June 18, 2025

Nathalie Vazquez, Associate Planner
City of Oceanside Planning Division
300 North Coast Highway
Oceanside, CA 92054

Dear Nathalie Vazquez:

Birdseye Planning Group (BPG) has evaluated RD24-00002, the 901 Mission Avenue Mixed-Use project ("proposed project" or "project") proposed for construction on a 1.5-acre lot at the southwest corner of Mission Avenue and North Horne Street in the City of Oceanside. As proposed, the project would provide 273 apartment units, of which 28 would be managed as affordable units and rented to income qualifying tenants. As the project provides affordable housing units and qualifies for a density bonus, the project is entitled to one incentive and unlimited waiver requests. The project would be consistent with the D-2 zone development standards contained in Section 1232 of the City's Zoning Ordinance as modified by the project's Mixed-Use Development Plan with the use of the density bonus waivers. The remaining units would be rented to market rate tenants. The project will also provide 322 parking stalls in four levels, of which 2.5 floors would be subterranean, and 4,006 square feet of ground floor commercial space with related amenities.

This letter evaluates the proposed project for consistency with the Class 32 Urban Infill Exemption criteria identified in Section 15532 of the CEQA Guidelines and the applicability of potential exceptions including those identified in Section 15300.2 of the CEQA Guidelines. Based on our technical analyses, the following demonstrates that the project meets all of the criteria for the categorical exemption under the CEQA Guidelines Section 15332, described herein, and that none of the Section 15300.2 exceptions apply. Substantial evidence regarding this determination is provided herein and in the other project materials.

**Categorical Exemptions – CEQA Exceptions**

Article 19 of the CEQA Guidelines includes a list of classes of projects which have been determined not to have a significant effect on the environment and which shall; therefore, be exempt from the provisions of CEQA. Such projects are categorically exempt from the requirement for the preparation of environmental documents provided they meet the following exceptions as defined in Section 15300.2 of the CEQA Guidelines. These exceptions apply to different categorical exemptions:

- **Location.** Classes 3, 4, 5, 6, and 11 exceptions are qualified by consideration of where the project is to

be located – a project that is ordinarily insignificant in its impact on the environment may, in a particularly sensitive environment, be significant. Therefore, these classes are considered to apply all instances, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.

- **Cumulative Impact.** All exemptions for these classes are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant.

- **Significant Effect (Unusual Circumstances).** A categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.

- **Scenic Highways.** A categorical exemption shall not be used for a project which may result in damage to scenic resources, including but not limited to, trees, historic buildings, rock outcroppings, or similar resources, within a highway officially designated as a state scenic highway. This does not apply to improvements which are required as mitigation by an adopted negative declaration or certified EIR.

- **Hazardous Waste Sites.** A categorical exemption shall not be used for a project located on a site which is included on any list compiled pursuant to Section 65962.5 of the Government Code.

- **Historical Resources.** A categorical exemption shall not be used for a project which may cause a substantial adverse change in the significance of a historical resource.

**Class 32 Urban Infill Categorical Exemption**

Article 19 of the CEQA Guidelines includes categories of projects which, based on the location and scope of the proposed action, would not have a significant environmental effect. Individual projects that meet specific criteria associated with one or more exemption, can be categorically exempt from CEQA compliance requirements. If so, then no further CEQA documentation is required as part of the discretionary review process.

Class 32 exemptions are intended to promote infill development within urbanized areas and are applicable primarily to in-fill projects that are consistent with local general plan and zoning requirements. Specific to a Class 32 Urban Infill exemption, Section 15332 of the CEQA Guidelines identifies the following criteria that must be met for a project to qualify for a Class 32 categorical exemption:

- The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulations.

- The proposed development occurs within city limits on a project site of no more than five acres substantially surrounded by urban uses.

- The project site has no value as habitat for endangered, rare or threatened species.

- Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality.

- The site can be adequately served by all required utilities and public services.

**Proposed Project Analysis**

To evaluate whether the proposed project qualifies for a Class 32 Exemption and the CEQA exceptions for that class of exemption apply, the following analysis relies on the project plans and other permitting information as well as technical studies including the following:

- Air Quality/Greenhouse Gas; and
- Noise;
- Biological Resources Assessment;
- Vehicle Miles Traveled Memo;
- Local Transportation Study;
- Geotechnical Report;
- Archaeological Survey Report
- Hydrology/Water Quality; and
- Phase I Environmental Site Assessment.

**Categorical Exemption – Exception Analysis**

This memorandum first analyzes whether an exception to the use of a categorical exemption applies. As the following demonstrates that none of the applicable exceptions apply, the memorandum goes on to analyze each of the Class 32 exemption criteria.

**Location. Classes 3, 4, 5, 6, and 11 are qualified by consideration of where the project is to be located – a project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant. Therefore, these classes are considered to apply all instances, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies. (14 CCR § 15300.2(a).)**

Because the project is relying on Class 32 exemption, this exception does not apply.

**Cumulative Impact. All exemptions for these classes are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant. (14 CCR § 15300.2(b).)**

Based on the technical reports and studies prepared for the project, the project would have no potentially significant adverse effects under CEQA. The following is a list of cumulative projects included within the project analysis as applicable:

1) 522 North Tremont Street 2 multi-family units;

2) 702 North Freeman Street 5 multi-family units and 5,000 square feet of retail space;

3) Sunset Mixed-Use Project located North Horne Street and Pier View Way, would provide 180 apartment units and commercial space.

4) Pier View Way Mixed-Use: This project proposes to construct 64 multi-family dwelling units and 2,450 square-feet of retail space;

5) 716 Seagaze Drive: This project proposes to construct 179 multi-family dwelling units and 1,581 square feet of retail space;

6) One 11 S Tremont: This project proposes to construct 12 multi-family dwelling units and a 1,500 square-foot fitness studio; and

7) 405 S Tremont Condos: This project proposes to construct 8 multi-family dwelling units.

8) 801 Mission Avenue: This project proposes to construct approximately 230 residential units and approximately 6,000 square feet of retail/restaurant space.

9) 810 Mission Avenue: This project proposes to replace an existing office building with 206 residential units, including five live/work units.

10) Oceanside Transit Center: This project is a Mixed-Use Transit Oriented Design project that includes a bus/rail transit station, hotel, office, retail, multifamily residential, and other associated amenities.

11) 401 Mission Avenue: This project proposes to construct 332 apartments units and 19,420 square feet of commercial uses, including 8,311 square feet of retail and 11,109 square feet of restaurant space), in a new 5-story building. The project would replace 79,805 square feet of specialty retail and theater uses.

12) Oceanside Blocks 5 & 20: This mixed-use project would redevelop two downtown city blocks with 193 multi-family units and 1,474 square feet of retail on Block 5 (north of Pier View Way) and 180 multi-family units and 2,612 square feet of retail on Block 20 (between Pier View Way and Mission Avenue). No individually significant impacts would result from the proposed project. According to the Air

Quality and Greenhouse Gas Report (Birdseye Planning Group, June 2025) the proposed project would have a less than significant direct and/or cumulative impacts associated with air quality and greenhouse gas emissions. According to the Noise Report (Birdseye Planning Group, June 2025), the project would have less than significant construction and operational noise and vibration impacts. The proposed Project meets the City of Oceanside screening criteria for Vehicle Miles Traveled (VMT); thus, no VMT analysis was required. The proposed project would have a less than significant direct and cumulative transportation impact. As stated in the Archaeological Survey Report (South Environmental, Inc., May 2024), no archaeological or historic resources would be affected. According to the Biological Resource Assessment (South Environmental, Inc., April 2025), the project site has no value as habitat for endangered, rare or threatened species. Other potentially direct environmental effects of the project evaluated herein, such as zoning and General Plan consistency and public services/utilities would also be less than significant per applicable CEQA thresholds; and thus, would not cause or contribute to cumulative impacts. Therefore, no cumulatively considerable impacts are anticipated to occur.

As the project is within the City's Downtown area and in proximity to transit, increased density of successive mixed-use and residential projects in this area would be anticipated to reduce VMT and associated impacts related to air quality and greenhouse gas emissions. The majority of development in the project vicinity would consist of infill development, which would not disturb significant natural resources. While individual projects may increase the resources required on a particular infill site, the overall pattern of development within mixed-use and transit-oriented neighborhoods reduces the cumulative environmental effects associated with population growth in the region. Successive projects of the same type in the project area would; therefore, decrease regional emissions and environmental effects associated with transportation and goods movement. These projects are all subject to the same regulatory review requirements and design standards specified by the City of Oceanside to avoid or minimize environmental effects. Should any of the cumulative projects have a potentially significant or adverse environmental impact, the impacts would be mitigated as appropriate to reduce potential impacts to less than significant, or otherwise addressed during the CEQA review process. Thus, the proposed project would not result in a cumulative impact consistent with **14 CCR § 15300.2(b).**

**Significant Effect. A categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances. (14 CCR § 15300.2(c).)**

The project site is located in a developed urban area. The site does not contain, nor is it located proximal to any unusual or environmentally sensitive areas that could be adversely affected by the proposed project. As stated, the proposed project would have no significant or adverse environmental effects in areas such as noise, air quality, greenhouse gas, historic resources, biological resource, water quality, utilities and public services or transportation and is consistent with the General Plan and zoning designation for the site. The site does not contain any usual features or natural resources. A Phase I Environmental Site Assessment (ESA) prepared in August 2024 by Hillman Consulting, Inc. determined that no recognized environmental conditions exist. Therefore, there is no reasonable possibility that the proposed project will have a significant effect on the environment due to unusual circumstances.

**Scenic Highways. A categorical exemption shall not be used for a project which may result in damage to scenic resources, including but not limited to, trees, historic buildings, rock outcroppings, or similar resources, within a highway officially designated as a state scenic highway. This does not apply to improvements which are required as mitigation by an adopted negative declaration or certified EIR. (14 CCR § 15300.2(d).)**

The project site is located at the southwest corner of Mission Avenue and North Horne Street and has a Downtown Subdistrict 2 zoning designation. The surrounding area is developed with existing residential, commercial and institutional uses. The surrounding streets are all local and none are designated scenic. According to the California Department of Transportation's State Scenic Highway Program, there are no state scenic highways in the vicinity of the project site. The closest scenic highway is Route 52 near Santo Road in the City of San Diego, approximately 29 miles south of the project site. Accordingly, the exception does not apply as the project will not damage scenic resources, including but not limited to, trees, historic buildings, rock outcroppings, or similar resources, within a highway officially designated as a state scenic highway.

**Hazardous Waste Sites. A categorical exemption shall not be used for a project located on a site which is included on any list compiled pursuant to Section 65962.5 of the Government Code. (14 CCR § 15300.2(e).)**

The project site was previously developed, however, no structures remain. This site is not within a designated hazardous site. The Project Site is not located on any list compiled pursuant to Section 65962.5 of the Government Code, which list is formally known as the California Department of Toxic Substances Control's Hazardous Waste and Substances Site List-Site Cleanup (Cortese List). Accordingly, this exception does not apply to the project. Although not required to demonstrate that the exception does not apply, the project site is also not listed on the EnviroStor database.

**Historical Resources. A categorical exemption shall not be used for a project which may cause a substantial adverse change in the significance of a historical resource. (14 CCR § 15300.2(f).)**

The project site is vacant. Development would require the removal of pavement from a vacated, former alley segment that bisects the site. With that exception, no buildings or other structures would be removed by the project. The project site is also not listed or deemed eligible for listing on the National Register of Historic Places, California Register of Historical Resources, or City of Oceanside's Historical Resources Inventory conducted in 1992 and has not been identified as a historic resource in any survey or otherwise meet the criteria of a historical resources as defined by Public Resources Code Section 21084.1(South Environmental, Inc. May 2024). Thus, the project will not cause a substantial adverse change in the significance of a historical resource.

**Class 32 Exemption: In-Fill Development Analysis**

The following presents an analysis of the project's consistency with the five criteria required for exemption from CEQA under the Class 32 Exemption. The determinations that the Class 32 Exemption

applies are supported by the above-referenced technical studies prepared for the project and the project record.

**The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulations. (14 CCR § 15332(a).)**

The project site has a General Plan designation of Downtown and Zoning designation of Downtown Subdistrict 2. The purpose of this zoning designation is to provide sites for a financial center supported by professional offices. Residential uses are permitted, where appropriate, as part of mixed-use development projects. The mixed-use development regulations applicable to this project are intended to allow unlimited density and flexibility while maintaining ground floor pedestrian orientation and activation through design rather than type of use. The project would provide 273 residential units and 4,006 square feet of commercial space.

As stated, the project is consistent with the General Plan and zoning designation and designed in accordance with applicable General Plan policies relevant to the project and the property. The project would be consistent with the D-2 zone development standards contained in Section 1232 of the City's Zoning Ordinance as modified by the project's Mixed-Use Development Plan with the use of the density bonus waivers/incentives allowed with the inclusion of 28 affordable housing units. The project meets this criterion.

**The proposed development occurs within city limits on a project site of no more than five acres substantially surrounded by urban uses. (14 CCR § 15332(b).)**

The project site is entirely within the city limits of the City of Oceanside. The site is approximately 1.5 acres in size which is less than five acres. The project site is substantially surrounded by urban uses. To the west of the project site (across North Clementine Street) and north of the site across Mission Avenue are offices and commercial buildings. The Oceanside High School campus is located to the east across North Horne Street. Single- and multifamily residences are located to the south across Seagaze Drive. As the Public Resources Code (PRC) defines qualified urban use as "any residential, commercial, public institutional, transit or transportation passenger facility, or retail use, or any combination of those uses," the project site is substantially surrounded by urban uses. (PRC § 21072.)

**The project site has no value as habitat for endangered, rare or threatened species. (14 CCR § 15332(c).)**

The entirety of the project site is disturbed. The majority of the site is an unpaved raised development pad. There is pavement from a vacated, former, alley that bisects the site east/west. On-site vegetation is limited to ruderal/weedy species throughout as observed during a field visit performed on April 26, 2024 (and confirmed during a field visit on April 17, 2025). Per the Biological Site Assessment for the Project prepared by South Environmental, dated April 2025, the project site has no value as habitat for endangered, rare or threatened species.

**Approval of the project would not result in any significant effects relating to traffic, noise, air**

**quality, or water quality. (14 CCR § 15332(d).)**

The project would not result in any significant effects related to traffic, noise, air quality or water quality. A Noise Study prepared by Birdseye Planning Group dated June 2025, analyzed the project with reference to the CEQA significant thresholds for noise. That study demonstrates that project construction noise and noise associated with operation would not exceed allowable noise thresholds or otherwise trigger a potentially significant noise impact. Thus, the project would not result in any significant effects related to noise.

CR Associates, Inc., demonstrated that the project is located in a low-VMT generating area within Appendix A of the Local Transportation Study (LTS) (CR Associates, Inc., June 2025).. Based on its location and uses, the project is screened out from a VMT analysis per the City's Traffic Impact Analysis Guidelines. Thus, consistent with the City's adopted CEQA significance thresholds, the project would have a less than significant VMT impact. The proposed project is surrounded on all four sides by public roads and, with its project design features, the project would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities (CR Associates, Inc. June 2025). As the LTS demonstrates, the project would not substantially increase hazards due to a geometric design feature as vehicles accessing the site would be typical construction, common passenger and delivery vehicles and would not introduce equipment or incompatible uses to the local street system. Finally, as reflected in the LTS, the project would not adversely impact emergency access by providing inadequate site access or otherwise impacting use of local streets by emergency vehicles. Therefore, the project would not result in any significant effects relating to transportation/traffic. "

An Air Quality and Greenhouse Gas study prepared by Birdseye Planning Group dated June 2025, analyzed the project with reference to the applicable CEQA air quality thresholds of significance. That report demonstrates that the project, through compliance with applicable laws including, without limitations, the San Diego Air Pollution Control District (SDAPCD) Rules 55 and 67, and that neither construction nor operation of the project would result in any significant effects relating to air quality.

The project drainage, including stormwater capture, conveyance and treatment system incorporated into the project design (a) is in accordance with the requirements of the San Diego Regional Water Quality Board, Order No. R9-2013-0001, other applicable laws and the project will implement the project specific Storm Water Quality Management Plan (SWQMP) such that the project will not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality; (b) The project would substantially increase the amount of impervious area on the site; however, through a project design feature and compliance with applicable regulatory requirements, runoff would be captured and conveyed into proprietary bioretention vault located in the building basement. The project would also not pump groundwater nor is the site over an aquifer recharge area such that the project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge in a manner that the project would impede sustainable groundwater management of the basin. (c) Further, the project would not 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 a substantial erosion or siltation on- or off-site; ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv) impede or redirect flood flows. Under the project design, the downstream point of stormwater discharge from the site will not be altered from the predevelopment condition. The project will not result in cross-lot drainage or an increase in the rate of off-site run-off in a manner that would impede or redirect flood flows. The project is required by law to implement stormwater Best Management Practices during construction to minimize erosion and pollutant discharge associated with stormwater runoff to the downstream drainage system. Consistent with applicable law and the project design features, post-construction runoff will be conveyed to said bioretention vault and a separate underground detention vault that will detain any increase in runoff from the predevelopment condition as required by applicable law. With the project design and in accordance with applicable regulatory requirements, post-construction runoff would be captured and treated by a proprietary biofiltration vault, so not to exceed existing or planned stormwater drainage system capacity or serve as a substantial additional source of polluted runoff (d) The project site is not located within a flood hazard area. The project is also not located within a dam inundation area nor are there large open water bodies proximal to the site that would pose a potential seiche impact. The project site is not located within the San Diego County Tsunami Hazard Area as depicted in the California Department of Conservation tsunami map, (https://www.conservation.ca.gov/cgs/tsunami/maps/san-diego). Thus, as the project is not within flood hazard, tsunami or seiche zones, the project would not have a significant impact with respect to the risk of release of pollutants due to project inundation in those zones.

Per the City of Oceanside 2020 Urban Water Management Plan, the City of Oceanside utilizes groundwater from the Mission Basin subbasin of the San Luis Rey Valley Groundwater Basin. The Mission Basin is an alluvial basin extending from the Pacific Ocean in the west to just beyond the City's eastern border. According to the Department of Water Resources' Bulletin 118 Groundwater Basin Lookup Map, the Project site is located south of the San Luis Rey Valley Groundwater Basin and Mission Subbasin boundary and is not within an area that is subject to an adopted water quality control plan for that basin or a sustainable groundwater management plan. Thus, the project would not result in any significant impacts relating to water quality.

**The site can be adequately served by all required utilities and public services. (14 CCR § 15332(e).)**

The project site is located within an urbanized downtown area and would connect to existing utilities located within street corridors surrounding the site. The project will provide necessary site-specific extensions from the building to existing utilities and public services located in the adjacent right of way. According to the City of Oceanside 2020 Urban Water Management Plan (June 2021), the City's water supply reliability analysis shows that with implementation of additional planned supplies and conservation measures, supplies will meet demands under all hydrologic scenarios, including the normal year, single dry year, and five consecutive dry years from 2025-2045. The project is consistent with General Plan and zoning designations; thus, water demand associated with the project has been factored into the demand calculations upon which the City determined that sufficient water supplies

exist to serve the project and reasonable foreseeable future development during normal, dry and multiple dry years. The project intensity is also consistent with the 2015 Sewer Master Plan and with the General Plan and zoning land use designations; thus, adequate wastewater treatment capacity exists to serve the project's projected demand in addition to existing commitments.

Further, the project would connect to existing electrical, natural gas and communications infrastructure located in the adjacent right of way. This infrastructure is in place and the project would not require expansion or relocation in a manner that would cause significant environmental effects. With the payment of connection fees and development impact fees to cover fair share impacts to public services (i.e., fire, law enforcement, parks and schools), the project would be adequately served by all required utilities and public services.

"The City contracts solid waste collection services with Waste Management and Agri Service. Waste is disposed at the El Sobrante Landfill, located at 10910 Dawson Canyon Road, Corona, CA 92883. The El Sobrante Landfill is permitted to accept up to 16,054 tons per day, has a remaining capacity of 143,977,170 tons and is estimated to be operational until 2051 (California Department of Resource Recycling and Recovery, SWIS Facility/Site Activity Details, October 2024).

According to CalEEMod 2022.1, the project would generate approximately 202 tons annually or 1,106 pounds (0.5 tons) daily assuming no waste material is recycled. The AB 341policy goal targets a 75% reduction in the volume of landfilled solid waste by 2025. Assuming this is achieved, the amount of material landfilled would be 51.5 tons annually (282 pounds daily). In either case, the volume of solid waste generated by the project would be within the permitted daily landfill capacity. The project would not 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. The impact would be less than significant.

The proposed project would be subject to the City's Solid Waste and Recycling Code (Chapter 13 of the City's Municipal Code) which will require separating recyclables from solid waste. The proposed project would be required to comply with required solid waste and recycling measures as provided in the California Green Building Code. Recycling bins for residential tenants would be provided. The applicant would collaborate with the applicable solid waste service providers regarding compliance with the Zero Waste Plan and the relevant statutes that the plan addresses. Thus, the proposed project would not 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 have no impact relative to compliance with solid waste laws.

Though the project will result in additional people using utilities and public services at this location, the project is consistent with long term City land use plans and policies, as identified in the Oceanside General Plan, 2020 Urban Water Management Plan and 2015 Sewer Master Plan. The record reflects that applicable utilities and public services have capacity to serve the demand associated with the site, the project can be adequately served by all required utilities and public services and the project will not result in substantial adverse physical impacts associated with the provision of or need for new or

physically altered governmental facilities or the relocation or construction of new utilities that could cause significant effects.

**CONCLUSION**

A project qualifies for a Class 32 Exemption if it is developed on an infill site and meets the conditions described in CEQA. The five (5) conditions which the project must meet to qualify for the Class 32 Categorical Exemption are as follows: (a) The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with the applicable zoning designation and regulations; (b) The proposed development occurs within city limits on a project site of no more than five acres substantially surrounded by urban uses; (c) The project site has no value as habitat for endangered, rare or threatened species; (d) Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality; and (e) The site can be adequately served by all required utilities and public services As demonstrated in this report and the project record, the project meets all 5 criteria for reliance on a Class 32 exemption. Further, none of the exceptions to the use of a categorical exemption, as defined in Article 19 of the CEQA Guidelines described above, apply.

Therefore, the project would meet the criterion associated with the Class 32 Urban Infill exemption. If you have any questions regarding this analysis, please feel free to contact me at 760-712-2199 or via e-mail at ryan@birdseyeplanninggroup.com

Regards,



Ryan Birdseye
Principal

**PLANNING DIVISION**
**INSTRUCTIONS FOR COMPLETING**
**ENVIRONMENTAL INFORMATION FORM**

## SUBMITTAL INFORMATION:

Attached is an Environmental Information Form which is to be filed with all projects in accordance with the California Environmental Quality Act. This form must be accompanied by the applicable processing fee and a legal description of the property (please refer to the fee schedule – Appendix C). If the Environmental Administrator/ City Planner determines that an Environmental Impact Report (EIR) is required, an additional fee will also be required for reimbursement of costs incurred in the processing of the EIR.

If the information requested does not apply to the project, insert "NA" (Not Applicable) in the space provided.

If the project is Categorically Exempt under the provisions of the California Environmental Quality Act, you need only complete Items 1 through 34 on the Environmental Information Form. The determination that the project is Categorically Exempt must be confirmed by a staff planner.

Please contact the Planning Division if you have any questions regarding the Environmental Information Form.

## PROCESSING PROCEDURE:

The information in this form will be to conduct an Initial Study of your project. Following interdepartmental review of the project by the Application Review Committee, the Initial Study will be completed by the project's environmental consultant. The Project Planner in consultation with the Environmental Administrator/City Planner will then determine whether a Negative Declaration should be issued or an EIR required. If an EIR is required, the Environmental Review Committee will review the decision and determine the scope of the EIR. The Planning Division will transmit a letter to you describing the procedure to be followed and the specific areas of concern to be addressed in the EIR.

If an EIR is required, the report must be prepared, published and circulated for public review, and any comments received must be responded to before the project can be scheduled for public hearing. Additional public input on the EIR may be provided during the public hearing of the project.

# City of Oceanside Planning Division
# Environmental Information Form

**TO BE COMPLETED BY APPLICANT**

Date Filed: 05/21/2024
Environmental Fee Paid: _____

**MAPS REQUIRED:**

1. The project site and surrounding area within 1000-ft. from the project's property lines must be shown on an aerial map (less than 2-years old). Acknowledged.

2. The project must be shown on a copy of a page or pages of a street map (i.e. Thomas Brothers Map). The project site must be labeled and the page numbers shown. Acknowledged.

**GENERAL INFORMATION:**

1. Name of Applicant: JPI REAL ESTATE ACQUISITION II, LLC
   Address: 11988 El Camino Real, Suite 200, San Diego, CA 92130
   City: _____ State: _____ Zip: _____
   Telephone: _____
2. Name of Applicant's Representative: Conner Kloeppel
   Address: 11988 El Camino Real, Suite 200, San Diego, CA 92130
   City: _____ State: _____ Zip: _____
   Telephone: 314-302-2469
3. Project Title and/or Application Number(s): 901 Mission Ave
4. If a Specific Plan has been prepared on the project site, give Specific Plan title: N/A
5. List any other related permits or approvals, required from agencies other than the City of Oceanside: N/A
6. Has the project site had any prior environmental review as part of this or another project? If so, please provide the Planning Application file number(s) of the permits previously applied for (i.e., A-1-92, D-1-92, C-1-92, Z-1-92, S-1-92, T-1-92) and the name of the project: The Belvedere
7. Is the project part of a larger project or series of projects? No If so, describe the project's relationship to the project or series of projects: N/A
8. If the project is included in an approved Specific Plan, is it in conformance with the plan? N/A If not, explain how it differs: Project is not within a specific plan.
9. Existing zoning: MU-Mixed Use Proposed zoning: MU-Mixed Use
   Existing General Plan Land Use Designation: Downtown Subdistrict D-2
   Proposed General Plan Land Use Designation: Downtown Subdistrict D-2

**LOCATION:**

10. Address of project: 901 Mission Ave, Oceanside, CA 92054
11. Project site is located on the N.S.E.W. (circle one) side of N Horne St between N Horne St and N Clementine St streets.
12. Is the project located within the Airport Influence Area? Yes
13. Is the project located within the Coastal Zone? No
14. What is the distance in miles on existing roadways from the project site to the nearest: Fire Station 0.2 Miles Airport 2.4 Miles
    Hospital 1.8 Miles
    Public Transportation 0.2 Miles
15. Is the site within ½ mile of a former sanitary landfill? Do not believe so.

**PROJECT DESCRIPTION:**

16. Site size: 1.513 Acre / 65,912 FT acres/square feet.
17. Please describe all off-site improvements proposed as part of the project. (Such improvements might include: drainage facilities, street improvements, extension of utilities, cut and fill slopes, pedestrian and bicycle paths, etc., that would be constructed outside of the project boundaries). Rerouting of existing utilities through the Alley. Sidewalk replacement along the perimeter.

**FOR RESIDENTIAL PROJECTS: (IF PROJECT IS COMMERCIAL OR INDUSTRIAL, SKIP ITEMS 18 THROUGH 26).**

18. Number of lots/dwelling units: 273 units
19. Maximum building height: 95 ft and 11 inches
20. Amount of off-street parking: 322 Parking Stalls
    (a) Number required: Per AB 2097, no parking requirement (site is located within ½ mile of the Oceanside Transit Center)
    (b) Number proposed: 322 Parking Stalls
    (c) Type of parking (size, whether covered): Garage Structure
21. Please describe any recreational facilities to be provided: Amenities include a Fitness Center
22. What is the distance in miles on existing roads from the project site to the nearest:
    Elementary School 1.0 Miles Shopping Center 0.2 Miles
    High School 0.1 Miles Public Library 0.3 Miles
23. If applicable, describe the project's relationship to larger project or series of projects: (How does it relate or conform to the larger project?) N/A
24. Will air conditioning or mechanical ventilation be provided? Yes
25. Describe the proposed scheduling or phasing of the project: Yes, project would phase occupancy
26. What percentage of the project site will be covered by:
    Paving 7.3%; Buildings 83.9%; Landscaping 11.5%

## FOR COMMERCIAL, INDUSTRIAL OR AGRICULTURAL PROJECTS: (IF PROJECT IS RESIDENTIAL, SKIP ITEMS 27 THROUGH 39.)

N/A →

27. Describe the type of uses proposed: _____
28. Size of proposed buildings: _____ square feet.
29. Number of buildings proposed:_____
30. Maximum building height: _____
31. Amount of off-street parking to be provided:_____
(a) Will there be a structure? _____ If so, how many aboveground levels? _____
32. Projected number of employees: _____ total _____ per shift. For agricultural projects, give maximum number of employees at harvesting time: _____; and specify harvesting times:_____
33. What will be the hours of operation? _____
34. Describe the proposed scheduling or phasing of the project: _____
35. For restaurants, how many seats will there be?_____
36. If applicable, describe the project's relationship to larger projects or series of projects:
37. What percentage of the project site will be covered by:
Paving _____%; Buildings _____%; Landscaping _____%
38. Does the project involve the handling, storage or disposal of any toxic or hazardous substance?_____ If so, what safety measures have been incorporated into the project:_____
39. Will the project result in the emission of any odor, vibration, glare or electrical disturbance?_____

**ENVIRONMENTAL SETTING:**

40. Please attach copies of any special studies that have been prepared in regard to this project or the project site. Examples would include: archaeological survey, biological survey, noise study, geo-technical report, slope analysis, traffic analysis, environmental impact reports, etc. Studies are attached and included in submittal materials.

41. Describe the following environmental conditions as they presently exist: (Use additional sheets, if necessary)

(a) Topography Project Site:
The site slopes from northeast to southwest at an average slope of 6% - 7%, there is approximately 18' of elevation difference across the site.
Within ½ mile: The surrounding area slopes from east to west.

(b) Water Bodies Project Site:

Within ½ mile: The pacific ocean is about 0.75 miles away.

(c) Vegetation Project Site:
The site is vacant and contains no vegetation outside of grass.

(d) Wildlife Project Site:
No wildlife observed on-site.

(e) Historical/Archaeological/Paleontological Resources Project Site:
No resources were identified within the project site.
Within ½ mile:_____

(f) Land Use Project Site:
Mixed Use Residential Development within the Downtown Subdistrict D-2
Within ½ mile:_____

42. Has the project site been previously graded? Correct.
If so, what percent of the site was graded? 100% of the site was graded due to historical uses.
43. If mature trees, wetlands, or riparian vegetation exist on site, please attach a map indicating their location. None exist.
44. Does the project contain slopes of more than 10 percent? No. If the project area includes hillsides with slopes of 20 percent or more, the Hillside Development Regulations require that a slope analysis be provided, even if the slopes are not to be graded. The slope analysis must be done on an accurate and recent topographic map with minimum five (5) foot contour lines and a scale of at least 200 feet. The slope categories must be as follows: slopes of less than 20 percent; slopes of 20-40 percent; and slopes over 40 percent. Within these areas, the following must be depicted and labeled: areas with slopes of 20-40 percent and a minimum 50-foot differential, and areas with slopes of more than 40 percent and having a 25-foot differential. The site slopes from northeast to southwest at an average slope of 6% - 7%, there is approximately 18' of elevation difference across the site.
45. Describe any existing structures on the project site and the current use of the structures No structures exist on site.

**ENVIRONMENTAL IMPACT:**

46. What is the street classification of proposed new streets? (e.g., "two-lane collector" or "four-lane major street", per Circulation Element of the General Plan) No new streets proposed.
47. What is the percentage grade of the steepest street involved in the project? N/A
48. What is the right-of-way standard for proposed new streets? (e.g., private, dedicated, to be acquired, etc.) N/A
49. If new water mains for this project will serve areas beyond the project boundary, please indicate the approximate service area on the map. Project intends to connect in at N Horne St & Seagaze Dr.
50. If new sewer mains for this project will serve areas beyond the project boundary, please indicate the approximate service area on the map. Project intends to connect in at N Horne St & Seagaze Dr.
51. Describe the improvements and extensions of existing electrical lines that will be required to serve the project. Project will work with SDG&E to abandon the gas line in the alley and design a dsitribution system to serve the site. In addition, the franchise utilities within the alley will be undergrounded.
52. If improvements are to be demolished or removed by the project, please describe them briefly. N/A
53. Identify any roadway or train track located within 500 feet of the project site. Please see project PIF
54. List any other potential noise sources which could affect the project site (i.e., industrial projects, etc.) and give approximate distances. No noise impacts anticipated.
55. Describe any noise that will be produced by the project during construction and after the project is completed. (Include equipment operation, blasting, etc. None
56. Estimate the number of motor vehicle trips generated by the project site currently: Please see project PIF ; after development Please see project PIF.
57. If the project is commercial or industrial, list any air pollutants that the project will emit.
58. To what extent will be project be located within a floodplain? (Specify whether U.S. Army Corps of Engineers Standard Project Flood or 100-year flood.) Not located within FEMA Flood Hazard Area
59. If the drainage from the project will not be discharged into an existing public stormwater drainage system, please describe how it will be accommodated.
Proprietary Bio-filtration is anticipated to be used to treat stormwater runoff. Treated water will be discharged to the public right-of-way.

60. What percentage of the project site will be graded? 100 %
61. Volume of cutting: 58,400 cubic yards; maximum cut-slope ratio will be 2:1; maximum cut-slope height will be 35.1 Depth feet.
62. Volume of fill: 0 cubic yards; maximum fill-slope ratio will be 2:1; maximum fill-slope height will be 0 feet.
63. Does the cut-and-fill volume balance? No. If not, how will import/export be handled? Export
64. Will the entire site be graded with the first phase? Yes If not, indicate those areas that will be left natural and those areas that will be used as temporary borrow sites. If so, please describe:
65. Will the project extract or preclude the extraction of any rock, sand, gravel, or other mineral resources? Soil If so, please describe:
66. Describe or indicate on a map any areas of vegetation to be removed by the project (May be combined with Item 40). N/A

**CERTIFICATION**

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements, and information presented are true and correct to the best of my knowledge or belief.

Date 05/21/24 Signature of Preparer

For 901 Mission Ave, Oceanside, CA

# Climate Action Plan (CAP) Consistent Checklist

For New Development Subject to Environmental Review
per the California Environmental Quality Act (CEQA)

With the adoption of the **Climate Action Plan (CAP)** on May 8, 2019, the City of Oceanside committed to measures designed to reduce local greenhouse gas (GHG) emissions in a manner consistent with state emissions reduction goals. In addition to City initiatives and voluntary community efforts, these measures include **requirements for certain types of new development**. These requirements promote local renewable energy generation, electric vehicle charging infrastructure, urban forestry, reduction in single-occupancy vehicle trips, recycled water use, and other efforts that reduce the City's carbon footprint while enhancing its energy and water independence.

The **CAP Consistency Checklist (Checklist)** consolidates these requirements within a single document, allowing for streamlined compliance review.

The **California Environmental Quality Act (CEQA)** requires that the potential GHG emissions impacts of new development be analyzed, and that significant emissions impacts be mitigated to the extent feasible. Under CEQA, local jurisdictions can establish their own significance thresholds for GHG emissions impacts.

The City of Oceanside has set a significance threshold that aligns with the City's emissions reduction targets as outlined in the CAP (3.5MT $CO_2^e$ per service population). This threshold is discussed in a policy directive that can be furnished upon request. While applicants can choose to conduct project-specific GHG emissions analysis to demonstrate compliance with the City's significance threshold, conforming to the requirements consolidated in the Checklist may be a more expeditious way to address CEQA requirements.

Applicants who choose to utilize the Checklist should factor the associated requirements into the project design process and submit the Checklist concurrently with the initial entitlement application.

# Project Information

## Contact Information

Project Number: _____ Project Name: 901 Mission Avenue Mixed Use

Property Address/APN: 901 Mission Avenue - APN 147-196-10-00

Applicant: JPI

Address: 11988 El Camino Real Suite 200, San Diego, CA 92130

Phone Number: 941-587-0210 Email: conner.kloeppel@jpi.com

Is the Checklist being prepared by a professional consultant? ◉ Yes ○ No

Consultant Firm: Birdseye Planning Group Point of Contact: Ryan Birdseye

Phone Number: 760-712-2199 Email ryan@birdseyeplanninggroup.com

## Project Description

Project Site Area (Acres): 1.5 Status: ☑ Vacant ☐ Developed

If the site is developed, describe nature of existing development: Site is vacant and bisected by a paved street segment that will be removed.

Located within a Smart Growth Opportunity Area? ◉ Yes ○ No

Located within ¼ mile of a priority corridor? ◉ Yes ○ No

Consistent with current land use and zoning designations? ◉ Yes ○ No

Proposed land use(s): ☑ Residential ☐ Commercial ☐ Industrial ☐ Institutional

Residential density: 178/acre Percentage of maximum allowable density: _____ Density bonus project

Commercial FAR: _____ Percentage above minimum commercial FAR: _____

Industrial FAR: _____ Percentage of permeable surface area: _____

# Applicability

In accordance with Section 15183.5 of the California Environmental Quality Act (CEQA), the Checklist provides for streamlined review of projects subject to environmental review, offering an alternative to project-specific analysis of GHG emissions impacts. The Checklist is available to projects that meet locational requirements that further the City's efforts to facilitate housing and employment growth in walkable, transit-served areas, as well as projects that either 1) conform to current land use and zoning standards or 2) involve uses that would generate less GHG emissions than those allowed under current standards. Projects not located in walkable, transit-served areas are subject to additional Checklist requirements designed to ensure that such projects

The Checklist is not mandatory. As part of the CEQA process, applicants can choose to mitigate significant GHG emissions impacts by other means. However, the City, as the lead agency for the CEQA process, reserves its discretion to determine if proposed mitigation measures are appropriate and adequate. For example, the City may or may not be amenable to out-of-jurisdiction carbon offsets as a means of mitigating significant GHG emissions impacts, based on the feasibility of on-site mitigation measures, opportunities for local offsets, etc.

Consistent with California's Climate Change Scoping Plan, the City has established a bright line threshold of significance for GHG emissions impacts: 900MT annually, with construction-related emissions amortized over 20 years. Projects that fall under this threshold are not required to conduct analysis of GHG emissions impacts, and thus would not benefit from the Checklist.

CEQA-exempted projects may still be subject to CAP measures. Requirements for on-site renewable energy generation, electric vehicle charging facilities, and transportation demand management (TDM) are triggered by project type and scale, as outlined in Section 3047 of the City's Zoning Ordinance.

The applicability of the Checklist may evolve in response to the City's progress in achieving its emissions reduction goals, new state policies or regulations, new methods of mitigating GHG emissions, etc. When the CAP is periodically updated, it is likely that the Checklist will need to be revised to accord with new or modified emissions reduction measures. The CEQA-qualified status of the CAP, which is the basis for its legal enforceability, relies upon a Checklist that ensures that new development supports the City's emissions reduction goals.

# Checklist

## Land Use Consistency

The City seeks to accommodate future housing and job growth primarily through infill and redevelopment within already urbanized areas. Specifically, the City seeks to facilitate new residential and employment-oriented development within SANDAG-designated Smart Growth Opportunity Areas and prior corridors (i.e., Coast Hwy, Mission Avenue, Oceanside Blvd, Vista Way). To this end, the Checklist includes locational criteria for new development subject to CEQA review.

Does the project meet one or more of the following locational criteria?

1) The project site is located within a designated Smart Growth Opportunity Area[1].

   ☑ Yes ☐ No

2) The project site is located within ¼ mile of a priority TOD corridor, as determined by the Smart and Sustainable Corridors Plan and/or SB 743 screen-out boundaries.

   ☒ Yes ☐ No

3) The project is consistent with current land use and zoning designations.

   ☒ Yes ☐ No

4) The project requires amendment of current land use and zoning designations. As demonstrated through a detailed analysis a) consistent with the precedent in the surrounding zoning district and b) subject to third party expert review, the proposed land uses would generate less GHG emissions than those associated with uses allowed under current land use and zoning designations.

   ☐ Yes ☒ No

[1] Smart Growth Opportunity Areas shall be defined as the half-mile radius around transit facilities identified on the current version of the SANDAG Smart Growth Concept Map.

Projects that do not qualify under any of the above criteria are not eligible for the Checklist. Projects that qualify under Criteria 3 or 4 are subject to additional Checklist requirements, as specified below.

## CAP Measure Consistency

### Renewable Energy Facilities

Outlined in Section 3047 of the City's Zoning Ordinance, this Checklist requirement applies to the following types of new development:

- Residential projects that include 25 or more dwelling units
- Commercial projects that comprise at least 12,500 square feet of habitable space
- Industrial projects that comprise at least 25,000 square feet of habitable space
- Institutional projects that comprise at least 12,500 square feet of habitable space

Does the project meet one or more of the above-noted thresholds?

☒ Yes ☐ No

If yes, will at least 50 percent of estimated electricity demand be met with on-site renewable, emissions-free energy supply (e.g., solar photovoltaic facilities)?

☑ Yes ☐ No

If no, will the project purchase an energy portfolio comprised of at least 75 percent renewable, emissions-free electricity?

☑ Yes ☐ No

### Electric Vehicle Parking and Charging Facilities

Outlined in Section 3047 of the City's Zoning Ordinance, this Checklist requirement is applicable to new development that requires at least five (5) parking spaces.

Is the project subject to this requirement?

☒ Yes ☐ No

If yes, how many electric vehicle parking stalls is the project required to provide?

155

If yes, how many electric vehicle charging stations is the project required to provide?

32

Briefly describe where the required parking spaces and charging stations will be located within the project site. Note the plan sheet(s) on which the parking spaces and charging stations are depicted.

Locations within garage are to be determined

## Recycled Water Infrastructure

The applicability of this requirement is determined by the City's Water Utilities Department. Does the Water Utilities Department require that the project install infrastructure to provide for recycled water service?

☐ Yes ☑ No

If yes, will the project install the required infrastructure?

☐ Yes ☑ No

If yes, please briefly describe how the project will fulfill this requirement.

Not Applicable.

_____

_____

_____

## Transportation Demand Management (TDM)

As outlined in Section 3047 of the City's Zoning Ordinance, the City requires that all new non-residential development expected to generate at least 50 daily employee commute trips prepare and implement a transportation demand management (TDM) plan that achieves a minimum 20 percent alternative commute mode share, with alternative commute modes being those that don't involve single-occupancy vehicle commute trips in combustion engine vehicles. The City does not prescribe specific TDM measures but rather allows developers and employers to tailor their TDM plans to suit their business location and operations.

Is the project subject to this requirement?

☐ Yes ☒ No

If yes, does the applicant accept this requirement as a condition of project approval?

☐ Yes ☐ No

If yes, please provide a preliminary indication of the resources that will be utilized to prepare the TDM Plan (e.g., qualified traffic consultant, SANDAG Mobility Management Toolbox).

_____

_____

_____

_____

_____

The TDM Plan must include a monitoring and reporting program that commits the project to submitting a bi-annual status report to the City. Does the applicant agree to conduct ongoing monitoring and reporting of employee commuting choices?

☐ Yes ☐ No

## Urban Forestry

As part of its urban forestry efforts, the City requires that all new development establish a minimum tree canopy and permeable surface area. When meeting the minimum tree canopy and permeable surface area requirements on the project site is determined to be infeasible, applicants can pursue alternatives. Listed in order of preference, these alternatives include installing trees in adjacent public parkways, installing trees elsewhere in the City (subject to review and approval by the Public Works Department), or paying into the City's Tree Fund, should such a fund be established. Minimum tree canopy and permeable surface area requirements are outlined in Section 3049 of the City's Zoning Ordinance.

Does the project comply with minimum tree canopy and permeable surface area requirements?

☒ Yes ☐ No

12% tree canopy
22% permeable surface

If yes, do the applicant and successors agree to maintain minimum tree canopy and permeable surface area throughout the life of the project?

☒ Yes ☐ No

Does the applicant intend to pursue one of the above-noted alternatives to establishing minimum on-site tree canopy?

☐ Yes ☒ No

If yes, which alternative does the applicant intend to pursue?

☐ Tree installation in the adjacent public parkway

☐ Tree installation elsewhere in the City, as approved by the Public Works Department

☐ Payment into the City's Tree Fund, in an amount determined by the Public Works Department

If one of the above-noted alternatives is proposed, please explain why compliance with the on-site requirement is infeasible and why the proposed alternative is the most appropriate option.

_____

_____

_____

_____

_____

_____

_____

_____

## Food Scraps Recycling Program

In accordance with state law (AB 1826 and SB 1383), all non-residential uses are required to participate in the City's Food Scraps Recycling Program, which involves placement of food scraps in a separate bin for separate processing. The City's Water Utilities Department and Waste Management of North County provide free technical assistance and training for businesses and their employees.

Is the project subject to this requirement?

☐ Yes ☒ No

If yes, does the applicant agree to ensure that all business owners and employees associated with the project participate in relevant training?

☐ Yes ☐ No

## Oceanside Green Business Network (Voluntary)

Supported by the City's Water Utilities Department, the Oceanside Green Business Network is a free program that encourages environmental stewardship in the local business community and provides members with strategies designed to help them thrive in the green economy. While membership is voluntary, applicants for non-residential development as well as those operating businesses within the development are strongly encouraged to join the Network. Membership is contingent upon earning a minimum score on the Network's Sustainability Scorecard.

Does the applicant intend to join and promote membership in the Oceanside Green Business Network?

☐ Yes ☐ No

## Energy Efficiency Audits & Analysis (Applicable to Projects Not Meeting Locational Criteria 1 or 2)

San Diego Gas and Electric (SDG&E) offers a variety of energy audits and evaluations for both residential and non-residential ratepayers. These programs identify opportunities for enhanced energy efficiency, which can result in lower energy costs. SDG&E services for non-residential development include the Comprehensive Audit Program and the Facility Assessment Service Program. Applicants for non-residential development located outside of Smart Growth Opportunities areas or a ¼-mile radius of a priority corridor are required to participate in one of the above-noted programs no sooner than one year and no later than two years after initial building occupancy. Applicants are not required to implement the recommendations of the audit.

Is the project subject to this requirement?

☐ Yes ☒ No

If yes, does the applicant agree to participate in an SDG&E energy efficiency audit program within the above-noted timeframe?

☐ Yes ☐ No

## Mitigation of Per Capita Vehicle Miles Traveled (VMT) above Baseline (Applicable to Projects Not Meeting Locational Criteria 1 or 2)

Consistent with state law (AB 743), the City's CEQA review process includes assessment of impacts on vehicle miles traveled (VMT). In general, projects located in walkable, transit-rich areas are expected to generate less VMT than those located in peripheral areas with more dispersed land use patterns. Projects not meeting locational criteria 1 or 2 are required to incorporate project features that reduce VMT by at least 15 percent below the regional average, consistent with the City's Traffic Impact Analysis Guidelines for Vehicle Miles Traveled (VMT) and Level of Service Assessment.

Is the project subject to this requirement?

☐ Yes ☒ No

If yes, will the project include features that will reduce estimated VMT by at least 15 percent below the regional average, consistent with the City's Traffic Impact Analysis Guidelines for Vehicle Miles Traveled (VMT) and Level of Service Assessment?

☐ Yes ☐ No

## STAFF DETERMINATION REGARDING CHECKLIST COMPLIANCE

Does the project comply with the City's CAP Consistency Checklist?

☐ Yes ☐ No

If not, what additional information and/or commitments are required?

_____

_____

_____

_____

_____

_____

_____

_____

_____

Staff Reviewer: Nathalie Vazquez

Staff Email: navazquez@oceansideca.org

Date: 6/18/2025

# *901 MISSION AVENUE MIXED-USE PROJECT*

## NOISE REPORT

**Prepared for:**

Conner Kloeppel, CFA
Development Manager, West Region
JPI Companies, Inc.
11988 El Camino Real Suite 200
San Diego, CA 92130

**Prepared by:**

BPG
BIRDSEYE
PLANNING GROUP

June 2025

## EXECUTIVE SUMMARY

The proposed Project (Project) is located on an undeveloped 1.5-acre site comprising the block bounded by Mission Avenue (north), South Horne Street (east), South Clementine Street (west) and Seagaze Drive (south). The site is zoned Downtown Subdistrict 2 and is bisected by an unnamed paved street corridor. This street segment would be vacated as part of the proposed Project. The project would develop 273 multifamily apartments and 4,006 square feet (sf) of space for commercial uses. The 273 apartments would be available to serve the housing needs of downtown Oceanside with 10% (28 apartments), reserved for low-income households. The residential rental apartment homes would be located within the upper five floors (3-8) of the building. The commercial space and parking level 1 would be located on the ground floor. Parking levels 2-3 would be subterranean. A total of 328 parking spaces would be provided in a four-level parking garage under the building. Of the four levels, 2.5 would be subterranean. On the Mission Avenue frontage, five parallel parking spaces in addition to a loading zone will be provided.

### Temporary Construction Noise

Consistent with the City's Noise Ordinance, project construction would be limited to the period between 7:00 a.m. and 6:00 p.m. each day, Monday through Friday, and no earthmoving or grading operations shall be conducted on the premises on Saturdays, Sundays or legal holidays. Maximum construction noise levels would not exceed 85 dBA Lmax at 100 feet as stated in the City of Oceanside General Plan. Thus, temporary construction noise impacts would be less than significant.

### Operational Noise

**Traffic.** The proposed project would not have a noticeable effect on traffic-related noise levels. Noise modeling was performed for existing conditions, 2030 Without the Project, 2030 With the Project and 2050 Without the Project and 2050 With the Project. Without the project, traffic noise at Receiver 1 and 3 would exceed 65 dBA. Thus, the project would have a potentially significant impact if the project's traffic contribution exceeded 3 dBA. For all receivers, the greatest increase would between the 2050 No Project and 2050 With Project scenario. The highest increase would be +0.3 dBA at Receivers 1, 2 and 3. The project would not cause noise levels that were (or are projected to be) below 65 dBA CNEL in a without project scenario, to exceed 65 dBA CNEL nor would the project cause an increase of 3 dBA or more for those scenarios where noise levels without the project exceed 65 dBA CNEL. Therefore, traffic noise impacts with the project at all receivers would be less than significant under the applicable thresholds.

The project design incorporates an approximately four-foot tall glass or other solid barrier around the balconies located along the Mission Avenue and North Horne Street frontage and those balconies located along a portion of the North Clementine Street frontage. A wall partition barrier with a single-layer of glass incorporated into the project design will provide 5-10 dBA of

attenuation as sound waves will refract over the top of the barrier. Noise reduction methods are only required for those units on floors two and three facing Mission Avenue and those units on floors one, two and three along North Horne Street. Noise reduction would also be required on the west building face, floors one, two and three from the northwest corner south approximately 100 feet. With that level of attenuation incorporated into the project design for those locations, noise levels at the exterior balconies will meet the significance threshold of 65 dBA.

**Heating, Ventilation and Air Conditioning.** As a design feature, the individual HVAC systems would be located within the building. The HVAC systems for the common areas would be either on the rooftop or within an enclosed space within the building. The rooftop units would be located near the center of the building with a screening wall separating the units from the remaining rooftop area. The pool equipment would be located within a 3rd level interior courtyard and activities in the pool area would not be audible off-site. No impact from stationary sources would occur with the project. Operational noise impacts would be less than significant.

**Temporary Construction-Related Vibration.** Construction activity on the project site would be temporary and vibration events would be transitory occuring only during equipment pass bys. Using vibration levels associated with a large bulldozer, the piece of grading equipment with the highest vibration level, as a worst case scenario, groundborne vibration would be approximately 0.089 PPV at 25 feet. Even conservatively, assuming a clam shovel or vibratory roller would be used on-site when excavating the parking garage or performing other site development activities, those equipment pieces can generate 0.202 PPV and 0.21 PPV, respectively, at 25 feet from the source. If used on-site, they would likely operate in the excavation pit below ground level and the elevation of neighboring properties. The PPV generated by a heavy bulldozer, clam shovel and vibratory roller at 25 feet are below the vibration thresholds of significance referenced above. As stated, the closest sensitive properties are 70 feet from the property line so project generated construction related vibrations would be below those reported in Table 9 herein.

**Operational Vibration.** The proposed project is a multistory residential apartment building. These uses do not generate vibration; thus, no vibration impacts are anticipated to occur with operation of the project. Operational vibration impacts would be less than significant.

**Airport Operations.** There are no private airstrips within the vicinity of the project site. The closest airport to the proposed project site is the Oceanside Municipal Airport, approximately 1.9 miles northeast of the site. The project site is not located within a noise exposure range of 60–75 dB CNEL. Thus, the project residents and employees would not be exposed to excessive noise levels associated with an airport or air strip. Impacts would be less than significant.

# 901 MISSION AVENUE MIXED-USE PROJECT
# OCEANSIDE, CALIFORNIA
## Noise Study

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# 901 MISSION AVENUE MIXED-USE PROJECT
# OCEANSIDE, CALIFORNIA
# NOISE STUDY

This report is an analysis of the potential noise and vibration impacts associated with the 901 Mission Avenue Mixed-Use Project, a multifamily residential development proposed for construction and operation at the southwest corner of Mission Avenue and South Horne Street in the City of Oceanside, California. This study analyzes the potential for impacts associated with construction activity and project operation.

## PROJECT DESCRIPTION

The proposed Project (Project) is located on an undeveloped 1.5 acre site comprising the block bounded by Mission Avenue (north), South Horne Street (east), South Clementine Street (west) and Seagaze Drive (south). The site is zoned Downtown Subdistrict 2 and is bisected by an unnamed paved street corridor. This street segment would be vacated as part of the proposed Project. The project would develop 273 multifamily apartment and 4,006 square feet (sf) of space for commercial uses. The 273 apartments would be available to serve the housing needs of downtown Oceanside with 10% (28 apartments), reserved for low-income households. The residential rental apartment homes would be located within the upper five floors (3-8) of the building. The commercial space and parking level 1 would be located on the ground floor. Parking levels 2-3 would be subterranean. A total of 322 parking spaces would be provided in a four-level parking garage under the building. Of the four levels, 2.5 would be subterranean. On the Mission Avenue frontage, five parallel parking spaces in addition to a loading zone will be provided.

The project would provide a total of 25,866 square foot studio units, 97,589 square foot one-bedroom units and 83,896 square foot two-bedroom units. The units would be arranged in a "stacked flat" configuration. Each unit would be open to an exterior wall along the perimeter of the building or into an interior courtyard that is open to the sky.

Access to the 3-level parking garage is separated would be provided from North Clementine Street. The levels would be connected by ramps; thus, vehicles will circulate between floors. Resident parking will all be assigned. The uppermost (P1) garage level accessible from South North Horne Street provides resident parking controlled by an entry gate. Taking advantage of the site grade, the first (P1) parking level entry is at grade with North Horne Street. The lowest parking level (P3) is below the alley grade. To accommodate the parking garage, approximately 58,400 cubic yards of soil export will be excavated from the site.

Construction of the project is expected to begin in November 2026 and be completed by January 2029. However, 2030 would be the first full year of stabilized occupancy. The project site is shown in Figure 1 - Vicinity Map). The preliminary site plan is shown on Figure 2 – Proposed Site Plan.

**Project Design Features**

The following design features will also minimize potential noise levels at neighboring residential properties during both construction and operation.

- Use of air compressor for application of architectural coatings would be staged within the building when work is occurring proximal to neighboring receivers to reduce equipment noise;

- The Heating, Ventilation and Air Conditioning (HVAC) systems for each unit and interior common areas would be contained within the units or within the building;

- All rooftop HVAC equipment for common areas would be located near the center of the building and behind behind screen walls; and

- The pool area would be located on the 3rd level within an internal courtyard. All equipment would be contained within an enclosed room adjacent to the pool area.

# SETTING

**Overview of Sound Measurement**

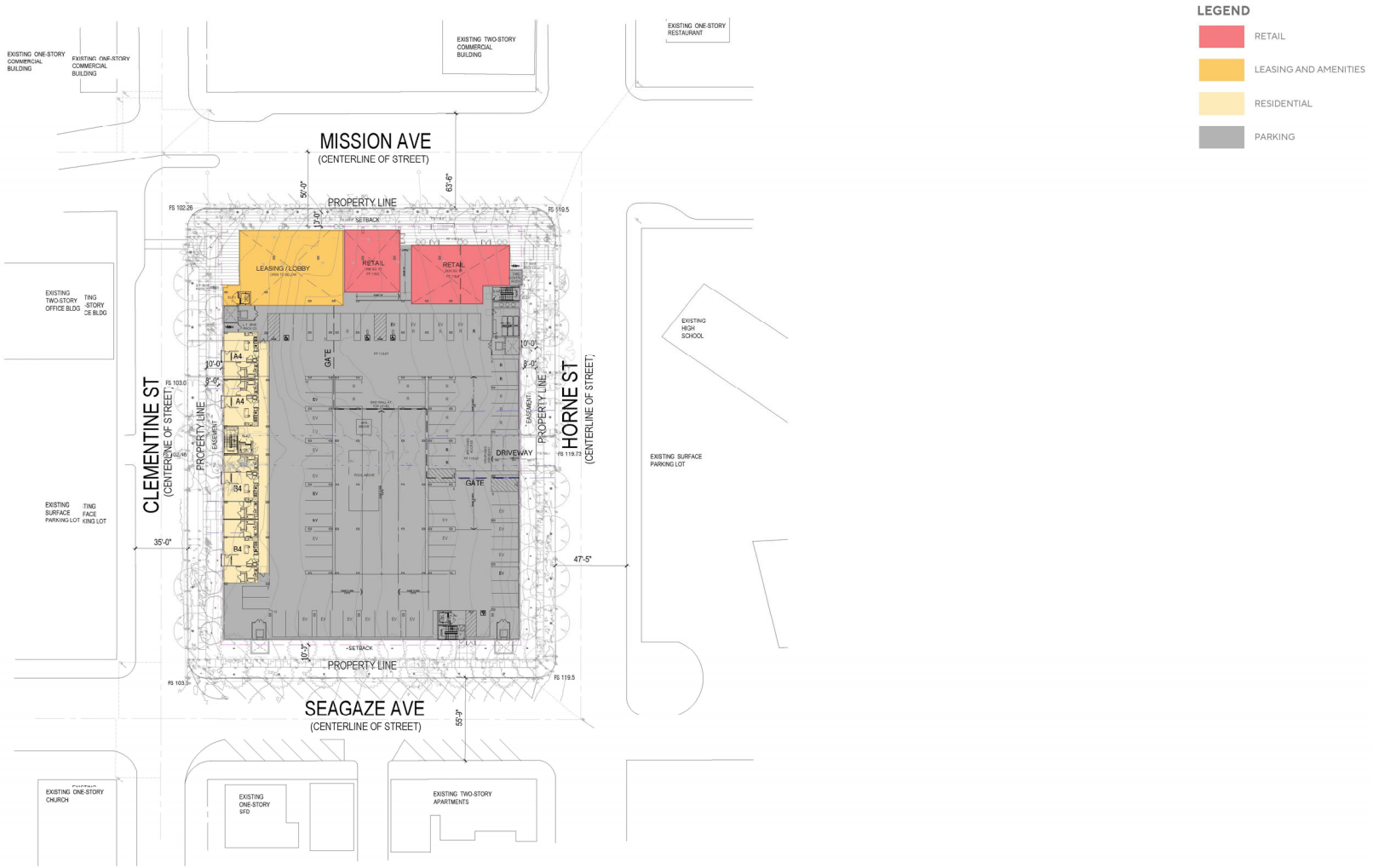
Noise level (or volume/loudness) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz).

Sound pressure level is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dBA, and a sound that is 10 dBA less than the ambient sound level would be half as loud and influence the character of ambient noise without influencing the overall sound level. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise




**Figure 1 - Vicinity Map**

- Project Site




901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

MIXED-USE BUILDING SITE PLAN

1"=30"

0 30' 60' 90' 120'

A1.0

JOB NO. 2023-0939

DATE 05-22-2024

**Figure 2— Site Plan**

levels is noticeable, while 1-2 dB changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40-50 dBA, while arterial streets are in the 50-60+ dBA range. Normal conversational levels are in the 60-65 dBA range, and ambient noise levels greater than 65 dBA can interrupt conversations. Noise levels typically attenuate (or drop off) at a rate of 6 dBA per doubling of distance from point sources (i.e., industrial machinery). Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dBA per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dBA per doubling of distance. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The manner in which older homes in California were constructed (approximately 30 years old or older) generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units and office buildings construction to California Energy Code standards is generally 30 dBA or more (FTA 2018).

In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound pressure level is the equivalent noise level (Leq). The Leq is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time (essentially, the average noise level). Typically, Leq is summed over a one-hour period. Lmax is the highest RMS (root mean squared) sound pressure level within the measuring period, and Lmin is the lowest RMS sound pressure level within the measuring period.

The time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than that which occurs during the day. Community noise is usually measured using Day-Night Average Level (Ldn), which is the 24-hour average noise level with a 10-dBA penalty for noise occurring during nighttime (10 p.m. to 7 a.m.) hours, or Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a 5 dBA penalty for noise occurring from 7 p.m. to 10 p.m. and a 10 dBA penalty for noise occurring from 10 p.m. to 7 a.m. Noise levels described by Ldn and CNEL usually do not differ by more than 1 dB. Table 1 shows sounds levels of typical noise sources in Leq.

## Noise Sensitive Receivers

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with each of these uses. Urban areas contain a variety of land use and development types that are noise sensitive including residences, schools, churches, hospitals and convalescent care facilities. Nearby noise sensitive receivers (NSRs) are single- and multifamily

## Table 1
## Sound Levels of Typical Noise Sources and Noise Environments

| Noise Source (at Given Distance) | Noise Environment | A-Weighted Sound Level (Decibels) | Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels*) |
|---|---|---|---|
| Military Jet Takeoff with Afterburner (50 ft) | Carrier Flight Deck | 140 | 128 times as loud |
| Civil Defense Siren (100 ft) | | 130 | 64 times as loud |
| Commercial Jet Take-off (200 ft) | | 120 | 32 times as loud **Threshold of Pain** |
| Pile Driver (50 ft) | Rock Music Concert Inside Subway Station (New York) | 110 | 16 times as loud |
| Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft) | | 100 | 8 times as loud **Very Loud** |
| Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft) | Boiler Room Printing Press Plant | 90 | 4 times as loud |
| Garbage Disposal (3 ft) | Noisy Urban Daytime | 80 | 2 times as loud |
| Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft) | Commercial Areas | 70 | Reference Loudness **Moderately Loud** |
| Normal Speech (5 ft) Air Conditioning Unit (100 ft) | Data Processing Center Department Store | 60 | ½ as loud |
| Light Traffic (100 ft) | Large Business Office Quiet Urban Daytime | 50 | ¼ as loud |
| Bird Calls (distant) | Quiet Urban Nighttime | 40 | 1/8 as loud **Quiet** |
| Soft Whisper (5 ft) | Library and Bedroom at Night Quiet Rural Nighttime | 30 | 1/16 as loud |
| | Broadcast and Recording Studio | 20 | 1/32 as loud **Just Audible** |

| | | | |
|---|---|---|---|
| | | 0 | 1/64 as loud<br>**Threshold of Hearing** |

Source: Compiled by dBF Associates, Inc., 2016

residences located adjacent to and south/southwest of the site along Seagaze Drive, South Clementine Street and South Horne Street. Classrooms that are part of the Oceanside High School campus are located on the north side of North/South Horne Street adjacent to the site. The closest receiver to the south/southeast are multi-family residences at 101 South Horne Street, across the street and approximatey 70 feet from the project site property line. The Oceanside High School property line is approximately 70 feet northeast of the site. The commercial uses to the north/northwest across Mission Avenue and west/southwest across South Clementine Street are not considered sensitive for the purpose of this evalution. Figure 3 shows the closest noise sensitive receivers and distances from the project site.

## Project Site Setting

The project area is urbanized and located at the southwest corner of the Mission Avenue and North Horne Street intersection. The site is approximately 1,200 feet (as measured from the southbound on-ramp to the northeast corner of the site) wesr/southwest of Interstate 5 and approximately 1,900 feet east/northeast of the Los Angeles-San Diego (LOSSAN) rail corridor. The southwest corner of the Oceanside High School campus is located east of the site across North Horne Street. Multifamily development is located to the north/northwest and west. Commercial/office uses are located to the north/northwest, west/southwest. Multifamily residences are located to the south/southwest/southeast. The most common and primary sources of noise in the project site vicinity are motor vehicles (e.g., automobiles and trucks) operating on Mission Avenue, Seagaze Drive, North/South Horne Street and North/South Clementine Street. Interstate 5 is not audible over the traffic operating adjacent to the site. Motor vehicle noise, because of the high number of individual events, can create a sustained noise level. Aircraft overflights occur but do not noticeably contribute to the ambient noise environment.

To gather data on the general noise environment at the project site, four weekday morning 15-minute noise measurements were taken on the site on April 11, 2024 using an ANSI Type II integrating sound level meter. The predominant noise source was traffic. The temperature during the monitoring episodes was 65 degrees Fahrenheit with 1-2 mile per hour westerly wind and 90% cloud cover. A second set of measurements was taken on March 18, 2025 during the evening peak hour (4:00 p.m. to 6:00 p.m.) at the same locations. The temperature during monitoring was 67 degrees Fahrenheit with 1-2 mile per hour westerly wind and 10% cloud cover.




**Figure 3 - Noise Sensitive Receivers**

- Project Site

Monitoring Site M1 is located on the southern site boundary adjacent to Seagaze Drive mid-block between North Horne Street and North Clementine Street. Traffic from both North/South Horne Street and Seagaze Drive contributes to ambient conditions at this location. During monitoring, 26 cars/light trucks, zero medium trucks (six tires/two axles) and zero heavy truck (all vehicles with three or more axles) passed the site and approximately 74 cars/light trucks, zero medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed the site on North/South Horne Street. Monitoring Site M2 is located at the southwest corner of the site adjacent to the Seagaze Drive and North/South Clementine Street intersection. During monitoring, approximately 45 cars/light trucks, four medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed the site on North/South Clementine Street and 85 cars/light trucks, zero medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed the site on Seagaze Drive. Monitoring Site M3 is located at the northeast corner of the site adjacent to the Oceanside High School campus. During monitoring, approximately 269 cars/light trucks, seven medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed the site on Mission Avenue and 148 cars/light trucks, four medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed the site on North Horne Street. Monitoring Site M4 is located along Mission Avenue mid-block between North Horne Street and North Clementine Street. During monitoring, approximately 181 cars/light trucks, four medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed the site on Mission Avenue.

As stated, a second set of measurements were taken on March 18, 2025 at the same locations identified above. During monitoring, approximately 77 cars/light trucks, one medium truck (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed the Site M1 on Seagaze Avenue and 47 cars/light trucks, zero medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed the site on South Clementine Street. During monitoring, approximately 76 cars/light trucks, zero medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed site M2 on Seagaze Drive. During monitoring, approximately 168 cars/light trucks, two medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed site M3 on South Horne Street and 252 cars/light trucks, two medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed site M3 on Mission Avenue. During monitoring, approximately 181 cars/light trucks, zero medium trucks (six tires/two axles) and zero heavy trucks (all vehicles with three or more axles) passed site M4 on Mission Avenue. Table 2 identifies the noise measurement location and measured noise level.

The monitoring location is shown in Figure 4. As shown in Table 2, during the April 11, 2024 monitoring period, the measured Leq was 54.7 dBA at Site M1, 62.2 dBA at Site M2, 66.1 dBA at Site M3 and 63.0 dBA at Site M4. During the March 18, 2025 monitoring period, . the measured Leq was 55.3 dBA at Site M1, 63.5 dBA at Site M2, 66.1 dBA at Site M3 and 66.7 dBA at Site M4.

The monitoring data sheets are provided in Appendix A.

**Table 2**
**Noise Monitoring Results**

| Measurement Location | Primary Noise Source | Sample Time | Leq (dBA) |
|---|---|---|---|
| April 11, 2024 | | | |
| M1. Southern site boundary mid-block between North Horne Steet and North Clementine Street. | Traffic | April 11, 2024 12:38 -12:53 p.m. | 54.7 |
| M2. Southwestern corner of the site at the intersection of Seagaze Avenue and North Clementine Street. | Traffic | April 11, 2024 12:59–1:14 p.m. | 62.2 |
| M3. Northeastern corner of site adjacent to Oceanside High School campus at northeast corner of North Horne Street and Mission Avenue. | Traffic | April 11, 2024 1:22-1:37 p.m. | 66.1 ($L_{10}$) |
| M4. Northern site boundary mid-block between North Clementine Street and North Horne Street | Traffic | April 11, 2024 1:43 p.m.-1:58 p.m. | 63.0 |
| March 18, 2025 | | | |
| M1. Southern site boundary mid-block between North Horne Steet and North Clementine Street. | Traffic | March 18, 2025 4:40 – 4:55 p.m. | 55.3 |
| M2. Southwestern corner of the site at the intersection of Seagaze Avenue and North Clementine Street. | Traffic | March 18, 2025 5:00 – 5:15 p.m. | 63.5 |
| M3. Northeastern corner of site adjacent to Oceanside High School campus at northeast corner of North Horne Street and Mission Avenue. | Traffic | March 18, 2025 5:41 – 5:56 p.m. | 66.1 |
| M4. Northern site boundary mid-block between North Clementine Street and North Horne Street | Traffic | March 18, 2025 5:20 – 5:35 p.m. | 66.7 |

*Source: Field visit using ANSI Type II Integrating sound level meter.*
*Note – the measured L10 is used for site M3 (April 11, 2024 monitoring period) to account to siren passby during last one minute of monitoring episode*

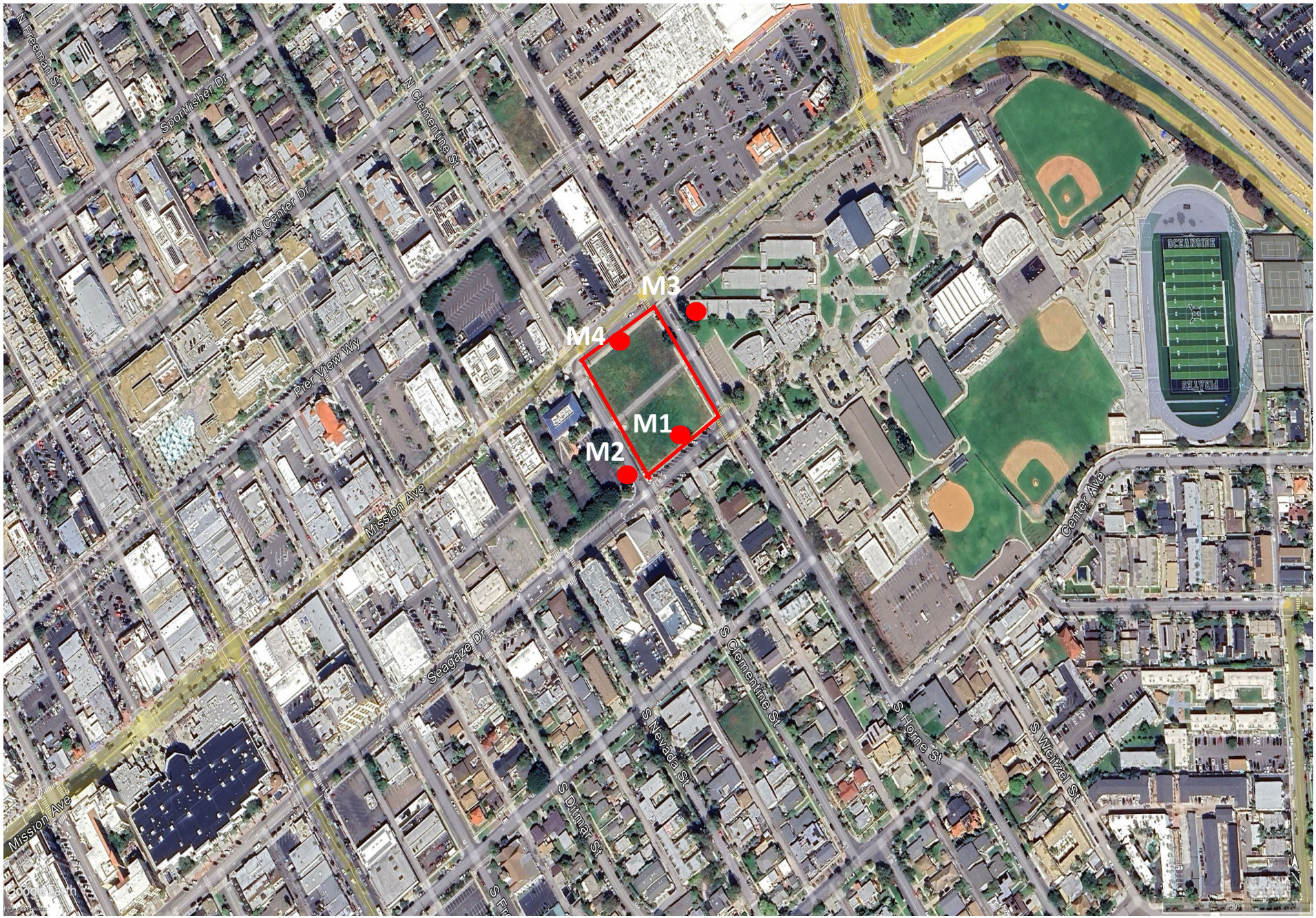



**Figure 4 - Noise Monitoring Locations**

- Project Site

## Regulatory Setting

## Noise Standards and Policies

## State of California

In 1976, the California Department of Health, State Office of Noise Control published a recommended noise/land use compatibility matrix which many jurisdictions have adopted as a standard in their general plan noise elements. The California State Office of Planning and Research 2017 updates to the General Plan Guidelines, Appendix D Noise Element Guidelines, Figure 2, shows that exterior noise levels up to 60 dBA (CNEL or Ldn) are normally compatible for low density single-family residences, duplexes and mobile homes. Noise levels up to 70 dBA (CNEL or Ldn) are conditionally compatible in urban settings like the project site for

multifamily residences. The term "normally compatible" refers to conmpatibility with the ambient outdoor noise environment for the land use type referenced such that interior noise levels are adequately attenuated without implementation of specific noise reduction measures. Whereas, "conditionally compatible" refers to exterior ambient conditions that require the use of construction materials and methods or mitigation to achieve interior noise standards for the specified land use type.

### California Green Building Code

Section 5.507.4.2 of the 2019 California Green Building Code (CALGreen) stipulates that for buildings exposed to a noise level of 65 dB or more when measured as a 1-hour Equivalent Sound Level (Leq), the building façade, including walls, windows, and roofs, shall provide enough sound insulation so that the interior sound level from exterior sources does not exceed 50 dBA during any hour of operation. This applies to non-residential occupancies only.

### California Building Code

Section 1206.4 Allowable Interior Noise Levels of California Building Code 2022, the interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL) consistent with noise element of the local general plan.

## City of Oceanside Noise Level Compatibility Standards

The Noise Element of the City's General Plan (June 2002) establishes target maximum noise levels in the City. The Noise Element provides the following limitations on construction noise:

1. It should be unlawful for any person within any residential zone or 500 feet therefrom to operate any pile driver, power shovel, pneumatic, power hoist, or other construction equipment between 8:00 p.m. and 7:00 a.m. generating an ambient noise levels of 50 dBA at any property line unless an emergency exists.

2. It should be unlawful for any person to operate any construction equipment at a level in excess of 85 dBA at 100 feet from the source.

3. It should be unlawful for any person to engage in construction activities between 6:00 p.m. and 7:00 a.m. when such activities exceed the ambient noise level by 5 dBA. A special permit may be granted by the Director of Public Works if extenuating circumstances exist.
In addition, the Noise Element addresses nuisance noise and states that it should be unlawful for any person to make or continue any loud, unnecessary noise that causes annoyance to any reasonable person of normal sensitivity.

## Noise Element Policies

- Noise levels shall not be so loud as to cause danger to public health in all zones except manufacturing zones where noise levels may be greater;
- Noise shall be controlled at the source where possible;

- Noise shall be intercepted by barriers or dissipated by space where other controls fail or are impractical;

- Noise levels shall be considered in any change to the Land Use and Circulation Elements of the General Plan; and

- Noise levels of City vehicles, construction equipment, and garbage trucks shall be reduced to acceptable levels.

## City of Oceanside Noise Ordinance

Chapter 38 of the Oceanside Municipal Code governs operational noise and contains the maximum one-hour average sound levels for various land uses (Table 3) generated by sources within or affecting each land use zone. The Noise Ordinance sets an allowed level for commercial zones, noise generation is limited to 65 dBA Leq from 7:00 a.m. to 9:59 p.m. and 60 dBA Leq from 10:00 p.m. to 6:59 a.m. Noise levels within the Downtown zone are limited to 65 dBA from 7:00 a.m. to 9:59 p.m. and 55 dBA Leq from 10:00 p.m. to 6:59 a.m. Where two land use zones abut one another, the more restrictive noise limit is enforced along the common boundary between the two land uses.

**Table 3**
**City of Oceanside Exterior Noise Standards**

| Base District Zone | Applicable Limit (dBA) | Time Period |
|---|---|---|
| Residential Estate, Single-Family Residential, Medium Density Residential, Agricultural, Open Space | 50<br>45 | 7:00 a.m. to 9:59 p.m.<br>10:00 p.m. to 6:59 a.m. |
| High Density, Residential Tourist | 55<br>50 | 7:00 a.m. to 9:59 p.m.<br>10:00 p.m. to 6:59 a.m. |
| Commercial | 65<br>60 | 7:00 a.m. to 9:59 p.m.<br>10:00 p.m. to 6:59 a.m. |
| Industrial | 70<br>65 | 7:00 a.m. to 9:59 p.m.<br>10:00 p.m. to 6:59 a.m. |
| Downtown | 65<br>55 | 7:00 a.m. to 9:59 p.m.<br>10:00 p.m. to 6:59 a.m. |

Source: City of Oceanside Municipal Code Section 38.12 – General Sound Level Limits

Construction activities are subject to Section 38.17 (h) of the Noise Ordinance, which specifically prohibits the operation of any pneumatic or air hammer, pile driver, steam shovel, derrick, steam, or electric hoist, parking lot cleaning equipment or other appliance, the use of which is attended by loud or unusual noise, between the hours of 10:00 p.m. and 7:00 a.m.

Section 38.16 prohibits nuisance noise as recommended in the General Plan Noise Element. It is unlawful for any person to make, continue or cause to be made or continued, within the limits of the City of Oceanside, any disturbing, excessive, or offensive noise that causes discomfort or annoyance to reasonable persons of normal sensitivity.

No specific noise standards are provided for school uses. The City of San Diego Calfornia Environmental Quality Act (CEQA) Significance Determination Thresholds (September 2022), Table K-2, establishes traffic noise standards for various land uses. The threshold for school uses is 65 dBA for usable exterior space. This is consistent with the neighboring Downtown zoning designation; and thus, is uses herein for for addressing traffic noise levels at the portion of the Oceaside High School campus adjacent to North Horne Street. For stationary noise purposes, the school is  considered a residential use.

## City of Oceanside Engineering Design Manual

Construction noise in Oceanside is governed by the City Engineering Design Manual, General Notes section, Grading Plan Design Notes, Note 20; states the following:
"All operations conducted on the premises, including the warming up, repair, arrival, departure, or running of trucks, earthmoving equipment, construction equipment, and any other associated equipment shall be limited to the period between 7:00 a.m. and 6:00 p.m. each day, Monday through Friday, and no earthmoving or grading operations shall be conducted on the premises on Saturdays, Sundays or legal holidays, unless waived by the City

Engineer."https://www.ci.oceanside.ca.us/government/development-services/engineering/engineering-manuals/engineering-design-manual

## Vibration Standards and Guidelines

Vibration is a unique form of noise as the energy is transmitted through buildings, structures and the ground whereas audible noise energy is transmitted through the air. Thus, vibration is generally felt rather than heard. The ground motion caused by vibration is measured as peak particle velocity (PPV) in inches per second. Vibration impacts to buildings are generally discussed in terms of PPV which describes particle movement over time (in terms of physical displacement of mass). Vibration can impact people, structures, and sensitive equipment Groundborne vibration generated by construction projects is usually highest during pile driving, rock blasting, soil compacting, jack hammering, and other high impact demolition and excavation-related activities. Grading also has the potential to cause short-term vibration impacts if large bulldozers, loaded trucks, or other heavy equipment operate within proximity to sensitive land uses. Use of the PPV descriptor is common when addressing potential impacts to structures. Per Caltrans standards, excessive ground-borne vibration would occur if construction-related ground-borne vibration exceeds the "severe" vibration annoyance potential criteria for human receptors of 0.4 inch per second PPV or the damage potential criteria to older residential structures of 0.3 inch per second PPV for continuous/frequent intermittent construction sources.

Construction activities referenced above that would generate significant vibration levels are not proposed (i.e., blasting, pile driving, jackhammering). On-site soils, as describe in the Geotechnical Investigation Report (May 2024), are comprised of undocumented fill and Old Paralitic Deposits. The fill generally consists of silty sand with scattered gravel. The fill is unsuitable to support the planned improvements and would be removed during excavation. The Old Paralic Deposits were encountered beneath the undocumented fill and extended through the full depth explored. The material consists of dense to very dense, silty sand, clayey sand, and sand with silt. Cobbles were encountered at a depth of approximately 20 feet below the ground surface. Excavation of these types of soils typically requires equipment such as excavators, back hoes and tractors. On-site soils would not require impact methods, such as rock breaking or blasting, to excavate and remove the soils from the site. To provide information for use in completing the CEQA evaluation, construction-related vibration impacts are evaluated using both PPV and associated VdB criteria. Table 4 shows PPV, approximate VdB and related human reaction and effects on buildings.

Table 5 summarizes the noise standards referenced above that apply to the proposed project.

## Table 4
## Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Traffic Vibration Levels

| Peak Particle Velocity (inches/second) | Approximate Vibration Velocity Level (VdB) | Human Reaction | Effects on Buildings |
|---|---|---|---|
| 0.006–0.019 | 64–74 | Range of threshold of perception. | Vibrations unlikely to cause damage of any type. |
| 0.08 | 87 | Vibrations readily perceptible. | Recommended upper level to which ruins and ancient monuments should be subjected. |
| 0.1 | 92 | Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities. | Virtually no risk of architectural damage to normal buildings. |
| 0.2 | 94 | Vibrations may begin to annoy people in buildings. | Threshold at which there is a risk of architectural damage to normal dwellings. |
| 0.4–0.6 | 98-104 | Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges. | Architectural damage and possibly minor structural damage. |

Source: Caltrans, April 2020

## Table 5
## Project Noise Standards

| Activity | Standard |
|---|---|
| Interior Noise in Project Residences | 45 CNEL |
| Operational Noise (Stationary Equipment) C-Commercial | 65 dBA Leq (1hr) 7:00 a.m. to 10:00 p.m.<br>60 dBA Leq (1hr) 10:00 p.m. to 7:00 a.m. |
| Operational Noise (Stationary Equipment) D-Downtown | 65 dBA Leq (1hr) 7:00 a.m. to 10:00 p.m.<br>55 dBA Leq (1hr) 10:00 p.m. to 7:00 a.m. |
| Operational Noise (Traffic) | CNEL increase of 3 dBA above ambient noise levels at noise sensitive receptors when ambient conditions exceed 65 dBA CNEL or the project causes noise levels to exceed 65 dBA CNEL. |
| Construction Noise | 85 dBA at 100 feet from source. |

| Activity | Standard |
|---|---|
| Ground-borne Vibration | 0.04 PPV for frequent events.<br>0.25 PPV for occasional events. |

# IMPACT ANALYSIS

## Significance Thresholds and Methodology

The following significance criteria are based on Appendix G of the California Environmental Quality Act Guidelines (14 CCR 15000 et seq.) and will be used to determine the significance of potential noise impacts. Impacts to noise would be significant if the proposed project would result in:

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

*(b) Generation of excessive groundborne vibration or groundborne noise levels; or*

*(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.*

Construction noise estimates are based upon noise levels reported by the Federal Transit Administration, Office of Planning and Environment, and the distance to nearby sensitive receptors. Reference noise levels from that document were used to estimate noise levels at nearby sensitive receptors based on the applicable noise attenuation rate of 6 dB per doubling of distance (free field propagation of sound attenuation).

The proposed project would be a new use; thus, noise levels associated with existing and future traffic were based on the difference in trip volumes attributable to the project between existing conditions and the proposed use. A doubling of traffic volumes would be required to cause a noticeable increase (3 dBA) in traffic noise. As stated, measured baseline conditions exceed 65 dBA CNEL, the normally acceptable exterior sound level for residential properties referenced in the General Plan Noise Element, at M3 which is located across from the northeast corner of the site adjacent to the northwest corner of the Oceanside High School campus.. This location is exposed to traffic from both Mission Avenue and North Horne Street, including southbound North Horne Street traffic turning eastbound on Mission Avenue towards Interstate 5. The normally acceptable exterior sound level is also exceeded at M4 which is located along the northern property boundary. The remaining two monitoring locations are within the normally acceptable exterior standard. Baseline (2025) and with project sound levels during the first full build out year (2030) and horizon year (2050) were calculated to determine whether project

traffic, when added to cumulative traffic, would noticeably increase (+3 dBA or greater) the Leq over baseline conditions for receivers exceeding 65 dBA CNEL or cause noise levels to exceed 65 dBA CNEL at receivers where noise levels are less than 65 dBA CNEL under baseline conditions.

As noted, a noise increase greater than 3 dBA is readily perceptible to the average human ear; and thus, is the level considered a substantial noise increase related to traffic operations when noise levels without the project exceed 65 dBA CNEL or the project causes the noise levels to exceed 65 dBA CNEL. For the purpose of this evaluation, the CNEL are used for traffic noise as it provides a conservative estimate of potential noise levels. Temporary construction noise was estimated at the noise sensitive properties shown in Figure 3. As shown, retail, commercial or office uses, which are not noise sensitive, are located approximately 50 feet to the west across North Clementine Street and 90 feet north across Mission Avenue; Multi-family residences, in a designated commercial zone, are located on the south side of Seagaze Drive approximately 70 feet south of the project site; and Oceanside High School is located approximately 70 feet east of the site on the east side of North Horne Street. Both the multifamily residences and Oceanside High School are noise sensitive.

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

**Temporary Construction Noise**

Consistent with the City's Noise Ordinance, project construction would be limited to the period between 7:00 a.m. and 6:00 p.m. each day, Monday through Friday, and no earthmoving or grading operations shall be conducted on the premises on Saturdays, Sundays or legal holidays. Construction noise data for individual pieces of equipment that are commonly used at construction sitewere used to evaluate temporary noise levels for consistency with the General Plan Noise Element standard of 85 dBA Lmax at 100 feet.

As stated, noise sensitive receivers are located 70 feet to the east and south of the site. Table 6 shows sound levels for each piece of equipment at a reference distance of 50 and 100 feet, as well as the percentage of time during a typical day that this equipment is in use. Project construction would occur over the entire project site; thus, construction activities will vary in distance from the nearest noise sensitive receivers which are existing classrooms located approximately 70 feet east/northeast of the eastern project site boundary and both single- and multifamily residences located in a commercial zone along the south side of Seagaze Drive (905 and 909 Seagaze Drive) and 104 South Clementine Street. As stated, these residences are approximately 70 feet south of the southern site boundary as measured from the back of each

sidewalk. Commerial uses, which are not noise sensitive, are located approximately 50 feet to the west and 90 feet to the north.

**Table 6**
**Typical Maximum Construction Equipment Noise Levels**

| Equipment Onsite | Typical Maximum Level (dBA) 50 Feet from the Source | Typical Maximum Level (dBA) 100 Feet from the Source | Usage Factor |
|---|---|---|---|
| Air Compressor | 78 | 72 | 40% |
| Backhoe | 78 | 72 | 40% |
| Bobcat Tractor | 84 | 78 | 40% |
| Concrete Mixer | 79 | 73 | 40% |
| Loader | 79 | 73 | 40% |
| Bulldozer | 82 | 76 | 40% |
| Jack Hammer | 89 | 83 | 20% |
| Pavement Roller | 80 | 74 | 20% |
| Street Sweeper | 82 | 76 | 10% |
| Man Lift | 75 | 69 | 20% |
| Dump Truck | 77 | 71 | 40% |
| Mobile Crane | 81 | 75 | 16% |
| Excavator/Scraper | 84 | 78 | 40% |

*Source: FTA Noise and Vibration Impact Assessment Manual (September 2018), Table 7-1.*
*Noise levels are based on actual maximum measured noise levels at 50 feet (Lmax).*
*Noise levels are based on a noise attenuation associated with the usage factor.*

The Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) data were used to estimate construction noise levels at the nearest occupied noise-sensitive receivers referenced above. Although the model was funded by the Federal Highway Administration, the RCNM data is used for non-roadway projects because the same types of construction equipment used for roadway projects are used for other types of construction. Input variables for the RCNM consist of the receiver/land use types, the equipment type and number of each type of equipment used; the duty cycle for each piece of equipment (e.g., percentage of hours the equipment typically works per day), and the distance from the noise-sensitive receiver. As noted, the distances were varied across the site as equipment cannot work simultaneously in the same location from a given point. Conservatively, no topographical or structural shielding was assumed nor did the calculations include reductions to account for the fact that not all equipment would operate at the same time. Table 7 shows noise levels during each phase of construction with equipment operating at 70, 85 and 100 feet from the noise sensitive receivers to the south and east.

**Table 7**
**Estimated Construction Noise Levels**

| Construction Phase | Lmax |
|---|---|
| Demolition (back hoe, front-end loader, dump truck) | 78.3(1) |
| Site Preparation (dozer, back hoe, front-end loader) | 79.7(2) |
| Grading (dozer, excavator, backhoe and front-loader, dump truck) | 81.8 (3) |
| Building Construction (crane, manlift, backhoe and front-end loader) | 79.8(4) |
| Paving (paver and roller) | 78.9(5) |
| Architectural Coating (air compressor) | 73.1(6) |

Methodology:
(1) Backhoe at 70 feet, front end loader at 85 feet and dump truck at 100 feet.
(2) Backhoe at 70 feet, front end loader at 85 feet and dozer at 100 feet.
(3) Dozer at 85 fee excavator at 100 feet, backhoe at 70 feet, front end loader at 85 feet and dump truck at 85 feet
(4) Crane at 100 feet, manlift at 85 feet, front end loader at 85 feet and backhoe at 70 feet;
(5) Paver and roller operate at 20 percent usage consecutively at 70 feet
(6) Air compressor(s) operating at 85 feet

As shown in Table 7, maximum construction noise levels would not exceed the applicable construction noise significance threshold - 85 dBA Lmax at 100 feet as stated in the City of Oceanside General Plan. Thus, temporary construction noise impacts would be less than significant.

## Operational Noise Exposure

Operation of the proposed project was evaluated for potential noise impacts associated with project operational traffic related as well as operational noise generated by project features such as HVAC equipment and common area open space.

**Exterior Traffic Noise.** Traffic is the primary noise source that would be generated by operation of the proposed project. As stated, existing noise levels were measured at the project site on April 11, 2024 and again on March 18, 2025. The Leq during the April 2024 monitoring period ranged from 54.7 dBA along the southern site boundary along Seagaze Drive to 66.1 dBA at the northeast corner of North Horne Street and Mission Avenue. Similar noise levels were measured during the March 18, 2025 monitoring period. The existing measured Leq along the Mission Avenue frontage and at the northeast corner of the project site exceeds 65 dBA, the traffic noise threshold established in the General Plan Noise Element for residential and other sensitive uses. The dominant noise source is traffic on both east and westbound Mission Avenue as well as north and southbound traffic on North Horne Street turning onto eastbound Mission Avenue. Interstate 5 traffic is not audible above ambient conditions at the site.
The roadway network adjacent to the project site, including the site driveway, was modeled using the Federal Highway Administration Traffic Noise Model (TNM) version 2.5 software. The model calculates traffic noise at receiver locations based on traffic volumes, travel speed,

mix of vehicle types operating on the roadways (i.e., cars/trucks, medium trucks and heavy trucks) and related factors. Traffic volumes used to establish the vehicle mix on Mission Avenue, North Clementine Street, North Horne Street and Seagaze Drive are based on the LTS trip distribution estimates (CR Associates, Inc.,June 2025).

Current hourly average baseline noise levels (Leq) were calculated for the residential receivers located south of the project site and the Oceanside High School classrooms located at the northwest corner of the campus. The following lists the closest sensitive receivers to the project site that would experience the highest concentration of project-related traffic noise.

- Receiver 1. Project northern façade between North Clementine Street and North Horne Street;
- Receiver 2.Project eastern façade between Mission Avenue and Seagaze Drive;
- Receiver 3. Oceanside High School classrooms and adjacent outdoor courtyard area located at northeast corner of North Horne Street and Mission Avenue.
- Receiver 4. Multifamily building at 909 Seagaze Avenue;
- Receiver 5. Single-family residence at 104 South Clementine Street;

The LTS demonstrates that the project will generate a total of 1,517 daily trips, including 101 (38-in/63-out) trips during the a.m. peak hour and 110 (67-in/43-out) trips during the p.m. peak hour. In the Opening Year modeling, noise levels associated with the project were calculated by distributing the highest 110 p.m. peak hour project trips into the cumulative projects plus baseline traffic volumes within the neighboring street network based on trip distribution volumes shown in the LTS, along Mission Avenue, North Clementine Street, North Horne Street and Seagaze Drive. Note that the LTS discloses that the Horizon Year (2050) scenario has some volumes that are less than Opening Year (2030) based on changes in factors such as population density and transit use. The Horizon Year volumes are based on the City's recent modeling efforts to update the General Plan and represent the most current and reliable projections of future volumes. This is reflected in Table 8 below which shows noise levels in 2050 are lower than 2030 for both the without and with project conditions.

The receiver locations are shown in Figure 5 and the modeling results are shown in Table 8 for existing conditions, 2030 No Project, 2030 With Project, 2050 No Project and 2050 With Project conditions. As stated, 2030 would be the first complete year of occupancy. As shown, without the project, traffic noise at Receiver 1 and 3 would exceed 65 dBA. Thus, the project would have a potentially significant impact if the project's traffic contribution exceeded 3 dBA. Table 8 shows the highest increase between the 2030 No Project/2030 With Project scenario and the 2050 No Project/2050 With Project scenario. For all receivers, the greatest increase would occur between 2050 No Project and 2050 With Project scenario. The highest increase would be +0.3 dBA at Receivers 1, 2 and 3. The project would not cause noise levels that were (or are projected to be) below 65 dBA CNEL in a without project scenario to exceed 65 dBA CNEL nor would the

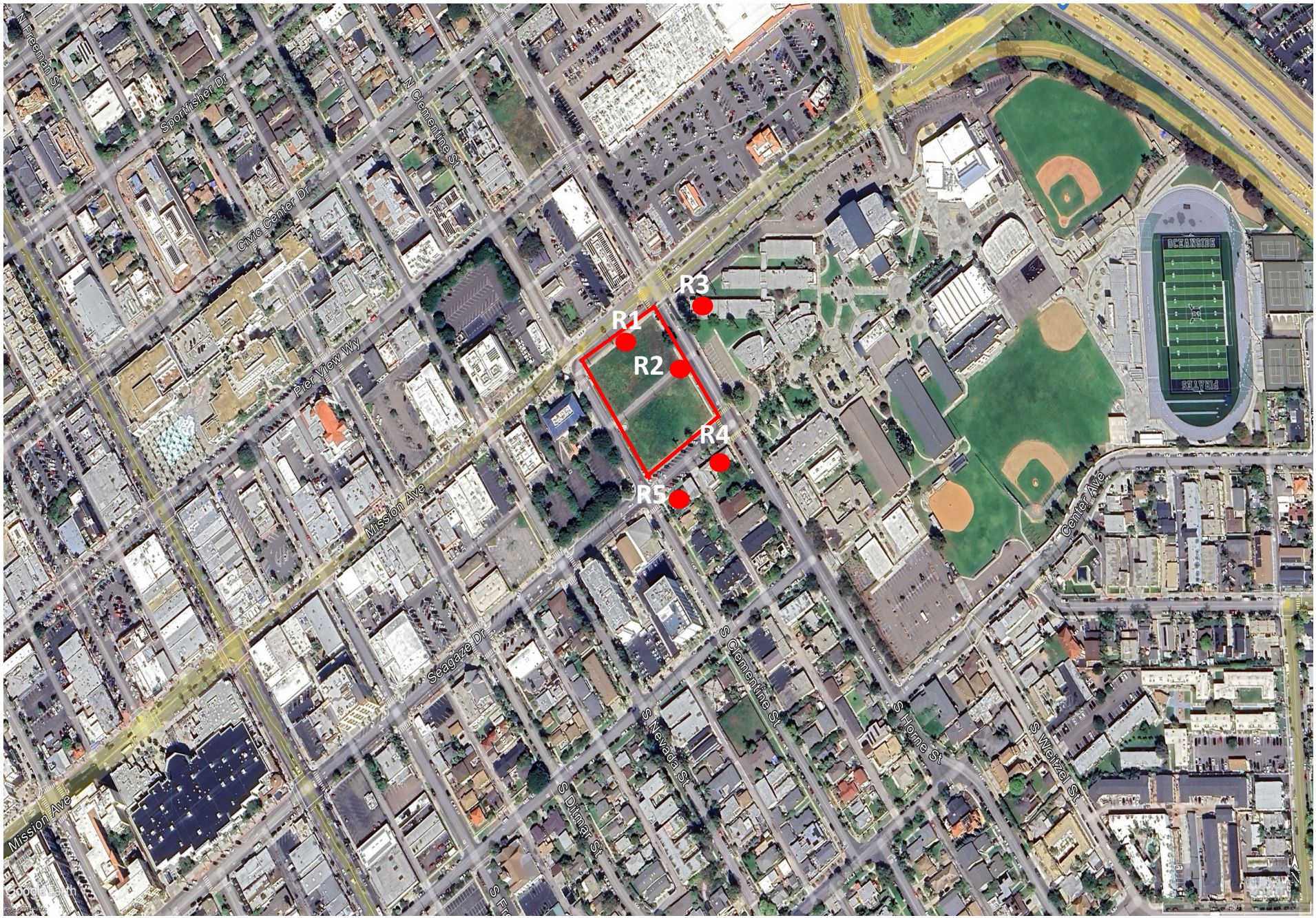



**Figure 5 - Noise Receiver Locations**

- Project Site

project cause an increase of 3 dBA or more for those scenarios where noise levels without the project exceed 65 dBA CNEL. Therefore, traffic noise impacts with the project at all receivers would be less than significant under the applicable thresholds.

**Table 8**
**Modeled Noise Levels**

| Receiver | Existing Ldn/CNEL | Opening Year No Project Ldn/CNEL (2030) | Opening Year w/Project Ldn/CNEL (2030) | Horizon Year No Project Ldn/CNEL (2050) | Horizon Year w/Project Ldn/CNEL (2050) | Highest dBA Increase Between 2030 and 2050 No Project and With Project Conditions | Significant Impact |
|---|---|---|---|---|---|---|---|
| Receiver 1 | 65.2 | 66.3 | 66.5 | 65.1 | 65.4 | +0.3 | No |
| Receiver 2 | 63.6 | 64.3 | 64.5 | 63.5 | 63.8 | +0.3 | No |
| Receiver 3 | 67.0 | 68.1 | 68.3 | 66.9 | 67.2 | +0.3 | No |
| Receiver 4 | 62.8 | 63.3 | 63.4 | 62.5 | 62.7 | +0.2 | No |
| Receiver 5 | 64.4 | 64.9 | 65.0 | 63.8 | 64.0 | +0.2 | No |

1st noise analysis the increase was calculated using Existing/ Ldn/CNEL, and this study is by the projection year 2030, with no project.

**Interior Traffic Noise.** California Energy Code Title 24 standards specify construction methods and materials that result in up to a 30 dBA reduction in exterior noise levels (assuming windows are closed). This includes operation of mechanical ventilation (e.g., heating and air conditioning), in combination with standard building construction that includes dual-glazed windows with a minimum Sound Transmission Class (STC) rating of 26 or higher. When windows are open, the insertion loss drops to about 10 dBA. The manner in which older homes in California were constructed (approximately 30 years old or older) generally provides a reduction of exterior-to-interior noise levels varying between 20 and 25 dBA with closed windows.

The project units would be constructed consistent with current Title 24 standards. The window, door and wall assemblies would provide at least a 30 dBA reduction in exterior to interior noise levels. Based on noise levels shown in Table 8, the highest interior noise levels would range from 36.5 dBA CNEL to 34.5 dBA CNEL for Receivers 1 and 2 in the Opening Year (2030) With Project Condition. Thus, interior noise levels at Receivers 1and 2 would be less than the 45 dBA Title 24 and City of Oceanside interior residential noise standard.

As stated above, the manner in which older homes in California were constructed (approximately 30 years old or older) generally provides a reduction of exterior-to-interior noise levels varying between 20 and 25 dBA with closed windows. For the purpose of this discussion, the buildings representing Receivers 3, 4 and 5 provide 20 to 25 dBA of attenuation. Using the lower 20 dBA attenuation, with project contributions during the 2030 With Project condition, interior noise levels at Receiver 4 would be 43.4 dBA CNEL and interior noise levels at Receiver 5 would be 45 dBA CNEL. Thus, interior noise levels at Receivers 4 and 5 would be equal to or less than the 45 dBA Title 24 and City of Oceanside interior residential noise standard. The Oceanside High School building (Receiver 3) interior noise levels would be 48.1 dBA without the project and interior noise levels with the project would be 48.3 dBA with the project . As the

without project conditions exceed 45 dBA, and the project would cause a maximum increase of 0.3, well below the significance threshould/audibility threshold of 3 dBA; project impacts to interior noise would be less than significant.

**Outdoor Open Space.** Balconies would be provided on the exterior of each project unit as outdoor open space. The maximum allowable sound levels within outdoor open spaces is 65 dBA CNEL. As shown in Table 8 above, exterior noise levels would exceed this requirement at the north and eastern building facades at ground level. Noise levels at outdoor open space balconies facing Mission Avenue, North Horne Street and North Clementine Street were estimated using the TNM with adjustments to receiver locations and heights to reflect the noise reduction distance associated with increased elevation and distance from adjacent roadways. The modeling results took into consideration the project design features that include four-foot tall glass or other solid barrier around the balconies located on (i) floors two and three facing Mission Avenue; (ii) units on floors one, two and three facing North Horne Street; and (iii) units on floors one, two and three facing North Clementine Street within approximately 100 feet of Mission Avenue. As the modeling demonstrates, a wall partition barrier with a single-layer of glass as incorporated into the project as a design feature will provide 5-10 dBA of attenuation as sound waves will refract over the top of the barrier (City of Vancouver Noise Control Manual). With that level of attenuation incorporated into the project design for those locations, noise levels at the exterior balconies will not exeed the significance threshold of 65 dBA.

With respect to the outdoor courtyard area adjacent to and south of the nearest Oceanside High School classroom building modeled as Receiver 3, exterior noise levels within the open space area would be approximately 66.9 dBA CNEL during the 2050Without Project condition. The noise level with the project under that scenario would increase by 0.3 dBA CNEL to 67.2 dBA CNEL. As the conditions without the project would alreadyexceed the 65 dBA CNEL threshold standard, but the project would only contribute a +0.3 dBA increase which is well below the significance/audibility threshold of 3 dBA, impacts will be less than significant as the project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project, nor would the proposed units be exposed to noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies

**Heating, Ventilation and Air Conditioning/Pool Equipment.** Stationary noise generated by residential properties can include noise associated with outdoor heating, ventilation and air conditioning systems (HVAC) and/or pool equipment. As a project design feature, the individual HVAC systems for each unit would be located within an enclosed space within each unit. The HVAC systems for the common areas, again as a project design feature, would be within an enclosed space within the building and any exterior rooftop HVAC units would be placed near the center of the buildng and shrouded to minimize sound levels. The project design places the pool within the interior courtyard on the 3rd level and the pool equipment

would be located within an enclosed space proximal to the pool area. Thus, no stationary sources associated with the project would be audible off-site such that the project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies; impacts would be less than significant.

**Outdoor Recreational Use Area.** As stated, the project would have an interior courtyard swimming pool and outdoor recreation area on the 3rd level that will only be available to project residents and their guests. Section 38.12 of the Oceanside Municipal Code limits noise levels at the adjacent noise sensitive receivers, which are located in a commercial zone along Seagaze Avenue or Public/Civic (Oceanside High School), to 65 dBA Leq from 7:00 a.m. to 9:59 p.m. and 60 dBA from 10:00 p.m. to 6:59 a.m. Noise levels in excess of that standard at any point beyond the propery boundary would violate the Municipal Code. Further, noise associated with use of the outdoor pool area would be required to comply with Chapter 38 - Noise Control, of the Municipal Code. Pool/outdoor recreation area would not be audible outside the project boundaries as those activites are located within an interior courtyard. Further California Public Resources Code section 21085 provides that "the effects of noise generated by project occupants and their guests on human beings is not a significant effect on the environment." Thus, CEQA does not require a noise of the effect of noise generated at the outdoor recreation use area by the occupants and guests of the project.

### *b. Generation of excessive groundborne vibration or groundborne noise levels?*

### Temporary Construction-Related Vibration

The vibration velocity level for perception by humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. The California Department of Transportation uses the following standards when addressing vibration. Excessive ground-borne vibration would occur if construction-related ground-borne vibration exceeds the "severe" vibration annoyance potential criteria for human receptors of 0.4 inch per second PPV or the damage potential criteria to older residential structures of 0.3 inch per second PPV for continuous/frequent intermittent construction sources, as specified by Caltrans (April 2020) The PPV and accompanying VdB level associated with common construction equipment is shown in Table 9. Based on the project geotechnical study and information from the applicant, heavy impact construction methods that could generate enough vibration to damage buildings proximal to the project site (i.e., pile driving, rock breaking, drilling, blasting) would not be required for the project.

Construction activity on the project site would be temporary and vibration events would be transitory occuring only during equipment pass bys. Using vibration levels associated with a large bulldozer, the piece of grading equipment with the highest vibration level, as a worst case

scenario, groundborne vibration would be approximately 0.089 PPV at 25 feet (see Table 9 below). Even conservatively assuming a clam shovel or vibratory roller would be used on-site when excavating the parking garage or performing other site development activities, those equipment pieces can generate 0.202 PPV and 0.21 PPV, respectively, at 25 feet from the source. If used on-site, they would likely operate in the excavation pit below ground level and the elevation of neighboring properties. The PPV generated by a heavy bulldozer, clam shovel and vibratry roller at 25 feet are below the vibration thresholds of significance referenced above. As stated, the closest sensitive properties are 70 feet from the property line so project generated construction related vibrations would be below those reported in Table 9 .

Sustained equipment operation is not expected to occur proximal to adjacent properties nor would the PPV reach levels reach the lowest of the signfigance thresholds of 0.3 inch per second PPV. Thus, even using conservative assumptions, project impacts related to construction vibration would be less than significant.

**Table 9**
**Vibration Source Levels for Construction Equipment**

| | Peak Particle Velocity (inches/second) at 25 feet | Approximate Vibration Level LV (dVB) at 25 feet |
|---|---|---|
| Pile driver (impact) | 1.518 (upper range) | 112 |
| | 0.644 (typical) | 104 |
| Pile driver (sonic) | 0.734 upper range | 105 |
| | 0.170 typical | 93 |
| Clam shovel drop (slurry wall) | 0.202 | 94 |
| Hydromill (slurry wall - soil) | 0.008 in soil | 66 |
| Hydromill (slurry wall - rock | 0.017 in rock | 75 |
| Vibratory Roller | 0.21 | 94 |
| Hoe Ram | 0.089 | 87 |
| Large bulldozer | 0.089 | 87 |
| Caisson drill | 0.089 | 87 |
| Loaded trucks | 0.076 | 86 |
| Jackhammer | 0.035 | 79 |
| Small bulldozer | 0.003 | 58 |
| Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, September 2018. | | |

## Operation-Related Vibration

The proposed project is a multistory mixed use project with residential apartments above ground floor commercial use along Mission Avenue. These uses do not generate vibration of the type that could result in excessive groundbourne vibration or groundborne noise. Project operation will not result in the generation of excessive groundborne vibration or groundborne noise levels. Impacts would be less than significant.

***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?***

There are no private airstrips within the vicinity of the project site. The closest airport to the proposed project site is the Oceanside Municipal Airport, approximately 1.9 miles northeast of the site. According to the Oceanside Municipal Airport's Airport Land Use Compatibility Plan Exhibit IV-5, Future Airport Noise Contours, the project site is not located within a noise exposure range of 60–75 dB CNEL (San Diego County Regional Airport Authority 2010). Thus, the project residents and employees would not be exposed to excessive noise levels associated with an airport or air strip. Impacts would be less than significant.

# CONCLUSION

The proposed project was evaluated for potential construction and operational noise impacts in accordance with the applicable CEQA significance thresholds. As discussed herein, project related noise impacts would be less than significant..

