**	**0**	**0**	**11**	**0**	**5**	**0**	**0**	**9**	**10**	**0**	**0**	**0**	**0**	**49**	**0**

Two-Hour Count Summaries - Bikes

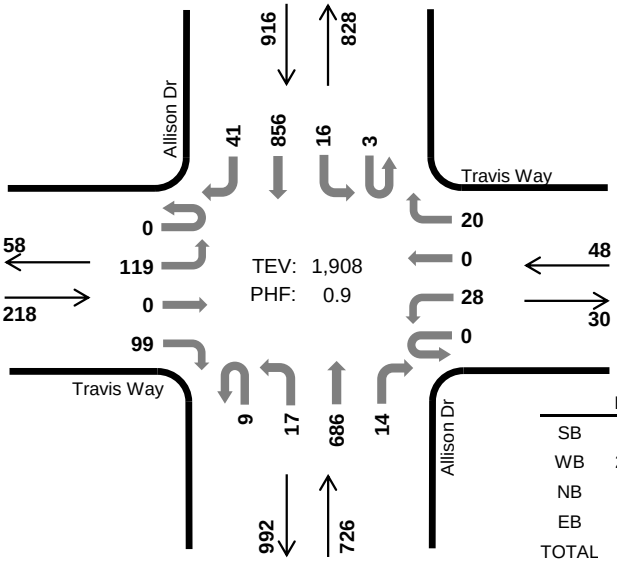
Interval Start	Allison Dr			Travis Way			Allison Dr			Travis Way			5-min Total	Rolling One Hour
	Southbound			Westbound			Northbound			Eastbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	1	2
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	1	0	0	0	0	0	0	2	0	0	0	0	3	0
Peak Hour	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

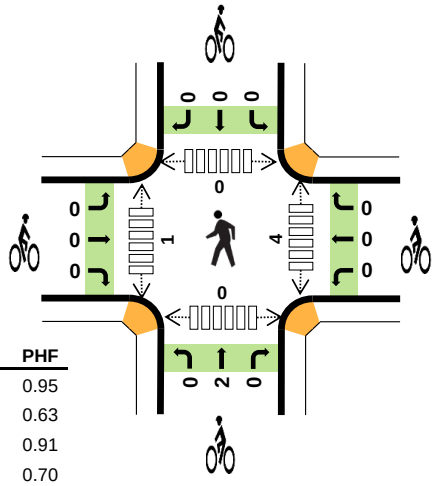
Allison Dr
Travis Way

Date: 06-21-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:55 PM to 5:55 PM

Peak Hour



	HV %:	PHF
SB	0.7%	0.95
WB	29.2%	0.63
NB	1.8%	0.91
EB	0.0%	0.70
TOTAL	1.7%	0.90



Peak-Hour Count Summaries

Interval Start		Allison Dr Southbound				Travis Way Westbound				Allison Dr Northbound				Travis Way Eastbound				5-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:55 PM		0	2	70	2	0	**7**	0	**4**	0	0	50	1	0	4	0	3	143	0
5:00 PM		**1**	**3**	67	2	0	6	0	1	1	2	68	0	0	10	0	8	169	0
5:05 PM		0	0	**92**	2	0	1	0	0	0	1	70	0	0	**23**	0	14	203	0
5:10 PM		**1**	**3**	66	3	0	1	0	1	0	3	55	0	0	13	0	10	156	0
5:15 PM		**1**	2	69	2	0	2	0	**4**	0	1	58	2	0	8	0	5	154	0
5:20 PM		0	0	62	**8**	0	0	0	2	2	2	64	**3**	0	7	0	5	155	0
5:25 PM		0	1	80	4	0	1	0	0	0	0	45	2	0	8	0	5	146	0
5:30 PM		0	1	66	5	0	4	0	3	1	1	50	2	0	11	0	8	152	0
5:35 PM		0	0	67	2	0	1	0	2	1	1	51	0	0	12	0	**16**	153	0
5:40 PM		0	0	72	5	0	0	0	1	1	1	59	1	0	12	0	9	161	0
5:45 PM		0	1	81	5	0	4	0	1	**3**	1	32	0	0	6	0	5	139	0
5:50 PM		0	**3**	64	1	0	1	0	1	0	**4**	**84**	**3**	0	5	0	11	177	**1,908**
Peak Hour	**All**	**3**	**16**	**856**	**41**	**0**	**28**	**0**	**20**	**9**	**17**	**686**	**14**	**0**	**119**	**0**	**99**	**1,908**	0
	HV	**0**	**3**	**3**	**0**	**0**	**10**	**0**	**4**	**0**	**0**	**0**	**13**	**0**	**0**	**0**	**0**	**33**	0
	HV%	**0%**	**19%**	**0%**	**0%**	**-**	**36%**	**-**	**20%**	**0%**	**0%**	**0%**	**93%**	**-**	**0%**	**-**	**0%**	**2%**	0

Note: For all two-hour count summary, see next page.

Two-Hour Count Summaries

Interval Start	Allison Dr (Southbound)				Travis Way (Westbound)				Allison Dr (Northbound)				Travis Way (Eastbound)				5-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	56	1	0	4	0	1	0	1	44	0	0	6	0	2	115	0
4:05 PM	0	1	63	2	0	0	0	1	0	2	52	1	0	7	0	4	133	0
4:10 PM	0	4	59	4	0	0	0	1	0	2	42	0	0	5	0	2	119	0
4:15 PM	1	0	70	0	0	3	0	1	1	3	51	0	0	7	0	3	140	0
4:20 PM	0	0	70	4	0	3	0	1	1	1	52	0	0	0	0	3	135	0
4:25 PM	1	4	73	5	0	3	0	2	1	1	35	1	0	6	0	3	135	0
4:30 PM	0	2	50	1	0	10	0	5	0	2	55	1	0	3	0	3	132	0
4:35 PM	0	4	57	7	0	4	0	3	0	3	40	1	0	9	0	3	131	0
4:40 PM	1	2	79	1	0	1	0	10	0	1	62	1	0	2	0	6	166	0
4:45 PM	0	2	52	4	0	4	0	2	1	5	55	0	0	3	0	5	133	0
4:50 PM	0	5	70	5	0	2	0	4	0	0	57	3	0	5	0	4	155	0
4:55 PM	0	2	70	2	0	7	0	4	0	0	50	1	0	4	0	3	143	1,637
5:00 PM	1	3	67	2	0	6	0	1	1	2	68	0	0	10	0	8	169	1,691
5:05 PM	0	0	92	2	0	1	0	0	0	1	70	0	0	23	0	14	203	1,761
5:10 PM	1	3	66	3	0	1	0	1	0	3	55	0	0	13	0	10	156	1,798
5:15 PM	1	2	69	2	0	2	0	4	0	1	58	2	0	8	0	5	154	1,812
5:20 PM	0	0	62	8	0	0	0	2	2	2	64	3	0	7	0	5	155	1,832
5:25 PM	0	1	80	4	0	1	0	0	0	0	45	2	0	8	0	5	146	1,843
5:30 PM	0	1	66	5	0	4	0	3	1	1	50	2	0	11	0	8	152	1,863
5:35 PM	0	0	67	2	0	1	0	2	1	1	51	0	0	12	0	16	153	1,885
5:40 PM	0	0	72	5	0	0	0	1	1	1	59	1	0	12	0	9	161	1,880
5:45 PM	0	1	81	5	0	4	0	1	3	1	32	0	0	6	0	5	139	1,886
5:50 PM	0	3	64	1	0	1	0	1	0	4	84	3	0	5	0	11	177	1,908
5:55 PM	0	1	67	2	0	1	0	2	0	3	46	1	0	9	0	5	137	1,902
Count Total	6	41	1,622	77	0	63	0	53	13	41	1,277	23	0	181	0	142	3,539	0
Peak Hour All	**3**	**16**	**856**	**41**	**0**	**28**	**0**	**20**	**9**	**17**	**686**	**14**	**0**	**119**	**0**	**99**	**1,908**	**0**
Peak Hour HV	**0**	**3**	**3**	**0**	**0**	**10**	**0**	**4**	**0**	**0**	**0**	**13**	**0**	**0**	**0**	**0**	**33**	**0**
Peak Hour HV%	**0%**	**19%**	**0%**	**0%**	**-**	**36%**	**-**	**20%**	**0%**	**0%**	**0%**	**93%**	**-**	**0%**	**-**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	SB	WB	NB	EB	Total	SB	WB	NB	EB	Total	North	East	South	West	Total
4:00 PM	0	5	1	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
4:05 PM	1	0	1	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:10 PM	2	1	0	0	*3*	0	0	0	0	*0*	0	2	0	0	*2*
4:15 PM	0	2	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:20 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:25 PM	0	1	1	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	1	4	1	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
4:35 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	0	0	*1*
4:40 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:50 PM	1	1	4	0	*6*	0	0	0	0	*0*	0	1	0	0	*1*
4:55 PM	1	0	1	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:00 PM	0	5	0	0	*5*	0	0	0	0	*0*	0	1	0	0	*1*
5:05 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:10 PM	3	0	0	0	*3*	0	0	1	0	*1*	0	1	0	0	*1*
5:15 PM	0	2	2	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
5:20 PM	1	1	2	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
5:25 PM	0	0	2	0	*2*	0	0	0	0	*0*	0	1	0	0	*1*
5:30 PM	0	4	2	0	*6*	0	0	0	0	*0*	0	1	0	0	*1*
5:35 PM	1	0	0	0	*1*	0	0	1	0	*1*	0	0	0	0	*0*
5:40 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	2	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:50 PM	0	0	3	0	*3*	0	0	0	0	*0*	0	0	0	1	*1*
5:55 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	12	29	23	0	*64*	0	0	2	0	*2*	0	8	0	1	*9*
Peak Hour	**6**	**14**	**13**	**0**	***33***	**0**	**0**	**2**	**0**	***2***	**0**	**4**	**0**	**1**	***5***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Allison Dr				Travis Way				Allison Dr				Travis Way				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	4	0	1	0	0	1	0	0	0	0	0	6	0
4:05 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
4:10 PM	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0
4:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	0
4:20 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
4:25 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	0
4:30 PM	0	0	1	0	0	3	0	1	0	0	1	0	0	0	0	0	6	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
4:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0
4:50 PM	0	1	0	0	0	0	0	1	0	0	1	3	0	0	0	0	6	0
4:55 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	33
5:00 PM	0	0	0	0	0	4	0	1	0	0	0	0	0	0	0	0	5	32
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
5:10 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	30
5:15 PM	0	0	0	0	0	1	0	1	0	0	0	2	0	0	0	0	4	32
5:20 PM	0	0	1	0	0	0	0	1	0	0	0	2	0	0	0	0	4	35
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	35
5:30 PM	0	0	0	0	0	3	0	1	0	0	0	2	0	0	0	0	6	35
5:35 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	36
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	36
5:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	36
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	33
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
Count Total	0	7	5	0	0	19	0	10	0	0	4	19	0	0	0	0	64	0
Peak Hour	**0**	**3**	**3**	**0**	**0**	**10**	**0**	**4**	**0**	**0**	**0**	**13**	**0**	**0**	**0**	**0**	**33**	**0**

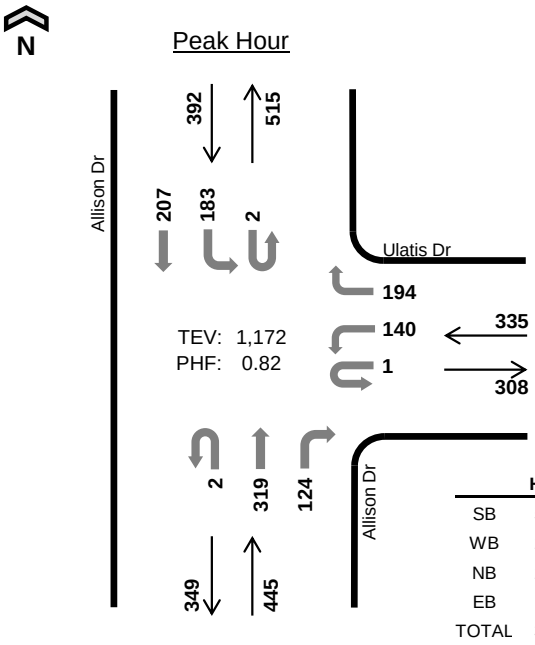
Two-Hour Count Summaries - Bikes

Interval Start	Allison Dr			Travis Way			Allison Dr			Travis Way			5-min Total	Rolling One Hour
	Southbound			Westbound			Northbound			Eastbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	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	0
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	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	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	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	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	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	0
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:10 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:35 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	2
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	0	0	0	0	0	0	0	2	0	0	0	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**

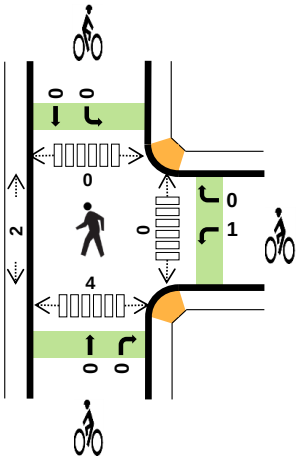
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Allison Dr
Ulatis Dr

Date: 06-21-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:55 AM to 8:55 AM



	HV %:	PHF
SB	5.1%	0.74
WB	2.4%	0.78
NB	2.9%	0.84
EB	-	-
TOTAL	3.5%	0.82



Peak-Hour Count Summaries

Interval Start		Allison Dr Southbound				Ulatis Dr Westbound				Allison Dr Northbound				0 Eastbound				5-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:55 AM		0	11	21	0	0	6	0	**26**	0	0	25	12	0	0	0	0	101	0
8:00 AM		0	16	14	0	0	12	0	12	0	0	31	10	0	0	0	0	95	0
8:05 AM		0	13	13	0	0	12	0	10	0	0	18	5	0	0	0	0	71	0
8:10 AM		0	13	22	0	0	10	0	19	**1**	0	17	10	0	0	0	0	92	0
8:15 AM		0	6	14	0	0	15	0	15	0	0	33	**15**	0	0	0	0	98	0
8:20 AM		**1**	15	15	0	0	4	0	19	0	0	30	10	0	0	0	0	94	0
8:25 AM		0	10	12	0	0	12	0	15	0	0	**37**	8	0	0	0	0	94	0
8:30 AM		0	15	17	0	0	8	0	11	0	0	19	12	0	0	0	0	82	0
8:35 AM		0	13	19	0	0	11	0	10	0	0	26	10	0	0	0	0	89	0
8:40 AM		**1**	21	**23**	0	**1**	16	0	13	0	0	28	11	0	0	0	0	114	0
8:45 AM		0	**29**	18	0	0	12	0	18	**1**	0	24	**15**	0	0	0	0	117	0
8:50 AM		0	21	19	0	0	**22**	0	**26**	0	0	31	6	0	0	0	0	125	**1,172**
Peak Hour	**All**	**2**	**183**	**207**	**0**	**1**	**140**	**0**	**194**	**2**	**0**	**319**	**124**	**0**	**0**	**0**	**0**	**1,172**	0
	HV	**0**	**11**	**9**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**11**	**2**	**0**	**0**	**0**	**0**	**41**	0
	HV%	**0%**	**6%**	**4%**	**-**	**0%**	**0%**	**-**	**4%**	**0%**	**-**	**3%**	**2%**	**-**	**-**	**-**	**-**	**3%**	0

Note: For all two-hour count summary, see next page.

Two-Hour Count Summaries

Interval Start	Allison Dr Southbound				Ulatis Dr Westbound				Allison Dr Northbound				0 Eastbound				5-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	6	19	0	0	10	0	9	0	0	16	3	0	0	0	0	63	0
7:05 AM	0	7	15	0	0	8	0	10	0	0	22	5	0	0	0	0	67	0
7:10 AM	0	8	8	0	0	9	0	15	0	0	16	5	0	0	0	0	61	0
7:15 AM	0	8	10	0	0	11	0	11	0	0	17	7	0	0	0	0	64	0
7:20 AM	0	7	10	0	0	7	0	11	1	0	18	5	0	0	0	0	59	0
7:25 AM	0	12	15	0	0	7	0	17	0	0	14	8	0	0	0	0	73	0
7:30 AM	0	9	9	0	1	15	0	13	0	0	23	7	0	0	0	0	77	0
7:35 AM	0	14	11	0	0	7	0	18	0	0	20	3	0	0	0	0	73	0
7:40 AM	0	13	16	0	0	9	0	19	0	0	26	5	0	0	0	0	88	0
7:45 AM	0	13	19	0	0	12	0	15	0	0	27	7	0	0	0	0	93	0
7:50 AM	0	14	17	0	0	13	0	20	0	0	25	8	0	0	0	0	97	0
7:55 AM	0	11	21	0	0	6	0	26	0	0	25	12	0	0	0	0	101	916
8:00 AM	0	16	14	0	0	12	0	12	0	0	31	10	0	0	0	0	95	948
8:05 AM	0	13	13	0	0	12	0	10	0	0	18	5	0	0	0	0	71	952
8:10 AM	0	13	22	0	0	10	0	19	1	0	17	10	0	0	0	0	92	983
8:15 AM	0	6	14	0	0	15	0	15	0	0	33	15	0	0	0	0	98	1,017
8:20 AM	1	15	15	0	0	4	0	19	0	0	30	10	0	0	0	0	94	1,052
8:25 AM	0	10	12	0	0	12	0	15	0	0	37	8	0	0	0	0	94	1,073
8:30 AM	0	15	17	0	0	8	0	11	0	0	19	12	0	0	0	0	82	1,078
8:35 AM	0	13	19	0	0	11	0	10	0	0	26	10	0	0	0	0	89	1,094
8:40 AM	1	21	23	0	1	16	0	13	0	0	28	11	0	0	0	0	114	1,120
8:45 AM	0	29	18	0	0	12	0	18	1	0	24	15	0	0	0	0	117	1,144
8:50 AM	0	21	19	0	0	22	0	26	0	0	31	6	0	0	0	0	125	1,172
8:55 AM	0	31	17	0	0	12	0	5	0	0	20	8	0	0	0	0	93	1,164
Count Total	2	325	373	0	2	260	0	357	3	0	563	195	0	0	0	0	2,080	0
Peak Hour All	**2**	**183**	**207**	**0**	**1**	**140**	**0**	**194**	**2**	**0**	**319**	**124**	**0**	**0**	**0**	**0**	**1,172**	**0**
Peak Hour HV	**0**	**11**	**9**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**11**	**2**	**0**	**0**	**0**	**0**	**41**	**0**
Peak Hour HV%	**0%**	**6%**	**4%**	**-**	**0%**	**0%**	**-**	**4%**	**0%**	**-**	**3%**	**2%**	**-**	**-**	**-**	**-**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	SB	WB	NB	EB	Total	SB	WB	NB	EB	Total	North	East	South	West	Total
7:00 AM	4	0	0	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
7:05 AM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:10 AM	0	1	2	0	*3*	0	0	1	0	*1*	0	0	0	0	*0*
7:15 AM	1	1	2	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
7:20 AM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:25 AM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	3	1	3	0	*7*	0	1	1	0	*2*	0	0	0	0	*0*
7:35 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
7:40 AM	2	2	0	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	2	1	0	0	*3*	0	0	0	0	*0*	0	1	0	0	*1*
7:50 AM	0	1	1	0	*2*	0	0	0	0	*0*	1	0	0	0	*1*
7:55 AM	1	0	1	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	7	0	1	0	*8*	0	1	0	0	*1*	1	0	0	0	*1*
8:05 AM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
8:10 AM	0	1	2	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
8:15 AM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:20 AM	1	1	3	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
8:25 AM	1	2	2	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	3	0	1	0	*4*	0	0	0	0	*0*	0	2	0	0	*2*
8:35 AM	2	0	0	0	*2*	0	0	0	0	*0*	1	0	0	0	*1*
8:40 AM	1	0	2	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	1	1	0	0	*2*	0	0	0	0	*0*	1	0	0	0	*1*
8:50 AM	1	2	1	0	*4*	0	0	0	0	*0*	1	0	0	0	*1*
8:55 AM	0	2	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	33	18	22	0	*73*	0	2	2	0	*4*	5	3	0	0	*8*
Peak Hr	**20**	**8**	**13**	**0**	***41***	**0**	**1**	**0**	**0**	***1***	**4**	**2**	**0**	**0**	***6***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Allison Dr				Ulatis Dr				Allison Dr				0				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:10 AM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	3	0
7:15 AM	0	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	4	12
7:20 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	9
7:25 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9
7:30 AM	0	1	2	0	0	0	0	1	0	0	2	1	0	0	0	0	7	13
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
7:40 AM	0	0	2	0	0	1	0	1	0	0	0	0	0	0	0	0	4	12
7:45 AM	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	14
7:50 AM	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	9
7:55 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	11
8:00 AM	0	4	3	0	0	0	0	0	0	0	0	1	0	0	0	0	8	15
8:05 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	13
8:10 AM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	3	14
8:15 AM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	14
8:20 AM	0	0	1	0	0	0	0	1	0	0	2	1	0	0	0	0	5	11
8:25 AM	0	1	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5	15
8:30 AM	0	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	4	16
8:35 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	16
8:40 AM	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	14
8:45 AM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	11
8:50 AM	0	0	1	0	0	0	0	2	0	0	1	0	0	0	0	0	4	11
8:55 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	11
Count Total	0	17	16	0	0	3	0	15	0	0	17	5	0	0	0	0	73	0
Peak Hour	**0**	**11**	**9**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**11**	**2**	**0**	**0**	**0**	**0**	**41**	**0**

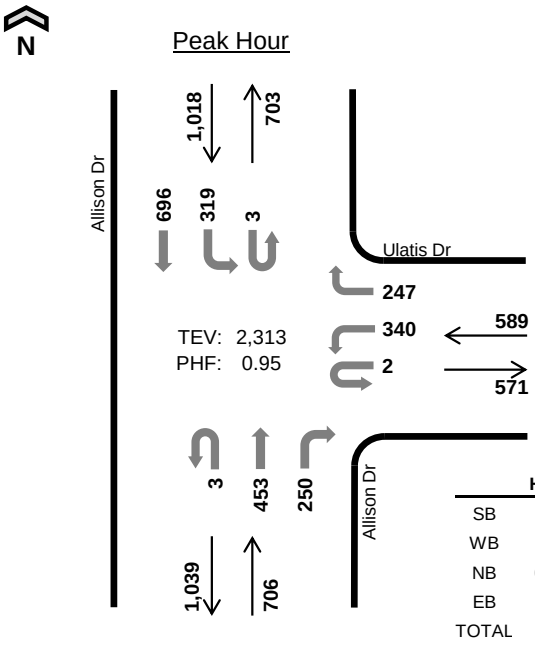
Two-Hour Count Summaries - Bikes

Interval Start	Allison Dr			Ulatis Dr			Allison Dr			0			5-min Total	Rolling One Hour
	Southbound			Westbound			Northbound			Eastbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	1	0	0	1	0	0	0	2	2
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	1	1
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	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	0
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:40 AM	0	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	0
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	1	0	1	0	1	1	0	0	0	4	0
Peak Hour	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

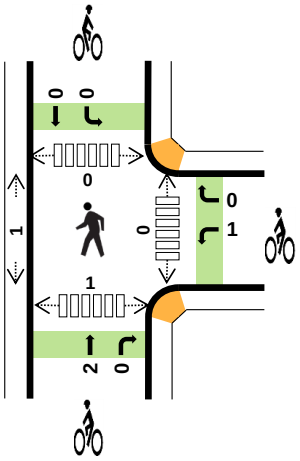
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Allison Dr
Ulatis Dr

Date: 06-21-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:55 PM to 5:55 PM



	HV %:	PHF
SB	1.2%	0.91
WB	1.5%	0.93
NB	0.6%	0.91
EB	-	-
TOTAL	1.1%	0.95



Peak-Hour Count Summaries

Interval Start		Allison Dr Southbound				Ulatis Dr Westbound				Allison Dr Northbound				0 Eastbound				5-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:55 PM		0	33	54	0	0	31	0	17	0	0	31	27	0	0	0	0	193	0
5:00 PM		0	35	54	0	0	29	0	27	**1**	0	43	20	0	0	0	0	209	0
5:05 PM		0	25	**77**	0	**1**	25	0	25	0	0	39	13	0	0	0	0	205	0
5:10 PM		0	**37**	51	0	0	27	0	25	**1**	0	36	17	0	0	0	0	194	0
5:15 PM		0	16	46	0	0	**34**	0	18	0	0	43	**33**	0	0	0	0	190	0
5:20 PM		0	27	61	0	0	23	0	25	0	0	41	22	0	0	0	0	199	0
5:25 PM		0	23	64	0	0	31	0	16	0	0	35	16	0	0	0	0	185	0
5:30 PM		**1**	26	56	0	**1**	24	0	17	**1**	0	34	23	0	0	0	0	183	0
5:35 PM		**1**	23	62	0	0	29	0	23	0	0	27	21	0	0	0	0	186	0
5:40 PM		**1**	25	53	0	0	23	0	9	0	0	**47**	22	0	0	0	0	180	0
5:45 PM		0	25	64	0	0	**34**	0	15	0	0	34	18	0	0	0	0	190	0
5:50 PM		0	24	54	0	0	30	0	**30**	0	0	43	18	0	0	0	0	199	**2,313**
Peak Hour	**All**	**3**	**319**	**696**	**0**	**2**	**340**	**0**	**247**	**3**	**0**	**453**	**250**	**0**	**0**	**0**	**0**	**2,313**	0
	HV	**0**	**5**	**7**	**0**	**0**	**1**	**0**	**8**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**25**	0
	HV%	**0%**	**2%**	**1%**	**-**	**0%**	**0%**	**-**	**3%**	**0%**	**-**	**0%**	**1%**	**-**	**-**	**-**	**-**	**1%**	0

Note: For all two-hour count summary, see next page.