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

As stated, construction noise levels would be less than the 85 dBA Lmax instaneous standard at 100 feet. Temporary construction impacts would be less than significant. With the project's design features and the relative contribution of the project compared to without project scenarios, operational impacts related to exterior and interior traffic noise would be less than significant.. No impact would occur with operation of the building HVAC system. Noise associated with use of the outdoor pool area would be confined to the 3rd level interior courtyard. The project would not result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

***Would the project result in the generation of excessive groundborne vibration or groundborne noise levels?***

As stated herein, temporary impacts associated with construction vibration would be less than significant. The proposed project is a multistory residential apartment building with ground floor commercial. These uses do not generate vibration; thus, no vibration impacts are anticipated to occur with operation of the project.

***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?***

With respect to airport operations, the project site is located west of the Oceanside Municipal Airport and is located outside the operational noise exposure range of 60–75 dB CNEL. Thus, the project residents and employees would not be exposed to excessive noise levels generated by airport operations. Impacts would be less than significant.

# REFERENCES

California State Office of Planning and Research, Updates to the General Plan Guidelines, Appendix D Noise Element Guidelines, 2017

California Department of Transportation, Noise and Vibration Guidance Manual, April 2020

City of Oceanside, General Plan Noise Element, 1974

City of Oceanside Municipal Code Section 38.12 – General Sound Level Limits

City of Oceanside Municipal Code Section 38.1 (h) – Noise Ordinance

City of Oceanside Municipal Code Section 38.16 – Nuisance Noise

City of Oceanside, *Engineering Design Manual*, August 26, 1992

City of San Diego Calfornia Environmental Quality Act (CEQA) Significance Determination Thresholds (September 2022)

City of Vancouver, Noise Control Manual

CR Associates, Inc., Trip Generation Rates and Distribution Figures, June 2025

dBF & Associates, Inc., Reference Noise Level Compilation Table, 2016.

Federal Highway Administration, Traffic Noise Model Version 2.5, 2004.

Federal Highway Administration, Road Construction Noise Model Version 2.5, June 2017

Federal Transit Administration. *Transit Noise and Vibration Impact Assessment*. September 2018.

Geocon, Incorporated, *Geotechnical Investigation, 901 Mission Avenue Mixed Use*, Oceanside, California, May 2024

# Appendix A

*Monitoring Data Sheet and Modeling Results*

# FIELD NOISE MEASUREMENT DATA

Project Name: 901 Mission Avenue
Project #: Day / Date Apr. 11 2024 My Name.
Page 1 of

| Sound Level Meter | Calibrator | Weather Meter |
|---|---|---|
| Model # Piccolo II | Model # | Model # Serial # |
| Serial # | Serial # | |
| Weighting: (A) / C / Flat | Pre-Test: dBA SPL | Terrain: Hard / Soft / (Mixed) |
| Response: (Slow) / Fast / Impl | Post-Test: dBA SPL | Topo: (Flat) / Hilly (describe) |
| Windscreen: (Yes) / No | | Wind: (Steady) / Gusty |

| ID | Time Start | Time Stop | Leq | Lmin | Lmax | L10 | L50 | L90 | Wind Spd/ Dir (mph) | Temp (°F) | RH (%) | Bar Psr (in Hg) | Cloud Cover (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12:38 | 12:53 | 54.7 | 47.9 | 63.9 | | | | 2-3 W | 75 | | | 60% |
| 2 | 12:59 | 1:14 | 62.2 | 48.2 | 83.4 | | | | 2-3 W | 75 | | | 60% |
| 3 | 1:22 | 1:37 | 66.1 | 52.4 | 103.7 | | | | 2-3 W | 75 | | | 60% |
| 4 | 1:43 | 1:58 | 63.0 | 50.6 | 84.3 | | | | 2-3 W | 75 | | | 60% |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| | | | | Location(s) / GPS Reading(s): |
|---|---|---|---|---|
| Roadway Name | SEACREST | SEACREST | HOME / MISSION | MISSION / 30 |
| Speed (post/obs) | 25 HOA | CLOSE 25 | 25 / 30 | |
| Number of Lanes | 2 | 2 | 2 / 4 | 4 |
| Width (pave/row) | 24 | 24 | 24 / 60 | 60 |
| 1- or 2- way | 2 | 2 | 2 / 2 | 2 |
| Grade | +2% | 2% | 0 / 2% | 2% |
| Bus Stops | NO | NO | NO | YES |
| Stoplights | NO | NO | @ MISSION | YES |
| Street Parking | YES | YES | NO | NO |
| Automobiles | 26 / 74 | ~~45~~ / 85 | 148 / 269 | 181 |
| Medium Trucks | 0 / 0 | 0 / 4 | 4 / 7 | 4 |
| Heavy Trucks | 0 / 0 | 0 / 0 | 0 / 0 | 0 |

Other Noise Sources: distant (aircraft) / (roadway traffic) trains / landscaping / rustling leaves / children playing / dogs barking / birds vocalizing

Notes and Sketches on Reverse

05/18/2023

# FIELD NOISE MEASUREMENT DATA

Project Name: clementine — Page 1 of

Project #: — Day / Date: — My Name:

| Sound Level Meter | Calibrator | Weather Meter |
|---|---|---|
| Model #: Piccolo II | Model # | Model # — Serial # |
| Serial # | Serial # | |
| Weighting: (A) C / Flat | Pre-Test: ___ dBA SPL | Terrain: Hard / Soft / Mixed |
| Response: Slow / Fast / Impl | Post-Test: ___ dBA SPL | Topo: Flat / Hilly (describe) |
| Windscreen: Yes / No | | Wind: Steady / Gusty |

| ID | Time Start | Time Stop | Leq | Lmin | Lmax | L10 | L50 | L90 | Wind Spd/ Dir (mph) | Temp (°F) | RH (%) | Bar Psr (in Hg) | Cloud Cover (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 63.5 | | | | | | 8mph E | 103° | | | 0% |

Roadway Name: clementine — Location(s) / GPS Reading(s):

Speed (post/obs): 25mph

Number of Lanes: 1

Width (pave/row): 12ft

1- or 2- way: 1 way

Grade: 0%

Bus Stops: n/a

Stoplights: n/a

Street Parking: yes

Automobiles: Sedgwick: 77 clementine: 47

Medium Trucks: 1 total

Heavy Trucks:

Other Noise Sources: distant aircraft / roadway traffic / trains / landscaping / rustling leaves / children playing / dogs barking / birds vocalizing

Notes and Sketches on Reverse

03/18/2025

(1)

# FIELD NOISE MEASUREMENT DATA

Project Name: Horne
Project #:
Day / Date
My Name.
Page 1 of

| Sound Level Meter | Calibrator | Weather Meter |
|---|---|---|
| Model #: Piccolo II | Model # | Model # Serial # |
| Serial # | Serial # | |
| Weighting: (A) C / Flat | Pre-Test: ____ dBA SPL | Terrain: Hard / Soft / Mixed |
| Response: (Slow) / Fast / Impl | Post-Test: ____ dBA SPL | Topo: (Flat) / Hilly (describe) |
| Windscreen: (Yes) / No | | Wind: (Steady) / Gusty |

| ID | Time Start | Time Stop | Leq | Lmin | Lmax | L10 | L50 | L90 | Wind Spd/ Dir (mph) | Temp (°F) | RH (%) | Bar Psr (in Hg) | Cloud Cover (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 66.1 | | | | | | 8mph E | 103 | | | 0% |

Roadway Name: Horne Street
Location(s) / GPS Reading(s):
Speed (post/obs): 25mph
Number of Lanes: 2
Width (pave/row): 12ft
1- or 2- way: 2
Grade: 0%
Bus Stops: n/a
Stoplights: yes
Street Parking: yes
Automobiles: Horne: 168 Mission: 252
Medium Trucks
Heavy Trucks: total: 04

Other Noise Sources: distant (aircraft) / (roadway traffic) trains / landscaping / rustling leaves / children playing / dogs barking / birds vocalizing

Notes and Sketches on Reverse

02/18/2025

(3)

# FIELD NOISE MEASUREMENT DATA

Project Name: Mission
Project #:
Day / Date
My Name.
Page 1 of

| Sound Level Meter | Calibrator | Weather Meter |
|---|---|---|
| Model # Piccolo II | Model # | Model # Serial # |
| Serial # | Serial # | |
| Weighting: (A) C / Flat | Pre-Test: dBA SPL | Terrain: Hard / Soft / Mixed |
| Response: (Slow) / Fast / Impl | Post-Test: dBA SPL | Topo: (Flat) / Hilly (describe) |
| Windscreen: (Yes) / No | | Wind: (Steady) / Gusty |

| ID | Time Start | Time Stop | Leq | Lmin | Lmax | L10 | L50 | L90 | Wind Spd/ Dir (mph) | Temp (°F) | RH (%) | Bar Psr (in Hg) | Cloud Cover (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 66.7 | | | | | | 8mph E | 102 | | | 0% |

Roadway Name: Mission Avenue
Location(s) / GPS Reading(s):

Speed (post/obs): 25
Number of Lanes: 4
Width (pave/row): 12
1- or 2- way: 2
Grade:
Bus Stops: yes
Stoplights: yes
Street Parking: No
Automobiles: 181
Medium Trucks: 0
Heavy Trucks: 0

Other Noise Sources: distant (aircraft) / (roadway traf) trains / landscaping / rustling leaves / children playing / dogs barking / birds vocalizing

Notes and Sketches on Reverse

03AB 2025

# FIELD NOISE MEASUREMENT DATA

Project Name: Seagate Street
Project #:
Day / Date
My Name
Page 1 of

| Sound Level Meter | Calibrator | Weather Meter |
|---|---|---|
| Model # Piccolo II | Model # | Model # Serial # |
| Serial # | Serial # | |
| Weighting: (A) C / Flat | Pre-Test: ____ dBA SPL | Terrain: (Hard) / Soft / Mixed |
| Response: (Slow) / Fast / Impl | Post-Test: ____ dBA SPL | Topo: (Flat) / Hilly (describe) |
| Windscreen: (Yes) / No | | Wind: (Steady) / Gusty |

| ID | Time Start | Time Stop | Leq | Lmin | Lmax | L10 | L50 | L90 | Wind Spd/ Dir (mph) | Temp (°F) | RH (%) | Bar Pr (in Hg) | Cloud Cover (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 55.3 | | | | | | 8mph E | 63° | | | 0% |

Roadway Name: Seagate Street
Speed (post/obs): 25mph
Number of Lanes: 2
Width (pave/row): 12ft.
1- or 2- way: 2way
Grade:
Bus Stops: n/a
Stoplights: n/a
Street Parking: yes
Automobiles: 10
Medium Trucks: 0
Heavy Trucks: 0

Location(s) / GPS Reading(s):

Other Noise Sources: distant (aircraft) / roadway traffic / trains / landscaping / rustling leaves / children playing / dogs barking / birds vocalizing

Notes and Sketches on Reverse

Site 1

| | |
|---|---|
| Start Date | 4/11/2024 |
| Start Time | 12:38:17 PM |
| End Time | 12:53:16 PM |
| Duration | 00:14:59 |
| Meas Mode | Single |
| Input Range | Low |
| Input Type | Mic |
| SPL Time Weight | Fast |
| LN% Freq Weight | dBA |
| Overload | No |
| UnderRange | No |
| Sensitivity | 18.44mV/Pa |

| | |
|---|---|
| LZeq | 76.3 |
| LCeq | 71.8 |
| LAeq | 54.7 |
| LZFmax | 91.9 |
| LCFmax | 84.5 |
| LAFmax | 63.9 |
| LZFmin | 64.4 |
| LCFmin | 61.8 |
| LAFmin | 47.9 |
| LZE | 105.8 |
| LCE | 101.3 |
| LAE | 84.2 |
| LZpk | 100.7 |
| LCpk | 94.5 |
| LApk | 81.0 |
| LAF1% | 60.0 |
| LAF2% | 59.2 |
| LAF5% | 58.0 |
| LAF8% | 57.3 |
| LAF10% | 57.0 |
| LAF25% | 55.4 |
| LAF50% | 53.9 |
| LAF90% | 51.4 |
| LAF95% | 50.6 |
| LAF99% | 49.4 |

Site 2

| | |
|---|---|
| Start Date | 4/11/2024 |
| Start Time | 12:59:22 PM |
| End Time | 1:14:22 PM |
| Duration | 00:15:00 |
| Meas Mode | Single |
| Input Range | Low |
| Input Type | Mic |
| SPL Time Weight | Fast |
| LN% Freq Weight | dBA |
| Overload | No |
| UnderRange | No |
| Sensitivity | 18.44mV/Pa |

| | |
|---|---|
| LZeq | 76.4 |
| LCeq | 73.9 |
| LAeq | 62.2 |
| LZFmax | 93.3 |
| LCFmax | 92.7 |
| LAFmax | 83.4 |
| LZFmin | 65.1 |
| LCFmin | 62.5 |
| LAFmin | 48.5 |
| LZE | 105.9 |
| LCE | 103.4 |
| LAE | 91.7 |
| LZpk | 102.5 |
| LCpk | 101.9 |
| LApk | 94.5 |
| LAF1% | 70.6 |
| LAF2% | 68.5 |
| LAF5% | 65.7 |
| LAF8% | 64.0 |
| LAF10% | 63.2 |
| LAF25% | 59.9 |
| LAF50% | 56.9 |
| LAF90% | 51.8 |
| LAF95% | 51.0 |
| LAF99% | 49.8 |

Site 3

| | |
|---|---|
| Start Date | 4/11/2024 |
| Start Time | 1:22:26 PM |
| End Time | 1:37:25 PM |
| Duration | 00:14:59 |
| Meas Mode | Single |
| Input Range | Low |
| Input Type | Mic |
| SPL Time Weight | Fast |
| LN% Freq Weight | dBA |
| Overload | Yes |
| UnderRange | No |
| Sensitivity | 18.44mV/Pa |

| | |
|---|---|
| LZeq | 80.1 |
| LCeq | 78.0 |
| LAeq | 71.4 |
| LZFmax | 103.3 |
| LCFmax | 103.1 |
| LAFmax | 103.2 |
| LZFmin | 67.9 |
| LCFmin | 65.7 |
| LAFmin | 52.4 |
| LZE | 109.6 |
| LCE | 107.5 |
| LAE | 100.9 |
| LZpk | 113.4 |
| LCpk | 113.4 |
| LApk | 115.7 |
| LAF1% | 76.2 |
| LAF2% | 73.2 |
| LAF5% | 69.5 |
| LAF8% | 67.0 |
| LAF10% | 66.1 |
| LAF25% | 62.9 |
| LAF50% | 60.6 |
| LAF90% | 57.0 |
| LAF95% | 55.8 |
| LAF99% | 53.7 |

Site 4

| | |
|---|---|
| Start Date | 4/11/2024 |
| Start Time | 1:43:26 PM |
| End Time | 1:58:25 PM |
| Duration | 00:14:59 |
| Meas Mode | Single |
| Input Range | Low |
| Input Type | Mic |
| SPL Time Weight | Fast |
| LN% Freq Weight | dBA |
| Overload | No |
| UnderRange | No |
| Sensitivity | 18.44mV/Pa |

| | |
|---|---|
| LZeq | 81.2 |
| LCeq | 79.4 |
| LAeq | 63.0 |
| LZFmax | 102.1 |
| LCFmax | 101.7 |
| LAFmax | 84.3 |
| LZFmin | 66.3 |
| LCFmin | 64.4 |
| LAFmin | 50.6 |
| LZE | 110.7 |
| LCE | 108.9 |
| LAE | 92.5 |
| LZpk | 109.4 |
| LCpk | 109.2 |
| LApk | 94.8 |
| LAF1% | 74.1 |
| LAF2% | 70.5 |
| LAF5% | 66.3 |
| LAF8% | 64.7 |
| LAF10% | 63.9 |
| LAF25% | 61.1 |
| LAF50% | 56.4 |
| LAF90% | 53.5 |
| LAF95% | 52.9 |
| LAF99% | 51.9 |

Site 1 - Seagaze

| | |
|---|---|
| Start Date | 3/18/2025 |
| Start Time | 4:40:13 PM |
| End Time | 4:55:13 PM |
| Duration | 00:15:00 |
| Meas Mode | Single |
| Input Range | Low |
| Input Type | Mic |
| SPL Time Weight | Slow |
| LN% Freq Weight | dBA |
| Overload | No |
| UnderRange | No |
| Sensitivity | 18.44mV/Pa |

| | |
|---|---|
| LZeq | 75.8 |
| LCeq | 71.8 |
| LAeq | 55.3 |
| LZSmax | 91.2 |
| LCSmax | 84.5 |
| LASmax | 67.0 |
| LZSmin | 66.0 |
| LCSmin | 63.5 |
| LASmin | 50.1 |
| LZE | 105.3 |
| LCE | 101.3 |
| LAE | 84.8 |
| LZpk | 102.7 |
| LCpk | 96.5 |
| LApk | 89.0 |
| LAS1% | 61.8 |
| LAS2% | 61.1 |
| LAS5% | 59.1 |
| LAS8% | 57.6 |
| LAS10% | 57.2 |
| LAS25% | 55.7 |
| LAS50% | 54.1 |
| LAS90% | 52.1 |
| LAS95% | 51.5 |
| LAS99% | 50.7 |

Site 2 - Clementine

| | |
|---|---|
| Start Date | 3/18/2025 |
| Start Time | 5:00:00 PM |
| End Time | 5:15:00 PM |
| Duration | 00:15:00 |
| Meas Mode | Single |
| Input Range | Low |
| Input Type | Mic |
| SPL Time Weight | Slow |
| LN% Freq Weight | dBA |
| Overload | No |
| UnderRange | No |
| Sensitivity | 18.44mV/Pa |

| | |
|---|---|
| LZeq | 80.1 |
| LCeq | 76.5 |
| LAeq | 63.5 |
| LZSmax | 95.3 |
| LCSmax | 95.0 |
| LASmax | 85.5 |
| LZSmin | 67.5 |
| LCSmin | 65.0 |
| LASmin | 50.4 |
| LZE | 109.6 |
| LCE | 106.0 |
| LAE | 93.0 |
| LZpk | 108.4 |
| LCpk | 104.4 |
| LApk | 96.8 |
| LAS1% | 75.6 |
| LAS2% | 69.7 |
| LAS5% | 64.5 |
| LAS8% | 63.1 |
| LAS10% | 62.6 |
| LAS25% | 59.7 |
| LAS50% | 56.3 |
| LAS90% | 52.4 |
| LAS95% | 51.7 |
| LAS99% | 50.9 |

Site 3 - Horne

| | |
|---|---|
| Start Date | 3/18/2025 |
| Start Time | 5:41:29 PM |
| End Time | 5:56:29 PM |
| Duration | 00:15:00 |
| Meas Mode | Single |
| Input Range | Low |
| Input Type | Mic |
| SPL Time Weight | Slow |
| LN% Freq Weight | dBA |
| Overload | Yes |
| UnderRange | No |
| Sensitivity | 18.44mV/Pa |

| | |
|---|---|
| LZeq | 83.1 |
| LCeq | 80.1 |
| LAeq | 66.1 |
| LZSmax | 98.7 |
| LCSmax | 93.2 |
| LASmax | 77.0 |
| LZSmin | 71.2 |
| LCSmin | 69.2 |
| LASmin | 57.0 |
| LZE | 112.6 |
| LCE | 109.6 |
| LAE | 95.6 |
| LZpk | 111.4 |
| LCpk | 106.6 |
| LApk | 105.9 |
| LAS1% | 74.6 |
| LAS2% | 73.5 |
| LAS5% | 71.2 |
| LAS8% | 69.7 |
| LAS10% | 69.2 |
| LAS25% | 65.9 |
| LAS50% | 63.8 |
| LAS90% | 61.1 |
| LAS95% | 60.2 |
| LAS99% | 58.3 |

Site 4 - Mission

| | |
|---|---|
| Start Date | 3/18/2025 |
| Start Time | 5:20:58 PM |
| End Time | 5:35:58 PM |
| Duration | 00:15:00 |
| Meas Mode | Single |
| Input Range | Low |
| Input Type | Mic |
| SPL Time Weight | Slow |
| LN% Freq Weight | dBA |
| Overload | Yes |
| UnderRange | No |
| Sensitivity | 18.44mV/Pa |

| | |
|---|---|
| LZeq | 80.8 |
| LCeq | 77.8 |
| LAeq | 66.7 |
| LZSmax | 95.1 |
| LCSmax | 95.0 |
| LASmax | 88.6 |
| LZSmin | 69.3 |
| LCSmin | 67.1 |
| LASmin | 54.3 |
| LZE | 110.3 |
| LCE | 107.3 |
| LAE | 96.2 |
| LZpk | 111.5 |
| LCpk | 110.6 |
| LApk | 107.1 |
| LAS1% | 76.5 |
| LAS2% | 73.2 |
| LAS5% | 69.8 |
| LAS8% | 68.0 |
| LAS10% | 67.3 |
| LAS25% | 64.3 |
| LAS50% | 61.5 |
| LAS90% | 57.4 |
| LAS95% | 56.3 |
| LAS99% | 55.5 |

<Organization?>
<Analysis By?>

16 April 2025
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: 901 Mission Avenue Existing
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier | | | | | With Barrier | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LAeq1h | | Increase over existing | | Type Impact | Calculated LAeq1h | Noise Reduction | | |
| | | | | Calculated | Crit'n | Calculated | Crit'n Sub'l Inc | | | Calculated | Goal | Calculated minus Goal |
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| Receiver1 | 1 | 1 | 0.0 | 64.2 | 66 | 64.2 | 10 | ---- | 64.2 | 0.0 | 8 | -8.0 |
| Receiver2 | 2 | 1 | 0.0 | 62.6 | 66 | 62.6 | 10 | ---- | 62.6 | 0.0 | 8 | -8.0 |
| Receiver3 | 3 | 1 | 0.0 | 66.0 | 66 | 66.0 | 10 | Snd Lvl | 66.0 | 0.0 | 8 | -8.0 |
| Receiver4 | 4 | 1 | 0.0 | 61.8 | 66 | 61.8 | 10 | ---- | 61.8 | 0.0 | 8 | -8.0 |
| Receiver5 | 5 | 1 | 0.0 | 63.4 | 66 | 63.4 | 10 | ---- | 63.4 | 0.0 | 8 | -8.0 |

| Dwelling Units | # DUs | Noise Reduction | | |
|---|---|---|---|---|
| | | Min | Avg | Max |
| | | dB | dB | dB |
| All Selected | 5 | 0.0 | 0.0 | 0.0 |
| All Impacted | 1 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

<Organization?>
<Analysis By?>

25 April 2025
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: 901 Mission Avenue OY Cumulative
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h Calculated | Crit'n | Increase over existing Calculated | Crit'n Sub'l Inc | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction Calculated | Goal | Calculated minus Goal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| Receiver1 | 1 | 1 | 0.0 | 65.5 | 66 | 65.5 | 10 | ---- | 65.5 | 0.0 | 8 | -8.0 |
| Receiver2 | 2 | 1 | 0.0 | 63.4 | 66 | 63.4 | 10 | ---- | 63.4 | 0.0 | 8 | -8.0 |
| Receiver3 | 3 | 1 | 0.0 | 67.3 | 66 | 67.3 | 10 | Snd Lvl | 67.3 | 0.0 | 8 | -8.0 |
| Receiver4 | 4 | 1 | 0.0 | 62.0 | 66 | 62.0 | 10 | ---- | 62.0 | 0.0 | 8 | -8.0 |
| Receiver5 | 5 | 1 | 0.0 | 64.0 | 66 | 64.0 | 10 | ---- | 64.0 | 0.0 | 8 | -8.0 |
| Receiver6 | 6 | 1 | 0.0 | 68.4 | 66 | 68.4 | 10 | Snd Lvl | 68.4 | 0.0 | 8 | -8.0 |
| Receiver7 | 7 | 1 | 0.0 | 65.7 | 66 | 65.7 | 10 | ---- | 65.7 | 0.0 | 8 | -8.0 |
| Receiver8 | 8 | 1 | 0.0 | 66.8 | 66 | 66.8 | 10 | Snd Lvl | 66.8 | 0.0 | 8 | -8.0 |

| Dwelling Units | # DUs | Noise Reduction Min | Avg | Max |
|---|---|---|---|---|
| | | dB | dB | dB |
| All Selected | 8 | 0.0 | 0.0 | 0.0 |
| All Impacted | 3 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

<Organization?>
<Analysis By?>

25 April 2025
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: 901 Mission Avenue 2030 Cumulative WP
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier | | | | | With Barrier | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LAeq1h | | Increase over existing | | Type Impact | Calculated LAeq1h | Noise Reduction | | |
| | | | | Calculated | Crit'n | Calculated | Crit'n Sub'l Inc | | | Calculated | Goal | Calculated minus Goal |
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| Receiver1 | 1 | 1 | 0.0 | 65.5 | 66 | 65.5 | 10 | ---- | 65.5 | 0.0 | 8 | -8.0 |
| Receiver2 | 2 | 1 | 0.0 | 63.5 | 66 | 63.5 | 10 | ---- | 63.5 | 0.0 | 8 | -8.0 |
| Receiver3 | 3 | 1 | 0.0 | 67.3 | 66 | 67.3 | 10 | Snd Lvl | 67.3 | 0.0 | 8 | -8.0 |
| Receiver4 | 4 | 1 | 0.0 | 62.4 | 66 | 62.4 | 10 | ---- | 62.4 | 0.0 | 8 | -8.0 |
| Receiver5 | 5 | 1 | 0.0 | 64.0 | 66 | 64.0 | 10 | ---- | 64.0 | 0.0 | 8 | -8.0 |

| Dwelling Units | # DUs | Noise Reduction | | |
|---|---|---|---|---|
| | | Min | Avg | Max |
| | | dB | dB | dB |
| All Selected | 5 | 0.0 | 0.0 | 0.0 |
| All Impacted | 1 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

<Organization?>
<Analysis By?>

25 April 2025
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: 901 Mission Avenue 2050 Cumulative NP
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h Calculated | Crit'n | Increase over existing Calculated | Crit'n Sub'l Inc | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction Calculated | Goal | Calculated minus Goal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| Receiver1 | 1 | 1 | 0.0 | 64.1 | 66 | 64.1 | 10 | ---- | 64.1 | 0.0 | 8 | -8.0 |
| Receiver2 | 2 | 1 | 0.0 | 62.5 | 66 | 62.5 | 10 | ---- | 62.5 | 0.0 | 8 | -8.0 |
| Receiver3 | 3 | 1 | 0.0 | 65.9 | 66 | 65.9 | 10 | ---- | 65.9 | 0.0 | 8 | -8.0 |
| Receiver4 | 4 | 1 | 0.0 | 61.5 | 66 | 61.5 | 10 | ---- | 61.5 | 0.0 | 8 | -8.0 |
| Receiver5 | 5 | 1 | 0.0 | 62.8 | 66 | 62.8 | 10 | ---- | 62.8 | 0.0 | 8 | -8.0 |

| Dwelling Units | # DUs | Noise Reduction Min | Avg | Max |
|---|---|---|---|---|
| | | dB | dB | dB |
| All Selected | 5 | 0.0 | 0.0 | 0.0 |
| All Impacted | 0 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

<Organization?>
<Analysis By?>

25 April 2025
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: 901 Mission Avenue 2050 Cumulative WP
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier | | | | | With Barrier | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LAeq1h | | Increase over existing | | Type Impact | Calculated LAeq1h | Noise Reduction | | |
| | | | | Calculated | Crit'n | Calculated | Crit'n Sub'l Inc | | | Calculated | Goal | Calculated minus Goal |
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| Receiver1 | 1 | 1 | 0.0 | 64.1 | 66 | 64.1 | 10 | ---- | 64.1 | 0.0 | 8 | -8.0 |
| Receiver2 | 2 | 1 | 0.0 | 62.5 | 66 | 62.5 | 10 | ---- | 62.5 | 0.0 | 8 | -8.0 |
| Receiver3 | 3 | 1 | 0.0 | 65.9 | 66 | 65.9 | 10 | ---- | 65.9 | 0.0 | 8 | -8.0 |
| Receiver4 | 4 | 1 | 0.0 | 61.5 | 66 | 61.5 | 10 | ---- | 61.5 | 0.0 | 8 | -8.0 |
| Receiver5 | 5 | 1 | 0.0 | 62.8 | 66 | 62.8 | 10 | ---- | 62.8 | 0.0 | 8 | -8.0 |

| Dwelling Units | # DUs | Noise Reduction | | |
|---|---|---|---|---|
| | | Min | Avg | Max |
| | | dB | dB | dB |
| All Selected | 5 | 0.0 | 0.0 | 0.0 |
| All Impacted | 0 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

# *901 MISSION AVENUE MIXED-USE PROJECT*

## AIR QUALITY/GREENHOUSE GAS STUDY

**Prepared for:**

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11988 El Camino Real Suite 200
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**Prepared by:**

BPG
BIRDSEYE
PLANNING GROUP

June 2025

## EXECUTIVE SUMMARY

The proposed Project (Project) is located on an undeveloped 1.5 acre site comprising the block bounded by Mission Avenue (north), South Horne Street (east), South Clementine Street (west) and Seagaze Drive (south). The site is zoned Downtown Subdistrict 2 and is bisected by an unnamed paved street corridor. This street segment would be vacated as part of the proposed Project. The project would develop 273 multifamily apartment and 4,006 square feet (sf) of space for commercial uses. The 273 apartments would be available to serve the housing needs of downtown Oceanside with 10% (28 apartments), reserved for low-income households. The residential rental apartment homes would be located within the upper five floors (3-8) of the building. The commercial space and parking level 1 would be located on the ground floor. Parking levels 2-3 would be subterranean. A total of 322 parking spaces would be provided in a four-level parking garage under the building. Of the four levels, 2.5 would be subterranean. On the Mission Avenue frontage, five parallel parking spaces in addition to a loading zone will be provided.

The project would provide a total of 25,866 square feet of studio units, 97,589 square feet of one-bedroom units and 83,896 square feet of two-bedroom units. The units would be arranged in a "stacked flat" configuration. Each unit would be open to an exterior wall along the perimeter of the building or into an interior courtyard that is open to the sky.

**Air Quality Management Plan Consistency.** The project is consistent with the Downtown District zoning designation and is anticipated in the local plans and SANDAG's population and employment growth projections. Thus, the project would be within SANDAG's population growth forecast and would not conflict with the State Implementation Plan or Regional Air Quality Strategy.

**Construction and Operational Emissions**. Project construction and operational emissions would not exceed the San Diego Air Pollution Control District thresholds. Thus, the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.

**Expose Sensitive Receptors to Substantial Pollutant Concentrations.** The project would not cause or contribute to CO hot spots, impacts related to indoor air quality or otherwise expose receptors to substantial pollutant concentrations.

**Odors.** The project would provide 273 residential units, associated parking and related infrastructure improvements. These uses would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

**Greenhouse Gas Emissions.** The proposed project's annual Greenhouse Gas emissions would not exceed the Service Population threshold of 3.5 Metric Tons of Carbon Dioxide Equivalent emissions each year. Further, the project would be consistent with the City of Oceanside Climate Action Plan, 2017 and 2022 CARB Scoping Plan, the City of Oceanside General Plan and the SANDAG Regional Plan; San Diego Forward, adopted in December 2021. Impacts related to air quality and greenhouse gas emissions would be less than significant.

# 901 MISSION AVENUE MIXED-USE PROJECT OCEANSIDE, CALIFORNIA

## AIR QUALITY and GREENHOUSE GAS STUDY

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Appendix A CalEEMod Air Quality and Greenhouse Gas Emissions Model Results –

# 901 MISSION AVENUE MIXED-USE PROJECT OCEANSIDE, CALIFORNIA

## AIR QUALITY and GREENHOUSE GAS STUDY

This report is an analysis of the potential air quality and greenhouse gas impacts associated with the 901 Mission Avenue Mixed-Use Project, a multifamily residential development proposed for construction and operation on the southwestern corner of Mission Avenue and North Horne Street in the City of Oceanside, California. This study analyzes the potential for impacts associated with construction activity and project operation.

## PROJECT DESCRIPTION

The proposed Project (Project) is located on an undeveloped 1.5 acre site comprising the block bounded by Mission Avenue (north), South Horne Street (east), South Clementine Street (west) and Seagaze Drive (south). The site is zoned Downtown Subdistrict 2 and is bisected by an unnamed paved street corridor. This street segment would be vacated as part of the proposed Project. The project would develop 273 multifamily apartment and 4,006 square feet (sf) of space for commercial uses. The 273 apartments would be available to serve the housing needs of downtown Oceanside with 10% (28 apartments), reserved for low-income households. The residential rental apartment homes would be located within the upper five floors (3-8) of the building. The commercial space and parking level 1 would be located on the ground floor. Parking levels 2-3 would be subterranean. A total of 322 parking spaces would be provided in a four-level parking garage under the building. Of the four levels, 2.5 would be subterranean. On the Mission Avenue frontage, five parallel parking spaces in addition to a loading zone will be provided.

The project would provide a total of 25,866 square feet of studio units, 97,589 square feet of one-bedroom units and 83,896 square feet of two-bedroom units. The units would be arranged in a "stacked flat" configuration. Each unit would be open to an exterior wall along the perimeter of the building or into an interior courtyard that is open to the sky.

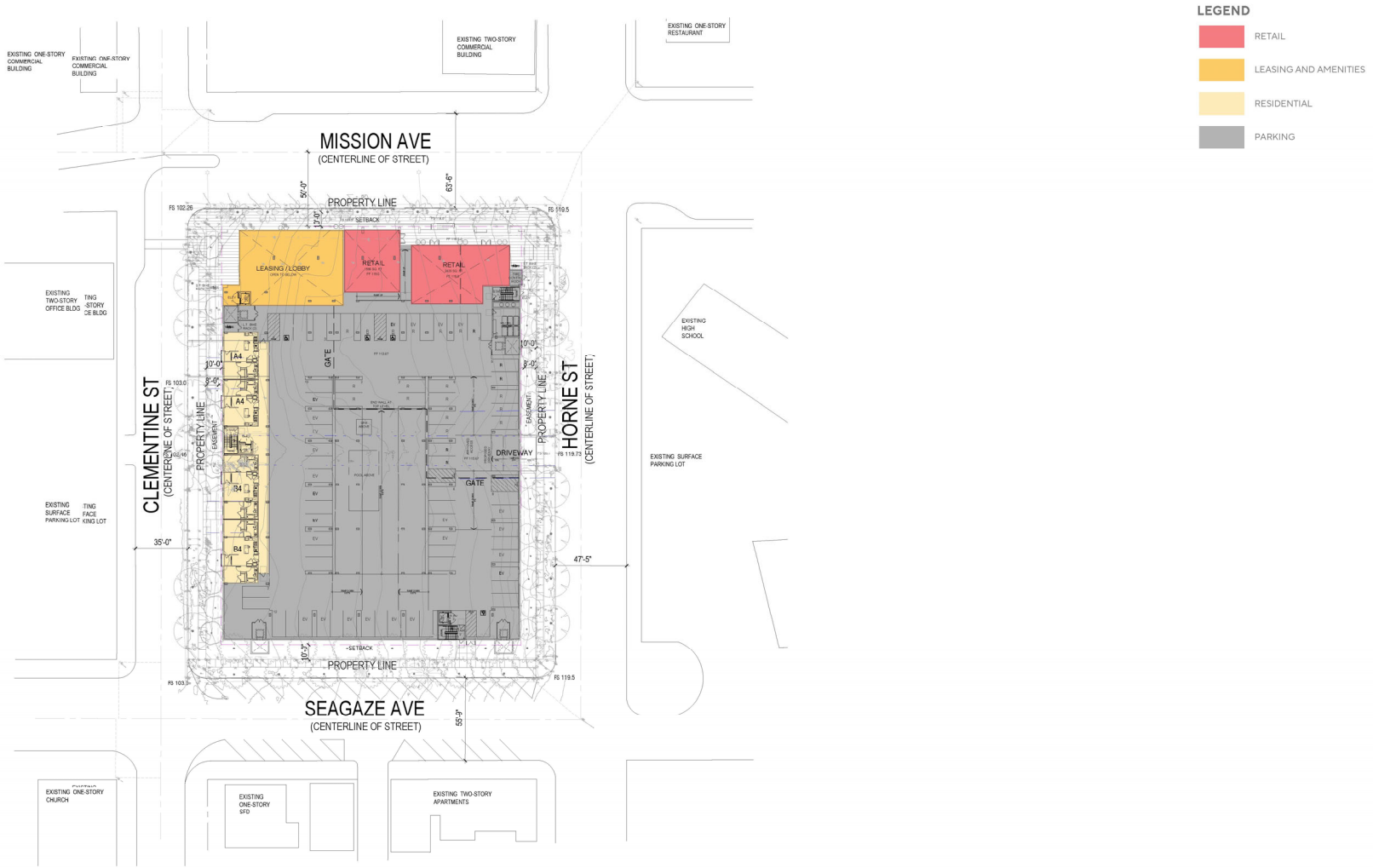
Access to the 3-level parking garage is separated would be provided from North Clementine Street. The levels would be connected by ramps; thus, vehicles will circulate between floors. Resident parking will all be assigned. The uppermost (P1) garage level accessible from South North Horne Street provides resident parking controlled by an entry gate. Taking advantage of the site grade, the first (P1) parking level entry is at grade with North Horne Street. The lowest parking level (P3) is below the alley grade. To accommodate the parking garage, approximately 58,400 cubic yards of soil export will be excavated from the site.

Construction of the project is expected to begin in November 2026 and completed in January 2029. The project site is shown in Figure 1 - Vicinity Map). The preliminary site plan is shown on Figure 2 – Proposed Site Plan.




**Figure 1 - Vicinity Map**

- Project Site




901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

MIXED-USE BUILDING SITE PLAN

1"=30"

0 30' 60' 90' 120'

A1.0

JOB NO. 2023-0939

DATE 05-22-2024

**Figure 2— Site Plan**

**Project Design Features**

To reduce air quality and greenhouse gas emissions to the extent feasible, the project would incorporate the project design features (PDFs). As defined herein, design features are project design elements not otherwise required by law that address compliance with CEQA impact areas:

- During construction, the contractror will overlap the architectural coating phase with the final 45 days of building construction to reflect actual construction methods;
- Per City of Oceanside Development Code Section 3047, *Renewable Energy Facilities*, project will install photovoltaic generating panels on the building rooftop and walls. The project will provide 306.7 kWh to support a portion o fthe daily electrical demand; and
- A total of 90% of indoor and outdoor lighting shall be LED or other high-efficiency lightbulbs.

The following measures are intended to demonstrate compliance with statewide regulations; and thus, have been incorporated into the the air emissions modeling

- The project will provide recycling bins in the trash enclosure areas;
- The project will install drought-tolerant vegetation and water-efficient irrigation systems;
- The project will install low-water use appliances and fixtures;
- The project will install Energy Star, or equivalent, dishwashers, clothes washers, refrigerators, and fans;
- The project will be compliant with San Diego Air Pollution Control District (SDAPCD) Rule 67.0.1 (d) which requires the use of low Volitile Organic Compound (VOC) paint (no greater than 50 grams/Liter) for use on buildng interior and exterior surface and 100 grams/Liter for traffic marking coatings; and
- The project will provide bicycle parking facilities.

**Dust Control Methods**

The project would implement various construction dust control strategies as design features to be compliant with SDAPCD Rule 55. Compliance with these dust control measures are listed as follows and would be identified on grading plan approvals:

- During clearing, grading, earth-moving, excavation, or transportation of cut or fill materials, water trucks or sprinkler systems shall be used to prevent dust from leaving the site and to create a crust after each day's activities cease;

- During construction, water trucks or sprinkler systems shall be used to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this would include wetting down such areas later in the morning, after work is completed for the day, and whenever winds exceed 15 mph during active operations. Watering of active disturbance areas, including active grading areas and unpaved roads,

would occur approximately every 2 hours of active operations, approximately three times per work day (at a minimum):

- All grading and excavation operations shall be halted when wind speeds exceed 25 miles per hour;

- Dirt and debris spilled onto paved surfaces at the project site and on the adjacent roadways shall be swept, vacuumed, and/or washed at the end of each workday; and

- All trucks hauling dirt, sand, soil, or other loose material to and from the construction site shall be covered and/or a minimum 2 feet of freeboard shall be maintained.

# REGULATORY SETTING

## Air Pollution Regulation

Air pollutants are regulated at the national, State, and air basin level; each agency has a different degree of control. The United States Environmental Protection Agency (USEPA) regulates at the national level; the California Air Resources Control Board (CARB) regulates at the State level; and the SDAPCD regulates air quality in San Diego County.

The federal and state governments have been empowered by the federal and state Clean Air Acts to regulate the emission of airborne pollutants and have established ambient air quality standards for the protection of public health. The USEPA is the federal agency designated to administer national air quality regulations, while CARB is the state equivalent in the California Environmental Protection Agency. Local control over air quality management is provided by CARB through multi-county and county-level Air Pollution Control Districts (APCDs) (also referred to as Air Quality Management Districts). CARB establishes statewide air quality standards and is responsible for the control of mobile emission sources, while the local APCDs are responsible for enforcing standards and regulating stationary sources. CARB has established 15 air basins statewide. The City of Oceanside is located in the San Diego Air Basin (SDAB), which is under the jurisdiction of the SDAPCD.

## California Air Resources Board

CARB, which became part of the California EPA (CalEPA) in 1991, is responsible for ensuring implementation of the California Clean Air Act (CCAA), meeting state requirements of the federal Clean Air Act and establishing California Ambient Air Quality Standards (CAAQSs). It is also responsible for setting emission standards for vehicles sold in California and for other emission sources such as consumer products and certain off-road equipment. CARB also established passenger vehicle fuel specifications and oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level. The CCAA is administered by CARB at the state level and by the Air Quality Management Districts at the regional level. Both state and federal

standards are summarized in Table 1. The federal "primary" standards have been established to protect the public health. The federal "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

**Table 1**
**Ambient Air Quality Standards**

| Pollutant | Average Time | California Standards | National Standards |
|---|---|---|---|
| Ozone ($O_3$) | 1 hour | 0.09 ppm | -- |
| | 8 hours | 0.070 ppm | 0.070 ppm |
| Carbon Monoxide (CO) | 8 hours | 9.0 ppm | 9 ppm |
| | 1 hour | 20 ppm | 35 ppm |
| Nitrogen Dioxide ($NO_2$) | Annual Average | 0.030 ppm | 0.053 ppm |
| | 1 hour | 0.18 ppm | 100 ppb |
| Sulfur Dioxide ($SO_2$) | Annual Average | -- | 0.03 ppm |
| | 24 hours | 0.04 ppm | 0.14 ppm |
| | 1 hour | 0.25 ppm | 75 ppb |
| Respirable Particulate Matter ($PM_{10}$) | 24 hours | 50 $mg/m^3$ | 150 $mg/m^3$ |
| | Annual Arithmetic Mean | 20 $mg/m^3$ | -- |
| Fine Particulate Matter ($PM_{2.5}$) | Annual Arithmetic Mean | 12 $mg/m^3$ | 12 $mg/m^3$ |
| | 24 hours | -- | 35 $mg/m^3$ |
| Sulfates | 24 hours | 25 $mg/m^3$ | -- |
| Lead | 30-day Average | 1.5 $mg/m^3$ | -- |
| | Calendar Quarter | -- | 1.5 $mg/m^3$ |
| | 3-month Rolling Average | -- | 0.15 $mg/m^3$ |
| Hydrogen Sulfide | 1 hour | 0.03 ppm | -- |
| Vinyl Chloride | 24 hours | 0.010 ppm | -- |

Notes:
ppm = parts per million
ppb – parts per billion
mg/m3 = micrograms per cubic meter
mg/m3 = milligrams per cubic meter
Source: California Air Resources Board 2016

### San Diego Air Pollution Control District

The SDAPCD was created to protect the public from the harmful effects of air pollution, achieve and maintain air quality standards, foster community involvement and develop and implement cost-effective programs that meet state and federal mandates while considering environmental and economic impacts.

Specifically, the SDAPCD is responsible for monitoring air quality and planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district. Programs developed include air quality rules and regulations that regulate stationary source emissions, including area sources, point sources, and certain mobile source emissions. The SDAPCD is also responsible for establishing permitting requirements for stationary sources and ensuring that new, modified or relocated stationary sources do not create net emissions increases; and thus, are consistent with the region's air quality goals. The SDAPCD provides significance thresholds in Regulation II, Rule 20.2, Table 20-2-1. "AQIA Trigger Levels." These trigger levels were established for stationary sources of air pollution and are commonly used for environmental evaluations. The SDAPCD enforces air quality rules and regulations through a variety of means, including inspections, educational or training programs, or fines, when necessary. The project site is within the SDAB; and thus, is subject to SDAPCD rules and regulations.

**State Implementation Plan/Air Quality Management Plan/Regional Air Quality Strategy**

The federal Clean Air Act Amendments (CAAA) mandate that states submit and implement a State Implementation Plan (SIP) for areas not meeting air quality standards. SIPs are comprehensive plans that describe how an area will attain national and state ambient air quality standards. SIPs are a compilation of new and previously submitted plans, programs (i.e., monitoring, modeling and permitting programs), district rules, state regulations and federal controls and include pollution control measures that demonstrate how the standards will be met through those measures.

State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB forwards SIP revisions to the USEPA for approval and publication in the Federal Register. Thus, the Regional Air Quality Strategy (RAQS) and Air Quality Management Plan (AQMP) prepared by SDAPCD and referenced herein become part of the SIP as the material relates to efforts ongoing in San Diego County to achieve the national and state ambient air quality standards. The most recent SIP element for San Diego County was submitted in December 2016. The document identifies control measures and associated emission reductions necessary to demonstrate attainment of the 2008 Federal 8-hour ozone standard by July 20, 2018.

The San Diego RAQS was developed pursuant to California Clean Air Act (CCAA) requirements. The RAQS was initially adopted in 1991 and was updated in 1995, 1998, 2001, 2004, 2009 and 2016. The 2022 RAQS update is under development. Until it is adopted, the 2016 is applicable and can be found at the following:
https://www.sdapcd.org/content/sdapcd/planning.html

The RAQS identifies feasible emission control measures to provide progress in San Diego County toward attaining the State ozone standard. The pollutants addressed in the RAQS are volatile organic compounds (VOC) (also referred to as Reactive Organic Gases (ROG)) and oxides of nitrogen (NOx), precursors to the photochemical formation of ozone (the primary component of smog). The RAQS was initially adopted by the SDAPCD on June 30, 1992, and

amended on March 2, 1993, in response to ARB comments. At present, no attainment plan for particulate matter less than 10 microns in diameter ($PM_{10}$) or particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) is required by the state regulations; however, SDAPCD has adopted measures to reduce particulate matter in the SDAB. These measures range from regulation against open burning to incentive programs that introduce cleaner technology. These measures can be found in a report titled "Measures to Reduce Particulate Matter in San Diego County, December 2005: https://www.sdapcd.org/content/dam/sdapcd/documents/grants/planning/PM-Measures.pdf

The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County, to estimate future emissions and then determine strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends as well as land use plans developed by the cities and the County as part of the development of the individual General Plans. As such, projects that propose development consistent with the growth anticipated by the general plans would be consistent with the RAQS. In the event that a project would propose development which is less dense than anticipated within the General Plan, the project would likewise be consistent with the RAQS. If a project proposes development that is greater than that anticipated in the General Plan and SANDAG's growth projections, the project might conflict with the RAQS and SIP; and thus, have a potentially significant impact on air quality.

Under state law, the SDAPCD is required to prepare an AQMP for pollutants for which the SDAB is designated non-attainment. Each iteration of the SDAPCD's AQMP is an update of the previous plan and has a 20-year horizon. Currently the SDAPCD has implemented the 2*020 Plan for Attaining the National Ambient Air Quality Standard for Ozone in San Diego County* (October 2020) and a 2004 Carbon Monoxide Plan. The 2020 ozone plan was submitted to CARB on October 20, 2020. It was adopted and submitted to the USEPA for review on December 28, 2020. Comments from the USEPA are pending. This plans is available for download on the ARB website located at the following URL: https://www.sdapcd.org/content/dam/sdapcd/documents/grants/planning/Att%20A%20(Attainment%20Plan)_ws.pdf

**SDAPCD Rules and Regulations**

As stated above, SDAPCD is responsible for planning, implementing, and enforcing federal and state ambient standards in the SDAB. The following rules and regulations apply to all sources in the jurisdiction of SDAPCD, and would apply to the project.

**SDAPCD Regulation IV: Prohibitions; Rule 50: Visible Emissions.** Prohibits discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than 3 minutes in any period of 60 consecutive minutes that is darker in shade than that designated as Number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or of such opacity as to obscure an observer's view to a

degree greater than does smoke of a shade designated as Number 1 on the Ringelmann Chart (SDAPCD 1997).

**SDAPCD Regulation IV: Prohibitions; Rule 51: Nuisance.** Prohibits the discharge, from any source, of such quantities of air contaminants or other materials that cause or have a tendency to cause injury, detriment, nuisance, annoyance to people and/or the public, or damage to any business or property (SDAPCD 1976).

**SDAPCD Regulation IV: Prohibitions; Rule 55: Fugitive Dust.** Regulates fugitive dust emissions from any commercial construction or demolition activity capable of generating fugitive dust emissions, including active operations, open storage piles, and inactive disturbed areas, as well as track-out and carry-out onto paved roads beyond a project site (SDAPCD 2009b).

**SDAPCD Regulation IV: Prohibitions; Rule 67.0.1: Architectural Coatings.** Requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories (SDAPCD 2015).

**SDAPCD Regulation XII: Toxic Air Contaminates; Rule 1200: Toxic Air Contaminants – New Source Review.** Requires new or modified stationary source units with the potential to emit Toxic Air Contaminatnts (TACs) above rule threshold levels to either demonstrate that they will not increase the maximum incremental cancer risk above 1 in 1 million at every receptor location, or demonstrate that toxics best available control technology (T-BACT) will be employed if maximum incremental cancer risk is equal to or less than 10 in 1 million, or demonstrate compliance with SDAPCD's protocol for those sources with an increase in maximum incremental cancer risk at any receptor location of greater than 10 in 1 million but less than 100 in 1 million (SDAPCD 2017b).

**SDAPCD Regulation XII: Toxic Air Contaminates; Rule 1210: Toxic Air Contaminant Public Health Risks – Public Notification and Risk Reduction.** Requires each stationary source that is required to prepare a public risk assessment to provide written public notice of risks at or above the following levels: maximum incremental cancer risks equal to or greater than 10 in 1 million, or cancer burden equal to or greater than 1.0, or total acute noncancer health hazard index equal to or greater than 1.0, or total chronic non-cancer health hazard index equal to or greater than 1.0 (SDAPCD 2017c).

## Regional Climate and Local Air Quality

The weather of San Diego County is profoundly influenced by the Pacific Ocean and its semi-permanent high-pressure systems that result in dry, warm summers and mild, occasionally wet winters. The average minimum temperature for January ranges from the mid-40s to the high-50s degrees Fahrenheit (4 to 15 degrees Celsius) across the county. July maximum temperatures average in the mid-80s to the high-90s degrees Fahrenheit (high-20s to the high-30s degrees

Celsius). Most of the county's precipitation falls from November to April, with infrequent (approximately 10 percent) precipitation during the summer. The average seasonal precipitation along the coast is approximately 10 inches (254 millimeters); the amount increases with elevations as moist air is lifted over the mountains.

The interaction of ocean, land, and the Pacific High-Pressure Zone maintains clear skies for much of the year and drives the prevailing winds. Local terrain is often the dominant factor inland and winds in inland mountainous areas tend to blow upwards in the valleys during the day and down the hills and valleys at night.

In conjunction with the onshore/offshore wind patterns, there are two types of temperature inversions (reversals of the normal decrease of temperature with height), which occur within the region that affect atmospheric dispersive capability and that act to degrade local air quality. In the summer, an inversion at about 1,100 to 2,500 feet (335 to 765 meters) is formed over the entire coastal plain when the warm air mass over land is undercut by a shallow layer of cool marine air flowing onshore. The prevailing sunny days in this region further exacerbate the smog problem by inducing additional adverse photochemical reactions. During the winter, a nightly shallow inversion layer (usually at about 800 feet or 243 meters) forms between the cooled air at the ground and the warmer air above, which can trap vehicular pollutants. The days of highest Carbon Monoxide (CO) concentrations occur during the winter months.
The predominant onshore/offshore wind pattern is sometimes interrupted by so-called Santa Ana conditions, when high pressure over the Nevada-Utah region overcomes the prevailing westerly wind direction. This draws strong, steady, hot, and dry winds from the east over the mountains and out to sea. Strong Santa Ana winds tend to blow pollutants out over the ocean, producing clear days. However, at the onset or breakdown of these conditions or if the Santa Ana is weak, prevailing northwesterly winds are reestablished which send polluted air from the Los Angeles basin ashore in the SDAB. "Smog transport from the South Coast Air Basin (the metropolitan areas of Los Angeles, Orange, San Bernardino, and Riverside counties) is a key factor on more than half the days San Diego exceeds clean air standards" (San Diego Air Pollution Control District, 2010).

**Pollutants**

The SDAPCD is required to monitor air pollutant levels to ensure that air quality standards are met and, if they are not met, to develop strategies to meet the standards. Depending on whether the standards are met or exceeded, the local air basin is classified as being in "attainment" or "non-attainment." San Diego County is listed as a federal non-attainment area for ozone (eight hour) and a state non-attainment area for ozone (one hour and eight-hour standards), $PM_{10}$ and $PM_{2.5}$. As shown in Table 2, the SDAB is in attainment for the state and federal standards for nitrogen dioxide, carbon monoxide, sulfur dioxide and lead. Characteristics of ozone, carbon monoxide, nitrogen dioxide, and suspended particulates are described below.

Ozone. Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides ($NO_x$) ROG[1]. Nitrogen oxides are formed during the combustion of fuels,

**Table 2**
**San Diego County Attainment Status**

| Criteria Pollutant | Federal Designation | State Designation |
|---|---|---|
| Ozone (one hour) | Attainment* | Non-Attainment |
| Ozone (eight hour) | Moderate Non-Attainment | Non-Attainment |
| Carbon Monoxide | Attainment | Attainment |
| $PM_{10}$ | Unclassifiable** | Non-Attainment |
| $PM_{2.5}$ | Attainment | Non-Attainment |
| Nitrogen Dioxide | Attainment | Attainment |
| Sulfur Dioxide | Attainment | Attainment |
| Lead | Attainment | Attainment |
| Sulfates | No Federal Standard | Attainment |
| Hydrogen Sulfide | No Federal Standard | Unclassified |
| Visibility | No Federal Standard | Unclassified |

** The federal 1-hour standard of 12 ppm was in effect from 1979 through June 1, 2005. The revoked standard is referenced here because it was used for such a long period and because this benchmark is addressed in State Implementation Plans (SIPs).*

*** At the time of designation, if the available data does not support a designation of attainment or non-attainment, the area is designated as unclassifiable.*

*Source: San Diego Air Pollution Control District. June 2016. http://www.sandiegocounty.gov/content/sdc/apcd/en/air-quality-planning/attainment-status.html*

while reactive organic compounds are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide. Carbon monoxide (CO) is a local pollutant that is found in high concentrations only near the source. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile exhaust. Elevated CO concentrations; therefore, are usually only found near areas of high traffic volumes operating in congested conditions. Carbon monoxide health effects are related to blood hemoglobin. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity and impaired mental abilities.

*[1] Organic compound precursors of ozone are routinely described by a number of variations of three terms: hydrocarbons (HC), organic gases (OG), and organic compounds (OC). These terms are often modified by adjectives such as total, reactive, or volatile, and result in a rather confusing array of acronyms: HC, THC (total hydrocarbons), RHC (reactive hydrocarbons), TOG (total organic gases), ROG (reactive organic gases), TOC (total organic compounds), ROC (reactive organic compounds), and VOC (volatile organic compounds). While most of these differ in some significant way from a chemical perspective, from an air quality perspective two groups are important: non-photochemically reactive in the lower atmosphere, or photochemically reactive in the lower atmosphere (HC, RHC, ROG, ROC, and VOC).*

Nitrogen Dioxide. Nitrogen dioxide ($NO_2$) is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form $NO_2$, creating the mixture of NO and $NO_2$ commonly called $NO_X$. Nitrogen dioxide is an acute irritant. A relationship between $NO_2$ and chronic pulmonary fibrosis may exist and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light and causes a reddish-brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of $PM_{10}$ and acid rain.

Suspended Particulates. $PM_{10}$ is particulate matter measuring no more than 10 microns in diameter, while $PM_{2.5}$ is fine particulate matter measuring no more than 2.5 microns in diameter. Suspended particulates are mostly dust particles, nitrates and sulfates. Both $PM_{10}$ and $PM_{2.5}$ are by-products of fuel combustion and wind erosion of soil and unpaved roads and are directly emitted into the atmosphere through these processes. Suspended particulates are also created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with the small particulates (those between 2.5 and 10 microns in diameter) and fine particulates ($PM_{2.5}$) can be very different. The small particulates generally come from windblown dust and dust kicked up from mobile sources. The fine particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. Fine particulate matter is more likely to penetrate deeply into the lungs and poses a health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern. Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead.

Sulfates. Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO2 in the atmosphere. Sulfates can result in respiratory impairment, as well as reduced visibility.

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor, which has been detected near landfills, sewage plants, and hazardous waste sites, due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air can cause nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer.

Hydrogen Sulfide. Hydrogen sulfide is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of hydrogen sulfide include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to hydrogen sulfide can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations.

Visibility-Reducing Particles. Visibility-reducing particles are any particles in the air that obstruct the range of visibility. Effects of reduced visibility can include obscuring the viewshed of natural scenery, reducing airport safety, and discouraging tourism. Sources of visibility-reducing particles are the same as for PM2.5 described above.

Toxic Air Contaminants/Diesel Particulate Matter. Hazardous air pollutants, also known as TACs or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Examples of toxic air pollutants include:

1. benzene, which is found in gasoline;
2. perchloroethylene, which is emitted from some dry-cleaning facilities; and
3. methylene chloride, which is used as a solvent.

Transportation related emissions are focused on particulate matter constituents within diesel exhaust and TAC constituents that comprise a portion of total organic gas (TOG) emissions from both diesel and gasoline fueled vehicles. Diesel engine emissions are comprised of exhaust particulate matter and TOGs which are collectively defined as Diesel Particulate Matter (DPM). DPM and TOG emissions from both diesel and gasoline fueled vehicles is typically composed of carbon particles and carcinogenic substances including polycyclic aromatic (i.e., odorous) hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. Diesel exhaust also contains gaseous pollutants, including volatile organic compounds and $NO_x$.

**Sensitive Receptors**

Land uses considered to be sensitive receptors include residential, school, childcare centers, acute care hospitals, and long-term health care facilities. Sensitive receptors are determined based upon special factors which may include the age of the users or occupants, the frequency and duration of the use or occupancy, continued exposure to hazardous substances as defined by federal and state regulations, and the user's ability to evacuate a specific site in the event of a hazardous incident. Ambient air quality standards have been established to represent the levels of air quality considered sufficient, with an adequate margin of safety, to protect public health and welfare. They are designed to protect that segment of the public most susceptible to respiratory distress, such as children; the elderly; persons engaged in strenuous work or

exercise and people with cardiovascular and chronic respiratory diseases. Recreational uses can be considered moderately sensitive to air pollution. Exercise can place a high demand on respiratory functions, which can be impaired by air pollution even though exposure periods during exercise are generally short.Residential uses are considered most sensitive to air pollution while Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time.

The closest receivers to the north is the single-family residence at 909 Seagaze Drive, across the street and approximatey 70 feet from the project site property line. A single-family residences is located at 104 South Clementine Street approximately 85 feet south of the project site property line. The northwest corner of the Oceanside High School campus is located across North Horne Street to the east of the project site. The closest classroom building is located approximately 77 feet from the eastern site boundary.

**Monitored Air Quality**

The SDAPCD monitors air quality conditions at locations throughout the SDAB. For this analysis, data from the Camp Pendleton monitoring station north of the site were used to characterize existing ozone and $PM_{2.5}$ conditions in the vicinity of the project site. A summary of $PM_{10}$ data recorded at the 533 First Street El Cajon monitoring station is presented in Table 3.

**Table 3**
**Measured Air Quality Data**

| Averaging Time | Unit | Agency/ Method | Ambient Air Quality Standard | Measured Concentration by Year | | | Exceedances by Year | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 2020 | 2021 | 2022 | 2020 | 2021 | 2022 |
| Ozone ($O_3$) – Camp Pendleton | | | | | | | | | |
| Maximum 1-hour concentration | ppm | State | 0.09 | 0.094 | 0.074 | 0.076 | 0 | 0 | 0 |
| Maximum 8-hour concentration | ppm | State | 0.070 | 0.074 | 0.059 | 0.067 | 3 | 0 | 0 |
| | | Federal | 0.070 | 0.074 | 0.059 | 0.067 | 3 | 0 | 0 |
| Nitrogen Dioxide ($NO_2$) – Camp Pendleton | | | | | | | | | |
| Maximum 1-hour concentration | ppm | State | 0.18 | 53 | 59 | 50 | 0 | 0 | 0 |
| | | Federal | 0.100 | 53 | 59 | 50 | 0 | 0 | 0 |
| Coarse Particulate Matter ($PM_{10}$)[a] – El Cajon – Lexington Elementary School, 533 First Street | | | | | | | | | |
| Maximum 24-hour concentration | $\mu g/m^3$ | State | 50 | | -- | -- | - | - | - |
| | | Federal | 150 | | _ | -- | - | - | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Annual concentration | µg/m$^3$ | State | 20 | -- | -- | -- | -- | -- | -- |
| Fine Particulate Matter ($PM_{2.5}$)[a] – El Cajon – Lexington Elementary School, 533 First Street | | | | | | | | | |
| Maximum 24-hour concentration | µg/m$^3$ | Federal | 35 | 38.2 | 30.2 | 26.4 | 2 | 0 | 0 |
| Annual concentration | µg/m$^3$ | State | 12.0 | 11.6 | 10.4 | - | 0 | 0 | - |
| | | Federal | 12.0 | 10.3 | 9.7 | 9.4 | 0 | 0 | 0 |

*[1] – Federal O3 standard reduced from 75 ppm to 70 ppm in October 2015*
*Insufficient data to determine number of exceedances
*Ozone and Nitrogen Oxide data from the Camp Pendleton Monitoring Station. PM10 and PM2.5 data from 533 First Street in El Cajon.*
*Source: California Air Resources Board, 2020, 2021 and 2022 Air Quality Data Summaries available at: http://www.arb.ca.gov/adam/topfour/topfourdisplay.php Accessed May 1, 2024.*

# AIR QUALITY IMPACT ANALYSIS

## Methodology and Significance Thresholds

Air quality modeling was performed in general accordance with the methodologies outlined in the SDAPCD 2016 RAQS to identify both construction and operational emissions associated with each phase and the cumulative total of all project phases at build out. All emissions were calculated using the California Emissions Estimator Model (CalEEMod) software version 2022.1 which incorporates current air emission data, planning methods and protocol approved by CARB.

Construction activities would include removal of existing asphalt and concrete located on-site; ruderal vegetation, site clearing, excavation for the subterranean portion of the parking garage, grading to create construction pads and other project improvements, construction of the buildings/utilities and related improvements as well as painting the interior and exterior building surfaces and paving driveways and parking areas. Construction activities would require the use of equipment that would generate criteria air pollutant emissions. For modeling purposes, it was assumed that all construction equipment used would be diesel-powered. Construction emissions associated with development of the proposed project were quantified by estimating the types of equipment, including the number of individual pieces of equipment, that would be used on-site during each of the construction phases as well as off-site haul trips to remove demolition debris and excavation spoils. Construction emissions are analyzed using the regional thresholds established by the SDAPCD and published under Rule 20-2. Excavation spoils are estimated to be 58,400 cubic yards. No fill import would be required.

Operational emissions include mobile source emissions, energy emissions, and area source emissions. Mobile source emissions are generated by motor vehicle trips associated with operation of the project. Emissions attributed to energy use include electricity and natural gas consumption for space and water heating. Area source emissions are generated by landscape maintenance equipment, consumer products and architectural coatings (i.e., paints). To

determine whether a regional air quality impact would occur, the increase in emissions are compared with the SDAPCD recommended regional thresholds for operational emissions.

Regional Thresholds. Based on Appendix G of the *CEQA Guidelines (2022)*, a project would have a significant air quality impact if it would:

a. *Conflict with or obstruct implementation of the applicable air quality plan;*
b. *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard;*
c. *Expose sensitive receptors to substantial pollutant concentrations;*
d. *Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.*

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or pollution control district may be relied upon to determine whether the project would have a significant impact on air quality. As part of its air quality permitting process, SDAPCD has established thresholds in Rule 20.2 requiring the preparation of Air Quality Impact Assessments for permitted stationary sources. SDAPCD establishes quantitative emission thresholds for stationary sources. Although these trigger levels do not generally apply to mobile sources or general land development projects, for comparative purposes these levels may be used to evaluate the increased emissions that would be emitted into the SDAB from proposed land development projects. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented below in Table 4 are exceeded.

**Table 4**
**SDAPCD Air Emission Significance Thresholds**

| Construction Emissions | | | |
|---|---|---|---|
| Pollutant | | Total Emissions (pounds per day) | |
| Reactive Organic Gas (ROG) | | 75 | |
| Nitrogen Oxides (NOx) | | 250 | |
| Carbon Monoxide (CO) | | 550 | |
| Sulfur Oxides (SOx) | | 250 | |
| Respirable Particulate Matter ($PM_{10}$) | | 100 | |
| Fine Particulate Matter (PM2.5) | | 55 | |
| Operational Emissions | | | |
| | Total Emissions | | |
| | Pounds per Hour | Pounds per Day | Tons per Year |
| Reactive Organic Gas (ROG) | -- | 75 | 13.7 |
| Nitrogen Oxides (NOx) | 25 | 250 | 40 |
| Carbon Monoxide (CO) | 100 | 550 | 100 |
| Sulfur Oxides (SOx) | 25 | 250 | 40 |
| Respirable Particulate Matter ($PM_{10}$) | -- | 100 | 15 |
| Fine Particulate Matter (PM2.5) | -- | 55 | 10 |
| Lead and Lead Compounds | -- | 3.2 | 0.6 |

The thresholds listed in Table 4 are screening-level thresholds used to evaluate whether proposed-project-related emissions could cause a significant impact to air quality. Emissions below the screening-level thresholds would not cause a significant impact. The emissions-based thresholds for ozone precursors (ROG and NOx) are intended to serve as the threshold for ozone. This approach is used because ozone is not emitted directly; thus, ozone concentrations associated with individual projects precursor (ROG and NOx) emissions cannot be determined through air quality models or other quantitative methods. For nonattainment pollutants, if emissions exceed the thresholds shown in Table 4, the project has the potential to result in a cumulatively considerable net increase in these pollutants; and thus, could have a significant impact on the ambient air quality.

With respect to odors, SDAPCD Rule 51 (Public Nuisance) prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A project that involves a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

***a. Would the project conflict with or obstruct implementation of the applicable air quality plan?***

As stated, under state law, the SDAPCD is required to prepare an AQMP for pollutants for which the SDAB is designated non-attainment. Each iteration of the SDAPCD's AQMP is an update of the previous plan and has a 20-year horizon. A project may be deemed inconsistent with the AQMP if it would generate population, housing, or employment growth exceeding forecasts used in the development of the AQMP. Currently the SDAPCD has implemented the 2*020 Plan for Attaining the National Ambient Air Quality Standard for Ozone in San Diego County* (October 2020) and a 2004 Carbon Monoxide Plan. The AQMP incorporates local city General Plans and the San Diego Association of Governments socioeconomic forecast projections of regional population, housing and employment growth.

The proposed project involves the construction of 273 multifamily residential apartment units with 4,006 square feet of commercial use. The site is 1.5 acres in size with General Plan designation of Downtown and Zoning designation of Downtown Subdistrict 2. The intent of this designation is to provide sites for office development, interspersed with residential stand-alone and/or mixed-use development, in response to market demands. The site is also located within the Downtown Transit Oriented District (TOD) that encompasses sites within one-half mile from the Oceanside Transit Center boundaries.

The proposed project would be consistent with the existing land use and zoning designations, including its allowance for density bonus projects. Of the 273 units, a total of 28 would be designated as affordable. These units would be managed as affordable and leased to income qualifying tenants.

According to the 2021-2029 Regional Housing Needs Assessment (RHNA) 6th cycle, the City of Oceanside will need to accommodate a total of 5,443 units at varying income levels (City of Oceanside, February 2022) . Of the total, 3,457 are allocated to the moderate and above moderate-income categories. However, in the 2021-2029 Housing Element (June 2021), the City of Oceanside disclosed its ability to accommodate 4,357 of the RHNA allocation units based on the existing land use inventory. Without rezoning land to accommodate housing, the City would be in a deficit of 1,086 units. The project would provide 273 units or approximately 5% of Oceanside's housing allocation, consistent withthe 2021-2029 RHNA.

The San Diego APCD and San Diego Association of Governments are responsible for developing and implementing the clean air plans for attainment and maintenance of the ambient air quality standards in the basin—specifically, the SIP and RAQS. The federal O3 maintenance plan, which is part of the SIP, was adopted in 2012. The most recent O3 attainment plan was adopted in 2020. The SIP includes a demonstration that current strategies and tactics will maintain acceptable air quality in the basin based on the NAAQS. The RAQS was initially adopted in 1991 and is updated on a triennial basis (most recently in 2016). The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O3. The SIP and RAQS rely on information from CARB and SANDAG, including mobile and area source emissions as well as information regarding projected growth in the County and the cities in the County, to project future emissions and determine the strategies necessary for the reduction of emissions through regulatory controls.

CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends and land use plans developed by the County and the cities in the County as part of the General Plan development process. If a project proposes development that is greater than that anticipated in the local plan and SANDAG's growth projections, the project might be in conflict with the SIP and RAQS and may contribute to a potentially significant cumulative impact on air quality.

The Downtown District zoning designation is intended to support multifamily residential development; state law as well as the City's municipal code has long authorized use of density bonus. Thus, the project is consistent with City's General Plan the land use designation/zoning; and thus, is factored into SANDAG's growth projections. Furthermore, the estimated increase in population, employment and housing generated by the project was compared to SANDAG's Regional Plan population, employee population, and housing estimates for the years 2020 and 2035. The number of housing units in the City was projected to be 67,817 in 2020 and 70,395 in 2035, or an increase in 2,578 housing units over the 15-year period. Furthermore, the City's population was projected to be 177,840 residents in 2020 and 188,597 residents in 2035, or increase of 10,757 residents over the period (SANDAG 2015). The average household size is 2.8 people per dwelling unit (City of Oceanside 2013). The project would construct 273 dwelling units, which would have the potential to house approximately 764 residents, both well within the applicable growth projections.

The employee population in the City was projected to be 48,205 in 2020 and 53,283 in 2035, or increase of 10,078 employees over the period (SANDAG 2015). The residential and commercial components would employ approximately 10 persons assuming one employee per 400 square feet. Because the project is consistent with the General Plan; and thus, SANDAG's growth projections, project emissions would not conflict with the SIP and RAQS. The project would not conflict with or obstruct implementation of the AQMP. Impacts would be less than significant.

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

## Construction Emissions

Project construction would generate temporary air pollutant emissions. These impacts are associated with fugitive dust ($PM_{10}$ and $PM_{2.5}$) and exhaust emissions from heavy construction vehicles, work crew vehicle trips in addition to ROG that would be released during the drying phase upon application of paint and other architectural coatings. Construction would generally consist of demolition (i.e., removal of the existing street pavement), site preparation (clearing/grubbing), excavation/grading, construction of the proposed buildings, architectural coating (i.e., paint) application and paving.

Emissions from the construction phase of the project were estimated using CalEEMod 2022.1. Construction scenario assumptions, including phasing, equipment mix, and vehicle trips, were based primarily on CalEEMod default values. The phasing durations were provided by the applicant. For purposes of estimating project emissions, it is assumed that construction of the project would occur five days per week and commence in November 2026 and would be complete in January 2029. The duration of each phase is approximated below:

- Demolition: 2 weeks
- Site Prepartion: 2 weeks
- Grading: 12 weeks
- Building Construction: 76 weeks
- Paving: 4 weeks
- Architectural Coating: 13 weeks

Construction-worker and vendor trips estimates by construction phase were based on CalEEMod default data. Mass grading would include the entire project site. Approxiamtely 30 daily round trips would be required to remove demolition material. Approximately 58,400 cubic yards of soil export would be required during site preparation and grading. Based on the CalEEMod 2022.1 default values and grading schedule, approximately 122 daily haul trips would be required to remove the excavated material. No fill import is anticipated during and after the building construction phase. CalEEMod default daily trip calculations and trip length values were used to quantify total worker, vendor and haul trips as well as distances for all construction-related trips. The default construction equipment mix and vehicle trips used for

estimating the project-generated construction emissions were used and are provided in Appendix A. As discussed, the project would implement dust control strategies as a project design feature. To reflect implementation of proposed dust control strategies, the following was used in CalEEMod:

- Water exposed area two times per day (55% reduction in $PM_{10}$ and $PM_{2.5}$); and
- Limit vehicle travel on unpaved roads to 10 miles per hour.

The modeling methodology conservatively provides for watering twice daily. As stated above, per APCD rules, watering during grading would occur a minimum of three times daily. Thus, the emissions Table 5 summarizes the estimated maximum daily emissions of pollutants occurring during construction.

**Table 5**
**Estimated Maximum Daily Construction Emissions with Dust Control Measures**

| Construction Phase | | Maximum Emissions (lbs/day) | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_x$ | CO | SOx | $PM_{10}$ | $PM_{2.5}$ |
| 2026 Maximum lbs/day | 3.3 | 38.7 | 32.6 | 0.11 | 9.1 | 5.1 |
| 2027 Maximum lbs/day | 3.2 | 36.6 | 32.1 | 0.11 | 7.2 | 3.2 |
| 2028 Maximum lbs/day | 26.5 | 11.1 | 22.2 | 0.03 | 2.7 | 0.8 |
| 2029 Maximum lbs/day | 26.6 | 0.9 | 2.7 | 0.001 | 0.4 | 0.1 |
| *SDAPCD Regional Thresholds* | *75* | *250* | *550* | *250* | *100* | *55* |
| **Threshold Exceeded 2022** | **No** | **No** | **No** | **No** | **No** | **No** |

As shown in Table 5, construction of the proposed project would not exceed the SDAPCD daily thresholds. With SDAPCD Rule 55 compliance, federal, state and local construction emission thresholds would be met. Construction emissions would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard. Impacts will be **less than significant.**

## Operational Impacts

Emissions from the operational phase of the project were estimated using CalEEMod version 2022.1 for 2030. Operational year 2030 was assumed to be consistent with the anticipated stabilized occupancy of the project.

**Area Sources.** CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with space heating and water heating are calculated in the building energy use module of CalEEMod.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products. Consumer product VOC emissions are estimated in CalEEMod based on the floor area of buildings and on the default factor of pounds of VOC per building square foot per day. The CalEEMod default values for consumer products were used.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as paints and primers used during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. VOC emissions were estimated based on compliance with SDAPCD Rule 67.0.1 which limits the VOC concentrations of various coatings sold and used in San Diego County. Rule 67.0.1, Table 1, lists numeous types of coatings and the allowable VOC concentrations in grams/litre (g/L).The three general coating categories are 50 grams per liter (g/L) VOC for flat coatings, 100 g/L VOC for non-flat coatings and 150 g/L VOC for non-flat high gloss coatings. Consistent with typical construction practices, it is anticipated that interior and exterior paint would not exceed non-flat coating limits, exterior paint would not exceed non-flat coating limits and a small portion of exterior paint and finishes (trim and other minor finishes) would not exceed non-flat high-gloss coatings limits. The interior and exterior coatings were estimated to have 50 g/L VOC while the traffic marking coatings were estimatedto be limited to 100 g/L VOC. The default values in CalEEMod 2022.1 rely on compliance with SDAPCD Rule 67.0.1 referenced above.

**Energy Sources.** Energy sources include emissions associated with building electricity and natural gas use. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site.

City of Oceanside Development Code Section 3047, *Renewable Energy Facilities,* requires that certain types of new development, including the proposed project, install and maintain renewable energy facilities (e.g. solar photovoltaic systems). Section 3047 (A) stipulates that these system supply at least 50 percent of forecasted electricity demand. The project will install photovoltaic generating panels on the building rooftop and exterior walls to provide up to 306.7 kWh of electricity to supplement electrical demand. A total of 90% of indoor and outdoor lighting will be LED or other high-efficiency lightbulbs. Further, the project will install Energy Star, or equivalent, dishwashers, clothes washers, refrigerators, and fans; bicycle parking facilities and electric vehicle charging stations to decrease overall energy demand.

**Mobile Sources.** CalEEMod default data, including trip characteristics, trip lengths, variable start information and emissions factors were used for the model inputs. Project-related traffic includes the mixture of vehicles consistent with CalEEMod default vehicle fleet assumptions. Emission factors for 2030 (the first full year of project operation) were used to estimate emissions associated with full buildout of the project. Trip data used are 6.0 daily trips per multifamily unit and 40.0 trips per 1,000 square feet for the commercial/retail use. These generation rates are consistent with the Local Transportation Study prepared by CR Associates, Inc., June 2025. Based on proximity to transit, these data likely provide a conservative estimate of daily trips.

Table 6 summarizes area, energy and mobile source emissions associated with operation of the proposed project. As shown in Table 6, daily emissions would not exceed the SDAPCD thresholds for ROG, $NO_X$, CO, $SO_X$, $PM_{10}$ or $PM_{2.5}$. Therefore, the project's air quality emissions(including impacts related to criteria pollutants, sensitive receptors and violations of air quality standards) would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard. Impacts will be less than significant.

***c. Would the project expose sensitive receptors to substantial pollutant concentrations?***

Construction-Related Toxic Air Contaminant Impacts

Certain construction projects can create the potential for toxic air contaminant emissions related to diesel particulate emissions associated with heavy equipment operations during construction. According to South Coast Air Quality Management District (SCAQMD) methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". A cancer risk greater than 10 cases per 1,000,000 people exposed would be considered a significant impact. The California Office of Environmental Health Hazard Assessment (OEHHA) health risk guidance states that a residential receptor should be evaluated based on a 30-year exposure period. "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. The construction schedule duration would be approximately 13 months; however, only a portion of the overall construction work would require the use of diesel-powered equipment. The proposed project would not result in a long-term (i.e., 30 or 70 year) exposure to a substantial source of toxic air contaminant emissions; and thus, neighboring residents would not be exposed to the related individual cancer risk. Further, existing and planned land use within the project area is focused on residential and supporting commercial uses. Thus, existing and future residents would not be exposed to neighboring development that generates TACs. Therefore, the project would not expose sensitive receptors to substantial concentrations of TACs. Impacts would be less than signficant.

**Table 6**
**Estimated Operational Emissions**

| | Estimated Emissions (lbs/day) | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| *Proposed Project* | | | | | | |
| **Maximum lbs/day - 2030** | 14.9 | 4.9 | 70.7 | 0.13 | 11.9 | 3.1 |
| *SDAPCD Thresholds* | **75** | **250** | **550** | **250** | **100** | **55** |
| **Threshold Exceeded?** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Maximum lbs/hour** | **--** | **0.2** | **2.9** | **0.005** | **--** | **--** |
| *SDACPD Thresholds* | **--** | **25** | **100** | **25** | **--** | **--** |
| **Threshold Exceeded?** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Maximum tons/year** | **2.7** | **0.89** | **12.9** | **0.023** | **2.17** | **0.56** |
| *SDAPCD Thresholds* | **13.7** | **40** | **100** | **40** | **15** | **10** |
| **Threshold Exceeded?** | **No** | **No** | **No** | **No** | **No** | **No** |

*See Appendix for CalEEMod version. 2022.1 computer model output - summer emissions shown*

Carbon Monoxide Hotspots

As discussed, carbon monoxide is a colorless, odorless, poisonous gas that may be found in high concentrations near areas of high traffic volumes. CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. The SDAB is in attainment of state and federal CO standards; thus, CO data is no longer collected and not all monitoring stations have CO data available. The East Valley monitoring station in Escondido is the closest monitoring station to the site that collected CO data. The maximum 8-hour average CO level recorded in 2015, was 2.0 parts per million (ppm). Concentrations at that time were below the 9-ppm state and federal 8-hour standard.

Numerous factors are related to the formation of CO hotspots. The potential for CO hotspots in the SDAB is steadily decreasing because of the continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion and the already very low ambient CO concentrations. Furthermore, CO transport is extremely limited and disperses rapidly with distance from the source. Under certain extreme meteorological conditions, however, CO concentrations near a congested roadway or intersection may reach unhealthy levels.

Typically, high CO concentrations are associated with roadways or intersections operating under congested conditions. Projects contributing to adverse traffic conditions may contribute to the formation of CO hotspots. Because the City of Oceanside does not have CO hotspot guidance, the guidance recommended by the County of San Diego was applied to evaluate the potential for CO hotspots to occur as a result of the project. As indicated in the County of San

Diego Guidelines for Determining Significance and Report Format and Content Requirements Air Quality (County of San Diego 2007), a site-specific CO hotspot analysis should be performed if a proposed development would cause road intersections to operate at or below a LOS E with intersection peak-hour trips exceeding 3,000.

The proposed project was evaluated for CO hotspots under 2030 cumulative with project conditions based on projected peak hour volumes provided by CR Associates, June 2025. Of the intersections evaluated, the Mission Avenue and North Horne Street intersection would have the highest peak hour volumes. The Average Daily Traffic (ADT) would be approximately 19,854 vehicles. Approximately 10% or 1,985 vehicles would pass through the intersection during the peak hour. The intersection would operatre at LOS C in AM peak hour and LOS D in the PM peak hour. Therefore, consistent with the standards identified above, the project would not result in CO hot spots that could expose sensitive receptors to substantial pollutant concentrations. Impacts would be less than significant.

Indoor Air Quality

CARB has stated that the control measures it has approved for reducing indoor emissions associated with the use of composite wood products, including formaldehyde, provides a level of control that protects health and safety. The first emission standards (Phase 1) went into effect in 2009 and more stringent Phase 2 standards are now in effect for all composite wood panels and finished goods sold in California. CARB regulations include provisions for no-added formaldehyde and ultra-low emitting formaldehyde-based resins, to encourage the use of these lower-emitting resins in composite wood products. Further, the project would be constructed using the most current ventilation requirements found in the Title 24 standards, including the requirement that new developments use MERV 13 or higher air filters and include mandatory compliance with the stringent CARB Phase 2 emission standards. Thus, the use of composite wood project will have no adverse impact on indoor air quality.

***d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?***

The State of California Health and Safety Code, Division 26, Part 4, Chapter 3, Section 41700, SDAPCD Rule 51, and City of Oceanside Municipal Code Section 13.16, commonly referred to as public nuisance law, prohibits emissions from any source whatsoever in such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to the public health or damage to property. Projects required to obtain permits from SDAPCD are evaluated by SDAPCD staff for potential odor nuisance, and conditions may be applied (or control equipment required) where necessary to prevent occurrence of public nuisance. SDAPCD Rule 51 also prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A project that involves a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors. Odor issues are subjective by the nature of odors themselves and due to the fact that their measurements are

difficult to quantify. As a result, this guideline is qualitative and will focus on the existing and potential surrounding uses and location of sensitive receptors.

The occurrence and severity of potential odor impacts depends on numerous factors. The nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of receiving location each contribute to the intensity of the impact. Although offensive odors seldom cause physical harm, they can be annoying and cause distress among the public and generate citizen complaints. Odors would be potentially generated from vehicles and equipment exhaust emissions during construction of the project. Potential odors produced during construction would be attributable to exhaust emissions, architectural coatings, and asphalt pavement application. Such odors would disperse rapidly from the project site and generally occur at magnitudes that would not affect substantial numbers of people. Therefore, project construction activities would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. Impacts would be less than significant.

Land uses that typically are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, industrial activities, composting, refineries, landfills, dairies, and fiberglass molding facilities. The project would construct and operate a new mixed-use project with 273residential units, 4,006 square feet of commercial space, a subterrancean parking garage and related infrastructure improvements. The commercial space may accommodate a restaurant which could generate food odors. SDAPCD Rule 51 prohibits the discharge of contaminants or materials that cause or have a tendency to cause a nuisance or annoyance associated with odor. If such a use were proposed of the commercial space, compliant ventilation systems would be required to ensure compliance with SDAPCD Rule 51. As the project would not include land uses that typically result in emissions (such as those leading to odors) that adversely affect a substantial number of people, impacts would be **less than significant**.

## GREENHOUSE GAS EMISSION DISCUSSION

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxides ($N_2O$), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride ($SF_6$). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, $CO_2$ and $CH_4$ are emitted in the greatest quantities from human activities. Emissions of $CO_2$ are largely by-products of fossil fuel combustion, whereas $CH_4$ results from off-gassing associated with agricultural practices and landfills. Man-made GHGs, many of which have greater heat-absorption potential

than $CO_2$, include fluorinated gases and sulfur hexafluoride ($SF_6$) (California Environmental Protection Agency [CalEPA], 2006). Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas ($CO_2$) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" ($CO_2E$), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a GWP of one. By contrast, methane ($CH_4$) has a GWP of 28, meaning its global warming effect is 28 times greater than carbon dioxide on a molecule per molecule basis (IPCC, 2014).

The largest source of GHG in California is transportation, contributing 39.9 percent of the state's total GHG emissions. The industrial sector is the second largest source, contributing 21 percent of the state's GHG emissions. California emissions result in part to its geographic size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. In July 2017, California's state legislature passed Assembly Bill (AB) 398 to reauthorize and extend until 2030 the state's economy-wide GHG reduction program. California has established a GHG target of at least 40% below the 1990 level of emissions by 2030.

## California Regulations

In 2005, former Governor Schwarzenegger issued Executive Order (EO) S-3-05, establishing statewide GHG emissions reduction targets. EO S-3-05 states that by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent of 1990 levels (CalEPA, 2006). In response to EO S-3-05, CalEPA created the Climate Action Team (CAT), which in March 2006 published the Climate Action Team Report (the "2006 CAT Report") (CalEPA, 2006). The 2006 CAT Report recommended various strategies that the state could pursue to reduce GHG emissions. These strategies could be implemented by various state agencies to ensure that the emission reduction targets in EO S-3-05 are met and can be met with existing authority of the state agencies. The strategies include the reduction of passenger and light duty truck emissions, the reduction of idling times for diesel trucks, an overhaul of shipping technology/infrastructure, increased use of alternative fuels, increased recycling, and landfill methane capture.

*Assembly Bill 32 and CARB's Scoping Plan*

To further the goals established in EO S-3-05, the Legislature passed Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020. Under AB 32, CARB is responsible for and is recognized as having the expertise to carry out and develop the programs and requirements necessary to achieve the GHG emissions reduction mandate of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions from specified sources. This program is used to monitor and enforce compliance with established standards. CARB also is required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 authorized CARB to adopt market-

based compliance mechanisms to meet the specified requirements. Finally, CARB is responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.
In 2007, CARB approved a limit on the statewide GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 MMT $CO_2E$). CARB's adoption of this limit is in accordance with Health and Safety Code, Section 38550.

Further, in 2008, CARB adopted the Scoping Plan in accordance with Health and Safety Code Section 38561. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions for various emission sources/sectors to 1990 levels by 2020. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction features by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. The key elements of the Scoping Plan include the following (CARB 2008):

1. Expanding and strengthening existing energy efficiency programs, as well as building and appliance standards;
2. Achieving a statewide renewable energy mix of 33%;
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions;
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

In the Scoping Plan (CARB 2008), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of approximately 28.5% from the otherwise projected 2020 emissions level (i.e., those emissions that would occur in 2020) absent GHG reducing laws and regulations (referred to as Business-As-Usual (BAU)). To calculate this percentage reduction, CARB assumed that all new electricity generation would be supplied by natural gas plants, no further regulatory action would impact vehicle fuel efficiency, and building energy efficiency codes would be held at 2005 standards.

In the 2011 Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document (CARB 2011a), CARB revised its estimates of the projected 2020 emissions level in light of the economic recession and the availability of updated information about GHG reduction regulations. Based on the new data, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7% (down from 28.5%) from the

BAU conditions. When the 2020 emissions level projection was updated to account for newly implemented regulatory measures, including Pavley I (model years 2009– 2016) and the Renewables Portfolio Standard (RPS) (12% to 20%), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of 16% (down from 28.5%) from the BAU conditions.

In 2014, CARB adopted the First Update to the Climate Change Scoping Plan: Building on the Framework (First Update; CARB 2014). The stated purpose of the First Update is to "highlight California's success to date in reducing its GHG emissions and lay the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80% below 1990 levels by 2050" (CARB 2014). The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32 and noted that California could reduce emissions further by 2030 to levels needed to stay on track to reduce emissions to 80% below 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals.

In conjunction with the First Update, CARB identified "six key focus areas comprising major components of the state's economy to evaluate and describe the larger transformative actions that will be needed to meet the state's more expansive emission reduction needs by 2050" (CARB 2014). Those six areas are (1) energy, (2) transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure), (3) agriculture, (4) water, (5) waste management, and (6) natural and working lands. The First Update identifies key recommended actions for each sector that will facilitate achievement of EO S-3-05's 2050 reduction goal (CARB 2014).

Based on CARB's research efforts presented in the First Update, it has a "strong sense of the mix of technologies needed to reduce emissions through 2050" (CARB 2014). Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies. As part of the First Update, CARB recalculated the state's 1990 emissions level using more recent GWPs identified by the IPCC. Using the recalculated 1990 emissions level (431 MMT $CO_2E$) and the revised 2020-emissions-level projection identified in the 2011 Final Supplement, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 15% (instead of 28.5% or 16%) from the BAU conditions (CARB 2014).

In January 2017, CARB released, *The 2017 Climate Change Scoping Plan Update (*Second Update; CARB 2017b), for public review and comment. This update proposes CARB's strategy for achieving the state's 2030 GHG target as established in Senate Bill (SB) 32 (discussed below), including continuing the Cap-and-Trade Program through 2030, and includes a new approach to reduce GHGs from refineries by 20%. The Second Update incorporates approaches to cutting short-lived climate pollutants (SLCPs) under the Short-Lived Climate Pollutant Reduction Strategy (a planning document that was adopted by CARB in March 2017), acknowledges the need for reducing emissions in agriculture, and highlights the work underway to ensure that

California's natural and working lands increasingly sequester carbon. During development of the Second Update, CARB held a number of public workshops in the Natural and Working Lands, Agriculture, Energy, and Transportation sectors to inform development of the 2030 Scoping Plan Update (CARB 2016). The Second Update has not been considered by CARB's Governing Board at the time this analysis was prepared.

Executive Order S-01-07 was enacted on January 18, 2007. The order mandates that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.

Adopted December 15, 2022, CARB's 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) sets a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels by 2045 in accordance with AB 1279. To achieve the targets of AB 1279, the 2022 Scoping Plan relies on existing and emerging fossil fuel alternatives and clean technologies, as well as carbon capture and storage. Specifically, the 2022 Scoping Plan focuses on zero-emission transportation; phasing out use of fossil gas use for heating homes and buildings; reducing chemical and refrigerants with high GWP; providing communities with sustainable options for walking, biking, and public transit; displacement of fossil-fuel fired electrical generation through use of renewable energy alternatives (e.g., solar arrays and wind turbines); and scaling up new options such as green hydrogen. Unlike the 2017 Scoping Plan, CARB no longer includes a numeric per capita threshold and instead advocates for compliance with a local GHG reduction strategy (i.e., Climate Action Plan) consistent with CEQA Guidelines Section 15183.5.

The key elements of the 2022 CARB Scoping Plan focus on transportation. Specifically, the 2022 Scoping Plan intends to rapidly move towards zero-emission transportation (i.e., electrifying cars, buses, trains, and trucks), which constitutes California's single largest source of GHGs. The regulations that impact the transportation sector are adopted and enforced by CARB on vehicle manufacturers and are outside the jurisdiction and control of local governments. The 2022 Scoping Plan accelerates development of new regulations as well as amendments to strengthen regulations and programs already in place. Included in the 2022 Scoping Plan is a set of Local Actions (2022 Scoping Plan Appendix D) focused on providing local jurisdictions with tools to reduce GHGs and assist the state in meeting the targets set forth in the 2022 Scoping Plan. The 2022 Scoping Plan also includes a section on evaluating plan-level and project-level alignment with the State's Climate Goals in CEQA GHG analyses. In this section, CARB identifies several recommendations and strategies that should be considered for new residential and mixed-use development to determine consistency with the 2022 Scoping Plan. These approaches are recommendations only and are not requirements. They do not supplant lead agencies' discretion to develop their own evidence-based approaches for determining whether a project would have a potentially significant impact on GHG emissions.

Other regulations affecting state and local GHG planning and policy development are summarized as follows:

*Assembly Bill 939 and Senate Bill 1374*
Assembly Bill 939 (AB 939) requires that each jurisdiction in California to divert at least 50 percent of its waste away from landfills, whether through waste reduction, recycling or other means. Senate Bill 1374 (SB 1374) requires the California Integrated Waste Management Board to adopt a model ordinance by March 1, 2004 suitable for adoption by any local agency to require 50 to 75 percent diversion of construction and demolition of waste materials from landfills.

*Senate Bill 1368*
SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007 and for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas-fired plant. Furthermore, the legislation states that all electricity provided to the State, including imported electricity, must be generated by plants that meet the standards set by CPUC and California Energy Commission (CEC).

*Senate Bill 97*
Senate Bill 97 (SB 97) was adopted August 2007 and acknowledges that climate change is an environmental issue that requires analysis under CEQA. SB 97 directed the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, by July 1, 2009. The Natural Resources Agency was required to certify and adopt those guidelines by January 1, 2010. On December 30, 2009 the Natural Resources Agency adopted amendments to the CEQA guidelines that address GHG emissions. The CEQA Guidelines Amendments changed sections of the CEQA Guidelines and incorporated GHG language throughout the Guidelines. However, no GHG emissions thresholds of significance were provided and no specific mitigation measures were identified. The GHG emission reduction amendments went into effect on March 18, 2010 and are summarized below:

1. Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.

2. Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.

3. When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.

4. New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix F of the CEQA Guidelines.

5. OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation."

6. OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.

7. Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential.

*Senate Bills 1078, 107, and X1-2 and Executive Orders S-14-08 and S-21-09*
Senate Bill 1078 (SB 1078) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. Senate Bill 107 (SB 107) changed the target date to 2010. Executive Order S-14-08 was signed on November 2008 and expands the State's Renewable Energy Standard to 33 percent renewable energy by 2020. Executive Order S-21-09 directed CARB to adopt regulations by July 31, 2010 to enforce S-14-08. Senate Bill X1-2 codifies the 33 percent renewable energy requirement by 2020.

*California Code of Regulations (CCR) Title 24, Part 6*
CCR Title 24, Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Although it was not originally intended to reduce GHG emissions, electricity production by fossil fuels results in GHG emissions and energy efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

The 2022 Title 24 standards are the currently applicable building energy efficiency standards, and became effective on January 1, 2023. The 2022 Title 24 Building Energy Efficiency Standards will further reduce energy used and associated GHG emissions compared to prior standards.

On August 11, 2021, the CEC adopted the 2022 Energy Code. In December 2021, it was approved by the California Building Standards Commission for inclusion into the California Building Standards Code. The 2022 Energy Code encourages efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery

storage standards, strengthens ventilation standards, and more. Buildings whose permit applications are applied for on or after January 1, 2023, must comply with the 2022 Energy Code.

*Senate Bill 375*

SB 375 (2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 required CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035. Regional metropolitan planning organizations are then responsible for preparing a Sustainable Communities Strategy (SCS) within their Regional Transportation Plan (RTP). The goal of the SCS is to establish a forecasted development pattern for the region that, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets. If an SCS is unable to achieve the GHG reduction target, a metropolitan planning organization must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies. Pursuant to California Government Code Section 65080(b)(2)(K), an SCS does not regulate the use of land; supersede the land use authority of cities and counties; or require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

In 2010, CARB adopted the SB 375 targets for the regional metropolitan planning organizations. The targets adopted for SANDAG in 2010 are a 7% reduction in per-capita passenger-vehicle GHG emissions by 2020 and a 13% reduction by 2035, measured relative to 2005 GHG emissions. In 2018, CARB adopted the second round of SB 375 reduction targets, and increased SANDAG's 2020 target to a 15% reduction in per-capita passenger-vehicle GHG emissions, and the 2035 target to a 19% reduction using the same 2005 baseline.

*Senate Bill X7-7*

Senate Bill X7-7 (SB X7-7), enacted on November 9, 2009, mandates water conservation targets and efficiency improvements for urban and agricultural water suppliers. SB X7-7 requires the Department of Water Resources (DWR) to develop a task force and technical panel to develop alternative best management practices for the water sector. Additionally, SB X7-7 required the DWR to develop criteria for baseline uses for residential, commercial, and industrial uses for both indoor and landscaped area uses. The DWR was also required to develop targets and regulations that achieve a statewide 20 percent reduction in water usage.

*Title 24 Building Energy Efficiency Standards*

California's Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR Title 24, Part 6) was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods.

Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. On August 11, 2021, the CEC adopted the 2022 Energy Code. In December 2021, it was approved by the California Building Standards Commission for inclusion into the California Building Standards Code. Among other updates like strengthened ventilation standards for gas cooking appliances, the 2022 Energy Code includes updated standards such as new electric heat pump requirements for residential uses, schools, offices, banks, libraries, retail, and grocery stores; the promotion of electric-ready requirements for new homes including the addition of circuitry for electric appliances, battery storage panels and dedicated infrastructure to allow for the conversion from natural gas to electricity; and the expansion of solar photovoltaic and battery storage standards to additional land uses including high-rise multi-family residences, hotels and motels, tenant spaces, offices (including medical offices and clinics), retail and grocery stores, restaurants, schools, and civic uses (including theaters auditoriums, and convention centers). Newly constructed commercial buildings would also be required to have a solar photovoltaic (PV) array and an energy storage system (ESS) installed. Projects whose permit applications are applied for on or after January 1, 2023, must comply with the 2022 Energy Code.

*California Green Building Standards*

Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically establishes Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC) (and revised if necessary) (California Public Resources Code, Section 25402(b)(1)). The regulations receive input from members of industry, as well as the public, with the goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (California Public Resources Code, Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (California Public Resources Code, Section 25402(d)) and cost effectiveness (California Public Resources Code, Sections 25402(b)(2) and (b)(3)). These standards are updated to consider and incorporate new energy efficient technologies and construction methods. As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The 2019 Title 24 building energy efficiency standards and became effective on January 1, 2020 and addressed lighting, heating, cooling, ventilation, and water heating stamdards. The 2022 Energy Code encourages efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery storage standards and strengthens ventilation standards.

*Title 24 California Green Building Standards Code*

The California Green Building Standards Code (CCR Title 24, Part 11 code) commonly referred to as the CALGreen Code, is a statewide mandatory construction code developed and adopted

by the California Building Standards Commission and the Department of Housing and Community Development. The CALGreen standards require new residential and commercial buildings to comply with mandatory measures under the topics of planning and design, energy efficiency, water efficiency/conservation, material conservation and resource efficiency, and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics: planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; and environmental quality. The CALGreen Code also provides voluntary measures (CALGreen Tier 1 and Tier 2) that local governments may adopt which encourage or require additional measures in the five green building topics. CALGreen's Tier 1 standards call for a 15% improvement in energy requirements, stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, 20% cement reduction, and cool/solar-reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 75% diversion of construction and demolition waste, 15% recycled content in building materials, 30% permeable paving, 25% cement reduction, and cool/solar-reflective roofs.

*Title 20*

Title 20 of the California Code of Regulations requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. Performance of appliances must be certified through the CEC to demonstrate compliance with standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwaters; clothes washers and dryers; cooking products; electric motors; low voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing for each type of appliance covered under the regulations and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: federal and state standards for federally regulated appliances, state standards for federally regulated appliances, and state standards for non-federally regulated appliances.

*Executive Order B-30-15*

EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing statewide GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing statewide GHG emissions to 80% below 1990 levels by 2050 as set forth in EO S-3-05. To facilitate achievement of this goal, EO B-30-15 calls for an update to CARB's Scoping Plan to express the 2030 target in terms of MMT CO2E. EO B-30-15 also calls for state agencies to continue to develop and implement GHG

emission reduction programs in support of the reduction targets. EO B-30-15 does not require local agencies to take any action to meet the new interim GHG reduction target.

*Senate Bill 32 and Assembly Bill 197*

SB 32 and AB 197 (enacted in 2016) are companion bills that set new statewide GHG reduction targets, make changes to CARB's membership, increase legislative oversight of CARB's climate change–based activities, and expand dissemination of GHG and other air quality–related emissions data to enhance transparency and accountability. More specifically, SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 added two members of the Legislature to CARB as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and toxic air contaminants from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

*SB 350— Clean Energy and Pollution Reduction Act of 2015*

In October 2015, the legislature approved and the Governor signed SB 350, which reaffirms California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include an increase in the renewables portfolio standard (RPS), higher energy efficiency requirements for buildings, initial strategies towards a regional electricity grid, and improved infrastructure for electric vehicle charging stations. Provisions for a 50 percent reduction in the use of petroleum statewide were removed from the Bill because of opposition and concern that it would prevent the Bill's passage. Specifically, SB 350 requires the following to reduce statewide GHG emissions:

1. Increase the amount of electricity procured from renewable energy sources from 33 percent to 50 percent by 2030, with interim targets of 40 percent by 2024, and 25 percent by 2027.

2. Double the energy efficiency in existing buildings by 2030. This target will be achieved through the CPUC, the CEC, and local publicly-owned utilities.

3. Reorganize the Independent System Operator (ISO) to develop more regional electrify transmission markets and to improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States.

*SB 100*

On September 10, 2018, Governor Brown signed SB 100, which raises California's RPS requirements to 60 percent by 2030, with interim targets, and 100 percent by 2045. The bill also establishes a state policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100

percent of electricity procured to serve all state agencies by December 31, 2045. Under the bill, the state cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

*Executive Order B-55-18*
On September 10, 2018, Governor Brown signed Executive Order B-55-2018 which established a new statewide goal to achieve carbon neutrality as soon as possible and no later than 2045. The executive order also states that California will achieve and maintain net negative emissions thereafter.

*AB 2127*
AB 2127 promotes better planning for EV infrastructure build-out across all vehicle classes. AB 2127 would help the state meet the goal of 5 million zero-emission vehicles (ZEV) on the road by 2030.

**Local Regulations and CEQA Requirements**
Pursuant to the requirements of SB 97, the Resources Agency has adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted CEQA Guidelines provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, but contain no suggested thresholds of significance for GHG emissions. Instead, lead agencies are given the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. The general approach to developing a Threshold of Significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions needed to move the state towards climate stabilization. If a project would generate GHG emissions above the threshold level, its contribution to cumulative impacts would be considered significant.

The California Supreme Court addressed the issue of GHG emissions and the evaluation of potential impacts in CEQA documents, in the Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming case, (2015) 224 Cal.App.4th 1105 (CBD vs. CDFW), also known as the "Newhall Ranch" case. The justices examined one of the most common approaches to GHG analyses for development projects which was evaluating the efficiency of a project's emissions reduction in the context of the AB 32's 2020 reduction goal, as presented in the statewide CARB Scoping Plan, using a comparison to an unregulated, "business as usual (BAU)" emissions scenario. As discussed in the Newhall Ranch decision, determining consistency with local GHG reduction plans or Climate Action Plans that qualify under Section 15183.5 of the CEQA Guidelines may be the most effective strategy for local governments to assess the significance of GHG emissions from proposed land use developments. Qualified CAPs also provide a workable option for addressing post-2020 GHG emissions and resolving issues that arise out of project-level GHG analyses raised in the Court's decision.

**City of Oceanside Climate Action Plan**

The City has held public workshops on the City's General Plan Update, which included the development and adoption of a Climate Action Plan (CAP) and the Energy and Climate Action Element (E-CAP). The E-CAP proactively supports statewide efforts to cut GHG emissions by expanding local renewable energy generation, reducing energy use, promoting recycling and reuse, facilitating active transportation, and encouraging other sustainable practices. The E-CAP builds upon a variety of City projects that promote energy efficiency, increased renewable energy use, water conservation, and solid waste reduction. These include the Oceanside Boulevard Vision Statement, which encourages the restoration of Loma Alta Creek in conjunction with a transit-oriented mixed-use development; the Coast Highway Vision and Strategic Plan, which promotes environmentally and economically sustainable infill and redevelopment within the North Coast Highway corridor; the Water Conservation Master Plan; the Zero Waste Plan; and the Energy Roadmap.

As part of this effort to ensure a sustainable future, the City prepared a GHG emissions inventory and a CAP, both of which inform the E-CAP. The City's Final CAP was adopted on May 8, 2019. Subsequent to adoption of the Final CAP, the City developed and approved a CAP Consistency Checklist. Thus, the City has established efficiency metric thresholds, which projects are to use to evaluate impacts from GHG emissions to assist the City with meeting state reduction targets for 2020 and 2030.

California State laws governing GHG emissions are written to conform to both the Global Warming Solutions Act of 2006 (AB 32) and Senate Bill 32 (SB 32). These laws are intended to reduce GHG emissions within the state to goals set forth within these laws. The current State goals are to reduce GHG emissions by 40 percent below 1990 levels by 2030. To demonstrate local compliance with measures intended to meet statewide goals, the City of Oceanside has adopted a screening threshold of 900 metric tons of GHG's per year or the utilization of an efficiency/service population (SP) threshold. In cases where projects would exceed the 900 metric ton annual standard, projects are required to meet an efficiency metric threshold of 4.0 MT CO2E per service population (MT CO2E/SP) per year for projects that will be implemented prior to year 2020 and an efficiency metric threshold of 3.5 MT CO2E/SP for projects that will not be implemented prior to 2020. Projects that meet these thresholds would be considered consistent with the City's CAP.

# CLIMATE CHANGE IMPACT ANALYSIS

## Thresholds of Significance

Pursuant to the requirements of SB 97, the Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions in March 2010. These guidelines are used in evaluating the cumulative significance of GHG emissions from the proposed project. According to the adopted CEQA Guidelines, impacts related to GHG emissions from the proposed project would be significant if the project would:

*a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; and/or*

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

The vast majority of individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence to climate change; therefore, the issue of climate change typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15355).

For future projects, the significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds, or consistency with a regional GHG reduction plan (such as a Climate Action Plan). The proposed project is evaluated herein based on use of a screening threshold of 900 MT CO2e annually or CAP's 3.5 MT CO2e/service population as referenced above.

## Methodology

GHG emissions associated with construction and operation of the proposed project and existing development have been estimated using California Emissions Estimator Model (CalEEMod) version 2022.1.

Construction Emissions

Construction of the proposed project would generate temporary GHG emissions primarily associated with the operation of construction equipment, worker trips and truck trips required for hauling excavation spoils, materials and equipment. Site preparation and grading typically generate the greatest emission quantities because the use of heavy equipment is greatest during this phase of construction. Emissions associated with the construction period were estimated based on the projected maximum amount of equipment that would be used on-site at one time. Air districts such as the SDAPCD have recommended amortizing construction-related emissions over a 30-year period to calculate annual emissions. Complete CalEEMod results and assumptions can be viewed in the Appendix.

Operational Emissions

Default values used in CalEEMod version 2022.1 are based on the CEC sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies. CalEEMod provides operational emissions of $CO_2$, $N_2O$ and $CH_4$. This methodology has been subjected to peer review by numerous public and private stakeholders, and in particular by the CEC; and therefore, is considered reasonable and reliable for use in GHG impact analysis pursuant to CEQA. It is also recommended by CAPCOA (January 2008).

Emissions associated with area sources (i.e., consumer products, landscape maintenance, and architectural coating) were calculated in CalEEMod based on standard emission rates from CARB, USEPA, and district supplied emission factor values (CalEEMod User Guide, 2022). Emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CalEEMod User Guide, April 2022). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and Southern California. Emissions from mobile sources were quantified based on trip generation rates in the Local Transportation Analysis (June 2025).

***a. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?***

Construction Emissions

Construction activity analysis is based on the anticipated construction period of approximately 28 months beginning in November 2026 and concluding in January 2029. Based on CalEEMod results, construction activity for the project would generate an estimated 62 metric tons of carbon dioxide equivalent (MT $CO_2E$) in 2026; 891 MT $CO_2E$ in 2027; 545 MT $CO_2E$ and 5 MT $CO_2E$ in 2029, as shown in Table 7. Amortized over a 30-year period (the assumed life of the project), construction of the proposed project would generate 50 metric tons of $CO_2E$ per year.

**Table 7**
**Estimated Construction Related Greenhouse Gas Emissions**

| Year | Annual Emissions (metric tons $CO_2E$) |
|---|---|
| 2026 | 62 |
| 2027 | 891 |
| 2028 | 545 |
| 2029 | 5 |
| **Total** | **1,503** |
| **Amortized over 30 years** | **50** |

*See Appendix for CalEEMod software program output*

Operational Indirect and Stationary Direct Emissions

Operational emissions relate to energy use, solid waste, water use, and transportation. Each source is discussed below and includes the emissions associated with existing development and the anticipated emissions that would result from the proposed project.

Energy Use. CalEEMod default values for electricity use and natural gas consumption for each land use type were applied for the proposed land use designation. The energy use from residential and commercial land uses is calculated in CalEEMod based on the Commercial End-Use Survey. Energy use in buildings (both natural gas and electricity) is divided by CalEEMod into end-use categories subject to Title 24 requirements (end uses associated with the building envelope, such as the HVAC system, water heating system, and integrated lighting) and those not subject to Title 24 requirements (such as appliances, electronics, and miscellaneous"plug-in" uses).

Operational GHG emissions from energy sources include natural gas combustion for appliances and space and water heating. The current Title 24, Part 6 standards, referred to as the 2022 Title 24 Building Energy Efficiency Standards, became effective on January 1, 2023. The current version of CalEEMod calculates electricity and natural gas emissions based on consumption estimates and Title 24 2019 Building Energy Efficiency Standards (CalEEMod Users Guide, 2022). CalEEMod default energy intensity factors (CO2, CH4, and N2O mass emissions per kilowatt hour) for SDG&E were based on the value for SDG&E's energy mix in 2021.

Without operation of a photovoltaic system, a total of 387 MT $CO_2E$ would need to be generated to meet the project's electrical demand. As shown in Table 8, with the photovoltaic system, the overall emissions associated with electrical energy use at the project site would be approximately 305 metric tons of $CO_2E$ per year. An additional 104 MT $CO_2E$ would be attributable to natural gas.

Water Use Emissions**.** Based on the amount of electricity generated to supply and convey this amount of water, as shown in Table 8, the project would generate approximately 25 metric tons of $CO_2E$ per year. Emissions related to water consumption would be reduced by 20% per Senate Bill X7-7, by implementing measures that include the installation of low flow plumbing fixtures (i.e., faucets, toilets, show heads) and water efficient irrigation systems.

Solid Waste Emissions. Implementation of a municipal recycling program that would achieve a 75% diversion rate statewide is required for residential uses per the California Integrated Waste Management Act of 1989 (AB 939). The CalEEMod results indicate that the project would result in approximately 16 metric tons of $CO_2E$ per year associated with solid waste disposed within landfills provided 75% of solid waste is recycled (Table 9).

Transportation Emissions. Mobile source GHG emissions were estimated using the trip generation rates used in the Local Transportation Study (CR Associates, Inc., June 2025). Further, consistent with the project description and applicable requirements, the analysis considered that electrical vehicle charging and bicycle parking would be provided on-site. Table

**Table 8**
**Estimated Annual Energy-Related Greenhouse Gas Emissions**

| Emission Source | Annual Emissions ($CO_2E$) |
|---|---|
| *Proposed Project* | |
| Electricity | 305 metric tons |
| Natural Gas | 104 metric tons |
| **Total** | **409 metric tons** |

*See Appendix for CalEEMod software program output.*

**Table 9**
**Estimated Annual**
**Solid Waste and Water Use Greenhouse Gas Emissions**

| Emission Source | Annual Emissions ($CO_2E$) |
|---|---|
| Water | 25 metric tons |
| Solid Waste | 16 metric tons |
| **Total Water and Solid Waste** | **41 metric tons** |

*See Appendix for CalEEMod software program output.*

10 shows the estimated mobile emissions of GHGs for the project based on the estimated annual VMT of 5,816,417 as estimated by CalEEMod 2022.1 (see Appendix A) As shown in Table 10, the project would generate approximately 1,911 metric tons of $CO_2E$ associated with new vehicle trips.

Combined Construction, Stationary and Mobile Source Emissions

Table 11 combines the net new construction, operational, and mobile GHG emissions associated with the proposed project. As discussed above, temporary emissions associated with construction activity (approximately 50 metric tons $CO_2E$) are amortized over 30 years (the anticipated life of the project).

**Table 10**
**Estimated Annual Mobile Emissions of Greenhouse Gases**

| Emission Source | Annual Emissions ($CO_2E$) |
|---|---|
| *Proposed Project* | |
| Mobile Emissions ($CO_2$ & $CH_4$) | 1,911 metric tons |
| **Total** | **1,911 metric tons** |

*See Appendix for CalEEMod software program output.*

**Table 11**
**Combined Annual Greenhouse Gas Emissions**

| Emission Source | Annual Emissions ($CO_2E$) |
|---|---|
| **Construction** | 50 metric tons |
| **Operational** | |
| Energy | 409 metric tons |
| Solid Waste | 16 metric tons |
| Water | 25 metric tons |
| Area Source | 5 metic tons |
| **Mobile** | 1,911 metric tons |
| **Total** | **2,416 metric tons** |

*See Appendix for CalEEMod software program output.*

For the proposed project, the combined annual emissions would total approximately 2,416 metric tons per year in $CO_2E$. The proposed project is evaluated based on the threshold of 900 MT $CO_2E$ annually. Project-related annual GHG emissions would exceed the 900 metric ton screening threshold; thus, emissions were compared to the SP threshold addressed above. The project is expected to house up to 764 residents based on 2.8 residents per household as stated above. The total number of employees anticipated to work at the project site is 10. The total number of residents and employees comprisng the Service Population is 774. The total GHG emissions (2,416 MT) divided by 774 would equal 3.12 MT CO2e per person. This would be less than 3.5, the SP threshold of significance that the City of Oceanside has established for projects developed after 2020. Thus, the project will not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. Construction and operational project impacts from GHG emissions would be less than significant.

***b. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?***

As referenced, specific goals and actions included in the City of Oceanside CAPand Title 24 that pertain to the proposed project include those addressing energy and water use reduction, promotion of green building measures, waste reduction, and reduction in vehicle miles traveled. The proposed project would also be required to implement all mandatory green building measures for new residential and commercial development under the CALGreen Code. This would require the project be designed to reduce water consumption, increase building system efficiencies, divert construction waste from landfills, and install low pollutant emitting finish materials. Implementation of these building and appliance standards would result in water, energy, and construction waste reductions for the proposed project. These requirements are included in the CAP Checklist prepared by the applicant to demonstrate project consistency with applicable elements of the CAP.

**Consistency with EO S-3-05 and SB 32**

**EO S-3-05.** This EO establishes the following goals: GHG emissions should be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

**SB 32.** This bill establishes a statewide GHG emissions reduction target whereby CARB, in adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions, shall ensure that statewide GHG emissions are reduced to at least 40% below 1990 levels by December 31, 2030.

The City prepared a GHG emissions inventory included in the above referenced CAP. The City's Final CAP was adopted on May 8, 2019. The CAP demonstrates that, with implementation of applicable General Plan objectives and policies, coupled with state and federal actions and execution of CAP measures and actions, the City will reduce GHG emissions consistent with state goals established by Senate Bill 32 and maintain a trajectory to meet its proportional share of the 2050 state target identified in Executive Order S-3-05. The project GHG emissions would not exceed the calculated efficiency metric threshold of 3.5 MT $CO_2e$/SP/year for a project constructed after 2020 established by the City for purposes of determining whether projects would conflict with applicable State goals and policies regarding GHG reductions, include SB 32 and Executive Order S-3-05,

CARB has indicated that statewide, California is on track to achieving both the 2030 and 2050 goals. This is confirmed in the 2017 Scoping Plan, which states that the Scoping Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while identifying new, technologically feasible and cost-effective strategies to ensure that California meets its GHG reduction targets. Table 12 summarizes the Project's consistency with applicable action elements of the 2017 Scoping Plan.

As stated, the project would not generate enough GHG emissions to cumulatively contribute to global climate change. Measures implemented by the project to reduce overall GHG emissions would also contribute to GHG statewide reduction goals. Thus, the project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases and impacts would be less than significant.

**Table 12**
**2017 Scoping Plan Consistency Summary**

| ACTION | RESPONSIBLE PARTIES | CONFLICT? |
|---|---|---|
| **Implement SB 350 by 2030** | | |
| Increase the Renewables Portfolio Standard to 50% of retail sales by 2030 and ensure grid reliability. | California Public Utility Commission (CPUC), California Energy Commission (CEC) and | No Conflict. The Project would use energy from San Diego Gas and Electric (SDG&E). SDG&E has committed to diversify their portfolio of energy sources by |

| ACTION | RESPONSIBLE PARTIES | CONFLICT? |
|---|---|---|
| | California Air Resources Board (CARB) | increasing energy from wind and solar sources. The Project would not interfere with or obstruct SDG&E's energy source diversification efforts. |
| Establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030. | | No Conflict. The Project would be constructed in compliance with current CBC requirements including the 2022 Building and Energy Efficiency Standards and the 2022 California Green Building Standard requirements. |
| Reduce GHG emissions in the electricity sector through the implementation of the above measures and other actions as modeled in Integrated Resource Planning (IRP) to meet GHG emissions reductions planning targets in the IRP process. Load-serving entities and publicly-owned utilities meet GHG emissions reductions planning targets through a combination of measures as described in IRPs. | | |
| **Implement Mobile Source Strategy (Cleaner Technology and Fuels)** | | |
| At least 1.5 million zero emission and plugin hybrid light-duty EVs by 2025. | CARB, California State Transportation Agency (CalSTA), Strategic Growth Council (SGC), California Department of Transportation (Caltrans), CEC, Office of Planning and Research (OPR), Local Agencies | No Conflict. This is a CARB Mobile Source Strategy. The Project would not obstruct or interfere with CARB zero emission and plug-in hybrid light-duty EV 2025 targets. As this is a CARB enforced standard, vehicles that access the Project must comply with the standards as applicable; and thus, would comply with the strategy. Further, the project would provide EV and/or EV ready spaces as required by the City. |
| At least 4.2 million zero emission and plugin hybrid light-duty EVs by 2030. | | No Conflict. This is a CARB Mobile Source Strategy. The Project would not obstruct or interfere with CARB zero emission and plug-in hybrid light-duty EV 2030 targets. |
| Further increase GHG stringency on all light-duty vehicles beyond existing Advanced Clean cars regulations. | CARB, California State Transportation Agency (CalSTA), Strategic Growth Council (SGC), California Department of Transportation (Caltrans), CEC, Office of Planning and | No Conflict. This is a CARB Mobile Source Strategy. The Project would not obstruct or interfere with CARB efforts to further increase GHG stringency on all light-duty vehicles beyond existing Advanced Clean cars regulations. |

| ACTION | RESPONSIBLE PARTIES | CONFLICT? |
|---|---|---|
| Medium- and Heavy-Duty GHG Phase 2. | Research (OPR), Local Agencies | No Conflict. This is a CARB Mobile Source Strategy. The Project would not obstruct or interfere with CARB efforts to implement Medium- and Heavy-Duty GHG Phase 2. |
| Innovative Clean Transit: Transition to a suite of to-be-determined innovative clean transit options. Assumed 20% of new urban buses purchased beginning in 2018 will be zero emission buses with the penetration of zero-emission technology ramped up to 100% of new sales in 2030. Also, new natural gas buses, starting in 2018, and diesel buses, starting in 2020, meet the optional heavy-duty low-NOX standard. | | Not Applicable. This measure is not related to the project scope. |
| Last Mile Delivery: New regulation that would result in the use of low NOX or cleaner engines and the deployment of increasing numbers of zero-emission trucks primarily for class 3-7 last mile delivery trucks in California. This measure assumes ZEVs comprise 2.5% of new Class 3–7 truck sales in local fleets starting in 2020, increasing to 10% in 2025 and remaining flat through 2030. | | No Conflict. This is a CARB Mobile Source Strategy. The Project would not obstruct or interfere with CARB efforts to improve last mile delivery emissions. |
| Further reduce VMT through continued implementation of SB 375 and regional Sustainable Communities Strategies; statewide implementation of SB 743; and potential additional VMT reduction strategies not specified in the Mobile Source Strategy but included in the document "Potential VMT Reduction Strategies for Discussion." | | No Conflict. As noted in the VMT analysis, the project is located in a low-VMT generating area ( 85% of regional average) as identified on the most recent SANDAG SB 743 Screening map. The project site proximal to bus transit stops and located less that 0.5 miles from the Oceanside Transit Station. Proximity to transit services would reduce daily vehicle trips. Further, on-site bicycle parking and EV charging stations would be provided to support use of alternative transportation modes and use of zero emission electric vehicles. |
| Increase stringency of SB 375 Sustainable Communities Strategy (2035 targets). | CARB | No Conflict. The project would not exceed the City's GHG emission thresholds or otherwise conflict with GHG reduction efforts. |

| ACTION | RESPONSIBLE PARTIES | CONFLICT? |
|---|---|---|
| Harmonize project performance with emissions reductions and increase competitiveness of transit and active transportation modes (e.g., via guideline documents, funding programs, project selection, etc.). | CalSTA, SGC, OPR, CARB, Governor's Office of Business and Economic Development (GOBiz), California Infrastructure and Economic Development Bank (IBank), Department of Finance (DOF), California Transportation Commission (CTC), Caltrans | No Conflict. The project would not conflict with use of adjacent streets by pedestrians or bicycles. Further, transit service is provided by the North County Transit District (BREEZE) Routes 303 and 313. The westbound stops is located along Mission Avenue in front of the site. The eastbound stop is located one block to the east. The Oceanside Transportation Center is located less than 0.5 miles from the site. |
| By 2019, develop pricing policies to support low-GHG transportation (e.g., low emission vehicle zones for heavy duty, road user, parking pricing, transit discounts). | CalSTA, Caltrans, California Transportation Commission (CTC), OPR, SGC, CARB | Not Applicable. This measure is not related to the project scope. |
| **Implement California Sustainable Freight Action Plan** | | |
| Improve freight system efficiency. | CalSTA, CalEPA, California Natural Resource Agency (CNRA), CARB, Caltrans, CEC, GO-Biz | No Conflict. This measure would apply to all trucks accessing the project site. It is presumed that these vehicles would primarily be delivery vans operated as part of the statewide goods movement sector. Access to the Project site would be provided from North Horne Street and North Clementine Street. |
| Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize both zero and near zero emission freight vehicles and equipment powered by renewable energy by 2030. | | Not applicable. This measure is unrelated to the project scope. |
| Adopt a Low Carbon Fuel Standard with a Carbon Intensity reduction of 18%. | CARB | No Conflict. When adopted, this measure would apply to all fuel purchased for use in vehicles accessing the project site. The Project would not obstruct or interfere with agency efforts to adopt a Low Carbon Fuel Standard with a Carbon Intensity reduction of 18%. |
| **Implement the Short-Lived Climate Pollutant Strategy (SLPS) by 2030** | | |
| 40% reduction in methane and hydrofluorocarbon emissions below 2013 levels. | CARB, CalRecycle, California Department of Food and Agriculture (CDFA), California State Water Resource Control | No Conflict. The Project would be required to comply with this measure and reduce any Project-source SLPS emissions accordingly. The Project would not |

| ACTION | RESPONSIBLE PARTIES | CONFLICT? |
|---|---|---|
| | Board (SWRCB), Local Air Districts | obstruct or interfere with agency efforts to reduce SLPS emissions. |
| Implement the post-2020 Cap-and-Trade Program with declining annual caps. | CARB | No Conflict. The Project would be required to comply with applicable Cap-and-Trade Program provisions. The Project would not obstruct or interfere agency efforts to implement the post-2020 Cap-and-Trade Program. |
| **By 2018, develop Integrated Natural and Working Lands Implementation Plan to secure California's land base as a net carbon sink:** | | |
| Protect land from conversion through conservation easements and other incentives. | CNRA, Departments Within CDFA, CalEPA, CARB | Not applicable. The site is not a property identified by federal, state, or local law for conservation. |
| Increase the long-term resilience of carbon storage in the land base and enhance sequestration capacity. | | Not applicable. The entire site is planned for development. |
| Utilize wood and agricultural products to increase the amount of carbon stored in the natural and built environments. | | No Conflict. To the extent appropriate for the proposed mixed-use buildings, wood products would be used in construction, including roof structure. Additionally, the Project includes landscaping appropriate for an urban location. |
| Establish scenario projections to serve as the foundation for the Implementation Plan. | | Not applicable. This measure is unrelated to the project scope. |
| Implement Forest Carbon Plan. | CNRA, California Department of Forestry and Fire Protection (CAL FIRE), CalEPA and Departments Within | Not applicable. This measure is unrelated to the project scope. |
| Identify and expand funding and financing mechanisms to support GHG reductions across all sectors. | State Agencies & Local Agencies | Not applicable. This measure is specific to state and local governments and cannot be implemented by the project. The project will be constructed and operated in a manner to that will reduce GHG consumption consistent with state and local policies and regulations. |

**San Diego Association of Governments: San Diego Forward**

Regarding consistency with SANDAG's Regional Plan (Regional Plan), the project would not conflict with the policy objectives of the Regional Plan and SB 375. Table 13 illustrates that the

project does not conflict with applicable goals and policies of San Diego Forward: The Regional Plan (SANDAG 2021). As shown in Table 13, the project is consistent with applicable Policy Objectives and Strategies from the San Diego Forward – the 2021 Regional Plan.

**Table 13**
**San Diego Forward: The Regional Plan Analysis**

| Category | Policy Objective or Strategy | Conflict Analysis |
|---|---|---|
| The Regional Plan –Implementation Actions | | |
| Land Use and Habitat | The 2021 Regional Plan vision for land use focuses on development and growth in Mobility Hub areas to preserve the region's habitat and open space while supporting transportation investments and reducing vehicle miles traveled (VMT). | No Conflict. The project would be consistent with planned land use for the site and would not adversely impact habitat. Further, the project site is within ½ mile of the North County Transit District (NCTD) Bus Routes 303 and 313 and within ½ miles from the Oceanside Transportation Center. The project is proposed within a VMT efficient area as determined by City of Oceanside guidelines (approved August 2020). Further, the site is located in a low-VMT generating area ( 85% of regional average) as identified on the most recent SANDAG SB 743 Screening map. |
| Housing | The 2021 Regional Plan addresses the housing crisis through Mobility Hubs, bringing locations where people live and work closer together and providing more housing options for more San Diegans through increased density. | No Conflict. The project would provide affordable and market rate housing within ½ mile of the Oceanside Transportation Center and NCTD and BREEZE bus routes 303 and 313.The project would utilitze density bonus benefits to increase the supply of affordable and market rate units per the City of Oceanside General Plan. |
| Climate Action Planning | To help reach regional and state greenhouse gas (GHG) emissions–reduction targets, the 2021 Regional Plan focuses heavily on the conversion to clean transportation and a shift from personal vehicle dependency through the 5 Big Moves. | No Conflict. The project would not impact regional initiatives to reduce GHG emissions. The project would be consistent with the City of Oceanside CAP and Service Population threshold for GHG emissions. The project's placement of 273 dwelling units and 4,006 square feet of commercial space in proximity to the NCTD transit resources is consistent with the 2021 Regional Plan's efforts to shift from personal vehicle dependency. |
| Climate Adaptation and Resilience | The 2021 Regional Plan aims to better prepare San Diego communities and habitats for climate change impacts by considering evacuation and rapid mobility needs in our transit corridors, evaluating and considering climate vulnerabilities to the region's transportation infrastructure, and using natural lands and conservation to absorb | No Conflict. The project would not impact regional efforts to implement actions related to climate adaptation. Further, the development would occur in an urban setting that has been identified by the City's General Plan and zoning as appropriate for development and is on a previously disturbed portion of the property outside the hardline preserve areas of the draft Habitat Conservation Plan. Thus, consistent with the 2021 Regional Plan, the project would not |

| | | |
|---|---|---|
| | and protect against climate change impacts. | impact the utilization of natural lands to absorb and protect against climate change impacts. |
| Electric Vehicles | SANDAG aims to incentivize and encourage the incorporation of all types of EVs into Flexible Fleets, Transit Leap, and goods movement and to support funding programs that increase the number of EVs and charging stations throughout the region and within Mobility Hubs and as part of the Complete Corridor strategy | No Conflict. The project would provide EV charging stations on-site. |
| Parking and Curb Management | The 2021 Regional Plan addresses curb management by proposing strategies to help balance competing and changing travel needs at the curb while remaining flexible to resident, employee, business, and visitor needs. | Not Applicable. The project would provide on-site parking and make all frontage improvements required by the City to ensure travel needs at the curb are met and off-site connectivity is maintained. |
| Transportation Demand Management | SANDAG will continue to administer and monitor the iCommute program by providing regional rideshare, employer outreach, and bike education and secure parking services to help reduce commute-related traffic congestion and vehicle miles traveled. | Not Applicable. The project would not affect implementation of SANDAG's ongoing TDM programs. |
| Vision Zero | Vision Zero is a national campaign to eliminate all traffic-related deaths and serious injuries by focusing on policies and the redesign of streets to create a transportation system that is safe for everyone. | Not Applicable. The project would not affect SANDAG's initiative to redesign streets and modify the transportation system. |
| Fix It First | The Fix It First strategy aims to repair existing roads and create a system for sustained maintenance in the future, creating a safe and efficient transportation network for all users. | No Conflict. The project would not affect SANDAG's goal related to the fix it first program. The Local Transportation Study (August 2024) determined the project will not generate the need for additional circulation improvements. |
| Transportation System Management and Operations | TSMO includes the establishment of institutional and governance actions to help advance and facilitate cross-agency collaboration to ensure existing and proposed transportation systems are not operated or | Not Applicable. The project would not affect SANDAGs ability to create and manage a TSMO program. |

| | | |
|---|---|---|
| | managed as independent systems but as a multimodal transportation system. | |
| Value Pricing and User Fees | The 2021 Regional Plan explores a network of Managed Lanes, a mileage-based road usage charge, a fee on the fares charged for rides provided by transportation network companies, and further subsidization of transit fares. | Not Applicable. The project would not affect SANDAGs ability to create and manage a value pricing and user fee program. |
| Sustainable Communities Strategy (SCS) – Strategies Related to Reimagined Transportation System | | |
| Complete Corridors | Focuses on regional transportation system including managed lanes, rural corridors, regional arterial network and other improvements. | Not applicable. The project would have no affect on the regional transportation system or SANDAGs efforts to improve the system. |
| Transit Leap | Provide new and expanded transit services including commuter rail, light rail, high speed rail, local buses and micro-transit. | Not applicable. The project would have no affect on the provision of regional transit services. The project would promote transit use as the site is adjacent to NCTD Bus Routes 303 and 313 and less than ½ mile from the Oceanside Transportation Center. |
| Mobility Hubs | Invest in a transportation mobility network that focus on micro-mobility, rideshare and micro-transit and other features that promote the development of mobility hubs. | Not Applicable. The project would not impair SANDAG's ability to invest in the development of mobility hubs. |
| Next OS | Next OS is the digital network that maximizes the efficiency and effectiveness of the other Big Moves—Complete Corridors, Transit Leap, Mobility Hubs, and Flexible Fleets—to make the entire transportation system work at its peak potential. | Not Applicable. The project would not impair SANDAG's ability to develop and/or expand the Next OS infrastructure. |
| Active Transportation | This strategy would develop a network to make critical connections along Complete Corridors and other streets, providing people with safe and convenient ways to connect to and from Transit Leap services and many other destinations within and between Mobility Hubs. | Not Applicable. The project would not impair the ability of SANDAG to implement the active transportation system. |

| | | |
|---|---|---|
| Climate Strategies | This strategy focuses on measures to mitigate climate change and adapt to inevitable impacts will make our region more resilient. Resilience is defined as "the ability to prepare for changing conditions and withstand, respond to, and recover rapidly from disruptions. | No Conflict. As disclosed throughout this report, the project would not impact regional efforts to implement actions related to climate adaptation. |
| Innovative Demand and System Management | Innovative demand and system management strategies are programs that encourage and support a choice of alternatives to driving alone. These alternatives include working remotely, carpooling, vanpooling, and choosing transit or active transportation. | Not Applicable. The project would not impair the ability of SANDAG to implement an innovative demand and system management program. However, the project would generally encourage the choice of alternatives to driving alone as it is within ½ mile of the NCTD Bus Routes 03 and 13 and the Oceanside Transportation Center. |

Source: SANDAG 2021.

**2022 Scoping Plan Consistency**

CARB's 2022 Scoping Plan sets a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels by 2045 in accordance with AB 1279. The 2022 Scoping Plan focuses on zero-emission transportation; phasing out use of fossil gas use for heating homes and buildings; reducing chemical and refrigerants with high GWP; providing communities with sustainable options for walking, biking, and public transit; displacement of fossil-fuel fired electrical generation through use of renewable energy alternatives (e.g., solar arrays and wind turbines); and scaling up new options such as green hydrogen. Unlike the 2017 Scoping Plan, CARB no longer includes a numeric per capita threshold and instead advocates for compliance with a local GHG reduction strategy (i.e., Climate Action Plan) consistent with CEQA Guidelines Section 15183.5. Statewide strategies to reduce GHG emissions in the latest 2022 Scoping Plan include implementing SB 100, which would achieve 100 percent clean electricity by 2045; achieving 100 percent zero emission vehicle sales in 2035 through Advanced Clean Cars II; and implementing the Advanced Clean Fleets regulation to deploy ZEV buses and trucks. Additional transportation policies include the Off-Road Zero Emission Targeted Manufacturer rule, Clean Off-Road Fleet Recognition Program, In-use Off-Road Diesel Fueled Fleets Regulation, Clean Off-Road Fleet Recognition Program, and Amendments to the In-use Off-Road Diesel-Fueled Fleets Regulation.

The 2022 Scoping Plan would continue to implement SB 375. GHGs would be further reduced through the Cap-and-Trade Program carbon pricing and SB 905. SB 905 requires CARB to create the Carbon Capture, Removal, Utilization, and Storage Program to evaluate, demonstrate, and regulate carbon dioxide removal projects and technology. As indicated above, GHG reductions are also achieved as a result of State of California energy and water efficiency requirements for new residential development. These efficiency improvements correspond to reductions in secondary GHG emissions. For example, in California, most of the electricity that powers homes

is derived from natural gas combustion. Therefore, energy saving measures, such as Title 24, reduces GHG emissions from the power generation facilities by reducing load demand. The 2022 Scoping Plan Appendix D provides local jurisdictions with tools to reduce GHGs and assist the state in meeting the ambitious targets set forth in the 2022 Scoping Plan. The 2022 Scoping Plan Appendix D focuses on Residential and Mixed-Use Projects. The 2022 Scoping Plan Appendix D lists potential actions that support the State's climate goals. However, the 2022 Scoping Plan notes that the applicability and performance of the actions may vary across the regions. The document is organized into two categories (A) examples of plan-level GHG reduction actions that could be implemented by local governments and (B) examples of on-site project design features, mitigation measures, that could be required of individual projects under CEQA, if feasible, when the local jurisdiction is the lead agency. The Project would include a number of the Standard Conditions and mitigation measures for construction and operation. For example, the 2022 Scoping Plan's construction actions include enforcing idling time restrictions on construction vehicles and requiring construction vehicles to operate highest tier engines commercially available. The Project would include a majority of the feasible operational mitigation measures listed in the 2022 Scoping Plan Appendix D as design features. Some of the recommended operational measures would include providing bicycle parking, creating on- and off-site safety improvements for bike, pedestrian, and transit connections, requiring solar panels, drought-tolerant landscaping, and energy conserving appliances. As discussed above, the Project would be consistent with all applicable plan goals and applicable regulatory programs designed to reduce GHG emissions generated by land use projects. The Project would be subject to compliance with all building codes in effect at the time of construction, which include energy conservation measures mandated by California Building Standards Code Title 24 – Energy Efficiency Standards. Because Title 24 standards require energy conservation features in new construction (e.g., high- efficiency lighting, high-efficiency heating, ventilating, and air-conditioning (HVAC) systems, thermal insulation, double-glazed windows, water conserving plumbing fixtures), they indirectly regulate and reduce GHG emissions. California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. As shown above, the majority of the Project's emissions are from energy and mobile sources, which would be further reduced by the 2022 Scoping Plan actions described above. The City has no control over vehicle emissions; however, these emissions would decline in the future because of Statewide measures as well as cleaner technology and fleet turnover. Many State plans and policies would contribute to a reduction in the Project's mobile source emissions, including the following:

*CARB's Advanced Clean Truck Regulation:* Adopted in June 2020, CARB's Advanced Clean Truck Regulation requires truck manufacturers to transition from diesel trucks and vans to electric zero-emission trucks beginning in 2024. By 2045, every new truck sold in California is required to be zero-emission. The Advanced Clean Truck Regulation accelerates the transition of zero-emission medium-and heavy-duty vehicles from Class 2b to Class 8.

*Executive Order N-79-20:* Executive Order N-79-20 establishes the goal for all new passenger cars and trucks, as well as all drayage/cargo trucks and off-road vehicles and equipment, sold in California, to be zero-emission by 2035 and all medium and heavy-duty vehicles to be zero-

emission by 2045. It also directs CARB to develop and propose rulemaking for passenger vehicles and trucks, medium-and heavy-duty fleets where feasible, drayage trucks, and off-road vehicles and equipment "requiring increasing volumes" of new ZEVs "towards the target of 100 percent."

*CARB's Mobile Source Strategy:* CARB's Mobile Source Strategy takes an integrated planning approach to identify the level of transition to cleaner mobile source technologies needed to achieve all of California's targets by increasing the adoption of ZEV buses and trucks.

*CARB's Sustainable Freight Action Plan:* The Sustainable Freight Action Plan which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of ZEV trucks. This Plan applies to all trucks accessing the Project site and may include existing trucks or new trucks that are part of the Statewide goods movement sector.

*CARB's Emissions Reduction Plan for Ports and Goods Movement:* CARB's Emissions Reduction Plan for Ports and Goods Movement identifies measures to improve goods movement efficiencies such as advanced combustion strategies, friction reduction, waste heat recovery, and electrification of accessories. While these measures are not directly applicable to the Project, any commercial activity associated with goods movement would be required to comply with these measures as adopted.

The Project would not obstruct or interfere with efforts to increase ZEVs or State efforts to improve system efficiency. Compliance with applicable State standards (e.g., continuation of the Cap-and-Trade regulation; CARB's Mobile Source Strategy, Sustainable Freight Action Plan, and Advanced Clean Truck Regulation; Executive Order N-79-20; SB 100/renewable electricity portfolio improvements that require 60 percent renewable electricity by 2030 and 100 percent renewable by 2045, etc.) would ensure consistency with State and regional GHG reduction planning efforts, including the 2022 Scoping Plan. It is also noted that the Project would not convert any Natural and Working Lands (NWL) and/or decrease the State's urban forest carbon stock, which are areas of emphasis in the 2022 Scoping Plan.

Regarding goals for 2050 under Executive Order S-3-05, at this time it is not possible to quantify the emissions savings from future regulatory measures, as they have not yet been developed; nevertheless, it can be anticipated that Project operations would benefit from applicable measures enacted to meet State GHG reduction goals. The Project would not impede the State's progress towards carbon neutrality by 2045 under the 2022 Scoping Plan. The Project would be required to comply with applicable current and future regulatory requirements promulgated through the 2022 Scoping Plan. Thus, impacts related to consistency with the 2022 Scoping Plan would be less than significant. The Project would not conflict with the applicable plans and regulatory programs that are discussed above; and therefore, with respect to this particular threshold, the Project does not have a significant impact.

### Consistency Analysis with City of Oceanside General Plan

The project also would be consistent with the goals set forth in the City's General Plan Environmental Resource Management Element, Land Use Element, and Circulation Element that are designed to reduce the emissions of GHGs, reduce energy use in buildings and infrastructure, and promote the use of renewable energy sources, conservation, and other methods of efficiency. Table 14 outlines the project's consistency with applicable General Plan goals. As shown in Table 14, the project would not conflict with applicable and goals and policies of the City's General Plan to the extent feasible.

**Table 14**
**City of Oceanside General Plan – Project Conflict Analysis**

| Goal | Conflict Analysis |
|---|---|
| Environmental Resource Management Element[a] | |
| Air Quality. Cooperate with County, State, and federal agencies in continuing programs of air quality improvement. | No Conflict. The project would not impair the City's ability to work with the County, state, and other local agencies. |
| Land Use Element | |
| Air Quality. The City shall cooperate with the San Diego County Air Pollution Control Board, and participate in the Regional Air Control Strategy (RAQS). | No Conflict. The project would not impair the City's ability to work with the SDAPCD Board or RAQS. |
| Bicycle Facilities. Policy A: Development shall provide Class II Bikeways (Bike Lanes) on all secondary, major, and prime arterials. | No Conflict. The implementation of street improvements by the project would serve as new linkages to the City's existing bicycle and pedestrian network and implement recommendations identified in the City of Oceanside 2017 Bicycle Master Plan. The street segments proximal to the site have Class 3 bike sharrow markings except on westbound Mission Avenue, eastbound Seagaze Drive and northbound North Horne Street. North Clementine Street is not marked with a sharrow; however, bicycle access is provided on the western-most lane. No off-site bike marking improvements are proposed or required of the project. |
| Bicycle Facilities. Policy D: The use of land shall integrate the Bicycle Circulation System with auto, pedestrian, and transit systems:<br>1. Development shall provide short-term bicycle parking and long-term bicycle storage facilities such as bicycle racks, pedestal posts, and rental bicycle lockers.<br>2. Development shall provide safe and convenient bicycle access to high activity land uses, such as schools, parks, shopping, employment, and entertainment centers. | No Conflict. The project would install bicycle parking facilities with the parking garage. This would facilitate the use of bicycles to access downtown Oceanside and related commercial development to the west. |

| | |
|---|---|
| Pedestrian. Policy A: The construction of five (5) foot wide sidewalks adjacent to the curb shall be required in all new developments and street improvements. | No Conflict. All existing sidewalks meet City of Oceanside 5-foot width standards.The project would reconstruct existing sidewalk segments impacted by constructing the main entrance from North Horne Street. There are no missing sidewalk segments that would require construction along Mission Avenue, North Horne Street, North Clementine Street or Seagaze Drive. |
| Transit System. Policy A: The City shall coordinate and encourage the existing bus system to serve newly developed areas. | No Conflict. NCTD Bus Routes 303 and 313 are adjacent to the site along Mission Avenue and North Horne Street. The Oceanside Transportation Center is less than ½ mile from the project access.<br><br>On Mission Avenue, the closest bus stops from the project site are located both east and west of North Horne Street (Route 303) and along N Horne Street and Seagaze Drive, both east and west of Mission Avenue (Route 313). |
| Energy. Policy A. The City shall encourage the design, installation, and use of passive and active solar collection systems. | No Conflict. Solar generating systems would be installed on the building rooftop and walls to offset electrical energy demand. |
| Energy. Policy B. The City shall encourage the use of energy efficient design, structures, materials, and equipment in all land developments or uses. | No Conflict. The project would incorporate integrated energy efficiency measures such as energy-efficient appliances to meet or exceed Title 24 requirements. |
| Circulation Element | |
| Policy 2.5. The City will strive to incorporate complete streets throughout Oceanside. | Not applicable. The project would not impair the City's ability to incorporate complete streets throughout the City. |
| Pedestrian Facilities. Support walking as a primary means of transportation. | No Conflict. . The project would not impair the City's ability to support walkability throughout the City. Existing pedestrian infrastructure along would not be affected by the project. As stated, NCTD Bus Routes 03 and 13 are adjacent to the site. The Oceanside Transportation Center is ess than ½ mile from the project access. |
| Intelligent Transportation System Technologies. Improve air quality and reduce greenhouse gas emissions through traffic signal optimization and the use of advanced signal control technologies. | Not applicable. The project would not impair the City's ability to optimize traffic signals or use advanced signal control technologies. |
| Transportation Demand Management. The City shall look for opportunities to incorporate Transportation Demand Management (TDM) programs into their Energy Roadmap that contributes to state and regional goals for saving energy and reducing greenhouse gas emissions. | Not applicable. The project would not impair the City's ability to incorporate TDM strategies into their Energy Roadmap. |

## Applicable Oceanside Development Code Regulations

City of Oceanside Development Code Section 3047, *Renewable Energy Facilities,* requires certain types of new development, including the proposed project, to install and maintain renewable

energy facilities (e.g. solar photovoltaic systems) to reduce emissions associated with the generation of electricity. Section 3047(A) stipulates that these systems supply at least 50 percent of forecasted electricity demand. In this case, the photovoltaic system would be designed to provide 306,700 kWh annually which is approximately 27 percent of the total annual demand (e.g., 1,138,634 kWh). However, as stated in City of Oceanside Development Code Section 3047, *Renewable Energy Facilities,* in the event that installing a renewable energy facility is not feasible, applicants can purchase an energy portfolio comprising at least 75% renewable, emissions-free energy. To achieve code compliance given the projections, the applicant will purchase an energy portfolio (such as the one available through the Clean Energy Alliance) that ensures at least 50% of the project's total energy demand will be met from renewable sources. Total GHG emissions reported herein are conservatrviely based on the electrical energy demand reduced solely by the generated on-site renewable sources.

As required by Section 3048, the proposed project will provide preferential parking and charging facilities for electric vehicles EVs. The project would provide 30 EV charging spaces. One additional charging space would be unassigned for leasing guests. A total of 132 spaces would be EV ready with low-power receptacles.

Consistent with Section 3049 (Urban Forestry), the project will provide a minimum canopy tree area of 12% and a minimum permeable surface area of 22%.

## Conclusion

As stated herein, the project is new construction of 273 multifamily apartment units in one new building with surface and subterranean parking. The proposed apartment building would contain 273 units and 4,006 square feet of commercial space in eight levels with 328 parking spaces in a four-level parking garage under the building. An additional five parallel parking spaces would be provided along the frontage for the commercial space.

**Would the project conflict with or obstruct implementation of the applicable air quality plan?**

The project is consistent with the Downtown Subdistrict 2 zoning designation and is anticipated in the local plans and SANDAG's population and employment growth projections. Thus, the project would be within SANDAG's population growth forecast and would not conflict with the SIP and RAQS.

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

Project construction and operational emissions would not exceed the SDAPCD thresholds. Thus, the project would not result in a cumulatively considerable net

increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.

**Would the project expose sensitive receptors to substantial pollutant concentrations?**
The project would not cause or contribute to CO hot spots or otherwise expose receptors to substantial pollutant concentrations during construction or operations.

**Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?**

The project would provide 273 residential units, 4,006 square feet of commercial/retail space, associated parking and related infrastructure improvements. These uses would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

**Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

The proposed project would generate annual GHG emissions; however, the emissions would not exceed the SP threshold of 3.5 MT CO2e each year.

**Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?**

The project would not conflict with the City of Oceanside Climate Action Plan, 2017 and 2022 CARB Scoping Plans, the City of Oceanside General Plan and the SANDAG Regional Plan; San Diego Forward. Further, the project would comply with applicable development code regulations pertaining to renewable energy, EV spaces and charging facilities as well as the Urban Forestry.

Impacts related to air quality and greenhouse gas emissions would be less than significant based on information presented herein and in the project materials.

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# Appendix A

CalEEMod Air Quality and Greenhouse Gas Emissions Model Results –

# 901 Mission Avenue Mixed Use Detailed Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | 901 Mission Avenue Mixed Use |
| Construction Start Date | 11/29/2027 |
| Operational Year | 2030 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 1.90 |
| Precipitation (days) | 20.6 |
| Location | 33.19753464207251, -117.37584193079988 |
| County | San Diego |
| City | Oceanside |
| Air District | San Diego County APCD |
| Air Basin | San Diego |
| TAZ | 6231 |
| EDFZ | 12 |
| Electric Utility | San Diego Gas & Electric |
| Gas Utility | San Diego Gas & Electric |
| App Version | 2022.1.1.29 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | 273 | Dwelling Unit | 7.18 | 262,080 | 1,000 | — | 762 | — |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Strip Mall | 4.01 | 1000sqft | 0.09 | 4,006 | 200 | — | — | — |
| Enclosed Parking with Elevator | 328 | Space | 2.95 | 131,200 | 100 | — | — | — |

## 1.3. User-Selected Emission Reduction Measures by Emissions Sector

| Sector | # | Measure Title |
|---|---|---|
| Construction | C-2* | Limit Heavy-Duty Diesel Vehicle Idling |
| Transportation | T-4 | Integrate A ordable and Below Market Rate Housing |
| Transportation | T-14* | Provide Electric Vehicle Charging Infrastructure |
| Energy | E-10-B | Establish Onsite Renewable Energy Systems: Solar Power |
| Water | W-7 | Adopt a Water Conservation Strategy |
| Waste | S-1/S-2 | Implement Waste Reduction Plan |

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

# 2. Emissions Summary

## 2.1. Construction Emissions Compared Against Thresholds

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

| Un/Mit. | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 1.97 | 11.6 | 24.0 | 0.03 | 0.35 | 2.47 | 2.82 | 0.33 | 0.59 | 0.92 | — | 5,943 | 5,943 | 0.25 | 0.28 | 10.2 | 6,042 |
| Mit. | 1.97 | 11.6 | 24.0 | 0.03 | 0.35 | 2.47 | 2.82 | 0.33 | 0.59 | 0.92 | — | 5,943 | 5,943 | 0.25 | 0.28 | 10.2 | 6,042 |
| % Reduced | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 26.6 | 38.7 | 32.6 | 0.12 | 1.28 | 7.81 | 9.06 | 1.14 | 3.97 | 5.12 | — | 15,335 | 15,335 | 0.70 | 1.44 | 0.48 | 15,781 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mit. | 26.6 | 38.7 | 32.6 | 0.12 | 1.28 | 7.81 | 9.06 | 1.14 | 3.97 | 5.12 | — | 15,335 | 15,335 | 0.70 | 1.44 | 0.48 | 15,781 |
| % Reduced | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 4.44 | 11.6 | 16.5 | 0.03 | 0.36 | 2.15 | 2.51 | 0.33 | 0.61 | 0.94 | — | 5,266 | 5,266 | 0.24 | 0.35 | 3.37 | 5,380 |
| Mit. | 4.44 | 11.6 | 16.5 | 0.03 | 0.36 | 2.15 | 2.51 | 0.33 | 0.61 | 0.94 | — | 5,266 | 5,266 | 0.24 | 0.35 | 3.37 | 5,380 |
| % Reduced | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.81 | 2.11 | 3.01 | 0.01 | 0.07 | 0.39 | 0.46 | 0.06 | 0.11 | 0.17 | — | 872 | 872 | 0.04 | 0.06 | 0.56 | 891 |
| Mit. | 0.81 | 2.11 | 3.01 | 0.01 | 0.07 | 0.39 | 0.46 | 0.06 | 0.11 | 0.17 | — | 872 | 872 | 0.04 | 0.06 | 0.56 | 891 |
| % Reduced | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 2.2. Construction Emissions by Year, Unmitigated

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

| Year | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2027 | 1.97 | 11.6 | 24.0 | 0.03 | 0.35 | 2.47 | 2.82 | 0.33 | 0.59 | 0.92 | — | 5,943 | 5,943 | 0.25 | 0.28 | 10.2 | 6,042 |
| 2028 | 1.90 | 11.0 | 23.4 | 0.03 | 0.32 | 2.47 | 2.79 | 0.29 | 0.59 | 0.89 | — | 5,871 | 5,871 | 0.18 | 0.28 | 9.24 | 5,967 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 3.30 | 38.7 | 32.6 | 0.12 | 1.28 | 7.81 | 9.06 | 1.14 | 3.97 | 5.12 | — | 15,335 | 15,335 | 0.70 | 1.44 | 0.48 | 15,781 |
| 2027 | 3.19 | 36.6 | 32.2 | 0.12 | 1.20 | 6.03 | 7.23 | 1.07 | 2.08 | 3.15 | — | 15,129 | 15,129 | 0.70 | 1.38 | 0.44 | 15,560 |
| 2028 | 26.6 | 11.2 | 22.2 | 0.03 | 0.32 | 2.47 | 2.79 | 0.29 | 0.59 | 0.89 | — | 5,746 | 5,746 | 0.19 | 0.28 | 0.24 | 5,833 |
| 2029 | 26.6 | 0.92 | 2.73 | < 0.005 | 0.01 | 0.43 | 0.44 | 0.01 | 0.10 | 0.11 | — | 555 | 555 | 0.01 | 0.02 | 0.03 | 561 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.18 | 1.68 | 1.60 | < 0.005 | 0.07 | 0.27 | 0.34 | 0.06 | 0.13 | 0.19 | — | 373 | 373 | 0.02 | 0.01 | 0.08 | 377 |
| 2027 | 1.47 | 11.6 | 16.5 | 0.03 | 0.36 | 2.15 | 2.51 | 0.33 | 0.61 | 0.94 | — | 5,266 | 5,266 | 0.24 | 0.35 | 3.37 | 5,380 |
| 2028 | 4.44 | 6.44 | 12.9 | 0.02 | 0.19 | 1.36 | 1.55 | 0.17 | 0.33 | 0.50 | — | 3,242 | 3,242 | 0.11 | 0.15 | 2.22 | 3,291 |
| 2029 | 1.35 | 0.05 | 0.14 | < 0.005 | < 0.005 | 0.02 | 0.02 | < 0.005 | 0.01 | 0.01 | — | 28.4 | 28.4 | < 0.005 | < 0.005 | 0.03 | 28.7 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.03 | 0.31 | 0.29 | < 0.005 | 0.01 | 0.05 | 0.06 | 0.01 | 0.02 | 0.03 | — | 61.7 | 61.7 | < 0.005 | < 0.005 | 0.01 | 62.5 |
| 2027 | 0.27 | 2.11 | 3.01 | 0.01 | 0.07 | 0.39 | 0.46 | 0.06 | 0.11 | 0.17 | — | 872 | 872 | 0.04 | 0.06 | 0.56 | 891 |
| 2028 | 0.81 | 1.18 | 2.35 | < 0.005 | 0.03 | 0.25 | 0.28 | 0.03 | 0.06 | 0.09 | — | 537 | 537 | 0.02 | 0.02 | 0.37 | 545 |
| 2029 | 0.25 | 0.01 | 0.03 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | 4.71 | 4.71 | < 0.005 | < 0.005 | < 0.005 | 4.76 |

## 2.3. Construction Emissions by Year, Mitigated

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

| Year | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2027 | 1.97 | 11.6 | 24.0 | 0.03 | 0.35 | 2.47 | 2.82 | 0.33 | 0.59 | 0.92 | — | 5,943 | 5,943 | 0.25 | 0.28 | 10.2 | 6,042 |
| 2028 | 1.90 | 11.0 | 23.4 | 0.03 | 0.32 | 2.47 | 2.79 | 0.29 | 0.59 | 0.89 | — | 5,871 | 5,871 | 0.18 | 0.28 | 9.24 | 5,967 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 3.30 | 38.7 | 32.6 | 0.12 | 1.28 | 7.81 | 9.06 | 1.14 | 3.97 | 5.12 | — | 15,335 | 15,335 | 0.70 | 1.44 | 0.48 | 15,781 |
| 2027 | 3.19 | 36.6 | 32.2 | 0.12 | 1.20 | 6.03 | 7.23 | 1.07 | 2.08 | 3.15 | — | 15,129 | 15,129 | 0.70 | 1.38 | 0.44 | 15,560 |
| 2028 | 26.6 | 11.2 | 22.2 | 0.03 | 0.32 | 2.47 | 2.79 | 0.29 | 0.59 | 0.89 | — | 5,746 | 5,746 | 0.19 | 0.28 | 0.24 | 5,833 |
| 2029 | 26.6 | 0.92 | 2.73 | < 0.005 | 0.01 | 0.43 | 0.44 | 0.01 | 0.10 | 0.11 | — | 555 | 555 | 0.01 | 0.02 | 0.03 | 561 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.18 | 1.68 | 1.60 | < 0.005 | 0.07 | 0.27 | 0.34 | 0.06 | 0.13 | 0.19 | — | 373 | 373 | 0.02 | 0.01 | 0.08 | 377 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2027 | 1.47 | 11.6 | 16.5 | 0.03 | 0.36 | 2.15 | 2.51 | 0.33 | 0.61 | 0.94 | — | 5,266 | 5,266 | 0.24 | 0.35 | 3.37 | 5,380 |
| 2028 | 4.44 | 6.44 | 12.9 | 0.02 | 0.19 | 1.36 | 1.55 | 0.17 | 0.33 | 0.50 | — | 3,242 | 3,242 | 0.11 | 0.15 | 2.22 | 3,291 |
| 2029 | 1.35 | 0.05 | 0.14 | < 0.005 | < 0.005 | 0.02 | 0.02 | < 0.005 | 0.01 | 0.01 | — | 28.4 | 28.4 | < 0.005 | < 0.005 | 0.03 | 28.7 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.03 | 0.31 | 0.29 | < 0.005 | 0.01 | 0.05 | 0.06 | 0.01 | 0.02 | 0.03 | — | 61.7 | 61.7 | < 0.005 | < 0.005 | 0.01 | 62.5 |
| 2027 | 0.27 | 2.11 | 3.01 | 0.01 | 0.07 | 0.39 | 0.46 | 0.06 | 0.11 | 0.17 | — | 872 | 872 | 0.04 | 0.06 | 0.56 | 891 |
| 2028 | 0.81 | 1.18 | 2.35 | < 0.005 | 0.03 | 0.25 | 0.28 | 0.03 | 0.06 | 0.09 | — | 537 | 537 | 0.02 | 0.02 | 0.37 | 545 |
| 2029 | 0.25 | 0.01 | 0.03 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | 4.71 | 4.71 | < 0.005 | < 0.005 | < 0.005 | 4.76 |

## 2.4. Operations Emissions Compared Against Thresholds

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

| Un/Mit. | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 14.9 | 4.93 | 70.8 | 0.13 | 0.14 | 12.2 | 12.3 | 0.13 | 3.08 | 3.22 | 130 | 16,265 | 16,395 | 13.8 | 0.53 | 30.8 | 16,930 |
| Mit. | 14.8 | 4.82 | 69.5 | 0.13 | 0.14 | 11.8 | 12.0 | 0.13 | 3.00 | 3.13 | 42.9 | 15,406 | 15,449 | 5.03 | 0.51 | 30.0 | 15,756 |
| % Reduced | 1% | 2% | 2% | 3% | 2% | 3% | 3% | 2% | 3% | 3% | 67% | 5% | 6% | 64% | 5% | 2% | 7% |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 12.5 | 5.15 | 46.1 | 0.13 | 0.13 | 12.2 | 12.3 | 0.12 | 3.08 | 3.20 | 130 | 15,614 | 15,744 | 13.8 | 0.56 | 2.65 | 16,259 |
| Mit. | 12.4 | 5.03 | 45.0 | 0.12 | 0.12 | 11.8 | 12.0 | 0.12 | 3.00 | 3.12 | 42.9 | 14,770 | 14,813 | 5.06 | 0.53 | 2.63 | 15,101 |
| % Reduced | 1% | 2% | 3% | 3% | 2% | 3% | 3% | 2% | 3% | 3% | 67% | 5% | 6% | 63% | 5% | 1% | 7% |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 13.1 | 4.84 | 53.3 | 0.12 | 0.13 | 11.1 | 11.2 | 0.12 | 2.82 | 2.94 | 130 | 14,792 | 14,922 | 13.8 | 0.52 | 13.4 | 15,434 |
| Mit. | 13.0 | 4.73 | 52.2 | 0.12 | 0.13 | 10.8 | 10.9 | 0.12 | 2.74 | 2.86 | 42.9 | 13,969 | 14,012 | 5.01 | 0.49 | 13.1 | 14,298 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Reduced | 1% | 2% | 2% | 3% | 2% | 3% | 3% | 2% | 3% | 3% | 67% | 6% | 6% | 64% | 5% | 2% | 7% |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 2.39 | 0.88 | 9.73 | 0.02 | 0.02 | 2.03 | 2.05 | 0.02 | 0.51 | 0.54 | 21.5 | 2,449 | 2,470 | 2.28 | 0.09 | 2.23 | 2,555 |
| Mit. | 2.37 | 0.86 | 9.53 | 0.02 | 0.02 | 1.97 | 2.00 | 0.02 | 0.50 | 0.52 | 7.11 | 2,313 | 2,320 | 0.83 | 0.08 | 2.18 | 2,367 |
| % Reduced | 1% | 2% | 2% | 3% | 2% | 3% | 3% | 2% | 3% | 3% | 67% | 6% | 6% | 64% | 5% | 2% | 7% |

## 2.5. Operations Emissions by Sector, Unmitigated

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

| Sector | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 6.44 | 4.24 | 49.1 | 0.13 | 0.09 | 12.2 | 12.2 | 0.08 | 3.08 | 3.16 | — | 13,134 | 13,134 | 0.55 | 0.47 | 28.9 | 13,316 |
| Area | 8.48 | 0.19 | 21.4 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 65.6 | 65.6 | < 0.005 | < 0.005 | — | 65.8 |
| Energy | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 2,957 | 2,957 | 0.19 | 0.02 | — | 2,967 |
| Water | — | — | — | — | — | — | — | — | — | — | 18.9 | 109 | 128 | 1.95 | 0.05 | — | 190 |
| Waste | — | — | — | — | — | — | — | — | — | — | 111 | 0.00 | 111 | 11.1 | 0.00 | — | 389 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.90 | 1.90 |
| Total | 14.9 | 4.93 | 70.8 | 0.13 | 0.14 | 12.2 | 12.3 | 0.13 | 3.08 | 3.22 | 130 | 16,265 | 16,395 | 13.8 | 0.53 | 30.8 | 16,930 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 6.33 | 4.66 | 45.9 | 0.12 | 0.09 | 12.2 | 12.2 | 0.08 | 3.08 | 3.16 | — | 12,548 | 12,548 | 0.58 | 0.50 | 0.75 | 12,711 |
| Area | 6.17 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Energy | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 2,957 | 2,957 | 0.19 | 0.02 | — | 2,967 |
| Water | — | — | — | — | — | — | — | — | — | — | 18.9 | 109 | 128 | 1.95 | 0.05 | — | 190 |
| Waste | — | — | — | — | — | — | — | — | — | — | 111 | 0.00 | 111 | 11.1 | 0.00 | — | 389 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.90 | 1.90 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 12.5 | 5.15 | 46.1 | 0.13 | 0.13 | 12.2 | 12.3 | 0.12 | 3.08 | 3.20 | 130 | 15,614 | 15,744 | 13.8 | 0.56 | 2.65 | 16,259 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 5.78 | 4.26 | 42.6 | 0.11 | 0.08 | 11.1 | 11.2 | 0.07 | 2.82 | 2.89 | — | 11,693 | 11,693 | 0.53 | 0.45 | 11.5 | 11,854 |
| Area | 7.31 | 0.10 | 10.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 32.3 | 32.3 | < 0.005 | < 0.005 | — | 32.5 |
| Energy | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 2,957 | 2,957 | 0.19 | 0.02 | — | 2,967 |
| Water | — | — | — | — | — | — | — | — | — | — | 18.9 | 109 | 128 | 1.95 | 0.05 | — | 190 |
| Waste | — | — | — | — | — | — | — | — | — | — | 111 | 0.00 | 111 | 11.1 | 0.00 | — | 389 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.90 | 1.90 |
| Total | 13.1 | 4.84 | 53.3 | 0.12 | 0.13 | 11.1 | 11.2 | 0.12 | 2.82 | 2.94 | 130 | 14,792 | 14,922 | 13.8 | 0.52 | 13.4 | 15,434 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 1.06 | 0.78 | 7.77 | 0.02 | 0.01 | 2.03 | 2.04 | 0.01 | 0.51 | 0.53 | — | 1,936 | 1,936 | 0.09 | 0.08 | 1.91 | 1,963 |
| Area | 1.33 | 0.02 | 1.93 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 5.36 | 5.36 | < 0.005 | < 0.005 | — | 5.37 |
| Energy | 0.01 | 0.09 | 0.04 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 490 | 490 | 0.03 | < 0.005 | — | 491 |
| Water | — | — | — | — | — | — | — | — | — | — | 3.14 | 18.0 | 21.2 | 0.32 | 0.01 | — | 31.5 |
| Waste | — | — | — | — | — | — | — | — | — | — | 18.4 | 0.00 | 18.4 | 1.84 | 0.00 | — | 64.4 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.31 | 0.31 |
| Total | 2.39 | 0.88 | 9.73 | 0.02 | 0.02 | 2.03 | 2.05 | 0.02 | 0.51 | 0.54 | 21.5 | 2,449 | 2,470 | 2.28 | 0.09 | 2.23 | 2,555 |

## 2.6. Operations Emissions by Sector, Mitigated

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

| Sector | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 6.27 | 4.13 | 47.9 | 0.13 | 0.08 | 11.8 | 11.9 | 0.08 | 3.00 | 3.08 | — | 12,791 | 12,791 | 0.53 | 0.46 | 28.1 | 12,969 |
| Area | 8.48 | 0.19 | 21.4 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 65.6 | 65.6 | < 0.005 | < 0.005 | — | 65.8 |
| Energy | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 2,462 | 2,462 | 0.16 | 0.01 | — | 2,470 |
| Water | — | — | — | — | — | — | — | — | — | — | 15.2 | 87.0 | 102 | 1.56 | 0.04 | — | 152 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Waste | — | — | — | — | — | — | — | — | — | — | 27.8 | 0.00 | 27.8 | 2.78 | 0.00 | — | 97.2 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.90 | 1.90 |
| Total | 14.8 | 4.82 | 69.5 | 0.13 | 0.14 | 11.8 | 12.0 | 0.13 | 3.00 | 3.13 | 42.9 | 15,406 | 15,449 | 5.03 | 0.51 | 30.0 | 15,756 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 6.16 | 4.54 | 44.7 | 0.12 | 0.08 | 11.8 | 11.9 | 0.08 | 3.00 | 3.08 | — | 12,221 | 12,221 | 0.56 | 0.48 | 0.73 | 12,380 |
| Area | 6.17 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Energy | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 2,462 | 2,462 | 0.16 | 0.01 | — | 2,470 |
| Water | — | — | — | — | — | — | — | — | — | — | 15.2 | 87.0 | 102 | 1.56 | 0.04 | — | 152 |
| Waste | — | — | — | — | — | — | — | — | — | — | 27.8 | 0.00 | 27.8 | 2.78 | 0.00 | — | 97.2 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.90 | 1.90 |
| Total | 12.4 | 5.03 | 45.0 | 0.12 | 0.12 | 11.8 | 12.0 | 0.12 | 3.00 | 3.12 | 42.9 | 14,770 | 14,813 | 5.06 | 0.53 | 2.63 | 15,101 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 5.63 | 4.14 | 41.5 | 0.11 | 0.08 | 10.8 | 10.9 | 0.07 | 2.74 | 2.81 | — | 11,387 | 11,387 | 0.51 | 0.44 | 11.2 | 11,543 |
| Area | 7.31 | 0.10 | 10.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 32.3 | 32.3 | < 0.005 | < 0.005 | — | 32.5 |
| Energy | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 2,462 | 2,462 | 0.16 | 0.01 | — | 2,470 |
| Water | — | — | — | — | — | — | — | — | — | — | 15.2 | 87.0 | 102 | 1.56 | 0.04 | — | 152 |
| Waste | — | — | — | — | — | — | — | — | — | — | 27.8 | 0.00 | 27.8 | 2.78 | 0.00 | — | 97.2 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.90 | 1.90 |
| Total | 13.0 | 4.73 | 52.2 | 0.12 | 0.13 | 10.8 | 10.9 | 0.12 | 2.74 | 2.86 | 42.9 | 13,969 | 14,012 | 5.01 | 0.49 | 13.1 | 14,298 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 1.03 | 0.76 | 7.56 | 0.02 | 0.01 | 1.97 | 1.99 | 0.01 | 0.50 | 0.51 | — | 1,885 | 1,885 | 0.08 | 0.07 | 1.86 | 1,911 |
| Area | 1.33 | 0.02 | 1.93 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 5.36 | 5.36 | < 0.005 | < 0.005 | — | 5.37 |
| Energy | 0.01 | 0.09 | 0.04 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 408 | 408 | 0.03 | < 0.005 | — | 409 |
| Water | — | — | — | — | — | — | — | — | — | — | 2.51 | 14.4 | 16.9 | 0.26 | 0.01 | — | 25.2 |
| Waste | — | — | — | — | — | — | — | — | — | — | 4.60 | 0.00 | 4.60 | 0.46 | 0.00 | — | 16.1 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.31 | 0.31 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 2.37 | 0.86 | 9.53 | 0.02 | 0.02 | 1.97 | 2.00 | 0.02 | 0.50 | 0.52 | 7.11 | 2,313 | 2,320 | 0.83 | 0.08 | 2.18 | 2,367 |

# 3. Construction Emissions Details

## 3.1. Demolition (2026) - Unmitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 2.29 | 20.7 | 19.0 | 0.03 | 0.84 | — | 0.84 | 0.78 | — | 0.78 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | 0.16 | 0.16 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.06 | 0.57 | 0.52 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 93.9 | 93.9 | < 0.005 | < 0.005 | — | 94.2 |
| Demolition | — | — | — | — | — | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.10 | 0.10 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 15.5 | 15.5 | < 0.005 | < 0.005 | — | 15.6 |
| Demolition | — | — | — | — | — | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.05 | 0.57 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.03 | 0.03 | — | 132 | 132 | 0.01 | 0.01 | 0.01 | 133 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | 0.27 | 0.10 | < 0.005 | < 0.005 | 0.05 | 0.06 | < 0.005 | 0.01 | 0.02 | — | 204 | 204 | 0.01 | 0.03 | 0.01 | 214 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 3.64 | 3.64 | < 0.005 | < 0.005 | 0.01 | 3.69 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | 5.59 | 5.59 | < 0.005 | < 0.005 | 0.01 | 5.87 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.60 | 0.60 | < 0.005 | < 0.005 | < 0.005 | 0.61 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | 0.93 | 0.93 | < 0.005 | < 0.005 | < 0.005 | 0.97 |

## 3.2. Demolition (2026) - Mitigated

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

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

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 2.29 | 20.7 | 19.0 | 0.03 | 0.84 | — | 0.84 | 0.78 | — | 0.78 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | 0.16 | 0.16 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.06 | 0.57 | 0.52 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 93.9 | 93.9 | < 0.005 | < 0.005 | — | 94.2 |
| Demolition | — | — | — | — | — | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.10 | 0.10 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 15.5 | 15.5 | < 0.005 | < 0.005 | — | 15.6 |
| Demolition | — | — | — | — | — | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.05 | 0.57 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.03 | 0.03 | — | 132 | 132 | 0.01 | 0.01 | 0.01 | 133 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | 0.27 | 0.10 | < 0.005 | < 0.005 | 0.05 | 0.06 | < 0.005 | 0.01 | 0.02 | — | 204 | 204 | 0.01 | 0.03 | 0.01 | 214 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 3.64 | 3.64 | < 0.005 | < 0.005 | 0.01 | 3.69 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | 5.59 | 5.59 | < 0.005 | < 0.005 | 0.01 | 5.87 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.60 | 0.60 | < 0.005 | < 0.005 | < 0.005 | 0.61 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | 0.93 | 0.93 | < 0.005 | < 0.005 | < 0.005 | 0.97 |

## 3.3. Site Preparation (2026) - Unmitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 3.14 | 29.2 | 28.8 | 0.05 | 1.24 | — | 1.24 | 1.14 | — | 1.14 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | 7.67 | 7.67 | — | 3.94 | 3.94 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.09 | 0.80 | 0.79 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 145 | 145 | 0.01 | < 0.005 | — | 146 |
| Dust From Material Movement | — | — | — | — | — | 0.21 | 0.21 | — | 0.11 | 0.11 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.15 | 0.14 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 24.0 | 24.0 | < 0.005 | < 0.005 | — | 24.1 |
| Dust From Material Movement | — | — | — | — | — | 0.04 | 0.04 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.05 | 0.67 | 0.00 | 0.00 | 0.15 | 0.15 | 0.00 | 0.03 | 0.03 | — | 154 | 154 | 0.01 | 0.01 | 0.01 | 156 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 4.25 | 4.25 | < 0.005 | < 0.005 | 0.01 | 4.31 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.70 | 0.70 | < 0.005 | < 0.005 | < 0.005 | 0.71 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.4. Site Preparation (2026) - Mitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 3.14 | 29.2 | 28.8 | 0.05 | 1.24 | — | 1.24 | 1.14 | — | 1.14 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | 7.67 | 7.67 | — | 3.94 | 3.94 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.09 | 0.80 | 0.79 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 145 | 145 | 0.01 | < 0.005 | — | 146 |
| Dust From Material Movement | — | — | — | — | — | 0.21 | 0.21 | — | 0.11 | 0.11 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.15 | 0.14 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 24.0 | 24.0 | < 0.005 | < 0.005 | — | 24.1 |
| Dust From Material Movement | — | — | — | — | — | 0.04 | 0.04 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.05 | 0.67 | 0.00 | 0.00 | 0.15 | 0.15 | 0.00 | 0.03 | 0.03 | — | 154 | 154 | 0.01 | 0.01 | 0.01 | 156 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 4.25 | 4.25 | < 0.005 | < 0.005 | 0.01 | 4.31 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.70 | 0.70 | < 0.005 | < 0.005 | < 0.005 | 0.71 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.5. Grading (2026) - Unmitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 3.04 | 27.2 | 27.6 | 0.06 | 1.12 | — | 1.12 | 1.03 | — | 1.03 | — | 6,599 | 6,599 | 0.27 | 0.05 | — | 6,621 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dust From Material Movement | — | — | — | — | — | 3.60 | 3.60 | — | 1.43 | 1.43 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.21 | 0.22 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 51.7 | 51.7 | < 0.005 | < 0.005 | — | 51.8 |
| Dust From Material Movement | — | — | — | — | — | 0.03 | 0.03 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | 0.04 | 0.04 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 8.55 | 8.55 | < 0.005 | < 0.005 | — | 8.58 |
| Dust From Material Movement | — | — | — | — | — | 0.01 | 0.01 | — | < 0.005 | < 0.005 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.76 | 0.00 | 0.00 | 0.17 | 0.17 | 0.00 | 0.04 | 0.04 | — | 176 | 176 | 0.01 | 0.01 | 0.02 | 178 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.18 | 11.4 | 4.28 | 0.06 | 0.16 | 2.26 | 2.42 | 0.11 | 0.62 | 0.72 | — | 8,561 | 8,561 | 0.43 | 1.38 | 0.46 | 8,982 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.39 | 1.39 | < 0.005 | < 0.005 | < 0.005 | 1.41 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | 0.09 | 0.03 | < 0.005 | < 0.005 | 0.02 | 0.02 | < 0.005 | < 0.005 | 0.01 | — | 67.0 | 67.0 | < 0.005 | 0.01 | 0.06 | 70.4 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.23 | 0.23 | < 0.005 | < 0.005 | < 0.005 | 0.23 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | 0.02 | 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | 11.1 | 11.1 | < 0.005 | < 0.005 | 0.01 | 11.6 |

## 3.6. Grading (2026) - Mitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 3.04 | 27.2 | 27.6 | 0.06 | 1.12 | — | 1.12 | 1.03 | — | 1.03 | — | 6,599 | 6,599 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | 3.60 | 3.60 | — | 1.43 | 1.43 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.21 | 0.22 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 51.7 | 51.7 | < 0.005 | < 0.005 | — | 51.8 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dust From Material Movement | — | — | — | — | — | 0.03 | 0.03 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | 0.04 | 0.04 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 8.55 | 8.55 | < 0.005 | < 0.005 | — | 8.58 |
| Dust From Material Movement | — | — | — | — | — | 0.01 | 0.01 | — | < 0.005 | < 0.005 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.76 | 0.00 | 0.00 | 0.17 | 0.17 | 0.00 | 0.04 | 0.04 | — | 176 | 176 | 0.01 | 0.01 | 0.02 | 178 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.18 | 11.4 | 4.28 | 0.06 | 0.16 | 2.26 | 2.42 | 0.11 | 0.62 | 0.72 | — | 8,561 | 8,561 | 0.43 | 1.38 | 0.46 | 8,982 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.39 | 1.39 | < 0.005 | < 0.005 | < 0.005 | 1.41 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | 0.09 | 0.03 | < 0.005 | < 0.005 | 0.02 | 0.02 | < 0.005 | < 0.005 | 0.01 | — | 67.0 | 67.0 | < 0.005 | 0.01 | 0.06 | 70.4 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.23 | 0.23 | < 0.005 | < 0.005 | < 0.005 | 0.23 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | 0.02 | 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | 11.1 | 11.1 | < 0.005 | < 0.005 | 0.01 | 11.6 |

## 3.7. Grading (2027) - Unmitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 2.95 | 25.6 | 27.3 | 0.06 | 1.04 | — | 1.04 | 0.96 | — | 0.96 | — | 6,598 | 6,598 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | 3.60 | 3.60 | — | 1.43 | 1.43 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.45 | 3.90 | 4.16 | 0.01 | 0.16 | — | 0.16 | 0.15 | — | 0.15 | — | 1,007 | 1,007 | 0.04 | 0.01 | — | 1,011 |
| Dust From Material Movement | — | — | — | — | — | 0.55 | 0.55 | — | 0.22 | 0.22 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.08 | 0.71 | 0.76 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 167 | 167 | 0.01 | < 0.005 | — | 167 |
| Dust From Material Movement | — | — | — | — | — | 0.10 | 0.10 | — | 0.04 | 0.04 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.72 | 0.00 | 0.00 | 0.17 | 0.17 | 0.00 | 0.04 | 0.04 | — | 173 | 173 | 0.01 | 0.01 | 0.02 | 175 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.18 | 11.0 | 4.17 | 0.06 | 0.16 | 2.26 | 2.42 | 0.11 | 0.62 | 0.72 | — | 8,359 | 8,359 | 0.43 | 1.32 | 0.43 | 8,764 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.11 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.01 | 0.01 | — | 26.6 | 26.6 | < 0.005 | < 0.005 | 0.04 | 27.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.03 | 1.68 | 0.63 | 0.01 | 0.02 | 0.34 | 0.37 | 0.02 | 0.09 | 0.11 | — | 1,276 | 1,276 | 0.07 | 0.20 | 1.09 | 1,338 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 4.40 | 4.40 | < 0.005 | < 0.005 | 0.01 | 4.46 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | 0.31 | 0.12 | < 0.005 | < 0.005 | 0.06 | 0.07 | < 0.005 | 0.02 | 0.02 | — | 211 | 211 | 0.01 | 0.03 | 0.18 | 222 |

## 3.8. Grading (2027) - Mitigated

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

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

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 2.95 | 25.6 | 27.3 | 0.06 | 1.04 | — | 1.04 | 0.96 | — | 0.96 | — | 6,598 | 6,598 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | 3.60 | 3.60 | — | 1.43 | 1.43 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.45 | 3.90 | 4.16 | 0.01 | 0.16 | — | 0.16 | 0.15 | — | 0.15 | — | 1,007 | 1,007 | 0.04 | 0.01 | — | 1,011 |
| Dust From Material Movement | — | — | — | — | — | 0.55 | 0.55 | — | 0.22 | 0.22 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.08 | 0.71 | 0.76 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 167 | 167 | 0.01 | < 0.005 | — | 167 |
| Dust From Material Movement | — | — | — | — | — | 0.10 | 0.10 | — | 0.04 | 0.04 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.72 | 0.00 | 0.00 | 0.17 | 0.17 | 0.00 | 0.04 | 0.04 | — | 173 | 173 | 0.01 | 0.01 | 0.02 | 175 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.18 | 11.0 | 4.17 | 0.06 | 0.16 | 2.26 | 2.42 | 0.11 | 0.62 | 0.72 | — | 8,359 | 8,359 | 0.43 | 1.32 | 0.43 | 8,764 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.11 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.01 | 0.01 | — | 26.6 | 26.6 | < 0.005 | < 0.005 | 0.04 | 27.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.03 | 1.68 | 0.63 | 0.01 | 0.02 | 0.34 | 0.37 | 0.02 | 0.09 | 0.11 | — | 1,276 | 1,276 | 0.07 | 0.20 | 1.09 | 1,338 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 4.40 | 4.40 | < 0.005 | < 0.005 | 0.01 | 4.46 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | 0.31 | 0.12 | < 0.005 | < 0.005 | 0.06 | 0.07 | < 0.005 | 0.02 | 0.02 | — | 211 | 211 | 0.01 | 0.03 | 0.18 | 222 |

## 3.9. Building Construction (2027) - Unmitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 1.03 | 9.39 | 12.9 | 0.02 | 0.34 | — | 0.34 | 0.31 | — | 0.31 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 1.03 | 9.39 | 12.9 | 0.02 | 0.34 | — | 0.34 | 0.31 | — | 0.31 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.52 | 4.76 | 6.56 | 0.01 | 0.17 | — | 0.17 | 0.16 | — | 0.16 | — | 1,215 | 1,215 | 0.05 | 0.01 | — | 1,219 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.87 | 1.20 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 201 | 201 | 0.01 | < 0.005 | — | 202 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.89 | 0.62 | 10.4 | 0.00 | 0.00 | 2.14 | 2.14 | 0.00 | 0.50 | 0.50 | — | 2,311 | 2,311 | 0.11 | 0.08 | 7.49 | 2,346 |
| Vendor | 0.04 | 1.56 | 0.74 | 0.01 | 0.02 | 0.33 | 0.35 | 0.02 | 0.09 | 0.11 | — | 1,234 | 1,234 | 0.05 | 0.17 | 2.75 | 1,290 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.87 | 0.78 | 9.11 | 0.00 | 0.00 | 2.14 | 2.14 | 0.00 | 0.50 | 0.50 | — | 2,183 | 2,183 | 0.12 | 0.09 | 0.19 | 2,213 |
| Vendor | 0.04 | 1.61 | 0.75 | 0.01 | 0.02 | 0.33 | 0.35 | 0.02 | 0.09 | 0.11 | — | 1,235 | 1,235 | 0.05 | 0.17 | 0.07 | 1,288 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.44 | 0.39 | 4.67 | 0.00 | 0.00 | 1.07 | 1.07 | 0.00 | 0.25 | 0.25 | — | 1,116 | 1,116 | 0.06 | 0.04 | 1.64 | 1,132 |
| Vendor | 0.02 | 0.81 | 0.38 | < 0.005 | 0.01 | 0.16 | 0.17 | 0.01 | 0.05 | 0.05 | — | 626 | 626 | 0.02 | 0.09 | 0.60 | 653 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.85 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 185 | 185 | 0.01 | 0.01 | 0.27 | 187 |
| Vendor | < 0.005 | 0.15 | 0.07 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 104 | 104 | < 0.005 | 0.01 | 0.10 | 108 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.10. Building Construction (2027) - Mitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 1.03 | 9.39 | 12.9 | 0.02 | 0.34 | — | 0.34 | 0.31 | — | 0.31 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 1.03 | 9.39 | 12.9 | 0.02 | 0.34 | — | 0.34 | 0.31 | — | 0.31 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.52 | 4.76 | 6.56 | 0.01 | 0.17 | — | 0.17 | 0.16 | — | 0.16 | — | 1,215 | 1,215 | 0.05 | 0.01 | — | 1,219 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.87 | 1.20 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 201 | 201 | 0.01 | < 0.005 | — | 202 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.89 | 0.62 | 10.4 | 0.00 | 0.00 | 2.14 | 2.14 | 0.00 | 0.50 | 0.50 | — | 2,311 | 2,311 | 0.11 | 0.08 | 7.49 | 2,346 |
| Vendor | 0.04 | 1.56 | 0.74 | 0.01 | 0.02 | 0.33 | 0.35 | 0.02 | 0.09 | 0.11 | — | 1,234 | 1,234 | 0.05 | 0.17 | 2.75 | 1,290 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.87 | 0.78 | 9.11 | 0.00 | 0.00 | 2.14 | 2.14 | 0.00 | 0.50 | 0.50 | — | 2,183 | 2,183 | 0.12 | 0.09 | 0.19 | 2,213 |
| Vendor | 0.04 | 1.61 | 0.75 | 0.01 | 0.02 | 0.33 | 0.35 | 0.02 | 0.09 | 0.11 | — | 1,235 | 1,235 | 0.05 | 0.17 | 0.07 | 1,288 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.44 | 0.39 | 4.67 | 0.00 | 0.00 | 1.07 | 1.07 | 0.00 | 0.25 | 0.25 | — | 1,116 | 1,116 | 0.06 | 0.04 | 1.64 | 1,132 |
| Vendor | 0.02 | 0.81 | 0.38 | < 0.005 | 0.01 | 0.16 | 0.17 | 0.01 | 0.05 | 0.05 | — | 626 | 626 | 0.02 | 0.09 | 0.60 | 653 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.85 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 185 | 185 | 0.01 | 0.01 | 0.27 | 187 |
| Vendor | < 0.005 | 0.15 | 0.07 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 104 | 104 | < 0.005 | 0.01 | 0.10 | 108 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.11. Building Construction (2028) - Unmitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.99 | 8.92 | 12.9 | 0.02 | 0.30 | — | 0.30 | 0.28 | — | 0.28 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.99 | 8.92 | 12.9 | 0.02 | 0.30 | — | 0.30 | 0.28 | — | 0.28 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.53 | 4.77 | 6.91 | 0.01 | 0.16 | — | 0.16 | 0.15 | — | 0.15 | — | 1,281 | 1,281 | 0.05 | 0.01 | — | 1,285 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.87 | 1.26 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 212 | 212 | 0.01 | < 0.005 | — | 213 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.86 | 0.62 | 9.81 | 0.00 | 0.00 | 2.14 | 2.14 | 0.00 | 0.50 | 0.50 | — | 2,270 | 2,270 | 0.04 | 0.08 | 6.79 | 2,303 |
| Vendor | 0.04 | 1.48 | 0.70 | 0.01 | 0.02 | 0.33 | 0.35 | 0.02 | 0.09 | 0.11 | — | 1,203 | 1,203 | 0.05 | 0.17 | 2.46 | 1,259 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.85 | 0.71 | 8.58 | 0.00 | 0.00 | 2.14 | 2.14 | 0.00 | 0.50 | 0.50 | — | 2,144 | 2,144 | 0.04 | 0.08 | 0.18 | 2,170 |
| Vendor | 0.04 | 1.54 | 0.73 | 0.01 | 0.02 | 0.33 | 0.35 | 0.02 | 0.09 | 0.11 | — | 1,204 | 1,204 | 0.05 | 0.17 | 0.06 | 1,257 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.45 | 0.37 | 4.65 | 0.00 | 0.00 | 1.13 | 1.13 | 0.00 | 0.26 | 0.26 | — | 1,156 | 1,156 | 0.02 | 0.04 | 1.57 | 1,171 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vendor | 0.02 | 0.81 | 0.38 | < 0.005 | 0.01 | 0.17 | 0.18 | 0.01 | 0.05 | 0.06 | — | 643 | 643 | 0.02 | 0.09 | 0.57 | 672 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.85 | 0.00 | 0.00 | 0.21 | 0.21 | 0.00 | 0.05 | 0.05 | — | 191 | 191 | < 0.005 | 0.01 | 0.26 | 194 |
| Vendor | < 0.005 | 0.15 | 0.07 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 106 | 106 | < 0.005 | 0.02 | 0.09 | 111 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.12. Building Construction (2028) - Mitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.99 | 8.92 | 12.9 | 0.02 | 0.30 | — | 0.30 | 0.28 | — | 0.28 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.99 | 8.92 | 12.9 | 0.02 | 0.30 | — | 0.30 | 0.28 | — | 0.28 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.53 | 4.77 | 6.91 | 0.01 | 0.16 | — | 0.16 | 0.15 | — | 0.15 | — | 1,281 | 1,281 | 0.05 | 0.01 | — | 1,285 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.10 | 0.87 | 1.26 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 212 | 212 | 0.01 | < 0.005 | — | 213 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.86 | 0.62 | 9.81 | 0.00 | 0.00 | 2.14 | 2.14 | 0.00 | 0.50 | 0.50 | — | 2,270 | 2,270 | 0.04 | 0.08 | 6.79 | 2,303 |
| Vendor | 0.04 | 1.48 | 0.70 | 0.01 | 0.02 | 0.33 | 0.35 | 0.02 | 0.09 | 0.11 | — | 1,203 | 1,203 | 0.05 | 0.17 | 2.46 | 1,259 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.85 | 0.71 | 8.58 | 0.00 | 0.00 | 2.14 | 2.14 | 0.00 | 0.50 | 0.50 | — | 2,144 | 2,144 | 0.04 | 0.08 | 0.18 | 2,170 |
| Vendor | 0.04 | 1.54 | 0.73 | 0.01 | 0.02 | 0.33 | 0.35 | 0.02 | 0.09 | 0.11 | — | 1,204 | 1,204 | 0.05 | 0.17 | 0.06 | 1,257 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.45 | 0.37 | 4.65 | 0.00 | 0.00 | 1.13 | 1.13 | 0.00 | 0.26 | 0.26 | — | 1,156 | 1,156 | 0.02 | 0.04 | 1.57 | 1,171 |
| Vendor | 0.02 | 0.81 | 0.38 | < 0.005 | 0.01 | 0.17 | 0.18 | 0.01 | 0.05 | 0.06 | — | 643 | 643 | 0.02 | 0.09 | 0.57 | 672 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.85 | 0.00 | 0.00 | 0.21 | 0.21 | 0.00 | 0.05 | 0.05 | — | 191 | 191 | < 0.005 | 0.01 | 0.26 | 194 |
| Vendor | < 0.005 | 0.15 | 0.07 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 106 | 106 | < 0.005 | 0.02 | 0.09 | 111 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.13. Paving (2028) - Unmitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.69 | 6.63 | 9.91 | 0.01 | 0.26 | — | 0.26 | 0.24 | — | 0.24 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.39 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.69 | 6.63 | 9.91 | 0.01 | 0.26 | — | 0.26 | 0.24 | — | 0.24 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.39 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.04 | 0.36 | 0.54 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 82.8 | 82.8 | < 0.005 | < 0.005 | — | 83.1 |
| Paving | 0.02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.07 | 0.10 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 13.7 | 13.7 | < 0.005 | < 0.005 | — | 13.8 |
| Paving | < 0.005 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.04 | 0.58 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.03 | 0.03 | — | 135 | 135 | < 0.005 | < 0.005 | 0.40 | 137 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.04 | 0.51 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.03 | 0.03 | — | 127 | 127 | < 0.005 | < 0.005 | 0.01 | 129 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.03 | 7.03 | < 0.005 | < 0.005 | 0.01 | 7.12 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.16 | 1.16 | < 0.005 | < 0.005 | < 0.005 | 1.18 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.14. Paving (2028) - Mitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.69 | 6.63 | 9.91 | 0.01 | 0.26 | — | 0.26 | 0.24 | — | 0.24 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.39 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.69 | 6.63 | 9.91 | 0.01 | 0.26 | — | 0.26 | 0.24 | — | 0.24 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.39 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.04 | 0.36 | 0.54 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 82.8 | 82.8 | < 0.005 | < 0.005 | — | 83.1 |
| Paving | 0.02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.07 | 0.10 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 13.7 | 13.7 | < 0.005 | < 0.005 | — | 13.8 |
| Paving | < 0.005 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.04 | 0.58 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.03 | 0.03 | — | 135 | 135 | < 0.005 | < 0.005 | 0.40 | 137 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.04 | 0.51 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.03 | 0.03 | — | 127 | 127 | < 0.005 | < 0.005 | 0.01 | 129 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.03 | 7.03 | < 0.005 | < 0.005 | 0.01 | 7.12 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.16 | 1.16 | < 0.005 | < 0.005 | < 0.005 | 1.18 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.15. Architectural Coating (2028) - Unmitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.11 | 0.81 | 1.12 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | 26.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.10 | 0.14 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 17.0 | 17.0 | < 0.005 | < 0.005 | — | 17.0 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Architect Coatings | 3.35 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | 0.02 | 0.03 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 2.81 | 2.81 | < 0.005 | < 0.005 | — | 2.82 |
| Architectural Coatings | 0.61 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.14 | 1.72 | 0.00 | 0.00 | 0.43 | 0.43 | 0.00 | 0.10 | 0.10 | — | 429 | 429 | 0.01 | 0.02 | 0.04 | 434 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.22 | 0.00 | 0.00 | 0.05 | 0.05 | 0.00 | 0.01 | 0.01 | — | 55.0 | 55.0 | < 0.005 | < 0.005 | 0.07 | 55.8 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.11 | 9.11 | < 0.005 | < 0.005 | 0.01 | 9.23 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.16. Architectural Coating (2028) - Mitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.11 | 0.81 | 1.12 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | 26.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.10 | 0.14 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 17.0 | 17.0 | < 0.005 | < 0.005 | — | 17.0 |
| Architectural Coatings | 3.35 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | 0.02 | 0.03 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 2.81 | 2.81 | < 0.005 | < 0.005 | — | 2.82 |
| Architectural Coatings | 0.61 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.14 | 1.72 | 0.00 | 0.00 | 0.43 | 0.43 | 0.00 | 0.10 | 0.10 | — | 429 | 429 | 0.01 | 0.02 | 0.04 | 434 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.22 | 0.00 | 0.00 | 0.05 | 0.05 | 0.00 | 0.01 | 0.01 | — | 55.0 | 55.0 | < 0.005 | < 0.005 | 0.07 | 55.8 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.11 | 9.11 | < 0.005 | < 0.005 | 0.01 | 9.23 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.17. Architectural Coating (2029) - Unmitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.79 | 1.11 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Architect Coatings | 26.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.04 | 0.06 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 6.79 | 6.79 | < 0.005 | < 0.005 | — | 6.82 |
| Architectural Coatings | 1.34 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.12 | 1.12 | < 0.005 | < 0.005 | — | 1.13 |
| Architectural Coatings | 0.24 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.16 | 0.13 | 1.61 | 0.00 | 0.00 | 0.43 | 0.43 | 0.00 | 0.10 | 0.10 | — | 422 | 422 | 0.01 | 0.02 | 0.03 | 427 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.08 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 | 0.01 | — | 21.6 | 21.6 | < 0.005 | < 0.005 | 0.03 | 21.9 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 3.58 | 3.58 | < 0.005 | < 0.005 | < 0.005 | 3.63 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.18. Architectural Coating (2029) - Mitigated

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

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.79 | 1.11 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | 26.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.04 | 0.06 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 6.79 | 6.79 | < 0.005 | < 0.005 | — | 6.82 |
| Architectural Coatings | 1.34 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.12 | 1.12 | < 0.005 | < 0.005 | — | 1.13 |
| Architectural Coatings | 0.24 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.16 | 0.13 | 1.61 | 0.00 | 0.00 | 0.43 | 0.43 | 0.00 | 0.10 | 0.10 | — | 422 | 422 | 0.01 | 0.02 | 0.03 | 427 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.08 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 | 0.01 | — | 21.6 | 21.6 | < 0.005 | < 0.005 | 0.03 | 21.9 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 3.58 | 3.58 | < 0.005 | < 0.005 | < 0.005 | 3.63 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.1. Unmitigated

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

| Land Use | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 5.85 | 3.87 | 44.8 | 0.12 | 0.08 | 11.1 | 11.2 | 0.07 | 2.81 | 2.89 | — | 11,981 | 11,981 | 0.50 | 0.43 | 26.4 | 12,148 |
| Strip Mall | 0.59 | 0.38 | 4.35 | 0.01 | 0.01 | 1.07 | 1.07 | 0.01 | 0.27 | 0.28 | — | 1,152 | 1,152 | 0.05 | 0.04 | 2.53 | 1,169 |
| Enclosed Parking with Elevator | 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 |
| Total | 6.44 | 4.24 | 49.1 | 0.13 | 0.09 | 12.2 | 12.2 | 0.08 | 3.08 | 3.16 | — | 13,134 | 13,134 | 0.55 | 0.47 | 28.9 | 13,316 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 5.75 | 4.25 | 41.9 | 0.11 | 0.08 | 11.1 | 11.2 | 0.07 | 2.81 | 2.89 | — | 11,447 | 11,447 | 0.53 | 0.45 | 0.68 | 11,596 |
| Strip Mall | 0.58 | 0.41 | 4.09 | 0.01 | 0.01 | 1.07 | 1.07 | 0.01 | 0.27 | 0.28 | — | 1,101 | 1,101 | 0.05 | 0.04 | 0.07 | 1,116 |
| Enclosed Parking with Elevator | 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 |
| Total | 6.33 | 4.66 | 45.9 | 0.12 | 0.09 | 12.2 | 12.2 | 0.08 | 3.08 | 3.16 | — | 12,548 | 12,548 | 0.58 | 0.50 | 0.75 | 12,711 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 0.96 | 0.71 | 7.10 | 0.02 | 0.01 | 1.85 | 1.87 | 0.01 | 0.47 | 0.48 | — | 1,772 | 1,772 | 0.08 | 0.07 | 1.75 | 1,797 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | 0.09 | 0.07 | 0.67 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.04 | — | 164 | 164 | 0.01 | 0.01 | 0.16 | 166 |
| Enclosed Parking with Elevator | 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 |
| Total | 1.06 | 0.78 | 7.77 | 0.02 | 0.01 | 2.03 | 2.04 | 0.01 | 0.51 | 0.53 | — | 1,936 | 1,936 | 0.09 | 0.08 | 1.91 | 1,963 |

### 4.1.2. Mitigated

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

| Land Use | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 5.68 | 3.76 | 43.5 | 0.11 | 0.08 | 10.8 | 10.9 | 0.07 | 2.73 | 2.80 | — | 11,639 | 11,639 | 0.48 | 0.41 | 25.6 | 11,800 |
| Strip Mall | 0.59 | 0.38 | 4.35 | 0.01 | 0.01 | 1.07 | 1.07 | 0.01 | 0.27 | 0.28 | — | 1,152 | 1,152 | 0.05 | 0.04 | 2.53 | 1,169 |
| Enclosed Parking with Elevator | 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 |
| Total | 6.27 | 4.13 | 47.9 | 0.13 | 0.08 | 11.8 | 11.9 | 0.08 | 3.00 | 3.08 | — | 12,791 | 12,791 | 0.53 | 0.46 | 28.1 | 12,969 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 5.58 | 4.13 | 40.7 | 0.11 | 0.08 | 10.8 | 10.9 | 0.07 | 2.73 | 2.80 | — | 11,120 | 11,120 | 0.51 | 0.44 | 0.66 | 11,264 |
| Strip Mall | 0.58 | 0.41 | 4.09 | 0.01 | 0.01 | 1.07 | 1.07 | 0.01 | 0.27 | 0.28 | — | 1,101 | 1,101 | 0.05 | 0.04 | 0.07 | 1,116 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enclosed Parking with Elevator | 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 |
| Total | 6.16 | 4.54 | 44.7 | 0.12 | 0.08 | 11.8 | 11.9 | 0.08 | 3.00 | 3.08 | — | 12,221 | 12,221 | 0.56 | 0.48 | 0.73 | 12,380 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 0.93 | 0.69 | 6.90 | 0.02 | 0.01 | 1.80 | 1.81 | 0.01 | 0.46 | 0.47 | — | 1,722 | 1,722 | 0.08 | 0.07 | 1.70 | 1,745 |
| Strip Mall | 0.09 | 0.07 | 0.67 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.04 | — | 164 | 164 | 0.01 | 0.01 | 0.16 | 166 |
| Enclosed Parking with Elevator | 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 |
| Total | 1.03 | 0.76 | 7.56 | 0.02 | 0.01 | 1.97 | 1.99 | 0.01 | 0.50 | 0.51 | — | 1,885 | 1,885 | 0.08 | 0.07 | 1.86 | 1,911 |

## 4.2. Energy

### 4.2.1. Electricity Emissions By Land Use - Unmitigated

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

| Land Use | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | 1,494 | 1,494 | 0.08 | 0.01 | — | 1,499 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 57.0 | 57.0 | < 0.005 | < 0.005 | — | 57.2 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | — | 782 | 782 | 0.04 | 0.01 | — | 784 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,332 | 2,332 | 0.13 | 0.02 | — | 2,340 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | 1,494 | 1,494 | 0.08 | 0.01 | — | 1,499 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 57.0 | 57.0 | < 0.005 | < 0.005 | — | 57.2 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | — | 782 | 782 | 0.04 | 0.01 | — | 784 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,332 | 2,332 | 0.13 | 0.02 | — | 2,340 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | 247 | 247 | 0.01 | < 0.005 | — | 248 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 9.43 | 9.43 | < 0.005 | < 0.005 | — | 9.47 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | — | 129 | 129 | 0.01 | < 0.005 | — | 130 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 386 | 386 | 0.02 | < 0.005 | — | 387 |

### 4.2.2. Electricity Emissions By Land Use - Mitigated

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

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

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | 999 | 999 | 0.06 | 0.01 | — | 1,002 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 57.0 | 57.0 | < 0.005 | < 0.005 | — | 57.2 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | — | 782 | 782 | 0.04 | 0.01 | — | 784 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 1,837 | 1,837 | 0.10 | 0.01 | — | 1,844 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | 999 | 999 | 0.06 | 0.01 | — | 1,002 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 57.0 | 57.0 | < 0.005 | < 0.005 | — | 57.2 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | — | 782 | 782 | 0.04 | 0.01 | — | 784 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 1,837 | 1,837 | 0.10 | 0.01 | — | 1,844 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | 165 | 165 | 0.01 | < 0.005 | — | 166 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 9.43 | 9.43 | < 0.005 | < 0.005 | — | 9.47 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | — | 129 | 129 | 0.01 | < 0.005 | — | 130 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 304 | 304 | 0.02 | < 0.005 | — | 305 |

## 4.2.3. Natural Gas Emissions By Land Use - Unmitigated

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

| Land Use | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 619 | 619 | 0.05 | < 0.005 | — | 621 |
| Strip Mall | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 5.56 | 5.56 | < 0.005 | < 0.005 | — | 5.57 |
| Enclosed Parking with Elevator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 625 | 625 | 0.06 | < 0.005 | — | 627 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 619 | 619 | 0.05 | < 0.005 | — | 621 |
| Strip Mall | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 5.56 | 5.56 | < 0.005 | < 0.005 | — | 5.57 |
| Enclosed Parking with Elevator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 625 | 625 | 0.06 | < 0.005 | — | 627 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 0.01 | 0.09 | 0.04 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 103 | 103 | 0.01 | < 0.005 | — | 103 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 0.92 | 0.92 | < 0.005 | < 0.005 | — | 0.92 |
| Enclosed Parking with Elevator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.01 | 0.09 | 0.04 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 103 | 103 | 0.01 | < 0.005 | — | 104 |

### 4.2.4. Natural Gas Emissions By Land Use - Mitigated

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

| Land Use | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 619 | 619 | 0.05 | < 0.005 | — | 621 |
| Strip Mall | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 5.56 | 5.56 | < 0.005 | < 0.005 | — | 5.57 |
| Enclosed Parking with Elevator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 625 | 625 | 0.06 | < 0.005 | — | 627 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 619 | 619 | 0.05 | < 0.005 | — | 621 |
| Strip Mall | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 5.56 | 5.56 | < 0.005 | < 0.005 | — | 5.57 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enclosed Parking with Elevator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.03 | 0.49 | 0.21 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 625 | 625 | 0.06 | < 0.005 | — | 627 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | 0.01 | 0.09 | 0.04 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 103 | 103 | 0.01 | < 0.005 | — | 103 |
| Strip Mall | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 0.92 | 0.92 | < 0.005 | < 0.005 | — | 0.92 |
| Enclosed Parking with Elevator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.01 | 0.09 | 0.04 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 103 | 103 | 0.01 | < 0.005 | — | 104 |

## 4.3. Area Emissions by Source

### 4.3.1. Unmitigated

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

| Source | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | 5.70 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 0.47 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 2.31 | 0.19 | 21.4 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 65.6 | 65.6 | < 0.005 | < 0.005 | — | 65.8 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 8.48 | 0.19 | 21.4 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 65.6 | 65.6 | < 0.005 | < 0.005 | — | 65.8 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | 5.70 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 0.47 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 6.17 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | 1.04 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 0.09 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 0.21 | 0.02 | 1.93 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 5.36 | 5.36 | < 0.005 | < 0.005 | — | 5.37 |
| Total | 1.33 | 0.02 | 1.93 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 5.36 | 5.36 | < 0.005 | < 0.005 | — | 5.37 |

### 4.3.2. Mitigated

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

| Source | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | 5.70 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Architectural Coatings | 0.47 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 2.31 | 0.19 | 21.4 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 65.6 | 65.6 | < 0.005 | < 0.005 | — | 65.8 |
| Total | 8.48 | 0.19 | 21.4 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 65.6 | 65.6 | < 0.005 | < 0.005 | — | 65.8 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | 5.70 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 0.47 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 6.17 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | 1.04 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 0.09 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 0.21 | 0.02 | 1.93 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 5.36 | 5.36 | < 0.005 | < 0.005 | — | 5.37 |
| Total | 1.33 | 0.02 | 1.93 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 5.36 | 5.36 | < 0.005 | < 0.005 | — | 5.37 |

## 4.4. Water Emissions by Land Use

### 4.4.1. Unmitigated

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

| Land Use | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 18.4 | 106 | 124 | 1.89 | 0.05 | — | 185 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 0.57 | 3.29 | 3.85 | 0.06 | < 0.005 | — | 5.74 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | 0.01 |
| Total | — | — | — | — | — | — | — | — | — | — | 18.9 | 109 | 128 | 1.95 | 0.05 | — | 190 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 18.4 | 106 | 124 | 1.89 | 0.05 | — | 185 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 0.57 | 3.29 | 3.85 | 0.06 | < 0.005 | — | 5.74 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | 0.01 |
| Total | — | — | — | — | — | — | — | — | — | — | 18.9 | 109 | 128 | 1.95 | 0.05 | — | 190 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 3.04 | 17.5 | 20.5 | 0.31 | 0.01 | — | 30.6 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 0.09 | 0.54 | 0.64 | 0.01 | < 0.005 | — | 0.95 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | < 0.005 |
| Total | — | — | — | — | — | — | — | — | — | — | 3.14 | 18.0 | 21.2 | 0.32 | 0.01 | — | 31.5 |

### 4.4.2. Mitigated

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

| Land Use | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 14.7 | 84.4 | 99.1 | 1.51 | 0.04 | — | 148 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 0.45 | 2.63 | 3.08 | 0.05 | < 0.005 | — | 4.59 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | 0.01 |
| Total | — | — | — | — | — | — | — | — | — | — | 15.2 | 87.0 | 102 | 1.56 | 0.04 | — | 152 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 14.7 | 84.4 | 99.1 | 1.51 | 0.04 | — | 148 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 0.45 | 2.63 | 3.08 | 0.05 | < 0.005 | — | 4.59 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | 0.01 |
| Total | — | — | — | — | — | — | — | — | — | — | 15.2 | 87.0 | 102 | 1.56 | 0.04 | — | 152 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 2.43 | 14.0 | 16.4 | 0.25 | 0.01 | — | 24.5 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 0.08 | 0.44 | 0.51 | 0.01 | < 0.005 | — | 0.76 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | < 0.005 |
| Total | — | — | — | — | — | — | — | — | — | — | 2.51 | 14.4 | 16.9 | 0.26 | 0.01 | — | 25.2 |

## 4.5. Waste Emissions by Land Use

### 4.5.1. Unmitigated

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

| Land Use | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 109 | 0.00 | 109 | 10.9 | 0.00 | — | 381 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 2.27 | 0.00 | 2.27 | 0.23 | 0.00 | — | 7.93 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | 111 | 0.00 | 111 | 11.1 | 0.00 | — | 389 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments | — | — | — | — | — | — | — | — | — | — | 109 | 0.00 | 109 | 10.9 | 0.00 | — | 381 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 2.27 | 0.00 | 2.27 | 0.23 | 0.00 | — | 7.93 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | 111 | 0.00 | 111 | 11.1 | 0.00 | — | 389 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 18.0 | 0.00 | 18.0 | 1.80 | 0.00 | — | 63.0 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 0.38 | 0.00 | 0.38 | 0.04 | 0.00 | — | 1.31 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | 18.4 | 0.00 | 18.4 | 1.84 | 0.00 | — | 64.4 |

### 4.5.2. Mitigated

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

| Land Use | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 27.2 | 0.00 | 27.2 | 2.72 | 0.00 | — | 95.2 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 0.57 | 0.00 | 0.57 | 0.06 | 0.00 | — | 1.98 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | 27.8 | 0.00 | 27.8 | 2.78 | 0.00 | — | 97.2 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 27.2 | 0.00 | 27.2 | 2.72 | 0.00 | — | 95.2 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 0.57 | 0.00 | 0.57 | 0.06 | 0.00 | — | 1.98 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | 27.8 | 0.00 | 27.8 | 2.78 | 0.00 | — | 97.2 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | 4.51 | 0.00 | 4.51 | 0.45 | 0.00 | — | 15.8 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | 0.09 | 0.00 | 0.09 | 0.01 | 0.00 | — | 0.33 |
| Enclosed Parking with Elevator | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | 4.60 | 0.00 | 4.60 | 0.46 | 0.00 | — | 16.1 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.1. Unmitigated

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

| Land Use | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.88 | 1.88 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.02 | 0.02 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.90 | 1.90 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.88 | 1.88 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.02 | 0.02 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.90 | 1.90 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.31 | 0.31 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | < 0.005 | < 0.005 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.31 | 0.31 |

### 4.6.2. Mitigated

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

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

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.88 | 1.88 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.02 | 0.02 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.90 | 1.90 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.88 | 1.88 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.02 | 0.02 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.90 | 1.90 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apartments Mid Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.31 | 0.31 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | < 0.005 | < 0.005 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.31 | 0.31 |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.1. Unmitigated

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

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

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

### 4.7.2. Mitigated

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

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

## 4.8. Stationary Emissions By Equipment Type

### 4.8.1. Unmitigated

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

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

### 4.8.2. Mitigated

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

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

## 4.9. User Defined Emissions By Equipment Type

### 4.9.1. Unmitigated

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

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

### 4.9.2. Mitigated

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

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

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

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

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

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

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

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

### 4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

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

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

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remove | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

### 4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

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

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

### 4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

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

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

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

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

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

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.1. Construction Schedule

| Phase Name | Phase Type | Start Date | End Date | Days Per Week | Work Days per Phase | Phase Description |
|---|---|---|---|---|---|---|
| Demolition | Demolition | 11/30/2026 | 12/11/2026 | 5.00 | 10.0 | — |
| Site Preparation | Site Preparation | 12/14/2026 | 12/25/2026 | 5.00 | 10.0 | — |
| Grading | Grading | 12/28/2026 | 3/19/2027 | 5.00 | 60.0 | — |
| Building Construction | Building Construction | 4/17/2027 | 9/29/2028 | 5.00 | 380 | — |
| Paving | Paving | 9/30/2028 | 10/27/2028 | 5.00 | 20.0 | — |
| Architectural Coating | Architectural Coating | 10/28/2028 | 1/26/2029 | 5.00 | 65.0 | — |

## 5.2. Off-Road Equipment

### 5.2.1. Unmitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Demolition | Concrete/Industrial Saws | Diesel | Average | 1.00 | 8.00 | 33.0 | 0.73 |
| Demolition | Excavators | Diesel | Average | 3.00 | 8.00 | 36.0 | 0.38 |
| Demolition | Rubber Tired Dozers | Diesel | Average | 2.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Rubber Tired Dozers | Diesel | Average | 3.00 | 8.00 | 367 | 0.40 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Site Preparation | Tractors/Loaders/Back | Diesel | Average | 4.00 | 8.00 | 84.0 | 0.37 |
| Grading | Excavators | Diesel | Average | 2.00 | 8.00 | 36.0 | 0.38 |
| Grading | Graders | Diesel | Average | 1.00 | 8.00 | 148 | 0.41 |
| Grading | Rubber Tired Dozers | Diesel | Average | 1.00 | 8.00 | 367 | 0.40 |
| Grading | Scrapers | Diesel | Average | 2.00 | 8.00 | 423 | 0.48 |
| Grading | Tractors/Loaders/Back hoes | Diesel | Average | 2.00 | 8.00 | 84.0 | 0.37 |
| Building Construction | Cranes | Diesel | Average | 1.00 | 7.00 | 367 | 0.29 |
| Building Construction | Forklifts | Diesel | Average | 3.00 | 8.00 | 82.0 | 0.20 |
| Building Construction | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Building Construction | Tractors/Loaders/Back hoes | Diesel | Average | 3.00 | 7.00 | 84.0 | 0.37 |
| Building Construction | Welders | Diesel | Average | 1.00 | 8.00 | 46.0 | 0.45 |
| Paving | Pavers | Diesel | Average | 2.00 | 8.00 | 81.0 | 0.42 |
| Paving | Paving Equipment | Diesel | Average | 2.00 | 8.00 | 89.0 | 0.36 |
| Paving | Rollers | Diesel | Average | 2.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Average | 1.00 | 6.00 | 37.0 | 0.48 |

### 5.2.2. Mitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Demolition | Concrete/Industrial Saws | Diesel | Average | 1.00 | 8.00 | 33.0 | 0.73 |
| Demolition | Excavators | Diesel | Average | 3.00 | 8.00 | 36.0 | 0.38 |
| Demolition | Rubber Tired Dozers | Diesel | Average | 2.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Rubber Tired Dozers | Diesel | Average | 3.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Tractors/Loaders/Back hoes | Diesel | Average | 4.00 | 8.00 | 84.0 | 0.37 |
| Grading | Excavators | Diesel | Average | 2.00 | 8.00 | 36.0 | 0.38 |
| Grading | Graders | Diesel | Average | 1.00 | 8.00 | 148 | 0.41 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Grading | Rubber Tired Dozers | Diesel | Average | 1.00 | 8.00 | 367 | 0.40 |
| Grading | Scrapers | Diesel | Average | 2.00 | 8.00 | 423 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | Diesel | Average | 2.00 | 8.00 | 84.0 | 0.37 |
| Building Construction | Cranes | Diesel | Average | 1.00 | 7.00 | 367 | 0.29 |
| Building Construction | Forklifts | Diesel | Average | 3.00 | 8.00 | 82.0 | 0.20 |
| Building Construction | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | Diesel | Average | 3.00 | 7.00 | 84.0 | 0.37 |
| Building Construction | Welders | Diesel | Average | 1.00 | 8.00 | 46.0 | 0.45 |
| Paving | Pavers | Diesel | Average | 2.00 | 8.00 | 81.0 | 0.42 |
| Paving | Paving Equipment | Diesel | Average | 2.00 | 8.00 | 89.0 | 0.36 |
| Paving | Rollers | Diesel | Average | 2.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Average | 1.00 | 6.00 | 37.0 | 0.48 |

## 5.3. Construction Vehicles

### 5.3.1. Unmitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Demolition | — | — | — | — |
| Demolition | Worker | 15.0 | 12.0 | LDA,LDT1,LDT2 |
| Demolition | Vendor | — | 7.63 | HHDT,MHDT |
| Demolition | Hauling | 2.90 | 20.0 | HHDT |
| Demolition | Onsite truck | — | — | HHDT |
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 17.5 | 12.0 | LDA,LDT1,LDT2 |
| Site Preparation | Vendor | — | 7.63 | HHDT,MHDT |
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |
| Site Preparation | Onsite truck | — | — | HHDT |

| | | | | |
|---|---|---|---|---|
| Grading | — | — | — | — |
| Grading | Worker | 20.0 | 12.0 | LDA,LDT1,LDT2 |
| Grading | Vendor | — | 7.63 | HHDT,MHDT |
| Grading | Hauling | 122 | 20.0 | HHDT |
| Grading | Onsite truck | — | — | HHDT |
| Building Construction | — | — | — | — |
| Building Construction | Worker | 253 | 12.0 | LDA,LDT1,LDT2 |
| Building Construction | Vendor | 51.3 | 7.63 | HHDT,MHDT |
| Building Construction | Hauling | 0.00 | 20.0 | HHDT |
| Building Construction | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 15.0 | 12.0 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 7.63 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 50.6 | 12.0 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 7.63 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |
| Architectural Coating | Onsite truck | — | — | HHDT |

### 5.3.2. Mitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Demolition | — | — | — | — |
| Demolition | Worker | 15.0 | 12.0 | LDA,LDT1,LDT2 |
| Demolition | Vendor | — | 7.63 | HHDT,MHDT |
| Demolition | Hauling | 2.90 | 20.0 | HHDT |
| Demolition | Onsite truck | — | — | HHDT |

| | | | | |
|---|---|---|---|---|
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 17.5 | 12.0 | LDA,LDT1,LDT2 |
| Site Preparation | Vendor | — | 7.63 | HHDT,MHDT |
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |
| Site Preparation | Onsite truck | — | — | HHDT |
| Grading | — | — | — | — |
| Grading | Worker | 20.0 | 12.0 | LDA,LDT1,LDT2 |
| Grading | Vendor | — | 7.63 | HHDT,MHDT |
| Grading | Hauling | 122 | 20.0 | HHDT |
| Grading | Onsite truck | — | — | HHDT |
| Building Construction | — | — | — | — |
| Building Construction | Worker | 253 | 12.0 | LDA,LDT1,LDT2 |
| Building Construction | Vendor | 51.3 | 7.63 | HHDT,MHDT |
| Building Construction | Hauling | 0.00 | 20.0 | HHDT |
| Building Construction | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 15.0 | 12.0 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 7.63 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 50.6 | 12.0 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 7.63 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |
| Architectural Coating | Onsite truck | — | — | HHDT |

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

## 5.5. Architectural Coatings

| Phase Name | Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|---|
| Architectural Coating | 530,712 | 176,904 | 11,796 | 2,646 | 7,715 |

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

| Phase Name | Material Imported (Cubic Yards) | Material Exported (Cubic Yards) | Acres Graded (acres) | Material Demolished (Building Square Footage) | Acres Paved (acres) |
|---|---|---|---|---|---|
| Demolition | 0.00 | 0.00 | 0.00 | 2,500 | — |
| Site Preparation | — | — | 15.0 | 0.00 | — |
| Grading | — | 58,400 | 90.0 | 0.00 | — |
| Paving | 0.00 | 0.00 | 0.00 | 0.00 | 2.95 |

### 5.6.2. Construction Earthmoving Control Strategies

| Control Strategies Applied | Frequency (per day) | PM10 Reduction | PM2.5 Reduction |
|---|---|---|---|
| Water Exposed Area | 2 | 61% | 61% |
| Water Demolished Area | 2 | 36% | 36% |

## 5.7. Construction Paving

| Land Use | Area Paved (acres) | % Asphalt |
|---|---|---|
| Apartments Mid Rise | — | 0% |
| Strip Mall | 0.00 | 0% |
| Enclosed Parking with Elevator | 2.95 | 100% |

## 5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

| Year | kWh per Year | CO2 | CH4 | N2O |
|---|---|---|---|---|
| 2026 | 0.00 | 589 | 0.03 | < 0.005 |
| 2027 | 0.00 | 589 | 0.03 | < 0.005 |
| 2028 | 0.00 | 589 | 0.03 | < 0.005 |
| 2029 | 0.00 | 589 | 0.03 | < 0.005 |

## 5.9. Operational Mobile Sources

### 5.9.1. Unmitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | 1,638 | 1,340 | 1,117 | 555,165 | 15,712 | 12,858 | 10,710 | 5,325,216 |
| Strip Mall | 160 | 168 | 81.8 | 54,826 | 1,436 | 1,509 | 733 | 491,201 |
| Enclosed Parking with Elevator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

### 5.9.2. Mitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | 1,591 | 1,302 | 1,085 | 539,287 | 15,263 | 12,490 | 10,404 | 5,172,915 |
| Strip Mall | 160 | 168 | 81.8 | 54,826 | 1,436 | 1,509 | 733 | 491,201 |
| Enclosed Parking with Elevator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.1. Unmitigated

#### 5.10.1.2. Mitigated

### 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|
| 530712 | 176,904 | 11,796 | 2,646 | 7,715 |

### 5.10.3. Landscape Equipment

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 180 |

### 5.10.4. Landscape Equipment - Mitigated

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 180 |

## 5.11. Operational Energy Consumption

### 5.11.1. Unmitigated

#### Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Apartments Mid Rise | 925,707 | 589 | 0.0330 | 0.0040 | 1,932,413 |
| Strip Mall | 35,311 | 589 | 0.0330 | 0.0040 | 17,336 |
| Enclosed Parking with Elevator | 484,316 | 589 | 0.0330 | 0.0040 | 0.00 |

### 5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Apartments Mid Rise | 619,007 | 589 | 0.0330 | 0.0040 | 1,932,413 |
| Strip Mall | 35,311 | 589 | 0.0330 | 0.0040 | 17,336 |
| Enclosed Parking with Elevator | 484,316 | 589 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.1. Unmitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|
| Apartments Mid Rise | 9,591,329 | 18,265 |
| Strip Mall | 296,735 | 2,989 |
| Enclosed Parking with Elevator | 0.00 | 1,494 |

### 5.12.2. Mitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|
| Apartments Mid Rise | 7,673,064 | 14,612 |
| Strip Mall | 237,388 | 2,391 |
| Enclosed Parking with Elevator | 0.00 | 1,196 |

## 5.13. Operational Waste Generation

### 5.13.1. Unmitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Apartments Mid Rise | 202 | — |
| Strip Mall | 4.21 | — |

| | | |
|---|---|---|
| Enclosed Parking with Elevator | 0.00 | — |

### 5.13.2. Mitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Apartments Mid Rise | 50.5 | — |
| Strip Mall | 1.05 | — |
| Enclosed Parking with Elevator | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

### 5.14.1. Unmitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Apartments Mid Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Strip Mall | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Strip Mall | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |
| Strip Mall | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |

### 5.14.2. Mitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Strip Mall | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Strip Mall | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |
| Strip Mall | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |

## 5.15. Operational Off-Road Equipment

### 5.15.1. Unmitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.15.2. Mitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|

# 5.18. Vegetation

## 5.18.1. Land Use Change

### 5.18.1.1. Unmitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1.2. Mitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

## 5.18.1. Biomass Cover Type

### 5.18.1.1. Unmitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.1.2. Mitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

## 5.18.2. Sequestration

### 5.18.2.1. Unmitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

### 5.18.2.2. Mitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 7.71 | annual days of extreme heat |
| Extreme Precipitation | 2.95 | annual days with precipitation above 20 mm |
| Sea Level Rise | — | meters of inundation depth |
| Wildfire | 21.9 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | N/A | N/A | N/A | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | N/A | N/A | N/A | N/A |
| Wildfire | N/A | N/A | N/A | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | N/A | N/A | N/A | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | N/A | N/A | N/A | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | N/A | N/A | N/A | N/A |
| Wildfire | N/A | N/A | N/A | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | N/A | N/A | N/A | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

## 6.4. Climate Risk Reduction Measures

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 29.9 |

| | |
|---|---|
| AQ-PM | 49.8 |
| AQ-DPM | 90.7 |
| Drinking Water | 54.3 |
| Lead Risk Housing | 49.8 |
| Pesticides | 0.00 |
| Toxic Releases | 15.6 |
| Traffic | 72.5 |
| Effect Indicators | — |
| CleanUp Sites | 42.6 |
| Groundwater | 70.3 |
| Haz Waste Facilities/Generators | 7.35 |
| Impaired Water Bodies | 83.0 |
| Solid Waste | 35.7 |
| Sensitive Population | — |
| Asthma | 31.1 |
| Cardio-vascular | 49.3 |
| Low Birth Weights | 15.0 |
| Socioeconomic Factor Indicators | — |
| Education | 52.3 |
| Housing | 50.3 |
| Linguistic | 44.4 |
| Poverty | 68.6 |
| Unemployment | 70.9 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |

| | |
|---|---|
| Above Poverty | 38.58591043 |
| Employed | 52.13653279 |
| Median HI | 29.38534582 |
| Education | — |
| Bachelor's or higher | 59.05299628 |
| High school enrollment | 0.115488259 |
| Preschool enrollment | 95.7141024 |
| Transportation | — |
| Auto Access | 17.29757475 |
| Active commuting | 80.14885153 |
| Social | — |
| 2-parent households | 0.731425638 |
| Voting | 47.61965867 |
| Neighborhood | — |
| Alcohol availability | 4.516874118 |
| Park access | 81.35506224 |
| Retail density | 80.05902733 |
| Supermarket access | 87.25779546 |
| Tree canopy | 10.61208777 |
| Housing | — |
| Homeownership | 10.18863082 |
| Housing habitability | 56.62774285 |
| Low-inc homeowner severe housing cost burden | 79.66123444 |
| Low-inc renter severe housing cost burden | 80.16168356 |
| Uncrowded housing | 60.05389452 |
| Health Outcomes | — |
| Insured adults | 54.27948159 |
| Arthritis | 20.2 |

| | |
|---|---|
| Asthma ER Admissions | 38.3 |
| High Blood Pressure | 40.5 |
| Cancer (excluding skin) | 36.4 |
| Asthma | 23.6 |
| Coronary Heart Disease | 19.3 |
| Chronic Obstructive Pulmonary Disease | 12.3 |
| Diagnosed Diabetes | 34.4 |
| Life Expectancy at Birth | 26.1 |
| Cognitively Disabled | 21.0 |
| Physically  Disabled | 21.0 |
| Heart Attack ER Admissions | 36.2 |
| Mental Health Not Good | 28.5 |
| Chronic Kidney Disease | 27.1 |
| Obesity | 39.2 |
| Pedestrian Injuries | 98.6 |
| Physical Health Not Good | 32.6 |
| Stroke | 22.5 |
| Health Risk Behaviors | — |
| Binge Drinking | 32.5 |
| Current Smoker | 28.0 |
| No Leisure Time for Physical Activity | 38.1 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 79.9 |
| Children | 56.6 |
| Elderly | 27.8 |
| English Speaking | 67.4 |
| Foreign-born | 16.0 |

| | |
|---|---|
| Outdoor Workers | 33.3 |
| Climate Change Adaptive Capacity | — |
| Impervious Surface Cover | 9.9 |
| Traffic Density | 92.4 |
| Traffic Access | 71.0 |
| Other Indices | — |
| Hardship | 44.7 |
| Other Decision Support | — |
| 2016 Voting | 55.5 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 51.0 |
| Healthy Places Index Score for Project Location (b) | 14.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | Yes |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
| --- | --- |
| Construction: Construction Phases | The architectural coating phase was overlapped with building construction to approximate actual construction scheduling. |
| Operations: Vehicle Data | Weekday trip generation rates adjusted to match trip generation memo (CR Associates, July 2024) |
| Operations: Hearths | Assumes no fireplaces/wood stoves would be constructed/installed |
| Construction: Dust From Material Movement | Grading plan shows 58,400 cy of export. |

| | |
|---|---|
| TO: | Conner Kloeppel, CFA; JPI |
| FROM: | Jonathan Sanchez, PE, TE, PTOE; CR Associates<br>Cristian Belmudez; CR Associates |
| DATE: | June 5, 2025 |
| RE: | 901 Mission Avenue – Vehicle Miles Traveled Analysis |

The purpose of this memorandum is to document the results of the Vehicle Miles Traveled (VMT) Analysis conducted for the 901 Mission Avenue (the "Project"). The analysis is based on the City of Oceanside's (the "City") Transportation Impact Analysis Guidelines (TIA Guidelines).