Two-Hour Count Summaries

Interval Start	Allison Dr Southbound				Ulatis Dr Westbound				Allison Dr Northbound				0 Eastbound				5-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	19	38	0	0	24	0	17	0	0	28	22	0	0	0	0	148	0
4:05 PM	0	20	46	0	0	33	0	21	0	0	34	23	0	0	0	0	177	0
4:10 PM	0	31	45	0	0	22	0	12	0	0	33	21	0	0	0	0	164	0
4:15 PM	0	26	54	0	0	38	0	17	0	0	37	36	0	0	0	0	208	0
4:20 PM	0	19	47	0	0	28	0	18	1	0	32	18	0	0	0	0	163	0
4:25 PM	0	33	48	0	0	29	0	13	0	0	20	18	0	0	0	0	161	0
4:30 PM	1	30	35	0	0	37	0	22	1	0	32	33	0	0	0	0	191	0
4:35 PM	0	23	40	0	0	49	0	14	0	0	35	28	0	0	0	0	189	0
4:40 PM	0	22	41	0	0	35	0	23	2	0	38	15	0	0	0	0	176	0
4:45 PM	0	28	57	0	0	20	0	22	0	0	38	19	0	0	0	0	184	0
4:50 PM	0	31	32	0	0	35	0	27	0	0	39	12	0	0	0	0	176	0
4:55 PM	0	33	54	0	0	31	0	17	0	0	31	27	0	0	0	0	193	2,130
5:00 PM	0	35	54	0	0	29	0	27	1	0	43	20	0	0	0	0	209	2,191
5:05 PM	0	25	77	0	1	25	0	25	0	0	39	13	0	0	0	0	205	2,219
5:10 PM	0	37	51	0	0	27	0	25	1	0	36	17	0	0	0	0	194	2,249
5:15 PM	0	16	46	0	0	34	0	18	0	0	43	33	0	0	0	0	190	2,231
5:20 PM	0	27	61	0	0	23	0	25	0	0	41	22	0	0	0	0	199	2,267
5:25 PM	0	23	64	0	0	31	0	16	0	0	35	16	0	0	0	0	185	2,291
5:30 PM	1	26	56	0	1	24	0	17	1	0	34	23	0	0	0	0	183	2,283
5:35 PM	1	23	62	0	0	29	0	23	0	0	27	21	0	0	0	0	186	2,280
5:40 PM	1	25	53	0	0	23	0	9	0	0	47	22	0	0	0	0	180	2,284
5:45 PM	0	25	64	0	0	34	0	15	0	0	34	18	0	0	0	0	190	2,290
5:50 PM	0	24	54	0	0	30	0	30	0	0	43	18	0	0	0	0	199	2,313
5:55 PM	0	25	46	0	0	25	0	14	1	0	40	24	0	0	0	0	175	2,295
Count Total	4	626	1,225	0	2	715	0	467	8	0	859	519	0	0	0	0	4,425	0
Peak Hour All	**3**	**319**	**696**	**0**	**2**	**340**	**0**	**247**	**3**	**0**	**453**	**250**	**0**	**0**	**0**	**0**	**2,313**	**0**
Peak Hour HV	**0**	**5**	**7**	**0**	**0**	**1**	**0**	**8**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**25**	**0**
Peak Hour HV%	**0%**	**2%**	**1%**	**-**	**0%**	**0%**	**-**	**3%**	**0%**	**-**	**0%**	**1%**	**-**	**-**	**-**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	SB	WB	NB	EB	Total	SB	WB	NB	EB	Total	North	East	South	West	Total
4:00 PM	4	0	1	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
4:05 PM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:10 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:20 PM	0	0	3	0	*3*	0	1	0	0	*1*	1	1	0	0	*2*
4:25 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	4	1	1	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
4:35 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:40 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:50 PM	0	4	1	0	*5*	0	0	0	0	*0*	1	0	0	0	*1*
4:55 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	1	0	0	*1*
5:00 PM	4	0	0	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
5:05 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:10 PM	0	0	0	0	*0*	0	1	1	0	*2*	0	0	0	0	*0*
5:15 PM	2	2	0	0	*4*	0	0	0	0	*0*	1	0	0	0	*1*
5:20 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:25 PM	0	1	2	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	3	0	0	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
5:35 PM	1	0	0	0	*1*	0	0	1	0	*1*	0	0	0	0	*0*
5:40 PM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:50 PM	1	3	1	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
5:55 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	24	17	10	0	*51*	0	2	2	0	*4*	3	2	0	0	*5*
Peak Hr	**12**	**9**	**4**	**0**	***25***	**0**	**1**	**2**	**0**	***3***	**1**	**1**	**0**	**0**	***2***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Allison Dr				Ulatis Dr				Allison Dr				0				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	5	0
4:05 PM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0
4:10 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9
4:20 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	7
4:25 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	6
4:30 PM	0	2	2	0	0	0	0	1	0	0	1	0	0	0	0	0	6	11
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
4:40 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	8
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8
4:50 PM	0	0	0	0	0	1	0	3	0	0	1	0	0	0	0	0	5	7
4:55 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	8
5:00 PM	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	11
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:15 PM	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	4	8
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	5
5:25 PM	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	3	8
5:30 PM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	11
5:35 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8
5:40 PM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	9
5:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	7
5:50 PM	0	0	1	0	0	0	0	3	0	0	1	0	0	0	0	0	5	9
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Count Total	0	12	12	0	0	2	0	15	0	0	8	2	0	0	0	0	51	0
Peak Hour	**0**	**5**	**7**	**0**	**0**	**1**	**0**	**8**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**25**	**0**

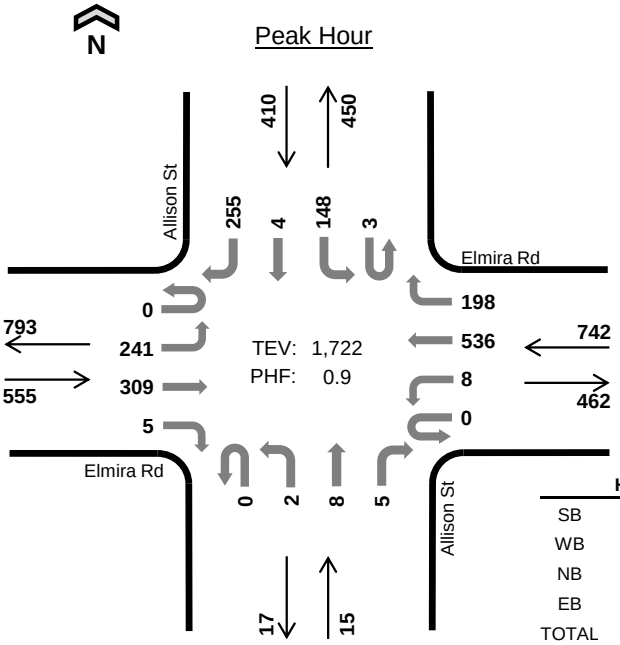
Two-Hour Count Summaries - Bikes

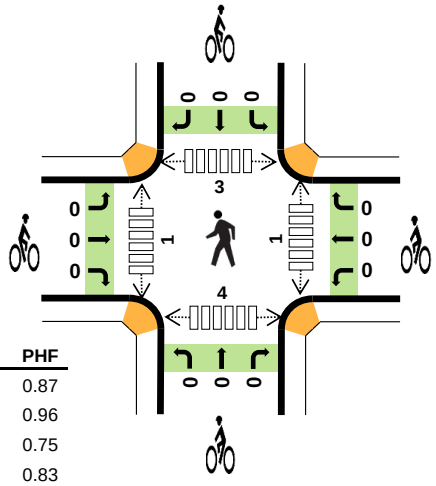
Interval Start	Allison Dr			Ulatis Dr			Allison Dr			0			5-min Total	Rolling One Hour
	Southbound			Westbound			Northbound			Eastbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	1
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:40 PM	0	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	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	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	0
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:10 PM	0	0	0	1	0	0	0	1	0	0	0	0	2	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	1
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	2	0	0	0	2	0	0	0	0	4	0
Peak Hour	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**3**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Allison St
Elmira Rd

Date: 06-26-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
SB	3.2%	0.87
WB	1.5%	0.96
NB	6.7%	0.75
EB	2.3%	0.83
TOTAL	2.2%	0.90

Peak-Hour Count Summaries

Interval Start		Allison St (Southbound)				Elmira Rd (Westbound)				Allison St (Northbound)				Elmira Rd (Eastbound)				5-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
8:00 AM		0	6	0	28	0	0	37	15	0	0	0	1	0	8	**32**	0	127	0
8:05 AM		0	12	0	15	0	1	55	16	0	0	0	**3**	0	12	24	**1**	139	0
8:10 AM		0	7	**1**	18	0	0	38	18	0	0	1	0	0	23	31	**1**	138	0
8:15 AM		0	11	0	19	0	0	43	19	0	0	0	0	0	22	25	0	139	0
8:20 AM		0	21	**1**	19	0	0	31	**29**	0	0	0	0	0	12	25	0	138	0
8:25 AM		0	11	0	18	0	**2**	51	16	0	0	1	0	0	15	28	0	142	0
8:30 AM		0	**22**	0	22	0	0	55	7	0	0	1	1	0	17	18	0	143	0
8:35 AM		1	12	**1**	16	0	1	46	12	0	**1**	0	0	0	14	21	**1**	126	0
8:40 AM		0	11	0	20	0	**2**	42	15	0	0	**2**	0	0	27	29	**1**	149	0
8:45 AM		0	13	0	**32**	0	0	**58**	16	0	0	1	0	0	23	26	0	169	0
8:50 AM		0	9	0	24	0	**2**	44	15	0	0	1	0	0	**38**	24	0	157	0
8:55 AM		**2**	13	**1**	24	0	0	36	20	0	**1**	1	0	0	30	26	**1**	155	**1,722**
Peak Hour	**All**	**3**	**148**	**4**	**255**	**0**	**8**	**536**	**198**	**0**	**2**	**8**	**5**	**0**	**241**	**309**	**5**	**1,722**	0
	HV	**0**	**8**	**0**	**5**	**0**	**0**	**7**	**4**	**0**	**0**	**1**	**0**	**0**	**4**	**8**	**1**	**38**	0
	HV%	**0%**	**5%**	**0%**	**2%**	**-**	**0%**	**1%**	**2%**	**-**	**0%**	**13%**	**0%**	**-**	**2%**	**3%**	**20%**	**2%**	0

Note: For all two-hour count summary, see next page.

Two-Hour Count Summaries

Interval Start	Allison St				Elmira Rd				Allison St				Elmira Rd				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	11	1	14	0	0	33	8	0	0	0	0	0	10	14	0	91	0
7:05 AM	0	7	1	9	0	1	34	10	0	0	1	0	0	8	21	0	92	0
7:10 AM	0	14	0	10	0	1	47	11	0	0	0	1	1	7	8	1	101	0
7:15 AM	0	13	0	16	0	0	41	14	0	1	0	0	0	9	13	0	107	0
7:20 AM	0	6	0	15	0	1	42	12	0	0	0	0	0	14	19	1	110	0
7:25 AM	1	2	1	21	0	0	34	14	0	0	1	1	0	11	15	1	102	0
7:30 AM	1	15	0	23	0	0	64	7	0	0	0	1	0	11	19	0	141	0
7:35 AM	2	6	0	16	0	2	44	11	0	0	0	2	0	13	21	0	117	0
7:40 AM	1	7	0	18	0	0	49	17	0	0	1	2	0	30	11	0	136	0
7:45 AM	0	10	1	12	0	0	63	16	0	0	0	0	0	19	22	0	143	0
7:50 AM	1	10	0	21	0	0	57	21	0	0	0	1	0	30	12	0	153	0
7:55 AM	1	5	0	16	0	0	42	22	0	0	0	0	1	26	36	0	149	1,442
8:00 AM	0	6	0	28	0	0	37	15	0	0	0	1	0	8	32	0	127	1,478
8:05 AM	0	12	0	15	0	1	55	16	0	0	0	3	0	12	24	1	139	1,525
8:10 AM	0	7	1	18	0	0	38	18	0	0	1	0	0	23	31	1	138	1,562
8:15 AM	0	11	0	19	0	0	43	19	0	0	0	0	0	22	25	0	139	1,594
8:20 AM	0	21	1	19	0	0	31	29	0	0	0	0	0	12	25	0	138	1,622
8:25 AM	0	11	0	18	0	2	51	16	0	0	1	0	0	15	28	0	142	1,662
8:30 AM	0	22	0	22	0	0	55	7	0	0	1	1	0	17	18	0	143	1,664
8:35 AM	1	12	1	16	0	1	46	12	0	1	0	0	0	14	21	1	126	1,673
8:40 AM	0	11	0	20	0	2	42	15	0	0	2	0	0	27	29	1	149	1,686
8:45 AM	0	13	0	32	0	0	58	16	0	0	1	0	0	23	26	0	169	1,712
8:50 AM	0	9	0	24	0	2	44	15	0	0	1	0	0	38	24	0	157	1,716
8:55 AM	2	13	1	24	0	0	36	20	0	1	1	0	0	30	26	1	155	1,722
Count Total	10	254	8	446	0	13	1,086	361	0	3	11	13	2	429	520	8	3,164	0
Peak Hour All	**3**	**148**	**4**	**255**	**0**	**8**	**536**	**198**	**0**	**2**	**8**	**5**	**0**	**241**	**309**	**5**	**1,722**	**0**
Peak Hour HV	**0**	**8**	**0**	**5**	**0**	**0**	**7**	**4**	**0**	**0**	**1**	**0**	**0**	**4**	**8**	**1**	**38**	**0**
Peak Hour HV%	**0%**	**5%**	**0%**	**2%**	**-**	**0%**	**1%**	**2%**	**-**	**0%**	**13%**	**0%**	**-**	**2%**	**3%**	**20%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	SB	WB	NB	EB	Total	SB	WB	NB	EB	Total	North	East	South	West	Total
7:00 AM	2	0	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
7:05 AM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
7:10 AM	3	0	0	1	*4*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	2	1	0	2	*5*	0	1	0	0	*1*	1	0	0	0	*1*
7:20 AM	1	2	0	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:25 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	3	2	0	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
7:35 AM	2	1	0	2	*5*	0	0	0	0	*0*	0	0	0	0	*0*
7:40 AM	0	1	1	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	0	2	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
7:50 AM	0	4	0	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
7:55 AM	0	2	0	3	*5*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	2	3	0	2	*7*	0	0	0	0	*0*	0	0	0	0	*0*
8:05 AM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	1	0	*1*
8:10 AM	2	0	0	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
8:15 AM	3	0	0	1	*4*	0	0	0	0	*0*	0	0	0	0	*0*
8:20 AM	0	3	0	0	*3*	0	0	0	0	*0*	0	0	1	0	*1*
8:25 AM	2	2	0	3	*7*	0	0	0	0	*0*	1	0	0	0	*1*
8:30 AM	2	0	0	0	*2*	0	0	0	0	*0*	0	0	1	0	*1*
8:35 AM	1	0	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:40 AM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	1	0	0	1	*2*	0	0	0	0	*0*	1	1	0	1	*3*
8:50 AM	0	1	1	1	*3*	0	0	0	0	*0*	1	0	1	0	*2*
8:55 AM	0	1	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	26	26	2	23	*77*	0	1	0	0	*1*	4	1	4	1	*10*
Peak Hour	**13**	**11**	**1**	**13**	***38***	**0**	**0**	**0**	**0**	***0***	**3**	**1**	**4**	**1**	***9***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Allison St				Elmira Rd				Allison St				Elmira Rd				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0
7:10 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	0
7:15 AM	0	2	0	0	0	0	0	1	0	0	0	0	0	2	0	0	5	0
7:20 AM	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	3	0
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	5	0
7:35 AM	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2	0	5	0
7:40 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	0
7:45 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0
7:50 AM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	0
7:55 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	2	1	0	5	39
8:00 AM	0	0	0	2	0	0	1	2	0	0	0	0	0	0	2	0	7	44
8:05 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	43
8:10 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	42
8:15 AM	0	2	0	1	0	0	0	0	0	0	0	0	0	0	1	0	4	41
8:20 AM	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3	41
8:25 AM	0	2	0	0	0	0	2	0	0	0	0	0	0	3	0	0	7	48
8:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	45
8:35 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	42
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	42
8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	42
8:50 AM	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	3	41
8:55 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	38
Count Total	0	15	0	11	0	0	17	9	0	0	1	1	0	8	14	1	77	0
Peak Hour	**0**	**8**	**0**	**5**	**0**	**0**	**7**	**4**	**0**	**0**	**1**	**0**	**0**	**4**	**8**	**1**	**38**	**0**

Two-Hour Count Summaries - Bikes

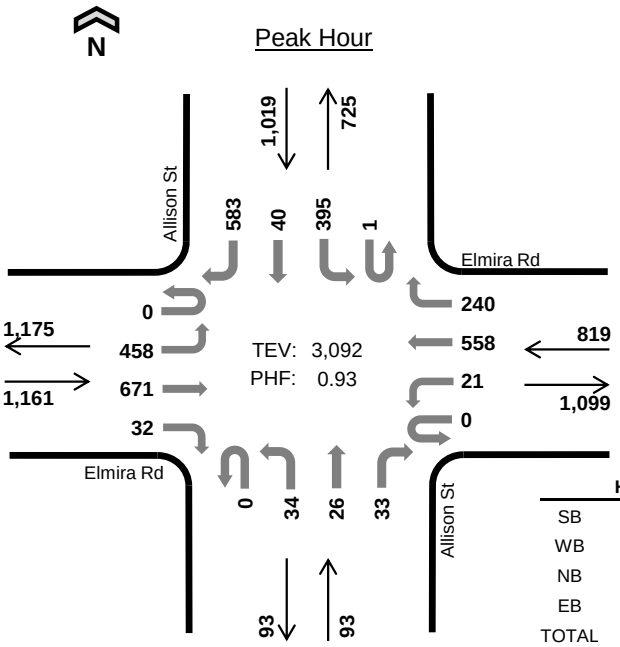
Interval Start	Allison St			Elmira Rd			Allison St			Elmira Rd			5-min Total	Rolling One Hour
	Southbound			Westbound			Northbound			Eastbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	0
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	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	0
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:40 AM	0	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	0
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

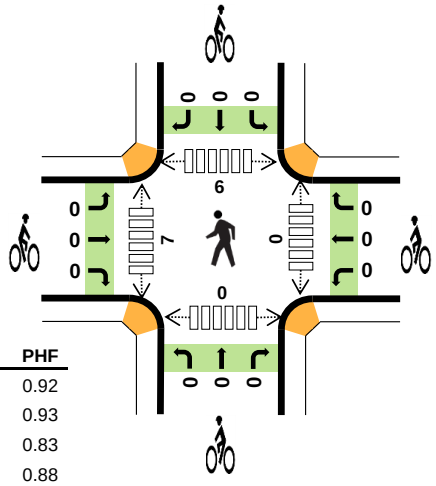
Allison St
Elmira Rd

Peak Hour

Date: 06-26-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:50 PM to 5:50 PM



	HV %:	PHF
SB	0.8%	0.92
WB	0.4%	0.93
NB	0.0%	0.83
EB	0.4%	0.88
TOTAL	0.5%	0.93



Peak-Hour Count Summaries

Interval Start		Allison St (Southbound)				Elmira Rd (Westbound)				Allison St (Northbound)				Elmira Rd (Eastbound)				5-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:50 PM		0	18	5	35	0	**6**	43	15	0	1	2	1	0	42	57	2	227	0
4:55 PM		0	32	3	47	0	2	50	**25**	0	1	**4**	**7**	0	32	57	3	263	0
5:00 PM		0	37	5	46	0	1	40	18	0	2	3	3	0	32	38	3	228	0
5:05 PM		0	33	2	47	0	2	53	22	0	3	3	0	0	**50**	50	1	266	0
5:10 PM		0	27	2	**58**	0	3	56	21	0	1	2	2	0	41	**84**	**6**	303	0
5:15 PM		0	33	**6**	56	0	2	36	22	0	3	**4**	0	0	46	47	5	260	0
5:20 PM		0	**42**	0	52	0	0	47	19	0	**5**	2	2	0	34	58	2	263	0
5:25 PM		0	36	4	40	0	0	36	19	0	3	2	1	0	38	68	2	249	0
5:30 PM		0	29	**6**	49	0	0	43	19	0	3	0	5	0	31	44	1	230	0
5:35 PM		0	36	4	54	0	2	**58**	20	0	4	2	4	0	44	70	2	300	0
5:40 PM		**1**	32	2	51	0	1	46	22	0	3	0	6	0	37	41	1	243	0
5:45 PM		0	40	1	48	0	2	50	18	0	**5**	2	2	0	31	57	4	260	**3,092**
Peak Hour	**All**	**1**	**395**	**40**	**583**	**0**	**21**	**558**	**240**	**0**	**34**	**26**	**33**	**0**	**458**	**671**	**32**	**3,092**	0
	HV	**0**	**4**	**0**	**4**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	**0**	**16**	0
	HV%	**0%**	**1%**	**0%**	**1%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**1%**	**0%**	**0%**	**1%**	0

Note: For all two-hour count summary, see next page.

Two-Hour Count Summaries

Interval Start	Allison St (Southbound)				Elmira Rd (Westbound)				Allison St (Northbound)				Elmira Rd (Eastbound)				5-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	1	31	2	59	0	1	39	17	0	2	1	3	1	38	53	1	249	0
4:05 PM	0	29	2	55	0	0	47	20	0	1	2	3	0	21	49	0	229	0
4:10 PM	0	27	2	58	0	2	32	21	0	4	0	1	0	62	50	2	261	0
4:15 PM	0	21	0	37	0	0	39	14	0	3	3	3	1	33	38	2	194	0
4:20 PM	0	28	2	50	0	1	37	18	0	3	2	0	1	39	39	0	220	0
4:25 PM	0	35	4	47	0	4	37	14	0	3	0	2	1	37	37	0	221	0
4:30 PM	0	21	1	49	0	1	47	15	0	8	2	0	0	35	54	0	233	0
4:35 PM	0	29	2	49	0	0	38	24	0	0	0	4	1	38	47	1	233	0
4:40 PM	0	23	3	50	0	3	33	15	0	0	0	0	2	51	43	1	224	0
4:45 PM	0	33	3	50	0	2	49	18	0	2	0	4	1	32	42	0	236	0
4:50 PM	0	18	5	35	0	6	43	15	0	1	2	1	0	42	57	2	227	0
4:55 PM	0	32	3	47	0	2	50	25	0	1	4	7	0	32	57	3	263	2,790
5:00 PM	0	37	5	46	0	1	40	18	0	2	3	3	0	32	38	3	228	2,769
5:05 PM	0	33	2	47	0	2	53	22	0	3	3	0	0	50	50	1	266	2,806
5:10 PM	0	27	2	58	0	3	56	21	0	1	2	2	0	41	84	6	303	2,848
5:15 PM	0	33	6	56	0	2	36	22	0	3	4	0	0	46	47	5	260	2,914
5:20 PM	0	42	0	52	0	0	47	19	0	5	2	2	0	34	58	2	263	2,957
5:25 PM	0	36	4	40	0	0	36	19	0	3	2	1	0	38	68	2	249	2,985
5:30 PM	0	29	6	49	0	0	43	19	0	3	0	5	0	31	44	1	230	2,982
5:35 PM	0	36	4	54	0	2	58	20	0	4	2	4	0	44	70	2	300	3,049
5:40 PM	1	32	2	51	0	1	46	22	0	3	0	6	0	37	41	1	243	3,068
5:45 PM	0	40	1	48	0	2	50	18	0	5	2	2	0	31	57	4	260	3,092
5:50 PM	0	27	1	43	0	1	41	17	0	2	2	3	0	38	44	1	220	3,085
5:55 PM	0	20	4	52	0	1	35	13	0	5	5	2	0	51	60	1	249	3,071
Count Total	2	719	66	1,182	0	37	1,032	446	0	67	43	58	8	933	1,227	41	5,861	0
Peak Hour All	**1**	**395**	**40**	**583**	**0**	**21**	**558**	**240**	**0**	**34**	**26**	**33**	**0**	**458**	**671**	**32**	**3,092**	**0**
Peak Hour HV	**0**	**4**	**0**	**4**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	**0**	**16**	**0**
Peak Hour HV%	**0%**	**1%**	**0%**	**1%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**1%**	**0%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	SB	WB	NB	EB	Total	SB	WB	NB	EB	Total	North	East	South	West	Total
4:00 PM	2	0	1	1	*4*	0	0	0	0	*0*	2	0	0	0	*2*
4:05 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:10 PM	0	0	0	1	*1*	0	0	0	0	*0*	1	0	0	1	*2*
4:15 PM	1	1	0	0	*2*	0	0	0	0	*0*	1	0	0	1	*2*
4:20 PM	1	0	0	0	*1*	0	0	0	0	*0*	1	0	0	1	*2*
4:25 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	2	0	0	1	*3*	0	0	0	0	*0*	3	0	0	0	*3*
4:35 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:40 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	1	0	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:50 PM	0	0	0	3	*3*	0	0	0	0	*0*	0	0	0	0	*0*
4:55 PM	0	0	0	0	*0*	0	0	0	0	*0*	2	0	0	2	*4*
5:00 PM	3	1	0	0	*4*	0	0	0	0	*0*	0	0	0	2	*2*
5:05 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:10 PM	0	1	0	0	*1*	0	0	0	0	*0*	2	0	0	0	*2*
5:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:20 PM	0	0	0	1	*1*	0	0	0	0	*0*	1	0	0	0	*1*
5:25 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	2	0	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:35 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	2	*2*
5:40 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	1	*1*
5:45 PM	1	1	0	0	*2*	0	0	0	0	*0*	1	0	0	0	*1*
5:50 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:55 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	16	4	1	12	*33*	0	0	0	0	*0*	14	0	0	10	*24*
Peak Hour	**8**	**3**	**0**	**5**	***16***	**0**	**0**	**0**	**0**	***0***	**6**	**0**	**0**	**7**	***13***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Allison St				Elmira Rd				Allison St				Elmira Rd				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	4	0
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
4:15 PM	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0
4:20 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
4:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	3	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
5:00 PM	0	1	0	2	0	0	1	0	0	0	0	0	0	0	0	0	4	18
5:05 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	19
5:10 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	19
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	17
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	17
5:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	16
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
5:40 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	16
5:45 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	16
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	14
5:55 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	15
Count Total	0	6	0	10	0	0	3	1	0	0	0	1	0	7	5	0	33	0
Peak Hour	**0**	**4**	**0**	**4**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	**0**	**16**	**0**

Two-Hour Count Summaries - Bikes

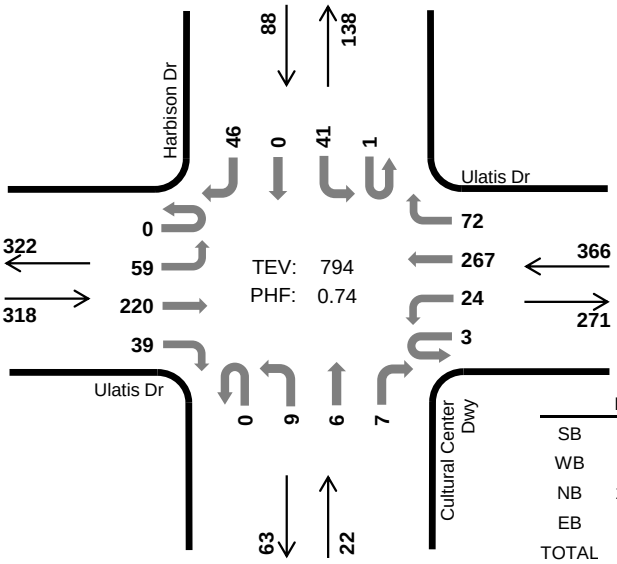
Interval Start	Allison St			Elmira Rd			Allison St			Elmira Rd			5-min Total	Rolling One Hour
	Southbound			Westbound			Northbound			Eastbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	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	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	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	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	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	0
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:10 PM	0	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	0
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:25 PM	0	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	0
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	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	0
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

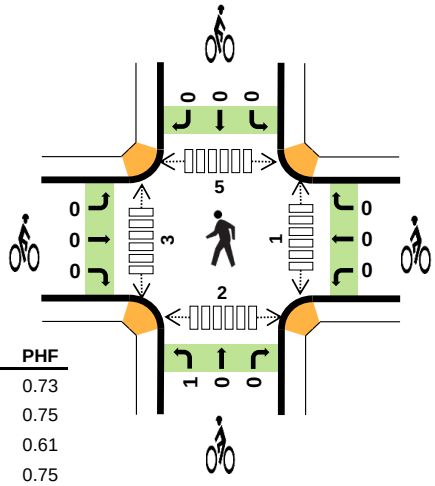
Harbison Dr
Ulatis Dr

Date: 06-21-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

Peak Hour



	HV %:	PHF
SB	8.0%	0.73
WB	1.6%	0.75
NB	13.6%	0.61
EB	3.8%	0.75
TOTAL	3.5%	0.74



Peak-Hour Count Summaries

Interval Start		Harbison Dr Southbound				Ulatis Dr Westbound				Cultural Center Dwy Northbound				Ulatis Dr Eastbound				5-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
8:00 AM		0	5	0	2	0	2	22	5	0	1	0	1	0	5	20	2	65	0
8:05 AM		0	1	0	2	0	0	22	6	0	0	**2**	0	0	5	7	4	49	0
8:10 AM		0	1	0	5	**1**	0	20	4	0	**2**	0	0	0	8	14	0	55	0
8:15 AM		**1**	6	0	5	0	1	24	4	0	1	0	0	0	6	13	1	62	0
8:20 AM		0	3	0	5	0	1	18	4	0	1	0	1	0	4	22	1	60	0
8:25 AM		0	3	0	4	0	1	22	4	0	0	0	0	0	3	15	0	52	0
8:30 AM		0	2	0	2	0	2	18	7	0	0	1	1	0	3	24	0	60	0
8:35 AM		0	4	0	2	**1**	0	18	4	0	0	0	0	0	5	15	2	51	0
8:40 AM		0	1	0	4	0	2	28	3	0	1	0	1	0	2	21	**10**	73	0
8:45 AM		0	**7**	0	5	0	4	29	10	0	0	1	**2**	0	**9**	**25**	8	100	0
8:50 AM		0	6	0	**6**	**1**	4	**33**	8	0	**2**	0	1	0	3	21	5	90	0
8:55 AM		0	2	0	4	0	**7**	13	**13**	0	1	**2**	0	0	6	23	6	77	**794**
Peak Hour	**All**	**1**	**41**	**0**	**46**	**3**	**24**	**267**	**72**	**0**	**9**	**6**	**7**	**0**	**59**	**220**	**39**	**794**	0
	HV	**0**	**1**	**0**	**6**	**0**	**1**	**3**	**2**	**0**	**1**	**1**	**1**	**0**	**5**	**6**	**1**	**28**	0
	HV%	**0%**	**2%**	**-**	**13%**	**0%**	**4%**	**1%**	**3%**	**-**	**11%**	**17%**	**14%**	**-**	**8%**	**3%**	**3%**	**4%**	0

Note: For all two-hour count summary, see next page.