## Project Description

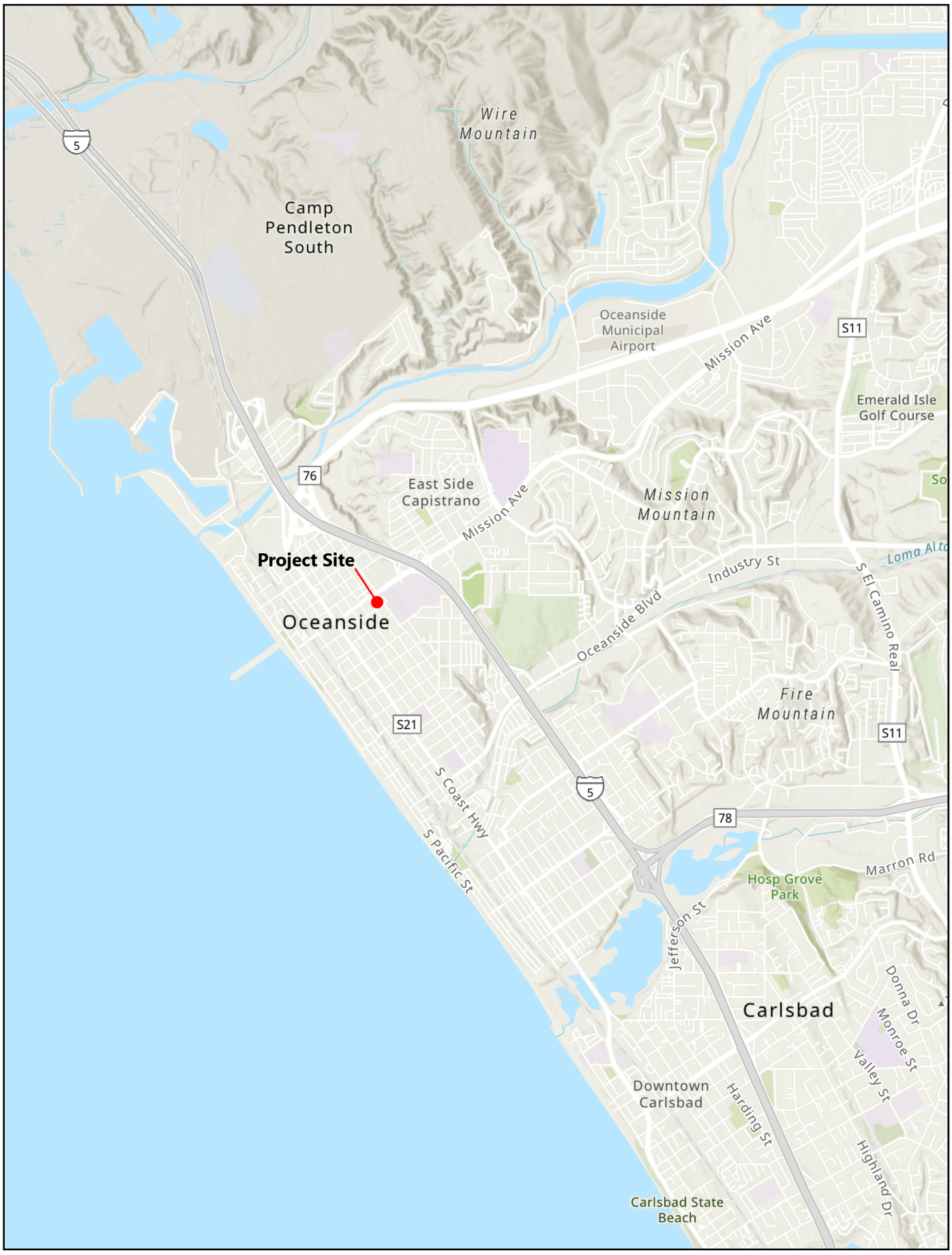
The Project seeks to construct 273 multi-family dwelling units, including 28 affordable units, and 4,006 square feet (SF) of retail at 901 Mission Avenue within the City of Oceanside. The project site is bounded by Mission Avenue to the north, Seagaze Drive to the south, Clementine Street to the west, and N Horne Street to the east. The Project will provide access via two new driveways, including one along Clementine Street and one along N Horne Street. Both project driveways will function as side-street stop-controlled intersections with the driveways as stop-controlled and Clementine Street and N Horne Street as uncontrolled. The anticipated opening year of the Project is 2030. **Figure 1** displays the Project's regional location. **Figure 2** displays the project site plan.

## VMT Analysis Screening

VMT analysis screening criteria were obtained from Table 2 of the City's TIA Guidelines. The following are the screening criteria relevant to the Project's proposed land uses:

- Based on SANDAG VMT screening maps, the Project is located in an area where the average VMT per Capita is 14.2 miles or 74.8% of the regional average. Since the Project would generate less than 85% of the regional average VMT per Capita, the Project's residential component would be deemed to have a less-than-significant VMT impact and no additional VMT analysis would be required. **Figure 3** displays the Project's VMT per Capita.
- Per the TIA Guidelines, projects that are consistent with the General Plan and located within a Smart Growth Opportunity Area as identified in the SANDAG San Diego Forward Regional Plan are presumed to be VMT-reducing projects. The Project is located within existing smart growth opportunity area OC-1, which is identified as a Town Center and serviced by Rapid Transit, Coaster/AMTRAK/Metrolink, Sprinter Express, and Local Bus. Therefore, the Project is presumed to be VMT-reducing and no additional VMT analysis would be required. **Figure 4** displays the Project's location within smart growth opportunity area OC-1.
- Per the TIA Guidelines, retail projects less than 50,000 are considered local serving and presumed to decrease VMT. The Project's retail component is 4,006 square feet. Therefore, the Project's retail component is presumed to have a less-than-significant VMT impact and no additional VMT analysis would be required.

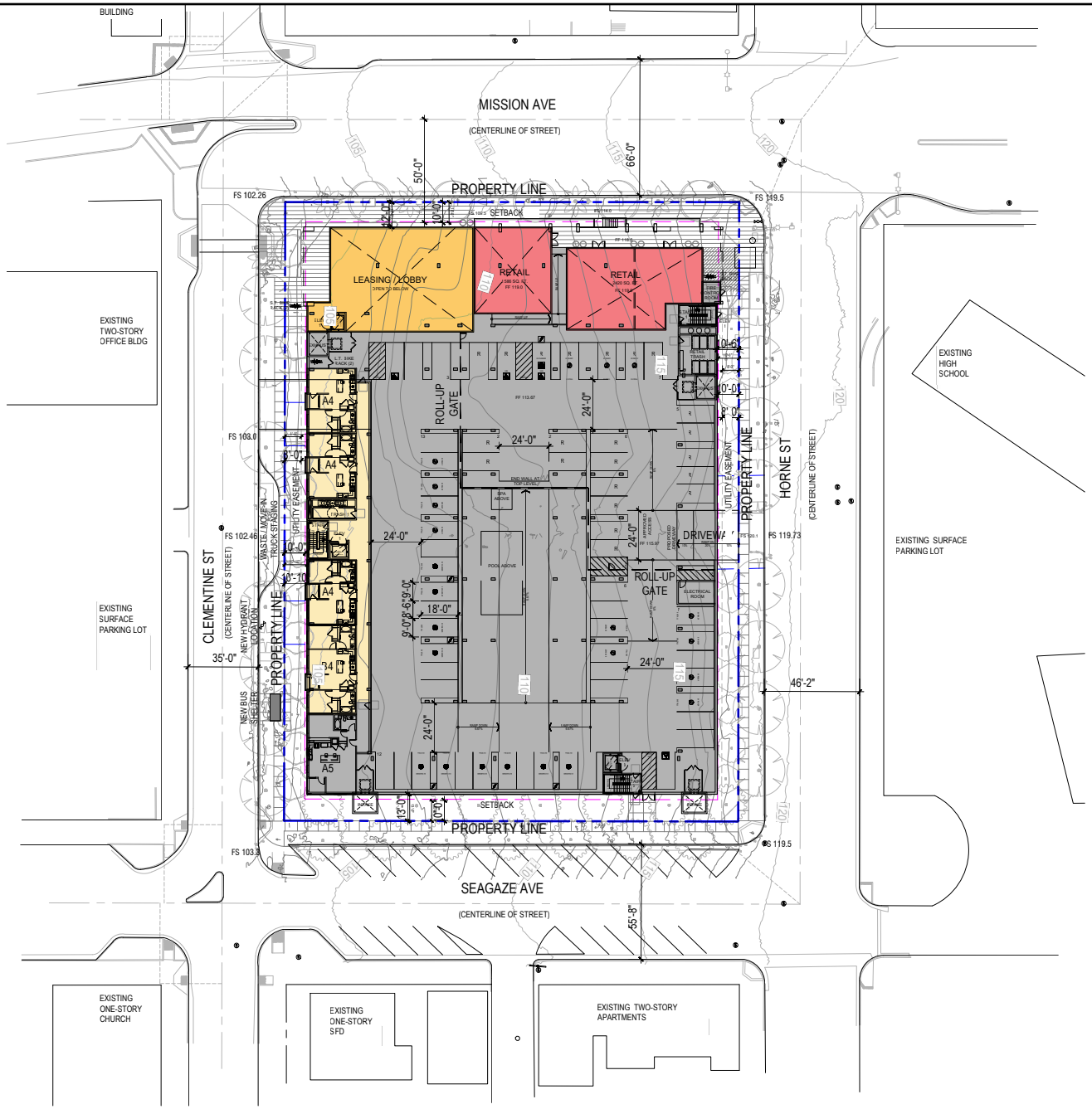
Based on the discussion above, the Project's residential and retail components are both presumed to have a less-than-significant VMT impact and no additional VMT analysis would be required.




**901 Mission Avenue**
**VMT Analysis**

C+R

*Figure 1*
*Project Regional Location*




**901 Mission Avenue**
**VMT Analysis**

C+R

*Figure 2*
*Project Site Plan*

**Figure 3 -** VMT per Capita

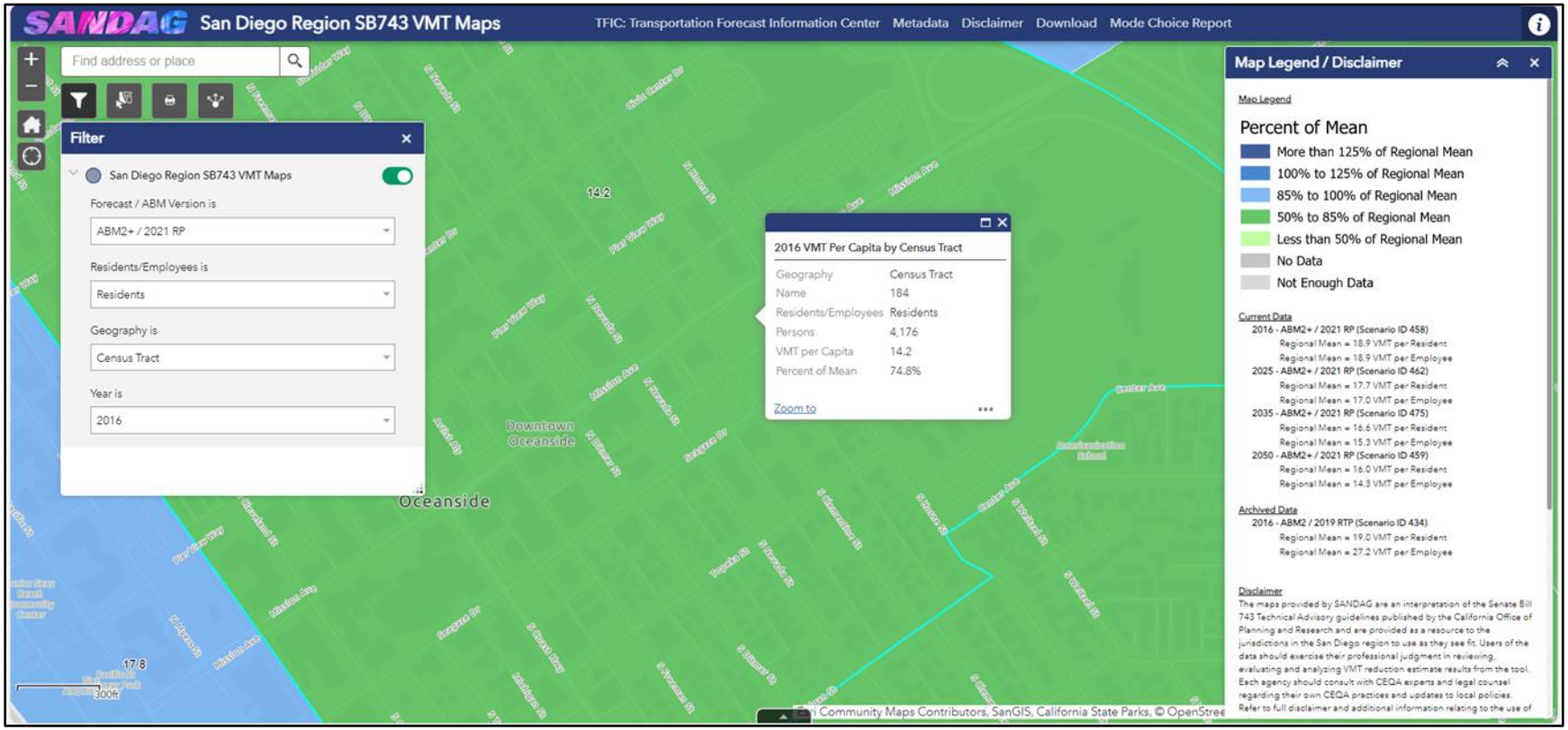
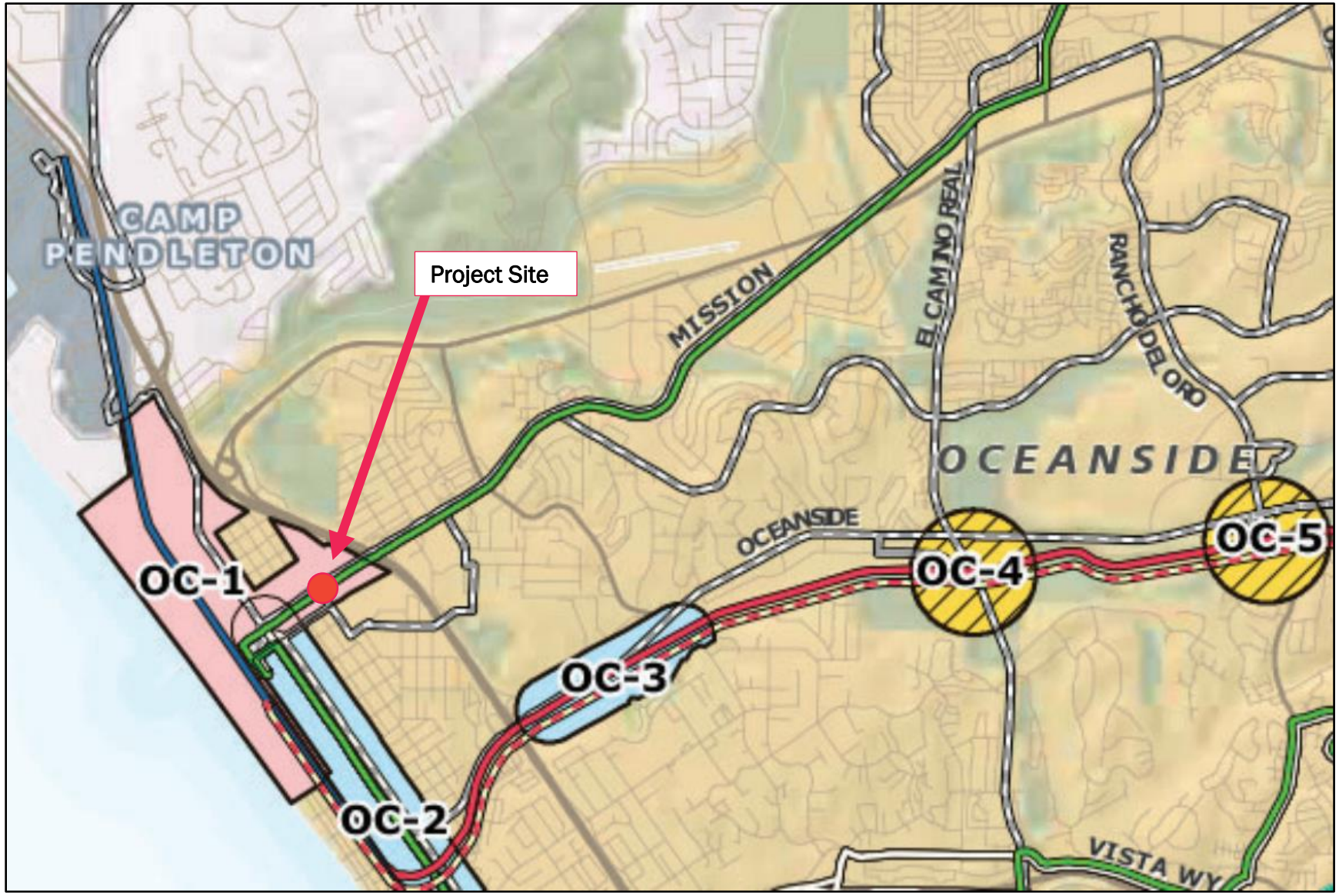


**Figure 4 -** Smart Growth Opportunity Map



# 901 MISSION AVENUE

## FINAL
## Local Transportation Study

*JUNE 2025*




Prepared For

JPI
11988 El Camino Real, Suite 200
San Diego, CA 92130

Prepared By

CR Associates
3900 Fifth Avenue, Suite 310
San Diego, CA 92103

# Executive Summary

## Project Description and Setting

The Project seeks to construct 273 multi-family dwelling units, including 28 affordable units, and 4,006 square feet (SF) of retail at 901 Mission Avenue within the City of Oceanside. The project site is bounded by Mission Avenue to the north, Seagaze Drive to the south, Clementine Street to the west, and N Horne Street to the east.

The Project will provide access via two new driveways, including one along Clementine Street and one along N Horne Street. Both project driveways will function as side-street stop-controlled intersections with the driveways as stop-controlled and Clementine Street and N Horne Street as uncontrolled. To enhance traffic flow and site access, the Project proposes restriping N Horne Street between Mission Avenue and Seagaze Drive, to include a two-way left-turn lane. As a result, the segment would be classified as a 2-Lane Collector with Two-Way Left-Turn Lane. This change will allow vehicles to enter and exit the site without disruption to through traffic. It is important to note that this improvement is not anticipated to affect existing parking. The anticipated opening year of the Project is 2030.

## Project Trip Generation

Per the direction of City staff, trip generation rates were derived from the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 11th Edition*. **Table ES.1** displays the projected daily and AM/PM peak hour project trip generation.

**Table ES.1** – Project Trip Generation

| Land Use | ITE Code | Units | Trip Rate | ADT | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Trips | Split | In | Out | Trips | Split | In | Out |
| Multi-Family (Mid-Rise) | 221[1] | 245 DU | 4.75 | 1,164 | 78 | 36:64 | 28 | 50 | 71 | 65:35 | 46 | 25 |
| Affordable Housing | 223 | 28 DU | 4.81 | 135 | 14 | 29:71 | 4 | 10 | 13 | 62:38 | 8 | 5 |
| Strip Retail Plaza (<40k) | 822 | 4.006 KSF | 54.45 | 218 | 9 | 66:33 | 6 | 3 | 26 | 50:50 | 13 | 13 |
| Total | | | | 1,517 | 101 | - | 38 | 63 | 110 | - | 67 | 43 |

*Source: ITE Trip Generation Manual, 11th Edition (2021); CR Associates (2024)*

Note:
[1] The Project is located within ½-mile walking distance of the Oceanside Transit Center. Therefore, ITE Trip Generation Land Use Code 221 with the land use subcategory 'Close to Rail Transit' was utilized.

As shown, the Project is anticipated to generate a total of 1,517 daily trips, including 101 (38-in/63-out) trips during the AM peak hour and 110 (67-in/43-out) trips during the PM peak hour.

## Local Transportation Study Summary

Roadway and intersection study facilities were evaluated using the City of Oceanside Traffic Impact Analysis Guidelines (TIAG) (August 2020). Detailed analyses are available in Chapters 4, 5, and 6.

## Existing Conditions

### Roadway Segment Analysis

**Table ES.2** displays the roadway segment level of service (LOS) results under Existing and Existing with Project conditions.

**Table ES.2** – Roadway Segment LOS Results – Existing Conditions

| Roadway | Segment | Level of Service | | ΔV/C | Improvement Required? |
|---|---|---|---|---|---|
| | | Existing | Existing with Project | | |
| Mission Avenue | N Ditmar Avenue to N Clementine Street | A | A | 0.011 | No |
| Mission Avenue | N Clementine Street to N Horne Street | B | B | 0.019 | No |
| Mission Avenue | N Horne Street to I-5 SB Ramps | C | C | 0.023 | No |
| Mission Avenue | I-5 SB Ramps to I-5 NB Ramps | C | C | 0.013 | No |
| Seagaze Drive | N Ditmar Avenue to N Clementine Street | A | A | 0.011 | No |
| Seagaze Drive | N Clementine Street to N Horne Street | A | A | 0.042 | No |
| N Clementine Street | Mission Avenue to Seagaze Drive | A | A | 0.043 | No |
| N Horne Street | Mission Avenue to Seagaze Drive | D | C | -0.188 | No |

*Source: CR Associates (2024)*

Notes:
**Bold** indicates substandard LOS E or LOS F.

## Intersection Analysis

**Table ES.3** displays the intersection LOS results under Existing and Existing with Project conditions.

**Table ES.3** – Intersection LOS Results – Existing Conditions

| ID | Intersection | Peak Hour | Level of Service | | Δ | Improvement Required? |
|---|---|---|---|---|---|---|
| | | | Existing | Existing with Project | | |
| 1 | N Ditmar Street & Mission Avenue | AM | A | A | 0.0 | No |
| | | PM | A | A | 0.1 | No |
| 2 | N Clementine Street & Mission Avenue | AM | B | B | 0.1 | No |
| | | PM | B | B | 0.1 | No |
| 3 | N Horne Street & Mission Avenue | AM | C | C | 1.4 | No |
| | | PM | C | D | 6.7 | No |
| 4 | I-5 SB Ramps & Mission Avenue | AM | B | B | 0.2 | No |
| | | PM | B | B | 0.2 | No |
| 5 | I-5 NB Ramps & Mission Avenue | AM | C | C | 0.1 | No |
| | | PM | **F** | **F** | 1.8 | No |
| 6 | N Ditmar Street & Seagaze Drive | AM | A | A | 0.1 | No |
| | | PM | A | A | 0.1 | No |
| 7 | N Clementine Street & Seagaze Drive | AM | A | A | 0.1 | No |
| | | PM | A | A | -0.1 | No |
| 8 | N Horne Street & Seagaze Drive | AM | A | A | 0.2 | No |
| | | PM | A | B | 0.3 | No |
| 9 | N Clementine Street & Project Driveway #1 | AM | N/A | A | 8.8 | No |
| | | PM | N/A | A | 8.8 | No |
| 10 | N Horne Street & Project Driveway #2 | AM | N/A | B | 13.5 | No |
| | | PM | N/A | B | 14.1 | No |

*Source: CR Associates (2024)*

Notes:
N/A = Not Applicable.
**Bold** indicates substandard LOS E or LOS F.

## LOS Impacts and Improvement Thresholds

Based on the roadway segment and intersection analysis results, implementation of the Project does not trigger the need for roadway segment or intersection improvements under Existing with Project conditions.

## Opening Year (2030) Conditions

**Table ES.4** displays the roadway segment level of service (LOS) results under Opening Year (2030) and Opening Year (2030) with Project conditions.

**Table ES.4** – Roadway Segment LOS Results – Opening Year (2030) Conditions

| Roadway | Segment | Level of Service | | ΔV/C | Improvement Required? |
|---|---|---|---|---|---|
| | | Opening Year (2030) | Opening Year (2030) with Project | | |
| Mission Avenue | N Ditmar Avenue to N Clementine Street | C | C | 0.011 | No |
| Mission Avenue | N Clementine Street to N Horne Street | B | B | 0.019 | No |
| Mission Avenue | N Horne Street to I-5 SB Ramps | D | D | 0.023 | No |
| Mission Avenue | I-5 SB Ramps to I-5 NB Ramps | D | D | 0.013 | No |
| Seagaze Drive | N Ditmar Avenue to N Clementine Street | A | A | 0.011 | No |
| Seagaze Drive | N Clementine Street to N Horne Street | B | B | 0.042 | No |
| N Clementine Street | Mission Avenue to Seagaze Drive | A | A | 0.043 | No |
| N Horne Street | Mission Avenue to Seagaze Drive | **E** | D | -0.246 | No |

*Source: CR Associates (2024)*

Notes:
**Bold** indicates substandard LOS E or LOS F.

## Intersection Analysis

**Table ES.5** displays the intersection LOS results under Opening Year (2030) and Opening Year (2030) with Project conditions.

**Table ES.5** – Intersection LOS Results – Opening Year (2030) Conditions

| ID | Intersection | Peak Hour | Level of Service | | Δ | Improvement Required? |
|---|---|---|---|---|---|---|
| | | | Opening Year (2030) | Opening Year (2030) with Project | | |
| 1 | N Ditmar Street & Mission Avenue | AM | A | A | 0.0 | No |
| | | PM | A | A | 0.1 | No |
| 2 | N Clementine Street & Mission Avenue | AM | B | B | 0.1 | No |
| | | PM | B | B | 0.1 | No |
| 3 | N Horne Street & Mission Avenue | AM | D | D | 2.2 | No |
| | | PM | **E** | **E** | 2.0 | No |
| 4 | I-5 SB Ramps & Mission Avenue | AM | B | B | 0.4 | No |
| | | PM | B | B | 0.3 | No |
| 5 | I-5 NB Ramps & Mission Avenue | AM | C | C | 0.1 | No |
| | | PM | **F** | **F** | 1.4 | No |
| 6 | N Ditmar Street & Seagaze Drive | AM | A | A | 0.1 | No |
| | | PM | B | B | 0.2 | No |
| 7 | N Clementine Street & Seagaze Drive | AM | B | B | 0.0 | No |
| | | PM | B | B | 0.1 | No |
| 8 | N Horne Street & Seagaze Drive | AM | B | B | 0.4 | No |
| | | PM | B | B | 0.5 | No |
| 9 | N Clementine Street & Project Driveway #1 | AM | N/A | A | 9.1 | No |
| | | PM | N/A | A | 9.1 | No |
| 10 | N Horne Street & Project Driveway #2 | AM | N/A | B | 14.9 | No |
| | | PM | N/A | C | 15.2 | No |

*Source: CR Associates (2024)*

Notes:
N/A = Not Applicable.
**Bold** indicates substandard LOS E or LOS F.

## LOS Impacts and Improvement Thresholds

Based on the roadway segment and intersection analysis results, implementation of the Project does not trigger the need for roadway segment or intersection improvements under Opening Year (2030) with Project conditions.

## Horizon Year (2050) Conditions

### Roadway Segment Analysis

**Table ES.6** displays the roadway segment level of service (LOS) results under Horizon Year (2050) and Horizon Year (2050) with Project conditions.

**Table ES.6** – Roadway Segment LOS Results – Horizon Year (2050) Conditions

| Roadway | Segment | Level of Service | | ΔV/C | Improvement Required? |
|---|---|---|---|---|---|
| | | Horizon Year (2050) | Horizon Year (2050) with Project | | |
| Mission Avenue | N Ditmar Avenue to N Clementine Street | C | C | 0.011 | No |
| Mission Avenue | N Clementine Street to N Horne Street | B | B | 0.019 | No |
| Mission Avenue | N Horne Street to I-5 SB Ramps | C | C | 0.023 | No |
| Mission Avenue | I-5 SB Ramps to I-5 NB Ramps | C | C | 0.013 | No |
| Seagaze Drive | N Ditmar Avenue to N Clementine Street | A | A | 0.011 | No |
| Seagaze Drive | N Clementine Street to N Horne Street | B | B | 0.042 | No |
| N Clementine Street | Mission Avenue to Seagaze Drive | A | A | 0.043 | No |
| N Horne Street | Mission Avenue to Seagaze Drive | C | C | -0.152 | No |

*Source: CR Associates (2024)*

Notes:
**Bold** indicates substandard LOS E or LOS F.

## Intersection Analysis

**Table ES.7** displays the intersection LOS results under Horizon Year (2050) and Horizon Year (2050) with Project conditions.

**Table ES.7** – Intersection LOS Results – Horizon Year (2050) Conditions

| ID | Intersection | Peak Hour | Level of Service | | Δ | Improvement Required? |
|---|---|---|---|---|---|---|
| | | | Horizon Year (2050) | Horizon Year (2050) with Project | | |
| 1 | N Ditmar Street & Mission Avenue | AM | A | A | 0.0 | No |
| | | PM | A | A | 0.0 | No |
| 2 | N Clementine Street & Mission Avenue | AM | B | B | 0.1 | No |
| | | PM | B | B | 0.1 | No |
| 3 | N Horne Street & Mission Avenue | AM | C | C | 0.6 | No |
| | | PM | D | D | 0.9 | No |
| 4 | I-5 SB Ramps & Mission Avenue | AM | B | B | 0.3 | No |
| | | PM | C | C | 0.7 | No |
| 5 | I-5 NB Ramps & Mission Avenue | AM | C | C | 0.2 | No |
| | | PM | **F** | **F** | 1.3 | No |
| 6 | N Ditmar Street & Seagaze Drive | AM | A | A | 0.1 | No |
| | | PM | A | A | 0.1 | No |
| 7 | N Clementine Street & Seagaze Drive | AM | A | A | 0.1 | No |
| | | PM | A | A | 0.0 | No |
| 8 | N Horne Street & Seagaze Drive | AM | B | B | 0.2 | No |
| | | PM | B | B | 0.6 | No |
| 9 | N Clementine Street & Project Driveway #1 | AM | N/A | A | 8.5 | No |
| | | PM | N/A | A | 9.0 | No |
| 10 | N Horne Street & Project Driveway #2 | AM | N/A | C | 8.9 | No |
| | | PM | N/A | C | 19.0 | No |

*Source: CR Associates (2024)*

Notes:
N/A = Not Applicable.
**Bold** indicates substandard LOS E or LOS F.

## LOS Impacts and Improvement Thresholds

Based on the roadway segment and intersection analysis results, implementation of the Project does not trigger the need for roadway segment or intersection improvements under Horizon Year (2050) with Project conditions.

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# 1.0 Introduction

The purpose of this Local Transportation Study (LTS) is to identify and document any potential level of service (LOS) impacts associated with the 901 Mission Avenue project (the "Project"), and to recommend improvement requirements, as necessary.

## 1.1 Project Description

The Project seeks to construct 273 multi-family dwelling units, including 28 affordable units, and 4,006 square feet (SF) of retail at 901 Mission Avenue within the City of Oceanside. The project site is bounded by Mission Avenue to the north, Seagaze Drive to the south, Clementine Street to the west, and N Horne Street to the east.

The Project will provide access via two new driveways, including one along Clementine Street and one along N Horne Street. Both project driveways will function as side-street stop-controlled intersections with the driveways as stop-controlled and Clementine Street and N Horne Street as uncontrolled. To enhance traffic flow and site access, the Project proposes restriping N Horne Street between Mission Avenue and Seagaze Drive, to include a two-way left-turn lane. As a result, the segment would be classified as a 2-Lane Collector with Two-Way Left-Turn Lane. This change will allow vehicles to enter and exit the site without disruption to through traffic. It is important to note that this improvement is not anticipated to affect existing parking. The anticipated opening year of the Project is 2030. **Figure 1.1** displays the Project's regional location. **Figure 1.2** displays the project site plan.

## 1.2 Report Organization

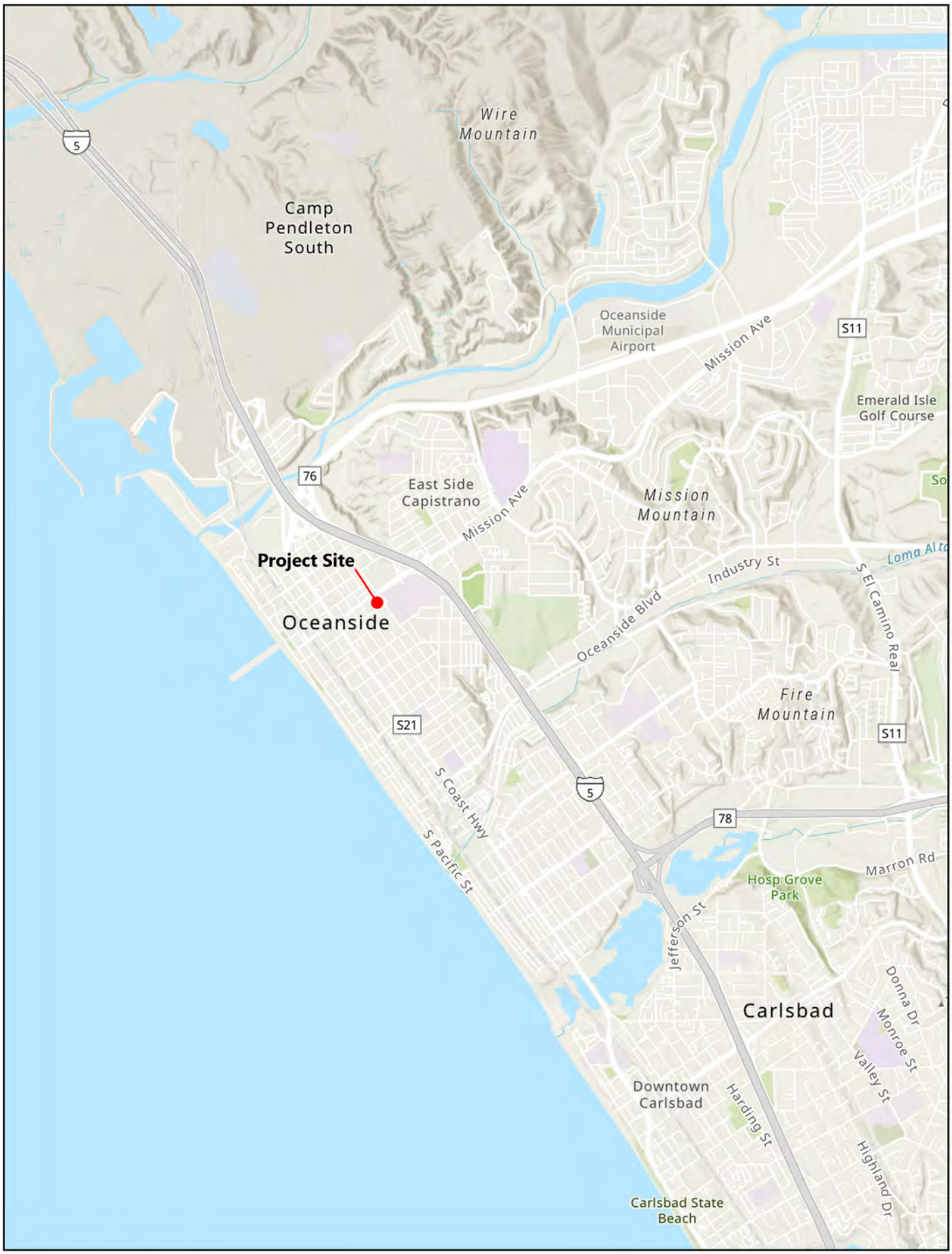
Following this introductory chapter, this report is organized into the following chapters:

2. **Analysis Methodology** – This chapter reviews the methods utilized to evaluate any LOS impacts associated with the implementation of the Project, as required by the City's Traffic Impact Analysis Guidelines (TIAG).

3. **Project Traffic** – This chapter describes the Project's land use and associated trip generation. Additional information such as trip distribution patterns and project trip assignment are also included in this chapter, which is used to determine the project study area.

4. **Existing Conditions** – This chapter describes and evaluates the existing transportation network. Vehicular operations within the study area are evaluated and LOS analysis results are provided for Existing and Existing with Project vehicular traffic conditions. Additionally, the Project's access to transit as well as pedestrian and bicycle facilities are evaluated. Recommendations are offered to enhance the experience and safety for pedestrians and bicyclists.

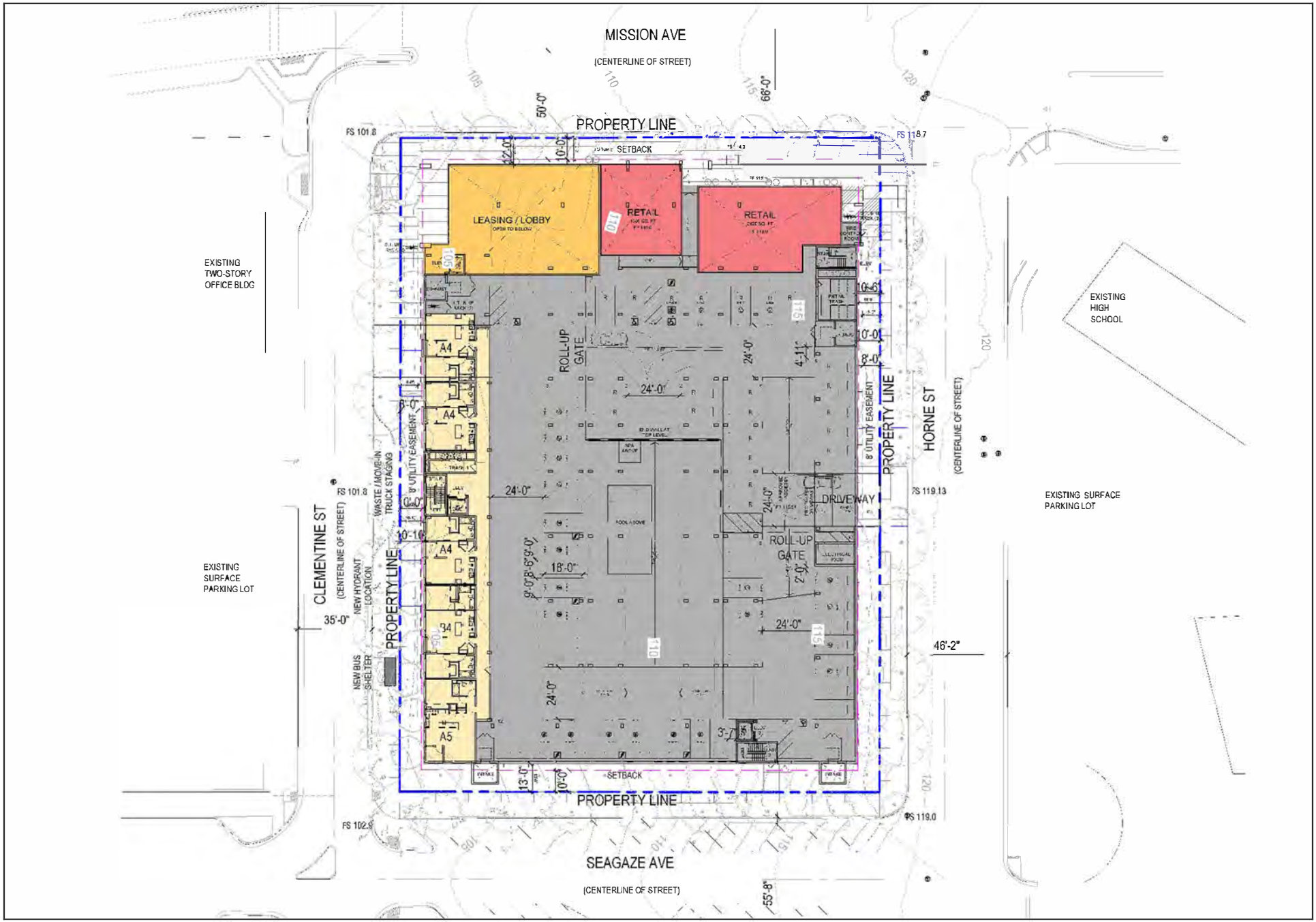
5. **Opening Year (2030) Conditions –** This chapter describes the opening year developments anticipated to generate additional trips within the project study area and establishes a opening year baseline against which traffic generated by the Project can be compared to at the Project's opening day, expected to be Year 2030. LOS analysis results are provided for Opening Year (2030) and Opening Year (2030) with Project vehicular traffic conditions.




**901 Mission Avenue**
**Local Transportation Study**

C+R

*Figure 1.1*
*Project Regional Location*




**901 Mission Avenue**
**Local Transportation Study**

*Figure 1.2*
*Project Site Plan*

6. **Horizon Year (2050) Conditions** – This chapter describes projected long-range conditions of the transportation network within the study area. Horizon Year (2050) scenario analysis is required per the City's TIAG. LOS analysis results are provided for Horizon Year (2050) and Horizon Year (2050) with Project vehicular traffic conditions.

7. **LOS Impacts and Improvement Requirements** – This chapter identifies any substandard facilities and provides improvement requirements to improve substandard facilities to acceptable LOS or pre-project conditions.

8. **Site Access & Circulation** – This chapter addresses access to the Project site and discusses the functionality of the Project's internal circulation.

# 2.0 Analysis Methodology

This study was performed in accordance with the standards and requirements in the City's TIAG. All analysis assumptions were documented within a scoping agreement memorandum, provided in **Appendix A**, and approved by city staff in July 2024. The following sections describe the analysis methods outlined in the City's TIAG to describe how transportation related impacts are analyzed and identified in relation to LOS. A transportation impact in relation to LOS is considered a non-CEQA transportation impact based on the City's TIAG.

## 2.1 LOS Definitions

LOS is a quantitative measure describing operational conditions within a traffic stream, and the motorist's and/or passengers' perception of operations. A LOS definition generally describes these conditions in terms of such factors as delay, speed, travel time, freedom to maneuver, interruptions in traffic flow, queuing, comfort, and convenience. **Table 2.1** describes generalized definitions of the various LOS categories (A through F) as applied to roadway operations.

**Table 2.1** – LOS Definitions

| LOS Category | Definition of Operation |
|---|---|
| A | This LOS represents a completely free-flow condition, where the operation of vehicles is virtually unaffected by the presence of other vehicles and only constrained by the geometric features of the highway and by driver preferences. |
| B | This LOS represents a relatively free-flow condition, although the presence of other vehicles becomes noticeable. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver. |
| C | At this LOS, the influence of traffic density on operations becomes marked. The ability to maneuver within the traffic stream is clearly affected by other vehicles. |
| D | At this LOS, the ability to maneuver is notably restricted due to traffic congestion, and only minor disruptions can be absorbed without extensive queues forming and the service deteriorating. |
| E | This LOS represents operations at or near capacity. LOS E is an unstable level, with vehicles operating with minimum spacing for maintaining uniform flow. At LOS E, disruptions cannot be dissipated readily thus causing deterioration down to LOS F. |
| F | At this LOS, forced or breakdown of traffic flow occurs, although operations appear to be at capacity, queues form behind these breakdowns. Operations within queues are highly unstable, with vehicles experiencing brief periods of movement followed by stoppages. |

*Source: Highway Capacity Manual 6th Edition (2016)*

## 2.2 Roadway Segment LOS Standards and Thresholds

Roadway segment LOS standards and thresholds provide the basis for analysis of arterial roadway segment performance. The analysis of roadway segment LOS is based on the functional classification of the roadway, the maximum capacity, roadway geometrics, and existing or forecast Average Daily Traffic (ADT) volumes. **Table 2.2** displays roadway segment capacity standards found in the City's TIAG. The actual capacity of a roadway facility varies according to its physical attributes.

**Table 2.2** – Roadway Segment Daily Capacity and LOS Standards

| Class | Lanes | LOS[1] | | | | |
|---|---|---|---|---|---|---|
| | | A | B | C | D | E |
| Expressway | 6 | 0 to 29,999 | 30,000 to 41,999 | 42,000 to 59,999 | 60,000 to 69,999 | 70,000 to 79,999 |
| Expressway | 4 | 0 to 24,999 | 25,000 to 34,999 | 35,000 to 49,999 | 50,000 to 54,999 | 55,000 to 59,999 |
| Prime Arterial | 6 | 0 to 24,999 | 25,000 to 34,999 | 35,000 to 49,999 | 50,000 to 54,999 | 55,000 to 59,999 |
| 6-Lane Major Arterial | 6 | 0 to 19,999 | 20,000 to 27,999 | 28,000 to 39,999 | 40,000 to 44,999 | 45,000 to 49,999 |
| 5-Lane Major Arterial[2] | 5 | 0 to 17,499 | 17,500 to 24,499 | 24,500 to 34,999 | 35,000 to 39,999 | 40,000 to 44,999 |
| 4-Lane Major Arterial | 4 | 0 to 14,999 | 15,000 to 20,999 | 21,000 to 29,999 | 30,000 to 34,999 | 35,000 to 39,999 |
| Secondary Collector (4 lanes with 2-way left turn lane) | 4 | 0 to 9,999 | 10,000 to 13,999 | 14,000 to 19,999 | 20,000 to 24,999 | 25,000 to 29,999 |
| Secondary Collector (4 lanes without 2-way left-turn lane, with left turn pockets | 4 | 0 to 8,999 | 9,000 to 12,999 | 13,000 to 17,999 | 18,000 to 21,999 | 22,000 to 24,999 |
| Collector (commercial fronting, 2-lanes with 2-way left turn lane)[4] | 2 | 0 to 4,999 | 5,000 to 6,999 | 7,000 to 9,999 | 10,000 to 12,999 | 13,000 to 14,999 |
| Collector (residential streets in the Circulation Element or industrial fronting) | 2 | 0 to 3,999 | 4,000 to 5,499 | 5,500 to 7,499 | 7,500 to 8,999 | 9,000 to 9,999 |
| Collector (One-Way)[5] | 2 | 0 to 7,499 | 7,500 to 9,499 | 9,500 to 12,499 | 12,500 to 14,999 | 15,000 to 17,499 |
| Local Street (residential streets NOT in the Circulation Element) | 2 | – | – | 2,200 | – | – |

Source: Oceanside TIAG (2020)

Notes:
[1] Roadway segments with a daily volume greater than the LOS E threshold operate at LOS F.

These standards are generally used as long-range planning guidelines to determine the functional classification of roadways. The actual capacity of a roadway varies according to its physical attributes. Typically, the performance and LOS of a roadway segment is heavily influenced by the ability of its intersections to accommodate peak hour traffic volumes. For the purposes of this traffic analysis, LOS D or better is considered acceptable for circulation element roadway segments.

## 2.3 Peak Hour Intersection LOS Standards and Thresholds

This section presents the methodologies used to perform peak hour intersection capacity analyses at signalized and unsignalized intersections within the study area. The following assumptions were utilized in conducting all intersection LOS analyses:

- **Peak Hour Factor (PHF)** – PHF from existing traffic counts utilized for Existing and Opening Year (2030) scenarios. For Horizon Year 2050 scenarios, a PHF of 0.95 was utilized, unless already higher under Existing conditions. Existing traffic counts are included in **Appendix B**.
- **Conflicting Pedestrians/Bicycles** – Existing pedestrian and bicycle traffic counts utilized for all scenarios.
- **Signal Timings** – Based on existing signal timing plans (as of July 2024) provided by City staff and included in **Appendix C**.

### 2.3.1 Signalized Intersections

The analysis of signalized intersections utilized the operational analysis procedure as outlined in the Highway Capacity Manual (HCM) 6th Edition signalized (Chapter 19) intersection analysis methodology. This method defines LOS in terms of delay, or more specifically, average stopped delay per vehicle. Delay is a measure of driver and/or passenger discomfort, frustration, fuel consumption and lost travel time. This technique uses 1,900 vehicles per hour per lane (VPHPL) as the maximum saturation volume of an intersection. This saturation volume is adjusted to account for lane width, on-street parking, pedestrians, traffic composition (i.e., percentage trucks) and shared lane movements (i.e., through and right-turn movements originating from the same lane). The LOS criteria used for the analysis of signalized intersections are described in **Table 2.3**, identifying the thresholds of control delays and the associated LOS. The computerized analysis of intersection operations was performed utilizing the Synchro Version 11 traffic analysis software by Trafficware Ltd.

**Table 2.3** – Signalized Intersection LOS Thresholds

| Average Stopped Delay Per Vehicle (Seconds) | LOS Characteristics |
|---|---|
| <10 | LOS A describes operations with very low delay. This occurs when progression is extremely favorable, and most vehicles do not stop at all. Short cycle lengths may also contribute to low delay. |
| >10– 20 | LOS B describes operations with generally good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay. |
| >20 – 35 | LOS C describes operations with higher delays, which may result 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 at this level, although many still pass through the intersection without stopping. |
| >35– 55 | LOS D describes operations with high delay, resulting from some combination of unfavorable progression, long cycle lengths, or high volumes. The influence of congestion becomes more noticeable, and individual cycle failures are noticeable. |
| >55 – 80 | LOS E is considered the limit of acceptable delay. Individual cycle failures are frequent occurrences. |
| >80 | LOS F describes a condition of excessively high delay, considered unacceptable to most drivers. This condition often occurs when arrival flow rates exceed the LOS D capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes to such delay. |

*Source: Highway Capacity Manual 6th Edition (2016)*

### 2.3.2 Unsignalized Intersections

The analysis of unsignalized intersections utilized the operational analysis procedures as outlined in the HCM 6th Edition side-street stop (Chapter 20) and all-way stop (Chapter 21) intersection analysis methodologies.

Unsignalized intersections were analyzed using the HCM 6th Edition side-street stop (Chapter 20) and all-way stop (Chapter 21) intersection analysis methodologies. The computerized analysis of intersection operations was performed utilizing the Synchro Version 11 traffic analysis software by Trafficware Ltd.

LOS was determined as follows:

- **All-Way Stop Intersections:** Reported for the entire intersection as an average value.
- **Side-Street Stop Intersections:** Reported for the worst-case movement.

The LOS criteria used for the analysis of unsignalized intersections are described in **Table 2.4**.

**Table 2.4** – LOS Criteria for Stop-Controlled Unsignalized Intersections

| Average Stopped Delay Per Vehicle (Seconds) | LOS |
|---|---|
| 0 – 10 | A |
| >10 – 15 | B |
| >15 – 25 | C |
| >25 – 35 | D |
| >35 – 50 | E |
| > 50 | F |

*Source: Highway Capacity Manual 6th Edition (2016)*

## 2.4 Determination of Project Study Area

Per the City's TIAG, the study area was defined using the following criteria:

- All signalized and unsignalized intersections or project driveways where the project will add 50 or more peak hour (final cumulative) trips in either direction.
- All freeway ramp intersections where the project will add 20 or more peak hour (final cumulative) trips in either direction.

## 2.5 City of Oceanside LOS Standards

**Table 2.5** presents the City's thresholds for determining if the Project is required to provide improvements to study area facilities:

**Table 2.5** – Determination of the Need for Roadway Improvements

| LOS with Project | Allowable Change Due to Project Effect | | | | | |
|---|---|---|---|---|---|---|
| | Freeway | | Roadway Segments | | Intersections | Ramp Metering |
| | V/C | Speed (MPH) | V/C | Speed | Delay (sec) | Delay (min) |
| E & F (or ramp meter delays above 15 min) | 0.01 | 1 | 0.02 | 1 | 2 | 2 |

*Source: City of Oceanside Traffic Impact Analysis Guidelines (August 2020)*

Improvements should be identified to increase performance to acceptable or pre-project conditions under each scenario. Improvements should be considered as follows on a case-by-case basis:

- Improvements should be consistent with the General Plan.
- Improvements for transit, bike, and pedestrian facilities should be given priority in Transit Priority Areas or Smart Growth Opportunity Area as identified by SANDAG.
- Projects in Transit Priority Areas or Smart Growth Opportunity Area as identified by SANDAG, that are consistent with the General Plan at the time of project application, should not be denied due to the inability to provide roadway improvements (i.e., existing right of way is constrained, etc.).

# 3.0 Project Traffic

This chapter describes the Project, including the Project's trip generation, trip distribution patterns, and trip assignment.

## 3.1 Project Trip Generation

Per the direction of City staff, trip generation rates were derived from the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 11th Edition*. **Table 3.1** displays the projected daily and AM/PM peak hour project trip generation.

**Table 3.1** – Project Trip Generation

| Land Use | ITE Code | Units | Trip Rate | ADT | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Trips | Split | In | Out | Trips | Split | In | Out |
| Multi-Family (Mid-Rise) | 221[1] | 245 DU | 4.75 | 1,164 | 78 | 36:64 | 28 | 50 | 71 | 65:35 | 46 | 25 |
| Affordable Housing | 223 | 28 DU | 4.81 | 135 | 14 | 29:71 | 4 | 10 | 13 | 62:38 | 8 | 5 |
| Strip Retail Plaza (<40k) | 822 | 4.006 KSF | 54.45 | 218 | 9 | 66:33 | 6 | 3 | 26 | 50:50 | 13 | 13 |
| Total | | | | 1,517 | 101 | - | 38 | 63 | 110 | - | 67 | 43 |

*Source: ITE Trip Generation Manual, 11th Edition (2021); CR Associates (2024)*

Note:
[1] The Project is located within ½-mile walking distance of the Oceanside Transit Center. Therefore, ITE Trip Generation Land Use Code 221 with the land use subcategory 'Close to Rail Transit' was utilized.

As shown, the Project is anticipated to generate a total of 1,517 daily trips, including 101 (38-in/63-out) trips during the AM peak hour and 110 (67-in/43-out) trips during the PM peak hour.

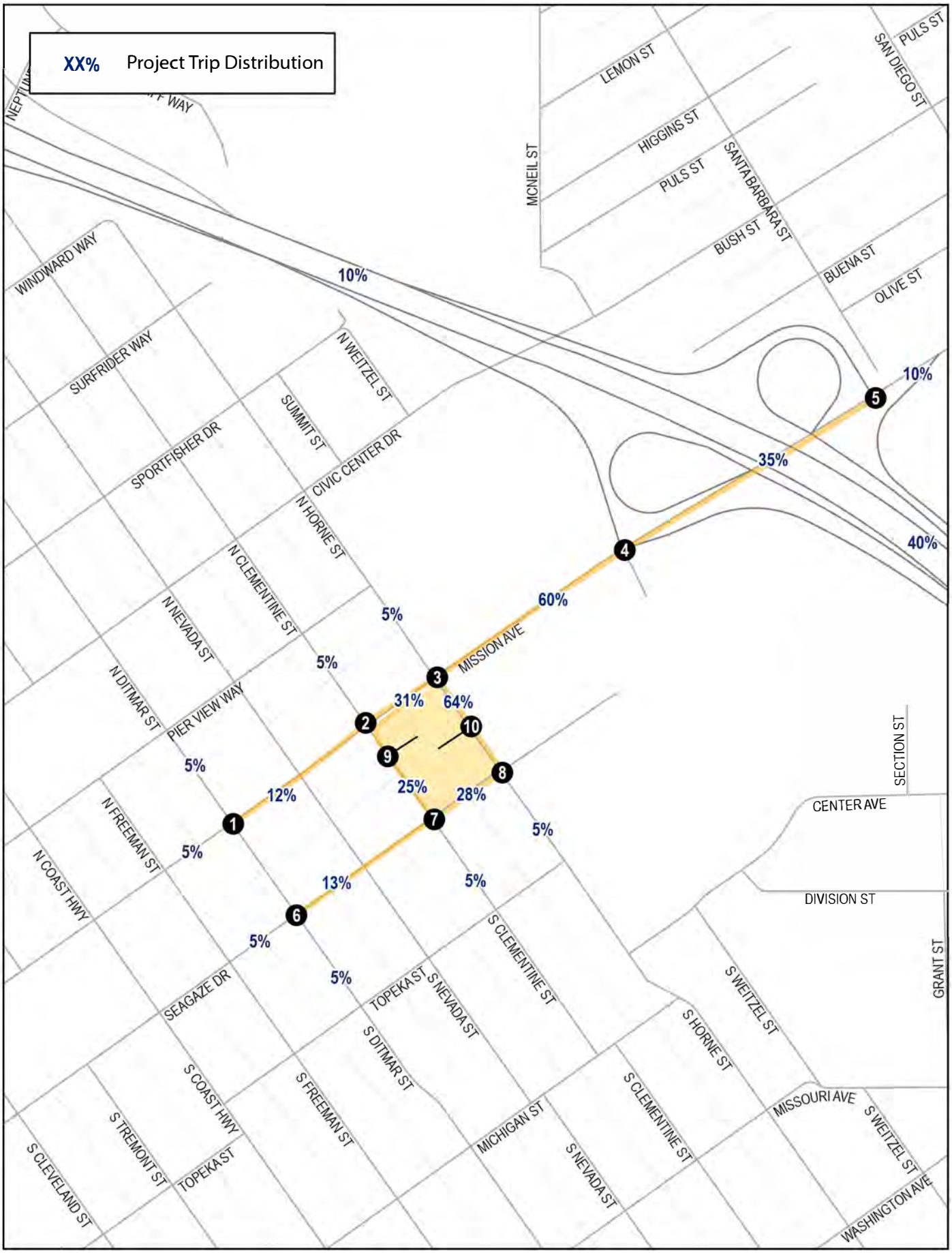
## 3.2 Project Trip Distribution

The project trip distribution was manually developed based on the geographical location of the Project, characteristics of the proposed and surrounding land uses, and big data from Replica[1]. **Figure 3.1** and **Figure 3.2** display the daily project trip distribution and AM/PM peak hour trip distribution, respectively.

## 3.3 Project Trip Assignment

Based on the Project's trip generation and distribution patterns, daily and AM/PM peak hour project trips were assigned to the adjacent roadway network. **Figure 3.3** displays the daily trip assignment and **Figure 3.4** displays the AM/PM peak hour trip assignment.

[1] Replica is a data provider that produces large-scale models to represent mobility throughout the United States. For more information, please visit the following: https://replicahq.com/




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*Figure 3.1*
*Project Trip Distribution*

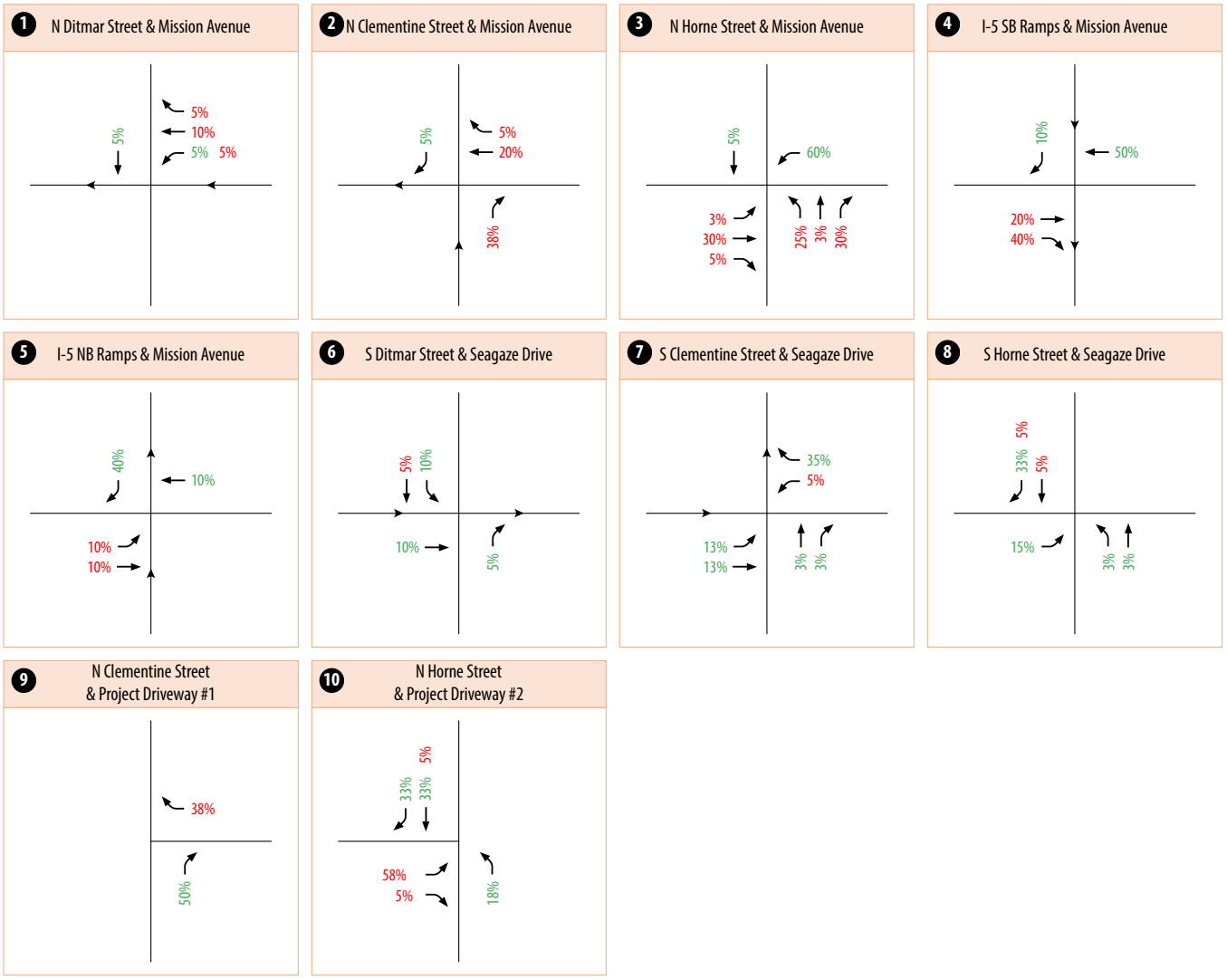
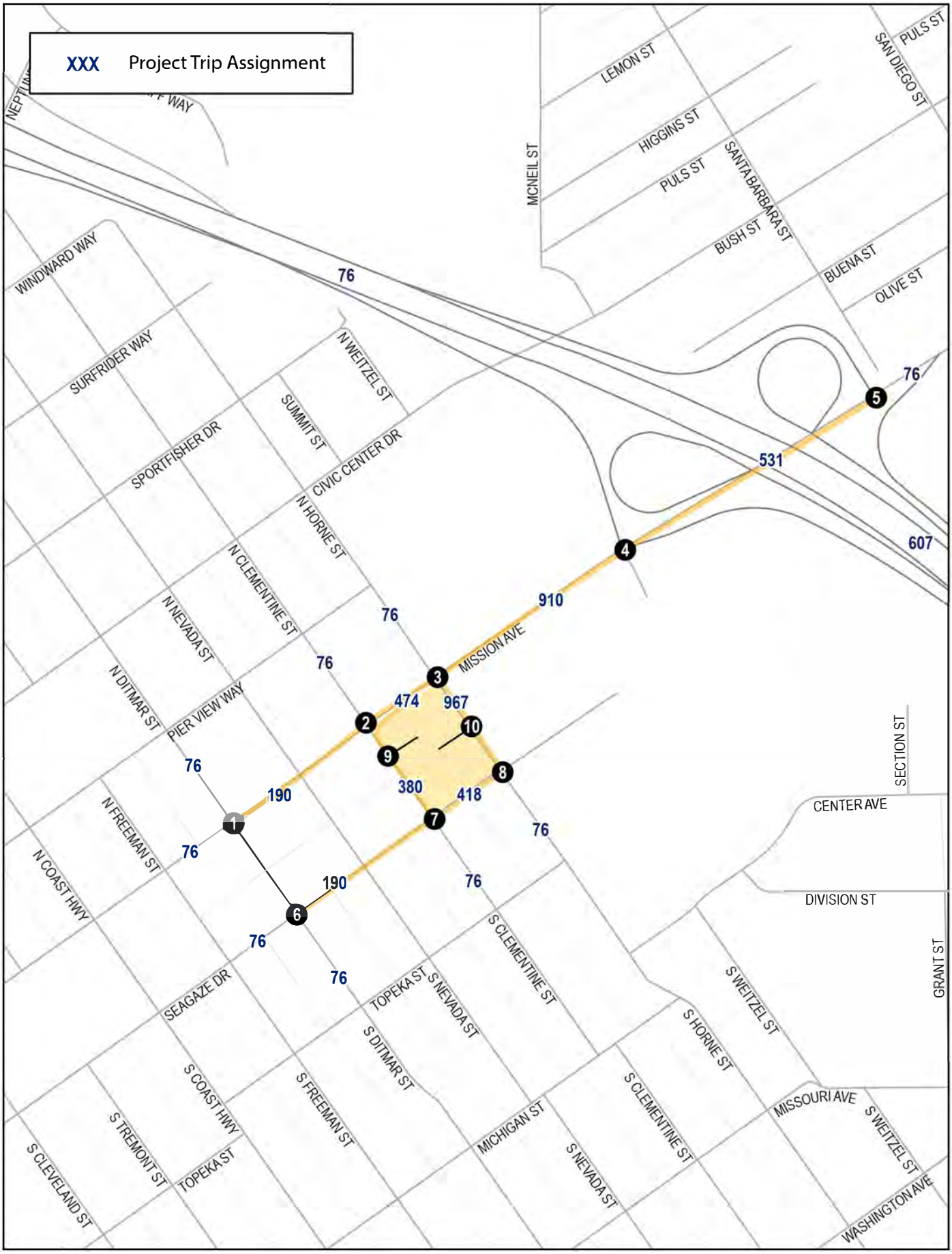
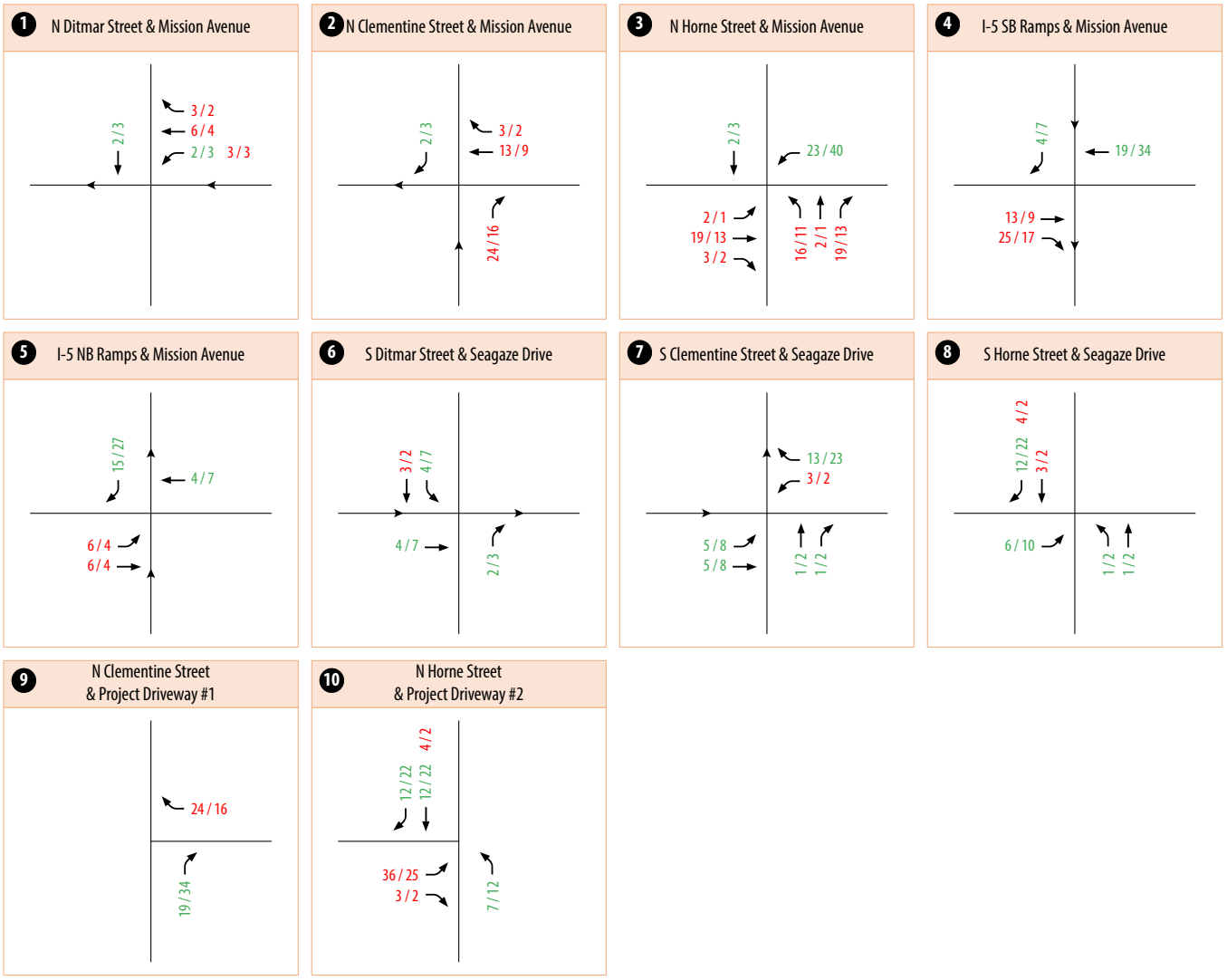



*Figure 3.2*
*AM/PM Peak Hour Project Trip Distribution*




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*Figure 3.3*
*Project Trip Assignment*




**901 Mission Avenue**
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*Figure 3.4*
*AM/PM Peak Hour Project Trip Assignment*

## 3.4 Project Study Area

Based on the Project's trip generation, distribution, and assignment, as well as the City's TIAG study area requirements previously outlined in Section 2.4, the following facilities were included in the project study area:

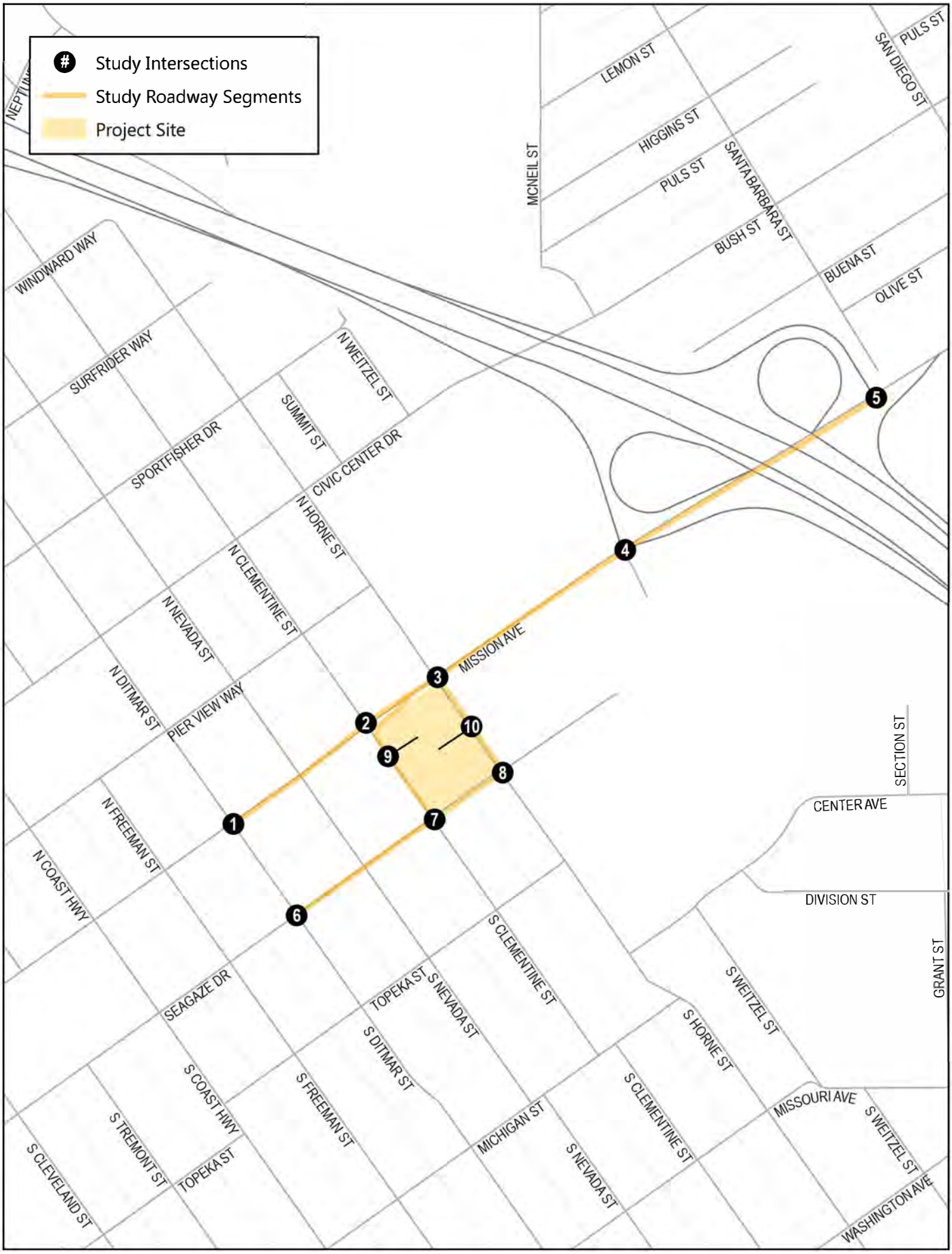
### Roadway Segments

- Mission Avenue, between N Ditmar Avenue and N Clementine Street
- Mission Avenue, between N Clementine Street and N Horne Street
- Mission Avenue, between N Horne Street and I-5 SB Ramps
- Mission Avenue, between I-5 SB Ramps and I-5 NB Ramps
- Seagaze Drive, between N Ditmar Avenue and N Clementine Street
- Seagaze Drive, between N Clementine Street and N Horne Street
- N Clementine Street, between Mission Avenue and Seagaze Drive
- N Horne Street, between Mission Avenue and Seagaze Drive

### Intersections

1. N Ditmar Street & Mission Avenue
2. N Clementine Street & Mission Avenue
3. N Horne Street & Mission Avenue
4. I-5 SB On/Off Ramps & Mission Avenue
5. I-5 NB On/Off Ramps & Mission Avenue
6. N Ditmar Street & Seagaze Drive
7. N Clementine Street & Seagaze Drive
8. N Horne Street & Seagaze Drive
9. N Clementine Street & Project Driveway #1
10. N Horne Street & Project Driveway #2

**Figure 3.5** displays the overall project study area.




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*Figure 3.5*
*Project Study Area*

# 4.0 Existing Conditions

This chapter provides a qualitative description of the transportation facilities located within the project study area. LOS analysis of the existing operations of the local transportation network facilities is also provided for study roadway segments and intersections.

## 4.1 Existing Transportation Network

Access to the Project from the regional transportation network will be provided via Interstate 5 (I-5), California State Route 76 (SR-76), Mission Avenue, Seagaze Drive, and Coast Highway. These facilities will either provide a direct connection to the Project or will provide a critical link between the Project and the regional transportation network. **Table 4.1** summarizes the existing physical characteristics of roadways within the study area, while **Figure 4.1** displays the roadway segment functional classifications under Existing conditions.

## 4.2 Active Transportation

This section discusses the project site's active transportation modes.

### 4.2.1 Pedestrian

Sidewalks are present along both sides of the roadways within a half mile walking distance from the project site. These existing pedestrian facilities are mostly surrounded by residential and commercial/retail land uses.

The City of Oceanside Public Review Draft General Plan (Oceanside PRD GP, 2024) established a system of three pedestrian route typologies to guide level of pedestrian amenities for mobility network streets: Connectors, Corridors, and Pedestrian Priority Zones. **Figure 4.2** displays example treatments of the pedestrian route typologies and **Figure 4.3** displays the pedestrian route typology designations across the City. A summary of the pedestrian route typology designations within the project study area is provided below:

**Pedestrian Priority Zones**

- Mission Avenue, between N Ditmar Street and N Horne Street
- Seagaze Drive, between N Ditmar Street and N Horne Street

**Corridor**

- Mission Avenue, between N Horne Street and I-5 NB Ramps

**Connector**

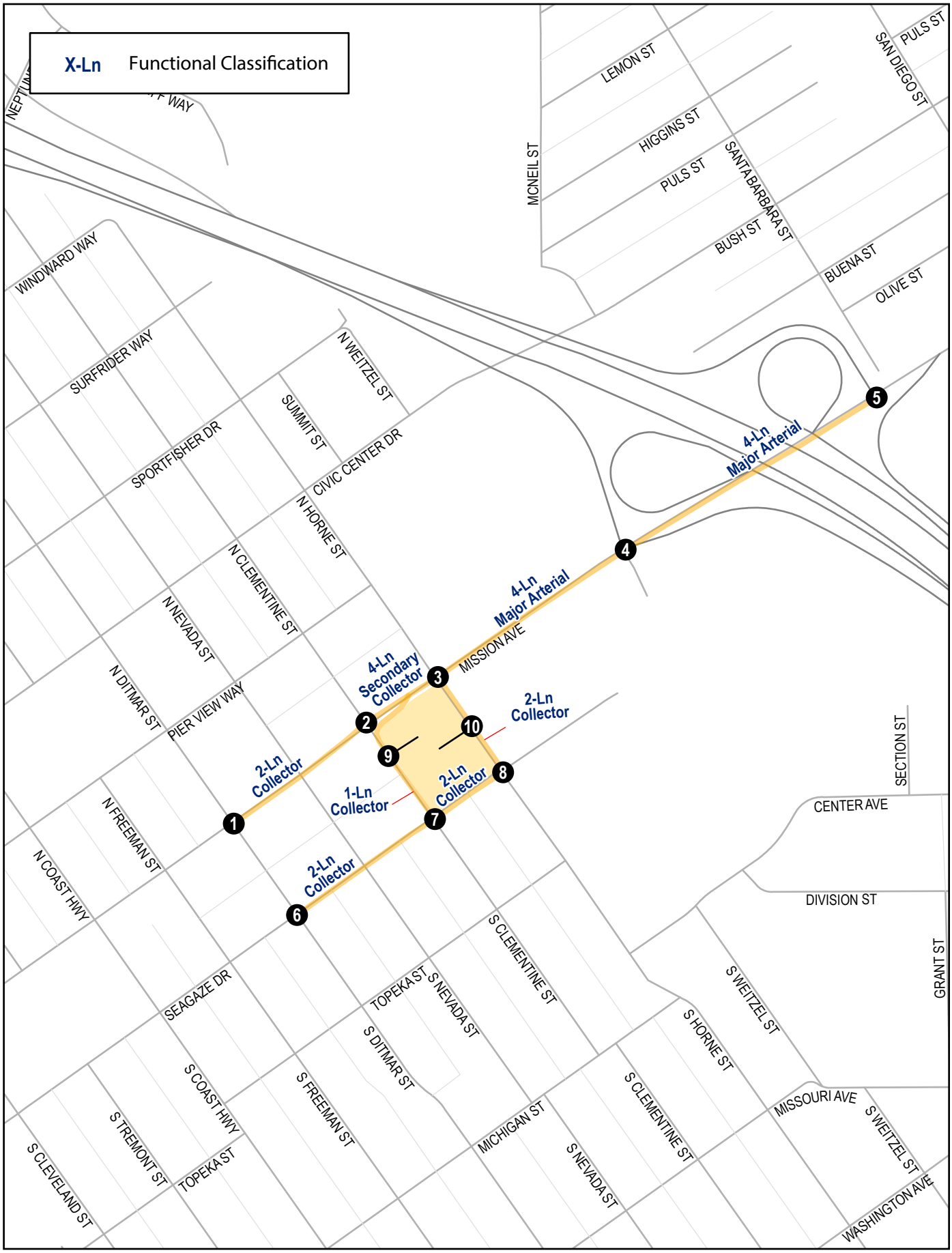
- N Horne Street, between Mission Avenue and Seagaze Drive

Based on the preliminary review of the project site plan, the Project would not conflict with existing or planned pedestrian facilities and would not result in any impacts to pedestrian safety and accessibility.

**Table 4.1** – Existing Transportation Network Characteristics

| Roadway | Segment | Number of Lanes | Curb to Curb Distance | Median Type | Roadway Classification[1] | Sidewalks | Bike Facility | Transit Route | Posted Speed Limit |
|---|---|---|---|---|---|---|---|---|---|
| Mission Avenue | N Ditmar Avenue to N Clementine Street | 2 | 25 | None | 2-Lane Collector (One-Way) | Present | Class III | 303, 313 | 25 |
| Mission Avenue | N Clementine Street to N Horne Street | 4 | 66 | None | 4-Lane Secondary Collector w/o TWLTL | Present | Class III | 303, 313 | 25 |
| Mission Avenue | N Horne Street to I-5 SB Ramps | 4 | 64 | Raised | 4-Lane Major Arterial | Present | Class III | 303 | 35 |
| Mission Avenue | I-5 SB Ramps to I-5 NB Ramps | 4 | 76 | Striped | 4-Lane Major Arterial | Present | Class III | 303 | 35 |
| Seagaze Drive | N Ditmar Avenue to N Clementine Street | 2 | 28 | None | 2-Lane Collector (One-Way) | Present | Class II | 303, 313 | 25 |
| Seagaze Drive | N Clementine Street to N Horne Street | 2 | 32 | None | 2-Lane Collector w/o TWLTL | Present | Class III | 303, 313 | 25 |
| N Clementine Street | Mission Avenue to Seagaze Drive | 1 | 32 | None | 1-Lane Collector (One-Way) | Present | None | None | 25 |
| N Horne Street | Mission Avenue to Seagaze Drive | 2 | 45 | None | 2-Lane Collector w/o TWLTL | Present | Class III | 303, 313 | 25 |

*Source: CR Associates (2024)*



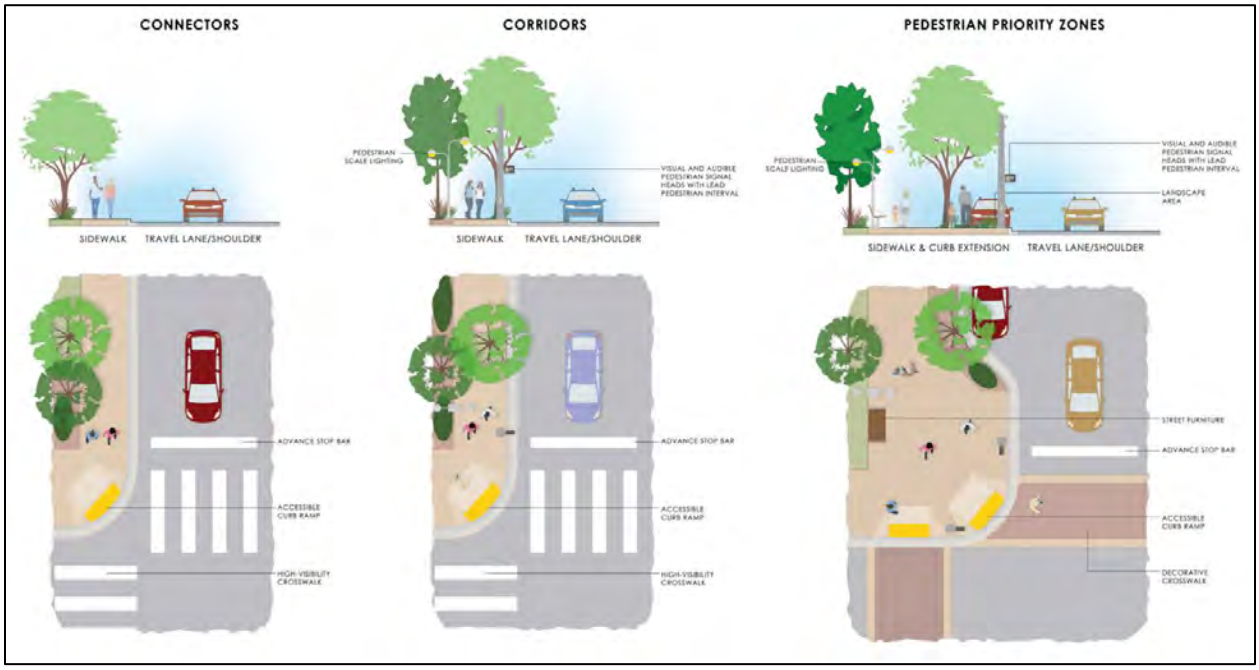

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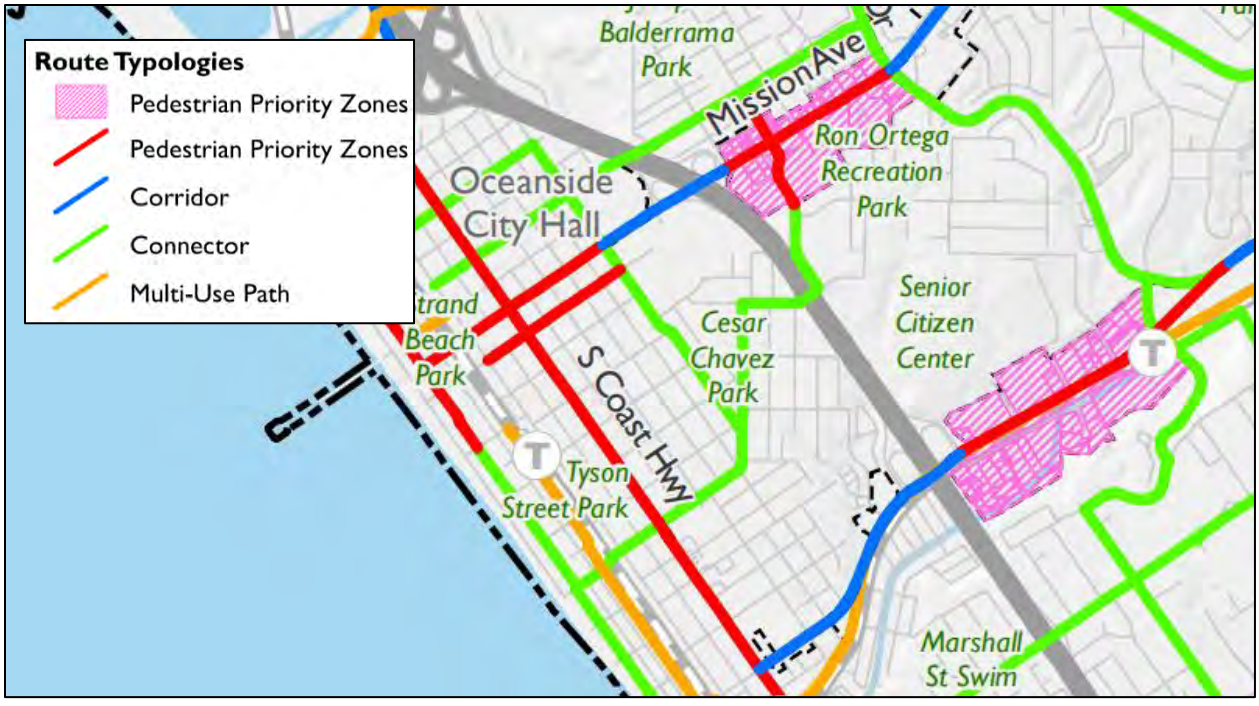
*Figure 4.1*
*Functional Classifications*
*Existing Conditions*

**Figure 4.2** – Pedestrian Route Types




*Source: City of Oceanside Public Review Draft General Plan (2024)*

**Figure 4.3** – Oceanside GPU Pedestrian Network




*Source: City of Oceanside Public Review Draft General Plan (2024)*

### 4.2.2 Bicycle

The following are existing bicycle facilities located within the project study area:

- Seagaze Drive, between N Ditmar Street and N Clementine Street – Class II
- Seagaze Drive, between N Clementine Street and N Horne Street – Class III
- Mission Avenue, between N Ditmar Street and I-5 NB Ramps – Class III
- N Horne Street, between Mission Avenue and Seagaze Drive – Class III

Per the Oceanside PRD GP, as shown in **Figure 4.4**, the bike facilities within the study area are built to their ultimate classification and there are no additional bike facilities proposed.

**Figure 4.4** – Oceanside GPU Bicycle Network




*Source: City of Oceanside Public Review Draft General Plan (2024)*

Based on the preliminary review of the project site plan, the Project would not conflict with existing or planned bicycle facilities and would not result in any impacts to bicyclist safety and accessibility.

### 4.2.3 Transit

The project site is within ½-mile walking distance of the following transit lines serviced by North County Transit District (NCTD):

- Bus Route 303 – Within the project study area, this bus route is serviced along Mission Avenue in the eastbound/westbound direction. The nearest bus stops are located along Mission Avenue, both east and west of N Horne Street. This bus route connects the Oceanside Transit Center to San Luis Rey Transit Center and the Vista Transit Center and includes several school destinations located within the City of Oceanside and the City of Vista. The route operates with headways ranging between 15-30 minutes on both weekdays and weekends.
- Bus Route 313 – Within the project study area, this bus route is serviced along N Horne Street in the northbound/southbound direction and Seagaze Drive in the eastbound/westbound direction. The nearest bus stops are located along N Horne Street and Seagaze Drive, both east and west of Mission Avenue. This bus route connects the Oceanside Transit Center to the San Luis Rey Transit Center and includes several school destinations. The route operates with headways of approximately 60 minutes on weekdays and does not operate on weekends.

Bus route schedules are provided in **Appendix D**. **Table 4.2** identifies the existing amenities provided at each transit stop located within the project study area.

**Table 4.2** – Existing Transit Amenities

| Stop ID | Stop Name | Bench | Shelter | Bus Stop Sign | ADA Accessible Pad | Connection to Adjacent Sidewalk | Trash Receptacle | Lighting | Bicycle Parking | Transit Route Information | Shading Elements | Transit System Information |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20540 | Mission Avenue & Clementine Street (WB) | ● | | ● | | ● | ● | ● | | | | |
| 20155 | Mission Avenue & Horne Street (EB) | ● | ● | ● | | ● | ● | | | | | |
| 20538 | Mission Avenue & N Ditmar Street (WB) | | | ● | | ● | | | ● | | | |
| 22638 | Seagaze Drive & N Ditmar Street (EB) | ● | | ● | | ● | ● | | ● | | | |
| 20399 | Center Avenue & S Horne Street (WB) | | | ● | | ● | | | | | | |
| 20157 | Center Avenue & S Horne Street (EB) | | | ● | | ● | | | | | | |

*Source: CR Associates (2024)*

Based on the preliminary review of the project site plan, the Project would not conflict with existing or planned transit facilities and would not result in any impacts to transit facilities.

## 4.3 Existing Traffic Volumes

Traffic counts for study roadway segments and study intersections were conducted on May 15, 2024, by Elite Traffic Dynamics, LLC. Traffic count worksheets are provided in Appendix B. **Figure 4.5** displays the projected daily roadway traffic volumes for study roadway segments and **Figure 4.6** displays the projected peak hour intersection volumes for study intersections.

## 4.4 Existing Traffic Conditions

LOS analyses under Existing conditions were conducted using the methodologies described in Chapter 2. Roadway segment and intersection LOS analysis results are discussed below.

### 4.4.1 Roadway Segment Analysis

**Table 4.3** displays the roadway segment LOS analysis results for study roadway segments under Existing conditions.

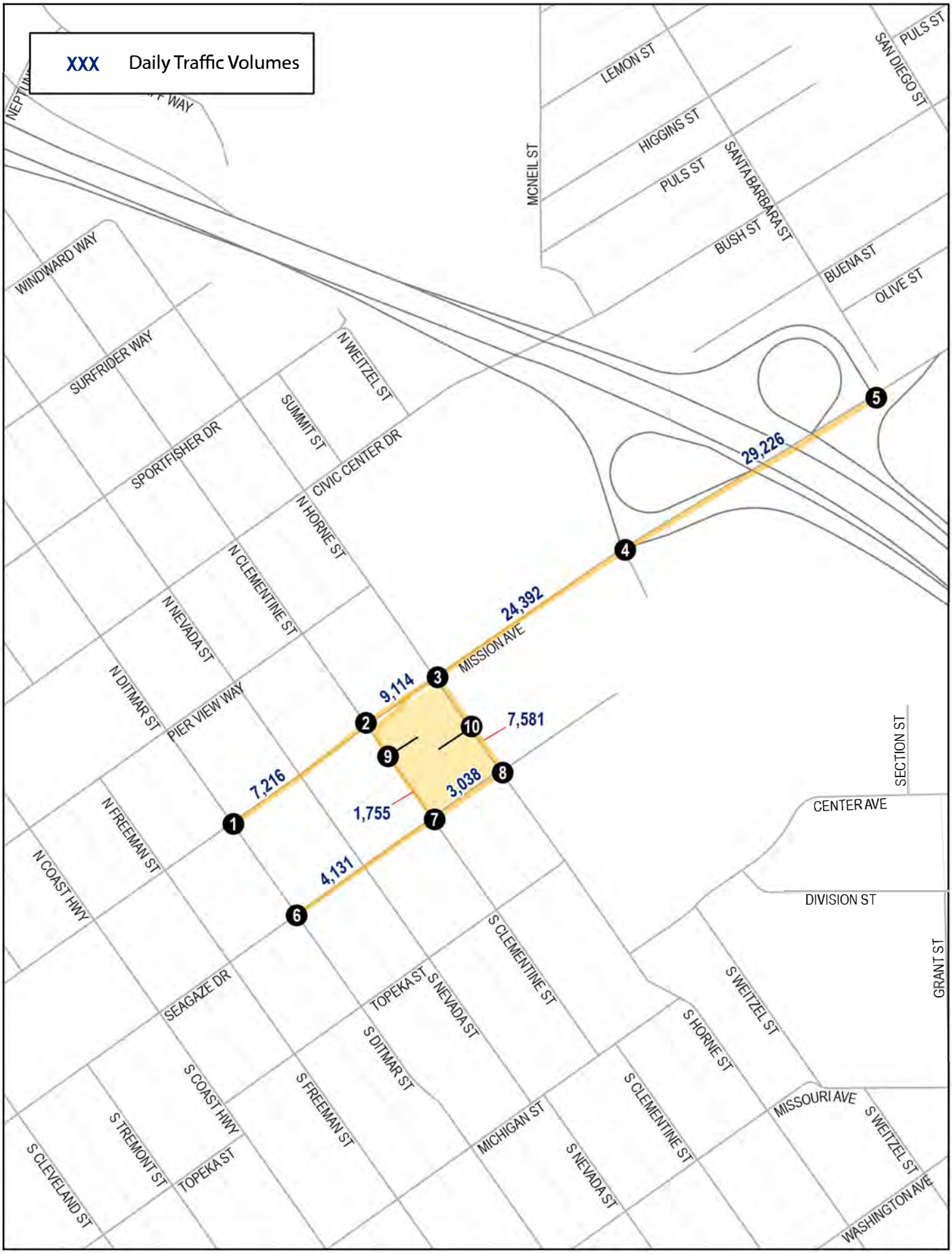
**Table 4.3** – Roadway Segment LOS Results – Existing Conditions

| Roadway | Segment | Function Classification | Capacity (LOS E) | ADT | V/C | LOS |
|---|---|---|---|---|---|---|
| Mission Avenue | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 7,216 | 0.412 | A |
| Mission Avenue | N Clementine Street to N Horne Street | 4-Lane Secondary Collector w/o TWLTL | 25,000 | 9,114 | 0.365 | B |
| Mission Avenue | N Horne Street to I-5 SB Ramps | 4-Lane Major Arterial | 40,000 | 24,392 | 0.610 | C |
| Mission Avenue | I-5 SB Ramps to I-5 NB Ramps | 4-Lane Major Arterial | 40,000 | 29,226 | 0.731 | C |
| Seagaze Drive | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 4,131 | 0.236 | A |
| Seagaze Drive | N Clementine Street to N Horne Street | 2-Lane Collector w/o TWLTL | 10,000 | 3,038 | 0.304 | A |
| N Clementine Street | Mission Avenue to Seagaze Drive | 1-Lane Collector (One-Way) | 8,750 | 1,755 | 0.201 | A |
| N Horne Street | Mission Avenue to Seagaze Drive | 2-Lane Collector w/o TWLTL | 10,000 | 7,581 | 0.758 | D |

*Source: CR Associates (2024)*

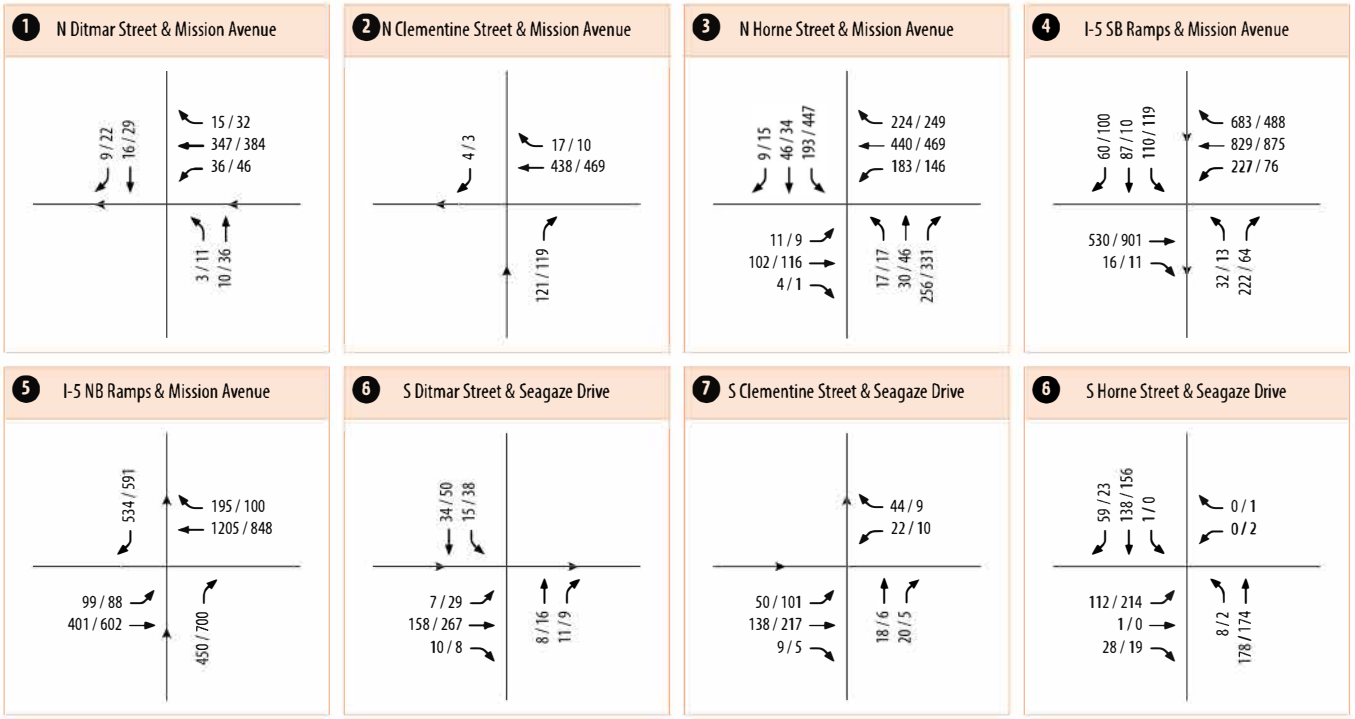
Note:
TWLTL = Two-Way Left-Turn Lane.
V/C = Volume-to-Capacity.

As shown, all of the study roadway segments currently operate at acceptable LOS D or better.




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*Figure 4.5*
*Daily Traffic Volumes*
*Existing Conditions*




**901 Mission Avenue**
**Local Transportation Study**



*Figure 4.6*
*AM/PM Peak Hour Intersection Traffic Volumes*
*Existing Conditions*

### 4.4.2 Intersection Analysis

**Table 4.4** displays intersection LOS and average vehicle delay results for the study intersections under Existing conditions. LOS calculation worksheets for Existing conditions are provided in **Appendix E**.

**Table 4.4** – Peak Hour Intersection LOS Results – Existing Conditions

| # | Intersection | Control Type | Peak Hour | Avg. Delay (sec.) | LOS |
|---|---|---|---|---|---|
| 1 | N Ditmar Street & Mission Avenue | Signal | AM | 4.6 | A |
| | | | PM | 5.9 | A |
| 2 | N Clementine Street & Mission Avenue | SSSC | AM | 10.0 | B |
| | | | PM | 10.1 | B |
| 3 | N Horne Street & Mission Avenue | Signal | AM | 29.1 | C |
| | | | PM | 34.2 | C |
| 4 | I-5 SB Ramps & Mission Avenue | Signal | AM | 14.4 | B |
| | | | PM | 11.4 | B |
| 5 | I-5 NB Ramps & Mission Avenue | SSSC | AM | 15.9 | C |
| | | | PM | 91.2 | **F** |
| 6 | N Ditmar Street & Seagaze Drive | AWSC | AM | 8.1 | A |
| | | | PM | 9.1 | A |
| 7 | N Clementine Street & Seagaze Drive | AWSC | AM | 8.4 | A |
| | | | PM | 9.0 | A |
| 8 | N Horne Street & Seagaze Drive | AWSC | AM | 9.7 | A |
| | | | PM | 9.9 | A |

*Source: CR Associates (2024)*

Note:
**Bold** indicates substandard LOS E or LOS F.

As shown, all of the study intersections are projected to operate at acceptable LOS C or better under Existing conditions, with the exception of the following:

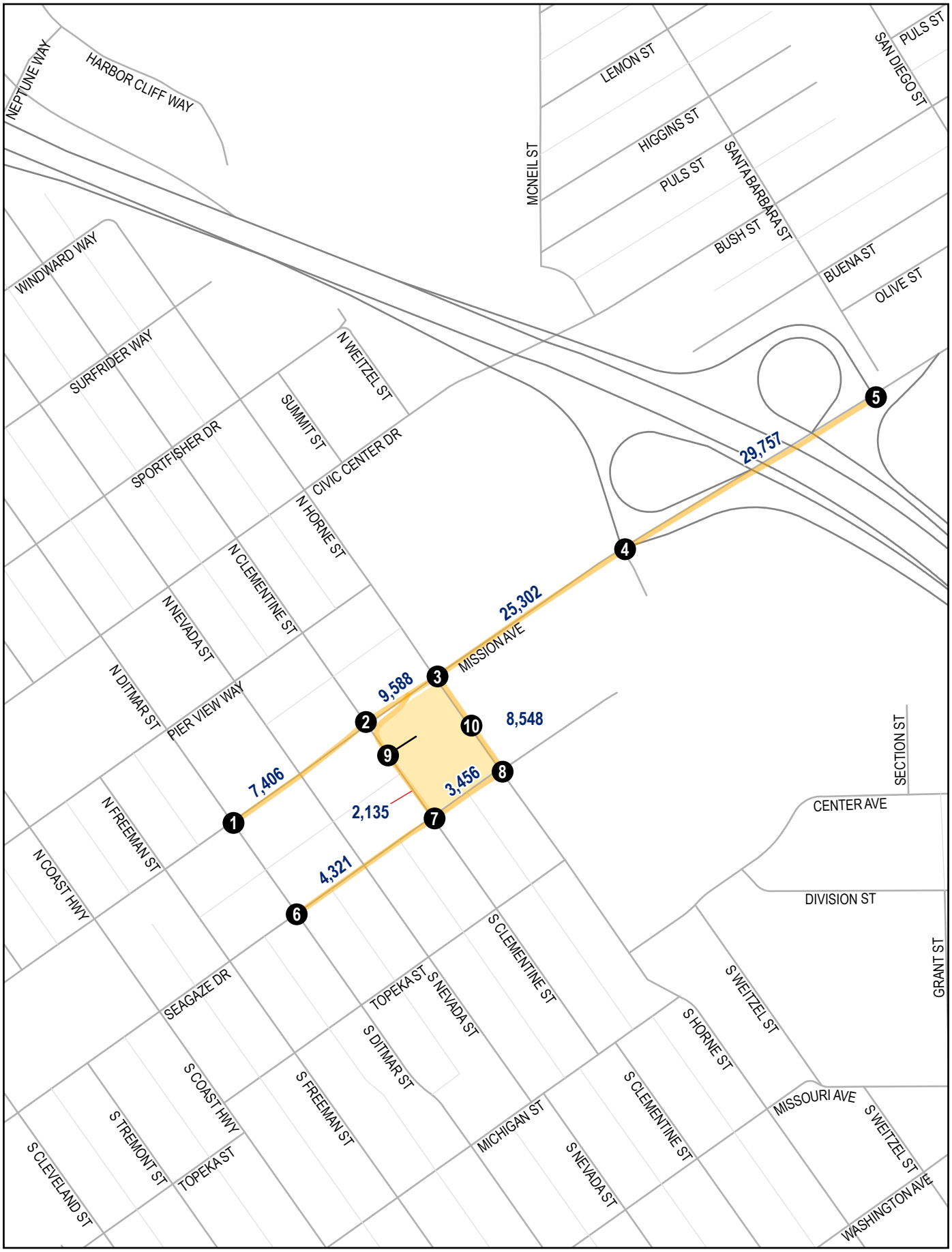
- **I-5 NB Ramps & Mission Avenue** – LOS F during the PM peak hour.

## 4.5 Existing with Project Roadway Network and Traffic Volumes

Functional classifications and intersection geometrics under Existing with Project conditions were assumed to be identical to Existing conditions, with the exception of the following:

- Construction of Project Driveway #1, intersecting with N Clementine Street.
- Construction of Project Driveway #2, intersecting with N Horne Street.
- Restriping of N Horne Street, between Mission Avenue and Seagaze Drive, to include a two-way left-turn lane. As a result, this segment of N Horne Street would be classified as a 2-Lane Collector with Two-Way Left-Turn Lane.

Daily roadway segment and AM/PM peak hour intersection volumes for Existing with Project conditions were derived by combining the Project's trip assignment (Figure 3.3 and Figure 3.4) with the traffic volumes under Existing conditions (Figure 4.5 and Figure 4.6). **Figure 4.7** displays the projected daily roadway traffic volumes for study roadway segments and **Figure 4.8** displays the projected peak hour intersection volumes for study intersections.

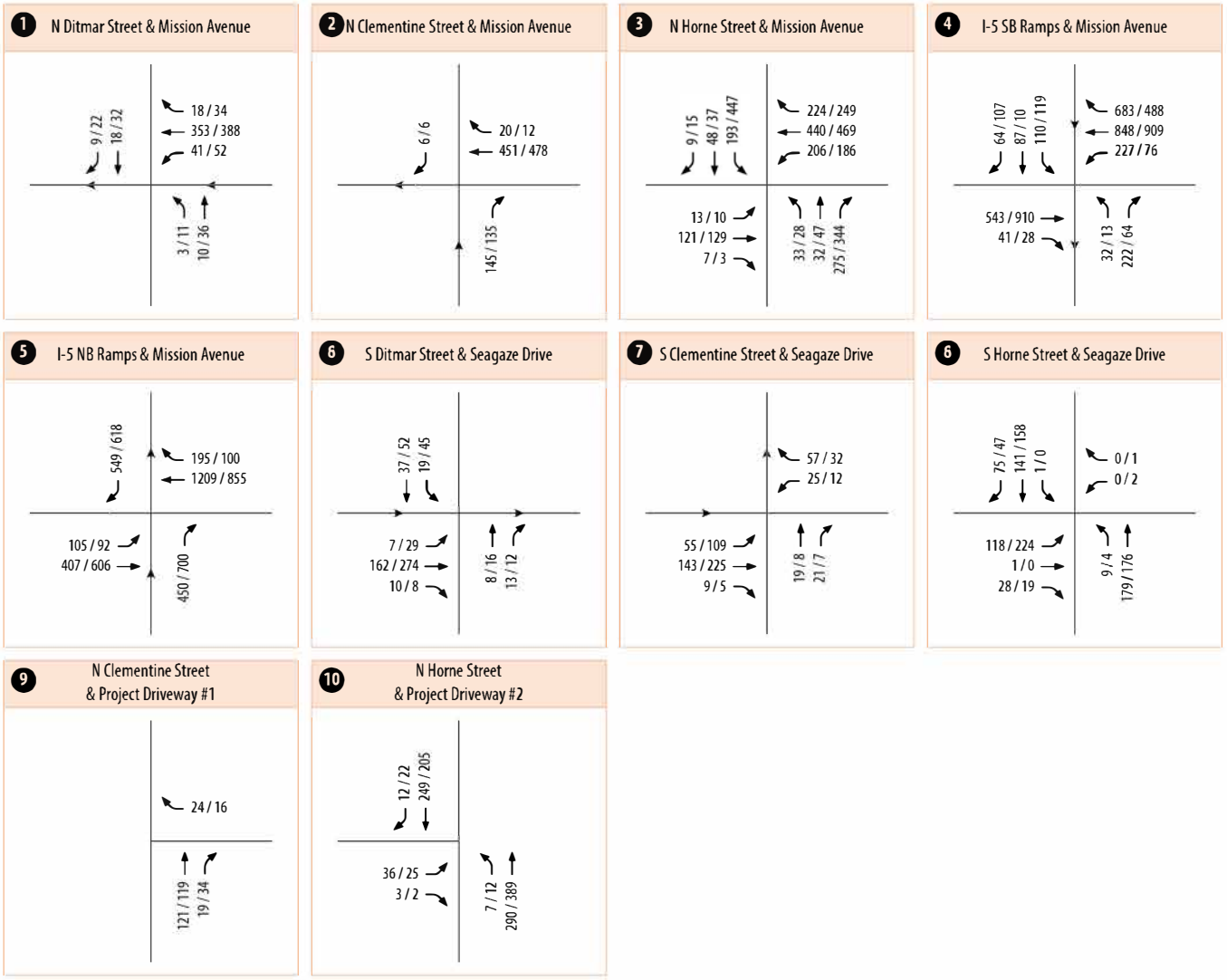



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*Figure 4.7*
*Daily Traffic Volumes*
*Existing with Project Conditions*




**901 Mission Avenue**
**Local Transportation Study**



*Figure 4.8*
*AM/PM Peak Hour Intersection Traffic Volumes*
*Existing with Project Conditions*

## 4.6 Existing with Project Traffic Conditions

LOS analyses under Existing with Project conditions were conducted using the methodologies described in Chapter 2. Roadway segment and intersection LOS analysis results are discussed below.

### 4.6.1 Roadway Segment Analysis

**Table 4.5** displays the roadway segment LOS analysis results for study roadway segments under Existing with Project conditions.

As shown, all of the study roadway segments are projected to operate at acceptable LOS D or better under Existing with Project conditions, including the segment of N Horne Street, between Mission Avenue and Seagaze Drive, which is improved from LOS D to LOS C due to the Project's proposed restriping to include a two-way left-turn lane. Therefore, no roadway segment improvements will be required.

### 4.6.2 Intersection Analysis

**Table 4.6** displays intersection LOS and average vehicle delay results for the study intersections under Existing with Project conditions. LOS calculation worksheets for Existing with Project conditions are provided in **Appendix F**.

As shown, all of the study intersections are projected to operate at acceptable LOS D or better under Existing with Project conditions, with the exception of the following:

- **I-5 NB Ramps & Mission Avenue** – LOS F. Implementation of the Project would cause this intersection to increase in delay by 1.8 seconds. However, since the Project does not add more than 2.0 seconds to an intersection already operating at unacceptable LOS F, the Project does not degrade LOS to unacceptable levels.

No study intersections are anticipated to degrade in LOS to unacceptable levels. Therefore, no intersection improvements will be required.

**Table 4.5** – Roadway Segment LOS Results – Existing with Project Conditions

| Roadway | Segment | Existing | | | | | Existing with Project | | | | | ΔV/C | Improvement Required? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Function Classification | Capacity (LOS E) | ADT | V/C | LOS | Function Classification | Capacity (LOS E) | ADT | V/C | LOS | | |
| Mission Avenue | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 7,216 | 0.412 | A | 2-Lane Collector (One-Way) | 17,500 | 7,406 | 0.423 | A | 0.011 | No |
| Mission Avenue | N Clementine Street to N Horne Street | 4-Lane Secondary Collector w/o TWLTL | 25,000 | 9,114 | 0.365 | B | 4-Lane Secondary Collector w/o TWLTL | 25,000 | 9,588 | 0.384 | B | 0.019 | No |
| Mission Avenue | N Horne Street to I-5 SB Ramps | 4-Lane Major Arterial | 40,000 | 24,392 | 0.610 | C | 4-Lane Major Arterial | 40,000 | 25,302 | 0.633 | C | 0.023 | No |
| Mission Avenue | I-5 SB Ramps to I-5 NB Ramps | 4-Lane Major Arterial | 40,000 | 29,226 | 0.731 | C | 4-Lane Major Arterial | 40,000 | 29,757 | 0.744 | C | 0.013 | No |
| Seagaze Drive | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 4,131 | 0.236 | A | 2-Lane Collector (One-Way) | 17,500 | 4,321 | 0.247 | A | 0.011 | No |
| Seagaze Drive | N Clementine Street to N Horne Street | 2-Lane Collector w/o TWLTL | 10,000 | 3,038 | 0.304 | A | 2-Lane Collector w/o TWLTL | 10,000 | 3,456 | 0.346 | A | 0.042 | No |
| N Clementine Street | Mission Avenue to Seagaze Drive | 1-Lane Collector (One-Way) | 8,750 | 1,755 | 0.201 | A | 1-Lane Collector (One-Way) | 8,750 | 2,135 | 0.244 | A | 0.043 | No |
| N Horne Street | Mission Avenue to Seagaze Drive | 2-Lane Collector w/o TWLTL | 10,000 | 7,581 | 0.758 | D | 2-Lane Collector w/ TWLTL | 15,000 | 8,548 | 0.570 | C | -0.188 | No |

*Source: CR Associates (2024)*

Notes:
TWLTL = Two-Way Left-Turn Lane.
V/C = Volume-to-Capacity.

**Table 4.6** – Peak Hour Intersection LOS Results – Existing with Project Conditions

| # | Intersection | Control Type | Peak Hour | Existing | | Existing with Project | | Δ | Improvement Required? |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Avg. Delay (sec.) | LOS | Avg. Delay (sec.) | LOS | | |
| 1 | N Ditmar Street & Mission Avenue | Signal | AM | 4.6 | A | 4.6 | A | 0.0 | No |
| | | | PM | 5.9 | A | 6.0 | A | 0.1 | |
| 2 | N Clementine Street & Mission Avenue | SSSC | AM | 10.0 | B | 10.1 | B | 0.1 | No |
| | | | PM | 10.1 | B | 10.2 | B | 0.1 | |
| 3 | N Horne Street & Mission Avenue | Signal | AM | 29.1 | C | 30.5 | C | 1.4 | No |
| | | | PM | 34.2 | C | 40.9 | D | 6.7 | |
| 4 | I-5 SB Ramps & Mission Avenue | Signal | AM | 14.4 | B | 14.6 | B | 0.2 | No |
| | | | PM | 11.4 | B | 11.6 | B | 0.2 | |
| 5 | I-5 NB Ramps & Mission Avenue | SSSC | AM | 15.9 | C | 16.0 | C | 0.1 | No[1] |
| | | | PM | 91.2 | **F** | 93.0 | **F** | 1.8 | |
| 6 | N Ditmar Street & Seagaze Drive | AWSC | AM | 8.1 | A | 8.2 | A | 0.1 | No |
| | | | PM | 9.1 | A | 9.2 | A | 0.1 | |
| 7 | N Clementine Street & Seagaze Drive | AWSC | AM | 8.4 | A | 8.5 | A | 0.1 | No |
| | | | PM | 9.0 | A | 8.9 | A | -0.1 | |
| 8 | N Horne Street & Seagaze Drive | AWSC | AM | 9.7 | A | 9.9 | A | 0.2 | No |
| | | | PM | 9.9 | A | 10.2 | B | 0.3 | |
| 9 | N Ditmar Street & Mission Avenue | Signal | AM | N/A | N/A | 8.8 | A | 8.8 | No |
| | | | PM | N/A | N/A | 8.8 | A | 8.8 | |
| 10 | N Clementine Street & Mission Avenue | SSSC | AM | N/A | N/A | 13.5 | B | 13.5 | No |
| | | | PM | N/A | N/A | 14.1 | B | 14.1 | |

*Source: CR Associates (2024)*

Notes:
SSSC = Side-Street Stop-Controlled. For SSSC intersections, the delay shown is the worst delay experienced by any of the movements.
**Bold** indicates substandard LOS E or LOS F.
[1] Although the intersection operates at LOS E or F, it does not meet the threshold that would require improvements.

# 5.0 Opening Year (2030) Conditions

This section provides an analysis of Opening Year (2030) conditions both with and without the Project. The scenarios analyzed in this section include:

- Opening Year (2030)
- Opening Year (2030) with Project

## 5.1 Cumulative Project Traffic

The following projects were identified by City of Oceanside staff as cumulative projects, since they are anticipated to contribute traffic within the project study area by the Project's opening year:

- **522 N Tremont Street Condos**: This project proposes to construct two condominiums.
- **702 N Freeman Mixed-Use**: This project proposes to construct 5 multi-family dwelling units with a hair salon and a fitness studio.
- **Sunsets Mixed-Use**: This project proposes to construct 180 multi-family dwelling units, including 18 affordable units, and 5,000 square feet of retail space.
- **Pier View Way Mixed-Use**: This project proposes to construct 64 multi-family dwelling units and 2,450 square-feet of retail space.
- **716 Seagaze Drive**: This project proposes to construct 179 multi-family dwelling units and 1,581 square feet of retail space.
- **One 11 S Tremont**: This project proposes to construct 12 multi-family dwelling units and a 1,500 square-foot fitness studio.
- **405 S Tremont Condos**: This project proposes to construct 8 multi-family dwelling units.
- **801 Mission Avenue**: This project proposes to construct approximately 230 residential units and approximately 6,000 square feet of retail/restaurant space.
- **810 Mission Avenue**: This project proposes to replace an existing office building with 206 residential units, including five live/work units.
- **Oceanside Transit Center**: This project proposes a Mixed-Use Transit Oriented Design that includes a bus/rail transit station, hotel, office, retail, multifamily residential, and other associated amenities.
- **401 Mission Avenue:** This project proposes to construct 332 apartments units and 19,420 square feet of commercial uses, including 8,311 square feet of retail and 11,109 square feet of restaurant space), in a new 5-story building. The project would replace 79,805 square feet of specialty retail and theater uses.
- **Oceanside Blocks 5 & 20:** This project proposes a mixed-use development, including the redevelopment of two downtown city blocks with 193 multi-family units and 1,474 square feet of retail on Block 5 (north of Pier View Way) and 180 multi-family units and 2,612 square feet of retail on Block 20 (between Pier View Way and Mission Avenue)

The traffic generated from the projects listed above was included in the Opening Year (2030) Base scenario. **Figure 5.1** displays the location of the cumulative projects identified above.

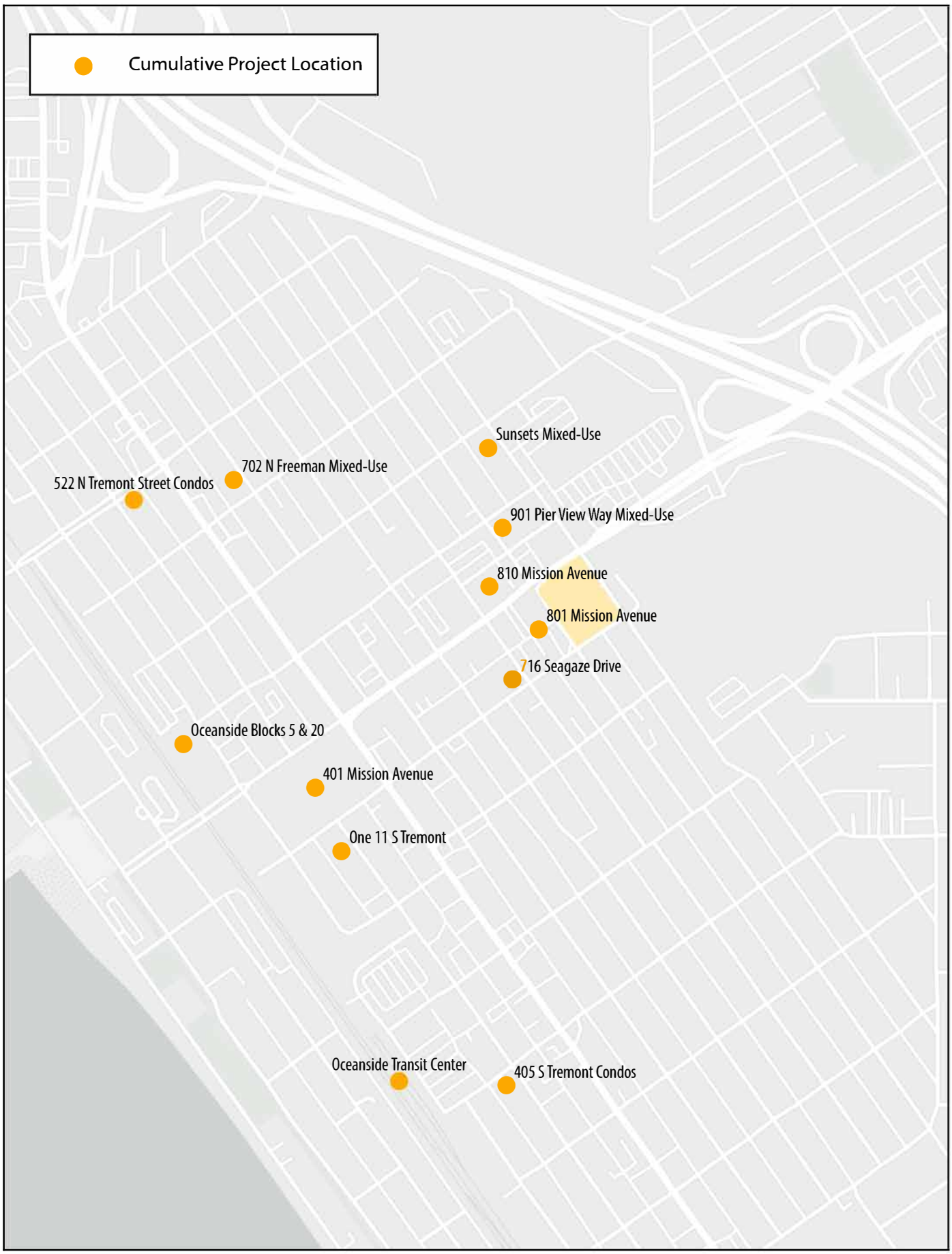





*Figure 5.1*
*Cumulative Project Locations*

## 5.2 Cumulative Project Trip Generation

Cumulative project traffic was assigned to the project study area as identified within their respective traffic studies. Cumulative project traffic for cumulative projects without completed traffic studies were estimated and assigned to the project study area utilizing the same methodology used for the Project, described in Chapter 3.0. **Table 5.1** displays the projected trip generation for the cumulative projects. **Figure 5.2** displays the daily cumulative project trip assignment for study roadway segments and **Figure 5.3** displays the AM/PM peak hour cumulative project trip assignment for study intersections. Relevant excerpts from the sources of information regarding the cumulative projects are provided in **Appendix G**.

As shown, the cumulative projects are anticipated to generate 15,205 daily trips, including 1,217 (349-in/888-out) trips during the AM peak hour and 1,371 (903-in/488-out) trips during the PM peak hour.

## 5.3 Opening Year (2030) Roadway Network and Traffic Volumes

Roadway functional classifications and intersection geometrics under Opening Year (2030) conditions were assumed to be identical to the Existing conditions.

Opening Year (2030) scenario traffic volumes were developed by adding the trips generated by the cumulative projects (Figure 5.2 and Figure 5.3) to the existing traffic volumes (Figure 4.5 and Figure 4.6). **Figure 5.4** displays the projected daily roadway traffic volumes for study roadway segments and **Figure 5.5** displays the projected peak hour intersection volumes for study intersections.

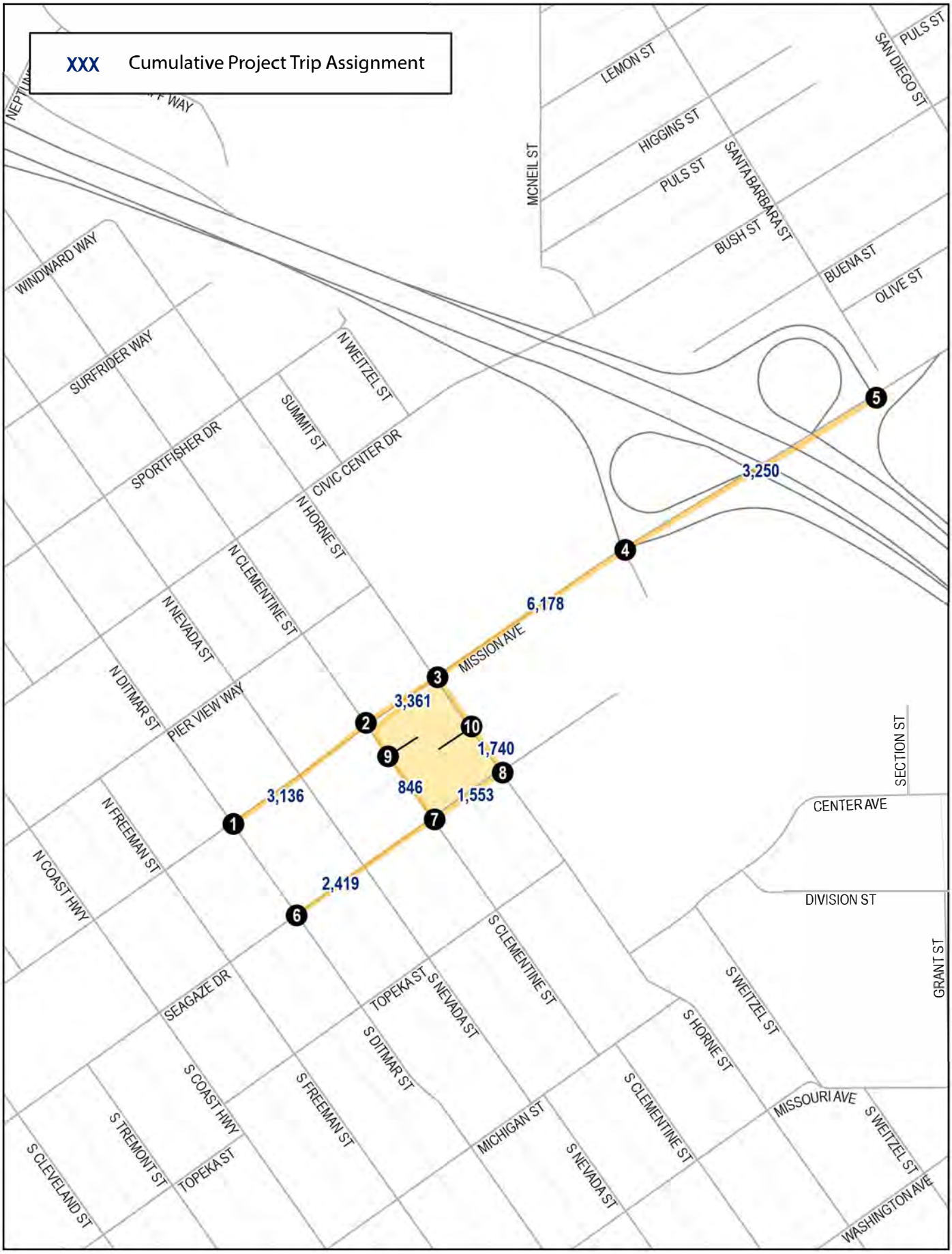
## 5.4 Opening Year (2030) Traffic Conditions

LOS analyses under Opening Year (2030) conditions were conducted using the methodologies described in Chapter 2. Roadway segment and intersection LOS analysis results are discussed below.

## Table 5.1 – Cumulative Project Trip Generation

| Land Use | Units | Trip Rate | ADT | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Trips | In | Out | Trips | In | Out |
| **522 N Tremont Street Condos** | | | | | | | | | |
| Single-Family Attached Housing | 2 DU | 7.2 | 14 | 1 | 0 | 1 | 1 | 1 | 0 |
| **702 N Freeman Mixed-Use** | | | | | | | | | |
| Multifamily Housing (Low-Rise) | 5 DU | 6.74 | 34 | 2 | 1 | 1 | 2 | 1 | 1 |
| Hair Salon | 0.5 KSF | 8 | 4 | 1 | 1 | 0 | 1 | 0 | 1 |
| Health/Fitness Club | 0.5 KSF | 10 | 5 | 1 | 0 | 1 | 2 | 1 | 1 |
| **Sunsets Mixed-Use** | | | | | | | | | |
| Multifamily Housing (Mid-Rise) | 162 DU | 4.54 | 735 | 60 | 19 | 41 | 63 | 36 | 27 |
| Affordable Housing | 18 DU | 4.81 | 87 | 9 | 3 | 6 | 8 | 5 | 3 |
| Strip Retail Plaza (<40k) | 5 KSF | 54.45 | 272 | 12 | 7 | 5 | 33 | 16 | 15 |
| **Pier View Way Mixed-Use** | | | | | | | | | |
| ***Existing*** | | | | | | | | | |
| Multifamily Housing (Mid-Rise) | 2 DU | 8 | 16 | 2 | 1 | 1 | 2 | 2 | 0 |
| ***Proposed*** | | | | | | | | | |
| Multifamily Housing (Mid-Rise) | 64 DU | 8 | 512 | 41 | 9 | 32 | 52 | 37 | 15 |
| Specialty Retail | 2.45 KSF | 40 | 98 | 3 | 2 | 1 | 9 | 5 | 4 |
| **716 Seagaze Drive** | | | | | | | | | |
| Multifamily Housing (Mid-Rise) | 179 DU | 6 | 1,074 | 86 | 17 | 69 | 97 | 68 | 29 |
| Specialty Retail | 1.581 KSF | 160 | 253 | 20 | 10 | 10 | 20 | 12 | 8 |
| **One 11 S Tremont** | | | | | | | | | |
| Multifamily Housing (Mid-Rise) | 12 DU | 4.54 | 54 | 4 | 1 | 3 | 5 | 3 | 2 |
| Health/Fitness Club | 1.5 KSF | 10 | 15 | 2 | 1 | 1 | 5 | 3 | 2 |
| **405 S Tremont Condos** | | | | | | | | | |
| Multifamily Housing (Low-Rise) | 8 DU | 7.2 | 58 | 3 | 1 | 2 | 4 | 3 | 1 |
| **801 Mission Avenue** | | | | | | | | | |
| Multi-Family Residential (<20 DU/acre) | 230 DU | 6 | 1,380 | 110 | 22 | 88 | 124 | 87 | 37 |
| High Turnover Restaurant | 6 KSF | 160 | 960 | 77 | 39 | 38 | 77 | 46 | 31 |
| Mixed Use (10%) Reduction | | | 234 | 19 | 6 | 13 | 20 | 13 | 7 |
| Transit Use (5%) Reduction | | | 117 | 9 | 3 | 6 | 10 | 7 | 3 |
| Net Total | | | 1,989 | 159 | 52 | 107 | 171 | 113 | 58 |
| **810 Mission Avenue** | | | | | | | | | |
| ***Existing*** | | | | | | | | | |
| Office | 30 KSF | 20 | 600 | 84 | 76 | 8 | 78 | 16 | 62 |
| ***Proposed*** | | | | | | | | | |
| Multi-family Residential | 201 DU | 6 | 1,206 | 96 | 19 | 77 | 109 | 76 | 33 |
| Live/Work Live Space | 5 DU | 6 | 30 | 2 | 0 | 2 | 3 | 2 | 1 |
| Live/Work Work Space | 2.2 KSF | 20 | 44 | 6 | 5 | 1 | 6 | 1 | 5 |
| Net Total | | | 680 | 20 | -52 | 72 | 40 | 63 | -23 |
| **Oceanside Transit Center** | | | | | | | | | |
| Multi-family Residential | 547 DU | 6 | 3,282 | 263 | 53 | 210 | 295 | 207 | 88 |
| Retail, Food & Beverage | 29.2 KSF | 120 | 3,504 | 140 | 84 | 56 | 350 | 175 | 175 |
| NCTD Headquarters | 58.1 KSF | 12 | 697 | 98 | 89 | 9 | 84 | 10 | 74 |
| Hotel | 170 Room | 4 | 680 | 61 | 24 | 37 | 54 | 30 | 24 |
| Total Trip Reduction | | | 1,902 | 121 | 54 | 67 | 180 | 98 | 82 |
| Net Total | | | 6,261 | 441 | 196 | 245 | 603 | 324 | 279 |
| **401 Mission Avenue** | | | | | | | | | |
| ***Existing*** | | | | | | | | | |
| Existing Site Total | | | 2,905 | 87 | 75 | 35 | 261 | 131 | 130 |
| ***Proposed*** | | | | | | | | | |
| Apartments | 332 DU | 6 | 1,992 | 159 | 32 | 127 | 179 | 125 | 54 |
| Retail | 8.31 KSF | 40 | 332 | 10 | 6 | 4 | 30 | 15 | 15 |
| Restaurant | 11.1 KSF | 160 | 1,777 | 142 | 71 | 71 | 142 | 85 | 57 |
| Total Reductions | | | 369 | 28 | 10 | 18 | 33 | 21 | 12 |
| Net Total | | | 827 | 196 | 46 | 149 | 58 | 74 | -15 |
| **Oceanside Blocks 5 & 20** | | | | | | | | | |
| Quality Restaurant | 1.47 KSF | 100 | 147 | 1 | 1 | 0 | 12 | 8 | 4 |
| Multi-Family Residential (<20 DU/acre) | 193 DU | 6 | 1,158 | 93 | 19 | 74 | 104 | 73 | 31 |
| Quality Restaurant | 2.61 KSF | 100 | 261 | 3 | 2 | 1 | 21 | 15 | 6 |
| Multi-Family Residential (<20 DU/acre) | 180 DU | 6 | 1,080 | 86 | 17 | 69 | 97 | 68 | 29 |
| Mixed Use (10%) Reduction | | | 265 | 18 | 4 | 14 | 23 | 16 | 7 |
| Transit Use (5%) Reduction | | | 132 | 9 | 2 | 7 | 12 | 8 | 4 |
| Net Total | | | 2,249 | 156 | 33 | 122 | 199 | 139 | 60 |
| **Total** | | | **15,205** | **1,217** | **349** | **868** | **1,371** | **903** | **468** |

*Source: CR Associates (2024); ITE Trip Generation Manual (2024)*




**901 Mission Avenue**
**Local Transportation Study**

*Figure 5.2*
*Cumulative Project Trip Assignment*

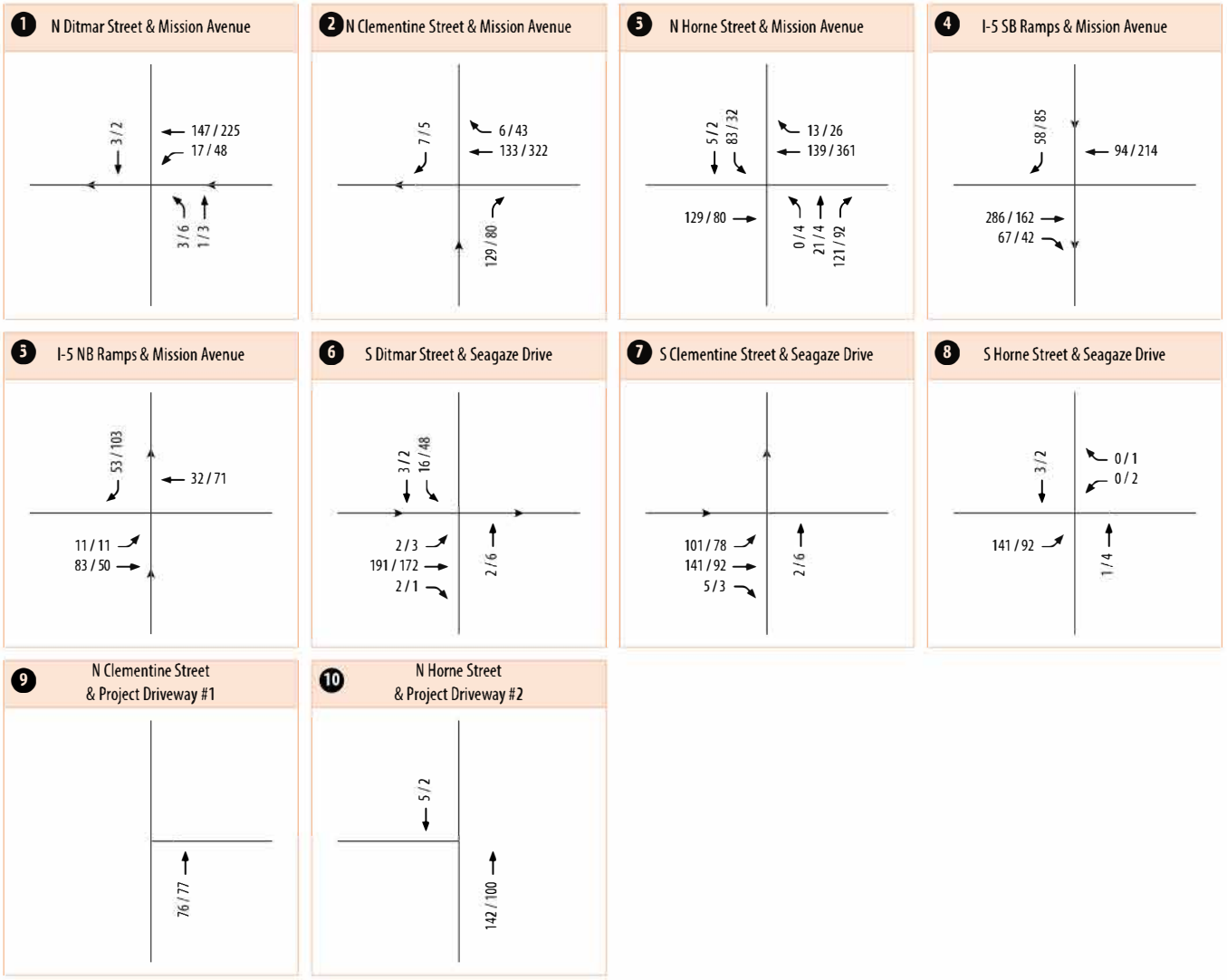
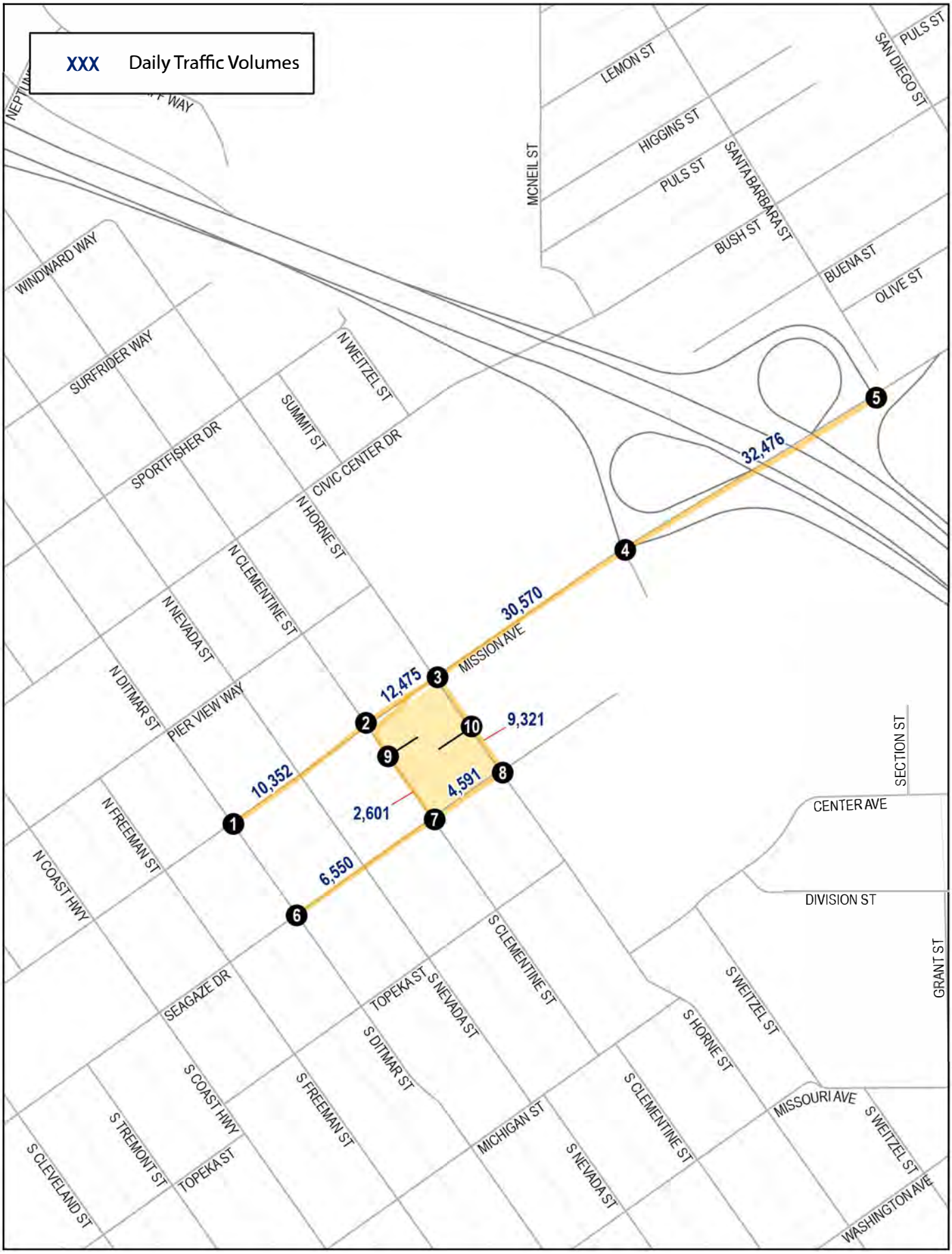



*Figure 5.3*
*Peak Hour Cumulative Project Trip Assignment*

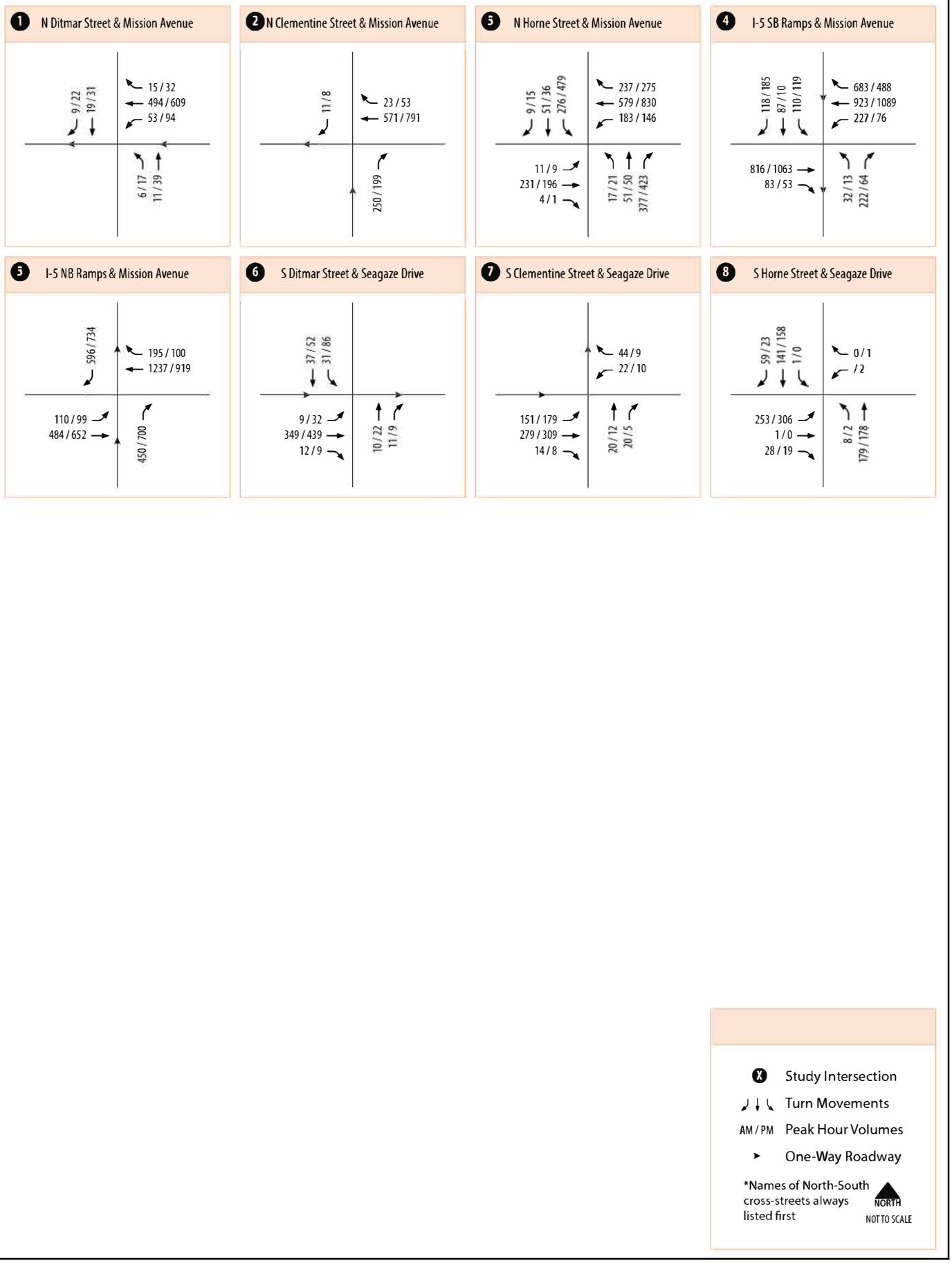



**901 Mission Avenue**
**Local Transportation Study**

C+R



*Figure 5.4*
*Daily Traffic Volumes*
*Opening Year (2030) Conditions*




**901 Mission Avenue**
**Local Transportation Study**



*Figure 5.5*
*AM/PM Peak Hour Intersection Traffic Volumes*
*Opening Year (2030) Conditions*

### 5.4.2 Roadway Segment Analysis

**Table 5.1** displays the roadway segment LOS analysis results for study roadway segments under Opening Year (2030) conditions.

**Table 5.1** – Roadway Segment LOS Results – Opening Year (2030) Conditions

| Roadway | Segment | Function Classification | Capacity (LOS E) | ADT | V/C | LOS |
|---|---|---|---|---|---|---|
| Mission Avenue | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 10,352 | 0.592 | C |
| Mission Avenue | N Clementine Street to N Horne Street | 4-Lane Secondary Collector w/o TWLTL | 25,000 | 12,475 | 0.499 | B |
| Mission Avenue | N Horne Street to I-5 SB Ramps | 4-Lane Major Arterial | 40,000 | 30,570 | 0.764 | D |
| Mission Avenue | I-5 SB Ramps to I-5 NB Ramps | 4-Lane Major Arterial | 40,000 | 32,476 | 0.812 | D |
| Seagaze Drive | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 6,550 | 0.374 | A |
| Seagaze Drive | N Clementine Street to N Horne Street | 2-Lane Collector w/o TWLTL | 10,000 | 4,591 | 0.459 | B |
| N Clementine Street | Mission Avenue to Seagaze Drive | 1-Lane Collector (One-Way) | 8,750 | 2,601 | 0.297 | A |
| N Horne Street | Mission Avenue to Seagaze Drive | 2-Lane Collector w/o TWLTL | 10,000 | 9,321 | 0.932 | **E** |

*Source: CR Associates (2024)*

Note:
TWLTL = Two-Way Left-Turn Lane.
V/C = Volume-to-Capacity.
**Bold** indicates substandard LOS E or F.

As shown, all of the study roadway segments are projected to operate at acceptable LOS D or better under Opening Year (2030) conditions, except for the following:

- **N Horne Street, between Mission Avenue and Seagaze Drive** – LOS E

### 5.4.3 Intersection Analysis

**Table 5.2** displays intersection LOS and average vehicle delay results for the study intersections under Opening Year (2030) conditions. LOS calculation worksheets for Opening Year (2030) conditions are provided in **Appendix H**.

**Table 5.2** – Peak Hour Intersection LOS Results – Opening Year (2030) Conditions

| # | Intersection | Control Type | Peak Hour | Avg. Delay (sec.) | LOS |
|---|---|---|---|---|---|
| 1 | N Ditmar Street & Mission Avenue | Signal | AM | 5.0 | A |
| | | | PM | 6.4 | A |
| 2 | N Clementine Street & Mission Avenue | SSSC | AM | 10.7 | B |
| | | | PM | 11.9 | B |
| 3 | N Horne Street & Mission Avenue | Signal | AM | 37.5 | D |
| | | | PM | 60.9 | **E** |
| 4 | I-5 SB Ramps & Mission Avenue | Signal | AM | 17.2 | B |
| | | | PM | 14.0 | B |
| 5 | I-5 NB Ramps & Mission Avenue | SSSC | AM | 17.7 | C |
| | | | PM | 108.8 | **F** |
| 6 | N Ditmar Street & Seagaze Drive | AWSC | AM | 9.5 | A |
| | | | PM | 10.8 | B |
| 7 | N Clementine Street & Seagaze Drive | AWSC | AM | 10.6 | B |
| | | | PM | 10.2 | B |
| 8 | N Horne Street & Seagaze Drive | AWSC | AM | 12.2 | B |
| | | | PM | 11.3 | B |

*Source: CR Associates (2024)*

Note:
**Bold** indicates substandard LOS E or LOS F.
SSSC = Side-Street Stop-Controlled. For SSSC intersections, the delay shown is the worst delay experienced by any of the approaches.
AWSC = All-Way Stop-Controlled. For AWSC intersections, the delay shown is the average delay experienced by all of the approaches.

As shown, all of the study intersections are projected to operate at acceptable LOS D or better under Opening Year (2030) conditions, with the exception of the following:

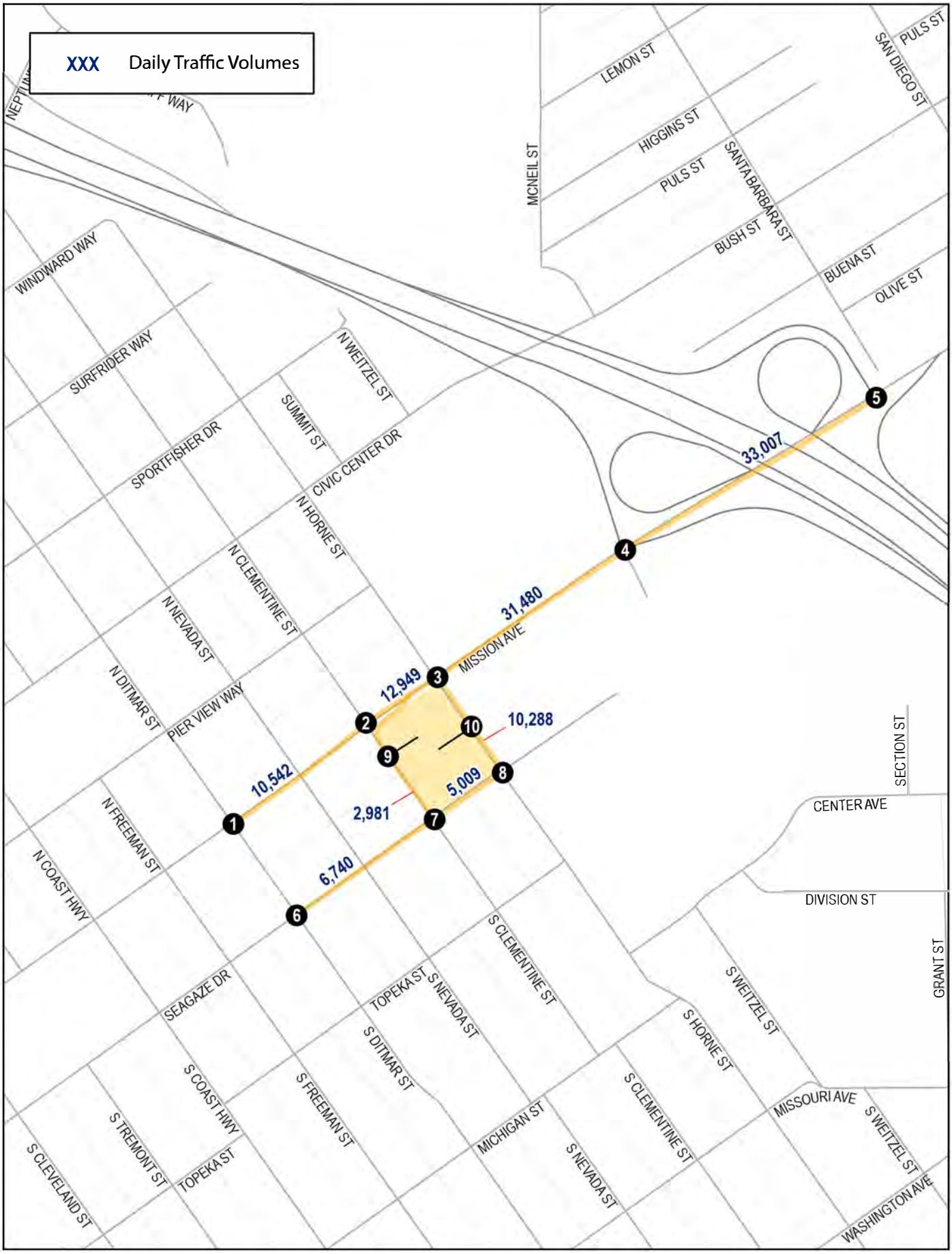
- **N Horne Street & Mission Avenue** – LOS E during the PM peak hour.
- **I-5 NB Ramps & Mission Avenue** – LOS F during the PM peak hour.

## 5.5 Opening Year (2030) with Project Roadway Network and Traffic Volumes

Functional classifications and intersection geometrics under Opening Year (2030) with Project conditions were assumed to be identical to Opening Year (2030) conditions, with the exception of the following:

- Construction of Project Driveway #1, intersecting with N Clementine Street.
- Construction of Project Driveway #2, intersecting with N Horne Street.
- Restriping of N Horne Street, between Mission Avenue and Seagaze Drive, to include a two-way left-turn lane. As a result, this segment of N Horne Street would be classified as a 2-Lane Collector with Two-Way Left-Turn Lane.

Daily roadway segment and AM/PM peak hour intersection volumes for Opening year (2030) with Project conditions were derived by combining the Project's trip assignment (Figure 3.3 and Figure 3.4) with the traffic volumes under Opening Year (2030) conditions (Figure 5.4 and Figure 5.5). **Figure 5.6** displays the projected daily roadway traffic volumes for study roadway segments and **Figure 5.7** displays the projected peak hour intersection volumes for study intersections.




**901 Mission Avenue**
**Local Transportation Study**

*Figure 5.6*
*Daily Traffic Volumes*
*Opening Year (2030) with Project Conditions*

**Figure 5.7** – AM/PM Peak Hour Intersection Traffic Volumes – Opening Year (2030) with Project Conditions

## 5.1 Opening Year (2030) with Project Traffic Conditions

LOS analyses under Opening Year (2030) with Project conditions were conducted using the methodologies described in Chapter 2. Roadway segment and intersection LOS analysis results are discussed below.

### 5.1.1 Roadway Segment Analysis

**Table 5.3** displays the roadway segment LOS analysis results for study roadway segments under Opening Year (2030) with Project conditions.

As shown, all of the study roadway segments are projected to operate at acceptable LOS D or better under Opening Year (2030) with Project conditions, including the segment of N Horne Street, between Mission Avenue and Seagaze Drive, which is improved from LOS E to LOS D due to the Project's proposed restriping to include a two-way left-turn lane. Therefore, no roadway segment improvements will be required.

### 5.1.2 Intersection Analysis

**Table 5.4** displays intersection LOS and average vehicle delay results for the study intersections under Opening Year (2030) with Project conditions. LOS calculation worksheets for Opening Year (2030) with Project conditions are provided in **Appendix I**.

As shown, all of the study intersections are projected to operate at acceptable LOS D or better under Opening Year (2030) with Project conditions, with the exception of the following:

- **N Horne Street & Mission Avenue** – LOS E during the PM peak hour. Implementation of the Project would cause this intersection already operating at LOS E to increase in delay by 2.0 seconds. However, since the Project does not add more than 2.0 seconds to an intersection already operating at unacceptable LOS E, the Project does not degrade LOS to unacceptable levels.
- **I-5 NB Ramps & Mission Avenue** – LOS F during the PM peak hour. Implementation of the Project would cause this intersection already operating at LOS F to increase in delay by 1.4 seconds. However, since the Project does not add more than 2.0 seconds to an intersection already operating at unacceptable LOS F, the Project does not degrade LOS to unacceptable levels.

No study intersections are anticipated to degrade in LOS to unacceptable levels. Therefore, no intersection improvements will be required.

**Table 5.3** – Roadway Segment LOS Results – Opening Year (2030) with Project Conditions

| Roadway | Segment | Opening Year (2030) | | | | | Opening Year (2030) with Project | | | | | ΔV/C | Improvement Required? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Function Classification | Capacity (LOS E) | ADT | V/C | LOS | Function Classification | Capacity (LOS E) | ADT | V/C | LOS | | |
| Mission Avenue | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 10,352 | 0.592 | C | 2-Lane Collector (One-Way) | 17,500 | 10,542 | 0.602 | C | 0.011 | No |
| Mission Avenue | N Clementine Street to N Horne Street | 4-Lane Secondary Collector w/o TWLTL | 25,000 | 12,475 | 0.499 | B | 4-Lane Secondary Collector w/o TWLTL | 25,000 | 12,949 | 0.518 | B | 0.019 | No |
| Mission Avenue | N Horne Street to I-5 SB Ramps | 4-Lane Major Arterial | 40,000 | 30,570 | 0.764 | D | 4-Lane Major Arterial | 40,000 | 31,480 | 0.787 | D | 0.023 | No |
| Mission Avenue | I-5 SB Ramps to I-5 NB Ramps | 4-Lane Major Arterial | 40,000 | 32,476 | 0.812 | D | 4-Lane Major Arterial | 40,000 | 33,007 | 0.825 | D | 0.013 | No |
| Seagaze Drive | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 6,550 | 0.374 | A | 2-Lane Collector (One-Way) | 17,500 | 6,740 | 0.385 | A | 0.011 | No |
| Seagaze Drive | N Clementine Street to N Horne Street | 2-Lane Collector w/o TWLTL | 10,000 | 4,591 | 0.459 | B | 2-Lane Collector w/o TWLTL | 10,000 | 5,009 | 0.501 | B | 0.042 | No |
| N Clementine Street | Mission Avenue to Seagaze Drive | 1-Lane Collector (One-Way) | 8,750 | 2,601 | 0.297 | A | 1-Lane Collector (One-Way) | 8,750 | 2,981 | 0.341 | A | 0.043 | No |
| N Horne Street | Mission Avenue to Seagaze Drive | 2-Lane Collector w/o TWLTL | 10,000 | 9,321 | 0.932 | **E** | 2-Lane Collector w/ TWLTL | 15,000 | 10,288 | 0.686 | D | -0.246 | No |

*Source: CR Associates (2024)*

Note:
TWLTL = Two-Way Left-Turn Lane.
V/C = Volume-to-Capacity.
**Bold** indicates substandard LOS E or LOS F.

**Table 5.4** – Peak Hour Intersection LOS Results – Opening Year (2030) with Project Conditions

| # | Intersection | Control Type | Peak Hour | Opening Year (2030) | | Opening Year (2030) with Project | | Δ | Improvement Required? |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Avg. Delay (sec.) | LOS | Avg. Delay (sec.) | LOS | | |
| 1 | N Ditmar Street & Mission Avenue | Signal | AM | 5.0 | A | 5.0 | A | 0.0 | No |
| | | | PM | 6.4 | A | 6.5 | A | 0.1 | |
| 2 | N Clementine Street & Mission Avenue | SSSC | AM | 10.7 | B | 10.8 | B | 0.1 | No |
| | | | PM | 11.9 | B | 12.0 | B | 0.1 | |
| 3 | N Horne Street & Mission Avenue | Signal | AM | 37.5 | D | 39.7 | D | 2.2 | No[1] |
| | | | PM | 60.9 | **E** | 62.9 | **E** | 2.0 | |
| 4 | I-5 SB Ramps & Mission Avenue | Signal | AM | 17.2 | B | 17.6 | B | 0.4 | No |
| | | | PM | 14.0 | B | 14.3 | B | 0.3 | |
| 5 | I-5 NB Ramps & Mission Avenue | Free | AM | 17.7 | C | 17.8 | C | 0.1 | No[1] |
| | | | PM | 108.8 | **F** | 110.2 | **F** | 1.4 | |
| 6 | N Ditmar Street & Seagaze Drive | AWSC | AM | 9.5 | A | 9.6 | A | 0.1 | No |
| | | | PM | 10.8 | B | 11.0 | B | 0.2 | |
| 7 | N Clementine Street & Seagaze Drive | AWSC | AM | 10.6 | B | 10.6 | B | 0.0 | No |
| | | | PM | 10.2 | B | 10.3 | B | 0.1 | |
| 8 | N Horne Street & Seagaze Drive | AWSC | AM | 12.2 | B | 12.6 | B | 0.4 | No |
| | | | PM | 11.3 | B | 11.8 | B | 0.5 | |
| 9 | N Ditmar Street & Mission Avenue | SSSC | AM | N/A | N/A | 9.1 | A | 9.1 | No |
| | | | PM | N/A | N/A | 9.1 | A | 9.1 | |
| 10 | N Clementine Street & Mission Avenue | SSSC | AM | N/A | N/A | 14.9 | B | 14.9 | No |
| | | | PM | N/A | N/A | 15.2 | C | 15.2 | |

*Source: CR Associates (2024)*

Notes:
SSSC = Side-Street Stop-Controlled. For SSSC intersections, the delay shown is the worst delay experienced by any of the approaches.
AWSC = All-Way Stop-Controlled. For AWSC intersections, the delay shown is the average delay experienced by all of the approaches.
**Bold** indicates substandard LOS E or LOS F.
[1] Although the intersection operates at LOS E or F, it does not meet the threshold that would require improvements.

# 6.0 Horizon Year (2050) Conditions

This section provides an analysis of Horizon Year (2050) traffic conditions both with and without the Project. The scenarios analyzed in this section include:

- Horizon Year (2050)
- Horizon Year (2050) with Project

## 6.1 Horizon Year (2050) Roadway Network and Traffic Volumes

Functional classifications and intersection geometrics under Horizon Year (2050) conditions were obtained from the Oceanside PRD GP, which identifies the ultimate classifications of mobility network roadways. The following are changes to the roadway network when compared to Existing conditions:

- N Horne Street & Mission Avenue: Installation of a northbound right-turn overlap.

Traffic volumes under Horizon Year (2050) conditions were derived from the Oceanside PRD GP, with the exception of the following study facilities not included in the Oceanside PRD GP:

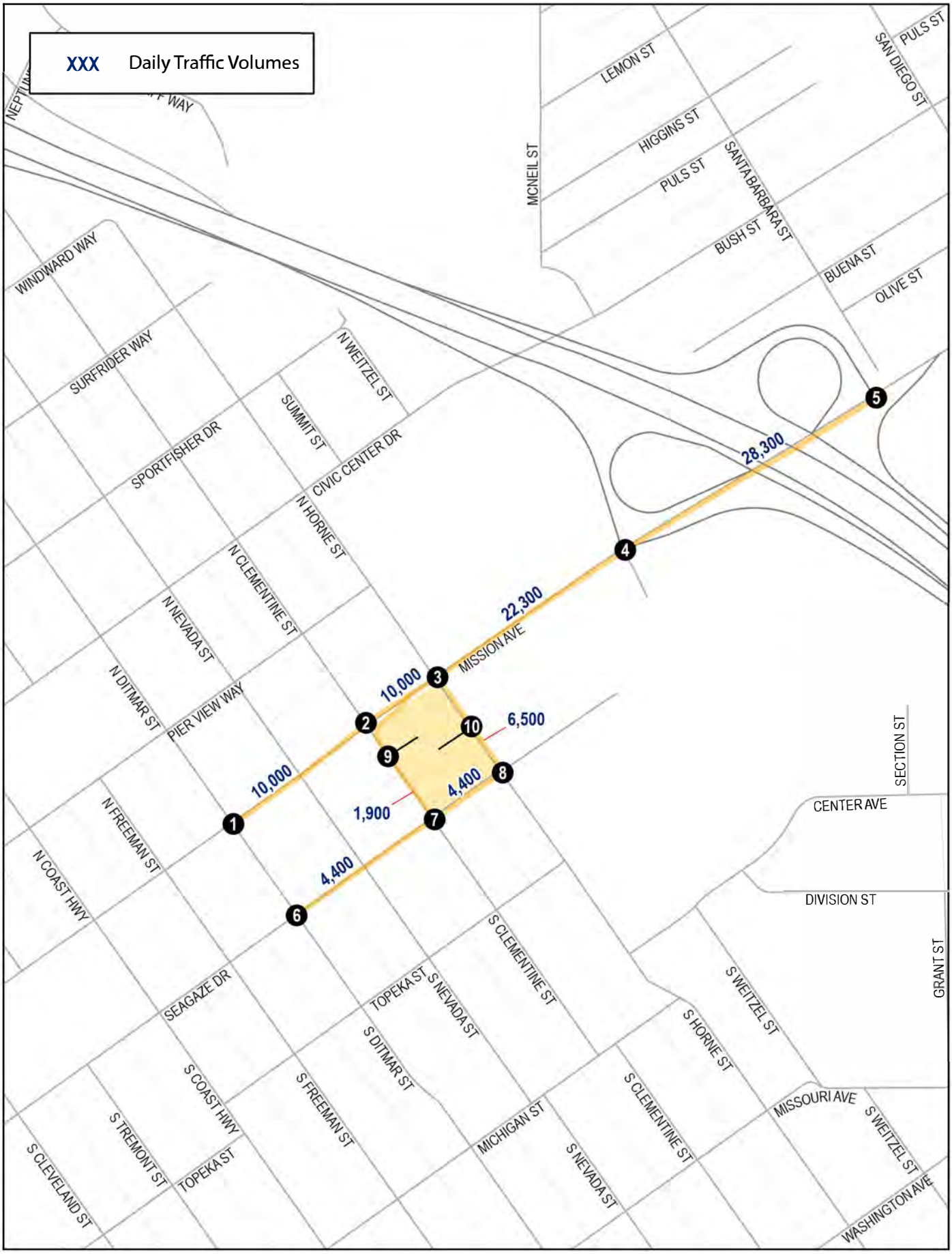
Roadway Segments

- N Clementine Street, between Mission Avenue and Seagaze Drive
- N Horne Street, between Mission Avenue and Seagaze Drive

Intersections

- N Ditmar Street & Mission Avenue
- N Clementine Street & Mission Avenue
- N Ditmar Street & Seagaze Drive
- N Clementine Street & Seagaze Drive
- N Horne Street & Seagaze Drive

Traffic volumes for the study facilities listed above were estimated based on the growth observed at adjacent study facilities and manually adjusted to balance volumes. **Figure 6.1** displays the projected daily roadway traffic volumes for study roadway segments and **Figure 6.2** displays the projected peak hour intersection volumes for study intersections.

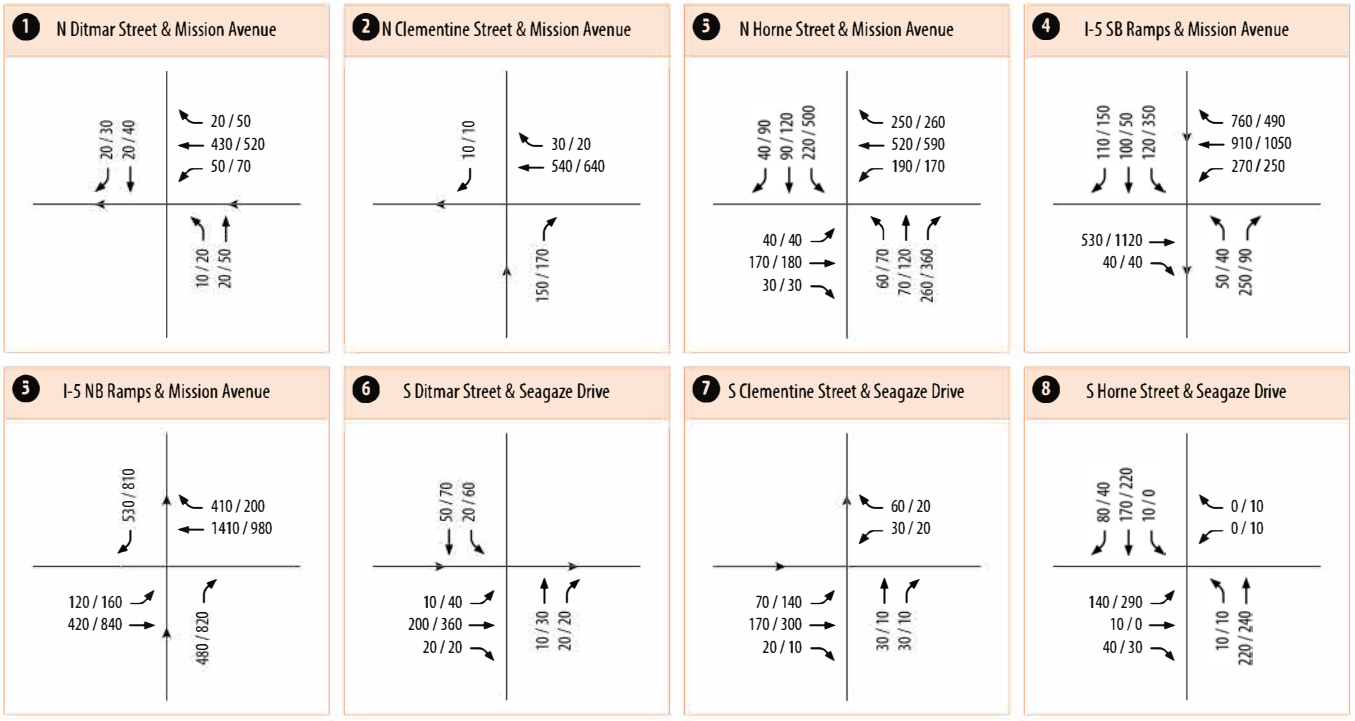



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*Figure 6.1*
*Daily Traffic Volumes*
*Horizon Year (2050) Conditions*




**901 Mission Avenue**
**Local Transportation Study**



*Figure 6.2*
*AM/PM Peak Hour Intersection Traffic Volumes*
*Horizon Year (2050) Conditions*

## 6.2 Horizon Year (2050) Traffic Conditions

LOS analyses under Horizon Year (2050) conditions were conducted using the methodologies described in Chapter 2. Roadway segment and intersection LOS analysis results are discussed below.

### 6.2.1 Roadway Segment Analysis

**Table 6.1** displays the roadway segment LOS analysis results for study roadway segments under Horizon Year (2050) conditions.

**Table 6.1** – Roadway Segment LOS Results – Horizon Year (2050) Conditions

| Roadway | Segment | Function Classification | Capacity (LOS E) | ADT | V/C | LOS |
|---|---|---|---|---|---|---|
| Mission Avenue | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 10,000 | 0.571 | C |
| Mission Avenue | N Clementine Street to N Horne Street | 4-Lane Secondary Collector w/o TWLTL | 25,000 | 10,000 | 0.400 | B |
| Mission Avenue | N Horne Street to I-5 SB Ramps | 4-Lane Major Arterial | 40,000 | 22,300 | 0.558 | C |
| Mission Avenue | I-5 SB Ramps to I-5 NB Ramps | 4-Lane Major Arterial | 40,000 | 28,300 | 0.708 | C |
| Seagaze Drive | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 4,400 | 0.251 | A |
| Seagaze Drive | N Clementine Street to N Horne Street | 2-Lane Collector w/o TWLTL | 10,000 | 4,400 | 0.440 | B |
| N Clementine Street | Mission Avenue to Seagaze Drive | 1-Lane Collector (One-Way) | 8,750 | 1,900 | 0.217 | A |
| N Horne Street | Mission Avenue to Seagaze Drive | 2-Lane Collector w/o TWLTL | 10,000 | 6,500 | 0.650 | C |

*Source: CR Associates (2024)*

Note:
TWLTL = Two-Way Left-Turn Lane.
V/C = Volume-to-Capacity.

As shown, all of the study roadway segments are projected to operate at acceptable LOS C or better under Horizon Year (2050) conditions.

### 6.2.2 Intersection Analysis

**Table 6.2** displays intersection LOS and average vehicle delay results for the study intersections under Horizon Year (2050) conditions. LOS calculation worksheets for Horizon Year (2050) conditions are provided in **Appendix J**.

**Table 6.2** – Peak Hour Intersection LOS Results – Horizon Year (2050) Conditions

| # | Intersection | Control Type | Peak Hour | Avg. Delay (sec.) | LOS |
|---|---|---|---|---|---|
| 1 | N Ditmar Street & Mission Avenue | Signal | AM<br>PM | 5.2<br>6.7 | A<br>A |
| 2 | N Clementine Street & Mission Avenue | SSSC | AM<br>PM | 10.4<br>10.9 | B<br>B |
| 3 | N Horne Street & Mission Avenue | Signal | AM<br>PM | 26.2<br>39.5 | C<br>D |
| 4 | I-5 SB Ramps & Mission Avenue | Signal | AM<br>PM | 15.2<br>20.4 | B<br>C |
| 5 | I-5 NB Ramps & Mission Avenue | SSSC | AM<br>PM | 17.7<br>272.1 | C<br>**F** |
| 6 | N Ditmar Street & Seagaze Drive | AWSC | AM<br>PM | 8.2<br>9.8 | A<br>A |
| 7 | N Clementine Street & Seagaze Drive | AWSC | AM<br>PM | 8.5<br>9.9 | A<br>A |
| 8 | N Horne Street & Seagaze Drive | AWSC | AM<br>PM | 10.2<br>12.9 | B<br>B |

*Source: CR Associates (2024)*

Note:
SSSC = Side-Street Stop-Controlled. For SSSC intersections, the delay shown is the worst delay experienced by any of the approaches.
AWSC = All-Way Stop-Controlled. For AWSC intersections, the delay shown is the average delay experience.

As shown, all of the study intersections are projected to operate at acceptable LOS D or better under Horizon Year (2050) conditions, with the exception of the following:

- **I-5 NB Ramps & Mission Avenue** – LOS F during the PM peak hour. It should be noted that this result is consistent with the Oceanside PRD GP.

## 6.3 Horizon Year (2050) with Project Roadway Network and Traffic Volumes

Functional classifications and intersection geometrics under Horizon Year (2050) with Project conditions were assumed to be identical to Horizon Year (2050) conditions, with the exception of the following:

- Construction of Project Driveway #1, intersecting with N Clementine Street.
- Construction of Project Driveway #2, intersecting with N Horne Street.
- Restriping of N Horne Street, between Mission Avenue and Seagaze Drive, to include a two-way left-turn lane. As a result, this segment of N Horne Street would be classified as a 2-Lane Collector with Two-Way Left-Turn Lane.

Daily roadway segment and AM/PM peak hour intersection volumes for Horizon Year (2050) with Project conditions were derived by combining the Project's trip assignment (Figure 3.3 and Figure 3.4) with the traffic volumes under Horizon Year (2050) conditions (Figure 6.1 and Figure 6.2). **Figure 6.3** displays the projected daily roadway traffic volumes for study roadway segments and **Figure 6.4** displays the projected peak hour intersection volumes for study intersections.

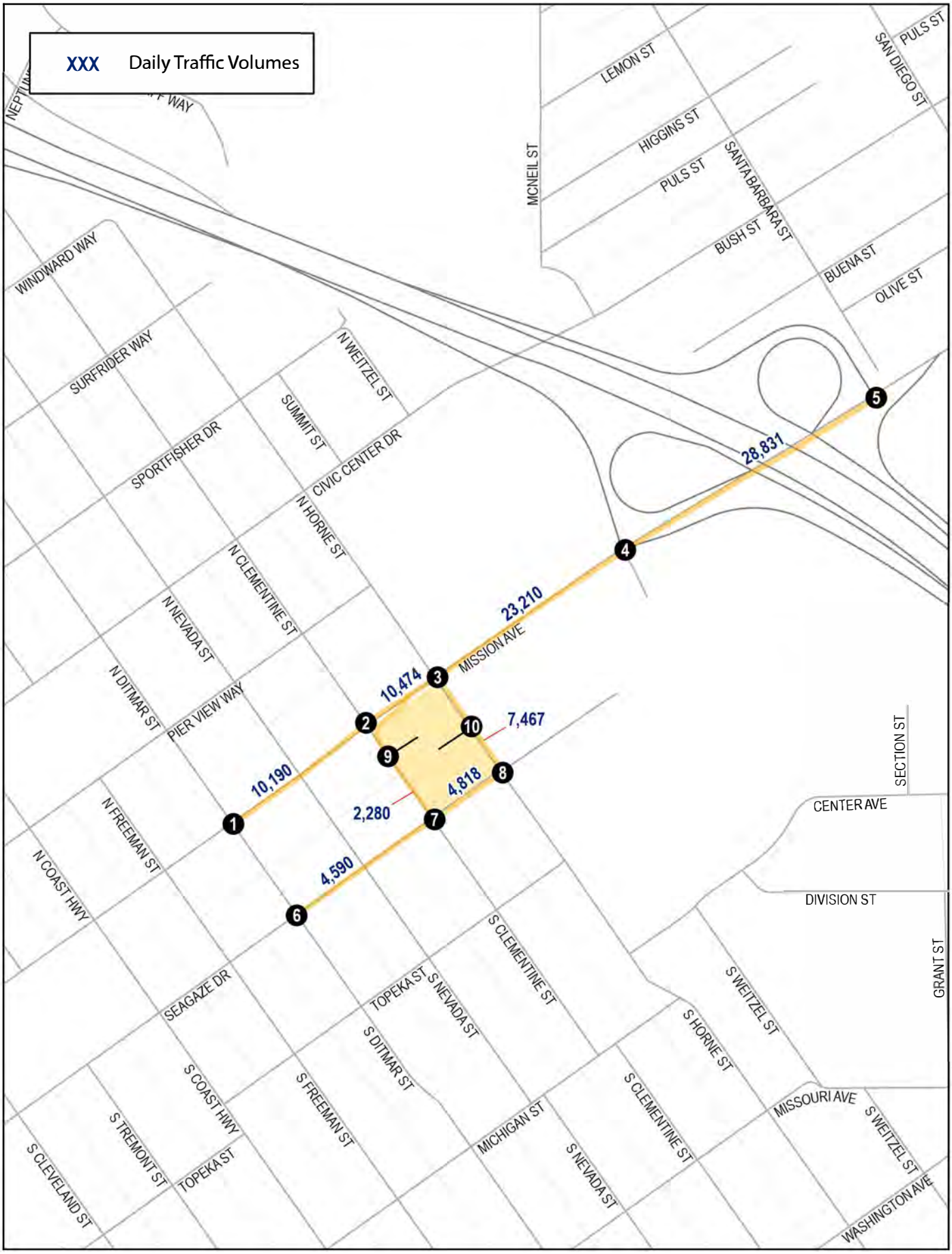
## 6.4 Horizon Year (2050) with Project Traffic Conditions

LOS analyses under Horizon Year (2050) with Project conditions were conducted using the methodologies described in Chapter 2. Roadway segment and intersection LOS analysis results are discussed below.

### 6.4.1 Roadway Segment Analysis

**Table 6.3** displays the roadway segment LOS analysis results for study roadway segments under Horizon Year (2050) with Project conditions.

As shown, all of the study roadway segments are projected to operate at acceptable LOS C or better under Horizon Year (2050) with Project conditions, including the segment of N Horne Street, between Mission Avenue and Seagaze Drive, where the Project proposes restriping to include a two-way left-turn lane. Therefore, no roadway segment improvements will be required.

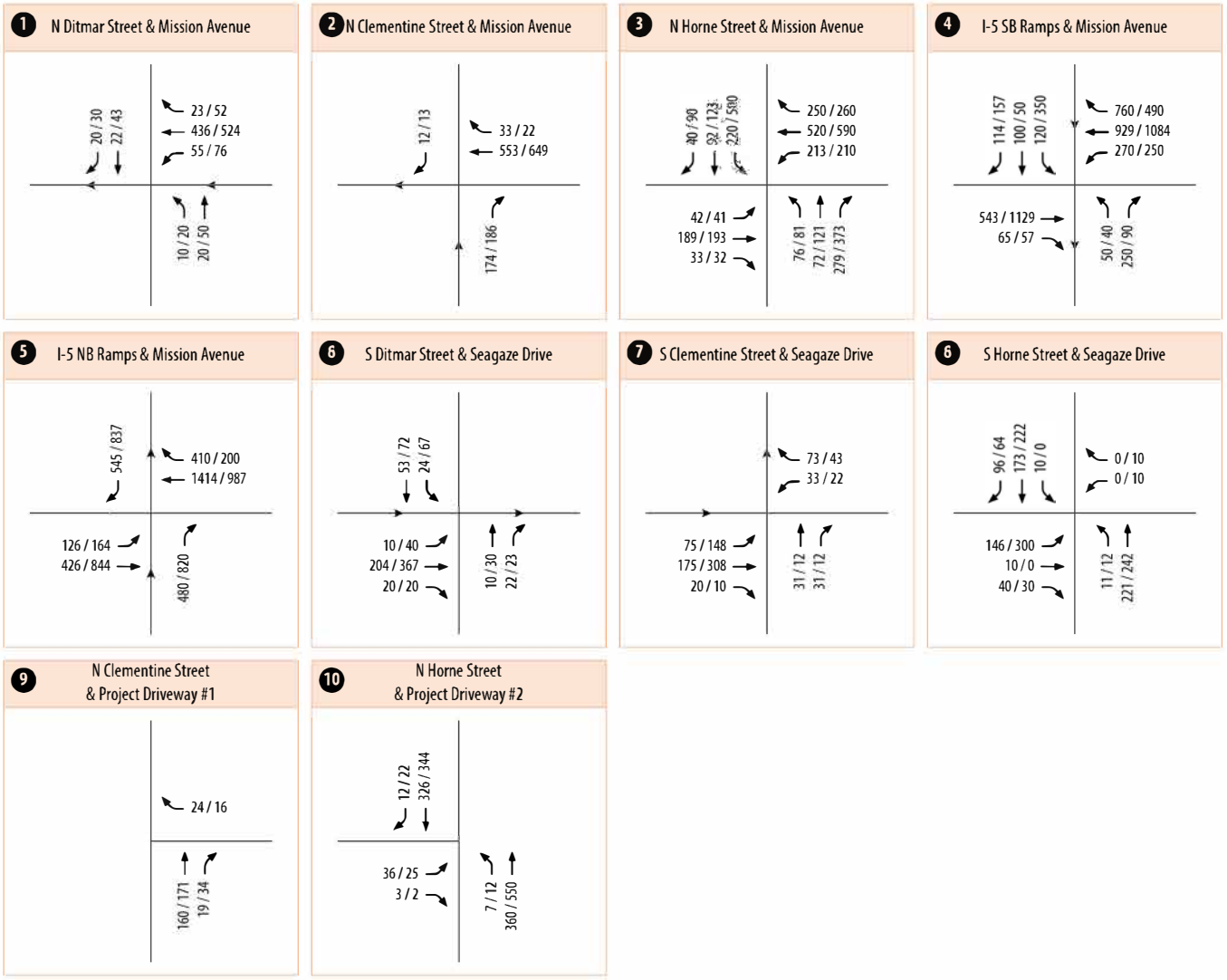



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*Figure 6.3*
*Daily Traffic Volumes*
*Horizon Year (2050) with Project Conditions*




**901 Mission Avenue**
**Local Transportation Study**



*Figure 6.4*
*AM/PM Peak Hour Intersection Traffic Volumes*
*Horizon Year (2050) with Project Conditions*

**Table 6.3** – Roadway Segment LOS Results – Horizon Year (2050) with Project Conditions

| Roadway | Segment | Horizon Year (2050) | | | | | Horizon Year (2050) with Project | | | | | ΔV/C | Improvement Required? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Function Classification | Capacity (LOS E) | ADT | V/C | LOS | Function Classification | Capacity (LOS E) | ADT | V/C | LOS | | |
| Mission Avenue | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 10,000 | 0.571 | C | 2-Lane Collector (One-Way) | 17,500 | 10,190 | 0.582 | C | 0.011 | No |
| Mission Avenue | N Clementine Street to N Horne Street | 4-Lane Secondary Collector w/o TWLTL | 25,000 | 10,000 | 0.400 | B | 4-Lane Secondary Collector w/o TWLTL | 25,000 | 10,474 | 0.419 | B | 0.019 | No |
| Mission Avenue | N Horne Street to I-5 SB Ramps | 4-Lane Major Arterial | 40,000 | 22,300 | 0.558 | C | 4-Lane Major Arterial | 40,000 | 23,210 | 0.580 | C | 0.023 | No |
| Mission Avenue | I-5 SB Ramps to I-5 NB Ramps | 4-Lane Major Arterial | 40,000 | 28,300 | 0.708 | C | 4-Lane Major Arterial | 40,000 | 28,831 | 0.721 | C | 0.013 | No |
| Seagaze Drive | N Ditmar Avenue to N Clementine Street | 2-Lane Collector (One-Way) | 17,500 | 4,400 | 0.251 | A | 2-Lane Collector (One-Way) | 17,500 | 4,590 | 0.262 | A | 0.011 | No |
| Seagaze Drive | N Clementine Street to N Horne Street | 2-Lane Collector w/o TWLTL | 10,000 | 4,400 | 0.440 | B | 2-Lane Collector w/o TWLTL | 10,000 | 4,818 | 0.482 | B | 0.042 | No |
| N Clementine Street | Mission Avenue to Seagaze Drive | 1-Lane Collector (One-Way) | 8,750 | 1,900 | 0.217 | A | 1-Lane Collector (One-Way) | 8,750 | 2,280 | 0.261 | A | 0.043 | No |
| N Horne Street | Mission Avenue to Seagaze Drive | 2-Lane Collector w/o TWLTL | 10,000 | 6,500 | 0.650 | C | 2-Lane Collector w/ TWLTL | 15,000 | 7,467 | 0.498 | C | -0.152 | No |

*Source: CR Associates (2024)*

Note:
TWLTL = Two-Way Left-Turn Lane.
V/C = Volume-to-Capacity.

### 6.4.2 Intersection Analysis

**Table 6.4** displays intersection LOS and average vehicle delay results for the study intersections under Horizon Year (2050) with Project conditions. LOS calculation worksheets for Horizon Year (2050) with Project conditions are provided in **Appendix K**.

As shown, all of the study intersections are projected to operate at acceptable LOS D or better under Horizon Year (2050) with Project conditions, with the exception of the following:

- **I-5 NB Ramps & Mission Avenue** – LOS F. Implementation of the Project would cause this intersection to increase in delay by 1.3 seconds. However, since the Project does not add more than 2.0 seconds to an intersection already operating at unacceptable LOS F, the Project does not degrade LOS to unacceptable levels.

No study intersections are anticipated to degrade in LOS to unacceptable levels. Therefore, no intersection improvements will be required.

**Table 6.4** – Peak Hour Intersection LOS Results – Horizon Year (2050) with Project Conditions

| # | Intersection | Control Type | Peak Hour | Horizon Year (2050) | | Horizon Year (2050) with Project | | Δ | Improvements Required? |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Avg. Delay (sec.) | LOS | Avg. Delay (sec.) | LOS | | |
| 1 | N Ditmar Street & Mission Avenue | Signal | AM | 5.2 | A | 5.2 | A | 0.0 | No |
| | | | PM | 6.7 | A | 6.7 | A | 0.0 | |
| 2 | N Clementine Street & Mission Avenue | SSSC | AM | 10.4 | B | 10.5 | B | 0.1 | No |
| | | | PM | 10.9 | B | 11.0 | B | 0.1 | |
| 3 | N Horne Street & Mission Avenue | Signal | AM | 26.2 | C | 26.8 | C | 0.6 | No |
| | | | PM | 39.5 | D | 40.4 | D | 0.9 | |
| 4 | I-5 SB Ramps & Mission Avenue | Signal | AM | 15.2 | B | 15.5 | B | 0.3 | No |
| | | | PM | 20.4 | C | 21.1 | C | 0.7 | |
| 5 | I-5 NB Ramps & Mission Avenue | SSSC | AM | 17.7 | C | 17.9 | C | 0.2 | No[1] |
| | | | PM | 272.1 | **F** | 273.4 | **F** | 1.3 | |
| 6 | N Ditmar Street & Seagaze Drive | AWSC | AM | 8.2 | A | 8.3 | A | 0.1 | No |
| | | | PM | 9.8 | A | 9.9 | A | 0.1 | |
| 7 | N Clementine Street & Seagaze Drive | AWSC | AM | 8.5 | A | 8.6 | A | 0.1 | No |
| | | | PM | 9.9 | A | 9.9 | A | 0.0 | |
| 8 | N Horne Street & Seagaze Drive | AWSC | AM | 10.2 | B | 10.4 | B | 0.2 | No |
| | | | PM | 12.9 | B | 13.5 | B | 0.6 | |
| 9 | N Clementine Street & Project Driveway #1 | Signal | AM | N/A | N/A | 8.9 | A | 8.5 | No |
| | | | PM | N/A | N/A | 9.0 | A | 9.0 | |
| 10 | N Horne Street & Project Driveway #2 | SSSC | AM | N/A | N/A | 15.3 | C | 8.9 | No |
| | | | PM | N/A | N/A | 19.0 | C | 19.0 | |

*Source: CR Associates (2024)*

Notes:
SSSC = Side-Street Stop-Controlled. For SSSC intersections, the delay shown is the worst delay experienced by any of the movements.
**Bold** indicates substandard LOS E or LOS F.
[1] Although the intersection operates at LOS F, it does not meet the threshold that would require improvements.

# 7.0 LOS Impacts and Improvement Requirements

This chapter provides improvements requirements needed to improve LOS to acceptable or pre-project conditions for any roadway segments or intersections found to operate unacceptably with implementation of the Project.

## 7.1 Roadway Segments

Based on the roadway segment analysis results, implementation of the Project does not trigger the need for roadway segment improvements.

## 7.2 Intersections

Based on the intersection analysis results, implementation of the Project does not trigger the need for intersection improvements.

# 8.0 Site Access and Circulation

This chapter addresses access to the project site and discusses the functionality of the Project's internal circulation.

## 8.1 Driveway Access

The Project will be located at the vacant site located on the southwest corner of N Horne Street & Mission Avenue. The property is primarily surrounded by residential and commercial/retail land uses, as well as Oceanside High School to the east. The Project will be accessed via two new driveways including one located along the east side of N Clementine Street and one located along the west side of N Horne Street. The project driveways will function as a side-street stop-controlled intersection with full access. Both driveways are projected to operate at LOS C or better under all study scenarios.

After further review of the project site plan, the following recommendations are provided:

- Driveways are recommended to be constructed in accordance with City standards
- Stop sign (R1-1) to be installed at the project driveways

## 8.2 Internal Circulation

The Project's driveways provide access to the Project's parking lot, intended for the use of residents, guests, and patrons of the retail component of the Project. Internal aisles allow for two-way flow of vehicle traffic.

Based upon review of the project site plan, the following recommendations are provided:

- Appropriate signage at the project driveways to warn drivers of pedestrian foot traffic

# Appendix A
# Project Information Form

## PROJECT INFORMATION FORM (PIF)

**THE FOLLOWING IS TO BE COMPLETED BY THE PROJECT APPLICANT:**

| PROJECT INFORMATION FORM | | | |
|---|---|---|---|
| 1. | **PROJECT DESCRIPTION:** The Project seeks to construct 273 multi-family dwelling units, including 28 affordable units, and 4,006 square feet (SF) of retail. | | |
| 2. | **PROJECT LOCATION:** 901 Mission Avenue. Located at the northwest corner of the intersection of N Horne Street and Seagaze Drive (APN 147-196-10). | | |
| 3. | **LAND USE:** Mixed-Use (Multi-family and retail)<br>**SIZE/DENSITY:** 273 DU and 4,006 SF | | |
| 4. | **ZONING AND LAND USE CONSISTENT WITH ADOPTED GENERAL PLAN?** | ☑ Yes | ☐ No |
| 5. | **PROJECT LOCATED IN TRANSIT PRIORITY AREA[1], SMART GROWTH AREA[2], OR LOW VMT AREA[3]?** | ☑ Yes | ☐ No |
| 6. | **PROJECT TRIP GENERATION:** 1,517 **ADT** | ☐ < 200 ADT<br>☐ ≥ 200 ADT<br>☑ ≥ 1,000 ADT<br>☐ ≥ 2,400 ADT | |
| | **ATTACHMENTS** | | |
| A. | **PROJECT LOCATION MAP** | ☑ Attached | |
| B. | **PROJECT TRIP DISTRIBUTION** | ☑ Attached | |
| C. | **PROJECT TRIP ASSIGNMENT** | ☑ Attached | |

1) Projects located in a TPA must be able to access the transit station within a ½ mile walking distance or 6 minute walk continuously without discontinuity of sidewalk or obstructions to the route. Qualifying transit stops means a site containing an existing rail transit station served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (OPR, 2017). A high-quality transit corridor may also be considered if a corridor with fixed route bus service has service intervals no longer than 15 minutes during peak commute hours (OPR, 2017).
(2) See Appendix B.
(3) Based on the most recent SANDAG SB 743 Screening Map. Example shown in Appendix C.

**TO BE COMPLETED BY CITY STAFF AND RETURNED TO PROJECT APPLICANT**

| | PROJECT STUDY REQUIREMENTS | | | |
|---|---|---|---|---|
| **1)** | **Does the project require a CEQA VMT analysis?**<br>**A. If yes, does the project require a SANDAG Model Run?** | ☐ Yes<br>☐ Yes | ☐ No<br>☐ No | ☐ Incomplete[(1)] |
| **2a)** | **Does the project require a Local Transportation Study?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |
| | **OR** | | | |
| **2b)** | **Does the project require a Local Transportation Assessment?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |

[(1)] Incomplete application or additional information is needed to determine study requirements.

Planning Division Date

Transportation Engineering Section Date

# Scoping Information

The purpose of this memo is to document the results of a preliminary traffic analysis for the 901 Mission Avenue project (the "Project"). The Project regional location is displayed in **Figure 1**.

## VMT Analysis

**Residential**

Based on the SANDAG VMT screening maps, the Project is located in an area where the average VMT per Capita is 14.2 miles or 74.8% of the regional average. **Figure 2** displays the Project's VMT per Capita. Since the Project would generate less than 85% of the regional average VMT per Capita, the Project's residential component would be deemed to have a less-than-significant VMT impact and no additional VMT analysis would be required.

**Retail**

Per the City of Oceanside VMT Guidelines, retail projects less than 50,000 square feet are considered local serving and presumed to decrease VMT. The Project's retail component is 4,138 square feet. Therefore, the Project's retail component would be deemed to have a less-than-significant VMT impact and no additional VMT analysis would be required.

**Smart Growth Opportunity Area**

Per the City of Oceanside VMT Guidelines, projects that are consistent with the General Plan and located within a Smart Growth Opportunity Area as identified in the SANDAG San Diego Forward Regional Plan are presumed to be VMT-reducing projects. The Project is located within existing smart growth opportunity area OC-1, which is identified as a Town Center and serviced by Rapid Transit, Coaster/AMTRAK/Metrolink, Sprinter Express, and Local Bus. Therefore, the Project is presumed to be VMT-reducing and no additional VMT analysis would be required.

## Local Transportation Study

The Project seeks to construct 273 multi-family dwelling units, including 28 affordable units, and 4,006 square feet (SF) of retail at 901 Mission Avenue within the City of Oceanside. The Project will provide vehicular access via Clementine Street and Horne Street.

### Project Trip Generation

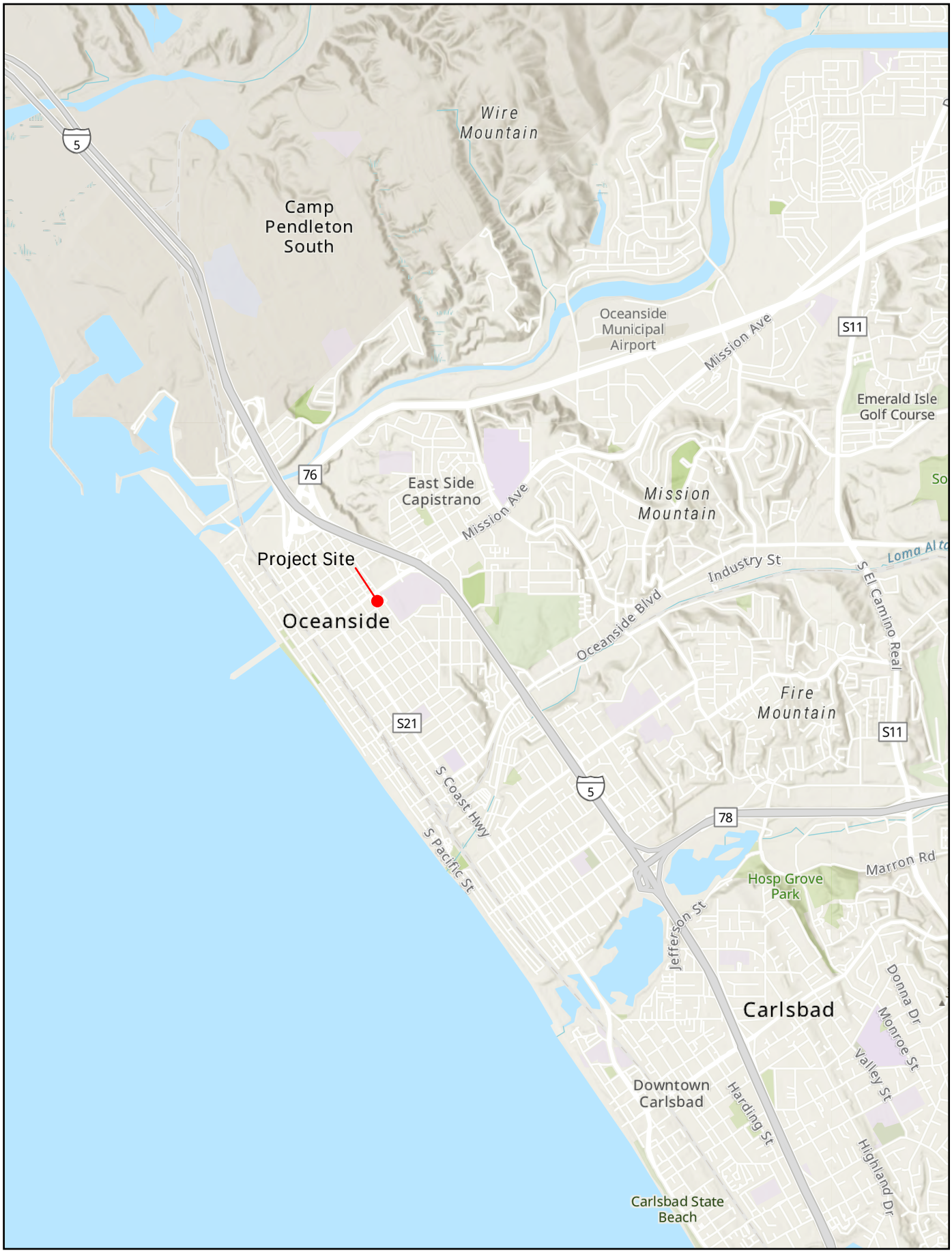
Per the direction of City staff, trip generation rates were derived from the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 11th Edition*. **Table 1** displays the projected daily and AM/PM peak hour project trip generation.

**Table 1 -** Project Trip Generation

| Land Use | Units | Trip Rate | ADT | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Trips | Split | In | Out | Trips | Split | In | Out |
| Multi-Family (Mid-Rise) | 245 DU | 4.75 | 1,164 | 78 | 36:64 | 28 | 50 | 71 | 65:35 | 46 | 25 |
| Affordable Housing | 28 DU | 4.81 | 135 | 14 | 29:71 | 4 | 10 | 13 | 62:38 | 8 | 5 |
| Strip Retail Plaza (<40k) | 4.006 KSF | 54.45 | 218 | 9 | 66:33 | 6 | 3 | 26 | 50:50 | 13 | 13 |
| Total | | | 1,517 | 101 | - | 38 | 63 | 110 | - | 67 | 43 |

*Source: ITE Trip Generation Manual, 11th Edition (2021); CR Associates (2024)*

As shown, the Project is anticipated to generate a total of 1,517 daily trips, including 101 (38-in/63-out) trips during the AM peak hour and 110 (67-in/43-out) trips during the PM peak hour.




901 Mission Avenue
Project Information Form

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*Figure 1*
*Project Regional Location*

**Figure 2 -** VMT per Capita



## Project Trip Distribution

The project trip distribution was manually developed based on the geographical location of the Project, characteristics of the proposed and surrounding land uses, and big data from Replica[1]. **Figure 3** displays the project trip distribution.

## Project Trip Assignment

Based on the Project's trip generation and distribution, daily projects trips and AM/PM peak hour trips were assigned to the adjacent roadway network. **Figure 4** displays the daily trip assignment and **Figure 5** displays the AM/PM peak hour trip assignment.