Two-Hour Count Summaries

Interval Start	Harbison Dr				Ulatis Dr				Cultural Center Dwy				Ulatis Dr				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	1	1	1	3	0	0	16	1	0	0	0	0	0	1	10	2	36	0
7:05 AM	0	3	0	4	0	1	16	1	0	0	0	1	1	0	10	1	38	0
7:10 AM	0	6	0	4	0	0	19	1	0	0	0	0	0	0	14	0	44	0
7:15 AM	0	1	0	4	0	0	17	2	0	0	0	0	0	2	12	0	38	0
7:20 AM	0	1	0	3	0	1	17	4	0	0	0	0	0	2	11	0	39	0
7:25 AM	0	2	0	3	0	0	22	4	0	0	0	0	0	2	16	1	50	0
7:30 AM	0	3	0	3	0	0	26	4	0	0	0	0	0	4	14	0	54	0
7:35 AM	0	1	0	4	0	0	20	3	0	0	1	0	0	1	13	0	43	0
7:40 AM	0	1	0	1	0	0	25	2	0	2	0	0	0	4	17	1	53	0
7:45 AM	0	2	0	1	0	1	30	7	0	1	0	0	0	3	17	0	62	0
7:50 AM	0	2	0	2	0	1	30	8	0	0	0	0	0	3	13	2	61	0
7:55 AM	0	3	0	1	0	0	23	3	0	2	0	0	0	3	20	2	57	575
8:00 AM	0	5	0	2	0	2	22	5	0	1	0	1	0	5	20	2	65	604
8:05 AM	0	1	0	2	0	0	22	6	0	0	2	0	0	5	7	4	49	615
8:10 AM	0	1	0	5	1	0	20	4	0	2	0	0	0	8	14	0	55	626
8:15 AM	1	6	0	5	0	1	24	4	0	1	0	0	0	6	13	1	62	650
8:20 AM	0	3	0	5	0	1	18	4	0	1	0	1	0	4	22	1	60	671
8:25 AM	0	3	0	4	0	1	22	4	0	0	0	0	0	3	15	0	52	673
8:30 AM	0	2	0	2	0	2	18	7	0	0	1	1	0	3	24	0	60	679
8:35 AM	0	4	0	2	1	0	18	4	0	0	0	0	0	5	15	2	51	687
8:40 AM	0	1	0	4	0	2	28	3	0	1	0	1	0	2	21	10	73	707
8:45 AM	0	7	0	5	0	4	29	10	0	0	1	2	0	9	25	8	100	745
8:50 AM	0	6	0	6	1	4	33	8	0	2	0	1	0	3	21	5	90	774
8:55 AM	0	2	0	4	0	7	13	13	0	1	2	0	0	6	23	6	77	794
Count Total	2	67	1	79	3	28	528	112	0	14	7	8	1	84	387	48	1,369	0
Peak Hour All	**1**	**41**	**0**	**46**	**3**	**24**	**267**	**72**	**0**	**9**	**6**	**7**	**0**	**59**	**220**	**39**	**794**	**0**
Peak Hour HV	**0**	**1**	**0**	**6**	**0**	**1**	**3**	**2**	**0**	**1**	**1**	**1**	**0**	**5**	**6**	**1**	**28**	**0**
Peak Hour HV%	**0%**	**2%**	**-**	**13%**	**0%**	**4%**	**1%**	**3%**	**-**	**11%**	**17%**	**14%**	**-**	**8%**	**3%**	**3%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	SB	WB	NB	EB	Total	SB	WB	NB	EB	Total	North	East	South	West	Total
7:00 AM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
7:05 AM	0	0	1	1	*2*	0	0	0	0	*0*	0	0	1	0	*1*
7:10 AM	1	0	0	0	*1*	0	0	0	0	*0*	1	0	0	0	*1*
7:15 AM	1	0	0	2	*3*	0	0	0	0	*0*	2	0	0	0	*2*
7:20 AM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	1	*1*
7:25 AM	1	0	0	0	*1*	0	0	0	0	*0*	2	0	0	0	*2*
7:30 AM	0	0	0	2	*2*	0	0	1	1	*2*	1	0	0	0	*1*
7:35 AM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:40 AM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	1	0	0	2	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:50 AM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
7:55 AM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	0	0	1	3	*4*	0	0	1	0	*1*	0	0	0	0	*0*
8:05 AM	0	0	1	3	*4*	0	0	0	0	*0*	0	0	0	0	*0*
8:10 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:15 AM	1	0	0	1	*2*	0	0	0	0	*0*	0	1	1	1	*3*
8:20 AM	1	0	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:25 AM	0	2	0	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
8:35 AM	0	0	0	1	*1*	0	0	0	0	*0*	2	0	0	2	*4*
8:40 AM	1	0	0	0	*1*	0	0	0	0	*0*	1	0	0	0	*1*
8:45 AM	2	3	0	1	*6*	0	0	0	0	*0*	0	0	0	0	*0*
8:50 AM	1	0	1	0	*2*	0	0	0	0	*0*	2	0	1	0	*3*
8:55 AM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	14	8	5	22	*49*	0	0	2	1	*3*	11	1	3	4	*19*
Peak Hour	**7**	**6**	**3**	**12**	***28***	**0**	**0**	**1**	**0**	***1***	**5**	**1**	**2**	**3**	***11***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Harbison Dr				Ulatis Dr				Cultural Center Dwy				Ulatis Dr				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0
7:10 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	3	0
7:20 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	0
7:25 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0
7:35 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:40 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
7:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	3	0
7:50 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	21
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	4	23
8:05 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	4	25
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
8:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	2	23
8:20 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	2	23
8:25 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	3	25
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	24
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	24
8:40 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	24
8:45 AM	0	1	0	1	0	1	0	2	0	0	0	0	0	1	0	0	6	27
8:50 AM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	2	27
8:55 AM	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	28
Count Total	0	1	0	13	0	2	3	3	0	2	1	2	0	9	10	3	49	0
Peak Hour	**0**	**1**	**0**	**6**	**0**	**1**	**3**	**2**	**0**	**1**	**1**	**1**	**0**	**5**	**6**	**1**	**28**	**0**

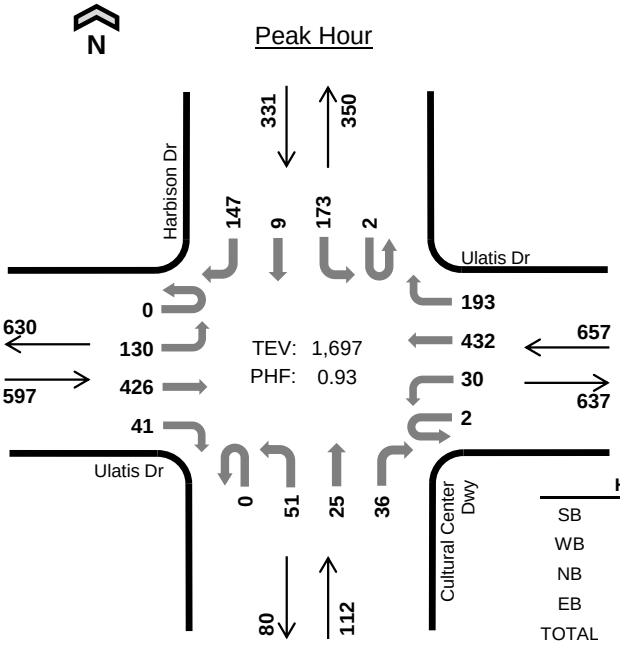
Two-Hour Count Summaries - Bikes

Interval Start	Harbison Dr			Ulatis Dr			Cultural Center Dwy			Ulatis Dr			5-min Total	Rolling One Hour
	Southbound			Westbound			Northbound			Eastbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	1	0	0	0	1	0	2	0
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	1	3
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	0	0	0	0	2	0	0	0	1	0	3	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

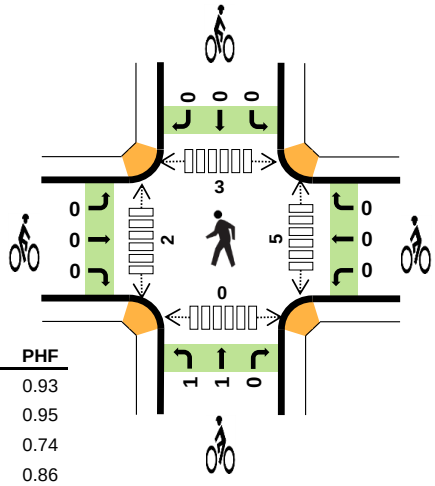
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Harbison Dr
Ulatis Dr

Date: 06-21-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:10 PM to 5:10 PM



	HV %:	PHF
SB	1.8%	0.93
WB	0.8%	0.95
NB	1.8%	0.74
EB	1.0%	0.86
TOTAL	1.1%	0.93



Peak-Hour Count Summaries

Interval Start		Harbison Dr Southbound				Ulatis Dr Westbound				Cultural Center Dwy Northbound				Ulatis Dr Eastbound				5-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:10 PM		0	9	0	5	0	4	33	15	0	2	2	3	0	**17**	36	4	130	0
4:15 PM		0	13	**3**	**17**	0	3	33	11	0	2	2	5	0	10	42	3	144	0
4:20 PM		**1**	15	1	9	0	3	29	18	0	**9**	1	3	0	8	26	4	127	0
4:25 PM		0	16	0	11	0	**6**	24	17	0	3	1	2	0	10	**45**	5	140	0
4:30 PM		0	9	2	15	0	2	**54**	16	0	1	3	4	0	13	34	**6**	159	0
4:35 PM		0	18	0	**17**	0	2	30	15	0	6	1	3	0	15	44	1	152	0
4:40 PM		0	13	1	14	0	1	35	18	0	8	**6**	**6**	0	9	32	0	143	0
4:45 PM		0	12	1	12	0	3	38	17	0	2	2	4	0	5	39	3	138	0
4:50 PM		**1**	17	0	12	**2**	2	44	11	0	2	1	1	0	7	25	1	126	0
4:55 PM		0	18	1	13	0	3	34	18	0	5	1	1	0	12	42	2	150	0
5:00 PM		0	11	0	11	0	0	40	**19**	0	7	4	1	0	9	35	**6**	143	0
5:05 PM		0	**22**	0	11	0	1	38	18	0	4	1	3	0	15	26	**6**	145	**1,697**
Peak Hour	**All**	**2**	**173**	**9**	**147**	**2**	**30**	**432**	**193**	**0**	**51**	**25**	**36**	**0**	**130**	**426**	**41**	**1,697**	0
	HV	**0**	**2**	**0**	**4**	**0**	**1**	**4**	**0**	**0**	**1**	**0**	**1**	**0**	**4**	**2**	**0**	**19**	0
	HV%	**0%**	**1%**	**0%**	**3%**	**0%**	**3%**	**1%**	**0%**	**-**	**2%**	**0%**	**3%**	**-**	**3%**	**0%**	**0%**	**1%**	0

Note: For all two-hour count summary, see next page.

Two-Hour Count Summaries

Interval Start	Harbison Dr				Ulatis Dr				Cultural Center Dwy				Ulatis Dr				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	7	1	13	1	3	32	14	0	0	2	1	0	12	24	3	113	0
4:05 PM	0	11	1	14	0	1	30	12	0	4	1	2	1	9	26	0	112	0
4:10 PM	0	9	0	5	0	4	33	15	0	2	2	3	0	17	36	4	130	0
4:15 PM	0	13	3	17	0	3	33	11	0	2	2	5	0	10	42	3	144	0
4:20 PM	1	15	1	9	0	3	29	18	0	9	1	3	0	8	26	4	127	0
4:25 PM	0	16	0	11	0	6	24	17	0	3	1	2	0	10	45	5	140	0
4:30 PM	0	9	2	15	0	2	54	16	0	1	3	4	0	13	34	6	159	0
4:35 PM	0	18	0	17	0	2	30	15	0	6	1	3	0	15	44	1	152	0
4:40 PM	0	13	1	14	0	1	35	18	0	8	6	6	0	9	32	0	143	0
4:45 PM	0	12	1	12	0	3	38	17	0	2	2	4	0	5	39	3	138	0
4:50 PM	1	17	0	12	2	2	44	11	0	2	1	1	0	7	25	1	126	0
4:55 PM	0	18	1	13	0	3	34	18	0	5	1	1	0	12	42	2	150	1,634
5:00 PM	0	11	0	11	0	0	40	19	0	7	4	1	0	9	35	6	143	1,664
5:05 PM	0	22	0	11	0	1	38	18	0	4	1	3	0	15	26	6	145	1,697
5:10 PM	0	16	0	12	0	5	25	5	0	3	4	3	0	4	40	4	121	1,688
5:15 PM	0	14	0	17	0	0	33	12	0	2	3	0	0	19	35	0	135	1,679
5:20 PM	0	14	1	8	0	2	36	16	0	2	1	1	0	8	35	2	126	1,678
5:25 PM	0	18	0	11	0	1	34	17	0	0	0	2	0	7	27	0	117	1,655
5:30 PM	0	17	0	10	0	1	36	28	0	1	0	1	1	13	39	1	148	1,644
5:35 PM	1	17	0	13	1	2	36	15	0	2	0	1	1	16	19	4	128	1,620
5:40 PM	0	12	0	11	1	1	22	20	0	1	0	6	0	10	40	2	126	1,603
5:45 PM	0	16	0	16	0	2	27	9	0	2	0	2	0	6	40	2	122	1,587
5:50 PM	0	16	0	15	0	2	40	18	0	5	1	1	0	9	24	1	132	1,593
5:55 PM	0	14	0	16	0	1	31	7	0	4	0	2	0	11	47	0	133	1,576
Count Total	3	345	12	303	5	51	814	366	0	77	37	58	3	254	822	60	3,210	0
Peak Hour All	**2**	**173**	**9**	**147**	**2**	**30**	**432**	**193**	**0**	**51**	**25**	**36**	**0**	**130**	**426**	**41**	**1,697**	**0**
Peak Hour HV	**0**	**2**	**0**	**4**	**0**	**1**	**4**	**0**	**0**	**1**	**0**	**1**	**0**	**4**	**2**	**0**	**19**	**0**
Peak Hour HV%	**0%**	**1%**	**0%**	**3%**	**0%**	**3%**	**1%**	**0%**	**-**	**2%**	**0%**	**3%**	**-**	**3%**	**0%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	SB	WB	NB	EB	Total	SB	WB	NB	EB	Total	North	East	South	West	Total
4:00 PM	0	1	0	2	*3*	0	0	0	0	*0*	0	0	0	0	*0*
4:05 PM	1	0	1	0	*2*	0	0	0	0	*0*	0	2	0	2	*4*
4:10 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	1	0	0	1	*2*	0	0	0	0	*0*	1	2	0	0	*3*
4:20 PM	0	0	0	0	*0*	0	0	1	0	*1*	0	0	0	2	*2*
4:25 PM	1	0	0	0	*1*	0	0	1	0	*1*	0	0	0	0	*0*
4:30 PM	0	1	0	2	*3*	0	0	0	0	*0*	1	0	0	0	*1*
4:35 PM	2	0	0	0	*2*	0	0	0	0	*0*	1	2	0	0	*3*
4:40 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:50 PM	1	4	1	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
4:55 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:00 PM	1	0	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:05 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	1	0	0	*1*
5:10 PM	0	0	0	0	*0*	0	0	1	0	*1*	0	0	0	0	*0*
5:15 PM	1	0	0	2	*3*	0	0	0	0	*0*	0	0	0	1	*1*
5:20 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:25 PM	1	1	0	1	*3*	0	0	0	0	*0*	0	0	0	1	*1*
5:30 PM	1	0	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:35 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:40 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	2	0	0	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
5:50 PM	1	0	1	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:55 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	1	0	*1*
Count Total	14	7	4	14	*39*	0	0	3	0	*3*	3	7	1	6	*17*
Peak Hour	**6**	**5**	**2**	**6**	***19***	**0**	**0**	**2**	**0**	***2***	**3**	**5**	**0**	**2**	***10***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Harbison Dr				Ulatis Dr				Cultural Center Dwy				Ulatis Dr				5-min Total	Rolling One Hour
	Southbound				Westbound				Northbound				Eastbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	3	0
4:05 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	2	0
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	3	0
4:35 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4:40 PM	0	0	0	0	0	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	1	0	0	1	0
4:50 PM	0	0	0	1	0	1	3	0	0	1	0	0	0	0	0	0	6	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	20
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	19
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
5:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	3	19
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
5:25 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	3	21
5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	20
5:35 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	19
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	20
5:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	3	22
5:50 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	2	18
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
Count Total	0	3	0	11	0	1	4	2	0	2	0	2	0	9	4	1	39	0
Peak Hour	**0**	**2**	**0**	**4**	**0**	**1**	**4**	**0**	**0**	**1**	**0**	**1**	**0**	**4**	**2**	**0**	**19**	**0**

Two-Hour Count Summaries - Bikes

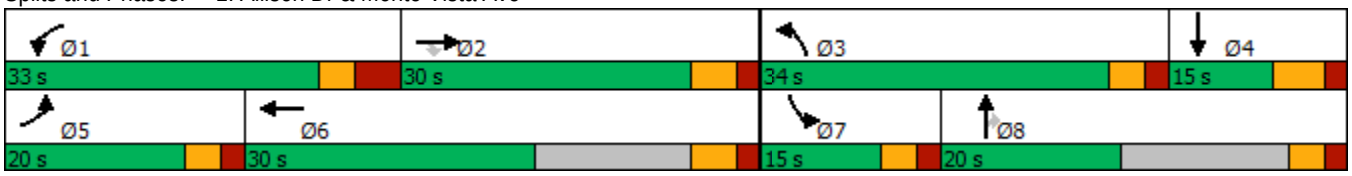
Interval Start	Harbison Dr			Ulatis Dr			Cultural Center Dwy			Ulatis Dr			5-min Total	Rolling One Hour
	Southbound			Westbound			Northbound			Eastbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	0	0	0	1	0	0	0	0	0	1	0
4:25 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	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	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:10 PM	0	0	0	0	0	0	1	0	0	0	0	0	1	3
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	0	0	0	0	2	1	0	0	0	0	3	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	202	437	144	200	280	171	317	9	155
Future Volume (vph)	32	202	437	144	200	280	171	317	9	155
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	2.1	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	20.0	30.0	30.0	33.0	30.0	34.0	20.0	20.0	15.0	15.0
Total Split (%)	17.9%	26.8%	26.8%	29.5%	26.8%	30.4%	17.9%	17.9%	13.4%	13.4%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.0	3.0	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	6.9	5.9	5.0	5.0	5.0	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	6.2	12.5	12.5	11.7	27.7	12.3	28.4	28.4	5.1	10.4
Actuated g/C Ratio	0.08	0.17	0.17	0.16	0.38	0.17	0.39	0.39	0.07	0.14
v/c Ratio	0.26	0.40	0.74	0.60	0.19	0.58	0.15	0.45	0.09	0.45
Control Delay	44.4	30.2	10.5	42.5	17.9	35.9	18.8	4.8	45.2	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	30.2	10.5	42.5	17.9	35.9	18.8	4.8	45.2	32.1
LOS	D	C	B	D	B	D	B	A	D	C
Approach Delay		18.1			27.9		19.2			32.7
Approach LOS		B			C		B			C

Intersection Summary	
Cycle Length: 112	
Actuated Cycle Length: 73.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 21.7	Intersection LOS: C
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

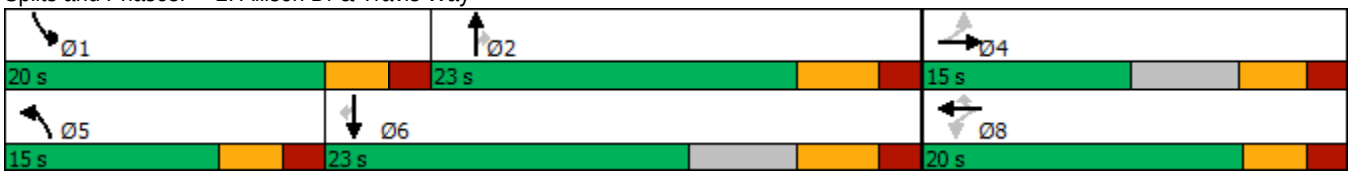
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	21	0	13	9	96	476	13	10	426	156
Future Volume (vph)	21	0	13	9	96	476	13	10	426	156
Turn Type	Perm	NA	Perm	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			5	2		1	6	
Permitted Phases	4		8	8			2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.9	9.9	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	23.0	23.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	36.5%	36.5%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.9	3.9	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0	5.0	5.9	5.9	5.0	5.9	5.9
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	6.1	6.1	6.1	6.1	7.5	23.2	23.2	5.7	17.4	17.4
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.26	0.80	0.80	0.20	0.60	0.60
v/c Ratio	0.07	0.02	0.04	0.02	0.26	0.21	0.01	0.04	0.17	0.19
Control Delay	16.7	0.1	16.4	0.0	15.0	4.4	0.0	17.5	8.2	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	0.1	16.4	0.0	15.0	4.4	0.0	17.5	8.2	3.3
LOS	B	A	B	A	B	A	A	B	A	A
Approach Delay		10.7				6.0			7.1	
Approach LOS		B				A			A	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 28.9	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.26	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 39.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	192	227	2	356	194	218	231
Future Volume (vph)	192	227	2	356	194	218	231
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Detector Phase	8	8	5	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	4.0	5.0	5.0	4.0	4.0
Minimum Split (s)	10.5	10.5	8.5	9.9	9.9	8.9	9.0
Total Split (s)	20.0	20.0	15.0	30.0	30.0	20.0	30.0
Total Split (%)	28.6%	28.6%	21.4%	42.9%	42.9%	28.6%	42.9%
Yellow Time (s)	3.9	3.9	3.0	3.9	3.9	3.0	3.9
All-Red Time (s)	1.6	1.6	1.5	1.0	1.0	1.9	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.9	4.9	4.9	5.0
Lead/Lag			Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None
Act Effct Green (s)	7.1	7.1	4.3	10.2	10.2	7.4	21.1
Actuated g/C Ratio	0.18	0.18	0.11	0.25	0.25	0.18	0.52
v/c Ratio	0.40	0.55	0.01	0.50	0.42	0.43	0.16
Control Delay	17.8	7.7	19.5	15.6	5.2	17.8	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	7.7	19.5	15.6	5.2	17.8	6.4
LOS	B	A	B	B	A	B	A
Approach Delay	12.3			11.9			12.0
Approach LOS	B			B			B

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 40.4	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 42.9%	ICU Level of Service A
Analysis Period (min) 15	

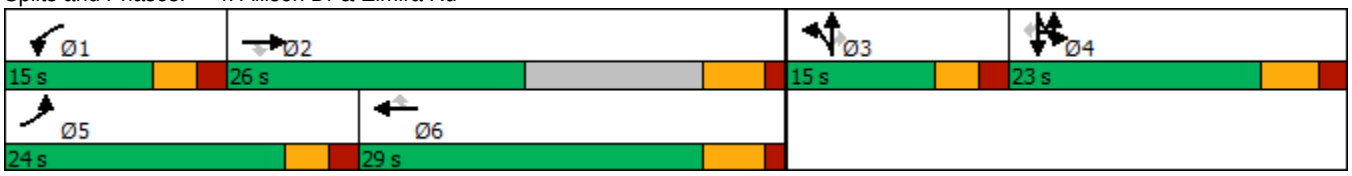
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	314	345	6	9	598	221	2	9	6	165	4	320
Future Volume (vph)	314	345	6	9	598	221	2	9	6	165	4	320
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	24.0	26.0	26.0	15.0	29.0	29.0	15.0	15.0	15.0	23.0	23.0	23.0
Total Split (%)	26.4%	28.6%	28.6%	16.5%	31.9%	31.9%	16.5%	16.5%	16.5%	25.3%	25.3%	25.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.4	29.7	29.7	4.9	15.3	15.3	4.8	4.8	4.8	8.0	8.0	8.0
Actuated g/C Ratio	0.19	0.54	0.54	0.09	0.28	0.28	0.09	0.09	0.09	0.15	0.15	0.15
v/c Ratio	0.54	0.20	0.01	0.06	0.67	0.42	0.01	0.06	0.02	0.38	0.39	0.67
Control Delay	25.8	9.0	0.0	32.0	22.9	7.3	32.0	32.0	0.2	29.9	30.0	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	9.0	0.0	32.0	22.9	7.3	32.0	32.0	0.2	29.9	30.0	10.7
LOS	C	A	A	C	C	A	C	C	A	C	C	B
Approach Delay		16.9			18.8			20.3			17.4	
Approach LOS		B			B			C			B	

Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 55	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 53.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBR
Lane Configurations									
Traffic Volume (vph)	125	245	27	340	15	7	8	46	65
Future Volume (vph)	125	245	27	340	15	7	8	46	65
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	5	2	1	6	3	8		7	
Permitted Phases							8		4
Detector Phase	5	2	1	6	3	8	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	10.7	9.0	10.8	9.0	9.0	9.0	9.0	9.9
Total Split (s)	15.0	40.0	15.0	40.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	17.6%	47.1%	17.6%	47.1%	17.6%	17.6%	17.6%	17.6%	17.6%
Yellow Time (s)	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.9
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.0	5.8	5.0	5.0	5.0	5.0	5.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.0	28.8	7.5	16.0	5.8	5.5	5.5	7.0	7.6
Actuated g/C Ratio	0.21	0.61	0.16	0.34	0.12	0.12	0.12	0.15	0.16
v/c Ratio	0.46	0.19	0.31	0.49	0.09	0.04	0.03	0.25	0.13
Control Delay	27.8	11.4	26.1	15.3	27.0	27.1	0.2	26.0	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	11.4	26.1	15.3	27.0	27.1	0.2	26.0	0.4
LOS	C	B	C	B	C	C	A	C	A
Approach Delay		16.4		16.7		19.7			
Approach LOS		B		B		B			

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 47.5	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 45.1%	ICU Level of Service A
Analysis Period (min) 15	

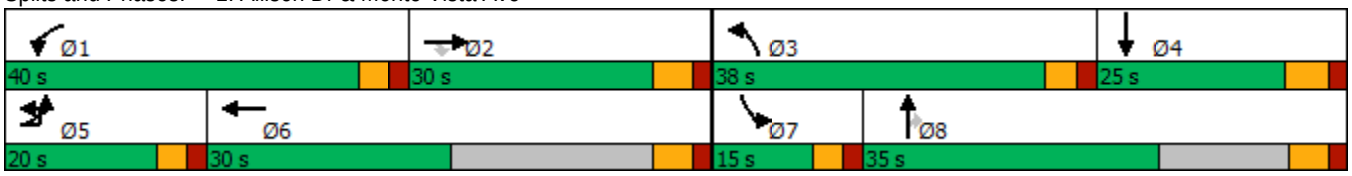
Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	89	375	508	376	393	468	595	815	22	177
Future Volume (vph)	89	375	508	376	393	468	595	815	22	177
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	20.0	30.0	30.0	40.0	30.0	38.0	35.0	35.0	15.0	25.0
Total Split (%)	15.0%	22.6%	22.6%	30.1%	22.6%	28.6%	26.3%	26.3%	11.3%	18.8%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.9	3.9	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9	5.0	5.9	5.9	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	None	None
Act Effct Green (s)	9.7	17.8	17.8	26.8	37.9	20.1	35.4	35.4	5.8	13.5
Actuated g/C Ratio	0.10	0.17	0.17	0.26	0.37	0.20	0.35	0.35	0.06	0.13
v/c Ratio	0.56	0.63	0.77	0.84	0.33	0.72	0.51	0.95	0.23	0.49
Control Delay	63.8	45.2	13.1	54.9	25.5	47.2	31.3	34.8	61.7	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.8	45.2	13.1	54.9	25.5	47.2	31.3	34.8	61.7	44.8
LOS	E	D	B	D	C	D	C	C	E	D
Approach Delay		30.2			39.5		36.8			46.4
Approach LOS		C			D		D			D

Intersection Summary	
Cycle Length: 133	
Actuated Cycle Length: 101.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 36.3	Intersection LOS: D
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

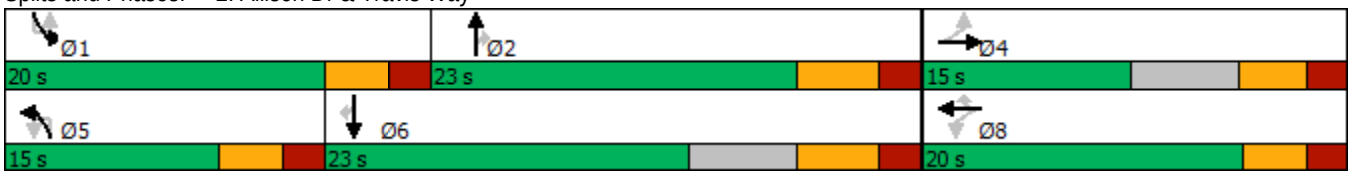
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	0	34	21	9	18	722	15	3	17	924	43
Future Volume (vph)	125	0	34	21	9	18	722	15	3	17	924	43
Turn Type	Perm	NA	Perm	Perm	custom	Prot	NA	Perm	custom	Prot	NA	Perm
Protected Phases		4				5	2			1	6	
Permitted Phases	4		8	8	5			2	1			6
Detector Phase	4	4	8	8	5	5	2	2	1	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.0	9.9	9.9	9.0	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	15.0	23.0	23.0	20.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	23.8%	36.5%	36.5%	31.7%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.0	3.9	3.9	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0		5.0	5.9	5.9		5.0	5.9	5.9
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	7.9	7.9	7.9	7.9		6.6	18.3	18.3		6.8	18.4	18.4
Actuated g/C Ratio	0.23	0.23	0.23	0.23		0.19	0.53	0.53		0.20	0.53	0.53
v/c Ratio	0.43	0.19	0.13	0.03		0.08	0.43	0.02		0.06	0.38	0.05
Control Delay	20.1	0.6	15.7	0.1		15.9	10.0	0.1		15.2	8.8	0.1
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	20.1	0.6	15.7	0.1		15.9	10.0	0.1		15.2	8.8	0.1
LOS	C	A	B	A		B	A	A		B	A	A
Approach Delay		11.0					10.0				8.6	
Approach LOS		B					B				A	