## Project Study Area

Based on the Project's trip generation, distribution, and assignment, as well as the City of Oceanside study area requirements for a Local Transportation Study (LTS), the following facilities were included in the Project's study area:

### Roadway Segments

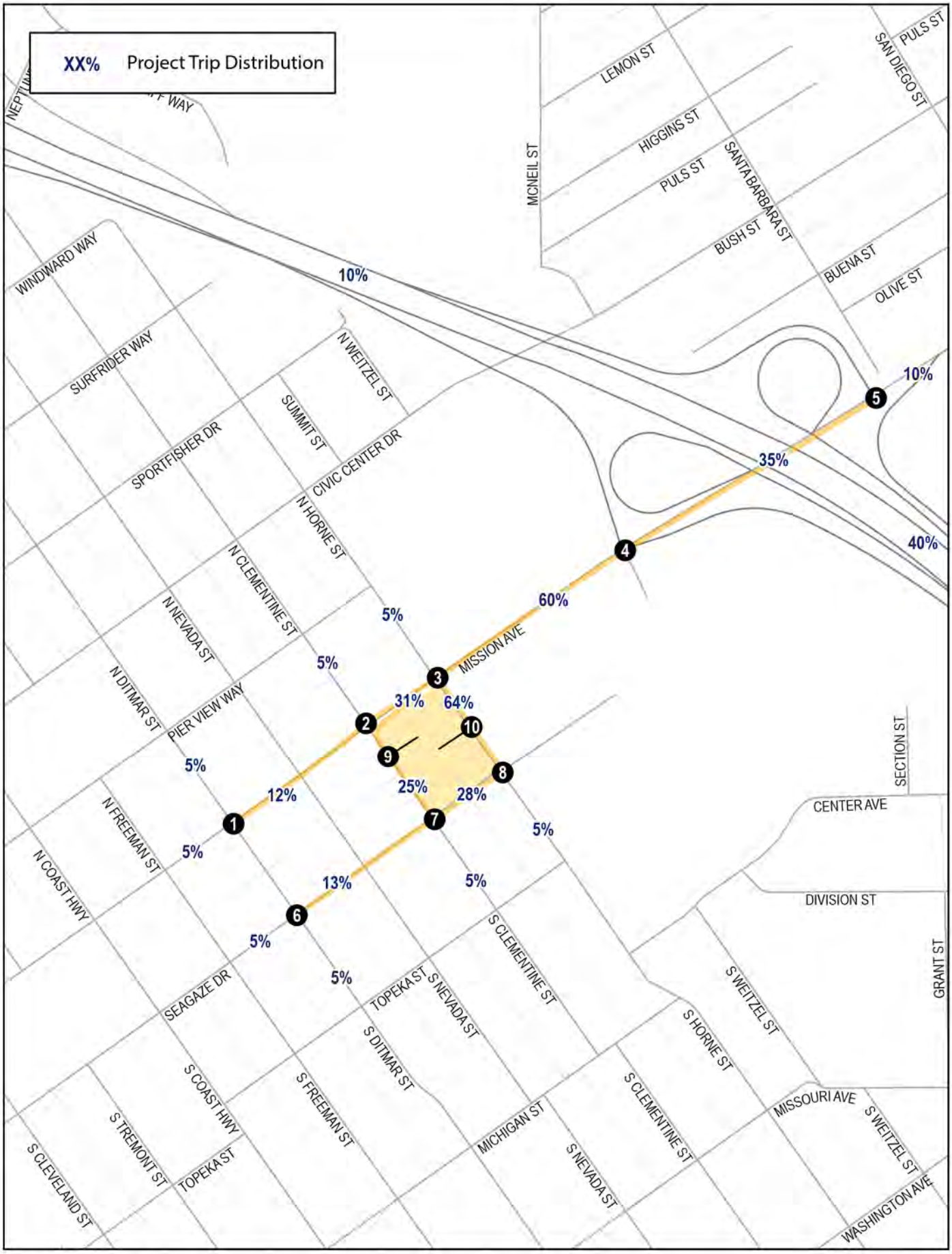
- Mission Avenue, between N Ditmar Avenue and N Clementine Street
- Mission Avenue, between N Clementine Street and N Horne Street
- Mission Avenue, between N Horne Street and I-5 SB Ramps
- Mission Avenue, between I-5 SB Ramps and I-5 NB Ramps
- Seagaze Drive, between N Ditmar Avenue and N Clementine Street
- Seagaze Drive, between N Clementine Street and N Horne Street
- N Clementine Street, between Mission Avenue and Seagaze Drive
- N Horne Street, between Mission Avenue and Seagaze Drive

### Intersections

1. N Ditmar Street & Mission Avenue
2. N Clementine Street & Mission Avenue
3. N Horne Street & Mission Avenue
4. I-5 SB On/Off Ramps & Mission Avenue
5. I-5 NB On/Off Ramps & Mission Avenue
6. N Ditmar Street & Seagaze Drive
7. N Clementine Street & Seagaze Drive
8. N Horne Street & Seagaze Drive
9. N Clementine Street & Project Driveway #1
10. N Horne Street & Project Driveway #2

**Figure 6** displays the project study area.

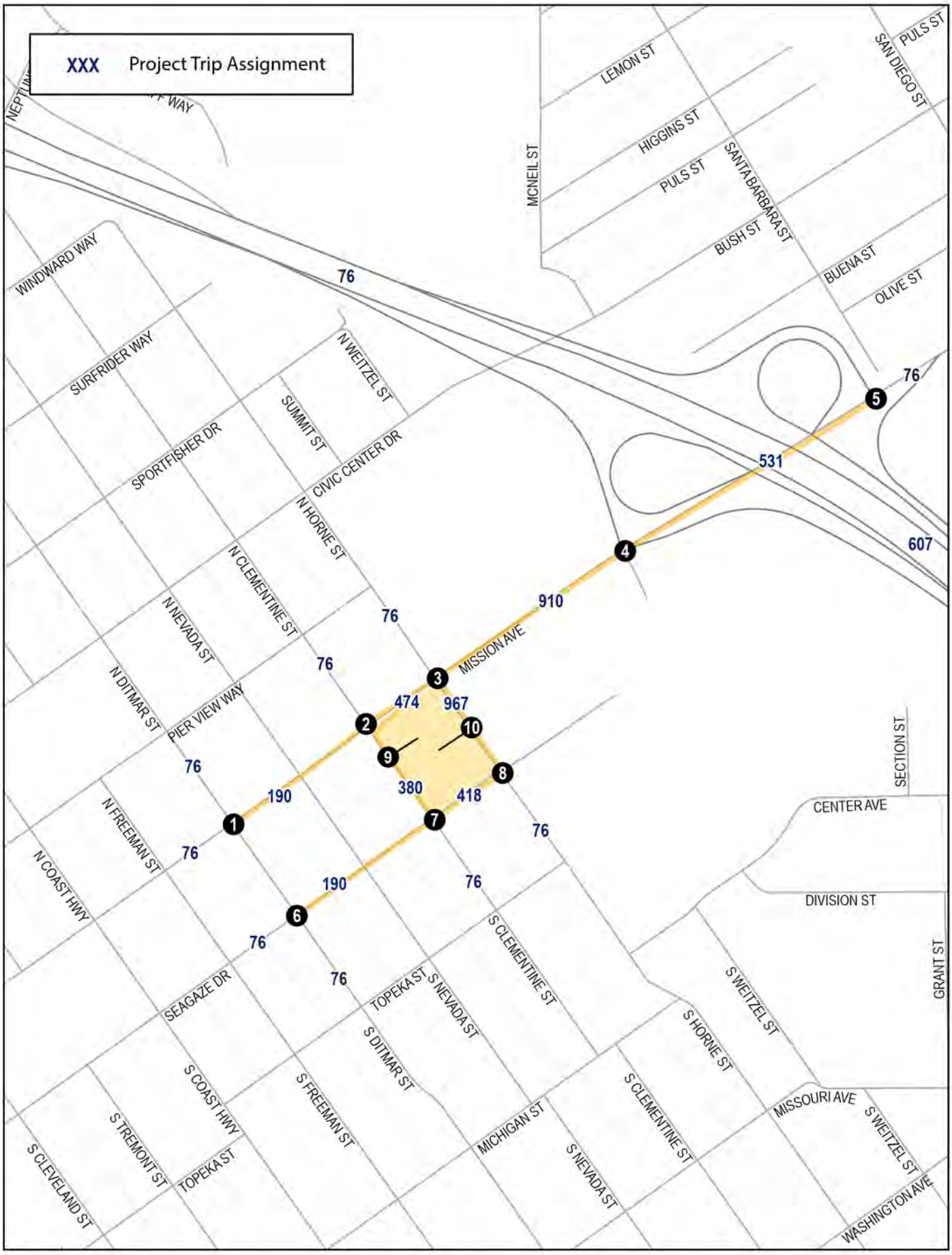
[1] Replica is a data provider that produces large-scale models to represent mobility throughout the United States. For more information, please visit the following: https://replicahq.com/




**901 Mission Avenue**

*Project Trip Distribution*

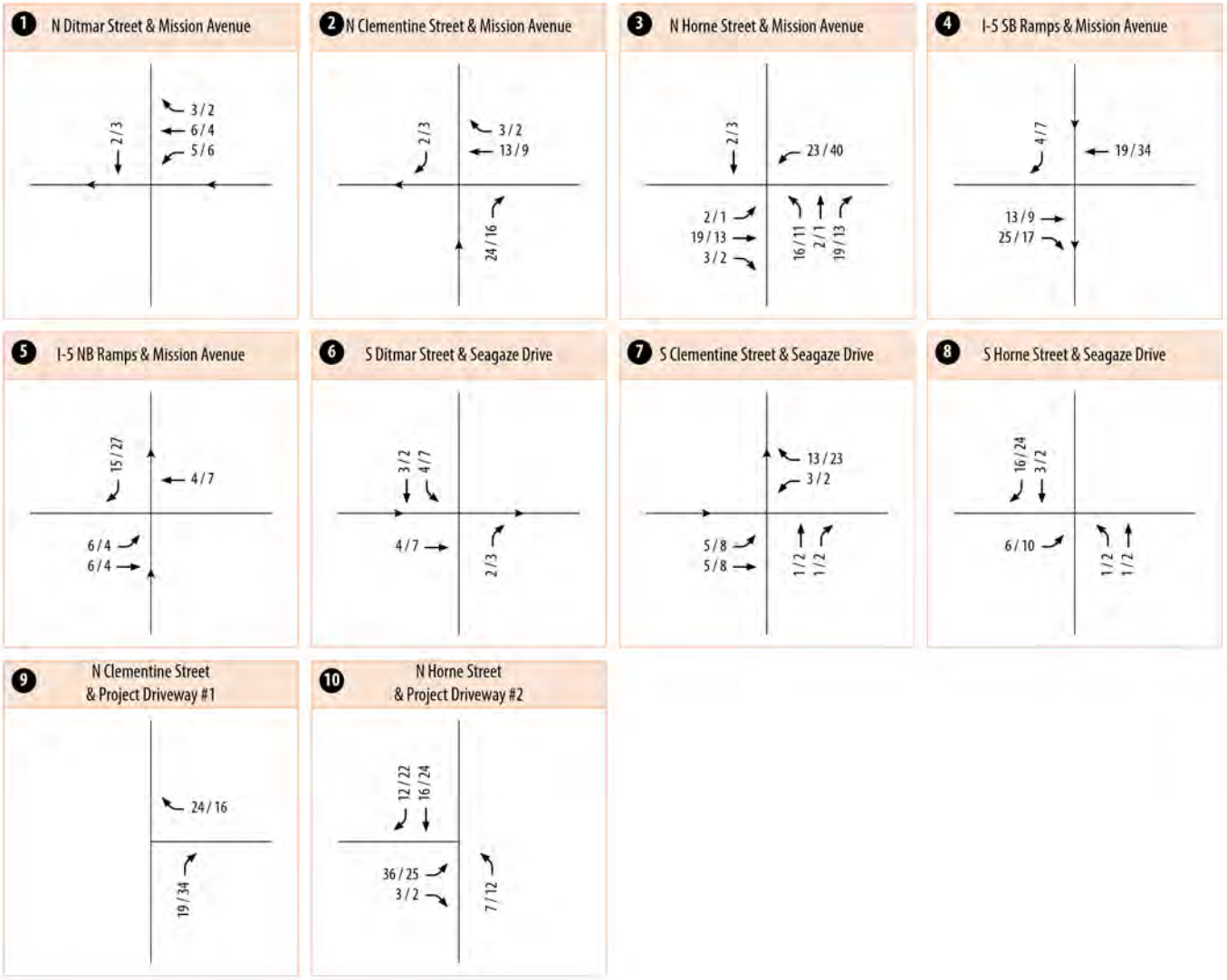
C+R




**901 Mission Avenue**

*Project Trip Assignment*

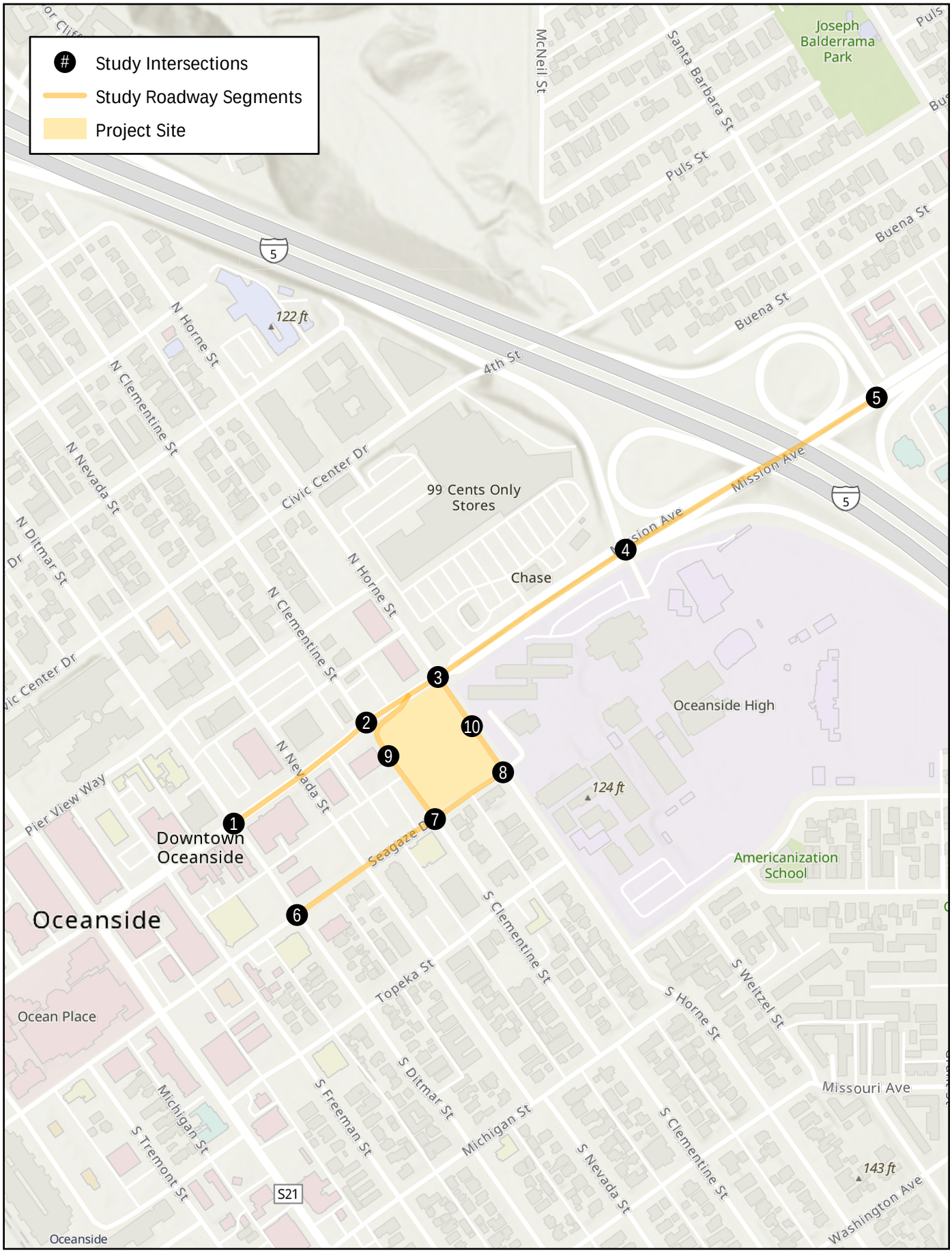
C+R




**901 Mission Avenue**

*AM/PM Peak Hour Project Trip Assignment*

C R




901 Mission Avenue
Project Information Form

C+R

*Project Study Area*

## Study Scenarios

- Existing Conditions
- Existing with Project Conditions
- Near-Term (2030) Conditions
    - Background traffic for this scenario is based on the cumulative projects identified in the City's planning projects map viewer. See discussion below for more details.
- Near-Term (2030) with Project Conditions
- Buildout Conditions
    - Background traffic for this scenario will be based on the traffic volumes from the draft Oceanside General Plan Update Traffic Operations Analysis, prepared by CR Associates in collaboration with City staff. Alternatively, SANDAG's Traffic Information Forecast Center can be utilized to develop an ambient growth rate.
- Buildout with Project Conditions

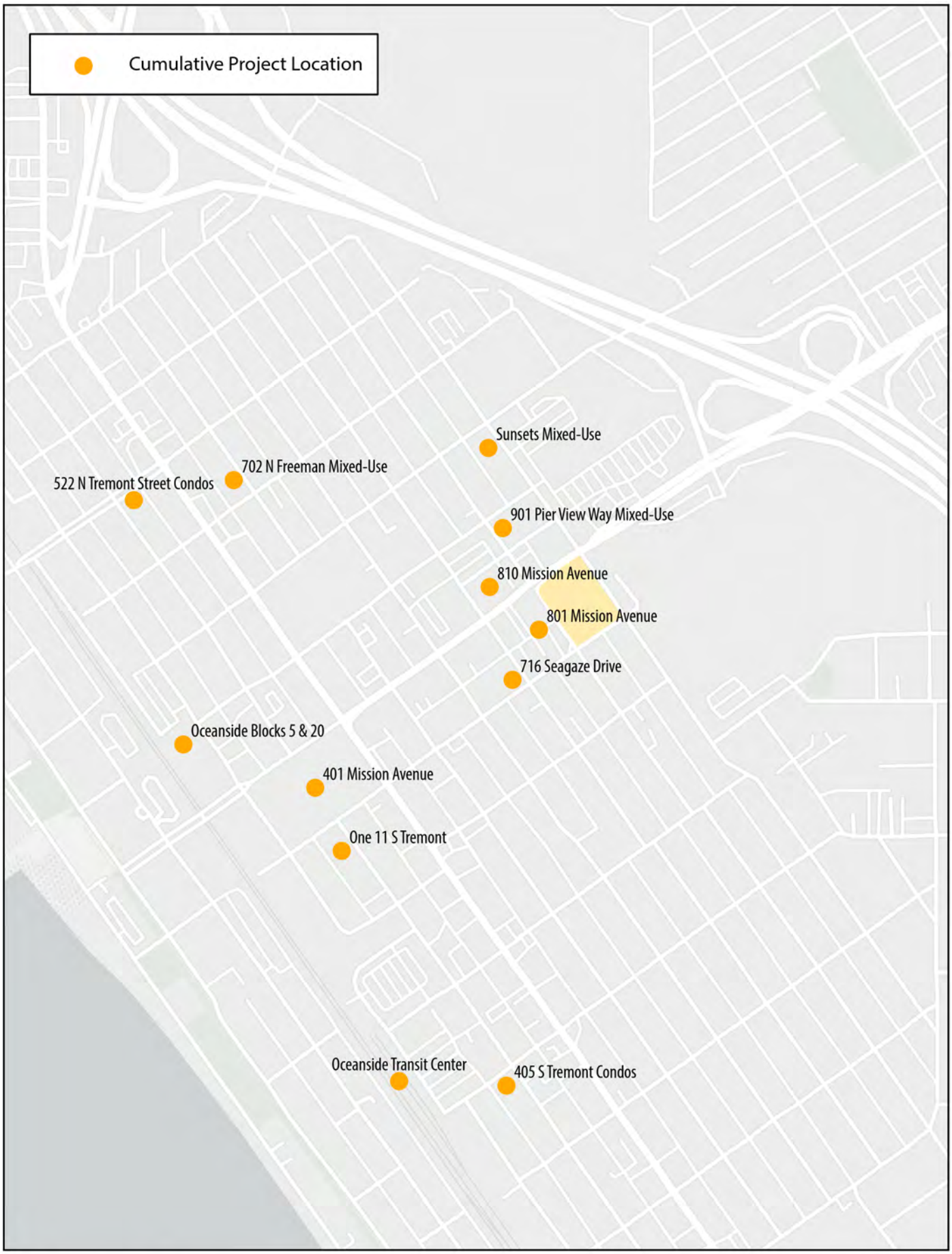
### Cumulative Projects

A list of developments was obtained from both City staff and the City of Oceanside's Planning Projects Map Viewer. Developments anticipated to contribute trips to the study area were assumed to be completed by the Project's opening year, 2030. Developments included are displayed in the figure and table below. Trip generation assumptions for each cumulative project were derived from their respective documents (i.e., Project Information Forms, Local Transportation Study) or manually utilizing ITE's Trip Generation Manual. **Table 2** summarizes the project trip generation for cumulative projects. **Figure 7** displays the cumulative project locations.

**Table 2 -** Cumulative Projects

| Land Use | Units | Trip Rate | ADT | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Trips | In | Out | Trips | In | Out |
| **522 N Tremont Street Condos** | | | | | | | | | |
| Single-Family Attached Housing | 2 DU | 7.2 | 14 | 1 | 0 | 1 | 1 | 1 | 0 |
| **702 N Freeman Mixed-Use** | | | | | | | | | |
| Multifamily Housing (Low-Rise) | 5 DU | 6.74 | 34 | 2 | 1 | 1 | 2 | 1 | 1 |
| Hair Salon | 0.5 KSF | 8 | 4 | 1 | 1 | 0 | 1 | 0 | 1 |
| Health/Fitness Club | 0.5 KSF | 10 | 5 | 1 | 0 | 1 | 2 | 1 | 1 |
| **Sunsets Mixed-Use** | | | | | | | | | |
| Multifamily Housing (Mid-Rise) | 162 DU | 4.54 | 735 | 60 | 19 | 41 | 63 | 36 | 27 |
| Affordable Housing | 18 DU | 4.81 | 87 | 9 | 3 | 6 | 8 | 5 | 3 |
| Strip Retail Plaza (<40k) | 5 KSF | 54.45 | 272 | 12 | 7 | 5 | 33 | 16 | 15 |
| **Pier View Way Mixed-Use** | | | | | | | | | |
| ***Existing*** | | | | | | | | | |
| Multifamily Housing (Mid-Rise) | 2 DU | 8 | 16 | 2 | 1 | 1 | 2 | 2 | 0 |
| ***Proposed*** | | | | | | | | | |
| Multifamily Housing (Mid-Rise) | 64 DU | 8 | 512 | 41 | 9 | 32 | 52 | 37 | 15 |
| Specialty Retail | 2.45 KSF | 40 | 98 | 3 | 2 | 1 | 9 | 5 | 4 |
| **716 Seagaze Drive** | | | | | | | | | |
| Multifamily Housing (Mid-Rise) | 179 DU | 6 | 1,074 | 86 | 17 | 69 | 97 | 68 | 29 |
| Specialty Retail | 1.581 KSF | 160 | 253 | 20 | 10 | 10 | 20 | 12 | 8 |
| **One 11 S Tremont** | | | | | | | | | |
| Multifamily Housing (Mid-Rise) | 12 DU | 4.54 | 54 | 4 | 1 | 3 | 5 | 3 | 2 |
| Health/Fitness Club | 1.5 KSF | 10 | 15 | 2 | 1 | 1 | 5 | 3 | 2 |
| **405 S Tremont Condos** | | | | | | | | | |
| Multifamily Housing (Low-Rise) | 8 DU | 7.2 | 58 | 3 | 1 | 2 | 4 | 3 | 1 |
| **801 Mission Avenue** | | | | | | | | | |
| Multi-Family Residential (<20 DU/acre) | 230 DU | 6 | 1,380 | 110 | 22 | 88 | 124 | 87 | 37 |
| High Turnover Restaurant | 6 KSF | 160 | 960 | 77 | 39 | 38 | 77 | 46 | 31 |
| Mixed Use (10%) Reduction | | | 234 | 19 | 6 | 13 | 20 | 13 | 7 |
| Transit Use (5%) Reduction | | | 117 | 9 | 3 | 6 | 10 | 7 | 3 |
| Net Total | | | 1,989 | 159 | 52 | 107 | 171 | 113 | 58 |
| **810 Mission Avenue** | | | | | | | | | |
| ***Existing*** | | | | | | | | | |
| Office | 30 KSF | 20 | 600 | 84 | 76 | 8 | 78 | 16 | 62 |
| ***Proposed*** | | | | | | | | | |
| Multi-family Residential | 201 DU | 6 | 1,206 | 96 | 19 | 77 | 109 | 76 | 33 |
| Live/Work Live Space | 5 DU | 6 | 30 | 2 | 0 | 2 | 3 | 2 | 1 |
| Live/Work Work Space | 2.2 KSF | 20 | 44 | 6 | 5 | 1 | 6 | 1 | 5 |
| Net Total | | | 680 | 20 | -52 | 72 | 40 | 63 | -23 |
| **Oceanside Transit Center** | | | | | | | | | |
| Multi-family Residential | 547 DU | 6 | 3,282 | 263 | 53 | 210 | 295 | 207 | 88 |
| Retail, Food & Beverage | 29.2 KSF | 120 | 3,504 | 140 | 84 | 56 | 350 | 175 | 175 |
| NCTD Headquarters | 58.1 KSF | 12 | 697 | 98 | 89 | 9 | 84 | 10 | 74 |
| Hotel | 170 Room | 4 | 680 | 61 | 24 | 37 | 54 | 30 | 24 |
| Total Trip Reduction | | | 1,902 | 121 | 54 | 67 | 180 | 98 | 82 |
| Net Total | | | 6,261 | 441 | 196 | 245 | 603 | 324 | 279 |
| **401 Mission Avenue** | | | | | | | | | |
| ***Existing*** | | | | | | | | | |
| Existing Site Total | | | 2,905 | 87 | 75 | 35 | 261 | 131 | 130 |
| ***Proposed*** | | | | | | | | | |
| Apartments | 332 DU | 6 | 1,992 | 159 | 32 | 127 | 179 | 125 | 54 |
| Retail | 8.31 KSF | 40 | 332 | 10 | 6 | 4 | 30 | 15 | 15 |
| Restaurant | 11.1 KSF | 160 | 1,777 | 142 | 71 | 71 | 142 | 85 | 57 |
| Total Reductions | | | 369 | 28 | 10 | 18 | 33 | 21 | 12 |
| Net Total | | | 827 | 196 | 46 | 149 | 58 | 74 | -15 |
| **Oceanside Blocks 5 & 20** | | | | | | | | | |
| Quality Restaurant | 1.47 KSF | 100 | 147 | 1 | 1 | 0 | 12 | 8 | 4 |
| Multi-Family Residential (<20 DU/acre) | 193 DU | 6 | 1,158 | 93 | 19 | 74 | 104 | 73 | 31 |
| Quality Restaurant | 2.61 KSF | 100 | 261 | 3 | 2 | 1 | 21 | 15 | 6 |
| Multi-Family Residential (<20 DU/acre) | 180 DU | 6 | 1,080 | 86 | 17 | 69 | 97 | 68 | 29 |
| Mixed Use (10%) Reduction | | | 265 | 18 | 4 | 14 | 23 | 16 | 7 |
| Transit Use (5%) Reduction | | | 132 | 9 | 2 | 7 | 12 | 8 | 4 |
| Net Total | | | 2,249 | 156 | 33 | 122 | 199 | 139 | 60 |
| **Total** | | | **15,205** | **1,217** | **349** | **868** | **1,371** | **903** | **468** |

*Source: ITE Trip Generation Manual, 11th Edition; City of Ventura Planning Department (2024); CR Associates (2024)*


Cumulative Project Location
Sunsets Mixed-Use
702 N Freeman Mixed-Use
522 N Tremont Street Condos
901 Pier View Way Mixed-Use
810 Mission Avenue
801 Mission Avenue
716 Seagaze Drive
Oceanside Blocks 5 & 20
401 Mission Avenue
One 11 S Tremont
Oceanside Transit Center
405 S Tremont Condos

# Appendix B
# Traffic Counts

WEDNESDAY - MAY 15, 2024 AREA: OCEANSIDE - MISSION PROJECT: ETD24-0517-02

MISSION AVE BETWEEN S DITMAR ST & S CLEMENTINE ST

| AM | NB | SB | EB | WB | | | PM | NB | SB | EB | WB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | | 11 | | | 12:00 | | | | 108 | | |
| 00:15 | | | | 11 | | | 12:15 | | | | 145 | | |
| 00:30 | | | | 7 | | | 12:30 | | | | 109 | | |
| 00:45 | | | | 6 | 35 | 35 | 12:45 | | | | 133 | 495 | 495 |
| 01:00 | | | | 8 | | | 13:00 | | | | 129 | | |
| 01:15 | | | | 7 | | | 13:15 | | | | 135 | | |
| 01:30 | | | | 5 | | | 13:30 | | | | 122 | | |
| 01:45 | | | | 11 | 31 | 31 | 13:45 | | | | 132 | 518 | 518 |
| 02:00 | | | | 11 | | | 14:00 | | | | 88 | | |
| 02:15 | | | | 8 | | | 14:15 | | | | 112 | | |
| 02:30 | | | | 6 | | | 14:30 | | | | 112 | | |
| 02:45 | | | | 8 | 33 | 33 | 14:45 | | | | 144 | 456 | 456 |
| 03:00 | | | | 6 | | | 15:00 | | | | 146 | | |
| 03:15 | | | | 2 | | | 15:15 | | | | 141 | | |
| 03:30 | | | | 2 | | | 15:30 | | | | 114 | | |
| 03:45 | | | | 1 | 11 | 11 | 15:45 | | | | 119 | 520 | 520 |
| 04:00 | | | | 8 | | | 16:00 | | | | 118 | | |
| 04:15 | | | | 7 | | | 16:15 | | | | 121 | | |
| 04:30 | | | | 15 | | | 16:30 | | | | 113 | | |
| 04:45 | | | | 12 | 42 | 42 | 16:45 | | | | 123 | 475 | 475 |
| 05:00 | | | | 9 | | | 17:00 | | | | 119 | | |
| 05:15 | | | | 26 | | | 17:15 | | | | 111 | | |
| 05:30 | | | | 16 | | | 17:30 | | | | 128 | | |
| 05:45 | | | | 37 | 88 | 88 | 17:45 | | | | 121 | 479 | 479 |
| 06:00 | | | | 43 | | | 18:00 | | | | 134 | | |
| 06:15 | | | | 68 | | | 18:15 | | | | 122 | | |
| 06:30 | | | | 47 | | | 18:30 | | | | 135 | | |
| 06:45 | | | | 64 | 222 | 222 | 18:45 | | | | 123 | 514 | 514 |
| 07:00 | | | | 64 | | | 19:00 | | | | 114 | | |
| 07:15 | | | | 74 | | | 19:15 | | | | 96 | | |
| 07:30 | | | | 77 | | | 19:30 | | | | 132 | | |
| 07:45 | | | | 112 | 327 | 327 | 19:45 | | | | 97 | 439 | 439 |
| 08:00 | | | | 98 | | | 20:00 | | | | 73 | | |
| 08:15 | | | | 113 | | | 20:15 | | | | 74 | | |
| 08:30 | | | | 97 | | | 20:30 | | | | 96 | | |
| 08:45 | | | | 125 | 433 | 433 | 20:45 | | | | 64 | 307 | 307 |
| 09:00 | | | | 99 | | | 21:00 | | | | 56 | | |
| 09:15 | | | | 89 | | | 21:15 | | | | 64 | | |
| 09:30 | | | | 89 | | | 21:30 | | | | 59 | | |
| 09:45 | | | | 110 | 387 | 387 | 21:45 | | | | 47 | 226 | 226 |
| 10:00 | | | | 91 | | | 22:00 | | | | 54 | | |
| 10:15 | | | | 104 | | | 22:15 | | | | 36 | | |
| 10:30 | | | | 100 | | | 22:30 | | | | 33 | | |
| 10:45 | | | | 139 | 434 | 434 | 22:45 | | | | 37 | 160 | 160 |
| 11:00 | | | | 142 | | | 23:00 | | | | 13 | | |
| 11:15 | | | | 127 | | | 23:15 | | | | 26 | | |
| 11:30 | | | | 105 | | | 23:30 | | | | 13 | | |
| 11:45 | | | | 142 | 516 | 516 | 23:45 | | | | 16 | 68 | 68 |
| **Total Vol.** | | | | | 2559 | **2559** | | | | | | 4657 | **4657** |

**Daily Totals**

| NB | SB | EB | WB | **Combined** |
|---|---|---|---|---|
| | | | 7216 | **7216** |

| | **AM** | | | **PM** | |
|---|---|---|---|---|---|
| **Split %** | | 100.0% | **35.5%** | | 100.0% | **64.5%** |
| **Peak Hour** | | 11:00 | **11:00** | | 14:45 | **14:45** |
| **Volume** | | 516 | **516** | | 545 | **545** |
| **P.H.F.** | | 0.91 | **0.91** | | 0.93 | **0.93** |

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

WEDNESDAY - MAY 15, 2024 AREA: OCEANSIDE - MISSION PROJECT: ETD24-0517-02

MISSION AVE BETWEEN S CLEMENTINE ST & S HORNE ST

| AM | NB | SB | EB | | WB | | | PM | NB | SB | EB | | WB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 1 | | 11 | | | 12:00 | | | 42 | | 103 | | |
| 00:15 | | | 2 | | 11 | | | 12:15 | | | 29 | | 153 | | |
| 00:30 | | | 0 | | 7 | | | 12:30 | | | 23 | | 105 | | |
| 00:45 | | | 2 | 5 | 6 | 35 | 40 | 12:45 | | | 32 | 126 | 138 | 499 | 625 |
| 01:00 | | | 3 | | 8 | | | 13:00 | | | 37 | | 134 | | |
| 01:15 | | | 1 | | 11 | | | 13:15 | | | 29 | | 136 | | |
| 01:30 | | | 1 | | 4 | | | 13:30 | | | 28 | | 126 | | |
| 01:45 | | | 3 | 8 | 9 | 32 | 40 | 13:45 | | | 32 | 126 | 139 | 535 | 661 |
| 02:00 | | | 2 | | 10 | | | 14:00 | | | 24 | | 94 | | |
| 02:15 | | | 0 | | 9 | | | 14:15 | | | 44 | | 109 | | |
| 02:30 | | | 0 | | 6 | | | 14:30 | | | 24 | | 113 | | |
| 02:45 | | | 0 | 2 | 7 | 32 | 34 | 14:45 | | | 91 | 183 | 141 | 457 | 640 |
| 03:00 | | | 0 | | 5 | | | 15:00 | | | 31 | | 148 | | |
| 03:15 | | | 0 | | 2 | | | 15:15 | | | 35 | | 141 | | |
| 03:30 | | | 0 | | 2 | | | 15:30 | | | 32 | | 124 | | |
| 03:45 | | | 0 | 0 | 1 | 10 | 10 | 15:45 | | | 29 | 127 | 108 | 521 | 648 |
| 04:00 | | | 2 | | 9 | | | 16:00 | | | 27 | | 122 | | |
| 04:15 | | | 3 | | 7 | | | 16:15 | | | 28 | | 122 | | |
| 04:30 | | | 8 | | 14 | | | 16:30 | | | 29 | | 112 | | |
| 04:45 | | | 0 | 13 | 13 | 43 | 56 | 16:45 | | | 20 | 104 | 123 | 479 | 583 |
| 05:00 | | | 3 | | 9 | | | 17:00 | | | 35 | | 125 | | |
| 05:15 | | | 4 | | 25 | | | 17:15 | | | 32 | | 109 | | |
| 05:30 | | | 2 | | 16 | | | 17:30 | | | 28 | | 138 | | |
| 05:45 | | | 8 | 17 | 39 | 89 | 106 | 17:45 | | | 26 | 121 | 120 | 492 | 613 |
| 06:00 | | | 2 | | 44 | | | 18:00 | | | 25 | | 133 | | |
| 06:15 | | | 6 | | 68 | | | 18:15 | | | 24 | | 126 | | |
| 06:30 | | | 8 | | 50 | | | 18:30 | | | 25 | | 136 | | |
| 06:45 | | | 6 | 22 | 70 | 232 | 254 | 18:45 | | | 33 | 107 | 126 | 521 | 628 |
| 07:00 | | | 9 | | 70 | | | 19:00 | | | 34 | | 115 | | |
| 07:15 | | | 9 | | 77 | | | 19:15 | | | 21 | | 104 | | |
| 07:30 | | | 12 | | 80 | | | 19:30 | | | 26 | | 126 | | |
| 07:45 | | | 18 | 48 | 110 | 337 | 385 | 19:45 | | | 19 | 100 | 97 | 442 | 542 |
| 08:00 | | | 31 | | 114 | | | 20:00 | | | 26 | | 76 | | |
| 08:15 | | | 38 | | 108 | | | 20:15 | | | 22 | | 74 | | |
| 08:30 | | | 31 | | 100 | | | 20:30 | | | 22 | | 93 | | |
| 08:45 | | | 22 | 122 | 140 | 462 | 584 | 20:45 | | | 19 | 89 | 65 | 308 | 397 |
| 09:00 | | | 27 | | 96 | | | 21:00 | | | 23 | | 54 | | |
| 09:15 | | | 15 | | 88 | | | 21:15 | | | 26 | | 68 | | |
| 09:30 | | | 21 | | 92 | | | 21:30 | | | 9 | | 62 | | |
| 09:45 | | | 24 | 87 | 123 | 399 | 486 | 21:45 | | | 20 | 78 | 47 | 231 | 309 |
| 10:00 | | | 19 | | 95 | | | 22:00 | | | 9 | | 54 | | |
| 10:15 | | | 20 | | 119 | | | 22:15 | | | 13 | | 37 | | |
| 10:30 | | | 21 | | 97 | | | 22:30 | | | 6 | | 36 | | |
| 10:45 | | | 20 | 80 | 140 | 451 | 531 | 22:45 | | | 6 | 34 | 35 | 162 | 196 |
| 11:00 | | | 33 | | 144 | | | 23:00 | | | 4 | | 13 | | |
| 11:15 | | | 31 | | 117 | | | 23:15 | | | 4 | | 26 | | |
| 11:30 | | | 35 | | 109 | | | 23:30 | | | 5 | | 14 | | |
| 11:45 | | | 43 | 142 | 148 | 518 | 660 | 23:45 | | | 5 | 18 | 15 | 68 | 86 |
| **Total Vol.** | | | | 546 | | 2640 | **3186** | | | | | 1213 | | 4715 | **5928** |

**Daily Totals**

| NB | SB | EB | WB | Combined |
|---|---|---|---|---|
| | | 1759 | 7355 | **9114** |

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| **Split %** | 17.1% | 82.9% | **35.0%** | 20.5% | 79.5% | **65.0%** |
| **Peak Hour** | 11:15 | 11:00 | **11:30** | 14:15 | 14:45 | **14:45** |
| **Volume** | 151 | 518 | **662** | 190 | 554 | **743** |
| **P.H.F.** | 0.88 | 0.88 | **0.87** | 0.52 | 0.94 | **0.80** |

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

WEDNESDAY - MAY 15, 2024 AREA: OCEANSIDE - MISSION PROJECT: ETD24-0517-02

MISSION AVE BETWEEN S HORNE ST & I-5 SB OFF-RAMP

| AM | NB | SB | EB | | WB | | | PM | NB | SB | EB | | WB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 26 | | 20 | | | 12:00 | | | 198 | | 232 | | |
| 00:15 | | | 16 | | 13 | | | 12:15 | | | 189 | | 250 | | |
| 00:30 | | | 9 | | 20 | | | 12:30 | | | 173 | | 221 | | |
| 00:45 | | | 10 | 61 | 10 | 63 | 124 | 12:45 | | | 172 | 732 | 264 | 967 | 1699 |
| 01:00 | | | 9 | | 9 | | | 13:00 | | | 193 | | 239 | | |
| 01:15 | | | 9 | | 10 | | | 13:15 | | | 163 | | 225 | | |
| 01:30 | | | 7 | | 9 | | | 13:30 | | | 184 | | 253 | | |
| 01:45 | | | 5 | 30 | 11 | 39 | 69 | 13:45 | | | 183 | 723 | 247 | 964 | 1687 |
| 02:00 | | | 8 | | 11 | | | 14:00 | | | 170 | | 186 | | |
| 02:15 | | | 7 | | 12 | | | 14:15 | | | 192 | | 233 | | |
| 02:30 | | | 8 | | 13 | | | 14:30 | | | 169 | | 247 | | |
| 02:45 | | | 6 | 29 | 9 | 45 | 74 | 14:45 | | | 223 | 754 | 275 | 941 | 1695 |
| 03:00 | | | 3 | | 6 | | | 15:00 | | | 235 | | 299 | | |
| 03:15 | | | 7 | | 2 | | | 15:15 | | | 201 | | 230 | | |
| 03:30 | | | 8 | | 6 | | | 15:30 | | | 163 | | 216 | | |
| 03:45 | | | 6 | 24 | 7 | 21 | 45 | 15:45 | | | 190 | 789 | 218 | 963 | 1752 |
| 04:00 | | | 10 | | 17 | | | 16:00 | | | 188 | | 241 | | |
| 04:15 | | | 12 | | 16 | | | 16:15 | | | 180 | | 244 | | |
| 04:30 | | | 20 | | 22 | | | 16:30 | | | 231 | | 252 | | |
| 04:45 | | | 35 | 77 | 20 | 75 | 152 | 16:45 | | | 211 | 810 | 256 | 993 | 1803 |
| 05:00 | | | 31 | | 24 | | | 17:00 | | | 250 | | 248 | | |
| 05:15 | | | 38 | | 26 | | | 17:15 | | | 226 | | 234 | | |
| 05:30 | | | 48 | | 31 | | | 17:30 | | | 200 | | 267 | | |
| 05:45 | | | 56 | 173 | 53 | 134 | 307 | 17:45 | | | 190 | 866 | 250 | 999 | 1865 |
| 06:00 | | | 48 | | 84 | | | 18:00 | | | 189 | | 259 | | |
| 06:15 | | | 55 | | 89 | | | 18:15 | | | 176 | | 250 | | |
| 06:30 | | | 84 | | 84 | | | 18:30 | | | 168 | | 273 | | |
| 06:45 | | | 68 | 255 | 120 | 377 | 632 | 18:45 | | | 177 | 710 | 209 | 991 | 1701 |
| 07:00 | | | 88 | | 117 | | | 19:00 | | | 188 | | 211 | | |
| 07:15 | | | 97 | | 171 | | | 19:15 | | | 154 | | 185 | | |
| 07:30 | | | 110 | | 159 | | | 19:30 | | | 147 | | 194 | | |
| 07:45 | | | 120 | 415 | 213 | 660 | 1075 | 19:45 | | | 151 | 640 | 153 | 743 | 1383 |
| 08:00 | | | 109 | | 249 | | | 20:00 | | | 157 | | 120 | | |
| 08:15 | | | 152 | | 241 | | | 20:15 | | | 128 | | 139 | | |
| 08:30 | | | 160 | | 226 | | | 20:30 | | | 137 | | 155 | | |
| 08:45 | | | 123 | 544 | 236 | 952 | 1496 | 20:45 | | | 137 | 559 | 123 | 537 | 1096 |
| 09:00 | | | 128 | | 177 | | | 21:00 | | | 121 | | 121 | | |
| 09:15 | | | 131 | | 169 | | | 21:15 | | | 130 | | 105 | | |
| 09:30 | | | 132 | | 180 | | | 21:30 | | | 83 | | 113 | | |
| 09:45 | | | 122 | 513 | 206 | 732 | 1245 | 21:45 | | | 92 | 426 | 77 | 416 | 842 |
| 10:00 | | | 146 | | 190 | | | 22:00 | | | 93 | | 70 | | |
| 10:15 | | | 128 | | 204 | | | 22:15 | | | 57 | | 63 | | |
| 10:30 | | | 158 | | 192 | | | 22:30 | | | 55 | | 60 | | |
| 10:45 | | | 137 | 569 | 232 | 818 | 1387 | 22:45 | | | 40 | 245 | 44 | 237 | 482 |
| 11:00 | | | 135 | | 248 | | | 23:00 | | | 28 | | 27 | | |
| 11:15 | | | 161 | | 200 | | | 23:15 | | | 31 | | 42 | | |
| 11:30 | | | 155 | | 225 | | | 23:30 | | | 36 | | 19 | | |
| 11:45 | | | 174 | 625 | 256 | 929 | 1554 | 23:45 | | | 21 | 116 | 23 | 111 | 227 |
| **Total Vol.** | | | | 3315 | | 4845 | **8160** | | | | | 7370 | | 8862 | **16232** |

**Daily Totals**

| NB | SB | EB | WB | Combined |
|---|---|---|---|---|
| | | 10685 | 13707 | **24392** |

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| **Split %** | 40.6% | 59.4% | **33.5%** | 45.4% | 54.6% | **66.5%** |
| **Peak Hour** | 11:45 | 11:30 | **11:45** | 16:30 | 14:15 | **16:30** |
| **Volume** | 734 | 963 | **1693** | 918 | 1054 | **1908** |
| **P.H.F.** | 0.93 | 0.94 | **0.96** | 0.92 | 0.88 | **0.96** |

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

WEDNESDAY - MAY 15, 2024 AREA: OCEANSIDE - MISSION PROJECT: ETD24-0517-02

MISSION AVE BETWEEN I-5 SB OFF-RAMP & I-5 NB ON-RAMP

| AM | NB | SB | EB | | WB | | | PM | NB | SB | EB | | WB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 19 | | 34 | | | 12:00 | | | 141 | | 333 | | |
| 00:15 | | | 14 | | 37 | | | 12:15 | | | 122 | | 349 | | |
| 00:30 | | | 14 | | 27 | | | 12:30 | | | 116 | | 315 | | |
| 00:45 | | | 10 | 57 | 28 | 126 | 183 | 12:45 | | | 123 | 502 | 359 | 1356 | 1858 |
| 01:00 | | | 4 | | 22 | | | 13:00 | | | 129 | | 338 | | |
| 01:15 | | | 7 | | 18 | | | 13:15 | | | 107 | | 369 | | |
| 01:30 | | | 4 | | 22 | | | 13:30 | | | 121 | | 345 | | |
| 01:45 | | | 5 | 20 | 22 | 84 | 104 | 13:45 | | | 115 | 472 | 330 | 1382 | 1854 |
| 02:00 | | | 9 | | 16 | | | 14:00 | | | 99 | | 292 | | |
| 02:15 | | | 8 | | 21 | | | 14:15 | | | 106 | | 328 | | |
| 02:30 | | | 5 | | 23 | | | 14:30 | | | 124 | | 350 | | |
| 02:45 | | | 5 | 27 | 21 | 81 | 108 | 14:45 | | | 156 | 485 | 395 | 1365 | 1850 |
| 03:00 | | | 8 | | 17 | | | 15:00 | | | 189 | | 405 | | |
| 03:15 | | | 2 | | 12 | | | 15:15 | | | 137 | | 354 | | |
| 03:30 | | | 7 | | 23 | | | 15:30 | | | 119 | | 333 | | |
| 03:45 | | | 5 | 22 | 27 | 79 | 101 | 15:45 | | | 119 | 564 | 339 | 1431 | 1995 |
| 04:00 | | | 7 | | 38 | | | 16:00 | | | 142 | | 341 | | |
| 04:15 | | | 4 | | 42 | | | 16:15 | | | 147 | | 333 | | |
| 04:30 | | | 9 | | 68 | | | 16:30 | | | 156 | | 344 | | |
| 04:45 | | | 12 | 32 | 82 | 230 | 262 | 16:45 | | | 190 | 635 | 359 | 1377 | 2012 |
| 05:00 | | | 20 | | 100 | | | 17:00 | | | 180 | | 371 | | |
| 05:15 | | | 15 | | 129 | | | 17:15 | | | 153 | | 338 | | |
| 05:30 | | | 22 | | 179 | | | 17:30 | | | 172 | | 352 | | |
| 05:45 | | | 27 | 84 | 170 | 578 | 662 | 17:45 | | | 144 | 649 | 313 | 1374 | 2023 |
| 06:00 | | | 23 | | 235 | | | 18:00 | | | 120 | | 322 | | |
| 06:15 | | | 20 | | 259 | | | 18:15 | | | 141 | | 331 | | |
| 06:30 | | | 44 | | 301 | | | 18:30 | | | 138 | | 351 | | |
| 06:45 | | | 36 | 123 | 313 | 1108 | 1231 | 18:45 | | | 152 | 551 | 276 | 1280 | 1831 |
| 07:00 | | | 51 | | 353 | | | 19:00 | | | 122 | | 285 | | |
| 07:15 | | | 56 | | 408 | | | 19:15 | | | 104 | | 246 | | |
| 07:30 | | | 48 | | 439 | | | 19:30 | | | 91 | | 236 | | |
| 07:45 | | | 106 | 261 | 459 | 1659 | 1920 | 19:45 | | | 93 | 410 | 190 | 957 | 1367 |
| 08:00 | | | 128 | | 460 | | | 20:00 | | | 101 | | 159 | | |
| 08:15 | | | 148 | | 427 | | | 20:15 | | | 78 | | 165 | | |
| 08:30 | | | 121 | | 400 | | | 20:30 | | | 90 | | 201 | | |
| 08:45 | | | 89 | 486 | 383 | 1670 | 2156 | 20:45 | | | 87 | 356 | 180 | 705 | 1061 |
| 09:00 | | | 80 | | 307 | | | 21:00 | | | 71 | | 186 | | |
| 09:15 | | | 76 | | 304 | | | 21:15 | | | 62 | | 160 | | |
| 09:30 | | | 90 | | 339 | | | 21:30 | | | 62 | | 137 | | |
| 09:45 | | | 79 | 325 | 350 | 1300 | 1625 | 21:45 | | | 62 | 257 | 118 | 601 | 858 |
| 10:00 | | | 81 | | 319 | | | 22:00 | | | 58 | | 116 | | |
| 10:15 | | | 81 | | 337 | | | 22:15 | | | 35 | | 92 | | |
| 10:30 | | | 90 | | 310 | | | 22:30 | | | 38 | | 86 | | |
| 10:45 | | | 92 | 344 | 323 | 1289 | 1633 | 22:45 | | | 34 | 165 | 82 | 376 | 541 |
| 11:00 | | | 101 | | 325 | | | 23:00 | | | 16 | | 50 | | |
| 11:15 | | | 120 | | 292 | | | 23:15 | | | 22 | | 56 | | |
| 11:30 | | | 110 | | 319 | | | 23:30 | | | 26 | | 35 | | |
| 11:45 | | | 120 | 451 | 355 | 1291 | 1742 | 23:45 | | | 14 | 78 | 30 | 171 | 249 |
| **Total Vol.** | | | | 2232 | | 9495 | **11727** | | | | | 5124 | | 12375 | **17499** |

**Daily Totals**

| NB | SB | EB | WB | Combined |
|---|---|---|---|---|
| | | 7356 | 21870 | **29226** |

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| **Split %** | 19.0% | 81.0% | **40.1%** | 29.3% | 70.7% | **59.9%** |
| **Peak Hour** | 07:45 | 07:30 | **07:45** | 16:45 | 14:30 | **16:45** |
| **Volume** | 503 | 1785 | **2249** | 695 | 1504 | **2115** |
| **P.H.F.** | 0.85 | 0.97 | **0.96** | 0.91 | 0.93 | **0.96** |

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

WEDNESDAY - MAY 15, 2024 AREA: OCEANSIDE - MISSION PROJECT: ETD24-0517-02

SEAGAZE DR BETWEEN S DITMAR ST & S CLEMENTINE ST

| AM | NB | SB | EB | WB | | PM | NB | SB | EB | WB | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 16 | | | 12:00 | | | 72 | | |
| 00:15 | | | 8 | | | 12:15 | | | 66 | | |
| 00:30 | | | 4 | | | 12:30 | | | 68 | | |
| 00:45 | | | 4 | 32 | 32 | 12:45 | | | 59 | 265 | 265 |
| 01:00 | | | 3 | | | 13:00 | | | 67 | | |
| 01:15 | | | 3 | | | 13:15 | | | 72 | | |
| 01:30 | | | 4 | | | 13:30 | | | 68 | | |
| 01:45 | | | 1 | 11 | 11 | 13:45 | | | 71 | 278 | 278 |
| 02:00 | | | 6 | | | 14:00 | | | 70 | | |
| 02:15 | | | 4 | | | 14:15 | | | 69 | | |
| 02:30 | | | 2 | | | 14:30 | | | 86 | | |
| 02:45 | | | 4 | 16 | 16 | 14:45 | | | 77 | 302 | 302 |
| 03:00 | | | 1 | | | 15:00 | | | 77 | | |
| 03:15 | | | 2 | | | 15:15 | | | 65 | | |
| 03:30 | | | 2 | | | 15:30 | | | 74 | | |
| 03:45 | | | 1 | 6 | 6 | 15:45 | | | 68 | 284 | 284 |
| 04:00 | | | 5 | | | 16:00 | | | 70 | | |
| 04:15 | | | 2 | | | 16:15 | | | 70 | | |
| 04:30 | | | 8 | | | 16:30 | | | 80 | | |
| 04:45 | | | 9 | 24 | 24 | 16:45 | | | 79 | 299 | 299 |
| 05:00 | | | 11 | | | 17:00 | | | 76 | | |
| 05:15 | | | 12 | | | 17:15 | | | 81 | | |
| 05:30 | | | 16 | | | 17:30 | | | 87 | | |
| 05:45 | | | 18 | 57 | 57 | 17:45 | | | 86 | 330 | 330 |
| 06:00 | | | 13 | | | 18:00 | | | 84 | | |
| 06:15 | | | 18 | | | 18:15 | | | 53 | | |
| 06:30 | | | 27 | | | 18:30 | | | 71 | | |
| 06:45 | | | 18 | 76 | 76 | 18:45 | | | 64 | 272 | 272 |
| 07:00 | | | 20 | | | 19:00 | | | 67 | | |
| 07:15 | | | 24 | | | 19:15 | | | 72 | | |
| 07:30 | | | 34 | | | 19:30 | | | 58 | | |
| 07:45 | | | 40 | 118 | 118 | 19:45 | | | 69 | 266 | 266 |
| 08:00 | | | 44 | | | 20:00 | | | 70 | | |
| 08:15 | | | 61 | | | 20:15 | | | 63 | | |
| 08:30 | | | 47 | | | 20:30 | | | 56 | | |
| 08:45 | | | 50 | 202 | 202 | 20:45 | | | 57 | 246 | 246 |
| 09:00 | | | 51 | | | 21:00 | | | 67 | | |
| 09:15 | | | 53 | | | 21:15 | | | 61 | | |
| 09:30 | | | 40 | | | 21:30 | | | 37 | | |
| 09:45 | | | 50 | 194 | 194 | 21:45 | | | 41 | 206 | 206 |
| 10:00 | | | 50 | | | 22:00 | | | 43 | | |
| 10:15 | | | 39 | | | 22:15 | | | 31 | | |
| 10:30 | | | 61 | | | 22:30 | | | 24 | | |
| 10:45 | | | 62 | 212 | 212 | 22:45 | | | 22 | 120 | 120 |
| 11:00 | | | 51 | | | 23:00 | | | 14 | | |
| 11:15 | | | 65 | | | 23:15 | | | 19 | | |
| 11:30 | | | 69 | | | 23:30 | | | 17 | | |
| 11:45 | | | 72 | 257 | 257 | 23:45 | | | 8 | 58 | 58 |
| **Total Vol.** | | | | 1205 | **1205** | | | | | 2926 | **2926** |

**Daily Totals**

| NB | SB | EB | WB | Combined |
|---|---|---|---|---|
| | | 4131 | | **4131** |

| | AM | | PM | |
|---|---|---|---|---|
| **Split %** | 100.0% | **29.2%** | 100.0% | **70.8%** |
| **Peak Hour** | 11:30 | **11:30** | 17:15 | **17:15** |
| **Volume** | 279 | **279** | 338 | **338** |
| **P.H.F.** | 0.97 | **0.97** | 0.97 | **0.97** |

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

WEDNESDAY - MAY 15, 2024 AREA: OCEANSIDE - MISSION PROJECT: ETD24-0517-02

SEAGAZE DR BETWEEN S CLEMENTINE ST & S HORNE ST

| AM | NB | SB | EB | WB | | | PM | NB | SB | EB | WB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | | 0 | | | 12:00 | | | | 6 | | |
| 00:15 | | | | 0 | | | 12:15 | | | | 5 | | |
| 00:30 | | | | 2 | | | 12:30 | | | | 2 | | |
| 00:45 | | | | 0 | 2 | 2 | 12:45 | | | | 6 | 19 | 19 |
| 01:00 | | | | 0 | | | 13:00 | | | | 9 | | |
| 01:15 | | | | 0 | | | 13:15 | | | | 10 | | |
| 01:30 | | | | 0 | | | 13:30 | | | | 13 | | |
| 01:45 | | | | 1 | 1 | 1 | 13:45 | | | | 4 | 36 | 36 |
| 02:00 | | | | 0 | | | 14:00 | | | | 5 | | |
| 02:15 | | | | 1 | | | 14:15 | | | | 6 | | |
| 02:30 | | | | 0 | | | 14:30 | | | | 5 | | |
| 02:45 | | | | 0 | 1 | 1 | 14:45 | | | | 21 | 37 | 37 |
| 03:00 | | | | 0 | | | 15:00 | | | | 9 | | |
| 03:15 | | | | 0 | | | 15:15 | | | | 5 | | |
| 03:30 | | | | 0 | | | 15:30 | | | | 4 | | |
| 03:45 | | | | 0 | 0 | | 15:45 | | | | 3 | 21 | 21 |
| 04:00 | | | | 1 | | | 16:00 | | | | 0 | | |
| 04:15 | | | | 0 | | | 16:15 | | | | 3 | | |
| 04:30 | | | | 0 | | | 16:30 | | | | 12 | | |
| 04:45 | | | | 0 | 1 | 1 | 16:45 | | | | 1 | 16 | 16 |
| 05:00 | | | | 0 | | | 17:00 | | | | 7 | | |
| 05:15 | | | | 2 | | | 17:15 | | | | 4 | | |
| 05:30 | | | | 1 | | | 17:30 | | | | 3 | | |
| 05:45 | | | | 2 | 5 | 5 | 17:45 | | | | 4 | 18 | 18 |
| 06:00 | | | | 0 | | | 18:00 | | | | 1 | | |
| 06:15 | | | | 3 | | | 18:15 | | | | 4 | | |
| 06:30 | | | | 0 | | | 18:30 | | | | 2 | | |
| 06:45 | | | | 5 | 8 | 8 | 18:45 | | | | 5 | 12 | 12 |
| 07:00 | | | | 3 | | | 19:00 | | | | 5 | | |
| 07:15 | | | | 1 | | | 19:15 | | | | 4 | | |
| 07:30 | | | | 4 | | | 19:30 | | | | 3 | | |
| 07:45 | | | | 7 | 15 | 15 | 19:45 | | | | 1 | 13 | 13 |
| 08:00 | | | | 17 | | | 20:00 | | | | 3 | | |
| 08:15 | | | | 22 | | | 20:15 | | | | 4 | | |
| 08:30 | | | | 17 | | | 20:30 | | | | 6 | | |
| 08:45 | | | | 9 | 65 | 65 | 20:45 | | | | 2 | 15 | 15 |
| 09:00 | | | | 7 | | | 21:00 | | | | 6 | | |
| 09:15 | | | | 5 | | | 21:15 | | | | 4 | | |
| 09:30 | | | | 5 | | | 21:30 | | | | 2 | | |
| 09:45 | | | | 6 | 23 | 23 | 21:45 | | | | 0 | 12 | 12 |
| 10:00 | | | | 5 | | | 22:00 | | | | 4 | | |
| 10:15 | | | | 3 | | | 22:15 | | | | 2 | | |
| 10:30 | | | | 11 | | | 22:30 | | | | 0 | | |
| 10:45 | | | | 9 | 28 | 28 | 22:45 | | | | 0 | 6 | 6 |
| 11:00 | | | | 9 | | | 23:00 | | | | 1 | | |
| 11:15 | | | | 4 | | | 23:15 | | | | 0 | | |
| 11:30 | | | | 9 | | | 23:30 | | | | 0 | | |
| 11:45 | | | | 10 | 32 | 32 | 23:45 | | | | 2 | 3 | 3 |
| **Total Vol.** | | | | | 181 | **181** | | | | | | 208 | **208** |

**Daily Totals**

| NB | SB | EB | WB | Combined |
|---|---|---|---|---|
| | | | 389 | **389** |

| | AM | | PM | |
|---|---|---|---|---|
| **Split %** | 100.0% | **46.5%** | 100.0% | **53.5%** |
| **Peak Hour** | 08:00 | **08:00** | 14:15 | **14:15** |
| **Volume** | 65 | **65** | 41 | **41** |
| **P.H.F.** | 0.74 | **0.74** | 0.49 | **0.49** |

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

THURSDAY - MAY 23, 2024 AREA: OCEANSIDE - MISSION PROJECT: ETD24-0517-02

SEAGAZE DR BETWEEN S CLEMENTINE ST & S HORNE ST

| AM | NB | SB | EB | WB | | PM | NB | SB | EB | WB | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 7 | | | 12:00 | | | 45 | | |
| 00:15 | | | 0 | | | 12:15 | | | 66 | | |
| 00:30 | | | 3 | | | 12:30 | | | 54 | | |
| 00:45 | | | 7 | 17 | 17 | 12:45 | | | 38 | 203 | 203 |
| 01:00 | | | 2 | | | 13:00 | | | 63 | | |
| 01:15 | | | 0 | | | 13:15 | | | 47 | | |
| 01:30 | | | 1 | | | 13:30 | | | 54 | | |
| 01:45 | | | 5 | 8 | 8 | 13:45 | | | 43 | 207 | 207 |
| 02:00 | | | 3 | | | 14:00 | | | 39 | | |
| 02:15 | | | 1 | | | 14:15 | | | 32 | | |
| 02:30 | | | 1 | | | 14:30 | | | 38 | | |
| 02:45 | | | 0 | 5 | 5 | 14:45 | | | 38 | 147 | 147 |
| 03:00 | | | 1 | | | 15:00 | | | 39 | | |
| 03:15 | | | 0 | | | 15:15 | | | 28 | | |
| 03:30 | | | 2 | | | 15:30 | | | 47 | | |
| 03:45 | | | 4 | 7 | 7 | 15:45 | | | 34 | 148 | 148 |
| 04:00 | | | 2 | | | 16:00 | | | 52 | | |
| 04:15 | | | 4 | | | 16:15 | | | 49 | | |
| 04:30 | | | 6 | | | 16:30 | | | 51 | | |
| 04:45 | | | 6 | 18 | 18 | 16:45 | | | 78 | 230 | 230 |
| 05:00 | | | 7 | | | 17:00 | | | 48 | | |
| 05:15 | | | 5 | | | 17:15 | | | 54 | | |
| 05:30 | | | 12 | | | 17:30 | | | 59 | | |
| 05:45 | | | 9 | 33 | 33 | 17:45 | | | 60 | 221 | 221 |
| 06:00 | | | 12 | | | 18:00 | | | 49 | | |
| 06:15 | | | 10 | | | 18:15 | | | 42 | | |
| 06:30 | | | 17 | | | 18:30 | | | 60 | | |
| 06:45 | | | 18 | 57 | 57 | 18:45 | | | 35 | 186 | 186 |
| 07:00 | | | 19 | | | 19:00 | | | 36 | | |
| 07:15 | | | 21 | | | 19:15 | | | 35 | | |
| 07:30 | | | 30 | | | 19:30 | | | 33 | | |
| 07:45 | | | 23 | 93 | 93 | 19:45 | | | 33 | 137 | 137 |
| 08:00 | | | 33 | | | 20:00 | | | 27 | | |
| 08:15 | | | 42 | | | 20:15 | | | 40 | | |
| 08:30 | | | 39 | | | 20:30 | | | 43 | | |
| 08:45 | | | 32 | 146 | 146 | 20:45 | | | 27 | 137 | 137 |
| 09:00 | | | 22 | | | 21:00 | | | 30 | | |
| 09:15 | | | 33 | | | 21:15 | | | 24 | | |
| 09:30 | | | 34 | | | 21:30 | | | 24 | | |
| 09:45 | | | 34 | 123 | 123 | 21:45 | | | 31 | 109 | 109 |
| 10:00 | | | 38 | | | 22:00 | | | 21 | | |
| 10:15 | | | 35 | | | 22:15 | | | 17 | | |
| 10:30 | | | 29 | | | 22:30 | | | 18 | | |
| 10:45 | | | 36 | 138 | 138 | 22:45 | | | 18 | 74 | 74 |
| 11:00 | | | 45 | | | 23:00 | | | 12 | | |
| 11:15 | | | 36 | | | 23:15 | | | 3 | | |
| 11:30 | | | 52 | | | 23:30 | | | 4 | | |
| 11:45 | | | 44 | 177 | 177 | 23:45 | | | 9 | 28 | 28 |
| **Total Vol.** | | | | 822 | **822** | | | | | 1827 | **1827** |

**Daily Totals**

| NB | SB | EB | WB | Combined |
|---|---|---|---|---|
| | | 2649 | | **2649** |

| | AM | | PM | |
|---|---|---|---|---|
| **Split %** | 100.0% | **31.0%** | 100.0% | **69.0%** |
| **Peak Hour** | 11:45 | **11:45** | 16:45 | **16:45** |
| **Volume** | 209 | **209** | 239 | **239** |
| **P.H.F.** | 0.79 | **0.79** | 0.77 | **0.77** |

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

WEDNESDAY - MAY 15, 2024 AREA: OCEANSIDE - MISSION PROJECT: ETD24-0517-02

S CLEMENTINE ST BETWEEN SEAGAZE DR & MISSION AVE

| AM | NB | SB | EB | WB | | PM | NB | SB | EB | WB | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 10 | | | | | 12:00 | 25 | | | | |
| 00:15 | 5 | | | | | 12:15 | 25 | | | | |
| 00:30 | 3 | | | | | 12:30 | 32 | | | | |
| 00:45 | 3 | 21 | | | 21 | 12:45 | 20 | 102 | | | 102 |
| 01:00 | 0 | | | | | 13:00 | 28 | | | | |
| 01:15 | 2 | | | | | 13:15 | 23 | | | | |
| 01:30 | 1 | | | | | 13:30 | 31 | | | | |
| 01:45 | 0 | 3 | | | 3 | 13:45 | 30 | 112 | | | 112 |
| 02:00 | 4 | | | | | 14:00 | 30 | | | | |
| 02:15 | 3 | | | | | 14:15 | 29 | | | | |
| 02:30 | 0 | | | | | 14:30 | 39 | | | | |
| 02:45 | 2 | 9 | | | 9 | 14:45 | 14 | 112 | | | 112 |
| 03:00 | 1 | | | | | 15:00 | 31 | | | | |
| 03:15 | 1 | | | | | 15:15 | 24 | | | | |
| 03:30 | 2 | | | | | 15:30 | 31 | | | | |
| 03:45 | 1 | 5 | | | 5 | 15:45 | 30 | 116 | | | 116 |
| 04:00 | 2 | | | | | 16:00 | 26 | | | | |
| 04:15 | 0 | | | | | 16:15 | 27 | | | | |
| 04:30 | 0 | | | | | 16:30 | 25 | | | | |
| 04:45 | 9 | 11 | | | 11 | 16:45 | 21 | 99 | | | 99 |
| 05:00 | 6 | | | | | 17:00 | 32 | | | | |
| 05:15 | 7 | | | | | 17:15 | 28 | | | | |
| 05:30 | 12 | | | | | 17:30 | 28 | | | | |
| 05:45 | 12 | 37 | | | 37 | 17:45 | 26 | 114 | | | 114 |
| 06:00 | 9 | | | | | 18:00 | 33 | | | | |
| 06:15 | 10 | | | | | 18:15 | 25 | | | | |
| 06:30 | 15 | | | | | 18:30 | 27 | | | | |
| 06:45 | 9 | 43 | | | 43 | 18:45 | 25 | 110 | | | 110 |
| 07:00 | 9 | | | | | 19:00 | 27 | | | | |
| 07:15 | 10 | | | | | 19:15 | 31 | | | | |
| 07:30 | 13 | | | | | 19:30 | 27 | | | | |
| 07:45 | 19 | 51 | | | 51 | 19:45 | 36 | 121 | | | 121 |
| 08:00 | 28 | | | | | 20:00 | 30 | | | | |
| 08:15 | 33 | | | | | 20:15 | 22 | | | | |
| 08:30 | 29 | | | | | 20:30 | 20 | | | | |
| 08:45 | 22 | 112 | | | 112 | 20:45 | 24 | 96 | | | 96 |
| 09:00 | 20 | | | | | 21:00 | 27 | | | | |
| 09:15 | 23 | | | | | 21:15 | 25 | | | | |
| 09:30 | 16 | | | | | 21:30 | 22 | | | | |
| 09:45 | 27 | 86 | | | 86 | 21:45 | 14 | 88 | | | 88 |
| 10:00 | 28 | | | | | 22:00 | 24 | | | | |
| 10:15 | 13 | | | | | 22:15 | 13 | | | | |
| 10:30 | 34 | | | | | 22:30 | 13 | | | | |
| 10:45 | 28 | 103 | | | 103 | 22:45 | 12 | 62 | | | 62 |
| 11:00 | 20 | | | | | 23:00 | 8 | | | | |
| 11:15 | 31 | | | | | 23:15 | 11 | | | | |
| 11:30 | 33 | | | | | 23:30 | 8 | | | | |
| 11:45 | 30 | 114 | | | 114 | 23:45 | 1 | 28 | | | 28 |
| **Total Vol.** | | 595 | | | **595** | | 1160 | | | | **1160** |

**Daily Totals**

| NB | SB | EB | WB | Combined |
|---|---|---|---|---|
| 1755 | | | | **1755** |

| | AM | | PM | |
|---|---|---|---|---|
| **Split %** | 100.0% | **33.9%** | 100.0% | **66.1%** |
| **Peak Hour** | 11:15 | **11:15** | 13:45 | **13:45** |
| **Volume** | 119 | **119** | 128 | **128** |
| **P.H.F.** | 0.90 | **0.90** | 0.98 | **0.82** |

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

WEDNESDAY - MAY 15, 2024 AREA: OCEANSIDE - MISSION PROJECT: ETD24-0517-02

S HORNE ST BETWEEN SEAGAZE DR & MISSION AVE

| AM | NB | | SB | | EB | WB | | PM | NB | | SB | | EB | WB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 18 | | 8 | | | | | 12:00 | 70 | | 33 | | | | |
| 00:15 | 9 | | 2 | | | | | 12:15 | 83 | | 45 | | | | |
| 00:30 | 6 | | 2 | | | | | 12:30 | 74 | | 36 | | | | |
| 00:45 | 3 | 36 | 3 | 15 | | | 51 | 12:45 | 76 | 303 | 49 | 163 | | | 466 |
| 01:00 | 1 | | 0 | | | | | 13:00 | 84 | | 30 | | | | |
| 01:15 | 1 | | 0 | | | | | 13:15 | 88 | | 36 | | | | |
| 01:30 | 4 | | 2 | | | | | 13:30 | 97 | | 51 | | | | |
| 01:45 | 2 | 8 | 2 | 4 | | | 12 | 13:45 | 81 | 350 | 40 | 157 | | | 507 |
| 02:00 | 3 | | 1 | | | | | 14:00 | 81 | | 44 | | | | |
| 02:15 | 4 | | 1 | | | | | 14:15 | 78 | | 39 | | | | |
| 02:30 | 4 | | 1 | | | | | 14:30 | 93 | | 48 | | | | |
| 02:45 | 2 | 13 | 0 | 3 | | | 16 | 14:45 | 83 | 335 | 47 | 178 | | | 513 |
| 03:00 | 1 | | 0 | | | | | 15:00 | 113 | | 49 | | | | |
| 03:15 | 3 | | 0 | | | | | 15:15 | 78 | | 37 | | | | |
| 03:30 | 6 | | 2 | | | | | 15:30 | 81 | | 34 | | | | |
| 03:45 | 6 | 16 | 0 | 2 | | | 18 | 15:45 | 89 | 361 | 39 | 159 | | | 520 |
| 04:00 | 11 | | 3 | | | | | 16:00 | 83 | | 38 | | | | |
| 04:15 | 7 | | 1 | | | | | 16:15 | 79 | | 38 | | | | |
| 04:30 | 8 | | 1 | | | | | 16:30 | 94 | | 51 | | | | |
| 04:45 | 23 | 49 | 3 | 8 | | | 57 | 16:45 | 98 | 354 | 42 | 169 | | | 523 |
| 05:00 | 21 | | 3 | | | | | 17:00 | 103 | | 58 | | | | |
| 05:15 | 28 | | 3 | | | | | 17:15 | 95 | | 30 | | | | |
| 05:30 | 37 | | 4 | | | | | 17:30 | 96 | | 51 | | | | |
| 05:45 | 39 | 125 | 4 | 14 | | | 139 | 17:45 | 102 | 396 | 40 | 179 | | | 575 |
| 06:00 | 27 | | 2 | | | | | 18:00 | 83 | | 38 | | | | |
| 06:15 | 39 | | 3 | | | | | 18:15 | 88 | | 42 | | | | |
| 06:30 | 52 | | 6 | | | | | 18:30 | 87 | | 41 | | | | |
| 06:45 | 40 | 158 | 20 | 31 | | | 189 | 18:45 | 82 | 340 | 43 | 164 | | | 504 |
| 07:00 | 54 | | 15 | | | | | 19:00 | 82 | | 46 | | | | |
| 07:15 | 57 | | 24 | | | | | 19:15 | 76 | | 34 | | | | |
| 07:30 | 55 | | 19 | | | | | 19:30 | 82 | | 47 | | | | |
| 07:45 | 68 | 234 | 39 | 97 | | | 331 | 19:45 | 91 | 331 | 31 | 158 | | | 489 |
| 08:00 | 60 | | 61 | | | | | 20:00 | 77 | | 25 | | | | |
| 08:15 | 92 | | 80 | | | | | 20:15 | 59 | | 26 | | | | |
| 08:30 | 78 | | 41 | | | | | 20:30 | 67 | | 33 | | | | |
| 08:45 | 70 | 300 | 39 | 221 | | | 521 | 20:45 | 67 | 270 | 35 | 119 | | | 389 |
| 09:00 | 67 | | 43 | | | | | 21:00 | 68 | | 27 | | | | |
| 09:15 | 77 | | 27 | | | | | 21:15 | 61 | | 22 | | | | |
| 09:30 | 59 | | 32 | | | | | 21:30 | 43 | | 15 | | | | |
| 09:45 | 72 | 275 | 26 | 128 | | | 403 | 21:45 | 35 | 207 | 16 | 80 | | | 287 |
| 10:00 | 65 | | 17 | | | | | 22:00 | 49 | | 8 | | | | |
| 10:15 | 57 | | 30 | | | | | 22:15 | 33 | | 12 | | | | |
| 10:30 | 87 | | 29 | | | | | 22:30 | 28 | | 11 | | | | |
| 10:45 | 65 | 274 | 27 | 103 | | | 377 | 22:45 | 23 | 133 | 8 | 39 | | | 172 |
| 11:00 | 59 | | 39 | | | | | 23:00 | 18 | | 7 | | | | |
| 11:15 | 65 | | 28 | | | | | 23:15 | 23 | | 8 | | | | |
| 11:30 | 76 | | 39 | | | | | 23:30 | 16 | | 5 | | | | |
| 11:45 | 81 | 281 | 47 | 153 | | | 434 | 23:45 | 8 | 65 | 3 | 23 | | | 88 |
| **Total Vol.** | | 1769 | | 779 | | | **2548** | | | 3445 | | 1588 | | | **5033** |

**Daily Totals**

| NB | SB | EB | WB | Combined |
|---|---|---|---|---|
| 5214 | 2367 | | | **7581** |

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| **Split %** | 69.4% | 30.6% | **33.6%** | 68.4% | 31.6% | **66.4%** |
| **Peak Hour** | 11:30 | 07:45 | **08:00** | 17:00 | 16:15 | **17:00** |
| **Volume** | 310 | 221 | **521** | 396 | 189 | **575** |
| **P.H.F.** | 0.93 | 0.69 | **0.76** | 0.95 | 0.81 | **0.89** |

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

| DATE: | LOCATION: | OCEANSIDE - MISSION | PROJECT #: | ETD24-0517-02 |
|---|---|---|---|---|
| 5/15/24 | NORTH & SOUTH: | S DITMAR ST | LOCATION #: | 1 |
| WEDNESDAY | EAST & WEST: | MISSION AVE | CONTROL: | SIGNAL |

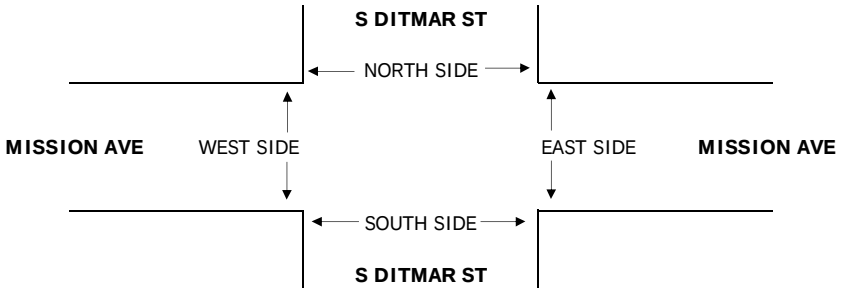
NOTES:

INCLUDES BIKE & PED

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

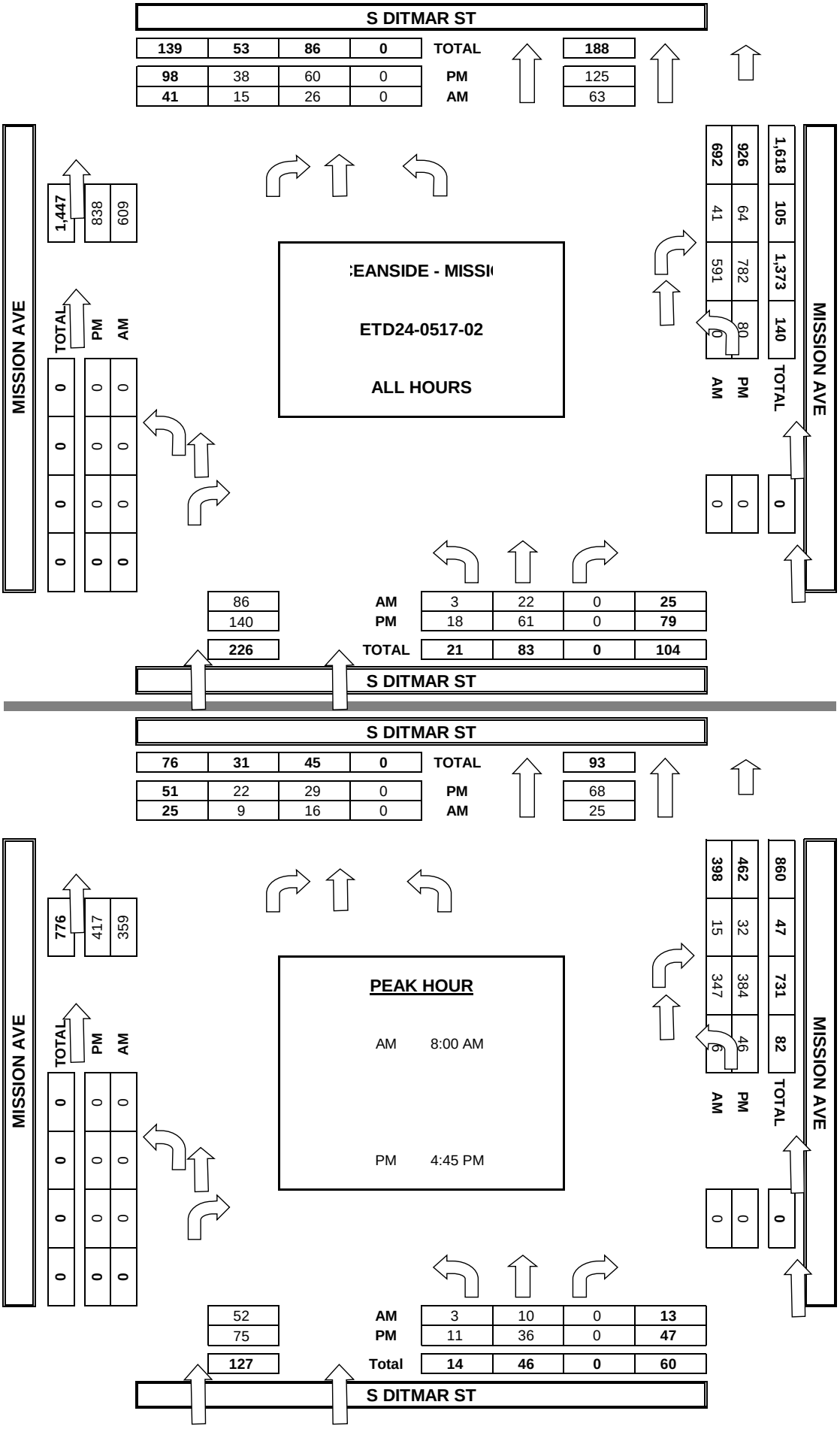
| | | NORTHBOUND S DITMAR ST | | | SOUTHBOUND S DITMAR ST | | | EASTBOUND MISSION AVE | | | WESTBOUND MISSION AVE | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR | TOTAL | NB X | SB X | EB X | WB X | TTL |
| AM | 7:00 AM | 0 | 1 | | | 2 | 0 | | | | 10 | 50 | 2 | 65 | | | | | 0 |
| | 7:15 AM | 0 | 4 | | | 2 | 1 | | | | 3 | 62 | 4 | 76 | | | | | 0 |
| | 7:30 AM | 0 | 2 | | | 2 | 0 | | | | 6 | 53 | 13 | 76 | | | | | 0 |
| | 7:45 AM | 0 | 5 | | | 4 | 5 | | | | 5 | 79 | 7 | 105 | | | | | 0 |
| | 8:00 AM | 1 | 0 | | | 3 | 1 | | | | 5 | 80 | 0 | 90 | | | | | 0 |
| | 8:15 AM | 0 | 3 | | | 2 | 2 | | | | 6 | 88 | 6 | 107 | | | | | 0 |
| | 8:30 AM | 1 | 2 | | | 3 | 3 | | | | 9 | 86 | 6 | 110 | | | | | 0 |
| | 8:45 AM | 1 | 5 | | | 8 | 3 | | | | 16 | 93 | 3 | 129 | | | | | 0 |
| | VOLUMES | 3 | 22 | 0 | 0 | 26 | 15 | 0 | 0 | 0 | 60 | 591 | 41 | 758 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 12% | 88% | 0% | 0% | 63% | 37% | 0% | 0% | 0% | 9% | 85% | 6% | | | | | | |
| | APP/DEPART | 25 | / | 63 | 41 | / | 86 | 0 | / | 0 | 692 | / | 609 | 0 | | | | | |
| | BEGIN PEAK HR | | 8:00 AM | | | | | | | | | | | | | | | | |
| | VOLUMES | 3 | 10 | 0 | 0 | 16 | 9 | 0 | 0 | 0 | 36 | 347 | 15 | 436 | | | | | |
| | APPROACH % | 23% | 77% | 0% | 0% | 64% | 36% | 0% | 0% | 0% | 9% | 87% | 4% | | | | | | |
| | PEAK HR FACTOR | | 0.542 | | | 0.568 | | | 0.000 | | | 0.888 | | 0.845 | | | | | |
| | APP/DEPART | 13 | / | 25 | 25 | / | 52 | 0 | / | 0 | 398 | / | 359 | 0 | | | | | |
| PM | 4:00 PM | 0 | 10 | | | 6 | 2 | | | | 11 | 97 | 9 | 135 | | | | | 0 |
| | 4:15 PM | 3 | 7 | | | 11 | 3 | | | | 7 | 99 | 10 | 140 | | | | | 0 |
| | 4:30 PM | 2 | 5 | | | 8 | 8 | | | | 6 | 97 | 7 | 133 | | | | | 0 |
| | 4:45 PM | 4 | 10 | | | 11 | 3 | | | | 11 | 98 | 6 | 143 | | | | | 0 |
| | 5:00 PM | 6 | 11 | | | 7 | 3 | | | | 17 | 88 | 11 | 143 | | | | | 0 |
| | 5:15 PM | 0 | 8 | | | 7 | 10 | | | | 11 | 89 | 10 | 135 | | | | | 0 |
| | 5:30 PM | 1 | 7 | | | 4 | 6 | | | | 7 | 109 | 5 | 139 | | | | | 0 |
| | 5:45 PM | 2 | 3 | | | 6 | 3 | | | | 10 | 105 | 6 | 135 | | | | | 0 |
| | VOLUMES | 18 | 61 | 0 | 0 | 60 | 38 | 0 | 0 | 0 | 80 | 782 | 64 | 1,103 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 23% | 77% | 0% | 0% | 61% | 39% | 0% | 0% | 0% | 9% | 84% | 7% | | | | | | |
| | APP/DEPART | 79 | / | 125 | 98 | / | 140 | 0 | / | 0 | 926 | / | 838 | 0 | | | | | |
| | BEGIN PEAK HR | | 4:45 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 11 | 36 | 0 | 0 | 29 | 22 | 0 | 0 | 0 | 46 | 384 | 32 | 560 | | | | | |
| | APPROACH % | 23% | 77% | 0% | 0% | 57% | 43% | 0% | 0% | 0% | 10% | 83% | 7% | | | | | | |
| | PEAK HR FACTOR | | 0.691 | | | 0.750 | | | 0.000 | | | 0.955 | | 0.979 | | | | | |
| | APP/DEPART | 47 | / | 68 | 51 | / | 75 | 0 | / | 0 | 462 | / | 417 | 0 | | | | | |




| | | PEDESTRIAN CROSSINGS | | | | | PEDESTRIAN ACTIVATIONS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| AM | 7:00 AM | | 4 | | 1 | 5 | | | | | 0 | | | | | 0 |
| | 7:15 AM | | 1 | | | 1 | | | | | 0 | | | | | 0 |
| | 7:30 AM | | 4 | | | 4 | | | | | 0 | | | | | 0 |
| | 7:45 AM | 1 | 3 | 2 | 3 | 9 | | | | | 0 | | | 1 | 1 | 2 |
| | 8:00 AM | 4 | 2 | 1 | 1 | 8 | | | | | 0 | | | | | 0 |
| | 8:15 AM | 1 | 2 | 1 | 3 | 7 | | | | | 0 | | | | 1 | 1 |
| | 8:30 AM | 3 | 2 | | 5 | 10 | | | | | 0 | | | | | 0 |
| | 8:45 AM | 5 | 10 | 1 | 8 | 24 | | | | | 0 | | | | 1 | 1 |
| | TOTAL | 14 | 28 | 5 | 21 | 68 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 4 |
| PM | 4:00 PM | 7 | 7 | 1 | 6 | 21 | | | | | 0 | | | | | 0 |
| | 4:15 PM | 5 | 5 | 2 | 4 | 16 | | | | | 0 | | | | | 0 |
| | 4:30 PM | 8 | 3 | 2 | 2 | 15 | | | | | 0 | | 1 | | | 1 |
| | 4:45 PM | 2 | 10 | 4 | 5 | 21 | | | | | 0 | | | | | 0 |
| | 5:00 PM | 5 | 4 | | 5 | 14 | | | | | 0 | | 1 | | | 1 |
| | 5:15 PM | 12 | 4 | 3 | 4 | 23 | | | | | 0 | | | | | 0 |
| | 5:30 PM | 10 | 8 | 4 | 9 | 31 | | | | | 0 | | 1 | | | 1 |
| | 5:45 PM | 25 | 12 | 4 | 9 | 50 | | | | | 0 | | | | 1 | 1 |
| | TOTAL | 74 | 53 | 20 | 44 | 191 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 4 |

**PACIFIC TECHNICAL DATA**

TURNING MOVEMENT COUNTS



| CAM | LOCATION |
|---|---|
| | 01 |



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NORTH
< WEST

MISSION AVE

S DITMAR ST

| NORTH / SOUTH STREET | S DITMAR ST |
|---|---|
| EAST / WEST STREET | MISSION AVE |

| | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR |
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|

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

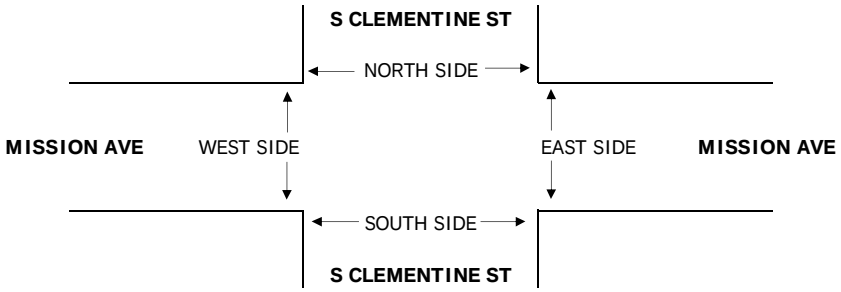
| DATE: | LOCATION: | OCEANSIDE - MISSION | PROJECT #: | ETD24-0517-02 |
|---|---|---|---|---|
| 5/15/24 | NORTH & SOUTH: | S CLEMENTINE ST | LOCATION #: | 2 |
| WEDNESDAY | EAST & WEST: | MISSION AVE | CONTROL: | SIGNAL |

NOTES:

INCLUDES BIKE & PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

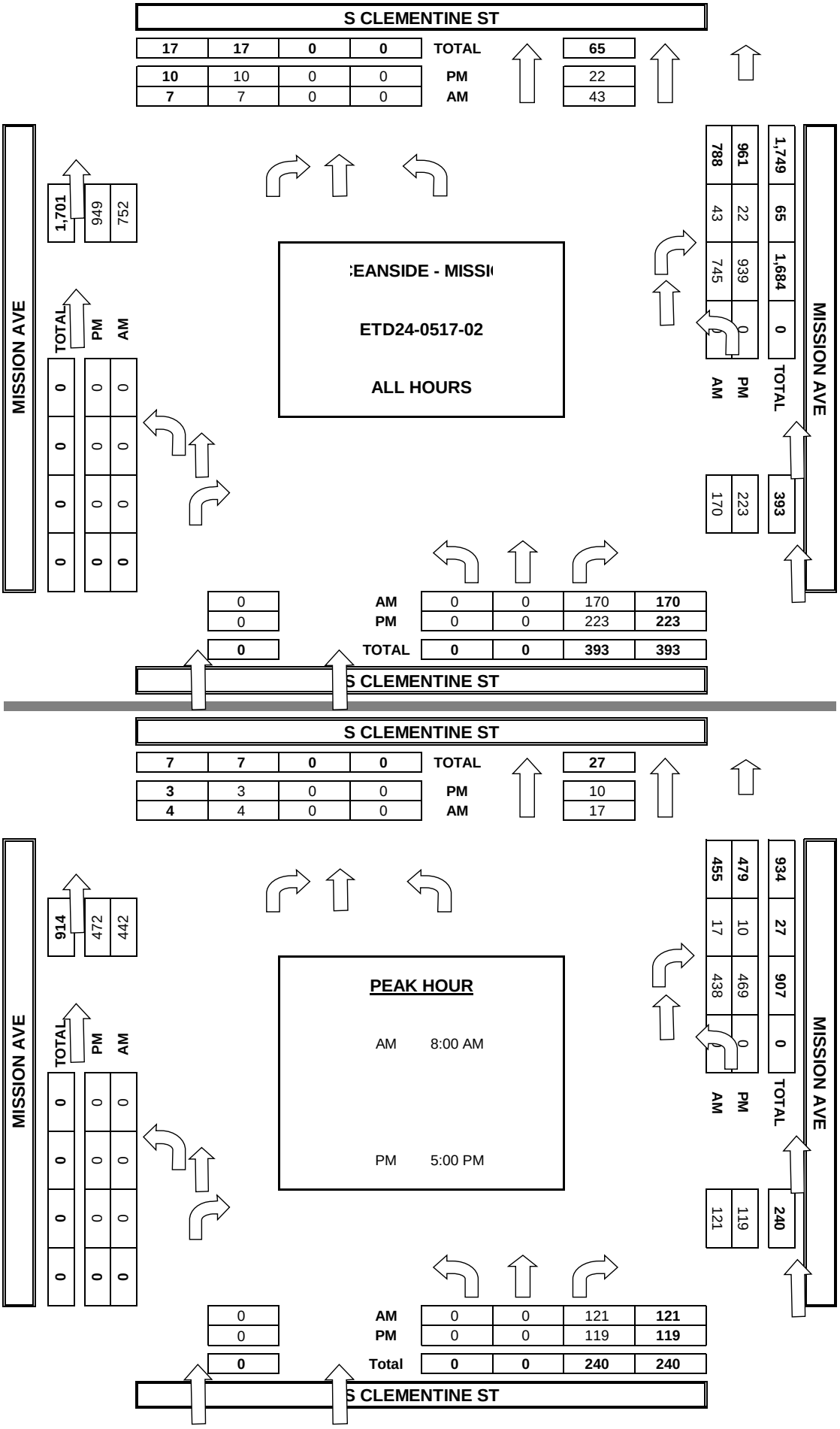
| | | NORTHBOUND S CLEMENTINE ST | | | SOUTHBOUND S CLEMENTINE ST | | | EASTBOUND MISSION AVE | | | WESTBOUND MISSION AVE | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR | TOTAL | NB X | SB X | EB X | WB X | TTL |
| AM | 7:00 AM | | | 9 | | | 2 | | | | | 56 | 7 | 74 | | | | | 0 |
| | 7:15 AM | | | 9 | | | 0 | | | | | 69 | 13 | 91 | | | | | 0 |
| | 7:30 AM | | | 12 | | | 0 | | | | | 80 | 2 | 94 | | | | | 0 |
| | 7:45 AM | | | 19 | | | 1 | | | | | 102 | 4 | 126 | | | | | 0 |
| | 8:00 AM | | | 31 | | | 1 | | | | | 94 | 8 | 134 | | | | | 0 |
| | 8:15 AM | | | 36 | | | 1 | | | | | 114 | 2 | 153 | | | | | 0 |
| | 8:30 AM | | | 32 | | | 0 | | | | | 96 | 4 | 132 | | | | | 0 |
| | 8:45 AM | | | 22 | | | 2 | | | | | 134 | 3 | 161 | | | | | 0 |
| | VOLUMES | 0 | 0 | 170 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 745 | 43 | 965 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 95% | 5% | | | | | | |
| | APP/DEPART | 170 | / | 43 | 7 | / | 0 | 0 | / | 170 | 788 | / | 752 | 0 | | | | | |
| | BEGIN PEAK HR | | 8:00 AM | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 0 | 121 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 438 | 17 | 580 | | | | | |
| | APPROACH % | 0% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 96% | 4% | | | | | | |
| | PEAK HR FACTOR | | 0.840 | | | 0.500 | | | 0.000 | | | 0.830 | | 0.901 | | | | | |
| | APP/DEPART | 121 | / | 17 | 4 | / | 0 | 0 | / | 121 | 455 | / | 442 | 0 | | | | | |
| PM | 4:00 PM | | | 27 | | | 2 | | | | | 117 | 5 | 151 | | | | | 0 |
| | 4:15 PM | | | 28 | | | 2 | | | | | 114 | 5 | 149 | | | | | 0 |
| | 4:30 PM | | | 28 | | | 3 | | | | | 114 | 1 | 146 | | | | | 0 |
| | 4:45 PM | | | 21 | | | 0 | | | | | 125 | 1 | 147 | | | | | 0 |
| | 5:00 PM | | | 34 | | | 1 | | | | | 113 | 1 | 149 | | | | | 0 |
| | 5:15 PM | | | 32 | | | 1 | | | | | 109 | 2 | 144 | | | | | 0 |
| | 5:30 PM | | | 27 | | | 0 | | | | | 129 | 3 | 159 | | | | | 0 |
| | 5:45 PM | | | 26 | | | 1 | | | | | 118 | 4 | 149 | | | | | 0 |
| | VOLUMES | 0 | 0 | 223 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 939 | 22 | 1,194 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 98% | 2% | | | | | | |
| | APP/DEPART | 223 | / | 22 | 10 | / | 0 | 0 | / | 223 | 961 | / | 949 | 0 | | | | | |
| | BEGIN PEAK HR | | 5:00 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 0 | 119 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 469 | 10 | 601 | | | | | |
| | APPROACH % | 0% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 98% | 2% | | | | | | |
| | PEAK HR FACTOR | | 0.875 | | | 0.750 | | | 0.000 | | | 0.907 | | 0.945 | | | | | |
| | APP/DEPART | 119 | / | 10 | 3 | / | 0 | 0 | / | 119 | 479 | / | 472 | 0 | | | | | |




| | | PEDESTRIAN CROSSINGS | | | | | PEDESTRIAN ACTIVATIONS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| AM | 7:00 AM | | | | 1 | 1 | | | | | 0 | | | | | 0 |
| | 7:15 AM | | | | | 0 | | | | | 0 | | | | | 0 |
| | 7:30 AM | | 1 | 1 | | 2 | | | | | 0 | | | | | 0 |
| | 7:45 AM | | | | 1 | 1 | | | | | 0 | | | | | 0 |
| | 8:00 AM | 5 | 3 | | 1 | 9 | | | | | 0 | | | | 1 | 1 |
| | 8:15 AM | 2 | 4 | 2 | 4 | 12 | | | | | 0 | | | | 2 | 2 |
| | 8:30 AM | 3 | 1 | | 1 | 5 | | | | | 0 | | | | | 0 |
| | 8:45 AM | 1 | 2 | | 1 | 4 | | | | | 0 | | | | | 0 |
| | TOTAL | 11 | 11 | 3 | 9 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| PM | 4:00 PM | 3 | 1 | | 2 | 6 | | | | | 0 | | | | | 0 |
| | 4:15 PM | 3 | 2 | | 1 | 6 | | | | | 0 | | | | | 0 |
| | 4:30 PM | 9 | 1 | 1 | 3 | 14 | | | | | 0 | | | | | 0 |
| | 4:45 PM | 3 | 2 | | 3 | 8 | | | | | 0 | | | | | 0 |
| | 5:00 PM | 3 | 3 | 1 | 1 | 8 | | | | | 0 | 3 | 1 | | | 4 |
| | 5:15 PM | 3 | | 3 | | 6 | | | | | 0 | | | | | 0 |
| | 5:30 PM | 5 | 3 | 2 | | 10 | | | | | 0 | | | 1 | | 1 |
| | 5:45 PM | 8 | 4 | 1 | | 13 | | | | | 0 | | | | | 0 |
| | TOTAL | 37 | 16 | 8 | 10 | 71 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 0 | 5 |

**PACIFIC TECHNICAL DATA**

TURNING MOVEMENT COUNTS



| CAM | LOCATION |
|---|---|
| | 02 |



^
NORTH
< WEST

MISSION AVE

S CLEMENTINE ST

| NORTH/SOUTH STREET | S CLEMENTINE ST |
|---|---|
| EAST/WEST STREET | MISSION AVE |

| | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0700 | | | | | | | | | | | | |
| 1600 | | | | | | | | | | | | |

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

| DATE: | LOCATION: | OCEANSIDE - MISSION | PROJECT #: | ETD24-0517-02 |
|---|---|---|---|---|
| 5/15/24 | NORTH & SOUTH: | S HORNE ST | LOCATION #: | 3 |
| WEDNESDAY | EAST & WEST: | MISSION AVE | CONTROL: | SIGNAL |

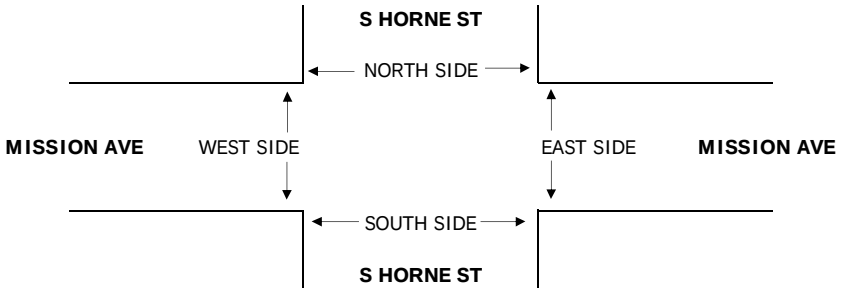
NOTES:

INCLUDES BIKE & PED

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

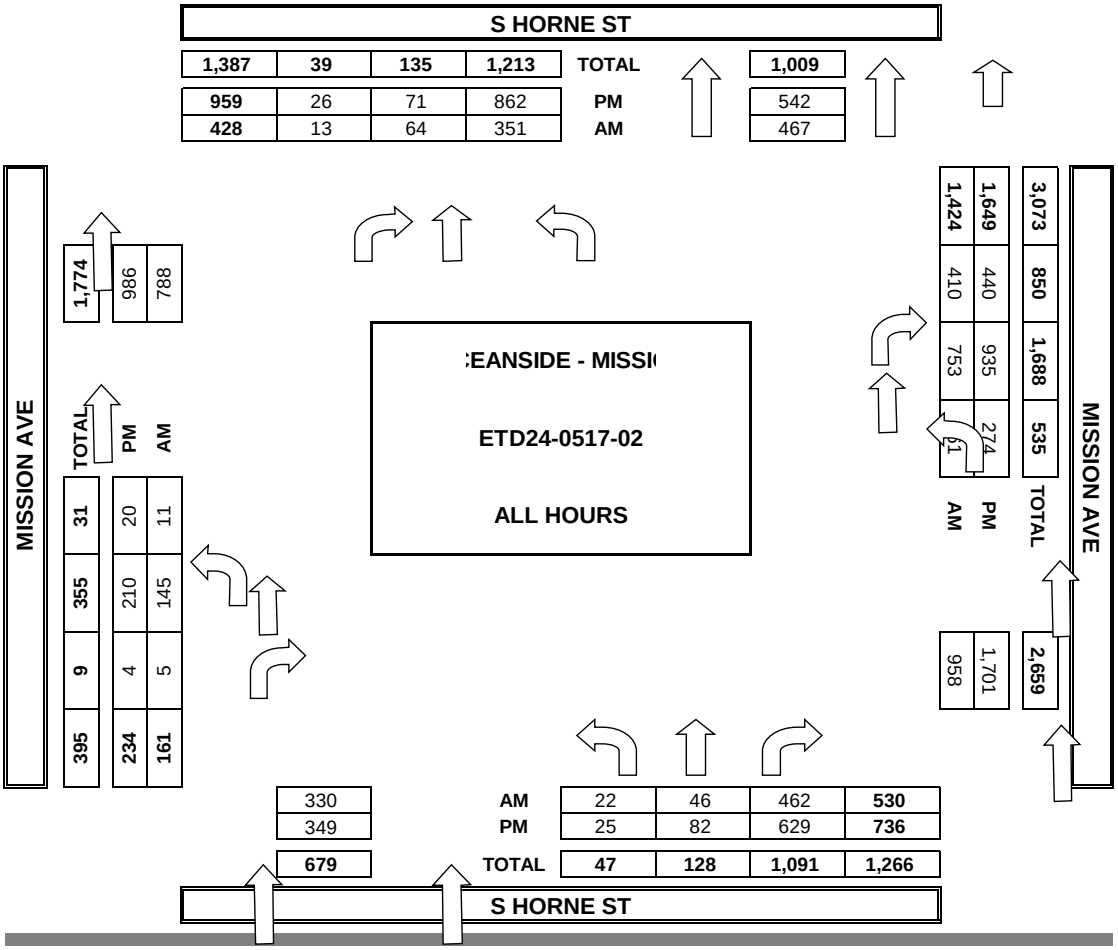
| | | NORTHBOUND S HORNE ST | | | SOUTHBOUND S HORNE ST | | | EASTBOUND MISSION AVE | | | WESTBOUND MISSION AVE | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR | TOTAL | NB X | SB X | EB X | WB X | TTL |
| AM | 7:00 AM | 0 | 5 | 40 | 31 | 2 | 1 | 0 | 9 | 0 | 13 | 53 | 24 | 178 | | | | | 0 |
| | 7:15 AM | 1 | 3 | 55 | 33 | 4 | 0 | 0 | 9 | 0 | 19 | 74 | 49 | 247 | | | | | 0 |
| | 7:30 AM | 1 | 8 | 46 | 55 | 4 | 2 | 0 | 9 | 0 | 15 | 80 | 64 | 284 | | | | | 0 |
| | 7:45 AM | 3 | 0 | 65 | 39 | 8 | 1 | 0 | 16 | 1 | 31 | 106 | 49 | 319 | | | | 1 | 1 |
| | 8:00 AM | 4 | 6 | 55 | 34 | 12 | 3 | 1 | 28 | 0 | 50 | 105 | 61 | 359 | | | | 1 | 1 |
| | 8:15 AM | 6 | 11 | 78 | 47 | 12 | 4 | 4 | 26 | 2 | 69 | 99 | 53 | 411 | | | | | 0 |
| | 8:30 AM | 4 | 8 | 68 | 63 | 12 | 1 | 3 | 29 | 0 | 33 | 97 | 54 | 372 | | | | 1 | 1 |
| | 8:45 AM | 3 | 5 | 55 | 49 | 10 | 1 | 3 | 19 | 2 | 31 | 139 | 56 | 373 | | | | 1 | 1 |
| | VOLUMES | 22 | 46 | 462 | 351 | 64 | 13 | 11 | 145 | 5 | 261 | 753 | 410 | 2,543 | 0 | 0 | 0 | 4 | 4 |
| | APPROACH % | 4% | 9% | 87% | 82% | 15% | 3% | 7% | 90% | 3% | 18% | 53% | 29% | | | | | | |
| | APP/DEPART | 530 | / | 467 | 428 | / | 330 | 161 | / | 958 | 1,424 | / | 788 | 0 | | | | | |
| | BEGIN PEAK HR | | 8:00 AM | | | | | | | | | | | | | | | | |
| | VOLUMES | 17 | 30 | 256 | 193 | 46 | 9 | 11 | 102 | 4 | 183 | 440 | 224 | 1,515 | | | | | |
| | APPROACH % | 6% | 10% | 84% | 78% | 19% | 4% | 9% | 87% | 3% | 22% | 52% | 26% | | | | | | |
| | PEAK HR FACTOR | | 0.797 | | | 0.816 | | | 0.914 | | | 0.937 | | 0.922 | | | | | |
| | APP/DEPART | 303 | / | 265 | 248 | / | 233 | 117 | / | 551 | 847 | / | 466 | 0 | | | | | |
| PM | 4:00 PM | 3 | 8 | 70 | 95 | 7 | 3 | 3 | 24 | 0 | 31 | 124 | 40 | 408 | | | | | 0 |
| | 4:15 PM | 3 | 7 | 69 | 94 | 13 | 3 | 5 | 25 | 0 | 25 | 117 | 70 | 431 | | | | | 0 |
| | 4:30 PM | 1 | 11 | 80 | 126 | 7 | 2 | 1 | 27 | 3 | 40 | 104 | 31 | 433 | | | | | 0 |
| | 4:45 PM | 1 | 10 | 79 | 100 | 10 | 3 | 2 | 18 | 0 | 32 | 121 | 50 | 426 | | | | 1 | 1 |
| | 5:00 PM | 7 | 12 | 90 | 140 | 7 | 3 | 2 | 30 | 0 | 52 | 106 | 63 | 512 | | | | | 0 |
| | 5:15 PM | 2 | 13 | 77 | 130 | 8 | 5 | 2 | 32 | 1 | 21 | 105 | 56 | 452 | | | | 1 | 1 |
| | 5:30 PM | 5 | 10 | 76 | 95 | 9 | 3 | 3 | 30 | 0 | 43 | 142 | 64 | 480 | | | | | 0 |
| | 5:45 PM | 3 | 11 | 88 | 82 | 10 | 4 | 2 | 24 | 0 | 30 | 116 | 66 | 436 | | | | | 0 |
| | VOLUMES | 25 | 82 | 629 | 862 | 71 | 26 | 20 | 210 | 4 | 274 | 935 | 440 | 3,578 | 0 | 0 | 0 | 2 | 2 |
| | APPROACH % | 3% | 11% | 85% | 90% | 7% | 3% | 9% | 90% | 2% | 17% | 57% | 27% | | | | | | |
| | APP/DEPART | 736 | / | 542 | 959 | / | 349 | 234 | / | 1,701 | 1,649 | / | 986 | 0 | | | | | |
| | BEGIN PEAK HR | | 5:00 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 17 | 46 | 331 | 447 | 34 | 15 | 9 | 116 | 1 | 146 | 469 | 249 | 1,880 | | | | | |
| | APPROACH % | 4% | 12% | 84% | 90% | 7% | 3% | 7% | 92% | 1% | 17% | 54% | 29% | | | | | | |
| | PEAK HR FACTOR | | 0.904 | | | 0.827 | | | 0.900 | | | 0.867 | | 0.918 | | | | | |
| | APP/DEPART | 394 | / | 304 | 496 | / | 181 | 126 | / | 894 | 864 | / | 501 | 0 | | | | | |

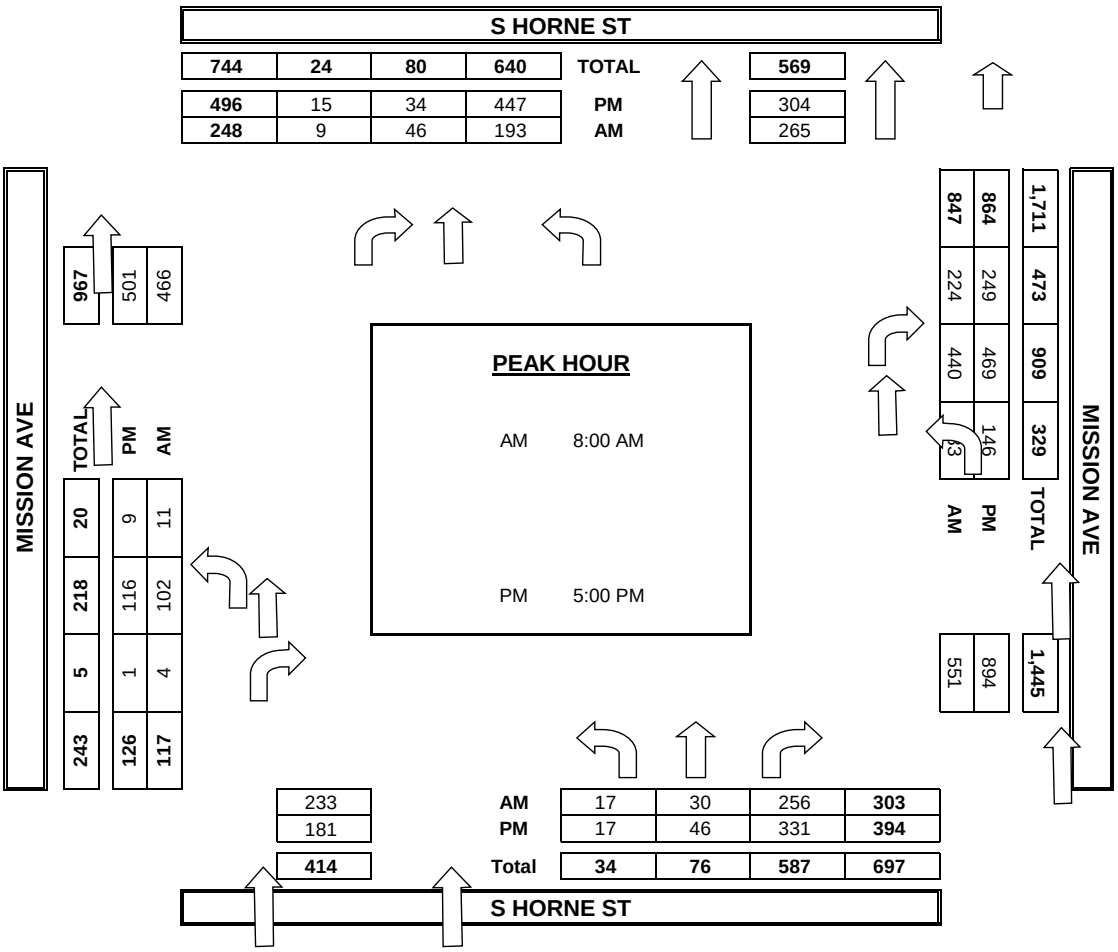



| | | PEDESTRIAN CROSSINGS | | | | | PEDESTRIAN ACTIVATIONS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| AM | 7:00 AM | 1 | | 1 | 1 | 3 | | | | | 0 | | | | | 0 |
| | 7:15 AM | | | 2 | | 2 | | | | | 0 | | | | | 0 |
| | 7:30 AM | 1 | 2 | | | 3 | | | | | 0 | | | | | 0 |
| | 7:45 AM | | 3 | 6 | 1 | 10 | | | | | 0 | | | 1 | | 1 |
| | 8:00 AM | 6 | 1 | 5 | 2 | 14 | | | | | 0 | | 1 | | | 1 |
| | 8:15 AM | 5 | 2 | 14 | 5 | 26 | | | | | 0 | | | | | 0 |
| | 8:30 AM | 4 | 2 | 13 | 2 | 21 | | | | | 0 | | | | | 0 |
| | 8:45 AM | 4 | 3 | 3 | 4 | 14 | | | | | 0 | | | 1 | | 1 |
| | TOTAL | 21 | 13 | 44 | 15 | 93 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 3 |
| PM | 4:00 PM | 1 | 3 | 4 | 1 | 9 | | | | | 0 | | | | | 0 |
| | 4:15 PM | 1 | 2 | 13 | | 16 | | | | | 0 | | | | | 0 |
| | 4:30 PM | 2 | 2 | 2 | 3 | 9 | | | | | 0 | | | 1 | | 1 |
| | 4:45 PM | 2 | 3 | | | 5 | | | | | 0 | | | 1 | | 1 |
| | 5:00 PM | 5 | 2 | 10 | 3 | 20 | | | | | 0 | 2 | 1 | | 1 | 4 |
| | 5:15 PM | | 1 | 6 | 4 | 11 | | | | | 0 | | | 1 | 2 | 3 |
| | 5:30 PM | 4 | 2 | 3 | | 9 | | | | | 0 | | | | | 0 |
| | 5:45 PM | 1 | 2 | 6 | 3 | 12 | | | | | 0 | | | 1 | | 1 |
| | TOTAL | 16 | 17 | 44 | 14 | 91 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 4 | 3 | 10 |

**PACIFIC TECHNICAL DATA**

TURNING MOVEMENT COUNTS



| CAM | LOCATION |
|---|---|
| | 03 |



^
NORTH
< WEST

**MISSION AVE**

**S HORNE ST**

| | |
|---|---|
| **NORTH / SOUTH STREET** | **S HORNE ST** |
| **EAST / WEST STREET** | **MISSION AVE** |

| | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0700 | | | | | | | | | | | | |
| 1600 | | | | | | | | | | | | |

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

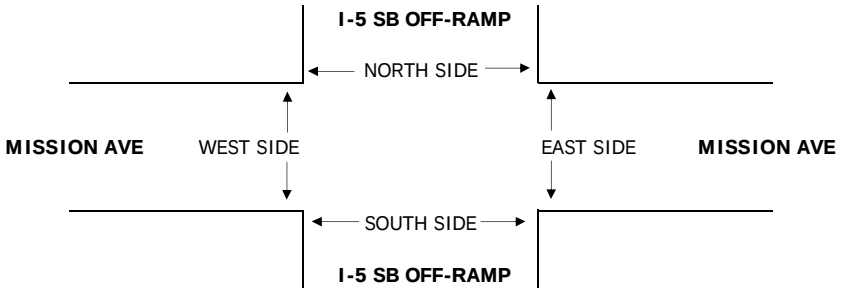
| DATE: | LOCATION: | OCEANSIDE - MISSION | PROJECT #: | ETD24-0517-02 |
|---|---|---|---|---|
| 5/15/24 | NORTH & SOUTH: | I-5 SB OFF-RAMP | LOCATION #: | 4 |
| WEDNESDAY | EAST & WEST: | MISSION AVE | CONTROL: | SIGNAL |

NOTES:

INCLUDES BIKE & PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

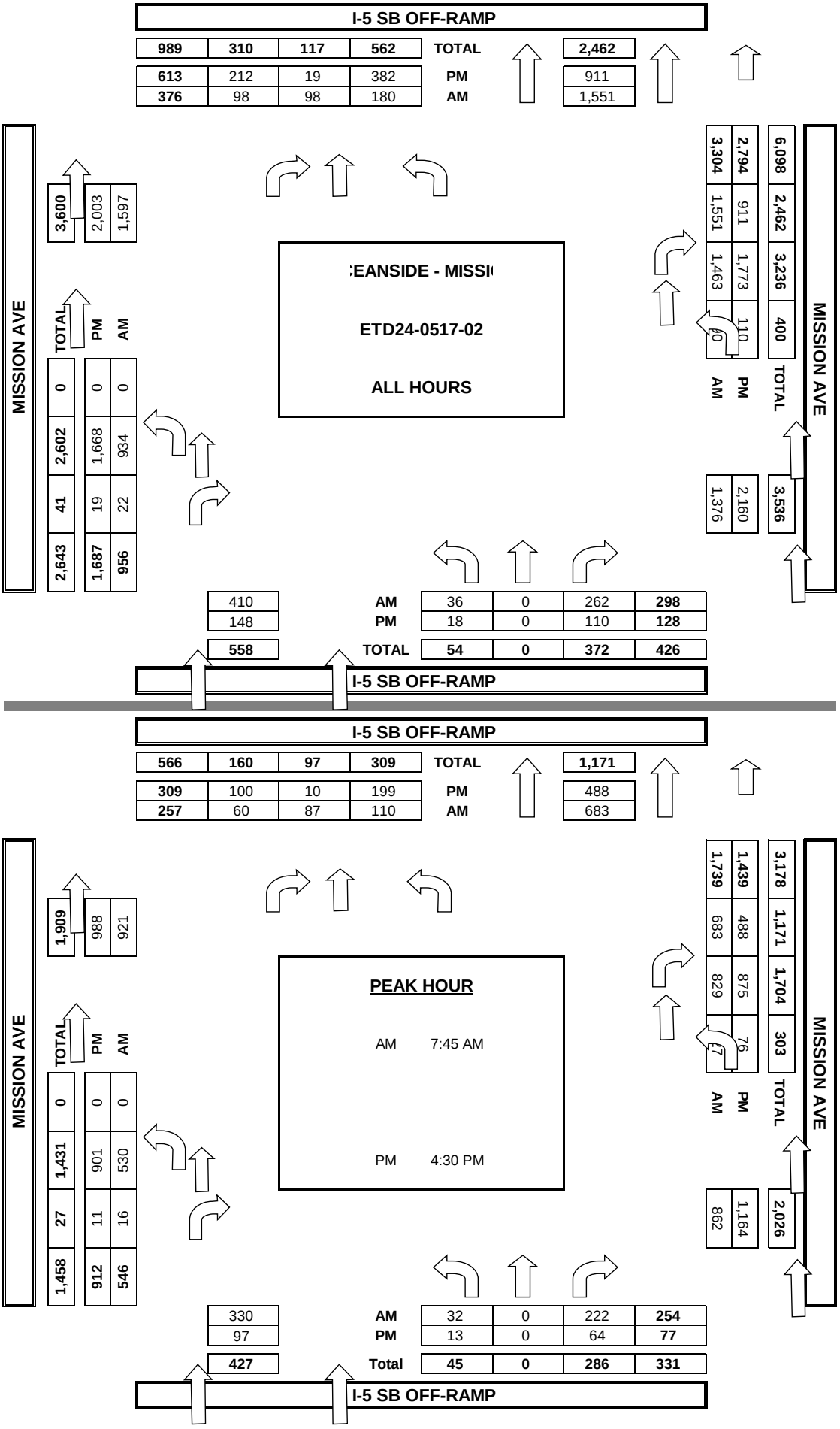
| | | NORTHBOUND (I-5 SB OFF-RAMP) | | | SOUTHBOUND (I-5 SB OFF-RAMP) | | | EASTBOUND (MISSION AVE) | | | WESTBOUND (MISSION AVE) | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR | TOTAL | NB X | SB X | EB X | WB X | TTL |
| AM | 7:00 AM | 1 | | 2 | 18 | 1 | 5 | | 85 | 2 | 6 | 108 | 206 | 434 | | | | 2 | 2 |
| | 7:15 AM | 0 | | 9 | 17 | 1 | 6 | | 90 | 0 | 20 | 155 | 242 | 540 | | | | 1 | 1 |
| | 7:30 AM | 1 | | 19 | 14 | 4 | 5 | | 102 | 1 | 28 | 153 | 252 | 579 | | | | | 0 |
| | 7:45 AM | 5 | | 33 | 40 | 14 | 13 | | 116 | 0 | 54 | 194 | 188 | 657 | | | | | 0 |
| | 8:00 AM | 7 | | 70 | 29 | 23 | 9 | | 107 | 5 | 81 | 231 | 170 | 732 | | | | | 0 |
| | 8:15 AM | 11 | | 74 | 24 | 38 | 22 | | 142 | 9 | 57 | 205 | 158 | 740 | | | | | 0 |
| | 8:30 AM | 9 | | 45 | 17 | 12 | 16 | | 165 | 2 | 35 | 199 | 167 | 667 | | | | | 0 |
| | 8:45 AM | 2 | | 10 | 21 | 5 | 22 | | 127 | 3 | 9 | 218 | 168 | 585 | | | | | 0 |
| | VOLUMES | 36 | 0 | 262 | 180 | 98 | 98 | 0 | 934 | 22 | 290 | 1,463 | 1,551 | 4,934 | 0 | 0 | 0 | 3 | 3 |
| | APPROACH % | 12% | 0% | 88% | 48% | 26% | 26% | 0% | 98% | 2% | 9% | 44% | 47% | | | | | | |
| | APP/DEPART | 298 | / | 1,551 | 376 | / | 410 | 956 | / | 1,376 | 3,304 | / | 1,597 | 0 | | | | | |
| | BEGIN PEAK HR | | 7:45 AM | | | | | | | | | | | | | | | | |
| | VOLUMES | 32 | 0 | 222 | 110 | 87 | 60 | 0 | 530 | 16 | 227 | 829 | 683 | 2,796 | | | | | |
| | APPROACH % | 13% | 0% | 87% | 43% | 34% | 23% | 0% | 97% | 3% | 13% | 48% | 39% | | | | | | |
| | PEAK HR FACTOR | | 0.747 | | | 0.765 | | | 0.817 | | | 0.902 | | 0.945 | | | | | |
| | APP/DEPART | 254 | / | 683 | 257 | / | 330 | 546 | / | 862 | 1,739 | / | 921 | 0 | | | | | |
| PM | 4:00 PM | 4 | | 21 | 38 | 2 | 15 | | 197 | 2 | 12 | 228 | 121 | 640 | | 1 | | | 1 |
| | 4:15 PM | 1 | | 10 | 46 | 3 | 30 | | 180 | 4 | 7 | 220 | 102 | 603 | | | | | 0 |
| | 4:30 PM | 4 | | 13 | 43 | 3 | 26 | | 216 | 1 | 16 | 221 | 120 | 663 | | | | 2 | 2 |
| | 4:45 PM | 2 | | 13 | 58 | 3 | 25 | | 217 | 0 | 23 | 224 | 104 | 669 | | | | | 0 |
| | 5:00 PM | 5 | | 19 | 52 | 2 | 22 | | 242 | 6 | 24 | 226 | 141 | 739 | | | | 3 | 3 |
| | 5:15 PM | 2 | | 19 | 46 | 2 | 27 | | 226 | 4 | 13 | 204 | 123 | 666 | | | | | 0 |
| | 5:30 PM | 0 | | 8 | 51 | 0 | 42 | | 203 | 0 | 11 | 231 | 109 | 655 | | | | | 0 |
| | 5:45 PM | 0 | | 7 | 48 | 4 | 25 | | 187 | 2 | 4 | 219 | 91 | 587 | | | | | 0 |
| | VOLUMES | 18 | 0 | 110 | 382 | 19 | 212 | 0 | 1,668 | 19 | 110 | 1,773 | 911 | 5,222 | 0 | 1 | 0 | 5 | 6 |
| | APPROACH % | 14% | 0% | 86% | 62% | 3% | 35% | 0% | 99% | 1% | 4% | 63% | 33% | | | | | | |
| | APP/DEPART | 128 | / | 911 | 613 | / | 148 | 1,687 | / | 2,160 | 2,794 | / | 2,003 | 0 | | | | | |
| | BEGIN PEAK HR | | 4:30 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 13 | 0 | 64 | 199 | 10 | 100 | 0 | 901 | 11 | 76 | 875 | 488 | 2,737 | | | | | |
| | APPROACH % | 17% | 0% | 83% | 64% | 3% | 32% | 0% | 99% | 1% | 5% | 61% | 34% | | | | | | |
| | PEAK HR FACTOR | | 0.802 | | | 0.898 | | | 0.919 | | | 0.920 | | 0.926 | | | | | |
| | APP/DEPART | 77 | / | 488 | 309 | / | 97 | 912 | / | 1,164 | 1,439 | / | 988 | 0 | | | | | |

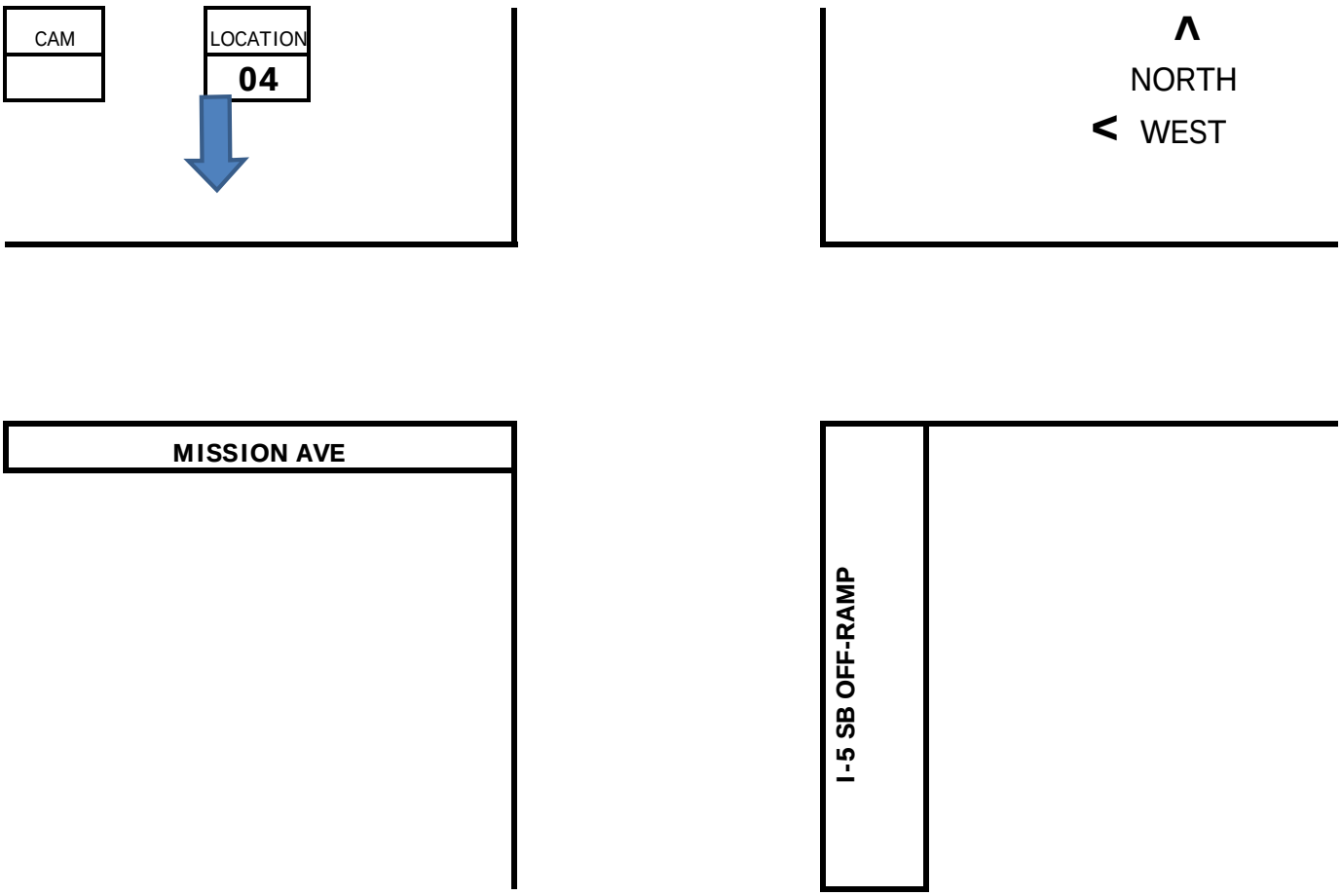



| | | PEDESTRIAN CROSSINGS | | | | | PEDESTRIAN ACTIVATIONS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| AM | 7:00 AM | | | | | 0 | | | | | 0 | | | | | 0 |
| | 7:15 AM | | | | 1 | 1 | | | | | 0 | | 1 | | | 1 |
| | 7:30 AM | | 2 | | 1 | 3 | | | | | 0 | | | | | 0 |
| | 7:45 AM | | 2 | | 8 | 10 | | | | | 0 | | | | | 0 |
| | 8:00 AM | 5 | 2 | | 6 | 13 | | | | | 0 | | | | 1 | 1 |
| | 8:15 AM | 10 | 2 | | 48 | 60 | | | | | 0 | | | | 4 | 4 |
| | 8:30 AM | 3 | 1 | | 23 | 27 | | | | | 0 | | | | | 0 |
| | 8:45 AM | 2 | 3 | | 11 | 16 | | | | | 0 | 1 | | | | 1 |
| | TOTAL | 20 | 12 | 0 | 98 | 130 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 5 | 7 |
| PM | 4:00 PM | | 1 | | 10 | 11 | | | | | 0 | | | | | 0 |
| | 4:15 PM | | 2 | | 27 | 29 | | | | | 0 | 1 | | | | 1 |
| | 4:30 PM | 1 | 2 | | 2 | 5 | | | | | 0 | 1 | | | | 1 |
| | 4:45 PM | 1 | 1 | | 2 | 4 | | | | | 0 | | | | 1 | 1 |
| | 5:00 PM | 1 | 2 | | 8 | 11 | | | | | 0 | 2 | 1 | | | 3 |
| | 5:15 PM | 1 | 1 | | 3 | 5 | | | | | 0 | | | | | 0 |
| | 5:30 PM | 3 | | | 3 | 6 | | | | | 0 | | | | 1 | 1 |
| | 5:45 PM | | | | | 0 | | | | | 0 | | | | | 0 |
| | TOTAL | 7 | 9 | 0 | 55 | 71 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 2 | 7 |

**PACIFIC TECHNICAL DATA**

TURNING MOVEMENT COUNTS






| NORTH/SOUTH STREET | I-5 SB OFF-RAMP |
|---|---|
| EAST/WEST STREET | MISSION AVE |

| | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0700 | | | | | | | | | | | | |
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# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

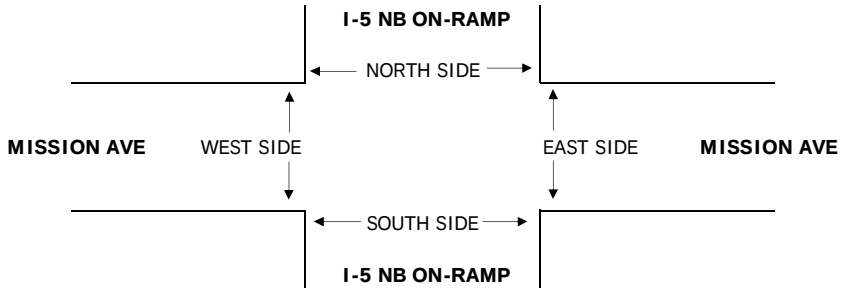
| DATE: | LOCATION: | OCEANSIDE - MISSION | PROJECT #: | ETD24-0517-02 |
|---|---|---|---|---|
| 5/15/24 | NORTH & SOUTH: | I-5 NB ON-RAMP | LOCATION #: | 5 |
| WEDNESDAY | EAST & WEST: | MISSION AVE | CONTROL: | SIGNAL |

NOTES:

INCLUDES BIKE & PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

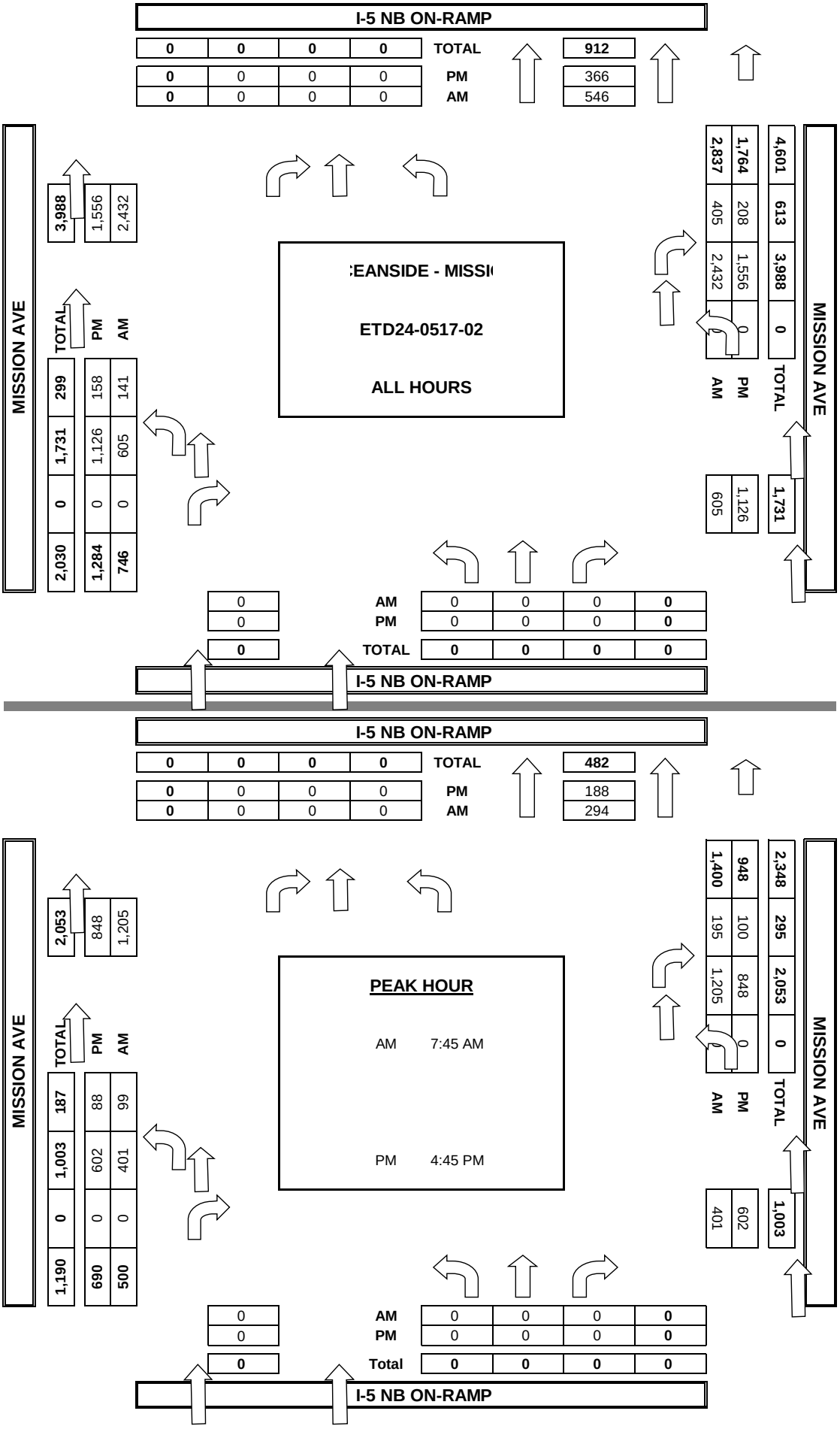
| | | NORTHBOUND I-5 NB ON-RAMP | | | SOUTHBOUND I-5 NB ON-RAMP | | | EASTBOUND MISSION AVE | | | WESTBOUND MISSION AVE | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR | TOTAL | NB X | SB X | EB X | WB X | TTL |
| AM | 7:00 AM | | | | | | | 8 | 41 | | | 314 | 59 | 422 | | | | | 0 |
| | 7:15 AM | | | | | | | 9 | 48 | | | 309 | 58 | 424 | | | | | 0 |
| | 7:30 AM | | | | | | | 8 | 41 | | | 335 | 56 | 440 | | | | | 0 |
| | 7:45 AM | | | | | | | 18 | 85 | | | 320 | 51 | 474 | | | | | 0 |
| | 8:00 AM | | | | | | | 26 | 106 | | | 310 | 51 | 493 | | | | | 0 |
| | 8:15 AM | | | | | | | 36 | 108 | | | 295 | 41 | 480 | | | | | 0 |
| | 8:30 AM | | | | | | | 19 | 102 | | | 280 | 52 | 453 | | | | | 0 |
| | 8:45 AM | | | | | | | 17 | 74 | | | 269 | 37 | 397 | | | | | 0 |
| | VOLUMES | 0 | 0 | 0 | 0 | 0 | 0 | 141 | 605 | 0 | 0 | 2,432 | 405 | 3,583 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 0% | 0% | 0% | 0% | 0% | 19% | 81% | 0% | 0% | 86% | 14% | | | | | | |
| | APP/DEPART | 0 | / | 546 | 0 | / | 0 | 746 | / | 605 | 2,837 | / | 2,432 | 0 | | | | | |
| | BEGIN PEAK HR | | 7:45 AM | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 0 | 0 | 0 | 0 | 0 | 99 | 401 | 0 | 0 | 1,205 | 195 | 1,900 | | | | | |
| | APPROACH % | 0% | 0% | 0% | 0% | 0% | 0% | 20% | 80% | 0% | 0% | 86% | 14% | | | | | | |
| | PEAK HR FACTOR | | 0.000 | | | 0.000 | | | 0.868 | | | 0.943 | | 0.963 | | | | | |
| | APP/DEPART | 0 | / | 294 | 0 | / | 0 | 500 | / | 401 | 1,400 | / | 1,205 | 0 | | | | | |
| PM | 4:00 PM | | | | | | | 21 | 124 | | | 213 | 35 | 393 | | | | | 0 |
| | 4:15 PM | | | | | | | 13 | 133 | | | 203 | 35 | 384 | | | | | 0 |
| | 4:30 PM | | | | | | | 21 | 137 | | | 114 | 10 | 282 | | | | | 0 |
| | 4:45 PM | | | | | | | 21 | 173 | | | 220 | 23 | 437 | | | | | 0 |
| | 5:00 PM | | | | | | | 20 | 153 | | | 223 | 24 | 420 | | | | | 0 |
| | 5:15 PM | | | | | | | 17 | 132 | | | 198 | 37 | 384 | | | | | 0 |
| | 5:30 PM | | | | | | | 30 | 144 | | | 207 | 16 | 397 | | | | | 0 |
| | 5:45 PM | | | | | | | 15 | 130 | | | 178 | 28 | 351 | | | | | 0 |
| | VOLUMES | 0 | 0 | 0 | 0 | 0 | 0 | 158 | 1,126 | 0 | 0 | 1,556 | 208 | 3,048 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 0% | 0% | 0% | 0% | 0% | 12% | 88% | 0% | 0% | 88% | 12% | | | | | | |
| | APP/DEPART | 0 | / | 366 | 0 | / | 0 | 1,284 | / | 1,126 | 1,764 | / | 1,556 | 0 | | | | | |
| | BEGIN PEAK HR | | 4:45 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 0 | 0 | 0 | 0 | 0 | 88 | 602 | 0 | 0 | 848 | 100 | 1,638 | | | | | |
| | APPROACH % | 0% | 0% | 0% | 0% | 0% | 0% | 13% | 87% | 0% | 0% | 89% | 11% | | | | | | |
| | PEAK HR FACTOR | | 0.000 | | | 0.000 | | | 0.889 | | | 0.960 | | 0.937 | | | | | |
| | APP/DEPART | 0 | / | 188 | 0 | / | 0 | 690 | / | 602 | 948 | / | 848 | 0 | | | | | |




| | | PEDESTRIAN CROSSINGS | | | | | PEDESTRIAN ACTIVATIONS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| AM | 7:00 AM | | | | | 0 | | | | | 0 | | | | | 0 |
| | 7:15 AM | | | | | 0 | | | | | 0 | | | | | 0 |
| | 7:30 AM | | | | | 0 | | | | | 0 | | | | | 0 |
| | 7:45 AM | 1 | | | | 1 | | | | | 0 | | | | | 0 |
| | 8:00 AM | 11 | | | | 11 | | | | | 0 | | | | | 0 |
| | 8:15 AM | 5 | | | | 5 | | | | | 0 | 1 | | | | 1 |
| | 8:30 AM | 2 | | | | 2 | | | | | 0 | | | | | 0 |
| | 8:45 AM | 2 | | | | 2 | | | | | 0 | 1 | | | | 1 |
| | TOTAL | 21 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| PM | 4:00 PM | | | | | 0 | | | | | 0 | | | | | 0 |
| | 4:15 PM | 3 | | | | 3 | | | | | 0 | | | | | 0 |
| | 4:30 PM | | | | | 0 | | | | | 0 | | | | | 0 |
| | 4:45 PM | 1 | | | | 1 | | | | | 0 | | | | | 0 |
| | 5:00 PM | 1 | | | | 1 | | | | | 0 | 2 | | | | 2 |
| | 5:15 PM | 3 | | | | 3 | | | | | 0 | | | | | 0 |
| | 5:30 PM | | | | | 0 | | | | | 0 | | | | | 0 |
| | 5:45 PM | 1 | | | | 1 | | | | | 0 | | | | | 0 |
| | TOTAL | 9 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |

**PACIFIC TECHNICAL DATA**

TURNING MOVEMENT COUNTS



| CAM | LOCATION |
|---|---|
| | 05 |



^
NORTH
< WEST

**MISSION AVE**

**I-5 NB ON-RAMP**

| | |
|---|---|
| **NORTH/SOUTH STREET** | **I-5 NB ON-RAMP** |
| **EAST/WEST STREET** | **MISSION AVE** |

| | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0700 | | | | | | | | | | | | |
| 1600 | | | | | | | | | | | | |

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

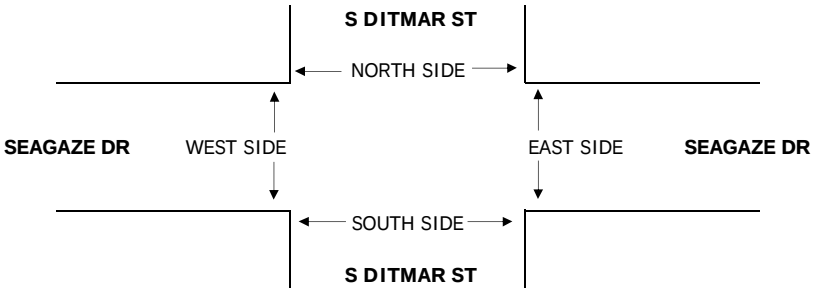
| DATE: | LOCATION: | OCEANSIDE - MISSION | PROJECT #: | ETD24-0517-02 |
|---|---|---|---|---|
| 5/15/24 | NORTH & SOUTH: | S DITMAR ST | LOCATION #: | 6 |
| WEDNESDAY | EAST & WEST: | SEAGAZE DR | CONTROL: | STOP |

NOTES:

INCLUDES BIKE & PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

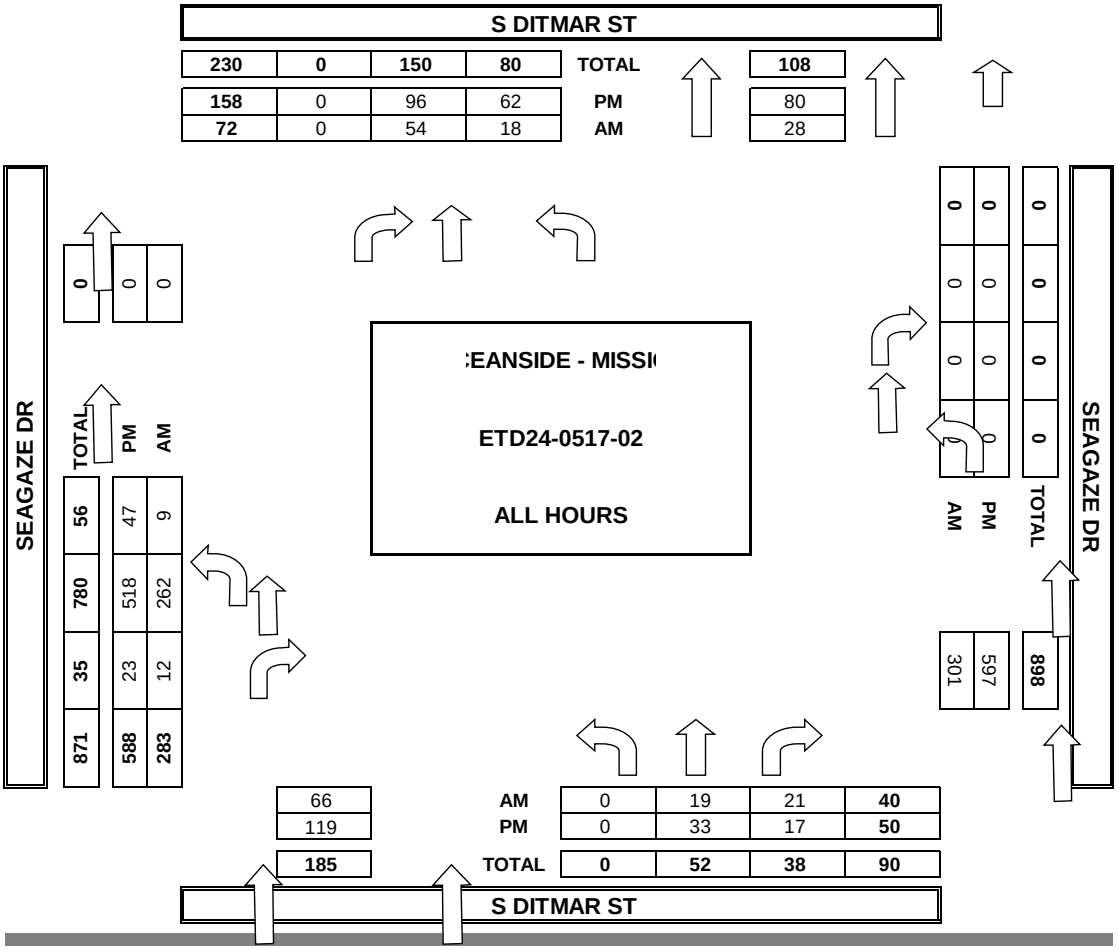
| | | NORTHBOUND S DITMAR ST | | | SOUTHBOUND S DITMAR ST | | | EASTBOUND SEAGAZE DR | | | WESTBOUND SEAGAZE DR | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR | TOTAL | NB X | SB X | EB X | WB X | TTL |
| AM | 7:00 AM | 0 | 1 | 1 | 0 | 3 | 0 | 0 | 20 | 0 | | | | 25 | | | | | 0 |
| | 7:15 AM | 0 | 4 | 1 | 0 | 5 | 0 | 0 | 18 | 1 | | | | 29 | | | | | 0 |
| | 7:30 AM | 0 | 2 | 2 | 1 | 7 | 0 | 1 | 33 | 0 | | | | 46 | | | | | 0 |
| | 7:45 AM | 0 | 4 | 6 | 2 | 5 | 0 | 1 | 33 | 1 | | | | 52 | | | | | 0 |
| | 8:00 AM | 0 | 0 | 4 | 4 | 6 | 0 | 2 | 28 | 2 | | | | 46 | | | | | 0 |
| | 8:15 AM | 0 | 2 | 2 | 1 | 6 | 0 | 1 | 48 | 3 | | | | 63 | | | | | 0 |
| | 8:30 AM | 0 | 2 | 2 | 4 | 10 | 0 | 1 | 38 | 0 | | | | 57 | | | | | 0 |
| | 8:45 AM | 0 | 4 | 3 | 6 | 12 | 0 | 3 | 44 | 5 | | | | 77 | | | | | 0 |
| | VOLUMES | 0 | 19 | 21 | 18 | 54 | 0 | 9 | 262 | 12 | 0 | 0 | 0 | 395 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 48% | 53% | 25% | 75% | 0% | 3% | 93% | 4% | 0% | 0% | 0% | | | | | | |
| | APP/DEPART | 40 | / | 28 | 72 | / | 66 | 283 | / | 301 | 0 | / | 0 | 0 | | | | | |
| | BEGIN PEAK HR | | 8:00 AM | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 8 | 11 | 15 | 34 | 0 | 7 | 158 | 10 | 0 | 0 | 0 | 243 | | | | | |
| | APPROACH % | 0% | 42% | 58% | 31% | 69% | 0% | 4% | 90% | 6% | 0% | 0% | 0% | | | | | | |
| | PEAK HR FACTOR | | 0.679 | | | 0.681 | | | 0.841 | | | 0.000 | | 0.789 | | | | | |
| | APP/DEPART | 19 | / | 15 | 49 | / | 44 | 175 | / | 184 | 0 | / | 0 | 0 | | | | | |
| PM | 4:00 PM | 0 | 6 | 4 | 6 | 13 | 0 | 3 | 53 | 7 | | | | 92 | | | | | 0 |
| | 4:15 PM | 0 | 2 | 2 | 7 | 14 | 0 | 9 | 56 | 3 | | | | 93 | | | | | 0 |
| | 4:30 PM | 0 | 6 | 1 | 3 | 8 | 0 | 3 | 72 | 3 | | | | 96 | | | | | 0 |
| | 4:45 PM | 0 | 6 | 2 | 10 | 20 | 0 | 9 | 71 | 5 | | | | 123 | | | | | 0 |
| | 5:00 PM | 0 | 7 | 4 | 9 | 14 | 0 | 9 | 57 | 3 | | | | 103 | | | | | 0 |
| | 5:15 PM | 0 | 1 | 2 | 12 | 8 | 0 | 6 | 64 | 0 | | | | 93 | | | | | 0 |
| | 5:30 PM | 0 | 2 | 1 | 7 | 8 | 0 | 5 | 75 | 0 | | | | 98 | | | | | 0 |
| | 5:45 PM | 0 | 3 | 1 | 8 | 11 | 0 | 3 | 70 | 2 | | | | 98 | | | | | 0 |
| | VOLUMES | 0 | 33 | 17 | 62 | 96 | 0 | 47 | 518 | 23 | 0 | 0 | 0 | 796 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 66% | 34% | 39% | 61% | 0% | 8% | 88% | 4% | 0% | 0% | 0% | | | | | | |
| | APP/DEPART | 50 | / | 80 | 158 | / | 119 | 588 | / | 597 | 0 | / | 0 | 0 | | | | | |
| | BEGIN PEAK HR | | 4:45 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 16 | 9 | 38 | 50 | 0 | 29 | 267 | 8 | 0 | 0 | 0 | 417 | | | | | |
| | APPROACH % | 0% | 64% | 36% | 43% | 57% | 0% | 10% | 88% | 3% | 0% | 0% | 0% | | | | | | |
| | PEAK HR FACTOR | | 0.568 | | | 0.733 | | | 0.894 | | | 0.000 | | 0.848 | | | | | |
| | APP/DEPART | 25 | / | 45 | 88 | / | 58 | 304 | / | 314 | 0 | / | 0 | 0 | | | | | |

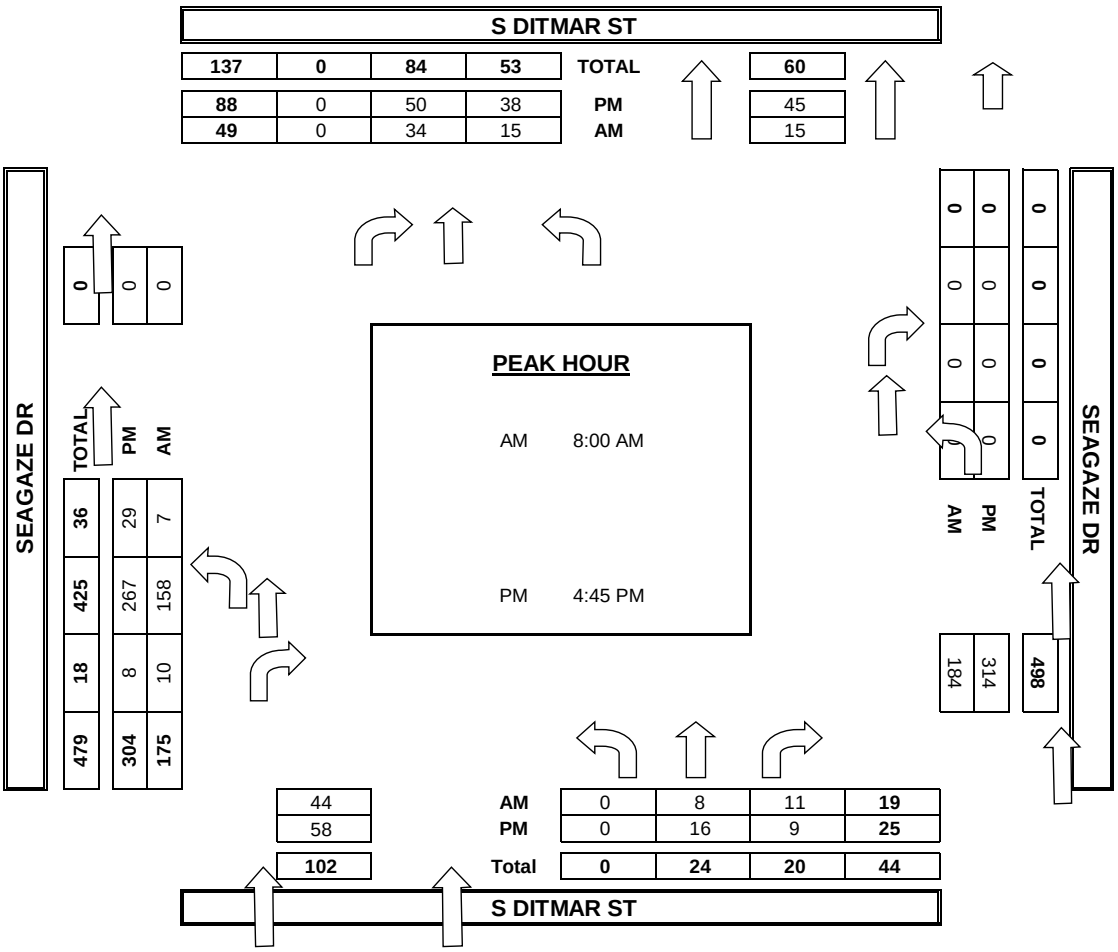



| | | PEDESTRIAN CROSSINGS | | | | | PEDESTRIAN ACTIVATIONS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| AM | 7:00 AM | 1 | 2 | | 1 | 4 | | | | | 0 | | | | | 0 |
| | 7:15 AM | 1 | | | | 1 | | | | | 0 | | | | | 0 |
| | 7:30 AM | 2 | 1 | | | 3 | | | | | 0 | | | | | 0 |
| | 7:45 AM | 1 | 4 | 2 | 4 | 11 | | | | | 0 | | | 2 | | 2 |
| | 8:00 AM | 1 | 2 | 2 | 1 | 6 | | | | | 0 | | | | | 0 |
| | 8:15 AM | 4 | 5 | 1 | 3 | 13 | | | | | 0 | | | | | 0 |
| | 8:30 AM | | 3 | | 3 | 6 | | | | | 0 | | | | 1 | 1 |
| | 8:45 AM | | 2 | 1 | 3 | 6 | | | | | 0 | | | 1 | | 1 |
| | TOTAL | 10 | 19 | 6 | 15 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 4 |
| PM | 4:00 PM | 3 | 8 | 1 | 3 | 15 | | | | | 0 | | | | | 0 |
| | 4:15 PM | 4 | 4 | 1 | 4 | 13 | | | | | 0 | 1 | | | | 1 |
| | 4:30 PM | 3 | 5 | 2 | 1 | 11 | | | | | 0 | | 1 | | | 1 |
| | 4:45 PM | 5 | 2 | 9 | 2 | 18 | | | | | 0 | | | | | 0 |
| | 5:00 PM | 1 | 2 | 1 | 2 | 6 | | | | | 0 | | | | | 0 |
| | 5:15 PM | 4 | | 2 | 1 | 7 | | | | | 0 | | | | | 0 |
| | 5:30 PM | 1 | 2 | 4 | 2 | 9 | | | | | 0 | | | | | 0 |
| | 5:45 PM | 3 | | 1 | 1 | 5 | | | | | 0 | 1 | | | 1 | 2 |
| | TOTAL | 24 | 23 | 21 | 16 | 84 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 4 |

**PACIFIC TECHNICAL DATA**

TURNING MOVEMENT COUNTS



| CAM | LOCATION |
|---|---|
| | 06 |



^
NORTH
< WEST

**SEAGAZE DR**

**S DITMAR ST**

| | |
|---|---|
| **NORTH / SOUTH STREET** | **S DITMAR ST** |
| **EAST / WEST STREET** | **SEAGAZE DR** |

| | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0700 | | | | | | | | | | | | |
| 1600 | | | | | | | | | | | | |

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

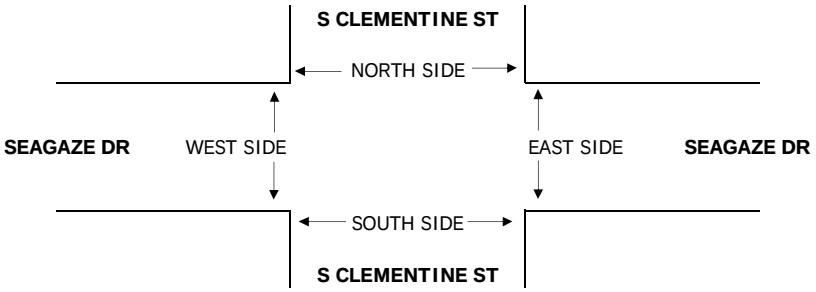
| DATE: | LOCATION: | OCEANSIDE - MISSION | PROJECT #: | ETD24-0517-02 |
|---|---|---|---|---|
| 5/15/24 | NORTH & SOUTH: | S CLEMENTINE ST | LOCATION #: | 7 |
| WEDNESDAY | EAST & WEST: | SEAGAZE DR | CONTROL: | STOP |

NOTES:

INCLUDES BIKE & PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

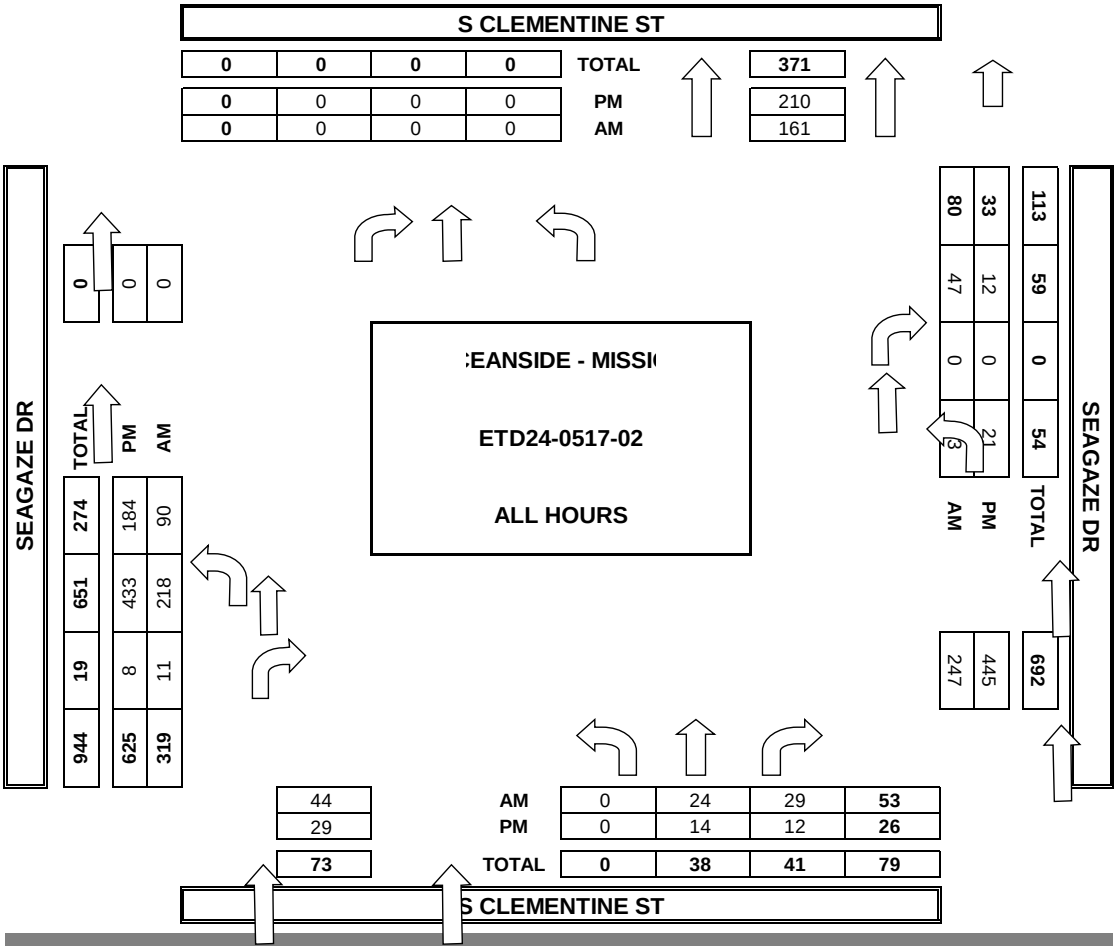
| | | NORTHBOUND S CLEMENTINE ST | | | SOUTHBOUND S CLEMENTINE ST | | | EASTBOUND SEAGAZE DR | | | WESTBOUND SEAGAZE DR | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR | TOTAL | NB X | SB X | EB X | WB X | TTL |
| AM | 7:00 AM | | 0 | 2 | | | | 9 | 12 | 0 | 3 | | 0 | 26 | | | | | 0 |
| | 7:15 AM | | 0 | 2 | | | | 9 | 16 | 0 | 1 | | 0 | 28 | | | | | 0 |
| | 7:30 AM | | 1 | 3 | | | | 11 | 22 | 2 | 5 | | 0 | 44 | | | | | 0 |
| | 7:45 AM | | 5 | 2 | | | | 11 | 30 | 0 | 2 | | 3 | 53 | | | | | 0 |
| | 8:00 AM | | 5 | 3 | | | | 12 | 30 | 1 | 3 | | 13 | 67 | | | | | 0 |
| | 8:15 AM | | 6 | 7 | | | | 11 | 44 | 5 | 7 | | 17 | 97 | | | | | 0 |
| | 8:30 AM | | 5 | 8 | | | | 12 | 34 | 2 | 7 | | 10 | 78 | | | | | 0 |
| | 8:45 AM | | 2 | 2 | | | | 15 | 30 | 1 | 5 | | 4 | 59 | | | | | 0 |
| | VOLUMES | 0 | 24 | 29 | 0 | 0 | 0 | 90 | 218 | 11 | 33 | 0 | 47 | 452 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 45% | 55% | 0% | 0% | 0% | 28% | 68% | 3% | 41% | 0% | 59% | | | | | | |
| | APP/DEPART | 53 | / | 161 | 0 | / | 44 | 319 | / | 247 | 80 | / | 0 | 0 | | | | | |
| | BEGIN PEAK HR | | 8:00 AM | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 18 | 20 | 0 | 0 | 0 | 50 | 138 | 9 | 22 | 0 | 44 | 301 | | | | | |
| | APPROACH % | 0% | 47% | 53% | 0% | 0% | 0% | 25% | 70% | 5% | 33% | 0% | 67% | | | | | | |
| | PEAK HR FACTOR | | 0.731 | | | 0.000 | | | 0.821 | | | 0.688 | | 0.776 | | | | | |
| | APP/DEPART | 38 | / | 112 | 0 | / | 31 | 197 | / | 158 | 66 | / | 0 | 0 | | | | | |
| PM | 4:00 PM | | 3 | 1 | | | | 21 | 47 | 1 | 0 | | 0 | 73 | | | | | 0 |
| | 4:15 PM | | 2 | 4 | | | | 25 | 46 | 0 | 3 | | 0 | 80 | | | | | 0 |
| | 4:30 PM | | 2 | 1 | | | | 20 | 60 | 2 | 7 | | 3 | 95 | | | | | 0 |
| | 4:45 PM | | 1 | 1 | | | | 17 | 63 | 0 | 1 | | 0 | 83 | | | | | 0 |
| | 5:00 PM | | 4 | 1 | | | | 26 | 49 | 0 | 2 | | 5 | 87 | | | | | 0 |
| | 5:15 PM | | 1 | 1 | | | | 26 | 53 | 3 | 3 | | 1 | 88 | | | | | 0 |
| | 5:30 PM | | 1 | 1 | | | | 26 | 56 | 1 | 2 | | 0 | 87 | | | | | 0 |
| | 5:45 PM | | 0 | 2 | | | | 23 | 59 | 1 | 3 | | 3 | 91 | | | | | 0 |
| | VOLUMES | 0 | 14 | 12 | 0 | 0 | 0 | 184 | 433 | 8 | 21 | 0 | 12 | 684 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 54% | 46% | 0% | 0% | 0% | 29% | 69% | 1% | 64% | 0% | 36% | | | | | | |
| | APP/DEPART | 26 | / | 210 | 0 | / | 29 | 625 | / | 445 | 33 | / | 0 | 0 | | | | | |
| | BEGIN PEAK HR | | 5:00 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 6 | 5 | 0 | 0 | 0 | 101 | 217 | 5 | 10 | 0 | 9 | 353 | | | | | |
| | APPROACH % | 0% | 55% | 45% | 0% | 0% | 0% | 31% | 67% | 2% | 53% | 0% | 47% | | | | | | |
| | PEAK HR FACTOR | | 0.550 | | | 0.000 | | | 0.973 | | | 0.475 | | 0.929 | | | | | |
| | APP/DEPART | 11 | / | 116 | 0 | / | 15 | 323 | / | 222 | 19 | / | 0 | 0 | | | | | |

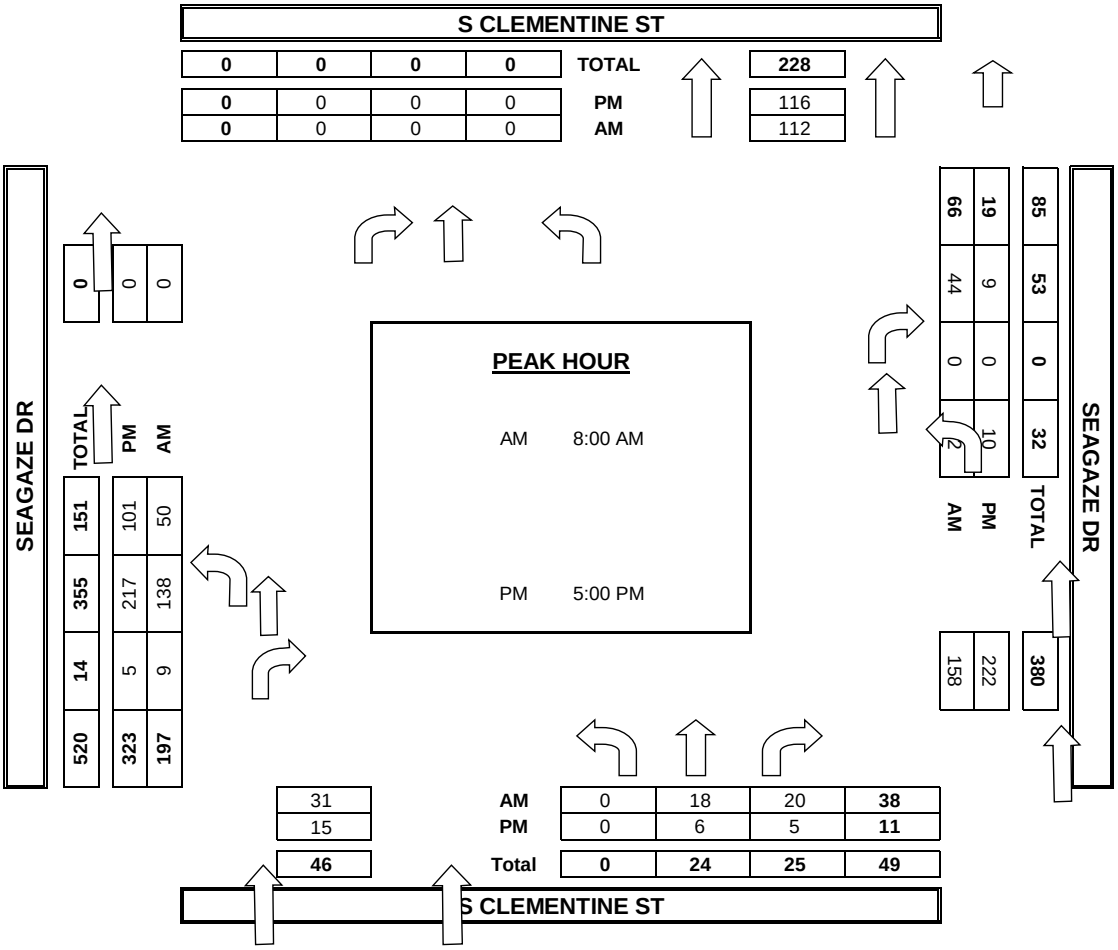


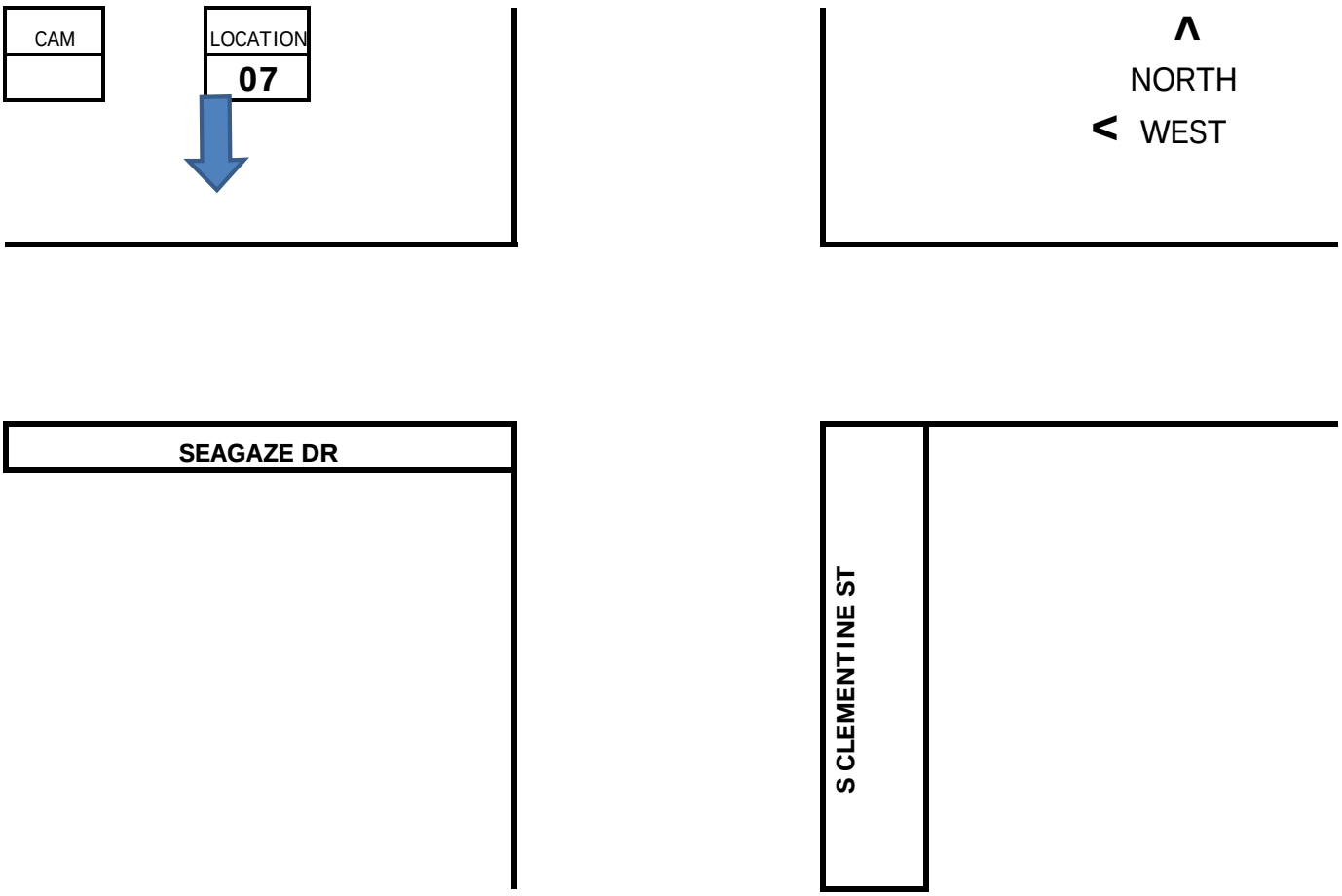

| | | PEDESTRIAN CROSSINGS | | | | | PEDESTRIAN ACTIVATIONS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| AM | 7:00 AM | | 2 | | 3 | 5 | | | | | 0 | | | | | 0 |
| | 7:15 AM | | 2 | | 2 | 4 | | | | | 0 | | | | | 0 |
| | 7:30 AM | 1 | 2 | | | 3 | | | | | 0 | | | | | 0 |
| | 7:45 AM | | 3 | 4 | 4 | 11 | | | | | 0 | | | 1 | 1 | 2 |
| | 8:00 AM | 1 | 3 | 1 | | 5 | | | | | 0 | | | 1 | | 1 |
| | 8:15 AM | 9 | 6 | 3 | 5 | 23 | | | | | 0 | | 2 | | | 2 |
| | 8:30 AM | 8 | 3 | | 3 | 14 | | | | | 0 | | | | 1 | 1 |
| | 8:45 AM | 1 | 3 | 1 | 3 | 8 | | | | | 0 | | | | | 0 |
| | TOTAL | 20 | 24 | 9 | 20 | 73 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 6 |
| PM | 4:00 PM | | 20 | | | 20 | | | | | 0 | | | | | 0 |
| | 4:15 PM | 1 | 12 | | 2 | 15 | | | | | 0 | | | | | 0 |
| | 4:30 PM | | 10 | 1 | 1 | 12 | | | | | 0 | 1 | 2 | | | 3 |
| | 4:45 PM | | 5 | | 1 | 6 | | | | | 0 | | 1 | | | 1 |
| | 5:00 PM | | 1 | 3 | 1 | 5 | | | | | 0 | | | | | 0 |
| | 5:15 PM | 4 | 4 | 2 | 1 | 11 | | | | | 0 | | | 1 | | 1 |
| | 5:30 PM | 2 | | 1 | | 3 | | | | | 0 | | | 1 | | 1 |
| | 5:45 PM | 1 | 1 | 1 | 1 | 4 | | | | | 0 | 1 | | | | 1 |
| | TOTAL | 8 | 53 | 8 | 7 | 76 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 2 | 0 | 7 |

**PACIFIC TECHNICAL DATA**

TURNING MOVEMENT COUNTS






| NORTH / SOUTH STREET | S CLEMENTINE ST |
|---|---|
| EAST / WEST STREET | SEAGAZE DR |

| | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0700 | | | | | | | | | | | | |
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# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: ELITE TRAFFIC DYNAMICS, LLC

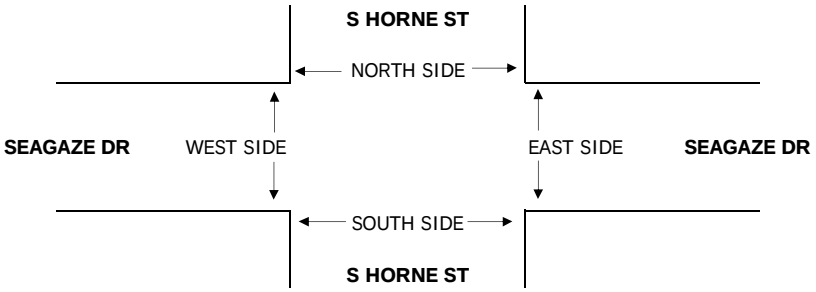
| DATE: | LOCATION: | OCEANSIDE - MISSION | PROJECT #: | ETD24-0517-02 |
|---|---|---|---|---|
| 5/15/24 | NORTH & SOUTH: | S HORNE ST | LOCATION #: | 8 |
| WEDNESDAY | EAST & WEST: | SEAGAZE DR | CONTROL: | STOP |

NOTES:

INCLUDES BIKE & PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

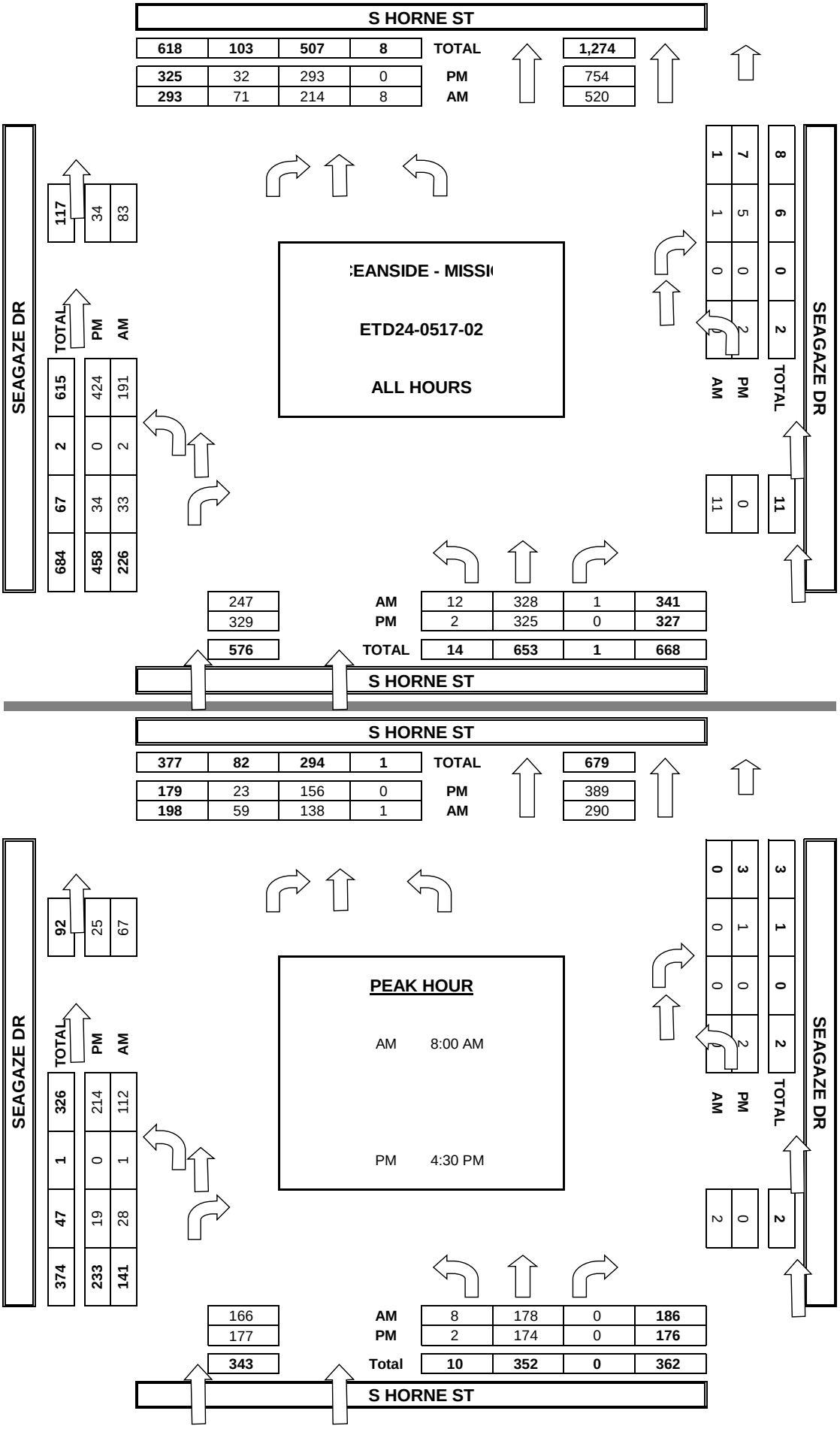
| | | NORTHBOUND S HORNE ST | | | SOUTHBOUND S HORNE ST | | | EASTBOUND SEAGAZE DR | | | WESTBOUND SEAGAZE DR | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR | TOTAL | NB X | SB X | EB X | WB X | TTL |
| AM | 7:00 AM | 0 | 41 | 0 | 0 | 13 | 2 | 13 | 1 | 0 | 0 | 0 | 1 | 71 | | | | | 0 |
| | 7:15 AM | 1 | 40 | 0 | 4 | 16 | 0 | 17 | 0 | 2 | 0 | 0 | 0 | 80 | | | | | 0 |
| | 7:30 AM | 1 | 31 | 1 | 2 | 19 | 2 | 21 | 0 | 2 | 0 | 0 | 0 | 79 | | | | | 0 |
| | 7:45 AM | 2 | 38 | 0 | 1 | 28 | 8 | 28 | 0 | 1 | 0 | 0 | 0 | 106 | | 1 | | | 1 |
| | 8:00 AM | 2 | 33 | 0 | 1 | 36 | 15 | 22 | 0 | 5 | 0 | 0 | 0 | 114 | | | | | 0 |
| | 8:15 AM | 2 | 59 | 0 | 0 | 39 | 22 | 28 | 0 | 12 | 0 | 0 | 0 | 162 | | | | | 0 |
| | 8:30 AM | 3 | 46 | 0 | 0 | 34 | 14 | 34 | 1 | 6 | 0 | 0 | 0 | 138 | | | | | 0 |
| | 8:45 AM | 1 | 40 | 0 | 0 | 29 | 8 | 28 | 0 | 5 | 0 | 0 | 0 | 111 | | | | | 0 |
| | VOLUMES | 12 | 328 | 1 | 8 | 214 | 71 | 191 | 2 | 33 | 0 | 0 | 1 | 861 | 0 | 1 | 0 | 0 | 1 |
| | APPROACH % | 4% | 96% | 0% | 3% | 73% | 24% | 85% | 1% | 15% | 0% | 0% | 100% | | | | | | |
| | APP/DEPART | 341 | / | 520 | 293 | / | 247 | 226 | / | 11 | 1 | / | 83 | 0 | | | | | |
| | BEGIN PEAK HR | | 8:00 AM | | | | | | | | | | | | | | | | |
| | VOLUMES | 8 | 178 | 0 | 1 | 138 | 59 | 112 | 1 | 28 | 0 | 0 | 0 | 525 | | | | | |
| | APPROACH % | 4% | 96% | 0% | 1% | 70% | 30% | 79% | 1% | 20% | 0% | 0% | 0% | | | | | | |
| | PEAK HR FACTOR | | 0.762 | | | 0.811 | | | 0.860 | | | 0.000 | | 0.810 | | | | | |
| | APP/DEPART | 186 | / | 290 | 198 | / | 166 | 141 | / | 2 | 0 | / | 67 | 0 | | | | | |
| PM | 4:00 PM | 0 | 36 | 0 | 0 | 36 | 0 | 46 | 0 | 2 | 0 | 0 | 0 | 120 | | | | | 0 |
| | 4:15 PM | 0 | 34 | 0 | 0 | 34 | 4 | 44 | 0 | 8 | 0 | 0 | 1 | 125 | | | | | 0 |
| | 4:30 PM | 1 | 44 | 0 | 0 | 38 | 11 | 52 | 0 | 6 | 0 | 0 | 0 | 152 | | | | | 0 |
| | 4:45 PM | 0 | 38 | 0 | 0 | 38 | 1 | 61 | 0 | 5 | 0 | 0 | 0 | 143 | | | | | 0 |
| | 5:00 PM | 1 | 51 | 0 | 0 | 47 | 5 | 49 | 0 | 3 | 1 | 0 | 0 | 157 | | | | | 0 |
| | 5:15 PM | 0 | 41 | 0 | 0 | 33 | 6 | 52 | 0 | 5 | 1 | 0 | 1 | 139 | | | | | 0 |
| | 5:30 PM | 0 | 38 | 0 | 0 | 44 | 3 | 56 | 0 | 1 | 0 | 0 | 1 | 143 | | | | | 0 |
| | 5:45 PM | 0 | 43 | 0 | 0 | 23 | 2 | 64 | 0 | 4 | 0 | 0 | 2 | 138 | | | | | 0 |
| | VOLUMES | 2 | 325 | 0 | 0 | 293 | 32 | 424 | 0 | 34 | 2 | 0 | 5 | 1,117 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 1% | 99% | 0% | 0% | 90% | 10% | 93% | 0% | 7% | 29% | 0% | 71% | | | | | | |
| | APP/DEPART | 327 | / | 754 | 325 | / | 329 | 458 | / | 0 | 7 | / | 34 | 0 | | | | | |
| | BEGIN PEAK HR | | 4:30 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 2 | 174 | 0 | 0 | 156 | 23 | 214 | 0 | 19 | 2 | 0 | 1 | 591 | | | | | |
| | APPROACH % | 1% | 99% | 0% | 0% | 87% | 13% | 92% | 0% | 8% | 67% | 0% | 33% | | | | | | |
| | PEAK HR FACTOR | | 0.846 | | | 0.861 | | | 0.883 | | | 0.375 | | 0.941 | | | | | |
| | APP/DEPART | 176 | / | 389 | 179 | / | 177 | 233 | / | 0 | 3 | / | 25 | 0 | | | | | |

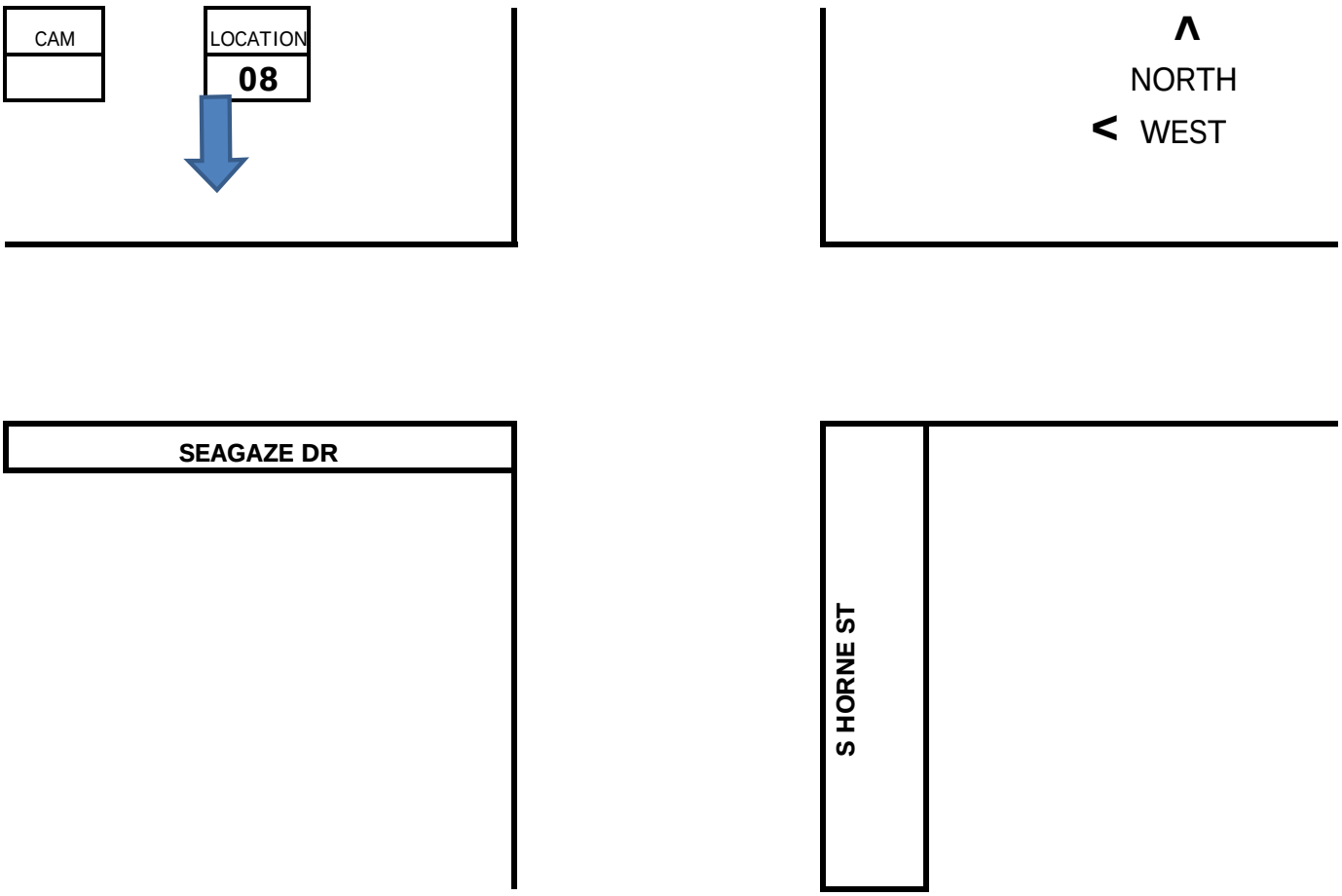



| | | PEDESTRIAN CROSSINGS | | | | | PEDESTRIAN ACTIVATIONS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| AM | 7:00 AM | | | | 1 | 1 | | | | | 0 | | | | | 0 |
| | 7:15 AM | | | | | 0 | | | | | 0 | | 1 | | | 1 |
| | 7:30 AM | 1 | 2 | | 2 | 5 | | | | | 0 | | | | | 0 |
| | 7:45 AM | 14 | 8 | | 2 | 24 | | | | | 0 | | 1 | | | 1 |
| | 8:00 AM | 36 | 9 | | 2 | 47 | | | | | 0 | | 1 | | | 1 |
| | 8:15 AM | 64 | 29 | | | 93 | | | | | 0 | 1 | 3 | | | 4 |
| | 8:30 AM | 37 | 7 | | | 44 | | | | | 0 | | 1 | | | 1 |
| | 8:45 AM | 6 | 4 | | | 10 | | | | | 0 | | 1 | | | 1 |
| | TOTAL | 158 | 59 | 0 | 7 | 224 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 9 |
| PM | 4:00 PM | | 20 | | 1 | 21 | | | | | 0 | | 1 | | | 1 |
| | 4:15 PM | | 16 | | | 16 | | | | | 0 | | | | | 0 |
| | 4:30 PM | 8 | 8 | | 3 | 19 | | | | | 0 | | | | 1 | 1 |
| | 4:45 PM | | 5 | | 2 | 7 | | | | | 0 | | | | | 0 |
| | 5:00 PM | 3 | 5 | | 1 | 9 | | | | | 0 | | 2 | | | 2 |
| | 5:15 PM | 1 | 3 | | 3 | 7 | | | | | 0 | | | | | 0 |
| | 5:30 PM | 2 | 1 | | 1 | 4 | | | | | 0 | | | | 2 | 2 |
| | 5:45 PM | | | | 2 | 2 | | | | | 0 | | | | | 0 |
| | TOTAL | 14 | 58 | 0 | 13 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 6 |

**PACIFIC TECHNICAL DATA**

TURNING MOVEMENT COUNTS






| | |
|---|---|
| **NORTH / SOUTH STREET** | **S HORNE ST** |
| **EAST / WEST STREET** | **SEAGAZE DR** |

| | NL | NT | NR | SL | ST | SR | EL | ET | ER | WL | WT | WR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
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|

# Appendix C
# Signal Timings

## INTERSECTION: Mission & Ditmar

Group Assignment: **NONE**
Field Master Assignment: **NONE**
System Reference Number: **61**

N/S Street Name: **Not Assigned**
E/W Street Name: **Not Assigned**

Last Database Change: **7/6/2022 3:33:04 PM +(**

| Change Record | | | | | |
|---|---|---|---|---|---|
| Change | By | Date | Change | By | Date |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Notes:

| | | |
|---|---|---|
| Drop Number | **12** | <C+0+0> |
| Zone Number | | <C+0+1> |
| Area Number | **1** | <C+0+2> |
| Area Address | **61** | <C+0+3> |
| QuicNet Channel | **Serial:COM35:** | (QuicNet) |

**Communication Addresses**

| | | |
|---|---|---|
| Manual Plan | | <C+A+1> |
| Manual Offset | | <C+B+1> |

**Manual Selection**

| | | |
|---|---|---|
| Max Initial | **20** | <F+0+E> |
| Red Revert | **5.0** | <F+0+F> |
| All Red Start | **5.0** | <F+C+0> |

**Start / Revert Times**

| Row | Column Numbers ----> | Phase 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| | *Phase Names ----->* | | | | | | | | |
| 0 | Ped Walk | 0 | 7 | 0 | 7 | 0 | 7 | 0 | 7 |
| 1 | Ped FDW | 0 | 10 | 0 | 11 | 0 | 11 | 0 | 11 |
| 2 | Min Green | 3 | 7 | 3 | 6 | 3 | 12 | 3 | 6 |
| 3 | Type 3 Limit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | Added Initial | 0.0 | 1.2 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 |
| 5 | Veh Extension | 0.5 | 3.5 | 0.5 | 3.0 | 0.5 | 3.0 | 0.5 | 3.0 |
| 6 | Max Gap | 0.5 | 5.0 | 0.5 | 3.0 | 0.5 | 3.0 | 0.5 | 3.0 |
| 7 | Min Gap | 0.5 | 2.0 | 0.5 | 3.0 | 0.5 | 3.0 | 0.5 | 3.0 |
| 8 | Max Limit | 17 | 40 | 17 | 20 | 17 | 40 | 17 | 20 |
| 9 | Max Limit 2 | 30 | 70 | 30 | 40 | 30 | 40 | 30 | 40 |
| A | - - - - - - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| B | Call To Phase | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C | Reduce By | 0.1 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 |
| D | Reduce Every | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 |
| E | Yellow Change | 3.0 | 4.0 | 3.0 | 3.6 | 3.0 | 4.1 | 3.0 | 3.6 |
| F | Red Clear | 0.0 | 0.5 | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 |

**Phase Timing - Bank 1** <F Page>

| | E |
|---|---|
| RR-1 Delay | 0 |
| RR-1 Clear | 10 |
| EV-A Delay | 0 |
| EV-A Clear | 5 |
| EV-B Delay | 0 |
| EV-B Clear | 0 |
| EV-C Delay | 0 |
| EV-C Clear | 5 |
| EV-D Delay | 0 |
| EV-D Clear | 0 |
| RR-2 Delay | 0 |
| RR-2 Clear | 10 |
| *View EV Delay* | - - - |
| *View EV Clear* | - - - |
| *View RR Delay* | - - - |
| *View RR Clear* | - - - |

**Preempt Timing**

| | F | Row |
|---|---|---|
| Permit | ___4_6_8 | 0 |
| Red Lock | _____ | 1 |
| Yellow Lock | _____ | 2 |
| Min Recall | _____6__ | 3 |
| Ped Recall | _____ | 4 |
| *View Set Peds* | - - - - - | 5 |
| Rest In Walk | _____ | 6 |
| Red Rest | _____ | 7 |
| Dual Entry | ___4___8 | 8 |
| Max Recall | _____ | 9 |
| Soft Recall | _____ | A |
| Max 2 | _____ | B |
| Cond. Service | _____ | C |
| Man Cntrl Calls | _____ | D |
| Yellow Start | ___4___8 | E |
| First Phases | _____6__ | F |

**Phase Functions** <F Page>

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

| Row | Column Numbers ----> / Plan Name ----> | Plan 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Row |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Cycle Length | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 0 |
| 1 | Phase 1 - ForceOff | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 1 |
| 2 | Phase 2 - ForceOff | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3 | Phase 3 - ForceOff | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 3 |
| 4 | Phase 4 - ForceOff | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 4 |
| 5 | Phase 5 - ForceOff | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 5 |
| 6 | Phase 6 - ForceOff | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 7 | Phase 7 - ForceOff | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 7 |
| 8 | Phase 8 - ForceOff | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 8 |
| 9 | Ring Offset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| A | Offset 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A |
| B | Offset 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | B |
| C | Offset 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C |
| D | Permissive | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 0 | D |
| E | Hold Release | 255 | 255 | 255 | 255 | 255 | 255 | 255 | 255 | 0 | E |
| F | Zone Offset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | F |

(* = Coordination Recall)

| Row | | E | Row |
|---|---|---|---|
| 0 | | | 0 |
| 1 | Plan 1 - Sync | _2___6__ | 1 |
| 2 | Plan 2 - Sync | _2___6__ | 2 |
| 3 | Plan 3 - Sync | _2___6__ | 3 |
| 4 | Plan 4 - Sync | _2___6__ | 4 |
| 5 | Plan 5 - Sync | _2___6__ | 5 |
| 6 | Plan 6 - Sync | _2___6__ | 6 |
| 7 | Plan 7 - Sync | _2___6__ | 7 |
| 8 | Plan 8 - Sync | _2___6__ | 8 |
| 9 | Plan 9 - Sync | _2___6__ | 9 |
| A | Coord Ped * | _____ | A |
| B | NEMA Hold | _____ | B |
| C | | | C |
| D | | | D |
| E | | | E |
| F | | | F |

**Sync Phases** <C Page>

| Row | Column Numbers ----> | E | Row |
|---|---|---|---|
| 0 | Exclusive Phases | _____ | 0 |
| 1 | RR-1 Clear Phases | _____ | 1 |
| 2 | RR-2 Clear Phases | _____ | 2 |
| 3 | RR-2 Limited Service | _____ | 3 |
| 4 | Prot / Perm Phases | _____ | 4 |
| 5 | Overlap A - Green Omit | _____ | 5 |
| 6 | Overlap B - Green Omit | _____ | 6 |
| 7 | Overlap C - Green Omit | _____ | 7 |
| 8 | Overlap D - Green Omit | _____ | 8 |
| 9 | Overlap Yellow Flash | _____ | 9 |
| A | EV-A Phases | _2__5___ | A |
| B | EV-B Phases | ___4__7_ | B |
| C | EV-C Phases | 1____6__ | C |
| D | EV-D Phases | __3____8 | D |
| E | Extra 1 Config. Bits | 1_34____ | E |
| F | IC Select (Interconnect) | _2_____ | F |

**Configuration** <E Page>

| | F |
|---|---|
| | |
| RR Overlap A - Phases | _____ |
| RR Overlap B - Phases | _____ |
| RR Overlap C - Phases | _____ |
| RR Overlap D - Phases | _____ |
| Ped 2P | _____ |
| Ped 6P | _____6__ |
| Ped 4P | ___4____ |
| Ped 8P | _____8 |
| Yellow Flash Phases | _____ |
| Overlap A - Phases | _____ |
| Overlap B - Phases | _____ |
| Overlap C - Phases | _____ |
| Overlap D - Phases | _____ |
| Restricted Phases | _____ |
| Assign 5 Outputs | _____ |

**Configuration** <E Page>

**Coordination** <C Page>

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 =
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

Assign 5 Outputs
(Ped Loadswitch Yellows)
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

| | |
|---|---|
| Force-Off Adjust | 0 |

**Coord Force-Off Adjust for Ped Service** <C+D+F>

| | |
|---|---|
| Transition Type | 0 |

**TBC Transition** <C+D+D>

Transition Type
0 = Shortway
Non-zero = Lengthen

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

| Row | | F | Row |
|---|---|---|---|
| 0 | Free Lag | _2_4_6_8 | 0 |
| 1 | Plan 1 - Lag | _2_4_6_8 | 1 |
| 2 | Plan 2 - Lag | _2_4_6_8 | 2 |
| 3 | Plan 3 - Lag | _2_4_6_8 | 3 |
| 4 | Plan 4 - Lag | _2_4_6_8 | 4 |
| 5 | Plan 5 - Lag | _2_4_6_8 | 5 |
| 6 | Plan 6 - Lag | _2_4_6_8 | 6 |
| 7 | Plan 7 - Lag | _2_4_6_8 | 7 |
| 8 | Plan 8 - Lag | _2_4_6_8 | 8 |
| 9 | Plan 9 - Lag | _2_4_6_8 | 9 |
| A | Coord Max * | _____ | A |
| B | Coord Lag * | _____ | B |
| C | | | C |
| D | | | D |
| E | | | E |
| F | | | F |

**Lag Phases** <C Page>

**TOD Coordination**
<9 Key with C+D+9=0>

| Row | Time | Plan | Offset | Day of Week |
|---|---|---|---|---|
| 0 | 00:00 | 0 | 0 | _____ |
| 1 | 00:00 | 0 | 0 | _____ |
| 2 | 00:00 | 0 | 0 | _____ |
| 3 | 00:00 | 0 | 0 | _____ |
| 4 | 00:00 | 0 | 0 | _____ |
| 5 | 00:00 | 0 | 0 | _____ |
| 6 | 00:00 | 0 | 0 | _____ |
| 7 | 00:00 | 0 | 0 | _____ |
| 8 | 00:00 | 0 | 0 | _____ |
| 9 | 00:00 | 0 | 0 | _____ |
| A | 00:00 | 0 | 0 | _____ |
| B | 00:00 | 0 | 0 | _____ |
| C | 00:00 | 0 | 0 | _____ |
| D | 00:00 | 0 | 0 | _____ |
| E | 00:00 | 0 | 0 | _____ |
| F | 00:00 | 0 | 0 | _____ |

Plan Select
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Offset Select
A = Offset A
B = Offset B
C = Offset C

**TOD Function**
<7 Key>

| Time | Funct. | Day of Week |
|---|---|---|
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

| Column F |
|---|
| Phases/Bits |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |

<D Page>

**Holiday # 1**
**TOD Coordination**
<9 Key with C+D+9=1>

| Time | Plan | Offset | Day of Week |
|---|---|---|---|
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |

**Holiday # 2**
**TOD Coordination**
<9 Key with C+D+9=2>

| Time | Plan | Offset | Day of Week |
|---|---|---|---|
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |

**Holiday # 3**
**TOD Coordination**
<9 Key with C+D+9=3>

| Time | Plan | Offset | Day of Week | Row |
|---|---|---|---|---|
| 00:00 | 0 | 0 | _____ | 0 |
| 00:00 | 0 | 0 | _____ | 1 |
| 00:00 | 0 | 0 | _____ | 2 |
| 00:00 | 0 | 0 | _____ | 3 |
| 00:00 | 0 | 0 | _____ | 4 |
| 00:00 | 0 | 0 | _____ | 5 |
| 00:00 | 0 | 0 | _____ | 6 |
| 00:00 | 0 | 0 | _____ | 7 |
| 00:00 | 0 | 0 | _____ | 8 |
| 00:00 | 0 | 0 | _____ | 9 |
| 00:00 | 0 | 0 | _____ | A |
| 00:00 | 0 | 0 | _____ | B |
| 00:00 | 0 | 0 | _____ | C |
| 00:00 | 0 | 0 | _____ | D |
| 00:00 | 0 | 0 | _____ | E |
| 00:00 | 0 | 0 | _____ | F |

Month Select
1 = January
2 = February
3 = March
4 = April
5 = May
6 = June
7 = July
8 = August
9 = September
A = October
B = November
C = December

**Holiday Dates**
<8 Key>

| Row | | Day | Year | Month | Day of Week |
|---|---|---|---|---|---|
| A | Holiday # 1 Date | 0 | 0 | 0 | _____ |
| B | Holiday # 2 Date | 0 | 0 | 0 | _____ |
| C | Holiday # 3 Date | 0 | 0 | 0 | _____ |

| Row | 1 Delay | 3 Carry-over | Detector Name | 332 Input File | Detector Number |
|---|---|---|---|---|---|
| 0 | 0.0 | 0.0 | | I-1 | 14 |
| 1 | 0.0 | 0.0 | | I-2U | 1 |
| 2 | 0.0 | 0.0 | | I-2L | 5 |
| 3 | 0.0 | 0.0 | | I-3U | 21 |
| 4 | 0.0 | 0.0 | | I-3L | 25 |
| 5 | 0.0 | 0.0 | | I-4 | 9 |
| 6 | 0.0 | 0.0 | | I-5 | 16 |
| 7 | 5.0 | 0.0 | | I-6U | 3 |
| 8 | 0.0 | 0.0 | | I-6L | 7 |
| 9 | 0.0 | 0.0 | | I-7U | 23 |
| A | 0.0 | 0.0 | | I-7L | 27 |
| B | 0.0 | 0.0 | | I-8 | 11 |
| C | 0.0 | 0.0 | | I-9U | 18 |
| D | 0.0 | 0.0 | | I-9L | 20 |
| E | - - - | - - - | - - - | - - - | - - - |
| F | - - - | - - - | - - - | - - - | - - - |

| Row | 2 Delay | 4 Carry-over | Detector Name | 332 Input File | Detector Number |
|---|---|---|---|---|---|
| 0 | 0.0 | 0.0 | | J-1 | 13 |
| 1 | 0.0 | 0.0 | | J-2U | 2 |
| 2 | 0.0 | 0.0 | | J-2L | 6 |
| 3 | 0.0 | 0.0 | | J-3U | 22 |
| 4 | 0.0 | 0.0 | | J-3L | 26 |
| 5 | 0.0 | 0.0 | | J-4 | 10 |
| 6 | 0.0 | 0.0 | | J-5 | 15 |
| 7 | 3.0 | 0.0 | | J-6U | 4 |
| 8 | 0.0 | 0.0 | | J-6L | 8 |
| 9 | 0.0 | 0.0 | | J-7U | 24 |
| A | 0.0 | 0.0 | | J-7L | 28 |
| B | 0.0 | 0.0 | | J-8 | 12 |
| C | 0.0 | 0.0 | | J-9U | 17 |
| D | 0.0 | 0.0 | | J-9L | 19 |
| E | - - - | - - - | - - - | - - - | - - - |
| F | - - - | - - - | - - - | - - - | - - - |

**Detector Delay & Carryover** <D Page>

| Row | | 9 Green Clear | C Yellow Change | D Red Clear | 0 Load-Switch # |
|---|---|---|---|---|---|
| A | Overlap A | 0.0 | 0.0 | 0.0 | 0 |
| B | Overlap B | 0.0 | 0.0 | 0.0 | 0 |
| C | Overlap C | 0.0 | 0.0 | 0.0 | 0 |
| D | Overlap D | 0.0 | 0.0 | 0.0 | 0 |

**Overlap Timing** <F Page> <D Page>

| Row | Detector Numbers | E |
|---|---|---|
| A | 1 2 3 4 5 6 7 8 | 12345678 |
| B | 9 10 11 12 -- -- -- -- | 1234____ |
| C | 13 14 15 16 17 18 19 20 | 12345678 |
| D | -- -- -- -- 21 22 23 24 | ____5678 |
| E | -- -- -- -- -- -- -- -- | 1234____ |
| F | -- 25 26 27 28 -- -- -- | _2345___ |

**Active Detectors** <D Page>

Note: Initialized data is for all detectors to be active (ie, all flag bits set). A Detector which is "not flagged", will not be active as a Phase Detector, and WILL NOT call or extend its associated phase. It will still function as a System Detector.

| Row | | 0 Detector Number |
|---|---|---|
| 0 | | |
| 1 | System Det. # 1 | 0 |
| 2 | System Det. # 2 | 0 |
| 3 | System Det. # 3 | 0 |
| 4 | System Det. # 4 | 0 |
| 5 | System Det. # 5 | 0 |
| 6 | System Det. # 6 | 0 |
| 7 | System Det. # 7 | 0 |
| 8 | System Det. # 8 | 0 |

**System Detectors** <D Page>

| | | |
|---|---|---|
| Max ON (minutes) | 5 | <D+A+E> |
| Max OFF (minutes) | 60 | <D+A+F> |

**Detector Failure Monitor**

| | | |
|---|---|---|
| Phase Number | 0 | <F+C+1> |
| Time Before Yellow | 0.0 | <F+C+3> |

**Advance Warning Beacon - Sign 1**

| | | |
|---|---|---|
| Phase Number | 0 | <F+D+1> |
| Time Before Yellow | 0.0 | <F+D+3> |

**Advance Warning Beacon - Sign 2**

| | | |
|---|---|---|
| Long Failure | 0.0 | <F+0+6> |
| Short Failure | 0.0 | <F+0+7> |

**Power Cycle Correction** (Default = 0.5)

| | | |
|---|---|---|
| Disable Parity | 0 | <D+B+0> |

**Dial-Up Telephone Communications**
(If set to a non-zero value, parity will be disabled)

## INTERSECTION: Mission & Ditmar

| Row | Column Numbers ----> | Phase 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Row |
|---|---|---|---|---|---|---|---|---|---|---|
| | Phase Names ----> | | | | | | | | | |
| 0 | Ped Walk | 0 | 7 | 0 | 7 | 0 | 7 | 0 | 7 | 0 |
| 1 | Ped FDW | 0 | 10 | 0 | 10 | 0 | 10 | 0 | 10 | 1 |
| 2 | Min Green | 3 | 7 | 3 | 7 | 3 | 7 | 3 | 7 | 2 |
| 3 | Type 3 Limit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 4 | Added Initial | 0.0 | 1.2 | 0.0 | 1.2 | 0.0 | 1.2 | 0.0 | 1.2 | 4 |
| 5 | Veh Extension | 0.5 | 3.5 | 0.5 | 3.5 | 0.5 | 3.5 | 0.5 | 3.5 | 5 |
| 6 | Max Gap | 0.5 | 5.0 | 0.5 | 5.0 | 0.5 | 5.0 | 0.5 | 5.0 | 6 |
| 7 | Min Gap | 0.5 | 2.0 | 0.5 | 2.0 | 0.5 | 2.0 | 0.5 | 2.0 | 7 |
| 8 | Max Limit | 17 | 40 | 17 | 40 | 17 | 40 | 17 | 40 | 8 |
| 9 | Max Limit 2 | 30 | 70 | 30 | 70 | 30 | 70 | 30 | 70 | 9 |
| A | - - - - - - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A |
| B | Call To Phase | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | B |
| C | Reduce By | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | C |
| D | Reduce Every | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | D |
| E | Yellow Change | 3.0 | 4.0 | 3.0 | 4.0 | 3.0 | 4.0 | 3.0 | 4.0 | E |
| F | Red Clear | 0.0 | 0.5 | 0.0 | 1.0 | 0.0 | 0.5 | 0.0 | 1.0 | F |

| Row | Column Numbers ----> | Phase 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Row |
|---|---|---|---|---|---|---|---|---|---|---|
| | Phase Names ----> | | | | | | | | | |
| 0 | Ped Walk | 0 | 7 | 0 | 7 | 0 | 7 | 0 | 7 | 0 |
| 1 | Ped FDW | 0 | 10 | 0 | 10 | 0 | 10 | 0 | 10 | 1 |
| 2 | Min Green | 3 | 7 | 3 | 7 | 3 | 7 | 3 | 7 | 2 |
| 3 | Type 3 Limit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 4 | Added Initial | 0.0 | 1.2 | 0.0 | 1.2 | 0.0 | 1.2 | 0.0 | 1.2 | 4 |
| 5 | Veh Extension | 0.5 | 3.5 | 0.5 | 3.5 | 0.5 | 3.5 | 0.5 | 3.5 | 5 |
| 6 | Max Gap | 0.5 | 5.0 | 0.5 | 5.0 | 0.5 | 5.0 | 0.5 | 5.0 | 6 |
| 7 | Min Gap | 0.5 | 2.0 | 0.5 | 2.0 | 0.5 | 2.0 | 0.5 | 2.0 | 7 |
| 8 | Max Limit | 17 | 40 | 17 | 40 | 17 | 40 | 17 | 40 | 8 |
| 9 | Max Limit 2 | 30 | 70 | 30 | 70 | 30 | 70 | 30 | 70 | 9 |
| A | - - - - - - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A |
| B | Call To Phase | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | B |
| C | Reduce By | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | C |
| D | Reduce Every | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | D |
| E | Yellow Change | 3.0 | 4.0 | 3.0 | 4.0 | 3.0 | 4.0 | 3.0 | 4.0 | E |
| F | Red Clear | 0.0 | 0.5 | 0.0 | 1.0 | 0.0 | 0.5 | 0.0 | 1.0 | F |

### Phase Timing - Bank 2 <F Page>

### Phase Timing - Bank 3 <F Page>

| Row | | 7 Time | 8 Dwell | 9 Hold | A Advance | B Force Off | C Vehicle Call | D Permit Phases | E Ped Omit | F Output | Row |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Delay Only ---> | 0 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | 0 |
| 1 | | 0 | 0 | | | | | | | | 1 |
| 2 | | 0 | 0 | | | | | | | | 2 |
| 3 | | 0 | 0 | | | | | | | | 3 |
| 4 | | 0 | 0 | | | | | | | | 4 |
| 5 | | 0 | 0 | | | | | | | | 5 |
| 6 | | 0 | 0 | | | | | | | | 6 |
| 7 | | 0 | 0 | | | | | | | | 7 |
| 8 | | 0 | 0 | | | | | | | | 8 |
| 9 | Limited Service | 0 | 0 | | | | | | | | 9 |
| A | Int. ---> | - - - | 0 | | | | | | | | A |
| B | | 0 | 0 | | | | | | | | B |
| C | | 0 | 0 | | | | | | | | C |
| D | | 0 | 0 | | | | | | | | D |
| E | | 0 | 0 | | | | | | | | E |
| F | | 0 | 0 | | | | | | | | F |

**<--- Limited Service Interval**
(Set Dwell = 255)

### Special Event Schedule

<C Page with F+9+F=22>

## INTERSECTION: Mission & Horne

Group Assignment: **NONE**
Field Master Assignment: **NONE**
System Reference Number: **62**

N/S Street Name: **Not Assigned**
E/W Street Name: **Not Assigned**

Last Database Change: **2/1/2023 12:54:37 AM**

| Change Record | | | | | |
|---|---|---|---|---|---|
| Change | By | Date | Change | By | Date |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Notes:

| | | |
|---|---|---|
| Drop Number | **13** | <C+0+0> |
| Zone Number | | <C+0+1> |
| Area Number | **1** | <C+0+2> |
| Area Address | **62** | <C+0+3> |
| QuicNet Channel | **P:8001:10.160.0.** | (QuicNet) |

**Communication Addresses**

| | | |
|---|---|---|
| Manual Plan | | <C+A+1> |
| Manual Offset | | <C+B+1> |

**Manual Selection**

| | | |
|---|---|---|
| Max Initial | **20** | <F+0+E> |
| Red Revert | **2.0** | <F+0+F> |
| All Red Start | **5.0** | <F+C+0> |

**Start / Revert Times**

| Row | Column Numbers ----> | Phase 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| | Phase Names ----> | | | | | | | | |
| 0 | Ped Walk | 0 | 7 | 7 | 7 | 0 | 7 | 0 | 0 |
| 1 | Ped FDW | 0 | 12 | 14 | 16 | 0 | 10 | 0 | 0 |
| 2 | Min Green | 10 | 20 | 6 | 6 | 20 | 18 | 3 | 0 |
| 3 | Type 3 Limit | 0 | 99 | 0 | 0 | 0 | 99 | 0 | 0 |
| 4 | Added Initial | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| 5 | Veh Extension | 2.5 | 6.0 | 4.0 | 4.0 | 2.5 | 4.0 | 0.5 | 0.0 |
| 6 | Max Gap | 2.5 | 8.0 | 4.0 | 4.0 | 2.5 | 6.0 | 0.5 | 0.0 |
| 7 | Min Gap | 2.5 | 4.0 | 4.0 | 4.0 | 2.5 | 4.0 | 0.5 | 0.0 |
| 8 | Max Limit | 15 | 40 | 35 | 20 | 30 | 40 | 17 | 0 |
| 9 | Max Limit 2 | 15 | 60 | 35 | 20 | 30 | 60 | 30 | 0 |
| A | - - - - - - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| B | Call To Phase | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C | Reduce By | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 |
| D | Reduce Every | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.8 | 1.0 | 1.0 |
| E | Yellow Change | 3.7 | 4.4 | 3.6 | 3.6 | 3.7 | 4.4 | 3.0 | 4.0 |
| F | Red Clear | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 |

**Phase Timing - Bank 1** <F Page>

| Row | E | |
|---|---|---|
| 0 | RR-1 Delay | 0 |
| 1 | RR-1 Clear | 10 |
| 2 | EV-A Delay | 0 |
| 3 | EV-A Clear | 5 |
| 4 | EV-B Delay | 0 |
| 5 | EV-B Clear | 5 |
| 6 | EV-C Delay | 0 |
| 7 | EV-C Clear | 5 |
| 8 | EV-D Delay | 0 |
| 9 | EV-D Clear | 5 |
| A | RR-2 Delay | 0 |
| B | RR-2 Clear | 10 |
| C | *View EV Delay* | - - - |
| D | *View EV Clear* | - - - |
| E | *View RR Delay* | - - - |
| F | *View RR Clear* | - - - |

**Preempt Timing**

| Row | F | |
|---|---|---|
| 0 | Permit | **123456**__ |
| 1 | Red Lock | _____ |
| 2 | Yellow Lock | _____ |
| 3 | Min Recall | **12__56**__ |
| 4 | Ped Recall | _____ |
| 5 | *View Set Peds* | **- - - - -** |
| 6 | Rest In Walk | _____ |
| 7 | Red Rest | _____ |
| 8 | Dual Entry | _**2**___**6**__ |
| 9 | Max Recall | _____ |
| A | Soft Recall | _____ |
| B | Max 2 | _____ |
| C | Cond. Service | _____ |
| D | Man Cntrl Calls | _____ |
| E | Yellow Start | **1**___**5**___ |
| F | First Phases | _**2**___**6**__ |

**Phase Functions** <F Page>

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

| Row | Column Numbers ----> / Plan Name ----> | Plan 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Row |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Cycle Length | 100 | 110 | 120 | 120 | 100 | 100 | 100 | 100 | 100 | 0 |
| 1 | Phase 1 - ForceOff | 75 | 75 | 75 | 75 | 65 | 65 | 65 | 65 | 65 | 1 |
| 2 | Phase 2 - ForceOff | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3 | Phase 3 - ForceOff | 30 | 30 | 33 | 33 | 25 | 25 | 25 | 25 | 25 | 3 |
| 4 | Phase 4 - ForceOff | 57 | 57 | 61 | 60 | 40 | 40 | 40 | 40 | 40 | 4 |
| 5 | Phase 5 - ForceOff | 80 | 80 | 84 | 83 | 65 | 65 | 65 | 65 | 65 | 5 |
| 6 | Phase 6 - ForceOff | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 7 | Phase 7 - ForceOff | 1 | 1 | 1 | 1 | 25 | 25 | 25 | 25 | 25 | 7 |
| 8 | Phase 8 - ForceOff | 1 | 1 | 1 | 1 | 40 | 40 | 40 | 40 | 40 | 8 |
| 9 | Ring Offset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| A | Offset 1 | 85 | 72 | 80 | 30 | 0 | 0 | 0 | 0 | 0 | A |
| B | Offset 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | B |
| C | Offset 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C |
| D | Permissive | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 0 | D |
| E | Hold Release | 255 | 255 | 255 | 255 | 255 | 255 | 255 | 255 | 0 | E |
| F | Zone Offset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | F |

(* = Coordination Recall)

| Row | | E | Row |
|---|---|---|---|
| 0 | | | 0 |
| 1 | Plan 1 - Sync | _2___6__ | 1 |
| 2 | Plan 2 - Sync | _2___6__ | 2 |
| 3 | Plan 3 - Sync | _2___6__ | 3 |
| 4 | Plan 4 - Sync | _2___6__ | 4 |
| 5 | Plan 5 - Sync | _2___6__ | 5 |
| 6 | Plan 6 - Sync | _2___6__ | 6 |
| 7 | Plan 7 - Sync | _2___6__ | 7 |
| 8 | Plan 8 - Sync | _2___6__ | 8 |
| 9 | Plan 9 - Sync | _2___6__ | 9 |
| A | Coord Ped * | _____ | A |
| B | NEMA Hold | _____ | B |
| C | | | C |
| D | | | D |
| E | | | E |
| F | | | F |

**Sync Phases** <C Page>

| Row | Column Numbers ----> | E |
|---|---|---|
| 0 | Exclusive Phases | _____ |
| 1 | RR-1 Clear Phases | _____ |
| 2 | RR-2 Clear Phases | _____ |
| 3 | RR-2 Limited Service | _____ |
| 4 | Prot / Perm Phases | _____ |
| 5 | Overlap A - Green Omit | _____ |
| 6 | Overlap B - Green Omit | _____ |
| 7 | Overlap C - Green Omit | _____ |
| 8 | Overlap D - Green Omit | _____ |
| 9 | Overlap Yellow Flash | _____ |
| A | EV-A Phases | _2__5___ |
| B | EV-B Phases | ___4____ |
| C | EV-C Phases | 1____6__ |
| D | EV-D Phases | __3_____ |
| E | Extra 1 Config. Bits | 1__4____ |
| F | IC Select (Interconnect) | _2______ |

**Configuration** <E Page>

| | F |
|---|---|
| | |
| RR Overlap A - Phases | _____ |
| RR Overlap B - Phases | _____ |
| RR Overlap C - Phases | _____ |
| RR Overlap D - Phases | _____ |
| Ped 2P | _2_____ |
| Ped 6P | _____6__ |
| Ped 4P | ___4____ |
| Ped 8P | __3_____ |
| Yellow Flash Phases | _____ |
| Overlap A - Phases | __3_____ |
| Overlap B - Phases | _____ |
| Overlap C - Phases | _____ |
| Overlap D - Phases | _____ |
| Restricted Phases | _____ |
| Assign 5 Outputs | 1_____ |

**Configuration** <E Page>

**Coordination** <C Page>

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 =
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