Intersection Summary			
Cycle Length: 63			
Actuated Cycle Length: 34.4			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 9.4		Intersection LOS: A	
Intersection Capacity Utilization 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	375	285	3	476	282	343	731
Future Volume (vph)	375	285	3	476	282	343	731
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Detector Phase	8	8	5	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	4.0	5.0	5.0	4.0	4.0
Minimum Split (s)	10.5	10.5	87.5	9.9	9.9	8.9	9.0
Total Split (s)	20.0	20.0	15.0	30.0	30.0	20.0	30.0
Total Split (%)	28.6%	28.6%	21.4%	42.9%	42.9%	28.6%	42.9%
Yellow Time (s)	3.9	3.9	3.0	3.9	3.9	3.0	3.9
All-Red Time (s)	1.6	1.6	1.5	1.0	1.0	1.9	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.9	4.9	4.9	5.0
Lead/Lag			Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None
Act Effct Green (s)	9.6	9.6	4.4	11.8	11.8	9.2	24.4
Actuated g/C Ratio	0.21	0.21	0.10	0.25	0.25	0.20	0.53
v/c Ratio	0.56	0.53	0.02	0.56	0.48	0.54	0.41
Control Delay	20.6	6.7	23.3	18.3	5.5	20.8	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	6.7	23.3	18.3	5.5	20.8	8.4
LOS	C	A	C	B	A	C	A
Approach Delay	14.6			13.6			12.4
Approach LOS	B			B			B

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 46.3	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 53.4%	ICU Level of Service A
Analysis Period (min) 15	

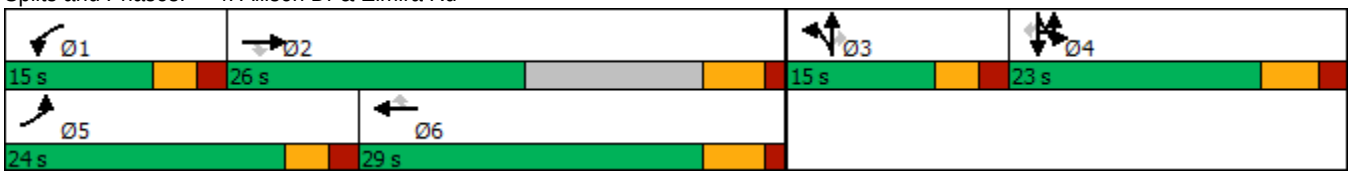
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	481	705	34	22	586	252	36	27	35	415	42	612
Future Volume (vph)	481	705	34	22	586	252	36	27	35	415	42	612
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	24.0	26.0	26.0	15.0	29.0	29.0	15.0	15.0	15.0	23.0	23.0	23.0
Total Split (%)	26.4%	28.6%	28.6%	16.5%	31.9%	31.9%	16.5%	16.5%	16.5%	25.3%	25.3%	25.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	15.1	34.0	34.0	5.4	17.7	17.7	6.0	6.0	6.0	16.6	16.6	16.6
Actuated g/C Ratio	0.20	0.45	0.45	0.07	0.24	0.24	0.08	0.08	0.08	0.22	0.22	0.22
v/c Ratio	0.75	0.47	0.05	0.19	0.76	0.49	0.28	0.20	0.11	0.67	0.66	0.91
Control Delay	37.5	17.5	0.1	41.1	34.4	8.8	41.9	39.8	0.7	40.8	40.3	28.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	17.5	0.1	41.1	34.4	8.8	41.9	39.8	0.7	40.8	40.3	28.8
LOS	D	B	A	D	C	A	D	D	A	D	D	C
Approach Delay		24.9			27.1			26.6			33.8	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 75.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 72.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	137	447	32	454	54	26	38	182	9	154
Future Volume (vph)	137	447	32	454	54	26	38	182	9	154
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	1	6	3	8		7	4	
Permitted Phases							8			4
Detector Phase	5	2	1	6	3	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	10.7	9.0	10.8	9.0	9.0	9.0	9.0	9.9	9.9
Total Split (s)	15.0	40.0	15.0	40.0	15.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	17.6%	47.1%	17.6%	47.1%	17.6%	17.6%	17.6%	17.6%	17.6%	17.6%
Yellow Time (s)	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.0	5.8	5.0	5.0	5.0	5.0	5.9	5.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	9.2	30.9	6.4	20.2	6.9	8.7	8.7	10.9	11.8	11.8
Actuated g/C Ratio	0.14	0.47	0.10	0.31	0.10	0.13	0.13	0.16	0.18	0.18
v/c Ratio	0.60	0.32	0.21	0.65	0.31	0.11	0.12	0.68	0.03	0.40
Control Delay	44.1	15.3	38.0	21.3	38.5	28.9	0.7	46.1	27.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	15.3	38.0	21.3	38.5	28.9	0.7	46.1	27.4	8.4
LOS	D	B	D	C	D	C	A	D	C	A
Approach Delay		21.6		22.1		24.2			28.8	
Approach LOS		C		C		C			C	

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 66.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 23.4	Intersection LOS: C
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

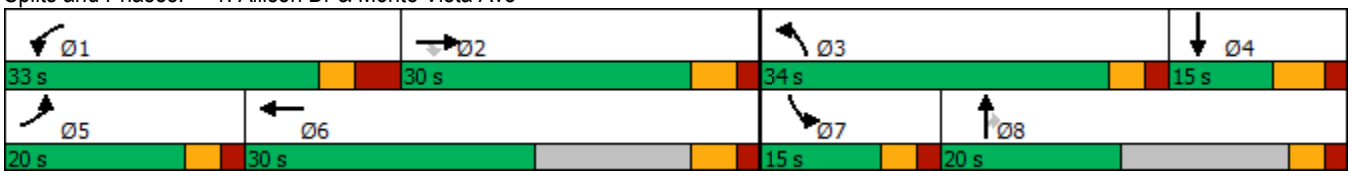
Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	202	439	155	200	288	173	327	9	156
Future Volume (vph)	32	202	439	155	200	288	173	327	9	156
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	2.1	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	20.0	30.0	30.0	33.0	30.0	34.0	20.0	20.0	15.0	15.0
Total Split (%)	17.9%	26.8%	26.8%	29.5%	26.8%	30.4%	17.9%	17.9%	13.4%	13.4%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.0	3.0	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	6.9	5.9	5.0	5.0	5.0	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	6.2	12.3	12.3	12.4	25.8	12.6	28.8	28.8	5.1	10.5
Actuated g/C Ratio	0.08	0.16	0.16	0.17	0.35	0.17	0.39	0.39	0.07	0.14
v/c Ratio	0.26	0.41	0.75	0.62	0.20	0.59	0.15	0.46	0.09	0.46
Control Delay	45.1	31.1	10.8	42.7	19.6	36.3	19.0	4.8	46.0	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	31.1	10.8	42.7	19.6	36.3	19.0	4.8	46.0	32.8
LOS	D	C	B	D	B	D	B	A	D	C
Approach Delay		18.5			29.4		19.4			33.4
Approach LOS		B			C		B			C

Intersection Summary	
Cycle Length: 112	
Actuated Cycle Length: 74.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 58.8%	ICU Level of Service B
Analysis Period (min) 15	

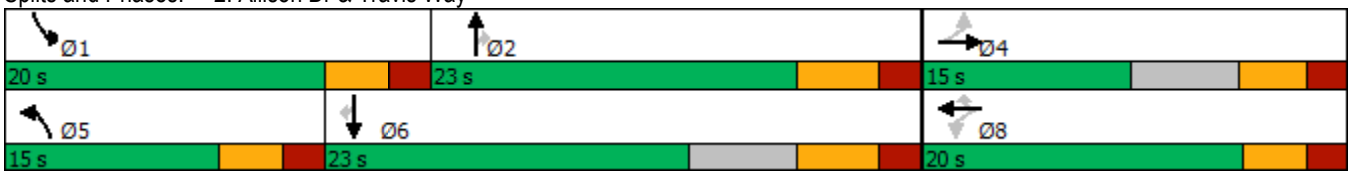
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	48	0	13	9	96	503	13	10	442	156
Future Volume (vph)	48	0	13	9	96	503	13	10	442	156
Turn Type	Perm	NA	Perm	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			5	2		1	6	
Permitted Phases	4		8	8			2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.9	9.9	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	23.0	23.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	36.5%	36.5%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.9	3.9	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0	5.0	5.9	5.9	5.0	5.9	5.9
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	7.3	7.3	7.2	7.2	8.1	23.4	23.4	6.0	19.0	19.0
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.25	0.72	0.72	0.18	0.58	0.58
v/c Ratio	0.14	0.04	0.04	0.02	0.27	0.25	0.01	0.04	0.19	0.20
Control Delay	17.2	0.1	16.8	0.0	17.3	5.8	0.0	19.5	9.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	0.1	16.8	0.0	17.3	5.8	0.0	19.5	9.8	3.5
LOS	B	A	B	A	B	A	A	B	A	A
Approach Delay		11.6				7.5			8.3	
Approach LOS		B				A			A	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 32.7	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.27	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 41.2%	ICU Level of Service A
Analysis Period (min) 15	

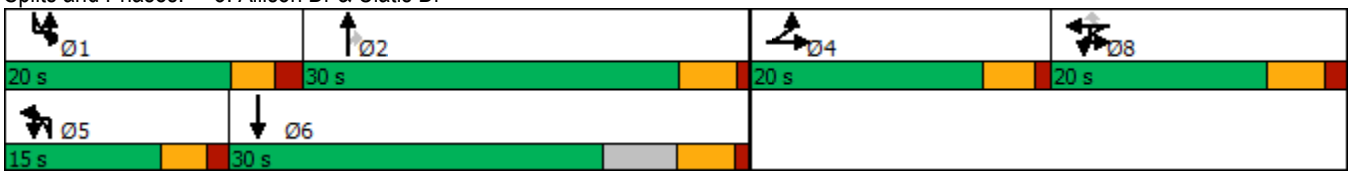
Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	192	2	227	9	356	194	218	242
Future Volume (vph)	4	192	2	227	9	356	194	218	242
Turn Type	NA	Split	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	8		5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	8	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0
Minimum Split (s)	10.5	10.5	10.5	10.5	8.5	9.9	9.9	8.9	9.0
Total Split (s)	20.0	20.0	20.0	20.0	15.0	30.0	30.0	20.0	30.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	16.7%	33.3%	33.3%	22.2%	33.3%
Yellow Time (s)	3.5	3.9	3.9	3.9	3.0	3.9	3.9	3.0	3.9
All-Red Time (s)	1.0	1.6	1.6	1.6	1.5	1.0	1.0	1.9	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	5.5	5.5	5.5	4.5	4.9	4.9	4.9	5.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	6.1	8.4	8.4	8.4	4.9	11.7	11.7	8.7	24.2
Actuated g/C Ratio	0.12	0.17	0.17	0.17	0.10	0.23	0.23	0.17	0.48
v/c Ratio	0.24	0.44	0.44	0.57	0.07	0.54	0.44	0.47	0.19
Control Delay	21.6	28.1	28.1	9.0	28.7	21.9	6.5	24.5	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	28.1	28.1	9.0	28.7	21.9	6.5	24.5	10.5
LOS	C	C	C	A	C	C	A	C	B
Approach Delay	21.6		17.8			16.7			17.0
Approach LOS	C		B			B			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 50.9	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 50.8%	ICU Level of Service A
Analysis Period (min) 15	

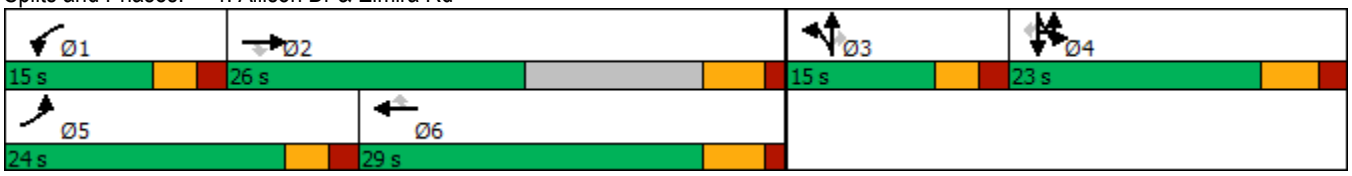
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	345	6	9	598	225	2	9	6	177	4	338
Future Volume (vph)	319	345	6	9	598	225	2	9	6	177	4	338
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	24.0	26.0	26.0	15.0	29.0	29.0	15.0	15.0	15.0	23.0	23.0	23.0
Total Split (%)	26.4%	28.6%	28.6%	16.5%	31.9%	31.9%	16.5%	16.5%	16.5%	25.3%	25.3%	25.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.6	30.0	30.0	4.9	15.4	15.4	4.9	4.9	4.9	8.3	8.3	8.3
Actuated g/C Ratio	0.19	0.54	0.54	0.09	0.28	0.28	0.09	0.09	0.09	0.15	0.15	0.15
v/c Ratio	0.54	0.20	0.01	0.06	0.68	0.43	0.01	0.06	0.02	0.40	0.41	0.68
Control Delay	26.0	9.1	0.0	32.3	23.2	7.6	32.5	32.3	0.2	30.2	30.3	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	9.1	0.0	32.3	23.2	7.6	32.5	32.3	0.2	30.2	30.3	10.7
LOS	C	A	A	C	C	A	C	C	A	C	C	B
Approach Delay		17.1			19.1			20.5			17.5	
Approach LOS		B			B			C			B	

Intersection Summary			
Cycle Length: 91			
Actuated Cycle Length: 55.5			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 55.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBR
Lane Configurations									
Traffic Volume (vph)	127	247	27	341	15	7	8	46	66
Future Volume (vph)	127	247	27	341	15	7	8	46	66
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	5	2	1	6	3	8		7	
Permitted Phases							8		4
Detector Phase	5	2	1	6	3	8	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	10.7	9.0	10.8	9.0	9.0	9.0	9.0	9.9
Total Split (s)	15.0	40.0	15.0	40.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	17.6%	47.1%	17.6%	47.1%	17.6%	17.6%	17.6%	17.6%	17.6%
Yellow Time (s)	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.9
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.0	5.8	5.0	5.0	5.0	5.0	5.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.1	28.8	7.4	15.9	5.8	5.5	5.5	7.0	7.6
Actuated g/C Ratio	0.21	0.61	0.16	0.33	0.12	0.12	0.12	0.15	0.16
v/c Ratio	0.47	0.19	0.31	0.49	0.09	0.04	0.03	0.25	0.13
Control Delay	28.0	11.4	26.1	15.4	27.1	27.1	0.2	26.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	11.4	26.1	15.4	27.1	27.1	0.2	26.1	0.4
LOS	C	B	C	B	C	C	A	C	A
Approach Delay		16.5		16.7		19.7			
Approach LOS		B		B		B			

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 47.5	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 45.2%	ICU Level of Service A
Analysis Period (min) 15	

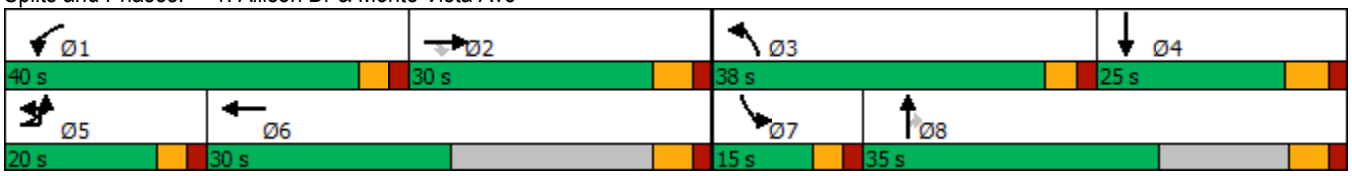
Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	89	375	516	407	393	473	596	821	22	179
Future Volume (vph)	89	375	516	407	393	473	596	821	22	179
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	20.0	30.0	30.0	40.0	30.0	38.0	35.0	35.0	15.0	25.0
Total Split (%)	15.0%	22.6%	22.6%	30.1%	22.6%	28.6%	26.3%	26.3%	11.3%	18.8%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.9	3.9	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9	5.0	5.9	5.9	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	9.8	18.0	18.0	29.8	41.0	20.5	35.5	35.5	5.8	13.3
Actuated g/C Ratio	0.09	0.17	0.17	0.28	0.39	0.20	0.34	0.34	0.06	0.13
v/c Ratio	0.58	0.64	0.79	0.84	0.31	0.74	0.52	0.97	0.24	0.51
Control Delay	65.9	46.9	15.4	54.0	25.1	49.0	32.7	38.2	63.0	46.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	46.9	15.4	54.0	25.1	49.0	32.7	38.2	63.0	46.8
LOS	E	D	B	D	C	D	C	D	E	D
Approach Delay		32.1			39.4		39.2			48.3
Approach LOS		C			D		D			D

Intersection Summary	
Cycle Length: 133	
Actuated Cycle Length: 105.1	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 38.0	Intersection LOS: D
Intersection Capacity Utilization 80.0%	ICU Level of Service D
Analysis Period (min) 15	

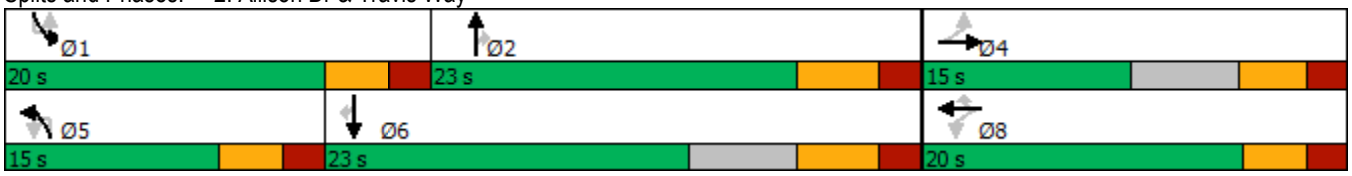
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	0	34	21	9	18	737	15	3	17	974	43
Future Volume (vph)	140	0	34	21	9	18	737	15	3	17	974	43
Turn Type	Perm	NA	Perm	Perm	custom	Prot	NA	Perm	custom	Prot	NA	Perm
Protected Phases		4				5	2			1	6	
Permitted Phases	4		8	8	5			2	1			6
Detector Phase	4	4	8	8	5	5	2	2	1	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.0	9.9	9.9	9.0	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	15.0	23.0	23.0	20.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	23.8%	36.5%	36.5%	31.7%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.0	3.9	3.9	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0		5.0	5.9	5.9		5.0	5.9	5.9
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	8.0	8.0	7.9	7.9		6.4	18.8	18.8		6.7	18.9	18.9
Actuated g/C Ratio	0.23	0.23	0.22	0.22		0.18	0.53	0.53		0.19	0.54	0.54
v/c Ratio	0.49	0.20	0.14	0.03		0.09	0.44	0.02		0.06	0.40	0.05
Control Delay	22.4	0.7	15.8	0.1		16.0	10.1	0.1		15.2	9.0	0.1
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	22.4	0.7	15.8	0.1		16.0	10.1	0.1		15.2	9.0	0.1
LOS	C	A	B	A		B	B	A		B	A	A
Approach Delay		12.5					10.1				8.7	
Approach LOS		B					B				A	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 35.3	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 46.9%	ICU Level of Service A
Analysis Period (min) 15	

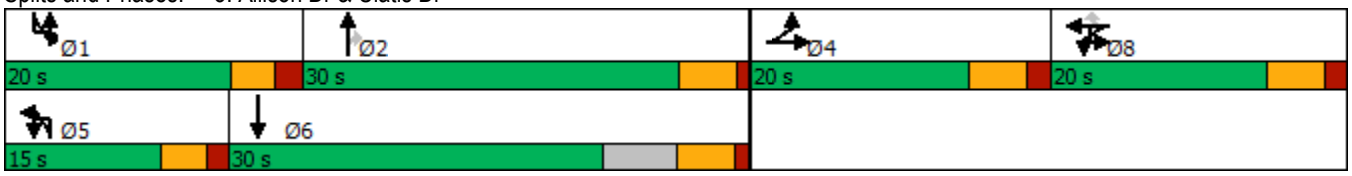
Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	375	4	285	28	476	282	343	738
Future Volume (vph)	2	375	4	285	28	476	282	343	738
Turn Type	NA	Split	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	8		5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	8	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0
Minimum Split (s)	10.5	10.5	10.5	10.5	87.5	9.9	9.9	8.9	9.0
Total Split (s)	20.0	20.0	20.0	20.0	15.0	30.0	30.0	20.0	30.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	16.7%	33.3%	33.3%	22.2%	33.3%
Yellow Time (s)	3.9	3.9	3.9	3.9	3.0	3.9	3.9	3.0	3.9
All-Red Time (s)	1.6	1.6	1.6	1.6	1.5	1.0	1.0	1.9	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	4.5	4.9	4.9	4.9	5.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	5.8	11.3	11.3	11.3	5.6	13.2	13.2	10.5	25.4
Actuated g/C Ratio	0.11	0.21	0.21	0.21	0.10	0.24	0.24	0.19	0.46
v/c Ratio	0.16	0.58	0.59	0.53	0.18	0.59	0.49	0.56	0.51
Control Delay	24.4	30.5	30.8	7.7	31.0	23.5	6.5	26.0	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	30.5	30.8	7.7	31.0	23.5	6.5	26.0	15.1
LOS	C	C	C	A	C	C	A	C	B
Approach Delay	24.4		20.8			17.7			18.4
Approach LOS	C		C			B			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 55	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 62.2%	ICU Level of Service B
Analysis Period (min) 15	

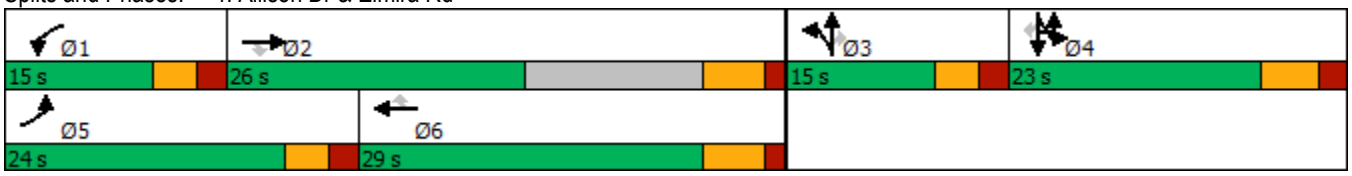
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	497	705	34	22	586	264	36	27	35	423	42	622
Future Volume (vph)	497	705	34	22	586	264	36	27	35	423	42	622
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	24.0	26.0	26.0	15.0	29.0	29.0	15.0	15.0	15.0	23.0	23.0	23.0
Total Split (%)	26.4%	28.6%	28.6%	16.5%	31.9%	31.9%	16.5%	16.5%	16.5%	25.3%	25.3%	25.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	15.4	34.4	34.4	5.4	17.8	17.8	6.0	6.0	6.0	17.4	17.4	17.4
Actuated g/C Ratio	0.20	0.45	0.45	0.07	0.23	0.23	0.08	0.08	0.08	0.23	0.23	0.23
v/c Ratio	0.77	0.48	0.05	0.19	0.76	0.51	0.28	0.20	0.12	0.66	0.65	0.92
Control Delay	38.4	17.6	0.1	41.4	35.0	8.9	42.2	40.0	0.7	40.4	39.8	29.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	17.6	0.1	41.4	35.0	8.9	42.2	40.0	0.7	40.4	39.8	29.8
LOS	D	B	A	D	D	A	D	D	A	D	D	C
Approach Delay		25.4			27.3			26.8			34.2	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 76.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 28.9	Intersection LOS: C
Intersection Capacity Utilization 73.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	138	448	32	456	54	26	38	182	9	156
Future Volume (vph)	138	448	32	456	54	26	38	182	9	156
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	1	6	3	8		7	4	
Permitted Phases							8			4
Detector Phase	5	2	1	6	3	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	10.7	9.0	10.8	9.0	9.0	9.0	9.0	9.9	9.9
Total Split (s)	15.0	40.0	15.0	40.0	15.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	17.6%	47.1%	17.6%	47.1%	17.6%	17.6%	17.6%	17.6%	17.6%	17.6%
Yellow Time (s)	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.0	5.8	5.0	5.0	5.0	5.0	5.9	5.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	9.3	31.0	6.4	20.3	7.0	8.7	8.7	10.9	11.8	11.8
Actuated g/C Ratio	0.14	0.47	0.10	0.31	0.11	0.13	0.13	0.16	0.18	0.18
v/c Ratio	0.60	0.32	0.21	0.65	0.31	0.12	0.12	0.68	0.03	0.40
Control Delay	44.2	15.3	38.0	21.3	38.6	28.9	0.7	46.1	27.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	15.3	38.0	21.3	38.6	28.9	0.7	46.1	27.4	8.4
LOS	D	B	D	C	D	C	A	D	C	A
Approach Delay		21.7		22.1		24.2			28.7	
Approach LOS		C		C		C			C	

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 66.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 23.4	Intersection LOS: C
Intersection Capacity Utilization 58.4%	ICU Level of Service B
Analysis Period (min) 15	

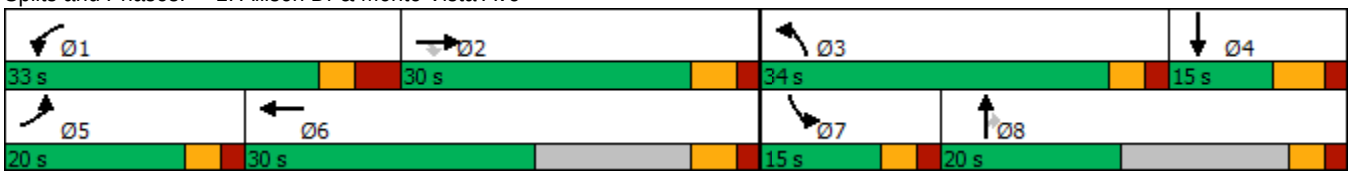
Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	45	255	545	180	250	350	215	400	15	195
Future Volume (vph)	45	255	545	180	250	350	215	400	15	195
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	2.1	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	20.0	30.0	30.0	33.0	30.0	34.0	20.0	20.0	15.0	15.0
Total Split (%)	17.9%	26.8%	26.8%	29.5%	26.8%	30.4%	17.9%	17.9%	13.4%	13.4%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.0	3.0	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	6.9	5.9	5.0	5.0	5.0	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	7.0	13.8	13.8	14.1	28.3	15.0	32.0	32.0	5.4	11.5
Actuated g/C Ratio	0.09	0.17	0.17	0.17	0.35	0.19	0.40	0.40	0.07	0.14
v/c Ratio	0.35	0.50	0.82	0.69	0.26	0.65	0.18	0.52	0.15	0.57
Control Delay	49.0	34.3	13.5	47.1	21.1	38.5	19.9	5.0	49.8	37.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	34.3	13.5	47.1	21.1	38.5	19.9	5.0	49.8	37.6
LOS	D	C	B	D	C	D	B	A	D	D
Approach Delay		21.7			31.5		20.5			38.4
Approach LOS		C			C		C			D

Intersection Summary	
Cycle Length: 112	
Actuated Cycle Length: 81	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 24.7	Intersection LOS: C
Intersection Capacity Utilization 67.9%	ICU Level of Service C
Analysis Period (min) 15	

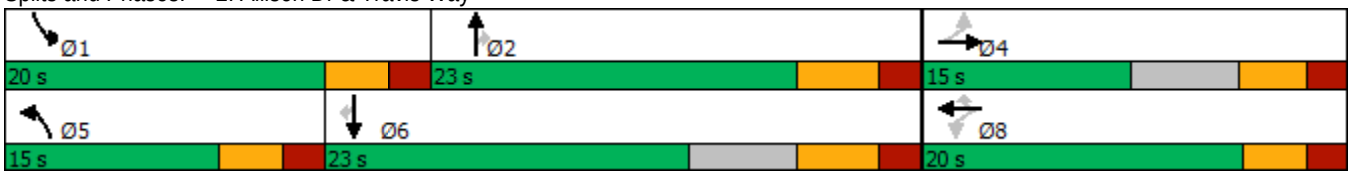
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	30	0	20	15	125	610	20	15	545	200
Future Volume (vph)	30	0	20	15	125	610	20	15	545	200
Turn Type	Perm	NA	Perm	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			5	2		1	6	
Permitted Phases	4		8	8			2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.9	9.9	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	23.0	23.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	36.5%	36.5%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.9	3.9	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0	5.0	5.9	5.9	5.0	5.9	5.9
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	6.2	6.2	6.3	6.3	8.1	26.8	26.8	5.6	17.3	17.3
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.22	0.74	0.74	0.15	0.48	0.48
v/c Ratio	0.12	0.04	0.08	0.03	0.40	0.29	0.02	0.07	0.28	0.29
Control Delay	19.2	0.1	18.8	0.1	19.7	5.5	0.1	20.1	10.5	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	0.1	18.8	0.1	19.7	5.5	0.1	20.1	10.5	3.4
LOS	B	A	B	A	B	A	A	C	B	A
Approach Delay		11.5				7.7			8.8	
Approach LOS		B				A			A	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 36.4	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 42.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	250	295	5	455	255	285	295
Future Volume (vph)	250	295	5	455	255	285	295
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Detector Phase	8	8	5	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	4.0	5.0	5.0	4.0	4.0
Minimum Split (s)	10.5	10.5	8.5	9.9	9.9	8.9	9.0
Total Split (s)	20.0	20.0	15.0	30.0	30.0	20.0	30.0
Total Split (%)	28.6%	28.6%	21.4%	42.9%	42.9%	28.6%	42.9%
Yellow Time (s)	3.9	3.9	3.0	3.9	3.9	3.0	3.9
All-Red Time (s)	1.6	1.6	1.5	1.0	1.0	1.9	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.9	4.9	4.9	5.0
Lead/Lag			Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None
Act Effct Green (s)	8.6	8.6	4.5	13.0	13.0	9.2	25.6
Actuated g/C Ratio	0.18	0.18	0.10	0.28	0.28	0.20	0.55
v/c Ratio	0.50	0.62	0.04	0.58	0.47	0.53	0.19
Control Delay	21.2	8.1	23.8	17.6	5.1	21.1	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	8.1	23.8	17.6	5.1	21.1	6.5
LOS	C	A	C	B	A	C	A
Approach Delay	14.2			13.2			13.7
Approach LOS	B			B			B

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 46.6	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 51.9%	ICU Level of Service A
Analysis Period (min) 15	

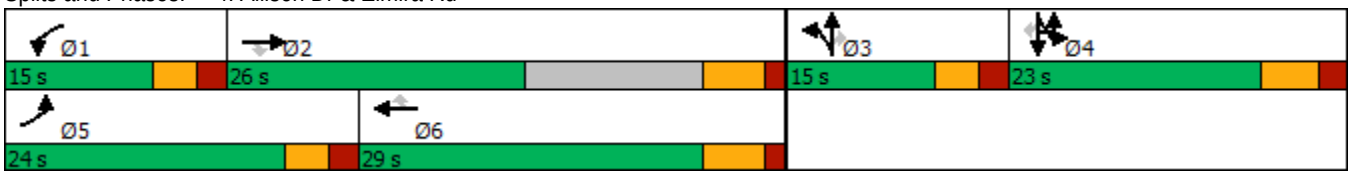
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	410	10	15	705	280	5	20	10	195	10	380
Future Volume (vph)	390	410	10	15	705	280	5	20	10	195	10	380
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	24.0	26.0	26.0	15.0	29.0	29.0	15.0	15.0	15.0	23.0	23.0	23.0
Total Split (%)	26.4%	28.6%	28.6%	16.5%	31.9%	31.9%	16.5%	16.5%	16.5%	25.3%	25.3%	25.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	12.8	35.5	35.5	5.1	19.0	19.0	5.3	5.3	5.3	9.4	9.4	9.4
Actuated g/C Ratio	0.20	0.55	0.55	0.08	0.29	0.29	0.08	0.08	0.08	0.15	0.15	0.15
v/c Ratio	0.64	0.23	0.01	0.12	0.76	0.51	0.04	0.14	0.03	0.48	0.48	0.72
Control Delay	30.7	10.4	0.0	37.5	28.5	10.8	36.0	37.4	0.2	36.0	35.8	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	10.4	0.0	37.5	28.5	10.8	36.0	37.4	0.2	36.0	35.8	11.3
LOS	C	B	A	D	C	B	D	D	A	D	D	B
Approach Delay		20.1			23.7			26.7			20.1	
Approach LOS		C			C			C			C	

Intersection Summary		
Cycle Length: 91		
Actuated Cycle Length: 64.7		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.76		
Intersection Signal Delay: 21.6	Intersection LOS: C	
Intersection Capacity Utilization 60.4%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBR
Lane Configurations									
Traffic Volume (vph)	165	320	40	445	20	15	15	65	85
Future Volume (vph)	165	320	40	445	20	15	15	65	85
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	5	2	1	6	3	8		7	
Permitted Phases							8		4
Detector Phase	5	2	1	6	3	8	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	10.7	9.0	10.8	9.0	9.0	9.0	9.0	9.9
Total Split (s)	23.0	41.0	15.0	35.0	10.0	9.0	9.0	13.0	14.0
Total Split (%)	28.0%	50.0%	18.3%	42.7%	12.2%	11.0%	11.0%	15.9%	17.1%
Yellow Time (s)	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.9
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.0	5.8	5.0	5.0	5.0	5.0	5.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	12.6	32.2	8.3	21.2	5.5	4.6	4.6	7.5	8.0
Actuated g/C Ratio	0.21	0.54	0.14	0.35	0.09	0.08	0.08	0.13	0.13
v/c Ratio	0.61	0.28	0.42	0.61	0.17	0.14	0.06	0.44	0.20
Control Delay	32.9	11.9	35.3	19.4	36.0	37.1	0.3	37.7	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	11.9	35.3	19.4	36.0	37.1	0.3	37.7	0.8
LOS	C	B	D	B	D	D	A	D	A
Approach Delay		18.3		21.3		25.7			
Approach LOS		B		C		C			

Intersection Summary	
Cycle Length: 82	
Actuated Cycle Length: 59.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 51.6%	ICU Level of Service A
Analysis Period (min) 15	

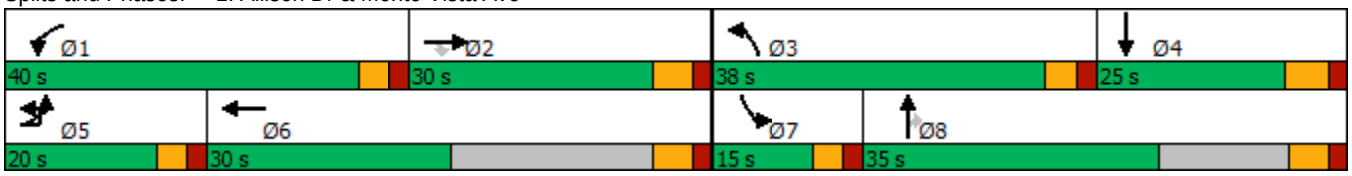
Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	105	435	590	440	455	545	690	945	30	210
Future Volume (vph)	105	435	590	440	455	545	690	945	30	210
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	20.0	30.0	30.0	40.0	30.0	38.0	35.0	35.0	15.0	25.0
Total Split (%)	15.0%	22.6%	22.6%	30.1%	22.6%	28.6%	26.3%	26.3%	11.3%	18.8%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.9	3.9	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9	5.0	5.9	5.9	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	None	None
Act Effct Green (s)	11.0	22.0	22.0	34.6	45.6	23.6	36.2	36.2	6.3	13.8
Actuated g/C Ratio	0.09	0.19	0.19	0.30	0.39	0.20	0.31	0.31	0.05	0.12
v/c Ratio	0.69	0.68	0.91	0.88	0.37	0.82	0.66	1.15	0.33	0.66
Control Delay	76.3	50.6	29.9	60.1	27.7	56.7	40.2	100.6	69.3	55.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	50.6	29.9	60.1	27.7	56.7	40.2	100.6	69.3	55.2
LOS	E	D	C	E	C	E	D	F	E	E
Approach Delay		42.3			43.2		70.5			56.6
Approach LOS		D			D		E			E

Intersection Summary	
Cycle Length: 133	
Actuated Cycle Length: 117	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 57.0	Intersection LOS: E
Intersection Capacity Utilization 89.2%	ICU Level of Service E
Analysis Period (min) 15	

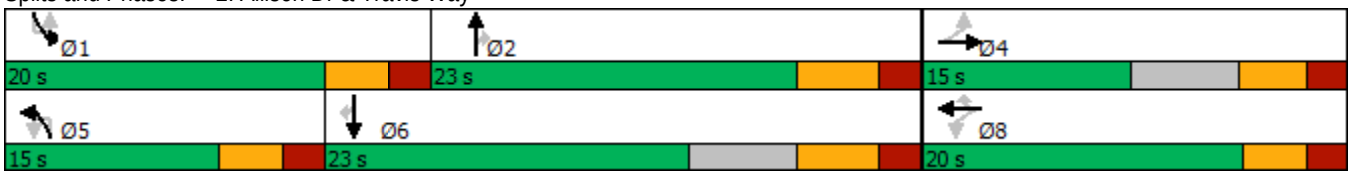
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	0	45	30	10	25	910	20	5	25	1160	55
Future Volume (vph)	160	0	45	30	10	25	910	20	5	25	1160	55
Turn Type	Perm	NA	Perm	Perm	custom	Prot	NA	Perm	custom	Prot	NA	Perm
Protected Phases		4				5	2			1	6	
Permitted Phases	4		8	8	5			2	1			6
Detector Phase	4	4	8	8	5	5	2	2	1	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.0	9.9	9.9	9.0	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	15.0	23.0	23.0	20.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	23.8%	36.5%	36.5%	31.7%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.0	3.9	3.9	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0		5.0	5.9	5.9		5.0	5.9	5.9
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	8.1	8.1	8.3	8.3		6.5	20.2	20.2		7.5	18.6	18.6
Actuated g/C Ratio	0.19	0.19	0.19	0.19		0.15	0.47	0.47		0.18	0.43	0.43
v/c Ratio	0.67	0.26	0.21	0.05		0.14	0.61	0.03		0.10	0.58	0.08
Control Delay	34.2	1.0	19.9	0.2		19.4	13.8	0.1		16.8	12.2	0.7
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	34.2	1.0	19.9	0.2		19.4	13.8	0.1		16.8	12.2	0.7
LOS	C	A	B	A		B	B	A		B	B	A
Approach Delay		18.7					13.8				11.8	
Approach LOS		B					B				B	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 42.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 54.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	465	360	5	600	350	435	915
Future Volume (vph)	465	360	5	600	350	435	915
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Detector Phase	8	8	5	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	4.0	5.0	5.0	4.0	4.0
Minimum Split (s)	10.5	10.5	87.5	9.9	9.9	8.9	9.0
Total Split (s)	20.0	20.0	15.0	30.0	30.0	20.0	30.0
Total Split (%)	28.6%	28.6%	21.4%	42.9%	42.9%	28.6%	42.9%
Yellow Time (s)	3.9	3.9	3.0	3.9	3.9	3.0	3.9
All-Red Time (s)	1.6	1.6	1.5	1.0	1.0	1.9	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.9	4.9	4.9	5.0
Lead/Lag			Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None
Act Effct Green (s)	11.4	11.4	4.5	14.5	14.5	11.1	29.1
Actuated g/C Ratio	0.22	0.22	0.09	0.27	0.27	0.21	0.55
v/c Ratio	0.67	0.59	0.03	0.65	0.52	0.64	0.49
Control Delay	25.1	7.2	27.2	21.0	5.3	24.6	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	7.2	27.2	21.0	5.3	24.6	9.2
LOS	C	A	C	C	A	C	A
Approach Delay	17.3			15.3			14.2
Approach LOS	B			B			B

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 52.8	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

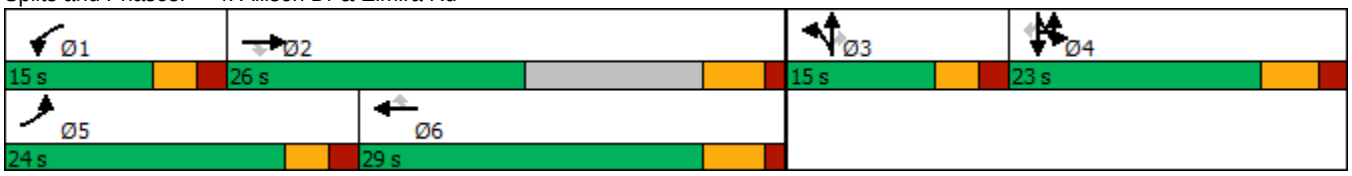
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	585	810	40	30	675	310	45	35	45	515	55	755
Future Volume (vph)	585	810	40	30	675	310	45	35	45	515	55	755
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	24.0	26.0	26.0	15.0	29.0	29.0	15.0	15.0	15.0	23.0	23.0	23.0
Total Split (%)	26.4%	28.6%	28.6%	16.5%	31.9%	31.9%	16.5%	16.5%	16.5%	25.3%	25.3%	25.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	17.5	36.2	36.2	5.8	20.1	20.1	6.4	6.4	6.4	17.5	17.5	17.5
Actuated g/C Ratio	0.22	0.45	0.45	0.07	0.25	0.25	0.08	0.08	0.08	0.22	0.22	0.22
v/c Ratio	0.85	0.55	0.05	0.26	0.83	0.58	0.35	0.26	0.15	0.86	0.84	1.16
Control Delay	44.5	20.1	0.1	43.7	39.0	11.7	44.9	42.1	0.9	58.0	55.9	104.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	20.1	0.1	43.7	39.0	11.7	44.9	42.1	0.9	58.0	55.9	104.9
LOS	D	C	A	D	D	B	D	D	A	E	E	F
Approach Delay		29.5			30.8			28.4			84.2	
Approach LOS		C			C			C			F	

Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 81.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.16	
Intersection Signal Delay: 48.4	Intersection LOS: D
Intersection Capacity Utilization 83.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	175	560	45	565	70	35	50	225	15	195
Future Volume (vph)	175	560	45	565	70	35	50	225	15	195
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	1	6	3	8		7	4	
Permitted Phases							8			4
Detector Phase	5	2	1	6	3	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	10.7	9.0	10.8	9.0	9.0	9.0	9.0	9.9	9.9
Total Split (s)	15.0	40.0	15.0	40.0	15.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	17.6%	47.1%	17.6%	47.1%	17.6%	17.6%	17.6%	17.6%	17.6%	17.6%
Yellow Time (s)	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.0	5.8	5.0	5.0	5.0	5.0	5.9	5.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.3	33.1	6.9	24.5	7.4	9.2	9.2	10.5	11.3	11.3
Actuated g/C Ratio	0.14	0.45	0.09	0.33	0.10	0.12	0.12	0.14	0.15	0.15
v/c Ratio	0.76	0.42	0.32	0.74	0.42	0.16	0.16	0.98	0.06	0.50
Control Delay	56.4	18.1	41.6	24.7	43.4	31.4	1.0	89.7	29.7	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	18.1	41.6	24.7	43.4	31.4	1.0	89.7	29.7	9.2
LOS	E	B	D	C	D	C	A	F	C	A
Approach Delay		26.6		25.7		27.0			52.0	
Approach LOS		C		C		C			D	

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 73.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 67.0%	ICU Level of Service C
Analysis Period (min) 15	

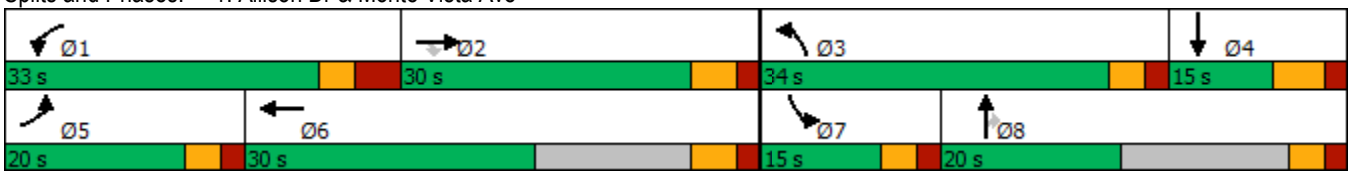
Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	45	255	547	191	250	358	217	410	15	196
Future Volume (vph)	45	255	547	191	250	358	217	410	15	196
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	2.1	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	20.0	30.0	30.0	33.0	30.0	34.0	20.0	20.0	15.0	15.0
Total Split (%)	17.9%	26.8%	26.8%	29.5%	26.8%	30.4%	17.9%	17.9%	13.4%	13.4%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.0	3.0	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	6.9	5.9	5.0	5.0	5.0	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	7.0	14.2	14.2	14.8	29.3	15.4	30.2	30.2	5.5	11.5
Actuated g/C Ratio	0.08	0.17	0.17	0.18	0.36	0.19	0.37	0.37	0.07	0.14
v/c Ratio	0.35	0.49	0.83	0.71	0.25	0.66	0.20	0.55	0.15	0.58
Control Delay	50.0	34.6	14.7	48.6	21.1	39.0	22.4	5.5	50.7	38.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	34.6	14.7	48.6	21.1	39.0	22.4	5.5	50.7	38.8
LOS	D	C	B	D	C	D	C	A	D	D
Approach Delay		22.5			32.5		21.4			39.5
Approach LOS		C			C		C			D

Intersection Summary	
Cycle Length: 112	
Actuated Cycle Length: 82.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 25.6	Intersection LOS: C
Intersection Capacity Utilization 68.6%	ICU Level of Service C
Analysis Period (min) 15	

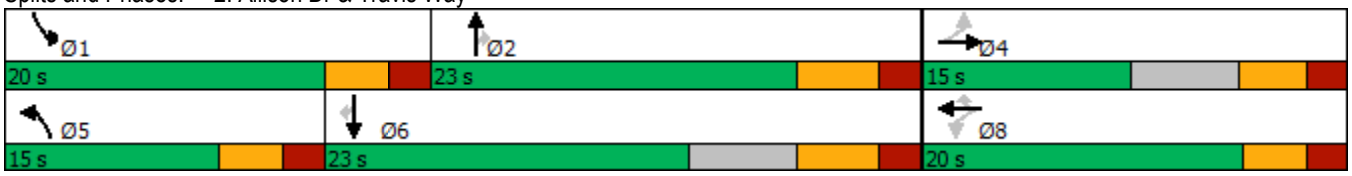
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	57	0	20	15	125	637	20	15	561	200
Future Volume (vph)	57	0	20	15	125	637	20	15	561	200
Turn Type	Perm	NA	Perm	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			5	2		1	6	
Permitted Phases	4		8	8			2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.9	9.9	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	23.0	23.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	36.5%	36.5%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.9	3.9	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0	5.0	5.9	5.9	5.0	5.9	5.9
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	7.2	7.2	7.1	7.1	8.4	27.1	27.1	5.7	17.5	17.5
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.22	0.72	0.72	0.15	0.47	0.47
v/c Ratio	0.20	0.06	0.07	0.03	0.39	0.31	0.02	0.07	0.29	0.29
Control Delay	19.0	0.2	17.9	0.1	20.3	6.2	0.1	20.9	11.4	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	0.2	17.9	0.1	20.3	6.2	0.1	20.9	11.4	3.6
LOS	B	A	B	A	C	A	A	C	B	A
Approach Delay		12.4				8.3			9.5	
Approach LOS		B				A			A	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 37.5	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 44.8%	ICU Level of Service A
Analysis Period (min) 15	

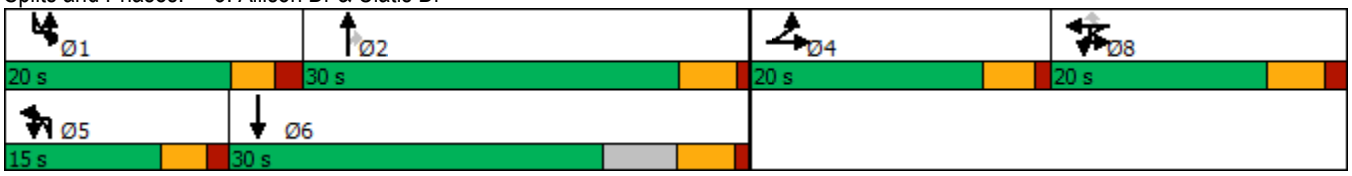
Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	250	2	295	9	455	255	285	306
Future Volume (vph)	4	250	2	295	9	455	255	285	306
Turn Type	NA	Split	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	8		5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	8	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0
Minimum Split (s)	10.5	10.5	10.5	10.5	8.5	9.9	9.9	8.9	9.0
Total Split (s)	20.0	20.0	20.0	20.0	15.0	30.0	30.0	20.0	30.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	16.7%	33.3%	33.3%	22.2%	33.3%
Yellow Time (s)	3.5	3.9	3.9	3.9	3.0	3.9	3.9	3.0	3.9
All-Red Time (s)	1.0	1.6	1.6	1.6	1.5	1.0	1.0	1.9	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	5.5	5.5	5.5	4.5	4.9	4.9	4.9	5.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	6.3	9.9	9.9	9.9	5.1	14.8	14.8	10.6	29.2
Actuated g/C Ratio	0.11	0.17	0.17	0.17	0.09	0.26	0.26	0.18	0.51
v/c Ratio	0.26	0.55	0.56	0.64	0.10	0.62	0.49	0.57	0.22
Control Delay	24.8	33.6	33.9	9.4	33.4	24.2	6.1	28.1	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	33.6	33.9	9.4	33.4	24.2	6.1	28.1	10.7
LOS	C	C	C	A	C	C	A	C	B
Approach Delay	24.8		20.7			18.0			19.0
Approach LOS	C		C			B			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 57.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

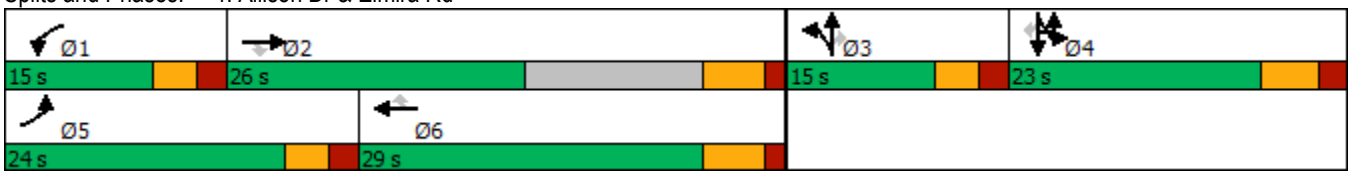
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	395	410	10	15	705	284	5	20	10	207	10	398
Future Volume (vph)	395	410	10	15	705	284	5	20	10	207	10	398
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	24.0	26.0	26.0	15.0	29.0	29.0	15.0	15.0	15.0	23.0	23.0	23.0
Total Split (%)	26.4%	28.6%	28.6%	16.5%	31.9%	31.9%	16.5%	16.5%	16.5%	25.3%	25.3%	25.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	13.0	35.7	35.7	5.1	19.0	19.0	5.3	5.3	5.3	9.6	9.6	9.6
Actuated g/C Ratio	0.20	0.55	0.55	0.08	0.29	0.29	0.08	0.08	0.08	0.15	0.15	0.15
v/c Ratio	0.64	0.24	0.01	0.12	0.76	0.51	0.04	0.15	0.03	0.50	0.50	0.73
Control Delay	30.9	10.5	0.0	37.7	28.8	10.9	36.0	37.6	0.2	36.4	36.4	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	10.5	0.0	37.7	28.8	10.9	36.0	37.6	0.2	36.4	36.4	11.3
LOS	C	B	A	D	C	B	D	D	A	D	D	B
Approach Delay		20.3			23.8			26.8			20.3	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 65.1	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 61.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBR
Lane Configurations									
Traffic Volume (vph)	167	322	40	446	20	15	15	65	86
Future Volume (vph)	167	322	40	446	20	15	15	65	86
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	5	2	1	6	3	8		7	
Permitted Phases							8		4
Detector Phase	5	2	1	6	3	8	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	10.7	9.0	10.8	9.0	9.0	9.0	9.0	9.9
Total Split (s)	23.0	41.0	15.0	35.0	10.0	9.0	9.0	13.0	14.0
Total Split (%)	28.0%	50.0%	18.3%	42.7%	12.2%	11.0%	11.0%	15.9%	17.1%
Yellow Time (s)	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.9
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.0	5.8	5.0	5.0	5.0	5.0	5.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	12.7	32.3	8.3	21.2	5.5	4.6	4.6	7.5	8.0
Actuated g/C Ratio	0.21	0.54	0.14	0.35	0.09	0.08	0.08	0.13	0.13
v/c Ratio	0.61	0.28	0.42	0.61	0.17	0.14	0.06	0.44	0.20
Control Delay	33.0	11.9	35.3	19.5	36.1	37.1	0.3	37.8	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	11.9	35.3	19.5	36.1	37.1	0.3	37.8	0.8
LOS	C	B	D	B	D	D	A	D	A
Approach Delay		18.3		21.4		25.7			
Approach LOS		B		C		C			

Intersection Summary	
Cycle Length: 82	
Actuated Cycle Length: 59.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 51.7%	ICU Level of Service A
Analysis Period (min) 15	

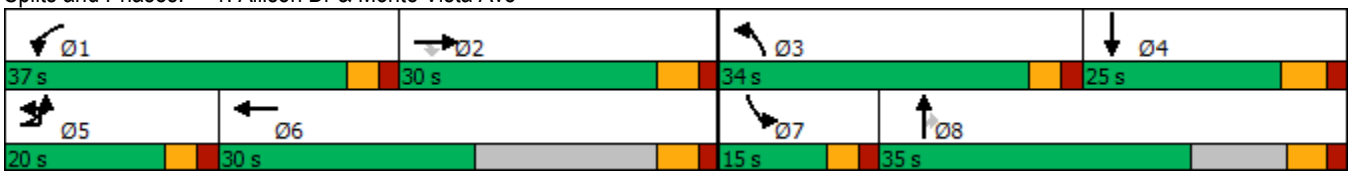
Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	105	435	598	471	455	550	691	951	30	212
Future Volume (vph)	105	435	598	471	455	550	691	951	30	212
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	20.0	30.0	30.0	37.0	30.0	34.0	35.0	35.0	15.0	25.0
Total Split (%)	15.9%	23.8%	23.8%	29.4%	23.8%	27.0%	27.8%	27.8%	11.9%	19.8%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.9	3.9	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9	5.0	5.9	5.9	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.9	23.0	23.0	32.8	44.9	22.7	35.1	35.1	6.3	13.8
Actuated g/C Ratio	0.09	0.20	0.20	0.29	0.39	0.20	0.31	0.31	0.05	0.12
v/c Ratio	0.68	0.64	0.93	0.97	0.36	0.85	0.67	1.15	0.32	0.65
Control Delay	74.3	47.0	34.5	77.1	27.2	58.3	40.0	97.8	66.9	53.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.3	47.0	34.5	77.1	27.2	58.3	40.0	97.8	66.9	53.3
LOS	E	D	C	E	C	E	D	F	E	D
Approach Delay		43.1			51.9		69.7			54.6
Approach LOS		D			D		E			D

Intersection Summary	
Cycle Length: 126	
Actuated Cycle Length: 115	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 58.4	Intersection LOS: E
Intersection Capacity Utilization 89.6%	ICU Level of Service E
Analysis Period (min) 15	

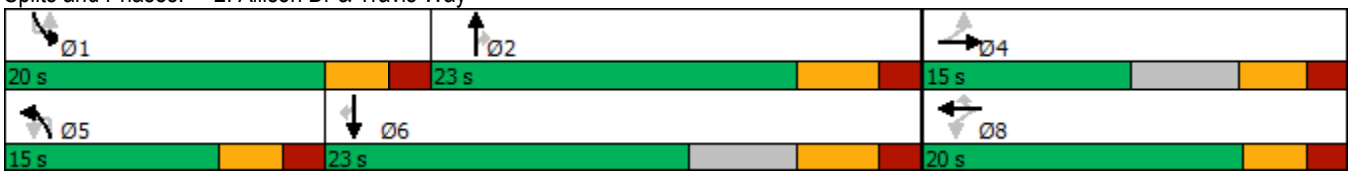
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	0	45	30	10	25	925	20	5	25	1210	55
Future Volume (vph)	175	0	45	30	10	25	925	20	5	25	1210	55
Turn Type	Perm	NA	Perm	Perm	custom	Prot	NA	Perm	custom	Prot	NA	Perm
Protected Phases		4				5	2			1	6	
Permitted Phases	4		8	8	5			2	1			6
Detector Phase	4	4	8	8	5	5	2	2	1	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.0	9.9	9.9	9.0	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	15.0	23.0	23.0	20.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	23.8%	36.5%	36.5%	31.7%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.0	3.9	3.9	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0		5.0	5.9	5.9		5.0	5.9	5.9
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	8.3	8.3	8.6	8.6		6.5	20.1	20.1		7.5	18.5	18.5
Actuated g/C Ratio	0.19	0.19	0.20	0.20		0.15	0.47	0.47		0.17	0.43	0.43
v/c Ratio	0.71	0.27	0.21	0.05		0.14	0.62	0.03		0.10	0.61	0.08
Control Delay	36.8	1.1	19.8	0.2		19.5	14.2	0.1		16.9	12.6	0.7
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	36.8	1.1	19.8	0.2		19.5	14.2	0.1		16.9	12.6	0.7
LOS	D	A	B	A		B	B	A		B	B	A
Approach Delay		20.5					14.1				12.2	
Approach LOS		C					B				B	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 43	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 55.5%	ICU Level of Service B
Analysis Period (min) 15	

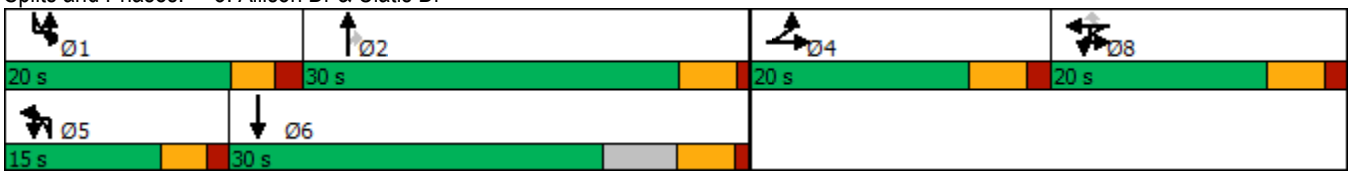
Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	465	4	360	28	600	350	435	922
Future Volume (vph)	2	465	4	360	28	600	350	435	922
Turn Type	NA	Split	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	8		5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	8	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0
Minimum Split (s)	10.5	10.5	10.5	10.5	87.5	9.9	9.9	8.9	9.0
Total Split (s)	20.0	20.0	20.0	20.0	15.0	30.0	30.0	20.0	30.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	16.7%	33.3%	33.3%	22.2%	33.3%
Yellow Time (s)	3.9	3.9	3.9	3.9	3.0	3.9	3.9	3.0	3.9
All-Red Time (s)	1.6	1.6	1.6	1.6	1.5	1.0	1.0	1.9	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	4.5	4.9	4.9	4.9	5.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	5.7	14.1	14.1	14.1	5.6	16.4	16.4	12.5	30.2
Actuated g/C Ratio	0.09	0.22	0.22	0.22	0.09	0.26	0.26	0.20	0.48
v/c Ratio	0.18	0.66	0.66	0.58	0.22	0.68	0.54	0.68	0.61
Control Delay	26.9	36.4	36.3	7.7	34.8	26.1	6.0	30.9	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	36.4	36.3	7.7	34.8	26.1	6.0	30.9	16.4
LOS	C	D	D	A	C	C	A	C	B
Approach Delay	26.9		24.0			19.3			20.9
Approach LOS	C		C			B			C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 62.8	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 21.3	Intersection LOS: C
Intersection Capacity Utilization 72.9%	ICU Level of Service C
Analysis Period (min) 15	

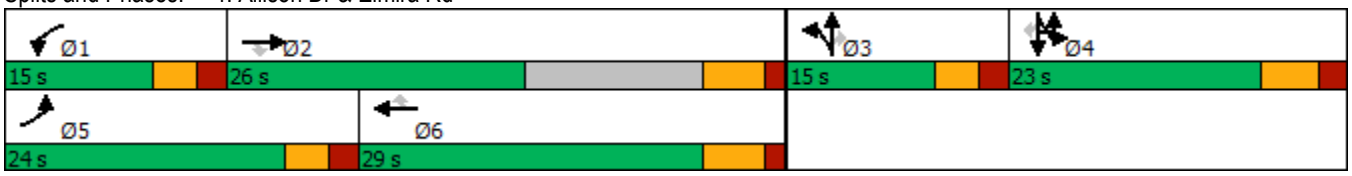
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	601	810	40	30	675	322	45	35	45	523	55	765
Future Volume (vph)	601	810	40	30	675	322	45	35	45	523	55	765
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	24.0	26.0	26.0	15.0	29.0	29.0	15.0	15.0	15.0	23.0	23.0	23.0
Total Split (%)	26.4%	28.6%	28.6%	16.5%	31.9%	31.9%	16.5%	16.5%	16.5%	25.3%	25.3%	25.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	17.8	36.6	36.6	5.8	20.1	20.1	6.4	6.4	6.4	17.5	17.5	17.5
Actuated g/C Ratio	0.22	0.45	0.45	0.07	0.25	0.25	0.08	0.08	0.08	0.21	0.21	0.21
v/c Ratio	0.86	0.55	0.05	0.26	0.83	0.59	0.35	0.26	0.15	0.87	0.86	1.18
Control Delay	45.1	20.1	0.1	43.7	39.3	12.0	45.0	42.2	0.9	60.2	57.9	112.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	20.1	0.1	43.7	39.3	12.0	45.0	42.2	0.9	60.2	57.9	112.3
LOS	D	C	A	D	D	B	D	D	A	E	E	F
Approach Delay		29.9			30.8			28.4			89.3	
Approach LOS		C			C			C			F	

Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 81.6	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 50.4	Intersection LOS: D
Intersection Capacity Utilization 84.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	176	561	45	567	70	35	50	225	15	197
Future Volume (vph)	176	561	45	567	70	35	50	225	15	197
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	1	6	3	8		7	4	
Permitted Phases							8			4
Detector Phase	5	2	1	6	3	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	10.7	9.0	10.8	9.0	9.0	9.0	9.0	9.9	9.9
Total Split (s)	15.0	40.0	15.0	40.0	15.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	17.6%	47.1%	17.6%	47.1%	17.6%	17.6%	17.6%	17.6%	17.6%	17.6%
Yellow Time (s)	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.0	5.8	5.0	5.0	5.0	5.0	5.9	5.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.3	33.2	6.9	24.6	7.4	9.2	9.2	10.5	11.3	11.3
Actuated g/C Ratio	0.14	0.45	0.09	0.33	0.10	0.12	0.12	0.14	0.15	0.15
v/c Ratio	0.77	0.42	0.32	0.74	0.42	0.16	0.16	0.98	0.06	0.51
Control Delay	56.8	18.1	41.6	24.8	43.4	31.4	1.0	90.2	29.8	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	18.1	41.6	24.8	43.4	31.4	1.0	90.2	29.8	9.3
LOS	E	B	D	C	D	C	A	F	C	A
Approach Delay		26.7		25.7		27.0			52.0	
Approach LOS		C		C		C			D	

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 73.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 31.3	Intersection LOS: C
Intersection Capacity Utilization 67.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	50	305	650	215	300	420	255	475	15	235
Future Volume (vph)	50	305	650	215	300	420	255	475	15	235
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	2.1	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	14.0	51.6	51.6	26.0	63.6	23.0	33.4	33.4	9.0	19.4
Total Split (%)	11.7%	43.0%	43.0%	21.7%	53.0%	19.2%	27.8%	27.8%	7.5%	16.2%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.0	3.0	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	6.9	5.9	5.0	5.0	5.0	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	6.9	29.2	29.2	16.7	43.7	16.8	34.2	34.2	4.2	13.7
Actuated g/C Ratio	0.07	0.29	0.29	0.16	0.43	0.16	0.34	0.34	0.04	0.13
v/c Ratio	0.45	0.33	0.95	0.81	0.23	0.81	0.23	0.60	0.22	0.66
Control Delay	64.9	29.3	36.5	66.4	19.4	56.1	29.0	6.2	64.5	48.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.9	29.3	36.5	66.4	19.4	56.1	29.0	6.2	64.5	48.8
LOS	E	C	D	E	B	E	C	A	E	D
Approach Delay		35.7			38.3		29.5			49.6
Approach LOS		D			D		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 35.2	Intersection LOS: D
Intersection Capacity Utilization 77.5%	ICU Level of Service D
Analysis Period (min) 15	

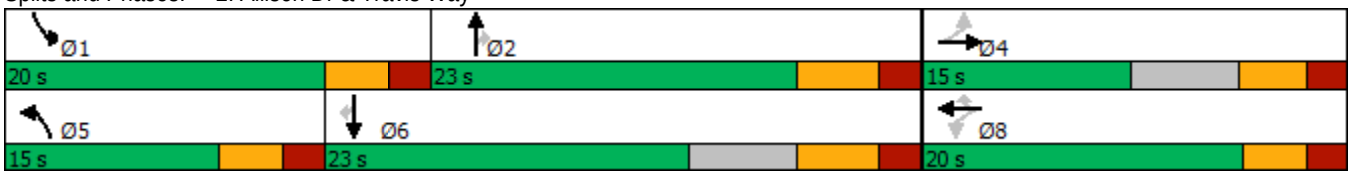
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	35	0	20	15	150	745	20	20	670	240
Future Volume (vph)	35	0	20	15	150	745	20	20	670	240
Turn Type	Perm	NA	Perm	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			5	2		1	6	
Permitted Phases	4		8	8			2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.9	9.9	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	23.0	23.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	36.5%	36.5%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.9	3.9	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0	5.0	5.9	5.9	5.0	5.9	5.9
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	6.3	6.3	6.3	6.3	8.4	26.9	26.9	5.7	17.4	17.4
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.23	0.73	0.73	0.16	0.47	0.47
v/c Ratio	0.12	0.03	0.07	0.03	0.41	0.32	0.02	0.08	0.31	0.31
Control Delay	19.2	0.1	18.7	0.1	19.8	5.8	0.1	20.2	10.9	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	0.1	18.7	0.1	19.8	5.8	0.1	20.2	10.9	3.4
LOS	B	A	B	A	B	A	A	C	B	A
Approach Delay		12.2				7.9			9.1	
Approach LOS		B				A			A	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 36.7	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 8.7	Intersection LOS: A
Intersection Capacity Utilization 46.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	305	365	5	545	315	350	355
Future Volume (vph)	305	365	5	545	315	350	355
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Detector Phase	8	8	5	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	4.0	5.0	5.0	4.0	4.0
Minimum Split (s)	10.5	10.5	8.5	9.9	9.9	8.9	9.0
Total Split (s)	20.0	20.0	15.0	30.0	30.0	20.0	30.0
Total Split (%)	28.6%	28.6%	21.4%	42.9%	42.9%	28.6%	42.9%
Yellow Time (s)	3.9	3.9	3.0	3.9	3.9	3.0	3.9
All-Red Time (s)	1.6	1.6	1.5	1.0	1.0	1.9	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.9	4.9	4.9	5.0
Lead/Lag			Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None
Act Effct Green (s)	9.2	9.2	4.5	13.4	13.4	9.8	26.7
Actuated g/C Ratio	0.19	0.19	0.09	0.28	0.28	0.20	0.55
v/c Ratio	0.53	0.64	0.03	0.62	0.51	0.56	0.20
Control Delay	22.0	8.3	25.2	18.9	5.3	21.9	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	8.3	25.2	18.9	5.3	21.9	6.7
LOS	C	A	C	B	A	C	A
Approach Delay	14.6			14.0			14.3
Approach LOS	B			B			B

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 48.2	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 60.5%	ICU Level of Service B
Analysis Period (min) 15	

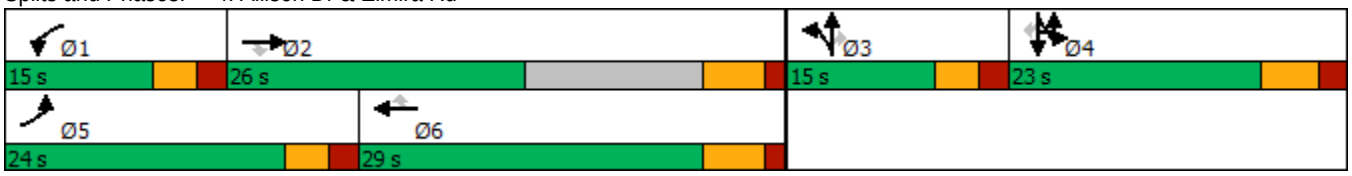
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	470	10	15	810	335	5	20	10	240	10	460
Future Volume (vph)	475	470	10	15	810	335	5	20	10	240	10	460
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	24.0	26.0	26.0	15.0	29.0	29.0	15.0	15.0	15.0	23.0	23.0	23.0
Total Split (%)	26.4%	28.6%	28.6%	16.5%	31.9%	31.9%	16.5%	16.5%	16.5%	25.3%	25.3%	25.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	14.5	40.2	40.2	5.0	22.3	22.3	5.2	5.2	5.2	10.4	10.4	10.4
Actuated g/C Ratio	0.21	0.57	0.57	0.07	0.32	0.32	0.07	0.07	0.07	0.15	0.15	0.15
v/c Ratio	0.73	0.25	0.01	0.13	0.79	0.56	0.04	0.16	0.03	0.55	0.55	0.76
Control Delay	34.4	10.5	0.0	39.2	30.9	13.0	37.2	39.1	0.2	39.2	39.2	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	10.5	0.0	39.2	30.9	13.0	37.2	39.1	0.2	39.2	39.2	11.7
LOS	C	B	A	D	C	B	D	D	A	D	D	B
Approach Delay		22.3			25.8			27.6			21.5	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 70.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 68.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBR
Lane Configurations									
Traffic Volume (vph)	205	395	45	545	25	15	15	75	105
Future Volume (vph)	205	395	45	545	25	15	15	75	105
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	5	2	1	6	3	8		7	
Permitted Phases							8		4
Detector Phase	5	2	1	6	3	8	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	10.9	9.2	11.0	9.2	10.1	10.1	9.2	10.1
Total Split (s)	15.0	40.0	15.0	40.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	17.6%	47.1%	17.6%	47.1%	17.6%	17.6%	17.6%	17.6%	17.6%
Yellow Time (s)	3.2	4.1	3.2	4.1	3.2	4.1	4.1	3.2	4.1
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.9	5.2	6.0	5.2	6.1	6.1	5.2	6.1
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.8	29.1	7.6	20.3	6.0	5.6	5.6	7.6	6.9
Actuated g/C Ratio	0.19	0.51	0.13	0.36	0.11	0.10	0.10	0.13	0.12
v/c Ratio	0.68	0.29	0.38	0.60	0.15	0.09	0.05	0.38	0.20
Control Delay	42.3	13.5	32.4	17.8	31.5	31.7	0.3	32.4	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	13.5	32.4	17.8	31.5	31.7	0.3	32.4	0.8
LOS	D	B	C	B	C	C	A	C	A
Approach Delay		22.4		19.3		23.1			
Approach LOS		C		B		C			

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 57	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 20.1	Intersection LOS: C
Intersection Capacity Utilization 57.8%	ICU Level of Service B
Analysis Period (min) 15	

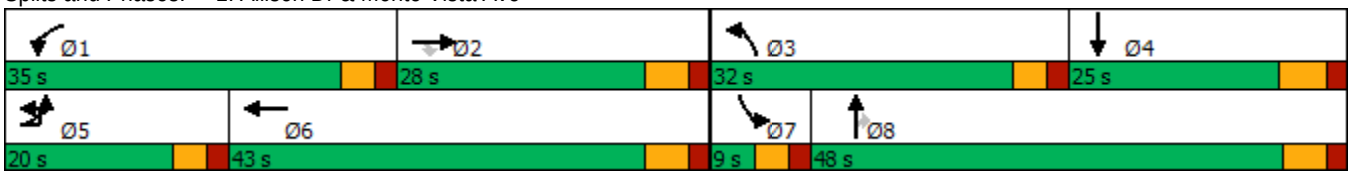
Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	120	495	665	495	515	615	780	1070	30	235
Future Volume (vph)	120	495	665	495	515	615	780	1070	30	235
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	20.0	28.0	28.0	35.0	43.0	32.0	48.0	48.0	9.0	25.0
Total Split (%)	16.7%	23.3%	23.3%	29.2%	35.8%	26.7%	40.0%	40.0%	7.5%	20.8%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.9	3.9	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9	5.0	5.9	5.9	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	11.9	24.8	24.8	30.2	43.2	24.7	43.5	43.5	4.0	18.5
Actuated g/C Ratio	0.10	0.21	0.21	0.25	0.36	0.20	0.36	0.36	0.03	0.15
v/c Ratio	0.75	0.71	1.05	1.16	0.45	0.91	0.64	1.20	0.53	0.56
Control Delay	79.5	50.9	65.5	136.8	31.8	65.7	35.7	120.4	90.6	48.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	50.9	65.5	136.8	31.8	65.7	35.7	120.4	90.6	48.8
LOS	E	D	E	F	C	E	D	F	F	D
Approach Delay		61.2			81.8		80.0			52.6
Approach LOS		E			F		E			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120.6	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 73.9	Intersection LOS: E
Intersection Capacity Utilization 98.5%	ICU Level of Service F
Analysis Period (min) 15	

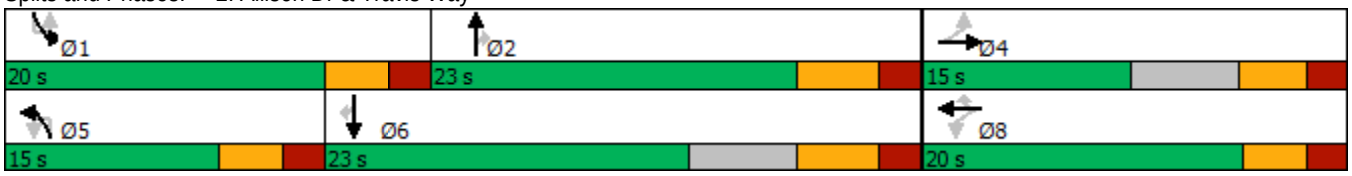
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	0	55	35	10	30	1090	25	5	30	1395	65
Future Volume (vph)	190	0	55	35	10	30	1090	25	5	30	1395	65
Turn Type	Perm	NA	Perm	Perm	custom	Prot	NA	Perm	custom	Prot	NA	Perm
Protected Phases		4				5	2			1	6	
Permitted Phases	4		8	8	5			2	1			6
Detector Phase	4	4	8	8	5	5	2	2	1	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.0	9.9	9.9	9.0	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	15.0	23.0	23.0	20.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	23.8%	36.5%	36.5%	31.7%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.0	3.9	3.9	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0		5.0	5.9	5.9		5.0	5.9	5.9
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	8.8	8.8	9.0	9.0		6.6	18.0	18.0		7.8	19.0	19.0
Actuated g/C Ratio	0.20	0.20	0.20	0.20		0.15	0.41	0.41		0.18	0.43	0.43
v/c Ratio	0.73	0.30	0.25	0.06		0.16	0.82	0.04		0.11	0.69	0.10
Control Delay	38.7	1.3	20.7	0.2		20.1	23.4	0.1		17.2	13.8	1.2
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	38.7	1.3	20.7	0.2		20.1	23.4	0.1		17.2	13.8	1.2
LOS	D	A	C	A		C	C	A		B	B	A
Approach Delay		21.0					22.8				13.3	
Approach LOS		C					C				B	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 44	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 60.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	550	430	5	720	415	520	1105
Future Volume (vph)	550	430	5	720	415	520	1105
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Detector Phase	8	8	5	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	4.0	5.0	5.0	4.0	4.0
Minimum Split (s)	10.5	10.5	87.5	9.9	9.9	8.9	9.0
Total Split (s)	20.0	20.0	15.0	30.0	30.0	20.0	30.0
Total Split (%)	28.6%	28.6%	21.4%	42.9%	42.9%	28.6%	42.9%
Yellow Time (s)	3.9	3.9	3.0	3.9	3.9	3.0	3.9
All-Red Time (s)	1.6	1.6	1.5	1.0	1.0	1.9	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.9	4.9	4.9	5.0
Lead/Lag			Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None
Act Effct Green (s)	13.0	13.0	4.4	17.9	17.9	12.8	34.0
Actuated g/C Ratio	0.22	0.22	0.07	0.30	0.30	0.22	0.57
v/c Ratio	0.77	0.72	0.04	0.71	0.56	0.75	0.57
Control Delay	31.7	13.7	30.0	22.9	5.1	29.9	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	13.7	30.0	22.9	5.1	29.9	10.2
LOS	C	B	C	C	A	C	B
Approach Delay	23.8			16.5			16.5
Approach LOS	C			B			B

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 59.4	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 18.4	Intersection LOS: B
Intersection Capacity Utilization 74.3%	ICU Level of Service D
Analysis Period (min) 15	

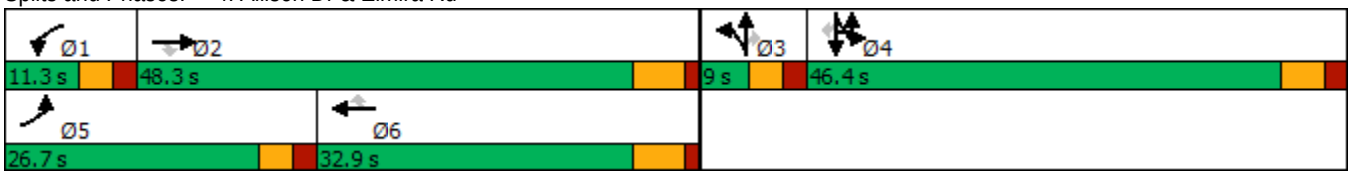
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	700	915	45	30	760	370	50	40	50	615	65	910
Future Volume (vph)	700	915	45	30	760	370	50	40	50	615	65	910
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	26.7	48.3	48.3	11.3	32.9	32.9	9.0	9.0	9.0	46.4	46.4	46.4
Total Split (%)	23.2%	42.0%	42.0%	9.8%	28.6%	28.6%	7.8%	7.8%	7.8%	40.3%	40.3%	40.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	21.7	47.1	47.1	5.6	27.1	27.1	4.0	4.0	4.0	40.5	40.5	40.5
Actuated g/C Ratio	0.19	0.41	0.41	0.05	0.24	0.24	0.03	0.03	0.03	0.35	0.35	0.35
v/c Ratio	1.16	0.68	0.07	0.38	0.98	0.76	0.89	0.67	0.24	0.62	0.61	1.21
Control Delay	131.7	31.7	0.2	65.4	71.0	28.9	142.0	100.0	2.5	36.5	36.1	129.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	131.7	31.7	0.2	65.4	71.0	28.9	142.0	100.0	2.5	36.5	36.1	129.6
LOS	F	C	A	E	E	C	F	F	A	D	D	F
Approach Delay		73.1			57.4			80.1			89.5	
Approach LOS		E			E			F			F	

Intersection Summary	
Cycle Length: 115	
Actuated Cycle Length: 115	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 75.0	Intersection LOS: E
Intersection Capacity Utilization 95.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	210	665	50	675	80	40	55	260	15	230
Future Volume (vph)	210	665	50	675	80	40	55	260	15	230
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	1	6	3	8		7	4	
Permitted Phases							8			4
Detector Phase	5	2	1	6	3	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	10.7	9.0	10.8	9.0	9.0	9.0	9.0	9.9	9.9
Total Split (s)	15.0	40.0	15.0	40.0	15.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	17.6%	47.1%	17.6%	47.1%	17.6%	17.6%	17.6%	17.6%	17.6%	17.6%
Yellow Time (s)	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.0	5.8	5.0	5.0	5.0	5.0	5.9	5.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.4	37.5	7.1	29.1	7.9	9.8	9.8	10.4	11.4	11.4
Actuated g/C Ratio	0.13	0.48	0.09	0.37	0.10	0.12	0.12	0.13	0.15	0.15
v/c Ratio	0.97	0.47	0.37	0.80	0.49	0.19	0.18	1.22	0.06	0.57
Control Delay	91.3	18.6	44.9	27.0	47.3	33.3	1.1	165.6	31.6	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.3	18.6	44.9	27.0	47.3	33.3	1.1	165.6	31.6	9.9
LOS	F	B	D	C	D	C	A	F	C	A
Approach Delay		34.9		28.0		29.6			91.5	
Approach LOS		C		C		C			F	

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 78.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.22	
Intersection Signal Delay: 42.8	Intersection LOS: D
Intersection Capacity Utilization 75.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	50	305	652	226	300	428	257	485	15	236
Future Volume (vph)	50	305	652	226	300	428	257	485	15	236
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	2.1	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	14.0	51.6	51.6	26.0	63.6	23.0	33.4	33.4	9.0	19.4
Total Split (%)	11.7%	43.0%	43.0%	21.7%	53.0%	19.2%	27.8%	27.8%	7.5%	16.2%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.0	3.0	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	6.9	5.9	5.0	5.0	5.0	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	6.9	30.1	30.1	17.3	45.2	17.1	34.5	34.5	4.2	13.8
Actuated g/C Ratio	0.07	0.29	0.29	0.17	0.44	0.17	0.33	0.33	0.04	0.13
v/c Ratio	0.46	0.32	0.95	0.83	0.23	0.82	0.24	0.61	0.23	0.67
Control Delay	65.7	29.3	37.2	69.0	19.3	57.8	29.5	6.4	65.2	49.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	29.3	37.2	69.0	19.3	57.8	29.5	6.4	65.2	49.8
LOS	E	C	D	E	B	E	C	A	E	D
Approach Delay		36.2			39.9		30.2			50.5
Approach LOS		D			D		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 103.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 36.0	Intersection LOS: D
Intersection Capacity Utilization 78.3%	ICU Level of Service D
Analysis Period (min) 15	

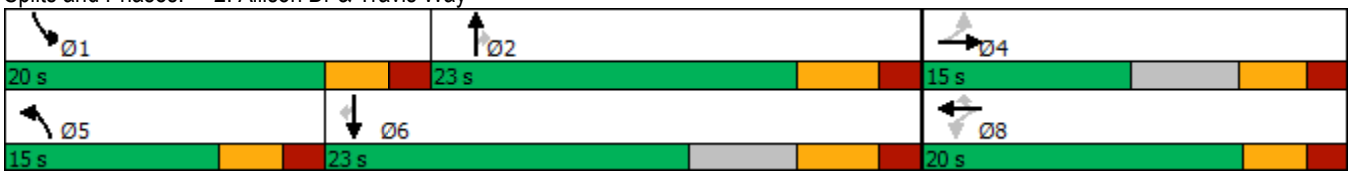
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	62	0	20	15	150	772	20	20	686	240
Future Volume (vph)	62	0	20	15	150	772	20	20	686	240
Turn Type	Perm	NA	Perm	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			5	2		1	6	
Permitted Phases	4		8	8			2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.9	9.9	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	23.0	23.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	36.5%	36.5%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.9	3.9	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0	5.0	5.9	5.9	5.0	5.9	5.9
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	7.2	7.2	7.0	7.0	8.7	27.8	27.8	5.8	18.2	18.2
Actuated g/C Ratio	0.19	0.19	0.18	0.18	0.23	0.73	0.73	0.15	0.48	0.48
v/c Ratio	0.20	0.05	0.07	0.03	0.42	0.34	0.02	0.09	0.32	0.31
Control Delay	19.4	0.2	18.2	0.1	20.8	6.4	0.1	21.1	11.5	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	0.2	18.2	0.1	20.8	6.4	0.1	21.1	11.5	3.5
LOS	B	A	B	A	C	A	A	C	B	A
Approach Delay		12.9				8.6			9.6	
Approach LOS		B				A			A	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 38.3	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.42	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 48.2%	ICU Level of Service A
Analysis Period (min) 15	

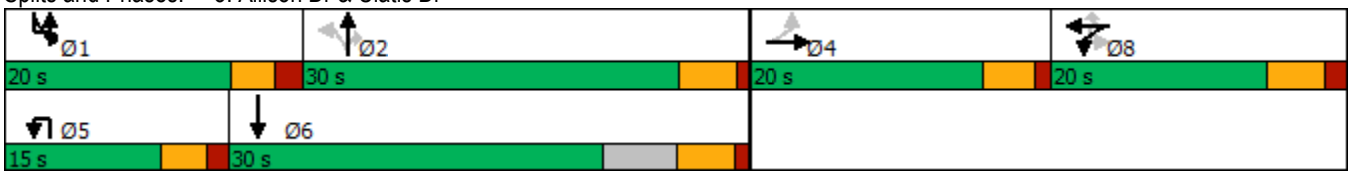
Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	EBL	EBT	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø5
Lane Configurations												
Traffic Volume (vph)	27	4	5	305	2	365	9	545	315	350	366	
Future Volume (vph)	27	4	5	305	2	365	9	545	315	350	366	
Turn Type	Perm	NA	Perm	Split	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		4		8	8			2		1	6	5
Permitted Phases	4		8			8	2		2			
Detector Phase	4	4	8	8	8	8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.6	3.6	3.6	4.0	4.0	4.0
Minimum Split (s)	10.5	10.5	10.5	10.5	10.5	10.5	9.9	9.9	9.9	8.9	9.0	8.5
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	20.0	30.0	15.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	33.3%	33.3%	33.3%	22.2%	33.3%	17%
Yellow Time (s)	3.5	3.5	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.0	3.9	3.0
All-Red Time (s)	1.0	1.0	1.6	1.6	1.6	1.6	1.0	1.0	1.0	1.9	1.1	1.5
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.5		5.5	5.5	5.5	4.9	4.9	4.9	4.9	5.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)		13.2		13.4	13.4	13.4	17.5	17.5	17.5	12.2	34.9	
Actuated g/C Ratio		0.18		0.18	0.18	0.18	0.24	0.24	0.24	0.17	0.48	
v/c Ratio		0.48		0.75	0.56	0.65	0.07	0.71	0.54	0.69	0.25	
Control Delay		37.9		55.6	40.1	9.7	25.4	32.6	6.8	38.3	12.9	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		37.9		55.6	40.1	9.7	25.4	32.6	6.8	38.3	12.9	
LOS		D		E	D	A	C	C	A	D	B	
Approach Delay		37.9			27.3			23.2			25.1	
Approach LOS		D			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 73.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 25.3	Intersection LOS: C
Intersection Capacity Utilization 68.5%	ICU Level of Service C
Analysis Period (min) 15	

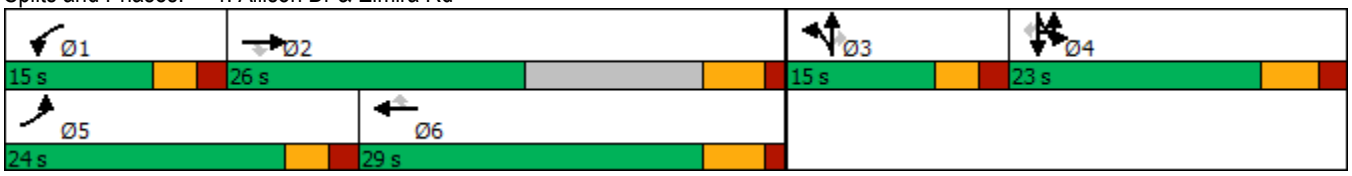
Splits and Phases: 3: Allison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	480	470	10	15	810	339	5	20	10	252	10	478
Future Volume (vph)	480	470	10	15	810	339	5	20	10	252	10	478
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Detector Phase	5	2	2	1	6	6	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	10.8	10.8	9.5	10.8	10.8	9.0	9.0	9.0	9.9	9.9	9.9
Total Split (s)	24.0	26.0	26.0	15.0	29.0	29.0	15.0	15.0	15.0	23.0	23.0	23.0
Total Split (%)	26.4%	28.6%	28.6%	16.5%	31.9%	31.9%	16.5%	16.5%	16.5%	25.3%	25.3%	25.3%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	3.0	3.0	3.9	3.9	3.9
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.8	5.8	5.0	5.8	5.8	5.0	5.0	5.0	5.9	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	14.7	40.4	40.4	5.0	22.3	22.3	5.2	5.2	5.2	10.7	10.7	10.7
Actuated g/C Ratio	0.21	0.57	0.57	0.07	0.31	0.31	0.07	0.07	0.07	0.15	0.15	0.15
v/c Ratio	0.74	0.25	0.01	0.13	0.79	0.56	0.04	0.16	0.03	0.57	0.57	0.77
Control Delay	34.7	10.6	0.0	39.4	31.3	13.2	37.2	39.2	0.2	39.8	39.6	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	10.6	0.0	39.4	31.3	13.2	37.2	39.2	0.2	39.8	39.6	11.7
LOS	C	B	A	D	C	B	D	D	A	D	D	B
Approach Delay		22.5			26.1			27.7			21.7	
Approach LOS		C			C			C			C	

Intersection Summary		
Cycle Length: 91		
Actuated Cycle Length: 70.8		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.79		
Intersection Signal Delay: 23.8	Intersection LOS: C	
Intersection Capacity Utilization 69.3%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 4: Allison Dr & Elmira Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBR
Lane Configurations									
Traffic Volume (vph)	207	397	45	546	25	15	15	75	106
Future Volume (vph)	207	397	45	546	25	15	15	75	106
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	5	2	1	6	3	8		7	
Permitted Phases							8		4
Detector Phase	5	2	1	6	3	8	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	10.9	9.2	11.0	9.2	10.1	10.1	9.2	10.1
Total Split (s)	15.0	40.0	15.0	40.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	17.6%	47.1%	17.6%	47.1%	17.6%	17.6%	17.6%	17.6%	17.6%
Yellow Time (s)	3.2	4.1	3.2	4.1	3.2	4.1	4.1	3.2	4.1
All-Red Time (s)	2.0	1.8	2.0	1.9	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.9	5.2	6.0	5.2	6.1	6.1	5.2	6.1
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.8	29.1	7.6	20.4	6.0	5.6	5.6	7.6	6.9
Actuated g/C Ratio	0.19	0.51	0.13	0.36	0.11	0.10	0.10	0.13	0.12
v/c Ratio	0.69	0.29	0.38	0.60	0.15	0.09	0.05	0.38	0.20
Control Delay	42.7	13.5	32.4	17.8	31.5	31.7	0.3	32.4	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	13.5	32.4	17.8	31.5	31.7	0.3	32.4	0.8
LOS	D	B	C	B	C	C	A	C	A
Approach Delay		22.5		19.3		23.1			
Approach LOS		C		B		C			

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 57.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 20.2	Intersection LOS: C
Intersection Capacity Utilization 58.0%	ICU Level of Service B
Analysis Period (min) 15	

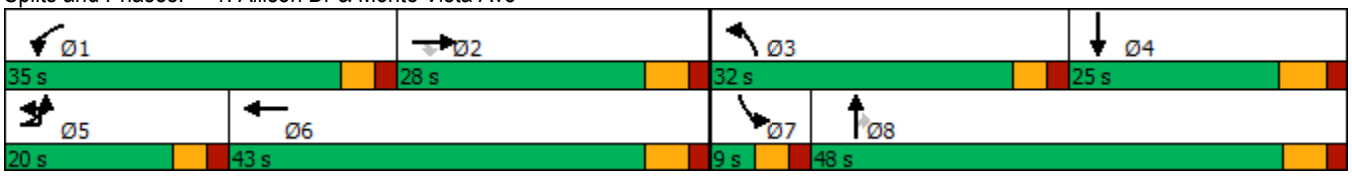
Splits and Phases: 5: Harbison Dr & Ulatis Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	120	495	673	526	515	620	781	1076	30	237
Future Volume (vph)	120	495	673	526	515	620	781	1076	30	237
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6	3	8		7	4
Permitted Phases			2					8		
Detector Phase	5	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	4.0	4.0
Minimum Split (s)	9.0	9.9	9.9	9.0	9.9	10.0	10.9	10.9	9.0	10.3
Total Split (s)	20.0	28.0	28.0	35.0	43.0	32.0	48.0	48.0	9.0	25.0
Total Split (%)	16.7%	23.3%	23.3%	29.2%	35.8%	26.7%	40.0%	40.0%	7.5%	20.8%
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9	3.0	3.9	3.9	3.0	4.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9	5.0	5.9	5.9	5.0	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	11.9	24.8	24.8	30.2	43.2	24.8	43.5	43.5	4.0	18.4
Actuated g/C Ratio	0.10	0.21	0.21	0.25	0.36	0.21	0.36	0.36	0.03	0.15
v/c Ratio	0.75	0.71	1.06	1.24	0.45	0.92	0.64	1.21	0.53	0.57
Control Delay	79.5	50.9	71.9	163.3	31.8	66.1	35.8	123.2	90.6	49.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	50.9	71.9	163.3	31.8	66.1	35.8	123.2	90.6	49.1
LOS	E	D	E	F	C	E	D	F	F	D
Approach Delay		64.5			96.5		81.3			52.9
Approach LOS		E			F		F			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120.6	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 78.5	Intersection LOS: E
Intersection Capacity Utilization 98.9%	ICU Level of Service F
Analysis Period (min) 15	

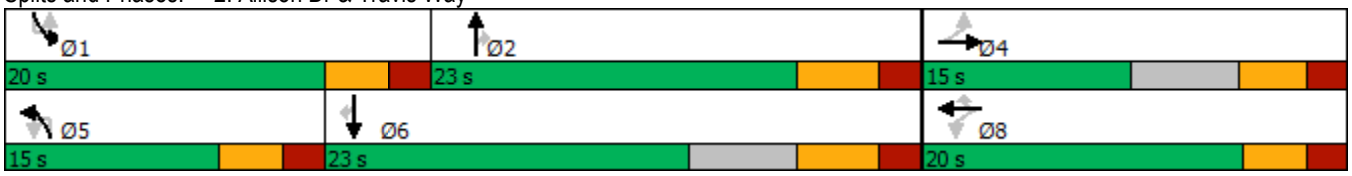
Splits and Phases: 1: Allison Dr & Monte Vista Ave



Lane Group	EBL	EBT	WBL	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	0	55	35	10	30	1105	25	5	30	1445	65
Future Volume (vph)	205	0	55	35	10	30	1105	25	5	30	1445	65
Turn Type	Perm	NA	Perm	Perm	custom	Prot	NA	Perm	custom	Prot	NA	Perm
Protected Phases		4				5	2			1	6	
Permitted Phases	4		8	8	5			2	1			6
Detector Phase	4	4	8	8	5	5	2	2	1	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.2	9.2	9.0	9.0	9.0	9.0	9.9	9.9	9.0	9.0	9.9	9.9
Total Split (s)	15.0	15.0	20.0	20.0	15.0	15.0	23.0	23.0	20.0	20.0	23.0	23.0
Total Split (%)	23.8%	23.8%	31.7%	31.7%	23.8%	23.8%	36.5%	36.5%	31.7%	31.7%	36.5%	36.5%
Yellow Time (s)	3.2	3.2	3.0	3.0	3.0	3.0	3.9	3.9	3.0	3.0	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.0	5.0		5.0	5.9	5.9		5.0	5.9	5.9
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	9.2	9.2	9.4	9.4		6.6	17.9	17.9		7.8	18.9	18.9
Actuated g/C Ratio	0.21	0.21	0.21	0.21		0.15	0.40	0.40		0.18	0.43	0.43
v/c Ratio	0.76	0.31	0.24	0.06		0.16	0.84	0.04		0.12	0.72	0.10
Control Delay	41.0	1.3	20.6	0.2		20.2	24.5	0.1		17.3	14.7	1.3
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	41.0	1.3	20.6	0.2		20.2	24.5	0.1		17.3	14.7	1.3
LOS	D	A	C	A		C	C	A		B	B	A
Approach Delay		22.6					23.8				14.2	
Approach LOS		C					C				B	

Intersection Summary	
Cycle Length: 63	
Actuated Cycle Length: 44.3	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 18.7	Intersection LOS: B
Intersection Capacity Utilization 61.3%	ICU Level of Service B
Analysis Period (min) 15	

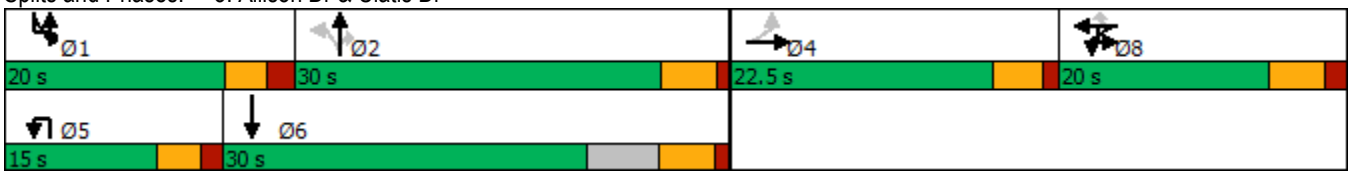
Splits and Phases: 2: Allison Dr & Travis Way



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø5
Lane Configurations											
Traffic Volume (vph)	15	2	550	4	430	28	720	415	520	1112	
Future Volume (vph)	15	2	550	4	430	28	720	415	520	1112	
Turn Type	Perm	NA	Split	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		4	8	8			2		1	6	5
Permitted Phases	4				8	2		2			
Detector Phase	4	4	8	8	8	2	2	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	10.5	10.5	10.5	9.9	9.9	9.9	8.9	9.0	87.5
Total Split (s)	22.5	22.5	20.0	20.0	20.0	30.0	30.0	30.0	20.0	30.0	15.0
Total Split (%)	24.3%	24.3%	21.6%	21.6%	21.6%	32.4%	32.4%	32.4%	21.6%	32.4%	16%
Yellow Time (s)	3.5	3.5	3.9	3.9	3.9	3.9	3.9	3.9	3.0	3.9	3.0
All-Red Time (s)	1.0	1.0	1.6	1.6	1.6	1.0	1.0	1.0	1.9	1.1	1.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.5	5.5	5.5	5.5	4.9	4.9	4.9	4.9	5.0	
Lead/Lag						Lag	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)		8.2	15.0	15.0	15.0	19.3	19.3	19.3	15.5	39.7	
Actuated g/C Ratio		0.12	0.21	0.21	0.21	0.27	0.27	0.27	0.22	0.56	
v/c Ratio		0.18	0.83	0.83	0.66	0.30	0.79	0.58	0.74	0.62	
Control Delay		25.5	52.7	52.5	8.7	30.8	31.3	6.2	36.1	13.4	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		25.5	52.7	52.5	8.7	30.8	31.3	6.2	36.1	13.4	
LOS		C	D	D	A	C	C	A	D	B	
Approach Delay		25.5		33.5			22.3			20.4	
Approach LOS		C		C			C			C	

Intersection Summary	
Cycle Length: 92.5	
Actuated Cycle Length: 70.9	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 82.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Allison Dr & Ulatis Dr



ATTACHMENT 8

ACOUSTICAL ANALYSIS REPORT

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j.c. brennan & associates
consultants in acoustics
P.O. Box 6748 - Auburn, California 95604
p. 530.823.0960 – f. 530.823.0961

January 17, 2019

Mr. David A. Claveau
c/o Mr. Richard Alexander
Travis Way, LLC
5780 Fleet Street, Suite 225
Carlsbad, CA 92008

Subject: Addendum Analysis of the Casa del Vista Apartments (Travis Apartments) Interior Noise Impacts

Dear Mr. Claveau:

At the request of Mr. Richard Alexander, the acoustical consulting firm of j.c. brennan & associates, Inc. has provided an addendum to the exterior noise analysis for the above mentioned project. This letter will address the interior noise levels of the project.

Generally, a typical building facade construction will provided an exterior to interior noise level reduction 25 dBA or more. Based upon that assumption, and assuming that the exterior noise levels from Allison Drive are 60 dBA DNL/CNEL, the interior noise levels for the project would range between 35 dBA DNL/CNEL to 38 dBA DNL/CNEL. This depends upon how many facades would be exposed to the traffic noise. For instance an end unit may have both perpendicular and parallel facades which receive exposure. Other units may only have a parallel facade exposed to the traffic noise.

For this project, j.c. brennan & associates, Inc. has conducted a detailed analysis of interior noise levels based upon a typical floor plan for the project.

To judge the potential for achieving an interior noise level of 45 dB DNL/CNEL, it is necessary to determine the noise reduction provided by the building facade. This may be calculated by assuming a generalized A-weighted noise frequency spectrum for roadway traffic noise. The composite transmission loss and resulting noise level in the receiving room is first determined. After correcting for room absorption, the overall noise level in the room is calculated. This analysis was conducted for a typical bedroom and living area of the project which faces Allison Drive. A 3 dB correction factor was added to the calculated noise levels to allow for variations in workmanship. Table 1 shows the calculated interior traffic noise levels. Appendix A shows the calculation sheets.

Table 1 Assumed Exterior Noise Levels of 60 dBA DNL/CNEL Casa del Vista Apts. Calculated Interior Noise Levels At the Most Affected Unit			
	Exterior Roadway Noise Levels	Interior Roadway Noise Levels	
Unit	Exterior Traffic	Interior Traffic	**Cumulative Interior**
Bedroom	Parallel Facade of 60.0 dBA DNL Perpendicular Facade of 60 dBA DNL	28 dBA DNL 32 dBA DNL	**34 dBA DNL**
LIving Area	Parallel Facade of 60 dBA DNL Perpendicular Facade of 60 dBA DNL	28 dBA DNL 29 dBA DNL	**32 dBA DNL**
Appendix A shows the results of the Interior Calculation Model. Source: j.c. brennan & associates, Inc., 2019			

Based upon Table 1, the predicted interior noise levels will comply with the City of Vacaville interior noise level standard of 45 dBA DNLl/CNEL.

If you or the City staff have questions, please contact me at 530-823-0960.

Respectfully submitted,
j.c. brennan & associates, Inc.



Jim Brennan
President
Member: Institute of Noise Control Engineering
file: 2019-103 Casa del Vista Interior Analysis

Appendix A

Building Facade Noise Reduction Worksheet

Bedroom - Casa del Vista Apts

Analysis Date: 1/17/2019 0:00
Room Description: Bedroom
Parallel Panel Size, ft²: 135
Traffic Exterior level, dB: 60.0
Correction Factor, dB: 3

Perpendicular Panel Size, ft²: 108
Traffic Exterior level, dB: 60.0

Noise Source Information:

Arterial Traffic	Parallel, dB	41	43	43	46	46	47	47	50	53	52	51	49	47	45	40	36
Arterial Traffic	Perpendicular, dB	41	43	43	46	46	47	47	50	53	52	51	49	47	45	40	36

		One-Third Octave Band Center Frequency (Hz)															
Material	***Area(ft²)***	***125***	***160***	***200***	***250***	***315***	***400***	***500***	***630***	***800***	***1K***	***1.25K***	***1.6K***	***2K***	***2.5K***	***3.15K***	***4K***
Sound Absorption Data:																	
Gyp Board	528	0.29	0.29	0.10	0.10	0.10	0.05	0.05	0.05	0.04	0.04	0.04	0.07	0.07	0.07	0.09	0.09
Glass	24	0.35	0.35	0.25	0.25	0.25	0.18	0.18	0.18	0.12	0.12	0.12	0.01	0.01	0.01	0.04	0.04
Wood	120	0.15	0.15	0.11	0.11	0.11	0.10	0.10	0.10	0.07	0.07	0.07	0.06	0.06	0.06	0.07	0.07
Soft Furnishings	40	0.19	0.19	0.37	0.37	0.37	0.56	0.56	0.56	0.67	0.67	0.67	0.61	0.61	0.61	0.59	0.59
		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
	Absorption Parallel, dB:	-1	-1	2	2	2	3	3	3	4	4	4	3	3	3	2	2
	Absorption Perpendicular, dB:	-2	-2	1	1	1	2	2	2	3	3	3	2	2	2	1	1
Transmission Loss Information: Parallel Façade																	
Wall - Stucco Wall (Egen)	135	21	21	33	33	33	41	41	41	46	46	46	47	47	47	51	51
Window - 1/8*1/4*1/8 STC28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PTAC - STC 30 (4.8 s.f.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Loss Information: Perpendicular Façade																	
Wall - Stucco Wall (Egen)	84	21	21	33	33	33	41	41	41	46	46	46	47	47	47	51	51
Window - 1/8*1/4*1/8 STC28	24	21	23	23	26	21	19	24	27	30	33	36	40	44	46	39	34
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary																	
	Composite TL - Parallel, dB:	21	21	33	33	33	41	41	41	46	46	46	47	47	47	51	51
	Composite TL - Roof, dB:	21	21	28	30	27	25	30	33	36	39	41	44	46	47	45	40
	Absorption Parallel, dB:	-1	-1	2	2	2	3	3	3	4	4	4	3	3	3	2	2
	Absorption Perpendicular, dB:	-2	-2	1	1	1	2	2	2	3	3	3	2	2	2	1	1
	Safety Factor, dB:	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Interior Level - Parallel, dB:	22	24	15	17	18	12	12	16	13	13	12	8	6	4	-5	-10
	Interior Level - Roof, dB:	21	23	19	19	23	27	22	23	22	19	15	10	6	4	0	0

Arterial Traffic Outside Level, dB: 60
Arterial Traffic Noise Reduction, dB: 32
Arterial Traffic Interior Level, dB: 28

Total Interior Noise Level, dB: **34**

Arterial Traffic - Outside Level, dB 60
Arterial Traffic Noise Reduction, dB 27
Arterial Traffic Interior Level, dB 33

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Appendix A

Building Facade Noise Reduction Worksheet

Living Area - Casa del Vista Apts

Analysis Date: 1/17/2019 0:00
Room Description: Living Area
Parallel Panel Size, ft²: 135 **Perpendicular Panel Size, ft²:** 108
Arterial Traffic Exterior level, dB: 60.0 **Arterial Traffic Exterior level, dB:** 60.0
Correction Factor, dB: 3

Noise Source Information:

Arterial Traffic	Parallel, dB	41	43	43	46	46	47	47	50	53	52	51	49	47	45	40	36
Arterial Traffic	Perpendicular, dB	41	43	43	46	46	47	47	50	53	52	51	49	47	45	40	36

		One-Third Octave Band Center Frequency (Hz)															
Material	***Area(ft²)***	***125***	***160***	***200***	***250***	***315***	***400***	***500***	***630***	***800***	***1K***	***1.25K***	***1.6K***	***2K***	***2.5K***	***3.15K***	***4K***

Sound Absorption Data:

Gyp Board	526	0.29	0.29	0.10	0.10	0.10	0.05	0.05	0.05	0.04	0.04	0.04	0.07	0.07	0.07	0.09	0.09
Glass	24	0.35	0.35	0.25	0.25	0.25	0.18	0.18	0.18	0.12	0.12	0.12	0.01	0.01	0.01	0.04	0.04
Wood	120	0.15	0.15	0.11	0.11	0.11	0.10	0.10	0.10	0.07	0.07	0.07	0.06	0.06	0.06	0.07	0.07
Soft Furnishings	40	0.19	0.19	0.37	0.37	0.37	0.56	0.56	0.56	0.67	0.67	0.67	0.61	0.61	0.61	0.59	0.59
		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
	Absorption Parallel, dB:	-1	-1	2	2	2	3	3	3	4	4	4	3	3	3	2	2
	Absorption Perpendicular, dB:	-2	-2	1	1	1	2	2	2	3	3	3	2	2	2	1	1

Transmission Loss Information: Parallel Façade

Wall - Stucco Wall (Egen)	135	21	21	33	33	33	41	41	41	46	46	46	47	47	47	51	51
Window - 1/4 inch Dual Glazed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PTAC - STC 30 (4.8 s.f.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Transmission Loss Information: Perpendicular Façade

Wall - Stucco Wall (Egen)	84	21	21	33	33	33	41	41	41	46	46	46	47	47	47	51	51
Window - 1/4 inch Dual Glazed	24	29	27	26	27	29	30	31	35	38	40	40	36	30	32	34	36
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Summary

Composite TL - Parallel, dB:	21	21	33	33	33	41	41	41	46	46	46	47	47	47	51	51
Composite TL - Roof, dB:	22	22	30	31	32	35	36	39	43	44	44	41	36	38	40	42
Absorption Parallel, dB:	-1	-1	2	2	2	3	3	3	4	4	4	3	3	3	2	2
Absorption Perpendicular, dB:	-2	-2	1	1	1	2	2	2	3	3	3	2	2	2	1	1
Safety Factor, dB:	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Interior Level - Parallel, dB:	22	24	15	17	18	12	12	16	13	13	12	8	6	4	-5	-10
Interior Level - Roof, dB:	20	22	17	19	18	17	16	17	16	14	13	13	16	12	4	-2

Arterial Traffic Outside Level, dB: 60 *Arterial Traffic - Outside Level, dB* 60
Arterial Traffic Noise Reduction, dB: 32 *Arterial Traffic Noise Reduction, dB* 31
Arerial Traffic Interior Level, dB: 28 *Arterial Traffic Interior Level, dB* 29

Total Interior Noise Level, dB: **32**

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Allison Drive Apartments Project

Acoustical Analysis Report

Prepared for:

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September 2018 | GCR-01

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
APN	Assessor Parcel Number
CAD	Computer Aided Design
CadnaA	Computer Aided Noise Abatement
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Vacaville
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
kHz	kilohertz
L_{DN}	Day Night sound level
L_{EQ}	time-averaged noise level
L_{MAX}	maximum sound level
mph	miles per hour
mPa	micro Pascal
NSLU	noise sensitive land use
RCNM	Roadway Construction Noise Model
SF	square foot/feet
SPL	sound pressure level
TNM	Traffic Noise Model
USDOT	U.S. Department of Transportation
VdB	Vibration velocity in decibels

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EXECUTIVE SUMMARY

This report presents an assessment of potential construction and operational noise impacts associated with the proposed Allison Drive Apartments (project) located in the city of Vacaville, CA. The proposed project would construct an apartment complex on an approximately 14.9-acre site. The project proposes a 252-unit apartment complex in six buildings.

The project's exterior use areas would not exceed the City of Vacaville General Plan limits for multi-family residential development. Operational noise from the project's heating, ventilation, and air conditioning (HVAC) units would not exceed the City Municipal Code limits. Project-generated traffic would also result in less than significant noise impacts to off-site receptors. Construction noise would be conducted within the hours specified by the City Municipal Code. Vibration impacts from construction would not exceed thresholds for sensitive receptors.

The project's easternmost buildings would be exposed to noise levels exceeding 60 CNEL from traffic on Allison Drive. Residential interiors for units facing this roadway at the project's eastern buildings would therefore be potentially exposed to significant noise levels exceeding 45 CNEL. Mitigation measure NOI-1 would require an exterior-to-interior study to reduce interior noise to a less than significant level.

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1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report analyzes potential noise and vibration impacts associated with the proposed Allison Drive Apartments Project (project). The analysis includes a description of existing conditions in the project vicinity, an assessment of potential impacts associated with project construction, and an evaluation of project operational impacts. Analysis within this report addresses the relevant issues listed in Appendix G of the California Environmental Quality Act (CEQA) Guidelines.

1.2 PROJECT LOCATION

The project is located in the city of Vacaville. The project site consists of two parcels totaling 14.91-acres of primarily vacant land. The site is bounded by Allison Drive to the east and Travis Way to the north. The project site is located on Assessor's Parcel Numbers (APNs) 0131-030-860 and 0131-030-840. See Figure 1, *Regional Location*, and Figure 2, *Project Vicinity* located in Appendix A.

1.3 PROJECT DESCRIPTION

The proposed project would construct an apartment complex with 252 units. The project proposes to construct six, four-story apartment buildings with a variety of unit sizes, bedrooms, and bathrooms. The project would include 102 one-bedroom and-one bathroom units, 132 two-bedroom and two-bathroom units and 18 three-bedroom and two-bathroom units. Each of the six buildings would include 15 individual garages for a total of 90 garages throughout the project, along with additional carport and open-air parking.

Recreational amenities include an approximately 6,600 square foot (SF) clubhouse with offices, fitness rooms, café, pool, outdoor courtyard, dog park, firepit, walking trails and open space. Exterior use areas would be located at the center of the site. Refer to Figure 3, *Site Plan*, located in Appendix A.

The site is currently undeveloped grassland with mature oaks. The project site is zoned as a Residential Low/Medium Density district (RLM-4.5), with a land use designation of Mixed Use. The project would access existing sewer, water, and electricity utilities from connections within adjacent roadways.

2.0 ENVIRONMENTAL SETTING

2.1 NOISE AND SOUND LEVEL DESCRIPTORS AND TERMINOLOGY

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels of one hour are expressed by the symbol L_{EQ}, unless a specified duration is provided. The Community Noise Equivalent Level (CNEL) is a 24-hour dBA average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. The maximum sound level (L_{MAX}) is the maximum level during a measurement period or noise event. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver contribute to the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA units. The threshold of hearing for the human ear is about 0 dBA, which corresponds to 20 micro Pascals (mPa).

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions.

2.2 NOISE AND VIBRATION SENSITIVE LAND USES

Noise-sensitive land uses (NSLU) are land uses that may be subject to stress and/or interference from excessive noise, such as residential dwellings, schools, transient lodging (hotels), hospitals, educational facilities, and libraries. Industrial and commercial land uses are generally not considered sensitive to

noise. NSLUs in the project area include multiple-family residences to the south and west and the Vacaville Public Library to the east of the site.

2.3 REGULATORY FRAMEWORK

2.3.1 City of Vacaville General Plan Noise Element

The City of Vacaville's General Plan Noise Element (Vacaville 2015a) provides a systematic approach to identifying and appraising noise problems in the community; quantifying existing and projected noise levels; addressing excessive noise exposure; and community planning for the regulation of noise. Table 1, *Land Use Compatibility for Community Noise Environments*, summarizes the City of Vacaville's (City's) exterior land use noise compatibility guidelines. Shading in this table represents the noise exposure level considered compatible for each land use category. The project proposes multiple-family residences, with normally acceptable noise levels of 65 CNEL.

Additionally, the General Plan Noise Element implements Policy NOI-P4.2, requiring the following construction noise control measures:

- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction area.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- Limit hours of operation of outdoor noise sources through conditions of approval.

California Noise Insulation Standards [California's Title 24 Noise Standards. Cal. Adm. Code Title 24, Chap. 2-35]

In 1974, the California Commission on Housing and Community Development adopted noise insulation standards for multi-family residential buildings (Title 24, Part 2, California Code of Regulations). Title 24 establishes standards for interior room noise (attributable to outside noise sources). The regulations also specify that acoustical studies must be prepared whenever a residential building or structure is proposed to be located near an existing or adopted freeway route, expressway, parkway, major street, thoroughfare, rail line, rapid transit line, or industrial noise source, and where such noise source or sources create an exterior CNEL (or L_{DN}) of 60 dBA or greater. Such acoustical analysis must demonstrate that the residence has been designed to limit intruding noise to an interior CNEL (or L_{DN}) of at least 45 dBA.

City of Vacaville Municipal Code

Chapter 8.10 of the City Municipal Code includes restrictions on the permitted hours of noise-producing construction activities. Construction, repair work, or grading within 500 feet from any occupied residence between the hours of 7:00 p.m. and 7:00 a.m. Monday through Saturday is prohibited. No construction activity is allowed on Sundays or holidays.

Section 14.09.127 restricts the noise generated by non-transportation sources. The limit for residential land uses is 50 dBA L_{EQ} during daytime hours and 45 dBA L_{EQ} during nighttime hours (City 2018).

Table 1
Land Use Compatibility Standards for Community Noise Environments

Type of Proposed Project	Community Noise Exposure Level (L_{DN} or CNEL, dBA)						
	55	60	65	70	75	80	85
Residential – Low Density Single Family, Duplex, and Mobile Homes							
Residential – Multiple Family							
Transient Lodging – Motels, Hotels							
Schools, Libraries, Churches, Hospitals, and Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business, Commercial, and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

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.

Normally Unacceptable
New construction or development should 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.

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.

Clearly Unacceptable
New construction or development clearly should not be undertaken

Source: Vacaville 2015a.

2.4 EXISTING CONDITIONS

2.4.1 Surrounding Land Uses

Surrounding land uses include a transportation center and public library to the east, commercial retail development and business offices to the north, undeveloped commercial land to the west, and multi-family residential developments to the south.

2.4.2 Existing Noise Conditions

2.4.2.1 Ambient Noise Survey

Two short-term ambient noise measurements (M1 through M2) were conducted during a site visit on September 7, 2018. The measured noise levels and related environmental conditions are shown in Table 2, *Noise Measurement Results*.

Table 2
Noise Measurement Results

Measurement 1 – Traffic Counts	
Date:	September 7, 2018
Conditions:	Temperature: 82°F. Wind Speed: 2 mph. 30% humidity.
Time:	10:45 a.m. – 11:00 a.m.
Location:	Approximately 320 feet northwest of the intersection of Allison Drive and Ulatis Drive and 70 feet from the centerline of Allison Drive
Measured Noise Level:	60.2 dBA L_{EQ}
Notes:	Noise from traffic along Allison Drive.
Measurement 2 – Ambient	
Date:	September 7, 2018
Conditions:	Temperature: 88°F. Wind Speed: 1 mph. 30% humidity.
Time:	11:20 a.m. – 11:30 a.m..
Location:	Approximately 500 feet west from the centerline of Allison Drive, and approximately 155 feet east of the western property boundary
Measured Noise Level:	44.9 dBA L_{EQ}
Notes:	N/A

Traffic counts were recorded for Measurement 1 for automobiles, medium-size trucks (double-tires/two axles), and heavy trucks (three or more axles). Traffic counts for the timed measurement and the one-hour equivalent volume are shown in Table 3, *Recorded Traffic Volume and Vehicle Mix*.

Table 3
Recorded Traffic Volume and Vehicle Mix

Roadway	Traffic	Autos	MT[1]	HT[2]
Allison Drive	15-minute Count	281	12	0
	One-hour Equivalent	1,124	48	0
	Percent	**96%**	**4%**	**0%**

[1] Medium Trucks (double tires/two axles).
[2] Heavy Trucks (three or more axles).

3.0 ANALYSIS METHODOLOGY AND ASSUMPTIONS

3.1 METHODOLOGY AND EQUIPMENT

3.1.1 Ambient Noise Survey

The following equipment was used to measure existing noise levels at the project site:

- Larson Davis, Model 720 Sound Level Meters
- Larson Davis Model CAL150 Calibrator
- Windscreen and tripod for the sound level meter

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report were made with a sound level meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2006). All instruments were maintained with National Institute of Standards and Technology traceable calibration per the manufacturers' standards.

3.1.2 Noise Modeling Software

Modeling of the exterior noise environment for this report was accomplished using Traffic Noise Model (TNM) version 2.5. TNM was released in February 2004 by the U.S. Department of Transportation (USDOT) and calculates the daytime average hourly L_{EQ} from three-dimensional model inputs and traffic data (Caltrans 2004). Computer Aided Design (CAD) plans provided by the project applicant were inputted into the models. Input variables included road alignment, elevation, lane configuration, area topography, existing and planned noise control features, projected traffic volumes, estimated truck composition percentages, and vehicle speeds.

The one-hour L_{EQ} noise level is calculated utilizing peak-hour traffic; peak-hour traffic volumes can be estimated based on the assumption that 10 percent of the average daily traffic would occur during a peak hour. The model-calculated one-hour L_{EQ} noise output is the equivalent to the CNEL (Caltrans 2013a).

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; USDOT 2006), which utilizes estimates of sound levels from standard construction equipment.

The measured noise level of 60.2 dBA L_{EQ} at the project site was compared to a modeled noise level in CadnaA, using the traffic counts and traffic mix for model calibration. The modeled traffic noise level for the same location was 61.8 dBA L_{EQ}. Given the 1.6 dBA variance, no adjustments to the model were made for traffic.

3.2 ASSUMPTIONS

3.2.1 Construction

Construction would require the use of equipment throughout the site for the full term of construction. Typical construction activities include grading and excavating. Construction activities would include site preparation, grading, installation of underground utilities, building construction, paving, and architectural coating. Equipment used on site would include the use of excavators, backhoes, dozers, dump trucks, cranes, forklifts, generators, pavers, and rollers.

The most likely source of vibration during project construction would be a vibratory roller, which may be used to achieve soil compaction as part of foundation construction and fill compaction.

3.2.2 Operation

The proposed operational noise sources for the residences would include heating, ventilation, and air conditioning (HVAC) systems and vehicular traffic.

3.2.2.1 Heating, Ventilation, and Air Conditioning Units

Specific planning data for the future HVAC systems is not available at this stage of project design; however, analysis using a typical to larger-sized residential condenser on the rooftops provides a reasonable basis for analysis of the project's residential structures. The unit used in this analysis is a Carrier 38HDR060 split system condenser (see Appendix B, *Carrier 38HDR060 Condenser Data*). The manufacturer's noise data is provided below in Table 4, *Residential Condenser Noise Data*.

Table 4
Residential Condenser Noise Data

Source	Noise Levels in Decibels[1] (dB) Measured at Octave Frequencies							Overall Noise Level in A-weighted Scale (dBA)[1]
	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
Carrier 38HDR 060 Condenser	63.0	61.5	64.0	66.5	66.0	64.5	55.5	72.0

[1] Sound Power Levels (S_{WL})
Hz = Hertz; kHz = kilohertz.

3.2.2.2 Transportation

Vehicular Traffic Volumes

The traffic data for the project was provided by GHD (2018; Appendix C, *Roadway Segment Data*). Road segment tables provides traffic volumes for the morning and evening peak hours for existing, cumulative, project conditions for surrounding street intersections with and without the project. Traffic by roadway segment were calculated from these intersections. Traffic volumes were calculated for those roadway segments on which NSLUs are located. These segments are shown in Table 5*, Traffic*

Volumes with and without the Project. Anticipated future traffic noise levels are based on these forecasted traffic volumes.

Table 5
Traffic Volumes With and Without Project

Roadway Segment	PM Peak Hour			
	Existing	Existing + Project	Cumulative	Cumulative + Project
Allison Drive				
North of Elmira Road	1,830	2,260	2,705	2,751
Elmira Road				
East of Allison Drive	2,016	2,390	2,745	1,865
West of Allison Drive	2,454	2,910	3,380	2,506

Source: GHD 2018.

The posted speed limits for the analyzed roads are 35 miles per hour (mph) for Allison Drive and 40 mph for Elmira Road. Site visit observations, shown in Table 3, revealed generally low number of heavy and medium trucks near the project site. A conservative breakdown of 97.5 percent automobiles, 2 percent medium trucks, and 0.5 percent heavy trucks was used for modeling existing and future noise conditions in the vicinity of the project for all segments in both the off-site and on-site scenarios. The aforementioned TNM software was used to calculate the noise contour distances for the off-site impacts.

Aircraft

The closest airport to the project site is Nut Tree Airport, located approximately one mile to the north. The project is not located within the 55-60 CNEL contour for the airport (Vacaville 2015a).

3.3 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, implementation of the project would result in a significant adverse impact if it would:

Threshold 1: Expose persons to or generate noise levels in excess of standards established in the City General Plan or Municipal Code.

Impacts would be significant if the project would expose proposed residential uses to noise levels exceeding 65 CNEL. Per the City Municipal Code, impacts would be significant if the project would generate noise levels at a common property line that would exceed the following one-hour average exterior noise levels: 50 dBA from 7:00 a.m. to 10:00 p.m. and 45 dBA from 10:00 p.m. to 7:00 a.m.

Threshold 2: Expose persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

As described in the Final Environmental Impact Report (EIR) for the City General Plan, for buildings considered of particular historical significance or that are particularly fragile structures, the damage threshold is approximately 96 vibration velocity in decibels (VdB); the damage threshold for other

structures is 100 VdB. Annoyance due to vibration in residential settings starts at approximately 70 VdB (Vacaville 2015b).

Threshold 3: Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

For traffic-related noise, impacts are considered significant if the project increases ambient noise levels in the project vicinity by more than 5 dBA above levels existing without the project (Vacaville 2015b).

Threshold 4: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

For construction-related noise, impacts are considered significant if construction, repair work, or grading within 500 feet from any occupied residence occurs between the hours of 7:00 p.m. and 7:00 a.m. Monday through Saturday, or on Sundays or holidays (City 2018).

Threshold 5: 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 use airport or private airstrip, expose people residing or working in the project area to excessive noise*.

Excessive noise exposure is defined as noise levels that exceed the standards in the City General Plan Noise Element for the associated land use.

4.0 IMPACTS

4.1 ISSUE 1: NOISE LEVEL STANDARD COMPLIANCE FOR NEW USES

Would the project expose persons to or generate noise levels in excess of standards established in the City General Plan or noise ordinance?

4.1.1 Exterior Noise Levels

As noted in Section 3.2.2.2, future traffic noise levels presented in this analysis are based on forecasted traffic volumes provided by GHD (Appendix C). Exposure of persons to excessive noise would be significant if exterior use areas of the new residential uses are subjected to noise levels above 65 CNEL. Noise contours depicting the noise levels across the site are depicted on Figure 4, *Future On-site Noise Level Contours*, located in Appendix A. As shown, noise levels at the project's pool and clubhouse areas are expected to be below 50 CNEL, which is below the 65 CNEL threshold for exterior use areas. At this point in project design, it is unclear if the project would include any private balconies or outdoor patios. However, as shown in Figure 4, if any private balconies or outdoor patios facing Allison Drive were to be constructed, they would not exceed City standards for exterior use areas. Noise levels at the building façade would remain below 65 CNEL. Impacts to exterior use areas throughout the project would be less than significant.

4.1.2 Interior Noise Levels

Noise levels at the eastern façades of the project's eastern residential structures would be exposed to noise levels of at least 60 CNEL. At locations where noise levels exceed 60 CNEL, interior noise levels may exceed the Title 24 interior noise standards of 45 CNEL. Impacts to residential units facing Allison Drive within Buildings 1, 2, and 3 (as depicted on Figure 4) would be potentially significant. Mitigation Measure NOI-1 would reduce impacts to below a level of significance.

4.1.3 Mitigation Measures

NOI-1 **Exterior-to-Interior Noise Analysis:** Interior noise levels for the project's proposed residences shall be demonstrated to not exceed 45 CNEL. Once specific building plan information is available, additional exterior-to-interior noise analysis shall be conducted for all proposed residential units facing Allison Drive within the project's three eastern buildings (i.e., Buildings 1, 2, and 3). These locations would be exposed to an exterior noise level exceeding 60 CNEL as depicted in Figure 4 of this report.

The information in the analysis shall include wall heights and lengths, room volumes, window and door tables typical for a building plan, as well as information on any other openings in the building shell. With this specific building plan information, the analysis shall determine the predicted interior noise levels at the planned on-site buildings. If predicted noise levels are found to exceed 45 CNEL, the report shall identify architectural materials or techniques that could be included to reduce noise levels to 45 CNEL in habitable rooms. Standard measures such as glazing with appropriate Sound Transmission Class (STC) ratings, as well as walls with appropriate STC ratings, should be considered.

Appropriate means of air circulation and provision of fresh air would be provided to allow windows to remain closed for extended intervals of time so that acceptable interior noise levels can be maintained. The mechanical ventilation system would meet the criteria of all applicable codes.

4.1.4 Significance of Impacts After Mitigation

Impacts to exterior use areas would be less than significant without mitigation. Following implementation of mitigation measure NOI-1, impacts related to interior noise levels would be less than significant.

4.2 ISSUE 2: PERMANENT INCREASE IN AMBIENT NOISE LEVELS

Would the project cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

4.2.1 Operational Noise

The proposed project would have HVAC units on the rooftops of each structure. The nearest NSLUs would be the residential property approximately 350 feet to the south. At these distances, noise levels from the project's rooftop HVAC units would be approximately 35 dBA, below the 45 dBA nighttime limits for residential uses. Operational noise levels would be less than significant.

4.2.2 Off-site Transportation Noise

TNM software was used to calculate the noise contour distances for off-site roadway segments in the project vicinity for the following scenarios: Existing, Existing + Project, Cumulative, and Cumulative + Project. The off-site roadway modeling represents a conservative analysis that does not account for topography or attenuation provided by existing structures. The results of this analysis for the CNEL at the nearest NSLU to the roadway segments are shown below in Table 6, *Off-site Traffic Noise Levels*.

Table 6
Off-Site Traffic Noise Levels

Roadway Segment	Distance to Nearest NSLU (feet)[1]	Noise Level at Nearest NSLU (CNEL)					
		Existing	Existing + Project	Change in Noise Level	Cumulative	Cumulative + Project	Change in Noise Level
Allison Drive							
North of Elmira Road	100	59.9	60.8	+0.9	61.6	61.6	0.0
Elmira Road							
East of Allison Drive	85	63.4	64.1	+0.7	64.7	64.9	+0.2
West of Allison Drive	85	6.2	65.0	+0.8	65.6	65.7	+0.1

[1] Distance measured from roadway centerline.

As described in the City's General Plan EIR, a direct significant impact would occur if exterior and interior noise levels are exposed to a 5 dBA increase. The nearest NSLUs along Allison Drive and Elmira Road are multi-family residences and single-family residences, respectively. As shown in Table 6, noise levels at the nearest NSLUs would not increase by more 1 dBA in either scenario, which would be well below the applicable 5 dBA allowed increase. Therefore, direct off-site transportation noise impacts would be less than significant.

4.2.3 Mitigation Measures

Because impacts related to Issue 2 would be less than significant, no mitigation is required.

4.2.4 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.3 ISSUE 3: TEMPORARY INCREASE IN AMBIENT NOISE LEVELS

4.3.1 Construction Noise

4.3.1.1 Construction Equipment

Construction of the project would involve grading, construction of new the structures, and paving of the site. Construction activity is assumed to occur between the hours of 7:00 a.m. and 7:00 p.m. from Monday through Saturday. Because construction would take place during these hours, noise impacts would be less than significant.

For informational purposes, noise calculations for typical construction equipment are provided. Construction equipment would not all operate at the same time or location and would not be in constant use during a typical operating day. The nearest NSLUs would be multi-family residences approximately 300 feet from the residential structure construction. Table 7, *Construction Equipment Noise Levels,* provides the 300-foot distance noise level for typical construction equipment.

Table 7
Construction Equipment Noise Levels

Unit	Percent Operating Time	L_{MAX} at 300 feet	dBA L_{EQ} at 300 feet
Backhoe	40	62.0	58.0
Concrete Pump Truck	20	65.8	58.8
Concrete Mixer Truck	40	63.2	59.3
Crane	16	65.0	57.0
Dump Truck	40	60.9	56.9
Excavator	40	65.1	61.2
Front End Loader	40	63.5	59.6
Grader	40	69.4	65.5
Paver	50	61.7	58.6
Scrapers	40	68.0	64.0

Source: RCNM.

4.3.2 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.4 ISSUE 4: EXCESSIVE GROUND-BORNE VIBRATION

4.4.1 Impact Analysis

4.4.1.1 Construction Vibration

Construction activities known to generate excessive ground-borne vibration, such as pile driving, are not expected for the project. A possible source of vibration during general project construction activities would be a vibratory roller, which may be used for building foundations, at a distance of over 300 feet from the nearest off-site residences to the south.

According to the City's General Plan EIR, a vibratory roller would generate approximately 94 VdB at 25 feet (Vacaville 2015b), less than the 96 VdB damage threshold for particularly fragile structures, and less than the 100 VdB damage threshold for all other structures. Furthermore, no potentially fragile structures are located within the vicinity of the project.

At a distance of 300 feet, the vibration level of a vibratory roller would equal 61.6 VdB.[1] This would be less than the 96 VdB damage threshold for particularly fragile structures, and less than the 100 VdB damage threshold for all other structures. Furthermore, it would be less than 70 VdB, which is considered the limit for annoyance due to vibration in residential settings (Vacaville 2015b).

4.4.1.2 Operational Vibration

The proposed land uses do not include equipment that would generate substantial vibration. Therefore, operational vibration impacts are less than significant.

4.4.2 Mitigation Measures

Because impacts related to Issue 4 would be less than significant, no mitigation is required.

4.4.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.5 ISSUE 5: AIRPORT NOISE LEVELS

4.5.1 Impact Analysis

The closest airport to the project site is Nut Tree Airport, located approximately one mile to the north. The project site is not located within the 55-60 CNEL contour for the airport (Vacaville 2015a). Therefore, airport noise would not create substantial noise at the project site, and impacts associated with airports would be less than significant.

[1] Equipment VdB = Reference VdB – 30 * log(D/Dref), where Reference VdB is VdB at 25 feet, D is distance from equipment to the receiver in feet, and Dref is 25 feet.

4.5.2 Mitigation Measures

Because impacts related to Issue 5 would be less than significant, no mitigation is required.

4.5.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

5.0 LIST OF PREPARERS

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Robert Edgerton, AICP CEP	Project Manager
Joanne Dramko, AICP	Senior Technical Specialist, Quality Assurance Reviewer

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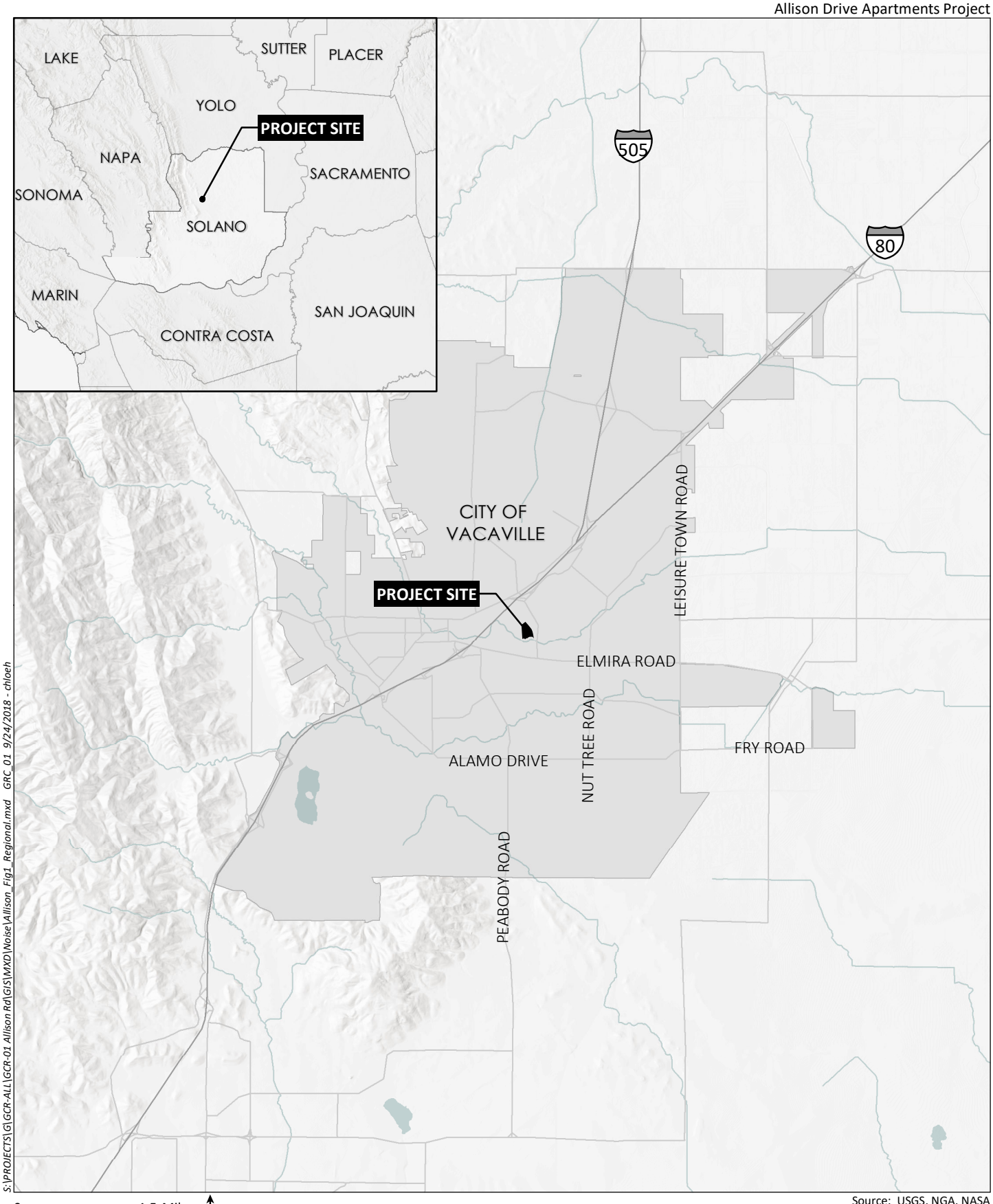
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Appendix A

Figures



HELIX Environmental Planning

Regional Location

Figure 1



S:\PROJECTS\G\GCR-ALL\GCR-01 Allison Rd\GIS\MXD\Noise\Allison_Fig2_AerialVicinity.mxd GRC_01 9/24/2018 - chloeh

HELIX Environmental Planning

Project Vicinity

Figure 2

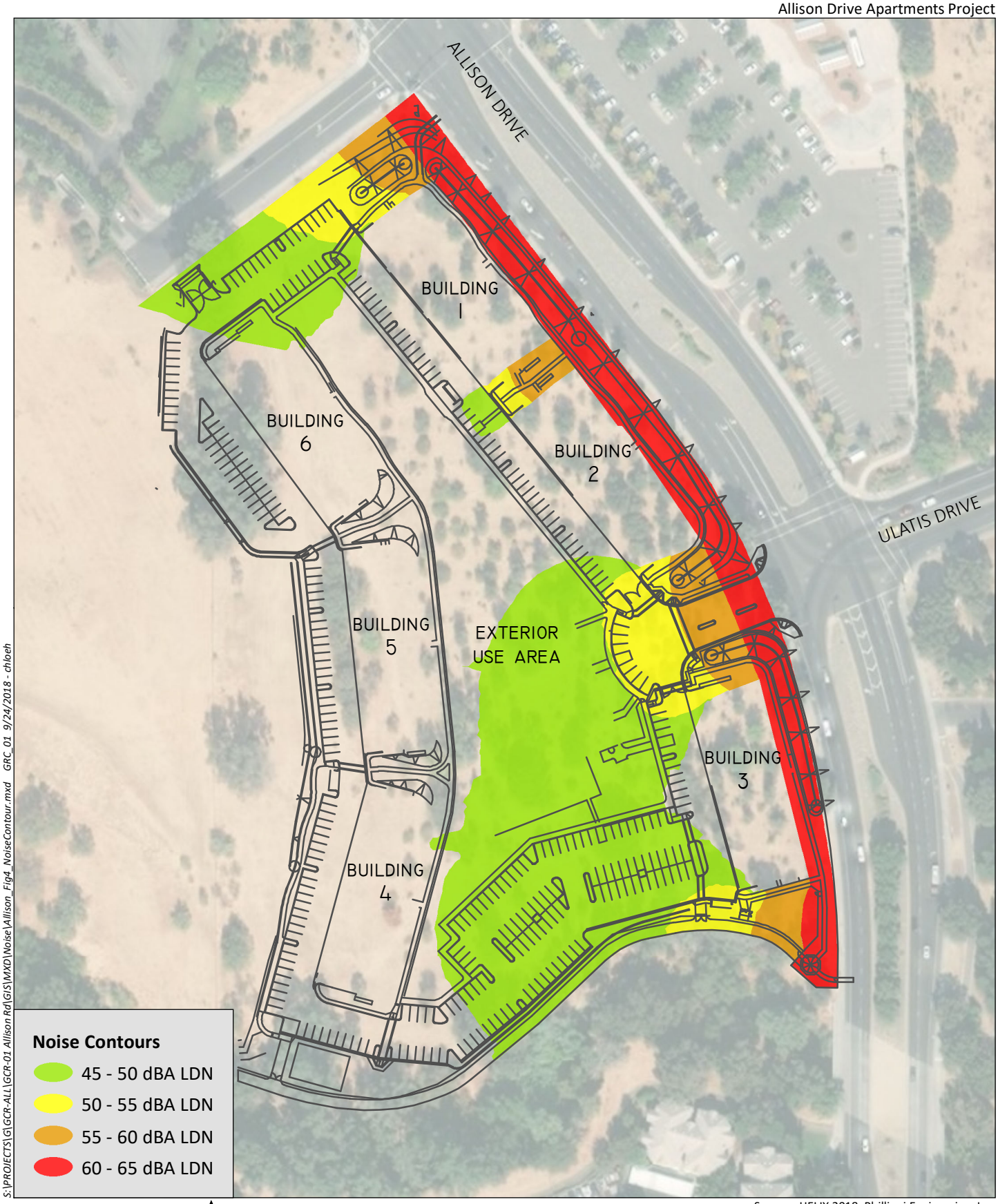


Source: Phillippi Engineering, Inc.

HELIX Environmental Planning

Site Plan

Figure 3



Source: HELIX 2018; Phillippi Engineering, Inc.

HELIX Environmental Planning

Future On-Site Noise Level Contours

Figure 4

Appendix B

Condenser Manufacturer's Specifications

ELECTRICAL DATA

38HDR UNIT SIZE	V–PH–Hz	VOLTAGE RANGE*		COMPRESSOR		OUTDOOR FAN MOTOR			MIN CKT AMPS	FUSE/ HACR BKR AMPS
		Min	Max	RLA	LRA	FLA	NEC Hp	kW Out		
018	208/230–1–60	187	253	9.0	48.0	0.80	0.125	0.09	12.1	20
024	208/230–1–60	187	253	12.8	58.3	0.80	0.125	0.09	16.8	25
030	208/230–1–60	187	253	14.1	73.0	1.45	0.25	0.19	19.1	30
036	208/230–1–60	187	253	14.1	77.0	1.45	0.25	0.19	19.1	30
	208/230–3–60	187	253	9.0	71.0	1.45	0.25	0.19	12.7	20
	460–3–60	414	506	5.6	38.0	0.80	0.25	0.19	7.8	15
048	208/230–1–60	187	253	21.8	117.0	1.45	0.25	0.19	28.7	50
	208/230–3–60	187	253	13.7	83.1	1.45	0.25	0.19	18.6	30
	460–3–60	414	506	6.2	41.0	0.80	0.25	0.19	8.6	15
060	208/230–1–60	187	253	26.4	134.0	1.45	0.25	0.19	34.5	60
	208/230–3–60	187	253	16.0	110.0	1.45	0.25	0.19	21.5	35
	460–3–60	414	506	7.8	52.0	0.80	0.25	0.19	10.6	15

* Permissible limits of the voltage range at which the unit will operate satisfactorily

FLA – Full Load Amps

HACR – Heating, Air Conditininng, Refrigeration

LRA – Locked Rotor Amps

NEC – National Electrical Code

RLA – Rated Load Amps (compressor)

NOTE: Control circuit is 24–V on all units and requires external power source. Copper wire must be used from service disconnect to unit. All motors/compressors contain internal overload protection.

SOUND LEVEL

Unit Size	Standard Rating (dB)	Typical Octave Band Spectrum (dBA) (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018	68	52.0	57.5	60.5	63.5	60.5	57.5	46.5
024	69	57.5	61.5	63.0	61.0	60.0	56.0	45.0
030	72	56.5	63.0	65.0	66.0	64.0	62.5	57.0
036	72	65.0	61.5	63.5	65.0	64.5	61.0	54.5
048	72	58.5	61.0	64.0	67.5	66.0	64.0	57.0
060	72	63.0	61.5	64.0	66.5	66.0	64.5	55.5

CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

UNIT SIZE–VOLTAGE, SERIES	REQUIRED SUBCOOLING °F (°C)
018	12 (6.7)
024	12 (6.7)
030	12 (6.7)
036	12 (6.7)
048	12 (6.7)
060	12 (6.7)

Appendix C

Roadway Segment Data

Existing and Future Traffic Volumes																
Roadway /Segment	Existing				Existing + Project				Cumulative				Cumulative + Project				Posted Speed (mph)
	Peak Hour Traffic	Traffic Breakdown			Peak Hour Traffic	Traffic Breakdown			Peak Hour Traffic	Traffic Breakdown			Peak Hour Traffic	Traffic Breakdown			
		Cars 97.5%	MT 2.0%	HT 0.5%		Cars 97.5%	MT 2.0%	HT 0.5%		Cars 97.5%	MT 2.0%	HT 0.5%		Cars 97.5%	MT 2.0%	HT 0.5%	
Allison Drive																	
North of Elmira Road	1830	1784	37	9	2260	2204	45	11	2705	2637	54	14	2751	2682	55	14	35
Elmira Road																	
East of Allison Drive	2016	1966	40	10	2390	2330	48	12	2745	2676	55	14	2765	2696	55	14	40
West of Allison Drive	2454	2393	49	12	2910	2837	58	15	3380	3296	68	17	3406	3321	68	17	40

Source: GHD 2018

Existing and Future Traffic Noise Levels							
Roadway/Segment	Dist. to NSLU	Existing	Existing + Project		Cumulative	Cumulative + Project	
		CNEL @ dist. (dBA)	CNEL @ dist. (dBA)	Δ at 100ft. (dBA)	CNEL @ dist. (dBA)	CNEL @ dist. (dBA)	Δ at 100ft. (dBA)
Allison Drive							
North of Elmira Road	100 ft	59.9	60.8	0.9	61.6	61.6	0.0
Elmira Road							
East of Allison Drive	85 ft	63.4	64.1	0.7	64.7	64.9	0.2
West of Allison Drive	65 ft	64.2	65.0	0.8	65.6	65.7	0.1

Source: Traffic Noise Model (TNM), version 2.5
Traffic Source Data: GHD 2018