Assign 5 Outputs
(Ped Loadswitch Yellows)
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

| Force-Off Adjust | 5 |
|---|---|

**Coord Force-Off Adjust for Ped Service** <C+D+F>

| Transition Type | 0 |
|---|---|

**TBC Transition** <C+D+D>

Transition Type
0 = Shortway
Non-zero = Lengthen

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

| Row | | F | Row |
|---|---|---|---|
| 0 | Free Lag | _2_4_6_8 | 0 |
| 1 | Plan 1 - Lag | _2_4_6_8 | 1 |
| 2 | Plan 2 - Lag | _2_4_6_8 | 2 |
| 3 | Plan 3 - Lag | _2_4_6_8 | 3 |
| 4 | Plan 4 - Lag | _2_4_6_8 | 4 |
| 5 | Plan 5 - Lag | _2_4_6_8 | 5 |
| 6 | Plan 6 - Lag | _2_4_6_8 | 6 |
| 7 | Plan 7 - Lag | _2_4_6_8 | 7 |
| 8 | Plan 8 - Lag | _2_4_6_8 | 8 |
| 9 | Plan 9 - Lag | _2_4_6_8 | 9 |
| A | Coord Max * | _____ | A |
| B | Coord Lag * | _____ | B |
| C | | | C |
| D | | | D |
| E | | | E |
| F | | | F |

**Lag Phases** <C Page>

**TOD Coordination**
<9 Key with C+D+9=0>

| Row | Time | Plan | Offset | Day of Week |
|---|---|---|---|---|
| 0 | 00:00 | 0 | 0 | _____ |
| 1 | 00:00 | 0 | 0 | _____ |
| 2 | 00:00 | 0 | 0 | _____ |
| 3 | 00:00 | 0 | 0 | _____ |
| 4 | 00:00 | 0 | 0 | _____ |
| 5 | 00:00 | 0 | 0 | _____ |
| 6 | 00:00 | 0 | 0 | _____ |
| 7 | 00:00 | 0 | 0 | _____ |
| 8 | 00:00 | 0 | 0 | _____ |
| 9 | 00:00 | 0 | 0 | _____ |
| A | 00:00 | 0 | 0 | _____ |
| B | 00:00 | 0 | 0 | _____ |
| C | 00:00 | 0 | 0 | _____ |
| D | 00:00 | 0 | 0 | _____ |
| E | 00:00 | 0 | 0 | _____ |
| F | 00:00 | 0 | 0 | _____ |

Plan Select
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Offset Select
A = Offset A
B = Offset B
C = Offset C

**TOD Function**
<7 Key>

| Time | Funct. | Day of Week |
|---|---|---|
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |
| 00:00 | 0 | _____ |

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

| Column F Phases/Bits |
|---|
| _2___6__ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |
| _____ |

<D Page>

**Holiday # 1**
**TOD Coordination**
<9 Key with C+D+9=1>

| Time | Plan | Offset | Day of Week |
|---|---|---|---|
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |

**Holiday # 2**
**TOD Coordination**
<9 Key with C+D+9=2>

| Time | Plan | Offset | Day of Week |
|---|---|---|---|
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |
| 00:00 | 0 | 0 | _____ |

**Holiday # 3**
**TOD Coordination**
<9 Key with C+D+9=3>

| Time | Plan | Offset | Day of Week | Row |
|---|---|---|---|---|
| 00:00 | 0 | 0 | _____ | 0 |
| 00:00 | 0 | 0 | _____ | 1 |
| 00:00 | 0 | 0 | _____ | 2 |
| 00:00 | 0 | 0 | _____ | 3 |
| 00:00 | 0 | 0 | _____ | 4 |
| 00:00 | 0 | 0 | _____ | 5 |
| 00:00 | 0 | 0 | _____ | 6 |
| 00:00 | 0 | 0 | _____ | 7 |
| 00:00 | 0 | 0 | _____ | 8 |
| 00:00 | 0 | 0 | _____ | 9 |
| 00:00 | 0 | 0 | _____ | A |
| 00:00 | 0 | 0 | _____ | B |
| 00:00 | 0 | 0 | _____ | C |
| 00:00 | 0 | 0 | _____ | D |
| 00:00 | 0 | 0 | _____ | E |
| 00:00 | 0 | 0 | _____ | F |

Month Select
1 = January
2 = February
3 = March
4 = April
5 = May
6 = June
7 = July
8 = August
9 = September
A = October
B = November
C = December

| Row | | Day | Year | Month | Day of Week |
|---|---|---|---|---|---|
| A | Holiday # 1 Date | 0 | 0 | 0 | _____ |
| B | Holiday # 2 Date | 0 | 0 | 0 | _____ |
| C | Holiday # 3 Date | 0 | 0 | 0 | _____ |

**Holiday Dates**
<8 Key>

| Row | 1 Delay | 3 Carry-over | Detector Name | 332 Input File | Detector Number |
|---|---|---|---|---|---|
| 0 | 0.0 | 0.0 | | I-1 | 14 |
| 1 | 0.0 | 0.0 | | I-2U | 1 |
| 2 | 0.0 | 0.0 | | I-2L | 5 |
| 3 | 0.0 | 0.0 | | I-3U | 21 |
| 4 | 0.0 | 0.0 | | I-3L | 25 |
| 5 | 0.0 | 0.0 | | I-4 | 9 |
| 6 | 0.0 | 0.0 | | I-5 | 16 |
| 7 | 0.0 | 0.0 | | I-6U | 3 |
| 8 | 5.0 | 0.0 | | I-6L | 7 |
| 9 | 0.0 | 0.0 | | I-7U | 23 |
| A | 0.0 | 0.0 | | I-7L | 27 |
| B | 0.0 | 0.0 | | I-8 | 11 |
| C | 0.0 | 0.0 | | I-9U | 18 |
| D | 0.0 | 0.0 | | I-9L | 20 |
| E | - - - | - - - | - - - | - - - | - - - |
| F | - - - | - - - | - - - | - - - | - - - |

| Row | 2 Delay | 4 Carry-over | Detector Name | 332 Input File | Detector Number |
|---|---|---|---|---|---|
| 0 | 0.0 | 0.0 | | J-1 | 13 |
| 1 | 0.0 | 0.0 | | J-2U | 2 |
| 2 | 0.0 | 0.0 | | J-2L | 6 |
| 3 | 0.0 | 0.0 | | J-3U | 22 |
| 4 | 0.0 | 0.0 | | J-3L | 26 |
| 5 | 0.0 | 0.0 | | J-4 | 10 |
| 6 | 0.0 | 0.0 | | J-5 | 15 |
| 7 | 0.0 | 0.0 | | J-6U | 4 |
| 8 | 0.0 | 0.0 | | J-6L | 8 |
| 9 | 0.0 | 0.0 | | J-7U | 24 |
| A | 0.0 | 0.0 | | J-7L | 28 |
| B | 0.0 | 0.0 | | J-8 | 12 |
| C | 0.0 | 0.0 | | J-9U | 17 |
| D | 0.0 | 0.0 | | J-9L | 19 |
| E | - - - | - - - | - - - | - - - | - - - |
| F | - - - | - - - | - - - | - - - | - - - |

**Detector Delay & Carryover** <D Page>

| Row | | 9 Green Clear | C Yellow Change | D Red Clear | 0 Load-Switch # |
|---|---|---|---|---|---|
| A | Overlap A | 0.0 | 0.0 | 0.0 | 0 |
| B | Overlap B | 0.0 | 0.0 | 0.0 | 0 |
| C | Overlap C | 0.0 | 0.0 | 0.0 | 0 |
| D | Overlap D | 0.0 | 0.0 | 0.0 | 0 |

**Overlap Timing** <F Page> <D Page>

| Row | Detector Numbers | E |
|---|---|---|
| A | 1 2 3 4 5 6 7 8 | 12345678 |
| B | 9 10 11 12 -- -- -- -- | 1234____ |
| C | 13 14 15 16 17 18 19 20 | 12345678 |
| D | -- -- -- -- 21 22 23 24 | ____5678 |
| E | -- -- -- -- -- -- -- -- | 1234____ |
| F | -- 25 26 27 28 -- -- -- | _2345___ |

**Active Detectors** <D Page>

Note: Initialized data is for all detectors to be active (ie, all flag bits set). A Detector which is "not flagged", will not be active as a Phase Detector, and WILL NOT call or extend its associated phase. It will still function as a System Detector.

| Row | | 0 Detector Number |
|---|---|---|
| 0 | | |
| 1 | System Det. # 1 | 0 |
| 2 | System Det. # 2 | 0 |
| 3 | System Det. # 3 | 0 |
| 4 | System Det. # 4 | 0 |
| 5 | System Det. # 5 | 0 |
| 6 | System Det. # 6 | 0 |
| 7 | System Det. # 7 | 0 |
| 8 | System Det. # 8 | 0 |

**System Detectors** <D Page>

| | | |
|---|---|---|
| Max ON (minutes) | 5 | <D+A+E> |
| Max OFF (minutes) | 60 | <D+A+F> |

**Detector Failure Monitor**

| | | |
|---|---|---|
| Phase Number | 0 | <F+C+1> |
| Time Before Yellow | 0.0 | <F+C+3> |

**Advance Warning Beacon - Sign 1**

| | | |
|---|---|---|
| Phase Number | 0 | <F+D+1> |
| Time Before Yellow | 0.0 | <F+D+3> |

**Advance Warning Beacon - Sign 2**

| | | |
|---|---|---|
| Long Failure | 0.0 | <F+0+6> |
| Short Failure | 0.0 | <F+0+7> |

**Power Cycle Correction** (Default = 0.5)

| | | |
|---|---|---|
| Disable Parity | 0 | <D+B+0> |

**Dial-Up Telephone Communications**
(If set to a non-zero value, parity will be disabled)

## INTERSECTION: Mission & Horne

| Row | Column Numbers ----> | Phase 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Row |
|---|---|---|---|---|---|---|---|---|---|---|
| | Phase Names ----> | | | | | | | | | |
| 0 | Ped Walk | 0 | 7 | 7 | 7 | 0 | 7 | 0 | 0 | 0 |
| 1 | Ped FDW | 0 | 12 | 14 | 16 | 0 | 10 | 0 | 0 | 1 |
| 2 | Min Green | 10 | 20 | 6 | 6 | 20 | 18 | 3 | 0 | 2 |
| 3 | Type 3 Limit | 0 | 99 | 0 | 0 | 0 | 99 | 0 | 0 | 3 |
| 4 | Added Initial | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 4 |
| 5 | Veh Extension | 2.5 | 6.0 | 4.0 | 4.0 | 2.5 | 4.0 | 0.5 | 0.0 | 5 |
| 6 | Max Gap | 2.5 | 8.0 | 4.0 | 4.0 | 2.5 | 6.0 | 0.5 | 0.0 | 6 |
| 7 | Min Gap | 2.5 | 4.0 | 4.0 | 4.0 | 2.5 | 4.0 | 0.5 | 0.0 | 7 |
| 8 | Max Limit | 15 | 40 | 35 | 20 | 30 | 40 | 17 | 0 | 8 |
| 9 | Max Limit 2 | 15 | 60 | 35 | 20 | 30 | 60 | 30 | 0 | 9 |
| A | - - - - - - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A |
| B | Call To Phase | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | B |
| C | Reduce By | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | C |
| D | Reduce Every | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.8 | 1.0 | 1.0 | D |
| E | Yellow Change | 3.7 | 4.4 | 3.6 | 3.6 | 3.7 | 4.4 | 3.0 | 4.0 | E |
| F | Red Clear | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | F |

| Row | Column Numbers ----> | Phase 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Row |
|---|---|---|---|---|---|---|---|---|---|---|
| | Phase Names ----> | | | | | | | | | |
| 0 | Ped Walk | 0 | 7 | 7 | 7 | 0 | 7 | 0 | 0 | 0 |
| 1 | Ped FDW | 0 | 12 | 14 | 16 | 0 | 10 | 0 | 0 | 1 |
| 2 | Min Green | 10 | 20 | 6 | 6 | 20 | 18 | 3 | 0 | 2 |
| 3 | Type 3 Limit | 0 | 99 | 0 | 0 | 0 | 99 | 0 | 0 | 3 |
| 4 | Added Initial | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 4 |
| 5 | Veh Extension | 2.5 | 6.0 | 4.0 | 4.0 | 2.5 | 4.0 | 0.5 | 0.0 | 5 |
| 6 | Max Gap | 2.5 | 8.0 | 4.0 | 4.0 | 2.5 | 6.0 | 0.5 | 0.0 | 6 |
| 7 | Min Gap | 2.5 | 4.0 | 4.0 | 4.0 | 2.5 | 4.0 | 0.5 | 0.0 | 7 |
| 8 | Max Limit | 15 | 40 | 35 | 20 | 30 | 40 | 17 | 0 | 8 |
| 9 | Max Limit 2 | 15 | 60 | 35 | 20 | 30 | 60 | 30 | 0 | 9 |
| A | - - - - - - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A |
| B | Call To Phase | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | B |
| C | Reduce By | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | C |
| D | Reduce Every | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.8 | 1.0 | 1.0 | D |
| E | Yellow Change | 3.7 | 4.4 | 3.6 | 3.6 | 3.7 | 4.4 | 3.0 | 4.0 | E |
| F | Red Clear | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | F |

## Phase Timing - Bank 2 <F Page>

## Phase Timing - Bank 3 <F Page>

| Row | | 7 Time | 8 Dwell | 9 Hold | A Advance | B Force Off | C Vehicle Call | D Permit Phases | E Ped Omit | F Output | Row |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Delay Only ---> | 0 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | 0 |
| 1 | | 0 | 0 | | | | | | | | 1 |
| 2 | | 0 | 0 | | | | | | | | 2 |
| 3 | | 0 | 0 | | | | | | | | 3 |
| 4 | | 0 | 0 | | | | | | | | 4 |
| 5 | | 0 | 0 | | | | | | | | 5 |
| 6 | | 0 | 0 | | | | | | | | 6 |
| 7 | | 0 | 0 | | | | | | | | 7 |
| 8 | | 0 | 0 | | | | | | | | 8 |
| 9 | Limited Service | 0 | 0 | | | | | | | | 9 |
| A | Int. ---> | - - - | 0 | | | | | | | | A |
| B | | 0 | 0 | | | | | | | | B |
| C | | 0 | 0 | | | | | | | | C |
| D | | 0 | 0 | | | | | | | | D |
| E | | 0 | 0 | | | | | | | | E |
| F | | 0 | 0 | | | | | | | | F |

**<--- Limited Service Interval**
(Set Dwell = 255)

## Special Event Schedule

<C Page with F+9+F=22>

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# 2070 Controller TSCP Timing Chart

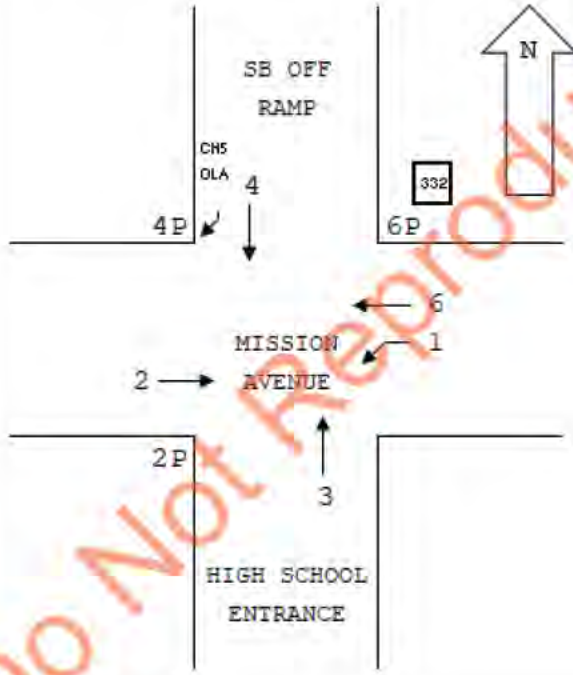


Location: 5 SB @ Mission
System:
Master At: N/A Standalone CTSCP
District: 11
I/C: None
Designed By:
Installed By:
Service Info:

Timing Change: Date Start: Date End: Designed: Installed:

| | | | FLASH |
|---|---|---|---|
| PHASE | 1) | WB Mission Ave Left Turn | [ ] |
| | 2) | EB Mission Ave | [ ] |
| | 3) | NB High School Entrance | [ ] |
| | 4) | SB 5 Off Ramp | [ ] |
| | 5) | SB 5 Off Ramp Right Turn | [ ] |
| | 6) | WB Mission Ave | [ ] |
| | 7) | | [ ] |
| | 8) | | [ ] |
| OVERLAP | A) | | [ ] |
| | B) | | [ ] |
| | C) | | [ ] |
| | D) | | [ ] |
| | E) | | [ ] |
| | F) | | [ ] |

## Intersection Layout




Do Not Reproduce

Comments and Notes:

| PHASES | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 3.5 PED FT | - | 45 | - | 70 | - | 58 | - | - |
| Bike xing FT | 97 | 66 | 85 | - | - | 92 | - | - |

OLA = FZ5
3/4 SPLIT

RAM Checksum

| | |
|---|---|
| Page 2: 7539 | Page 8: 85AF |
| Page 3: CDA4 | Page 9: 2E61 |
| Page 4: D244 | Page 10: B585 |
| Page 5: 191A | Page 11: A119 |
| Page 6: 191A | Page 12: D68F |
| Page 7: C208 | Page 13: 84E7 |

***Post Mile: RTE 5 P53.079: 5 SB @ Mission Rd***

***Printed: 3/30/2021***

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# CONFIGURATION PHASE FLAGS

| Cabinet ( 9-3 ) |
|---|
| 332 |
| Configuration |
| CALTRANS |

| Phases ( 2-1-1-1 ) | |
|---|---|
| Permitted | 1 2 3 4 5 6 . . |
| Restricted | . . . . . |

| Phase Recalls ( 2-1-1-2 ) | |
|---|---|
| Vehicle Min | . 2 . . . 6 . . |
| Vehicle Max | . . . . . |
| Pedestrian | . . . . . |
| Bicycle | . . . . . |

| Phase Locks ( 2-1-1-3 ) | |
|---|---|
| Red | 1 . . 4 . . . . |
| Yellow | . . . . . |
| Force/Max | . . . . . |

| Phase Features ( 2-1-1-4 ) | |
|---|---|
| Double Entry | . . . . . |
| Rest In Walk | . . . . . |
| Rest In Red | . . . . . |
| Walk 2 | . . . . . |
| Max Green 2 | . . . . . |
| Max Green 3 | . . . . . |

| Startup ( 2-1-1-5 ) | |
|---|---|
| First Green Phases | . 2 . . . 6 . . |
| Yellow Start Phases | . . . . . |
| Vehicle Calls | 1 2 3 4 5 6 . . |
| Pedestrian Calls | . 2 . 4 . 6 . . |
| Yellow Start Overlaps | . . . . . |
| Startup All-Red | 6.0 |

| Call To Phase ( 2-1-2-1 ) | | Omit On Green | |
|---|---|---|---|
| 1 | . . . . . | 1 | . . . . . |
| 2 | . . . . . | 2 | . . . . . |
| 3 | . . . . . | 3 | . . . . . |
| 4 | . . . . . | 4 | . . . . . |
| 5 | . . . . . | 5 | . . . . . |
| 6 | . . . . . | 6 | . . . . . |
| 7 | . . . . . | 7 | . . . . . |
| 8 | . . . . . | 8 | . . . . . |

| Flashing Colors ( 2-1-2-2 ) | |
|---|---|
| Yellow Flash Phases | . . . . . |
| Yellow Flash Overlap | . . . . . |
| Flash In Red Phases | . . . . . |
| Flash In Red Overlap | . . . . . |

| Special Operation ( 2-1-2-3 ) | |
|---|---|
| Single Exit Phase | . . . . . |
| Driveway Signal Phases | . . . . . |
| Driveway Signal Overlaps | . . . . . |
| Leading Ped Phases | . . . . . |

| Protected Permissive ( 2-1-2-4 ) | |
|---|---|
| Protected Permissive | . . . . . |

| Pedestrian ( 2-1-3 ) | |
|---|---|
| P1 | . . . . . |
| P2 | . 2 . . . . . |
| P3 | . . . . . |
| P4 | . . . 4 . . . . |
| P5 | . . . . . |
| P6 | . . . . . 6 . . |
| P7 | . . . . . |
| P8 | . . . . . |

| Overlap ( 2-1-4 ) | | | | |
|---|---|---|---|---|
| Overlap | Parent | Omit | No Start | Not |
| A | . . . . . | . . . . . | . . . . . | . . . . . |
| B | . . . . . | . . . . . | . . . . . | . . . . . |
| C | . . . . . | . . . . . | . . . . . | . . . . . |
| D | . . . . . | . . . . . | . . . . . | . . . . . |
| E | . . . . . | . . . . . | . . . . . | . . . . . |
| F | . . . . . | . . . . . | . . . . . | . . . . . |

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## PHASE TIMING

| Phase ( 2-2 ) | -1- | -2- | -3- | -4- | -5- | -6- | -7- | -8- |
|---|---|---|---|---|---|---|---|---|
| --- Walk 1 --- | 0 | 7 | 0 | 7 | 0 | 7 | 0 | 10 |
| Flash Don't Walk | 0 | 10 | 0 | 14 | 0 | 11 | 0 | 10 |
| Minimum Green | 8 | 6 | 7 | 5 | 5 | 7 | 10 | 10 |
| Det Limit | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| Max Initial | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| Max Green 1 | 25 | 50 | 25 | 25 | 20 | 50 | 50 | 50 |
| Max Green 2 | 45 | 40 | 3 | 0 | 0 | 40 | 50 | 50 |
| Max Green 3 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| Extension | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 5.0 | 5.0 |
| Maximum Gap | 5.0 | 1.0 | 5.0 | 1.0 | 1.0 | 1.0 | 5.0 | 5.0 |
| Minimum Gap | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 5.0 | 5.0 |
| Add Per Vehicle | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 |
| Reduce Gap By | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Reduce Every | 0.5 | 1.0 | 0.5 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Yellow | 3.7 | 4.1 | 4.1 | 4.1 | 3.7 | 4.1 | 5.0 | 5.0 |
| All-Red | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 |
| **Ped/Bike (2-3 )** | **-1-** | **-2-** | **-3-** | **-4-** | **-5-** | **-6-** | **-7-** | **-8-** |
| --- Walk 2 --- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay/Early Walk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Solid Don't Walk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bike Green | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bike All-Red | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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### OVERLAP TIMING

| Overlap ( 2-4 ) | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| Green | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Yellow | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Red | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

### Red Revert

| Red Revert ( 2-5 ) | |
|---|---|
| Time | 5.0 |
| **All-Red Sec/Min ( 2-6 )** | |
| All-Red Sec/Min: | OFF |

### Max 2 Extension

| Max/Gap Out ( 2-7 ) | |
|---|---|
| Max Cnt | 0 |
| Gap Cnt | 0 |

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## Local Plan 1...9 (7-1) TIMING DATA

## COORDINATION

[ Offsets ] Green Factors or Press [F] to Select Force-Off

| | | Cycle | Multi | Lag Gap | A | B | C | -1- | -2- | -3- | -4- | -5- | -6- | -7- | -8- |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plan 1 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 2 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 3 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 4 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 5 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 6 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 7 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 8 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 9 | Green Factor | | | ..... | | | | | | | | | | | |

## Local Plan 1...9 (7-1) PHASE FLAGS

| | Lag | Sync | Hold | Omit | Veh Min | Veh Max | Ped | Bike |
|---|---|---|---|---|---|---|---|---|
| Plan 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 2 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 3 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 4 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 5 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 6 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 7 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 8 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 9 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

| Master Timer Sync ( 7-A ) | |
|---|---|
| Enable in Plans | |
| 1-9 | ..... |
| 11-19 | ..... |
| 21-29 | ..... |

| Master Sub Master | |
|---|---|
| Input | |
| Output | |

### FREE PLAN PHASE FLAGS

| ( 7-E ) Free | |
|---|---|
| Lag | Omit |
| . 2 3 . . 6 . 8 | ..... |
| Veh Min | Veh Max |
| . 2 . . . 6 . . | ..... |
| Ped | Bike |
| ..... | ..... |
| Cond | Cond Grn |
| ..... | 10 |

### MANUAL COMMANDS

| Manual Plan (4-1) | |
|---|---|
| Plan | OffSet |
| | A |

*Plan: 1-29*
*254 = Flash*
*255 = Free*
*Offset A, B, or C*

| Special Function Override (4-2) | | | |
|---|---|---|---|
| # | Control | # | Control |
| 1 | NORMAL | 3 | NORMAL |
| 2 | NORMAL | 4 | NORMAL |

| | |
|---|---|
| Detector Reset | (4-3) |
| Local Manual (4-4) | OFF |

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## Local Plan 11...19 (7-2) TIMING DATA

## COORDINATION

[ Offsets ] Green Factors or Press [F] to Select Force-Off

| | | Cycle | Multi | Lag Gap | A | B | C | -1- | -2- | -3- | -4- | -5- | -6- | -7- | -8- |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plan 11 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 12 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 13 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 14 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 15 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 16 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 17 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 18 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 19 | Green Factor | | | ..... | | | | | | | | | | | |

## Local Plan 11...19 (7-2) PHASE FLAGS

| | Lag | Sync | Hold | Omit | Veh Min | Veh Max | Ped | Bike |
|---|---|---|---|---|---|---|---|---|
| Plan 11 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 12 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 13 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 14 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 15 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 16 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 17 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 18 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 19 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

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## Local Plan 21...29 (7-3) TIMING DATA

## COORDINATION

[ Offsets ] Green Factors or Press [F] to Select Force-Off

| | | Cycle | Multi | Lag Gap | A | B | C | -1- | -2- | -3- | -4- | -5- | -6- | -7- | -8- |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plan 21 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 22 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 23 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 24 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 25 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 26 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 27 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 28 | Green Factor | | | ..... | | | | | | | | | | | |
| Plan 29 | Green Factor | | | ..... | | | | | | | | | | | |

## Local Plan 21...29 (7-3) PHASE FLAGS

| | Lag | Sync | Hold | Omit | Veh Min | Veh Max | Ped | Bike |
|---|---|---|---|---|---|---|---|---|
| Plan 21 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 22 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 23 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 24 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 25 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 26 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 27 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 28 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 29 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

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# TOD SCHEDULE

| Table 1 (8-2-1) | | |
|---|---|---|
| Time | Plan | OS |
| | | A |
| | | A |
| | | A |
| | | A |
| | | A |
| | | A |
| | | A |
| | | A |
| | | A |
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| | | A |
| | | A |
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| | | A |
| | | A |

| Table 2 (8-2-2) | | |
|---|---|---|
| Time | Plan | OS |
| | | A |
| | | A |
| | | A |
| | | A |
| | | A |
| | | A |
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| | | A |

| Table 3 (8-2-3) | | |
|---|---|---|
| Time | Plan | OS |
| | | A |
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| | | A |
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| | | A |
| | | A |
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| Table 4 (8-2-4) | | |
|---|---|---|
| Time | Plan | OS |
| | | A |
| | | A |
| | | A |
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| Table 5 (8-2-5) | | |
|---|---|---|
| Time | Plan | OS |
| | | A |
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| Table 6 (8-2-6) | | |
|---|---|---|
| Time | Plan | OS |
| | | A |
| | | A |
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| | | A |
| | | A |
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Do Not Reproduce

# WEEKDAY ASSIGNMENT

| Weekday Table Assignments (8-2-7) | | | | | | |
|---|---|---|---|---|---|---|
| Mon | Tue | Wed | Thu | Fri | Sat | Sun |
| 1 | 1 | 1 | 1 | 1 | 2 | 2 |

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## HOLIDAY TABLES

**Floating Holiday Table (8-2-8)**

| # | Mnth | Week | DOW | Table |
|---|---|---|---|---|
| 1 | | | . . . . . | |
| 2 | | | . . . . . | |
| 3 | | | . . . . . | |
| 4 | | | . . . . . | |
| 5 | | | . . . . . | |
| 6 | | | . . . . . | |
| 7 | | | . . . . . | |
| 8 | | | . . . . . | |
| 9 | | | . . . . . | |
| 10 | | | . . . . . | |
| 11 | | | . . . . . | |
| 12 | | | . . . . . | |
| 13 | | | . . . . . | |
| 14 | | | . . . . . | |
| 15 | | | . . . . . | |
| 16 | | | . . . . . | |

**Fixed Holiday Table (8-2-9)**

| # | Mnth | Day | DOW | Table |
|---|---|---|---|---|
| 1 | | | . . . . . | |
| 2 | | | . . . . . | |
| 3 | | | . . . . . | |
| 4 | | | . . . . . | |
| 5 | | | . . . . . | |
| 6 | | | . . . . . | |
| 7 | | | . . . . . | |
| 8 | | | . . . . . | |
| 9 | | | . . . . . | |
| 10 | | | . . . . . | |
| 11 | | | . . . . . | |
| 12 | | | . . . . . | |
| 13 | | | . . . . . | |
| 14 | | | . . . . . | |
| 15 | | | . . . . . | |
| 16 | | | . . . . . | |

**Daylight Saving (8-1)**

| Enabl | YES | Month | Sunday |
|---|---|---|---|
| | Start | MAR | 2nd |
| | End | NOV | 1st |

**Solar Clock Data (8-4)**

| | |
|---|---|
| North Latitude | 34 |
| West Longitude | 118 |
| Local Time Zone | 8 |

**Sabbatical Clock (8-5)**

| Hebrew | Ped Recall |
|---|---|
| Sabbath | . . . . . |
| Holiday | . . . . . |

## TOD FUNCTIONS

**TOD Functions (8-3)**

| # | Start | End | DOW | Action | Phases |
|---|---|---|---|---|---|
| 1 | 0700 | 0741 | M T W T F . . | 17 | 1 2 3 . . 6 . . |
| 2 | | | . . . . . | | . . . . . |
| 3 | | | . . . . . | | . . . . . |
| 4 | | | . . . . . | | . . . . . |
| 5 | | | . . . . . | | . . . . . |
| 6 | | | . . . . . | | . . . . . |
| 7 | | | . . . . . | | . . . . . |
| 8 | | | . . . . . | | . . . . . |
| 9 | | | . . . . . | | . . . . . |
| 10 | | | . . . . . | | . . . . . |
| 11 | | | . . . . . | | . . . . . |
| 12 | | | . . . . . | | . . . . . |
| 13 | | | . . . . . | | . . . . . |
| 14 | | | . . . . . | | . . . . . |
| 15 | | | . . . . . | | . . . . . |
| 16 | | | . . . . . | | . . . . . |

**Action Codes:**

0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11. Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting

100+Action Code = Phases removed

200+Action Code = Phases replaced

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# RAILROAD PREEMPTION

**RR 1**

| ( 3-1-1 ) | Timing | Phase Flags (3-1-2) | | | Pedestrian Flags (3-1-3) | | | Overlap Flags (3-1-4) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Delay | | Grn Hold | Yel Flash | Red Flash | Walk | Flash DW | Solid DW | Grn Hold | Yel Flash | Red Flash |
| Clear 1 | 10 | . 2 . . 5 . . . | . . . . . | . . . . . | . . . . . | . . . . . | . 2 . 4 . 6 . 8 | . . . . . | . . . . . | . . . . . |
| Clear 2 | | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . |
| Clear 3 | | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . |
| Hold | | . . . . . | . . . . . | 1 2 3 4 5 6 7 8 | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | A B C D E F |
| Exit | 5 | | | | | | | | | |
| Min Grn | | | | | | | | | | |
| Ped Clr | | | | | | | | | | |

**Exit Parameters (3-1-5)**

| Phase Green | Overlap Green | Vehicle Call | Ped Call |
|---|---|---|---|
| . . . . . | . . . . . | 1 2 3 4 5 6 7 8 | . 2 . 4 . 6 . 8 |

**Configuration (3-1-6)**

| PR 1 | PR 2 | Latching | Power-Up |
|---|---|---|---|
| 2.5 | 0.0 | YES | FLASHING |

**RR 2**

| ( 3-2-1 ) | Timing | Phase Flags (3-2-2) | | | Pedestrian Flags (3-2-3) | | | Overlap Flags (3-2-4) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Delay | | Grn Hold | Yel Flash | Red Flash | Walk | Flash DW | Solid DW | Grn Hold | Yel Flash | Red Flash |
| Clear 1 | 10 | . . . 4 . . 7 . | . . . . . | . . . . . | . . . . . | . . . . . | . 2 . 4 . 6 . 8 | . . . . . | . . . . . | . . . . . |
| Clear 2 | | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . |
| Clear 3 | | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . . . . |
| Hold | | 1 2 3 . . 6 . . | . . . . . | . . . . . | . 2 . . 6 . . | . . . . . | . . . 4 . . . 8 | . . . . . | . . . . . | . . . . . |
| Exit | | | | | | | | | | |
| Min Grn | | | | | | | | | | |
| Ped Clr | | | | | | | | | | |

**Exit Parameters (3-2-5)**

| Phase Green | Overlap Green | Vehicle Call | Ped Call |
|---|---|---|---|
| . . . . . | . . . . . | . . . 4 . . 7 . | . . . . . |

**Configuration (3-2-6)**

| PR 1 | PR 2 | Latching | Power-up |
|---|---|---|---|
| 2.6 | 0.0 | YES | DARK |

# EMERGENCY VEHICLE PREEMPTION

**EVA (3-A)**

| Preempt Timers | | | Phase Green | Overlap Green |
|---|---|---|---|---|
| Delay | Clear | Max | | |
| | 5 | 255 | 2 . . 5 . . . | . . . . . |

| Port | Latching | Phase Termination |
|---|---|---|
| 5.5 | NO | ADVANCE |

**EVB (3-B)**

| Preempt Timers | | | Phase Green | Overlap Green |
|---|---|---|---|---|
| Delay | Clear | Max | | |
| | 5 | 255 | . . . 4 . . . . | . . . . . |

| Port | Latching | Phase Termination |
|---|---|---|
| 5.6 | NO | ADVANCE |

**EVC (3-C)**

| Preempt Timers | | | Phase Green | Overlap Green |
|---|---|---|---|---|
| Delay | Clear | Max | | |
| | 5 | 255 | 1 . . . . 6 . . | . . . . . |

| Port | Latching | Phase Termination |
|---|---|---|
| 5.7 | NO | ADVANCE |

**EVD (3-D)**

| Preempt Timers | | | Phase Green | Overlap Green |
|---|---|---|---|---|
| Delay | Clear | Max | | |
| | 30 | 30 | . . 3 . . . . 8 | . . . . . |

| Port | Latching | Phase Termination |
|---|---|---|
| 5.8 | NO | ADVANCE |

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# INPUTS

| | | 7 Wire I/C ( 2-1-5-1 ) | | | |
|---|---|---|---|---|---|
| | | Input | Port | Input | Port |
| Enable | NO | R1 | 3.8 | Free | 3.6 |
| Max ON | | R2 | 3.5 | D2 | 2.8 |
| Max OFF | | R3 | 3.7 | D3 | 6.1 |

| Manual Control ( 2-1-5-2 ) | |
|---|---|
| Input | Port |
| Manual Advance | |
| Advance Enable | |

| Cabinet Status ( 2-1-5-3 ) | |
|---|---|
| Input | Port |
| Flash Bus | |
| Door Ajar | |
| Flash Sense | 6.7 |
| Stop Time | 6.8 |

| Special Function (2-1-5-4) | |
|---|---|
| Input | Port |
| 1 | |
| 2 | |
| 3 | |
| 4 | |

| Battery Backup ( 2-1-5-5 ) | |
|---|---|
| Port | Operation |
| 2.7 | FLASHING |

| Y-Coordination ( 2-1-5-6 ) | |
|---|---|
| Port C | Port D |
| 6.1 | 2.8 |

# OUTPUTS

| Loadswitch Assignments ( 2-1-6 ) | | | | | | | + |
|---|---|---|---|---|---|---|---|
| A | 1 | 2 | 22 | 3 | 4 | 24 | 9 |
| B | 5 | 6 | 26 | 7 | 8 | 28 | 10 |
| X | 13 | 14 | 0 | 11 | 12 | 0 | 0 |

**Loadswitch Codes:**

0 Unused (no output)
1-8 Vehicle 1-8
9-14 Overlap A-F
21-28 Ped 1-8
41-47 Special Functions
41 Protected Permissive Flashing Phase 1
43 Protected Permissive Flashing Phase 3
45 Protected Permissive Flashing Phase 5
47 Protected Permissive Flashing Phase 7
51-57 Special Functions
71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6 Channel 9 and 10

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## TRANSIT PRIORITY

| Local Plans (3-E) 1...9 11...19 | | Early Green | Green Extend | Inhibit Cycles | Phase 1 Minimum | Phase 2 Minimum | Phase 3 Minimum | Phase 4 Minimum | Phase 5 Minimum | Phase 6 Minimum | Phase 7 Minimum | Phase 8 Minimum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plan 1 | Green Factor | | | | | | | | | | | |
| Plan 2 | Green Factor | | | | | | | | | | | |
| Plan 3 | Green Factor | | | | | | | | | | | |
| Plan 4 | Green Factor | | | | | | | | | | | |
| Plan 5 | Green Factor | | | | | | | | | | | |
| Plan 6 | Green Factor | | | | | | | | | | | |
| Plan 7 | Green Factor | | | | | | | | | | | |
| Plan 8 | Green Factor | | | | | | | | | | | |
| Plan 9 | Green Factor | | | | | | | | | | | |
| Plan 11 | Green Factor | | | | | | | | | | | |
| Plan 12 | Green Factor | | | | | | | | | | | |
| Plan 13 | Green Factor | | | | | | | | | | | |
| Plan 14 | Green Factor | | | | | | | | | | | |
| Plan 15 | Green Factor | | | | | | | | | | | |
| Plan 16 | Green Factor | | | | | | | | | | | |
| Plan 17 | Green Factor | | | | | | | | | | | |
| Plan 18 | Green Factor | | | | | | | | | | | |
| Plan 19 | Green Factor | | | | | | | | | | | |

| Transit Priority Configuration (3-E-A) | | | | Indicator Output | |
|---|---|---|---|---|---|
| Enable in Plans | | Input | Type | Stop | Go |
| Plan 1-9 | . . . . . | 0.0 | NONE | 0 | 0 |
| Plan 11-19 | . . . . . | 0.0 | NONE | 0 | 0 |

| Queue Jump (3-E-B) | |
|---|---|
| Grn Hold | Hold Phase |
| | . . . . . |
| | . . . . . |

| Free Plans (3-E-E) | |
|---|---|
| Max Grn Hold | Hold Phase |
| | . . . . . |

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## YELLOW YIELD COORDINATION

| | | | | | Force-Offs | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y-Coord Plans (7-C,D) | Long Grn | No Grn | Offset | Perm | -1- | -2- | -3- | -4- | -5- | -6- | -7- | -8- | Coord | Lag | Min Recall | Restricted |
| Plan C | | | | | | | | | | | | | . 2 . . . 6 . . | . 2 . 4 . 6 . 8 | . . . . . | . . . . . |
| Plan D | | | | | | | | | | | | | . 2 . . . 6 . . | . 2 . 4 . 6 . 8 | . . . . . | . . . . . |

## TRUCK PRIORITY

| Truck Priority (3-F) | Passage | CarryOver | Clearance | Next Priority | Phase Green | Det 2 Port | Det 3 Port | Det 4 Port | Sign Output | Slave Input | Slave Output |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | . . . . . | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0 |

# Appendix D
# Bus Route Schedules

# 303

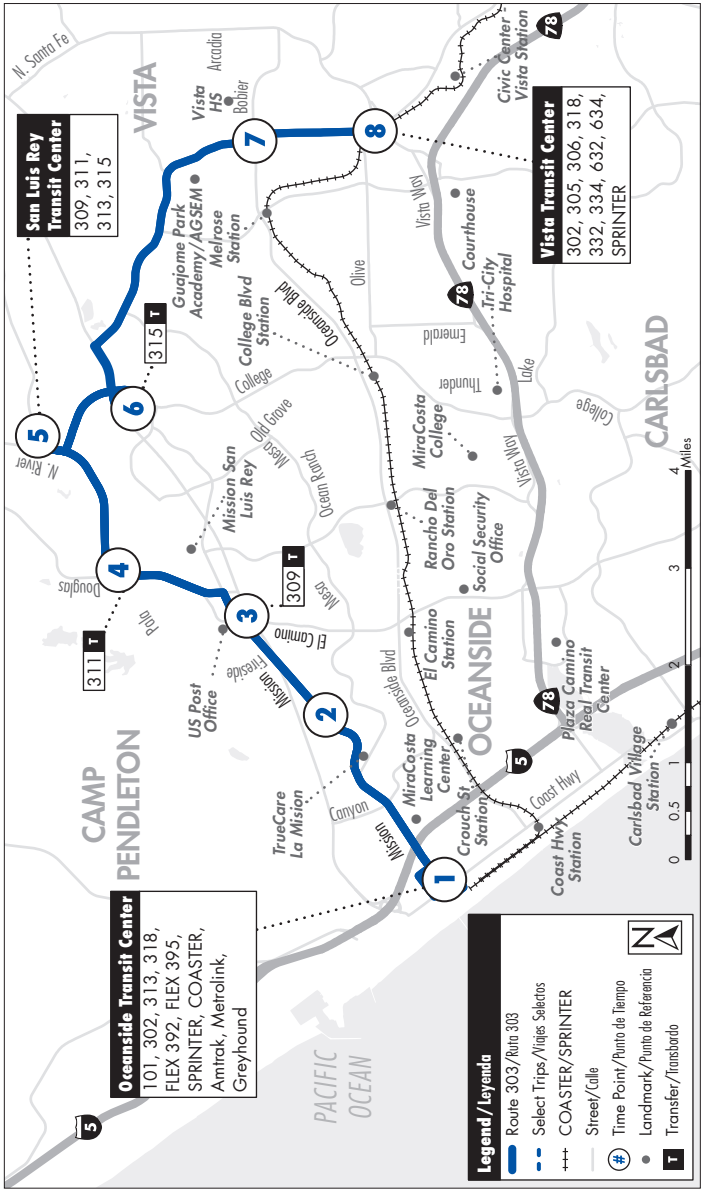
## Oceanside to Vista via Town Center North

Oceanside a Vista vía Town Center North

**M-F • SA • SU**
**L-V • SÁ • DO**

**Destinations/Destinos**

- TrueCare La Mision
- MiraCosta College Learning Center
- Vista High School
- Antique Gas & Steam Engine Museum (AGSEM)
- Jefferson Middle School
- Oceanside High School
- Vista Community Clinic



# 303 Oceanside to Vista via Town Center North

Oceanside a Vista vía Town Center North

**Monday - Friday**
**Eastbound to Vista**
*Lunes a Viernes • Dirección hacia el este a Vista*

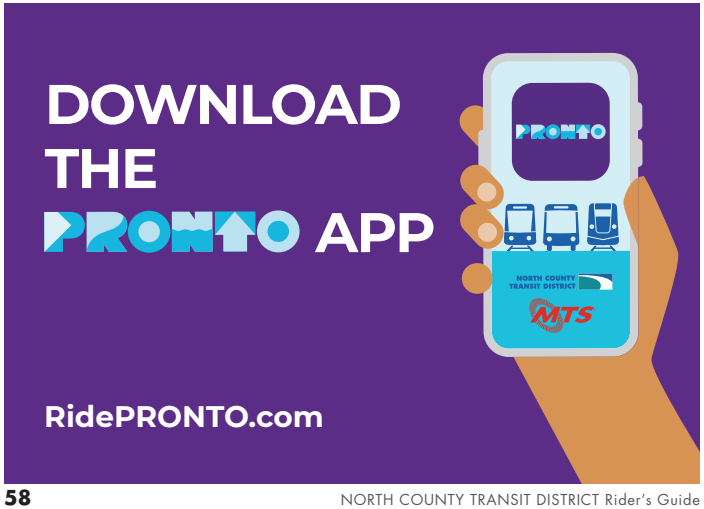
| Oceanside Transit Center | Mission Ave. & Airport Rd. | Mission Ave. & El Camino Real | Douglas Dr. & N. River Rd. | San Luis Rey Transit Center | Town Center North | N. Santa Fe & Bobier Dr. | Vista Transit Center |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 4:05a | 4:14a | 4:18a | 4:22a | 4:28a | 4:34a | 4:43a | 4:51a |
| 4:35a | 4:44a | 4:48a | 4:52a | 4:58a | 5:04a | 5:13a | 5:21a |
| 5:00a | 5:10a | 5:14a | 5:18a | 5:25a | 5:32a | 5:43a | 5:51a |
| 5:30a | 5:40a | 5:44a | 5:48a | 5:55a | 6:02a | 6:13a | 6:21a |
| 5:56a | 6:07a | 6:11a | 6:15a | 6:22a | 6:31a | 6:42a | 6:51a |
| 6:14a | 6:25a | 6:29a | 6:34a | 6:41a | 6:50a | 7:02a | 7:11a |
| 6:29a | 6:42a | 6:48a | 6:53a | 7:01a | 7:10a | 7:23a | 7:31a |
| 6:46a | 6:57a | 7:03a | 7:08a | 7:16a | 7:25a | 7:40a | 7:51a |
| 7:04a | 7:17a | 7:23a | 7:28a | 7:36a | 7:45a | 8:00a | 8:11a |
| 7:24a | 7:37a | 7:43a | 7:48a | 7:56a | 8:05a | 8:20a | 8:31a |
| 7:49a | 8:02a | 8:08a | 8:13a | 8:21a | 8:30a | 8:43a | 8:51a |
| 8:10a | 8:23a | 8:29a | 8:34a | 8:42a | 8:51a | 9:03a | 9:11a |
| 8:30a | 8:43a | 8:49a | 8:54a | 9:02a | 9:11a | 9:23a | 9:31a |
| 8:50a | 9:03a | 9:09a | 9:14a | 9:22a | 9:31a | 9:43a | 9:51a |
| 9:10a | 9:23a | 9:29a | 9:34a | 9:42a | 9:51a | 10:03a | 10:11a |
| 9:30a | 9:43a | 9:49a | 9:54a | 10:02a | 10:11a | 10:23a | 10:31a |
| 9:50a | 10:03a | 10:09a | 10:14a | 10:22a | 10:31a | 10:43a | 10:51a |
| 10:09a | 10:22a | 10:28a | 10:33a | 10:41a | 10:51a | 11:03a | 11:11a |
| 10:29a | 10:42a | 10:48a | 10:53a | 11:01a | 11:11a | 11:23a | 11:31a |
| 10:49a | 11:02a | 11:08a | 11:13a | 11:21a | 11:31a | 11:43a | 11:51a |
| 11:08a | 11:22a | 11:28a | 11:33a | 11:41a | 11:51a | **12:03p** | **12:11p** |
| 11:27a | 11:41a | 11:47a | 11:53a | **12:01p** | **12:11p** | **12:23p** | **12:31p** |
| 11:45a | 11:59p | **12:06p** | **12:12p** | **12:21p** | **12:31p** | **12:43p** | **12:51p** |
| **12:05p** | **12:19p** | **12:26p** | **12:32p** | **12:41p** | **12:51p** | **1:03p** | **1:11p** |
| **12:25p** | **12:39p** | **12:46p** | **12:52p** | **1:01p** | **1:11p** | **1:23p** | **1:31p** |
| **12:45p** | **12:59p** | **1:06p** | **1:12p** | **1:21p** | **1:31p** | **1:43p** | **1:51p** |
| **1:03p** | **1:17p** | **1:24p** | **1:31p** | **1:40p** | **1:50p** | **2:02p** | **2:11p** |
| **1:23p** | **1:37p** | **1:44p** | **1:51p** | **2:00p** | **2:10p** | **2:22p** | **2:31p** |
| **1:39p** | **1:54p** | **2:01p** | **2:08p** | **2:17p** | **2:27p** | **2:40p** | **2:51p** |
| **1:56p** | **2:11p** | **2:18p** | **2:25p** | **2:34p** | **2:45p** | **3:00p** | **3:11p** |
| **2:14p** | **2:30p** | **2:37p** | **2:45p** | **2:54p** | **3:05p** | **3:20p** | **3:31p** |
| **2:33p** | **2:49p** | **2:56p** | **3:04p** | **3:13p** | **3:25p** | **3:40p** | **3:51p** |
| **2:52p** | **3:08p** | **3:15p** | **3:23p** | **3:32p** | **3:45p** | **4:00p** | **4:11p** |
| **3:12p** | **3:28p** | **3:35p** | **3:43p** | **3:52p** | **4:05p** | **4:20p** | **4:31p** |
| **3:31p** | **3:48p** | **3:55p** | **4:03p** | **4:12p** | **4:25p** | **4:40p** | **4:51p** |
| **3:51p** | **4:08p** | **4:15p** | **4:23p** | **4:32p** | **4:45p** | **5:00p** | **5:11p** |
| **4:16p** | **4:31p** | **4:38p** | **4:46p** | **4:55p** | **5:08p** | **5:22p** | **5:31p** |
| **4:36p** | **4:51p** | **4:58p** | **5:06p** | **5:15p** | **5:28p** | **5:42p** | **5:51p** |

# 303 Oceanside to Vista via Town Center North

Oceanside a Vista vía Town Center North

**Monday - Friday**
**Eastbound to Vista**
*Lunes a Viernes • Dirección hacia el este a Vista*

| Oceanside Transit Center | Mission Ave. & Airport Rd. | Mission Ave. & El Camino Real | Douglas Dr. & N. River Rd. | San Luis Rey Transit Center | Town Center North | N. Santa Fe & Bobier Dr. | Vista Transit Center |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 4:56p | 5:11p | 5:18p | 5:26p | 5:35p | 5:48p | 6:02p | 6:11p |
| 5:18p | 5:33p | 5:40p | 5:48p | 5:57p | 6:09p | 6:22p | 6:31p |
| 5:41p | 5:56p | 6:03p | 6:11p | 6:20p | 6:31p | 6:42p | 6:51p |
| 6:04p | 6:19p | 6:26p | 6:32p | 6:41p | 6:52p | 7:03p | 7:11p |
| 6:24p | 6:39p | 6:46p | 6:52p | 7:01p | 7:12p | 7:23p | 7:31p |
| 6:47p | 7:01p | 7:08p | 7:14p | 7:22p | 7:32p | 7:43p | 7:51p |
| 7:10p | 7:23p | 7:29p | 7:35p | 7:43p | 7:52p | 8:03p | 8:11p |
| 7:32p | 7:45p | 7:51p | 7:56p | 8:04p | 8:13p | 8:24p | 8:31p |
| 7:52p | 8:05p | 8:11p | 8:16p | 8:24p | 8:33p | 8:44p | 8:51p |
| 8:25p | 8:38p | 8:44p | 8:49p | 8:56p | 9:03p | – | – |
| 9:00p | 9:12p | 9:17p | 9:22p | 9:28p | 9:35p | 9:45p | 9:51p |
| 9:31p | 9:43p | 9:48p | 9:52p | 9:58p | 10:05p | – | – |
| 10:02p | 10:14p | 10:19p | 10:23p | 10:29p | 10:36p | 10:45p | 10:51p |
| 10:39p | 10:49p | 10:52p | 10:56p | 11:01p | 11:07p | 11:15p | 11:21p |
| 11:09p | 11:19p | 11:22p | 11:26p | 11:31p | 11:37p | 11:45p | 11:51p |
| 11:39p | 11:49p | 11:52p | 11:56p | 12:01a | 12:07a | – | – |

# 303 Oceanside to Vista via Town Center North

Oceanside a Vista vía Town Center North

**Monday - Friday**
**Westbound to Oceanside**
*Lunes a Viernes • Dirección hacia el oeste a Oceanside*

| Vista Transit Center | N. Santa Fe & Bobier Dr. | Town Center North | San Luis Rey Transit Center | Douglas Dr. & N. River Rd. | Mission Ave. & El Camino Real | Mission Ave. & Airport Rd. | Oceanside Transit Center |
|---|---|---|---|---|---|---|---|
| **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** |
| – | – | 4:05a | 4:13a | 4:21a | 4:26a | 4:33a | 4:43a |
| 5:06a | 5:11a | 5:22a | 5:30a | 5:38a | 5:43a | 5:50a | 6:00a |
| 5:36a | 5:41a | 5:52a | 6:00a | 6:08a | 6:15a | 6:22a | 6:32a |
| 6:06a | 6:12a | 6:24a | 6:33a | 6:41a | 6:48a | 6:55a | 7:07a |
| 6:35a | 6:41a | 6:54a | 7:03a | 7:11a | 7:18a | 7:26a | 7:40a |
| 6:55a | 7:01a | 7:16a | 7:25a | 7:33a | 7:40a | 7:48a | 8:02a |
| 7:15a | 7:22a | 7:39a | 7:48a | 7:56a | 8:03a | 8:11a | 8:25a |
| 7:35a | 7:42a | 7:59a | 8:08a | 8:16a | 8:23a | 8:31a | 8:45a |
| 7:55a | 8:02a | 8:17a | 8:26a | 8:34a | 8:41a | 8:49a | 9:03a |
| 8:15a | 8:22a | 8:35a | 8:42a | 8:50a | 8:57a | 9:04a | 9:17a |
| 8:35a | 8:41a | 8:54a | 9:01a | 9:09a | 9:15a | 9:22a | 9:35a |
| 8:55a | 9:01a | 9:14a | 9:21a | 9:29a | 9:35a | 9:42a | 9:55a |
| 9:15a | 9:21a | 9:34a | 9:41a | 9:49a | 9:55a | 10:02a | 10:15a |
| 9:35a | 9:41a | 9:54a | 10:01a | 10:09a | 10:15a | 10:22a | 10:35a |
| 9:55a | 10:01a | 10:14a | 10:21a | 10:29a | 10:35a | 10:42a | 10:55a |
| 10:15a | 10:21a | 10:34a | 10:43a | 10:51a | 10:57a | 11:04a | 11:17a |
| 10:35a | 10:41a | 10:54a | 11:03a | 11:11a | 11:17a | 11:24a | 11:37a |
| 10:55a | 11:01a | 11:14a | 11:23a | 11:31a | 11:37a | 11:44a | 11:57a |
| 11:15a | 11:21a | 11:34a | 11:43a | 11:51a | 11:57a | **12:04p** | **12:18p** |
| 11:35a | 11:41a | 11:54a | **12:03p** | **12:11p** | **12:17p** | **12:24** | **12:38** |
| 11:55a | **12:01p** | **12:14p** | **12:23** | **12:31** | **12:37** | **12:44** | **12:58** |
| **12:15p** | **12:21p** | **12:34p** | **12:43p** | **12:52p** | **12:58p** | **1:05p** | **1:19p** |
| **12:35p** | **12:41p** | **12:54p** | **1:03p** | **1:12p** | **1:18p** | **1:25p** | **1:39p** |
| **12:55p** | **1:01p** | **1:14p** | **1:23p** | **1:32p** | **1:38p** | **1:45p** | **1:59p** |
| **1:15p** | **1:22p** | **1:35p** | **1:44p** | **1:53p** | **2:00p** | **2:07p** | **2:19p** |
| **1:35p** | **1:42p** | **1:55p** | **2:04p** | **2:13p** | **2:20p** | **2:27p** | **2:39p** |
| **1:55p** | **2:02p** | **2:15p** | **2:24p** | **2:33p** | **2:40p** | **2:47p** | **2:59p** |
| **2:15p** | **2:22p** | **2:36p** | **2:46p** | **2:55p** | **3:02p** | **3:09p** | **3:22p** |
| **2:35p** | **2:44p** | **3:02p** | **3:12p** | **3:21p** | **3:29p** | **3:37p** | **3:50p** |
| **2:55p** | **3:03p** | **3:21p** | **3:31p** | **3:40p** | **3:47p** | **3:55p** | **4:08p** |
| **3:15p** | **3:23p** | **3:41p** | **3:51p** | **4:00p** | **4:07p** | **4:15p** | **4:28p** |
| **3:35p** | **3:43p** | **4:01p** | **4:11p** | **4:20p** | **4:27p** | **4:34p** | **4:47p** |
| **3:55p** | **4:03p** | **4:21p** | **4:31p** | **4:40p** | **4:47p** | **4:54p** | **5:07p** |
| **4:15p** | **4:23p** | **4:41p** | **4:51p** | **5:00p** | **5:07p** | **5:13p** | **5:26p** |
| **4:35p** | **4:43p** | **5:01p** | **5:11p** | **5:20p** | **5:27p** | **5:33p** | **5:46p** |
| **4:55p** | **5:03p** | **5:21p** | **5:31p** | **5:40p** | **5:47p** | **5:53p** | **6:06p** |
| **5:15p** | **5:23p** | **5:41p** | **5:51p** | **6:00p** | **6:06p** | **6:12p** | **6:24p** |

# 303 Oceanside to Vista via Town Center North

Oceanside a Vista vía Town Center North

**Monday - Friday**
**Westbound to Oceanside**
*Lunes a Viernes • Dirección hacia el oeste a Oceanside*

| Vista Transit Center | N. Santa Fe & Bobier Dr. | Town Center North | San Luis Rey Transit Center | Douglas Dr. & N. River Rd. | Mission Ave. & El Camino Real | Mission Ave. & Airport Rd. | Oceanside Transit Center |
|---|---|---|---|---|---|---|---|
| **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** |
| 5:35p | 5:43p | 6:00p | 6:10p | 6:19p | 6:25p | 6:31p | 6:42p |
| 5:55p | 6:03p | 6:20p | 6:28p | 6:37p | 6:43p | 6:49p | 7:00p |
| 6:15p | 6:22p | 6:37p | 6:45p | 6:53p | 6:59p | 7:05p | 7:17p |
| 6:35p | 6:42p | 6:56p | 7:04p | 7:12p | 7:18p | 7:24p | 7:36p |
| 6:55p | 7:02p | 7:16p | 7:24p | 7:32p | 7:37p | 7:43p | 7:55p |
| 7:15p | 7:22p | 7:36p | 7:43p | 7:51p | 7:56p | 8:02p | 8:14p |
| 7:36p | 7:43p | 7:57p | 8:04p | 8:12p | 8:17p | 8:23p | 8:35p |
| 8:06p | 8:13p | 8:25p | 8:32p | 8:40p | 8:45p | 8:50p | 9:00p |
| 8:36p | 8:43p | 8:55p | 9:02p | 9:10p | 9:15p | 9:20p | 9:30p |
| 9:06p | 9:12p | 9:24p | 9:31p | 9:37p | 9:42p | 9:47p | 9:57p |
| 10:08p | 10:13p | 10:24p | 10:30p | 10:36p | 10:41p | 10:46p | 10:55p |

# 303 Oceanside to Vista via Town Center North

Oceanside a Vista vía Town Center North

**Saturday & Sunday**
**Eastbound to Vista**
*Sábado y Domingo • Dirección hacia el este a Vista*

| Oceanside Transit Center | Mission Ave. & Airport Rd. | Mission Ave. & El Camino Real | Douglas Dr. & N. River Rd. | San Luis Rey Transit Center | Town Center North | N. Santa Fe & Bobier Dr. | Vista Transit Center |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 4:33a | 4:40a | 4:44a | 4:47a | 4:53a | 4:59a | – | – |
| 5:07a | 5:15a | 5:19a | 5:22a | 5:28a | 5:34a | 5:44a | 5:51a |
| 5:34a | 5:42a | 5:46a | 5:51a | 5:57a | 6:04a | 6:14a | 6:21a |
| 6:03a | 6:12a | 6:16a | 6:21a | 6:27a | 6:34a | 6:44a | 6:51a |
| 6:31a | 6:40a | 6:44a | 6:49a | 6:57a | 7:04a | 7:14a | 7:21a |
| 6:58a | 7:07a | 7:11a | 7:17a | 7:25a | 7:32a | 7:43a | 7:51a |
| 7:25a | 7:35a | 7:39a | 7:46a | 7:54a | 8:02a | 8:13a | 8:21a |
| 7:55a | 8:05a | 8:09a | 8:16a | 8:24a | 8:32a | 8:43a | 8:51a |
| 8:15a | 8:25a | 8:29a | 8:36a | 8:44a | 8:52a | 9:03a | 9:11a |
| 8:32a | 8:43a | 8:49a | 8:56a | 9:04a | 9:12a | 9:23a | 9:31a |
| 8:52a | 9:03a | 9:09a | 9:16a | 9:24a | 9:32a | 9:43a | 9:51a |
| 9:11a | 9:22a | 9:28a | 9:35a | 9:43a | 9:52a | 10:03a | 10:11a |
| 9:31a | 9:42a | 9:48a | 9:55a | 10:03a | 10:12a | 10:23a | 10:31a |
| 9:51a | 10:02a | 10:08a | 10:15a | 10:23a | 10:32a | 10:43a | 10:51a |
| 10:07a | 10:18a | 10:25a | 10:33a | 10:42a | 10:52a | 11:03a | 11:11a |
| 10:26a | 10:37a | 10:44a | 10:52a | 11:01a | 11:11a | 11:22a | 11:31a |
| 10:45a | 10:56a | 11:04a | 11:12a | 11:21a | 11:31a | 11:42a | 11:51a |
| 11:02a | 11:13a | 11:21a | 11:29a | 11:40a | 11:51a | **12:02p** | **12:11p** |
| 11:22a | 11:33a | 11:41a | 11:49a | **12:00p** | **12:11p** | **12:22** | **12:31** |
| 11:42a | 11:53a | **12:01p** | **12:09p** | **12:20** | **12:31** | **12:42** | **12:51** |
| **12:02p** | **12:13p** | **12:21p** | **12:29p** | **12:40p** | **12:51p** | **1:02p** | **1:11p** |
| **12:22p** | **12:33p** | **12:41p** | **12:49p** | **1:00p** | **1:11p** | **1:22p** | **1:31p** |
| **12:39p** | **12:51p** | **1:00p** | **1:08p** | **1:19p** | **1:30p** | **1:42p** | **1:51p** |
| **12:59p** | **1:11p** | **1:20p** | **1:28p** | **1:39p** | **1:50p** | **2:02p** | **2:11p** |
| **1:19p** | **1:31p** | **1:40p** | **1:48p** | **1:59p** | **2:10p** | **2:22p** | **2:31p** |
| **1:39p** | **1:51p** | **2:00p** | **2:08p** | **2:19p** | **2:30p** | **2:42p** | **2:51p** |
| **1:59p** | **2:11p** | **2:20p** | **2:28p** | **2:39p** | **2:50p** | **3:02p** | **3:11p** |
| **2:20p** | **2:32p** | **2:40p** | **2:48p** | **2:59p** | **3:10p** | **3:22p** | **3:31p** |
| **2:40p** | **2:52p** | **3:00p** | **3:08p** | **3:19p** | **3:30p** | **3:42p** | **3:51p** |
| **3:00p** | **3:12p** | **3:20p** | **3:28p** | **3:39p** | **3:50p** | **4:02p** | **4:11p** |
| **3:20p** | **3:32p** | **3:40p** | **3:48p** | **3:59p** | **4:10p** | **4:22p** | **4:31p** |
| **3:40p** | **3:52p** | **4:00p** | **4:08p** | **4:19p** | **4:30p** | **4:42p** | **4:51p** |
| **4:12p** | **4:24p** | **4:32p** | **4:40p** | **4:51p** | **5:01p** | **5:12p** | **5:21p** |
| **4:43p** | **4:55p** | **5:02p** | **5:10p** | **5:21p** | **5:31p** | **5:42p** | **5:51p** |
| **5:14p** | **5:26p** | **5:33p** | **5:41p** | **5:52p** | **6:02p** | **6:13p** | **6:21p** |
| **5:44p** | **5:56p** | **6:03p** | **6:11p** | **6:22p** | **6:32p** | **6:43p** | **6:51p** |
| **6:15p** | **6:27p** | **6:34p** | **6:41p** | **6:52p** | **7:02p** | **7:13p** | **7:21p** |

# 303 Oceanside to Vista via Town Center North

Oceanside a Vista vía Town Center North

**Saturday & Sunday**
**Eastbound to Vista**
*Sábado y Domingo • Dirección hacia el este a Vista*

| Oceanside Transit Center | Mission Ave. & Airport Rd. | Mission Ave. & El Camino Real | Douglas Dr. & N. River Rd. | San Luis Rey Transit Center | Town Center North | N. Santa Fe & Bobier Dr. | Vista Transit Center |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 6:46p | 6:58p | 7:04p | 7:11p | 7:22p | 7:32p | 7:43p | 7:51p |
| 7:21p | 7:32p | 7:37p | 7:44p | 7:55p | 8:04p | – | – |
| 7:50p | 8:01p | 8:06p | 8:13p | 8:24p | 8:33p | 8:44p | 8:51p |
| 8:25p | 8:36p | 8:41p | 8:48p | 8:56p | 9:04p | – | – |
| 8:58p | 9:08p | 9:13p | 9:19p | 9:26p | 9:34p | 9:44p | 9:51p |
| 9:32p | 9:41p | 9:46p | 9:51p | 9:58p | 10:05p | – | – |
| 10:01p | 10:10p | 10:15p | 10:20p | 10:27p | 10:34p | 10:44p | 10:51p |
| 10:34p | 10:42p | 10:46p | 10:51p | 10:58p | 11:04p | – | – |
| 11:04p | 11:11p | 11:15p | 11:20p | 11:27p | 11:33p | – | – |
| 11:35p | 11:42p | 11:46p | 11:51p | 11:58p | 12:04a | – | – |

# 303 Oceanside to Vista via Town Center North

Oceanside a Vista vía Town Center North

**Saturday & Sunday**
**Westbound to Oceanside**
*Sábado y Domingo • Dirección hacia el oeste a Oceanside*

| Vista Transit Center | N. Santa Fe & Bobier Dr. | Town Center North | San Luis Rey Transit Center | Douglas Dr. & N. River Rd. | Mission Ave. & El Camino Real | Mission Ave. & Airport Rd. | Oceanside Transit Center |
|---|---|---|---|---|---|---|---|
| **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** |
| 6:06a | 6:11a | 6:22a | 6:30a | 6:38a | 6:43a | 6:50a | 7:00a |
| 6:36a | 6:41a | 6:53a | 7:01a | 7:09a | 7:14a | 7:21a | 7:31a |
| 7:06a | 7:12a | 7:24a | 7:32a | 7:40a | 7:45a | 7:52a | 8:04a |
| 7:36a | 7:42a | 7:54a | 8:02a | 8:10a | 8:15a | 8:22a | 8:34a |
| 7:55a | 8:01a | 8:13a | 8:21a | 8:29a | 8:34a | 8:41a | 8:53a |
| 8:15a | 8:21a | 8:33a | 8:41a | 8:49a | 8:55a | 9:02a | 9:14a |
| 8:35a | 8:41a | 8:53a | 9:01a | 9:09a | 9:15a | 9:22a | 9:34a |
| 8:55a | 9:01a | 9:13a | 9:21a | 9:29a | 9:35a | 9:42a | 9:55a |
| 9:15a | 9:21a | 9:34a | 9:42a | 9:50a | 9:57a | 10:04a | 10:17a |
| 9:35a | 9:41a | 9:54a | 10:02a | 10:10a | 10:17a | 10:24a | 10:37a |
| 9:55a | 10:01a | 10:14a | 10:22a | 10:30a | 10:38a | 10:45a | 10:58a |
| 10:15a | 10:21a | 10:35a | 10:43a | 10:52a | 11:00a | 11:07a | 11:20a |
| 10:35a | 10:41a | 10:55a | 11:03a | 11:12a | 11:20a | 11:27a | 11:40a |
| 10:55a | 11:01a | 11:15a | 11:23a | 11:32a | 11:40a | 11:47a | **12:00p** |
| 11:15a | 11:21a | 11:35a | 11:43a | 11:52a | **12:00p** | **12:07p** | **12:20** |
| 11:35a | 11:41a | 11:55a | **12:03p** | **12:12p** | **12:20** | **12:27** | **12:40** |
| 11:55a | **12:01p** | **12:15p** | **12:23** | **12:32** | **12:40** | **12:47** | **1:00** |
| **12:15p** | **12:21p** | **12:36p** | **12:44p** | **12:53p** | **1:01p** | **1:08p** | **1:21p** |
| **12:35p** | **12:41p** | **12:56p** | **1:04p** | **1:13p** | **1:21p** | **1:28p** | **1:41p** |
| **12:55p** | **1:01p** | **1:16p** | **1:24p** | **1:33p** | **1:41p** | **1:48p** | **2:01p** |
| **1:15p** | **1:21p** | **1:36p** | **1:44p** | **1:52p** | **2:00p** | **2:07p** | **2:20p** |
| **1:35p** | **1:41p** | **1:56p** | **2:04p** | **2:12p** | **2:20p** | **2:27p** | **2:40p** |
| **1:55p** | **2:01p** | **2:16p** | **2:24p** | **2:32p** | **2:40p** | **2:47p** | **3:00p** |
| **2:15p** | **2:21p** | **2:36p** | **2:44p** | **2:52p** | **3:00p** | **3:07p** | **3:20p** |
| **2:35p** | **2:41p** | **2:56p** | **3:04p** | **3:12p** | **3:20p** | **3:27p** | **3:40p** |
| **2:55p** | **3:01p** | **3:16p** | **3:24p** | **3:32p** | **3:40p** | **3:47p** | **4:00p** |
| **3:15p** | **3:21p** | **3:36p** | **3:44p** | **3:52p** | **4:00p** | **4:07p** | **4:20p** |
| **3:35p** | **3:41p** | **3:56p** | **4:04p** | **4:12p** | **4:20p** | **4:27p** | **4:40p** |
| **3:55p** | **4:01p** | **4:16p** | **4:24p** | **4:32p** | **4:40p** | **4:47p** | **5:00p** |
| **4:15p** | **4:21p** | **4:36p** | **4:44p** | **4:52p** | **5:00p** | **5:07p** | **5:20p** |
| **4:36p** | **4:42p** | **4:57p** | **5:05p** | **5:13p** | **5:21p** | **5:28p** | **5:41p** |
| **5:06p** | **5:13p** | **5:28p** | **5:36p** | **5:44p** | **5:51p** | **5:58p** | **6:11p** |
| **5:36p** | **5:43p** | **5:58p** | **6:06p** | **6:14p** | **6:21p** | **6:28p** | **6:41p** |
| **6:06p** | **6:12p** | **6:27p** | **6:35p** | **6:43p** | **6:49p** | **6:56p** | **7:08p** |
| **6:36p** | **6:42p** | **6:55p** | **7:03p** | **7:11p** | **7:17p** | **7:24p** | **7:36p** |
| **7:06p** | **7:12p** | **7:25p** | **7:33p** | **7:41p** | **7:47p** | **7:53p** | **8:05p** |
| **7:36p** | **7:42p** | **7:55p** | **8:03p** | **8:11p** | **8:17p** | **8:23p** | **8:35p** |

# 303 Oceanside to Vista via Town Center North

Oceanside a Vista vía Town Center North

**Saturday & Sunday**
**Westbound to Oceanside**
*Sábado y Domingo • Dirección hacia el oeste a Oceanside*

| Vista Transit Center | N. Santa Fe & Bobier Dr. | Town Center North | San Luis Rey Transit Center | Douglas Dr. & N. River Rd. | Mission Ave. & El Camino Real | Mission Ave. & Airport Rd. | Oceanside Transit Center |
|---|---|---|---|---|---|---|---|
| **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** |
| 8:06p | 8:12p | 8:25p | 8:33p | 8:41p | 8:47p | 8:53p | 9:05p |
| 9:06p | 9:12p | 9:23p | 9:31p | 9:38p | 9:43p | 9:48p | 9:59p |
| 10:06p | 10:11p | 10:22p | 10:30p | 10:36p | 10:41p | 10:46p | 10:55p |

# 313

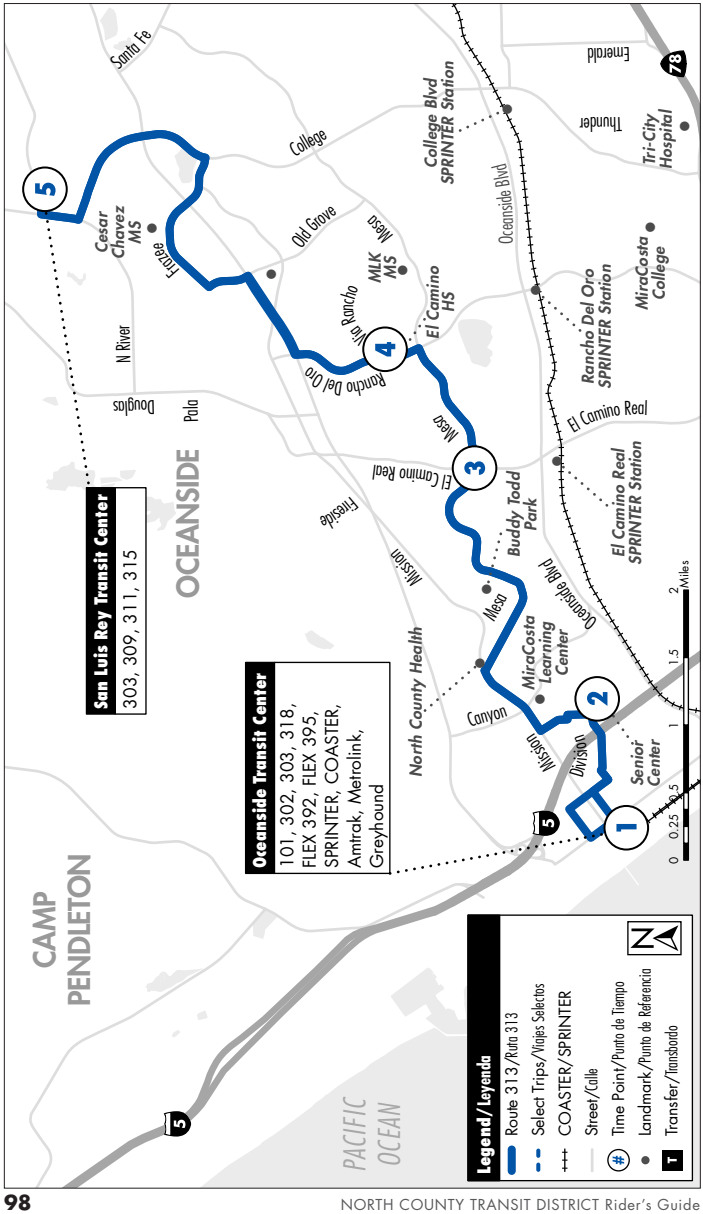
## Oceanside Transit Center to San Luis Rey Transit Center via Mesa Dr.

Centro de Tránsito Oceanside al Centro de Tránsito San Luis Rey vía Mesa Dr.

**M-F**
L-V

**Destinations/Destinos**

- Oceanside Pier & Beach
- El Camino High School
- Jefferson Middle School
- Mission San Luis Rey
- Buddy Todd Park
- Ivey Ranch Park
- Oceanside Senior Center
- Boys and Girls Club



# 313 Oceanside Transit Center to San Luis Rey Transit Center via Mesa Dr.

Centro de Tránsito Oceanside al Centro de Tránsito San Luis Rey vía Mesa Dr.

**Monday - Friday**
**Eastbound to San Luis Rey Transit Center**
*Lunes a Viernes • Dirección hacia el este al Centro de Tránsito San Luis Rey*

| Oceanside Transit Center | Division St. & Country Club Ln. | Mesa Dr. & El Camino Real | Rancho Del Oro & Via Rancho Rd. | San Luis Rey Transit Center |
|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** |
| 6:33a | 6:38a | 6:47a | 6:50a | 7:09a |
| 7:33a | 7:38a | 7:52a | 7:57a | 8:16a |
| 8:36a | 8:41a | 8:51a | 8:54a | 9:13a |
| 9:33a | 9:38a | 9:48a | 9:51a | 10:10a |
| 10:33a | 10:38a | 10:48a | 10:51a | 11:11a |
| 11:33a | 11:38a | 11:50a | 11:54a | **12:14p** |
| **12:33p** | **12:38p** | **12:50p** | **12:54p** | **1:14p** |
| **1:33p** | **1:38p** | **1:50p** | **1:54p** | **2:17p** |
| **2:33p** | **2:39p** | **2:52p** | **2:57p** | **3:23p** |
| – | – | – | ***3:00** | ***3:25** |
| – | – | – | ****3:30** | ****3:54** |
| **3:33p** | **3:39p** | **3:52p** | **3:57p** | **4:21p** |
| **4:33p** | **4:39p** | **4:52p** | **4:56p** | **5:20p** |
| **5:33p** | **5:38p** | **5:50p** | **5:54p** | **6:15p** |
| **6:33p** | **6:38p** | **6:50p** | **6:54p** | **7:15p** |

* **Operates Wednesday only.**
Opera solamente los Miércoles.

** **Operates Monday, Tuesday, Thursday, and Friday.**
Opera Lunes, Martes, Jueves y Viernes.

**Route 313 does not operate on Saturdays, Sundays, or holidays.**
La Ruta 313 no opera los sábados, domingos o en días festivos.

**Please note, BREEZE "school tripper" bus service only runs while El Camino High School is in session and is subject to change based on bell times. NCTD will update trip planning applications and GoNCTD.com if this service changes.**

Tenga en cuenta que el servicio de autobús "school tripper" de BREEZE solo opera mientras El Camino High School se encuentre abierta y está sujeto a cambios en función de los horarios de entrada y salida. NCTD actualizará las aplicaciones de planificación de viaje y GoNCTD.com si este servicio cambia.

# 313 Oceanside Transit Center to San Luis Rey Transit Center via Mesa Dr.

Centro de Tránsito Oceanside al Centro de Tránsito San Luis Rey vía Mesa Dr.

**Monday - Friday**
**Westbound to Oceanside Transit Center**
*Lunes a Viernes • Dirección hacia el oeste al Centro de Tránsito Oceanside*

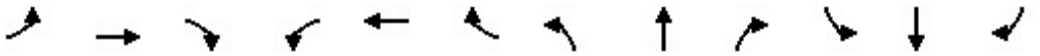
| San Luis Rey Transit Center | Rancho Del Oro & Via Rancho Rd. | Mesa Dr. & El Camino Real | Division St. & Country Club Ln. | Oceanside Transit Center |
|---|---|---|---|---|
| **5** | **4** | **3** | **2** | **1** |
| 5:48a | 6:01a | 6:04a | 6:14a | 6:23a |
| 6:43a | 6:57a | 7:00a | 7:11a | 7:20a |
| 7:43a | 8:07a | 8:10a | 8:23a | 8:33a |
| 7:46a | 8:10a | – | – | – |
| 8:46a | 9:00a | 9:03a | 9:15a | 9:25a |
| 9:44a | 9:58a | 10:01a | 10:13a | 10:23a |
| 10:44a | 10:58a | 11:01a | 11:13a | 11:23a |
| 11:44a | 11:58a | **12:01p** | **12:13p** | **12:23p** |
| **12:40p** | **12:56p** | **12:59p** | **1:11p** | **1:22p** |
| **1:38p** | **1:54p** | **1:57p** | **2:09p** | **2:20p** |
| **2:40p** | **2:57p** | **3:01p** | **3:14p** | **3:27p** |
| **3:37p** | **3:56p** | **4:00p** | **4:14p** | **4:27p** |
| **4:40p** | **4:58p** | **5:01p** | **5:13p** | **5:24p** |
| **5:37p** | **5:55p** | **5:58p** | **6:11p** | **6:22p** |

**Route 313 does not operate on Saturdays, Sundays, or holidays.**
La Ruta 313 no opera los sábados, domingos o en días festivos.

**Please note, BREEZE "school tripper" bus service only runs while El Camino High School is in session and is subject to change based on bell times. NCTD will update trip planning applications and GoNCTD.com if this service changes.**

Tenga en cuenta que el servicio de autobús "school tripper" de BREEZE solo funciona mientras El Camino High School se encuentre abierta y está sujeto a cambios en función de los horarios de entrada y salida. NCTD actualizará las aplicaciones de planificación de viaje y GoNCTD.com si este servicio cambia.

# Appendix E
# Synchro Calculation Worksheets
# Existing Conditions



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 36 | 347 | 15 | 3 | 10 | 0 | 0 | 16 | 9 |
| Future Volume (veh/h) | 0 | 0 | 0 | 36 | 347 | 15 | 3 | 10 | 0 | 0 | 16 | 9 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.99 | 0.97 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 43 | 413 | 17 | 4 | 12 | 0 | 0 | 19 | 10 |
| Peak Hour Factor | | | | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 153 | 1545 | 67 | 215 | 203 | 0 | 0 | 156 | 82 |
| Arrive On Green | | | | 0.48 | 0.48 | 0.48 | 0.14 | 0.14 | 0.00 | 0.00 | 0.14 | 0.14 |
| Sat Flow, veh/h | | | | 319 | 3211 | 138 | 276 | 1469 | 0 | 0 | 1129 | 594 |
| Grp Volume(v), veh/h | | | | 248 | 0 | 225 | 16 | 0 | 0 | 0 | 0 | 29 |
| Grp Sat Flow(s),veh/h/ln | | | | 1840 | 0 | 1828 | 1745 | 0 | 0 | 0 | 0 | 1723 |
| Q Serve(g_s), s | | | | 2.1 | 0.0 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 |
| Cycle Q Clear(g_c), s | | | | 2.1 | 0.0 | 1.9 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 |
| Prop In Lane | | | | 0.17 | | 0.08 | 0.25 | | 0.00 | 0.00 | | 0.34 |
| Lane Grp Cap(c), veh/h | | | | 885 | 0 | 880 | 418 | 0 | 0 | 0 | 0 | 238 |
| V/C Ratio(X) | | | | 0.28 | 0.00 | 0.26 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 |
| Avail Cap(c_a), veh/h | | | | 2907 | 0 | 2889 | 1507 | 0 | 0 | 0 | 0 | 1351 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 4.0 | 0.0 | 3.9 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 9.6 |
| Incr Delay (d2), s/veh | | | | 0.2 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 0.3 | 0.0 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 4.1 | 0.0 | 4.1 | 9.6 | 0.0 | 0.0 | 0.0 | 0.0 | 9.9 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 473 | | | 16 | | | 29 | |
| Approach Delay, s/veh | | | | | 4.1 | | | 9.6 | | | 9.9 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | 4 | 6 | 8 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.1 | 17.4 | 8.1 |
| Change Period (Y+Rc), s | 4.6 | 5.1 | 4.6 |
| Max Green Setting (Gmax), s | 20.0 | 40.3 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 2.4 | 4.1 | 2.2 |
| Green Ext Time (p_c), s | 0.1 | 3.3 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 4.6 |
| HCM 6th LOS | A |

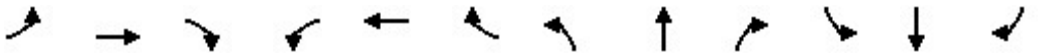
| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 438 | 17 | 0 | 0 | 121 | 0 | 0 | 4 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 438 | 17 | 0 | 0 | 121 | 0 | 0 | 4 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 487 | 19 | 0 | 0 | 134 | 0 | 0 | 4 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 264 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 731 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 723 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 10 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 723 |
| HCM Lane V/C Ratio | - | - | 0.006 |
| HCM Control Delay (s) | - | - | 10 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 11 | 102 | 4 | 183 | 440 | 224 | 17 | 30 | 256 | 193 | 46 | 9 |
| Future Volume (veh/h) | 11 | 102 | 4 | 183 | 440 | 224 | 17 | 30 | 256 | 193 | 46 | 9 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.90 | 1.00 | | 0.97 | 1.00 | | 0.97 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 12 | 111 | 4 | 199 | 478 | 195 | 18 | 33 | 224 | 135 | 155 | 10 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 207 | 730 | 26 | 415 | 1159 | 736 | 115 | 211 | 274 | 262 | 256 | 16 |
| Arrive On Green | 0.12 | 0.21 | 0.21 | 0.23 | 0.33 | 0.33 | 0.18 | 0.18 | 0.18 | 0.15 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1767 | 3456 | 124 | 1767 | 3526 | 1527 | 644 | 1180 | 1531 | 1767 | 1721 | 111 |
| Grp Volume(v), veh/h | 12 | 56 | 59 | 199 | 478 | 195 | 51 | 0 | 224 | 135 | 0 | 165 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1817 | 1767 | 1763 | 1527 | 1823 | 0 | 1531 | 1767 | 0 | 1832 |
| Q Serve(g_s), s | 0.5 | 2.2 | 2.2 | 8.3 | 9.0 | 6.5 | 2.0 | 0.0 | 12.0 | 6.0 | 0.0 | 7.2 |
| Cycle Q Clear(g_c), s | 0.5 | 2.2 | 2.2 | 8.3 | 9.0 | 6.5 | 2.0 | 0.0 | 12.0 | 6.0 | 0.0 | 7.2 |
| Prop In Lane | 1.00 | | 0.07 | 1.00 | | 1.00 | 0.35 | | 1.00 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 207 | 373 | 384 | 415 | 1159 | 736 | 326 | 0 | 274 | 262 | 0 | 272 |
| V/C Ratio(X) | 0.06 | 0.15 | 0.15 | 0.48 | 0.41 | 0.27 | 0.16 | 0.00 | 0.82 | 0.51 | 0.00 | 0.61 |
| Avail Cap(c_a), veh/h | 311 | 828 | 853 | 622 | 2277 | 1220 | 428 | 0 | 359 | 720 | 0 | 746 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.4 | 27.4 | 27.4 | 28.1 | 22.2 | 13.3 | 29.5 | 0.0 | 33.6 | 33.4 | 0.0 | 33.9 |
| Incr Delay (d2), s/veh | 0.1 | 0.3 | 0.3 | 0.6 | 0.9 | 0.7 | 0.3 | 0.0 | 12.3 | 2.2 | 0.0 | 3.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 1.0 | 1.0 | 3.5 | 3.8 | 3.1 | 0.9 | 0.0 | 5.3 | 2.7 | 0.0 | 3.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 33.5 | 27.6 | 27.6 | 28.7 | 23.1 | 14.0 | 29.9 | 0.0 | 46.0 | 35.6 | 0.0 | 37.0 |
| LnGrp LOS | C | C | C | C | C | B | C | A | D | D | A | D |
| Approach Vol, veh/h | | 127 | | | 872 | | | 275 | | | 300 | |
| Approach Delay, s/veh | | 28.2 | | | 22.3 | | | 43.0 | | | 36.4 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 33.4 | | 19.8 | 24.7 | 23.4 | | 17.2 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.5 | 11.0 | | 14.0 | 10.3 | 4.2 | | 9.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 12.4 | | 0.8 | 0.4 | 1.0 | | 2.1 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 6th Ctrl Delay | | 29.1 | |
| HCM 6th LOS | | C | |

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 530 | 16 | 227 | 829 | 683 | 32 | 0 | 222 | 110 | 87 | 60 |
| Future Volume (veh/h) | 0 | 530 | 16 | 227 | 829 | 683 | 32 | 0 | 222 | 110 | 87 | 60 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.88 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 564 | 17 | 241 | 882 | 0 | 34 | 0 | 213 | 105 | 110 | 51 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 750 | 23 | 293 | 1730 | | 0 | 0 | 0 | 320 | 335 | 251 |
| Arrive On Green | 0.00 | 0.22 | 0.22 | 0.17 | 0.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.25 | 0.25 |
| Sat Flow, veh/h | 0 | 3443 | 101 | 1710 | 3410 | 1521 | | 0 | | 1266 | 1329 | 993 |
| Grp Volume(v), veh/h | 0 | 284 | 297 | 241 | 882 | 0 | | 0.0 | | 105 | 110 | 51 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1763 | 1710 | 1705 | 1521 | | | | 1266 | 1329 | 993 |
| Q Serve(g_s), s | 0.0 | 8.0 | 8.0 | 6.9 | 8.7 | 0.0 | | | | 3.4 | 3.4 | 2.1 |
| Cycle Q Clear(g_c), s | 0.0 | 8.0 | 8.0 | 6.9 | 8.7 | 0.0 | | | | 3.4 | 3.4 | 2.1 |
| Prop In Lane | 0.00 | | 0.06 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 378 | 394 | 293 | 1730 | | | | | 320 | 335 | 251 |
| V/C Ratio(X) | 0.00 | 0.75 | 0.75 | 0.82 | 0.51 | | | | | 0.33 | 0.33 | 0.20 |
| Avail Cap(c_a), veh/h | 0 | 1334 | 1390 | 1516 | 6095 | | | | | 624 | 655 | 489 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 18.4 | 18.4 | 20.3 | 8.3 | 0.0 | | | | 15.5 | 15.5 | 15.0 |
| Incr Delay (d2), s/veh | 0.0 | 1.1 | 1.1 | 2.2 | 0.1 | 0.0 | | | | 0.2 | 0.2 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 3.0 | 3.1 | 2.6 | 2.3 | 0.0 | | | | 0.9 | 1.0 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 19.5 | 19.5 | 22.5 | 8.4 | 0.0 | | | | 15.7 | 15.7 | 15.1 |
| LnGrp LOS | A | B | B | C | A | | | | | B | B | B |
| Approach Vol, veh/h | | 581 | | | 1123 | | | | | | 266 | |
| Approach Delay, s/veh | | 19.5 | | | 11.4 | | | | | | 15.6 | |
| Approach LOS | | B | | | B | | | | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.4 | 17.4 | | 18.9 | | 31.8 | | | |
| Change Period (Y+Rc), s* | 5.7 | 6.1 | | 6.1 | | 6.1 | | | |
| Max Green Setting (Gmax), s | 8.5 | 40.0 | | 25.0 | | 90.7 | | | |
| Max Q Clear Time (g_c+I1), s | 8.9 | 10.0 | | 5.4 | | 10.7 | | | |
| Green Ext Time (p_c), s | 0.1 | 1.4 | | 0.3 | | 2.4 | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 14.4 |
| HCM 6th LOS | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 99 | 401 | 0 | 0 | 1205 | 195 | 0 | 0 | 450 | 0 | 0 | 534 |
| Future Vol, veh/h | 99 | 401 | 0 | 0 | 1205 | 195 | 0 | 0 | 450 | 0 | 0 | 534 |
| Conflicting Peds, #/hr | 20 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 103 | 418 | 0 | 0 | 1255 | 203 | 0 | 0 | 469 | 0 | 0 | 556 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1478 | 0 | - | - | - | 0 | - | - | 209 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 447 | - | 0 | 0 | - | - | 0 | 0 | 794 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 447 | - | - | - | - | - | - | - | 794 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 3.1 | 0 | 15.9 | 0 |
| HCM LOS | | | C | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 794 | 447 | - | - | - | - |
| HCM Lane V/C Ratio | 0.59 | 0.231 | - | - | - | - |
| HCM Control Delay (s) | 15.9 | 15.5 | - | - | - | 0 |
| HCM Lane LOS | C | C | - | - | - | A |
| HCM 95th %tile Q(veh) | 3.9 | 0.9 | - | - | - | - |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.1 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 7 | 158 | 10 | 0 | 0 | 0 | 0 | 8 | 11 | 15 | 34 | 0 |
| Future Vol, veh/h | 7 | 158 | 10 | 0 | 0 | 0 | 0 | 8 | 11 | 15 | 34 | 0 |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 9 | 200 | 13 | 0 | 0 | 0 | 0 | 10 | 14 | 19 | 43 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 8.2 | 7.3 | 8 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 8% | 0% | 31% |
| Vol Thru, % | 42% | 92% | 89% | 69% |
| Vol Right, % | 58% | 0% | 11% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 19 | 86 | 89 | 49 |
| LT Vol | 0 | 7 | 0 | 15 |
| Through Vol | 8 | 79 | 79 | 34 |
| RT Vol | 11 | 0 | 10 | 0 |
| Lane Flow Rate | 24 | 109 | 113 | 62 |
| Geometry Grp | 2 | 7 | 7 | 2 |
| Degree of Util (X) | 0.028 | 0.143 | 0.145 | 0.079 |
| Departure Headway (Hd) | 4.195 | 4.74 | 4.621 | 4.559 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 858 | 751 | 771 | 790 |
| Service Time | 2.198 | 2.5 | 2.381 | 2.56 |
| HCM Lane V/C Ratio | 0.028 | 0.145 | 0.147 | 0.078 |
| HCM Control Delay | 7.3 | 8.3 | 8.2 | 8 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.5 | 0.5 | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.4 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 50 | 138 | 9 | 22 | 0 | 44 | 0 | 18 | 20 | 0 | 0 | 0 |
| Future Vol, veh/h | 50 | 138 | 9 | 22 | 0 | 44 | 0 | 18 | 20 | 0 | 0 | 0 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 64 | 177 | 12 | 28 | 0 | 56 | 0 | 23 | 26 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 8.8 | 7.5 | 7.7 |
| HCM LOS | A | A | A |

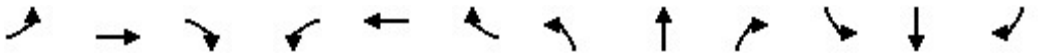
| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 33% |
| Vol Thru, % | 47% | 0% | 94% | 0% |
| Vol Right, % | 53% | 0% | 6% | 67% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 38 | 50 | 147 | 66 |
| LT Vol | 0 | 50 | 0 | 22 |
| Through Vol | 18 | 0 | 138 | 0 |
| RT Vol | 20 | 0 | 9 | 44 |
| Lane Flow Rate | 49 | 64 | 188 | 85 |
| Geometry Grp | 2 | 7 | 7 | 5 |
| Degree of Util (X) | 0.06 | 0.092 | 0.243 | 0.096 |
| Departure Headway (Hd) | 4.399 | 5.18 | 4.636 | 4.094 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 818 | 690 | 771 | 879 |
| Service Time | 2.403 | 2.927 | 2.383 | 2.101 |
| HCM Lane V/C Ratio | 0.06 | 0.093 | 0.244 | 0.097 |
| HCM Control Delay | 7.7 | 8.5 | 8.9 | 7.5 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.2 | 0.3 | 1 | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.7 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 112 | 1 | 28 | 0 | 0 | 0 | 8 | 178 | 0 | 1 | 138 | 59 |
| Future Vol, veh/h | 112 | 1 | 28 | 0 | 0 | 0 | 8 | 178 | 0 | 1 | 138 | 59 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 138 | 1 | 35 | 0 | 0 | 0 | 10 | 220 | 0 | 1 | 170 | 73 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 9.8 | 0 | 9.7 | 9.5 |
| HCM LOS | A | - | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 4% | 79% | 0% | 1% |
| Vol Thru, % | 96% | 1% | 100% | 70% |
| Vol Right, % | 0% | 20% | 0% | 30% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 186 | 141 | 0 | 198 |
| LT Vol | 8 | 112 | 0 | 1 |
| Through Vol | 178 | 1 | 0 | 138 |
| RT Vol | 0 | 28 | 0 | 59 |
| Lane Flow Rate | 230 | 174 | 0 | 244 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.299 | 0.244 | 0 | 0.305 |
| Departure Headway (Hd) | 4.685 | 5.056 | 5.288 | 4.493 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 765 | 707 | 0 | 797 |
| Service Time | 2.727 | 3.109 | 3.361 | 2.534 |
| HCM Lane V/C Ratio | 0.301 | 0.246 | 0 | 0.306 |
| HCM Control Delay | 9.7 | 9.8 | 8.4 | 9.5 |
| HCM Lane LOS | A | A | N | A |
| HCM 95th-tile Q | 1.3 | 1 | 0 | 1.3 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 46 | 384 | 32 | 11 | 36 | 0 | 0 | 29 | 22 |
| Future Volume (veh/h) | 0 | 0 | 0 | 46 | 384 | 32 | 11 | 36 | 0 | 0 | 29 | 22 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.94 | 0.97 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 47 | 392 | 30 | 11 | 37 | 0 | 0 | 30 | 21 |
| Peak Hour Factor | | | | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 158 | 1375 | 110 | 193 | 339 | 0 | 0 | 214 | 150 |
| Arrive On Green | | | | 0.45 | 0.45 | 0.45 | 0.21 | 0.21 | 0.00 | 0.00 | 0.21 | 0.21 |
| Sat Flow, veh/h | | | | 349 | 3040 | 243 | 190 | 1583 | 0 | 0 | 998 | 699 |
| Grp Volume(v), veh/h | | | | 248 | 0 | 221 | 48 | 0 | 0 | 0 | 0 | 51 |
| Grp Sat Flow(s),veh/h/ln | | | | 1838 | 0 | 1794 | 1774 | 0 | 0 | 0 | 0 | 1697 |
| Q Serve(g_s), s | | | | 2.5 | 0.0 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Cycle Q Clear(g_c), s | | | | 2.5 | 0.0 | 2.2 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Prop In Lane | | | | 0.19 | | 0.14 | 0.23 | | 0.00 | 0.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | | | | 831 | 0 | 811 | 532 | 0 | 0 | 0 | 0 | 364 |
| V/C Ratio(X) | | | | 0.30 | 0.00 | 0.27 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 |
| Avail Cap(c_a), veh/h | | | | 2546 | 0 | 2485 | 1332 | 0 | 0 | 0 | 0 | 1167 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 5.0 | 0.0 | 5.0 | 9.2 | 0.0 | 0.0 | 0.0 | 0.0 | 9.3 |
| Incr Delay (d2), s/veh | | | | 0.2 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 0.5 | 0.0 | 0.5 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 5.2 | 0.0 | 5.2 | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 | 9.4 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 469 | | | 48 | | | 51 | |
| Approach Delay, s/veh | | | | | 5.2 | | | 9.3 | | | 9.4 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | | | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | | | 10.8 | | 18.3 | | 10.8 | | | | |
| Change Period (Y+Rc), s | | | | 4.6 | | 5.1 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | | | | 20.0 | | 40.3 | | 20.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | | 2.7 | | 4.5 | | 2.6 | | | | |
| Green Ext Time (p_c), s | | | | 0.2 | | 3.3 | | 0.1 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | 5.9 | |
| HCM 6th LOS | A | |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 469 | 10 | 0 | 0 | 119 | 0 | 0 | 3 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 469 | 10 | 0 | 0 | 119 | 0 | 0 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 7 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 494 | 11 | 0 | 0 | 125 | 0 | 0 | 3 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 272 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 723 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 710 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 10.1 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 710 |
| HCM Lane V/C Ratio | - | - | 0.004 |
| HCM Control Delay (s) | - | - | 10.1 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 9 | 116 | 1 | 146 | 469 | 249 | 17 | 46 | 331 | 447 | 34 | 15 |
| Future Volume (veh/h) | 9 | 116 | 1 | 146 | 469 | 249 | 17 | 46 | 331 | 447 | 34 | 15 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.91 | 1.00 | | 0.96 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 10 | 126 | 1 | 159 | 510 | 191 | 18 | 50 | 252 | 526 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 189 | 690 | 5 | 378 | 1057 | 764 | 92 | 255 | 290 | 698 | 367 | 0 |
| Arrive On Green | 0.11 | 0.19 | 0.19 | 0.21 | 0.30 | 0.30 | 0.19 | 0.19 | 0.19 | 0.20 | 0.00 | 0.00 |
| Sat Flow, veh/h | 1767 | 3582 | 28 | 1767 | 3526 | 1512 | 485 | 1347 | 1535 | 3534 | 1856 | 0 |
| Grp Volume(v), veh/h | 10 | 62 | 65 | 159 | 510 | 191 | 68 | 0 | 252 | 526 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1847 | 1767 | 1763 | 1512 | 1831 | 0 | 1535 | 1767 | 1856 | 0 |
| Q Serve(g_s), s | 0.5 | 2.7 | 2.8 | 7.3 | 11.1 | 6.8 | 2.9 | 0.0 | 14.9 | 13.1 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.5 | 2.7 | 2.8 | 7.3 | 11.1 | 6.8 | 2.9 | 0.0 | 14.9 | 13.1 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 0.26 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 189 | 340 | 356 | 378 | 1057 | 764 | 346 | 0 | 290 | 698 | 367 | 0 |
| V/C Ratio(X) | 0.05 | 0.18 | 0.18 | 0.42 | 0.48 | 0.25 | 0.20 | 0.00 | 0.87 | 0.75 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 284 | 755 | 791 | 567 | 2076 | 1201 | 392 | 0 | 329 | 1313 | 689 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 37.5 | 31.6 | 31.6 | 31.7 | 26.8 | 13.5 | 31.9 | 0.0 | 36.8 | 35.3 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.4 | 0.3 | 0.6 | 1.2 | 0.6 | 0.4 | 0.0 | 20.6 | 2.4 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 1.2 | 1.3 | 3.2 | 4.8 | 3.5 | 1.3 | 0.0 | 7.2 | 5.8 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 37.5 | 31.9 | 31.9 | 32.3 | 28.0 | 14.1 | 32.3 | 0.0 | 57.4 | 37.7 | 0.0 | 0.0 |
| LnGrp LOS | D | C | C | C | C | B | C | A | E | D | A | A |
| Approach Vol, veh/h | | 137 | | | 860 | | | 320 | | | 526 | |
| Approach Delay, s/veh | | 32.3 | | | 25.7 | | | 52.0 | | | 37.7 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 33.4 | | 22.3 | 24.7 | 23.4 | | 23.1 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.5 | 13.1 | | 16.9 | 9.3 | 4.8 | | 15.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 13.0 | | 0.6 | 0.3 | 1.1 | | 3.0 | | | | |

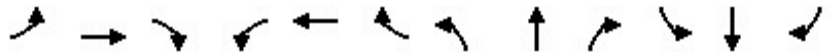
| Intersection Summary | | | |
|---|---|---|---|
| HCM 6th Ctrl Delay | | 34.2 | |
| HCM 6th LOS | | C | |

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 901 | 11 | 76 | 875 | 488 | 13 | 0 | 64 | 119 | 10 | 100 |
| Future Volume (veh/h) | 0 | 901 | 11 | 76 | 875 | 488 | 13 | 0 | 64 | 119 | 10 | 100 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 969 | 12 | 82 | 941 | 0 | 14 | 0 | 45 | 136 | 0 | 95 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 1210 | 15 | 192 | 2005 | | 0 | 0 | 0 | 382 | 0 | 163 |
| Arrive On Green | 0.00 | 0.35 | 0.35 | 0.11 | 0.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.15 |
| Sat Flow, veh/h | 0 | 3513 | 42 | 1710 | 3410 | 1521 | | 0 | | 2532 | 0 | 1081 |
| Grp Volume(v), veh/h | 0 | 479 | 502 | 82 | 941 | 0 | | 0.0 | | 136 | 0 | 95 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1774 | 1710 | 1705 | 1521 | | | | 1266 | 0 | 1081 |
| Q Serve(g_s), s | 0.0 | 11.9 | 11.9 | 2.1 | 7.3 | 0.0 | | | | 2.2 | 0.0 | 3.8 |
| Cycle Q Clear(g_c), s | 0.0 | 11.9 | 11.9 | 2.1 | 7.3 | 0.0 | | | | 2.2 | 0.0 | 3.8 |
| Prop In Lane | 0.00 | | 0.02 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 598 | 627 | 192 | 2005 | | | | | 382 | 0 | 163 |
| V/C Ratio(X) | 0.00 | 0.80 | 0.80 | 0.43 | 0.47 | | | | | 0.36 | 0.00 | 0.58 |
| Avail Cap(c_a), veh/h | 0 | 1813 | 1900 | 916 | 5898 | | | | | 1356 | 0 | 579 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 13.6 | 13.6 | 19.3 | 5.5 | 0.0 | | | | 17.8 | 0.0 | 18.5 |
| Incr Delay (d2), s/veh | 0.0 | 1.0 | 0.9 | 0.6 | 0.1 | 0.0 | | | | 0.2 | 0.0 | 1.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 4.0 | 4.2 | 0.8 | 1.5 | 0.0 | | | | 0.6 | 0.0 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 14.6 | 14.5 | 19.9 | 5.5 | 0.0 | | | | 18.0 | 0.0 | 19.7 |
| LnGrp LOS | A | B | B | B | A | | | | | B | A | B |
| Approach Vol, veh/h | | 981 | | | 1023 | | | | | | 231 | |
| Approach Delay, s/veh | | 14.5 | | | 6.7 | | | | | | 18.7 | |
| Approach LOS | | B | | | A | | | | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.9 | 22.6 | | 13.1 | | 33.5 |
| Change Period (Y+Rc), s* | 5.7 | 6.1 | | 6.1 | | 6.1 |
| Max Green Setting (Gmax), s | 5.2 | 50.0 | | 25.0 | | 80.7 |
| Max Q Clear Time (g_c+I1), s | 4.1 | 13.9 | | 5.8 | | 9.3 |
| Green Ext Time (p_c), s | 0.0 | 2.6 | | 0.2 | | 2.6 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 11.4 |
| HCM 6th LOS | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 27.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 88 | 602 | 0 | 0 | 848 | 100 | 0 | 0 | 700 | 0 | 0 | 591 |
| Future Vol, veh/h | 88 | 602 | 0 | 0 | 848 | 100 | 0 | 0 | 700 | 0 | 0 | 591 |
| Conflicting Peds, #/hr | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 94 | 640 | 0 | 0 | 902 | 106 | 0 | 0 | 745 | 0 | 0 | 629 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1013 | 0 | - | - | - | 0 | - | - | 320 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 674 | - | 0 | 0 | - | - | 0 | 0 | ~ 673 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 674 | - | - | - | - | - | - | - | ~ 673 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 1.4 | 0 | 91.2 | 0 |
| HCM LOS | | | F | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 673 | 674 | - | - | - | - |
| HCM Lane V/C Ratio | 1.107 | 0.139 | - | - | - | - |
| HCM Control Delay (s) | 91.2 | 11.2 | - | - | - | 0 |
| HCM Lane LOS | F | B | - | - | - | A |
| HCM 95th %tile Q(veh) | 21.8 | 0.5 | - | - | - | - |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.1 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 29 | 267 | 8 | 0 | 0 | 0 | 0 | 16 | 9 | 38 | 50 | 0 |
| Future Vol, veh/h | 29 | 267 | 8 | 0 | 0 | 0 | 0 | 16 | 9 | 38 | 50 | 0 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 34 | 314 | 9 | 0 | 0 | 0 | 0 | 19 | 11 | 45 | 59 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 9.3 | 7.9 | 8.7 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 18% | 0% | 43% |
| Vol Thru, % | 64% | 82% | 94% | 57% |
| Vol Right, % | 36% | 0% | 6% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 25 | 163 | 142 | 88 |
| LT Vol | 0 | 29 | 0 | 38 |
| Through Vol | 16 | 134 | 134 | 50 |
| RT Vol | 9 | 0 | 8 | 0 |
| Lane Flow Rate | 29 | 191 | 166 | 104 |
| Geometry Grp | 2 | 7 | 7 | 2 |
| Degree of Util (X) | 0.038 | 0.265 | 0.225 | 0.141 |
| Departure Headway (Hd) | 4.69 | 4.988 | 4.859 | 4.896 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 764 | 725 | 744 | 734 |
| Service Time | 2.717 | 2.688 | 2.559 | 2.916 |
| HCM Lane V/C Ratio | 0.038 | 0.263 | 0.223 | 0.142 |
| HCM Control Delay | 7.9 | 9.5 | 9 | 8.7 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 1.1 | 0.9 | 0.5 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 101 | 217 | 5 | 10 | 0 | 9 | 0 | 6 | 5 | 0 | 0 | 0 |
| Future Vol, veh/h | 101 | 217 | 5 | 10 | 0 | 9 | 0 | 6 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 109 | 233 | 5 | 11 | 0 | 10 | 0 | 6 | 5 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 9.1 | 7.3 | 7.6 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 53% |
| Vol Thru, % | 55% | 0% | 98% | 0% |
| Vol Right, % | 45% | 0% | 2% | 47% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 11 | 101 | 222 | 19 |
| LT Vol | 0 | 101 | 0 | 10 |
| Through Vol | 6 | 0 | 217 | 0 |
| RT Vol | 5 | 0 | 5 | 9 |
| Lane Flow Rate | 12 | 109 | 239 | 20 |
| Geometry Grp | 2 | 7 | 7 | 5 |
| Degree of Util (X) | 0.015 | 0.153 | 0.303 | 0.024 |
| Departure Headway (Hd) | 4.505 | 5.083 | 4.567 | 4.238 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 799 | 708 | 790 | 849 |
| Service Time | 2.507 | 2.794 | 2.278 | 2.24 |
| HCM Lane V/C Ratio | 0.015 | 0.154 | 0.303 | 0.024 |
| HCM Control Delay | 7.6 | 8.7 | 9.3 | 7.3 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.5 | 1.3 | 0.1 |

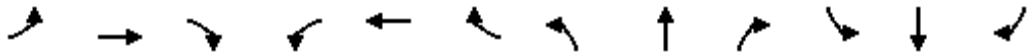
| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 214 | 0 | 19 | 2 | 0 | 1 | 2 | 174 | 0 | 0 | 156 | 23 |
| Future Vol, veh/h | 214 | 0 | 19 | 2 | 0 | 1 | 2 | 174 | 0 | 0 | 156 | 23 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 228 | 0 | 20 | 2 | 0 | 1 | 2 | 185 | 0 | 0 | 166 | 24 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 10.6 | 8.2 | 9.5 | 9.4 |
| HCM LOS | B | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 1% | 92% | 67% | 0% |
| Vol Thru, % | 99% | 0% | 0% | 87% |
| Vol Right, % | 0% | 8% | 33% | 13% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 176 | 233 | 3 | 179 |
| LT Vol | 2 | 214 | 2 | 0 |
| Through Vol | 174 | 0 | 0 | 156 |
| RT Vol | 0 | 19 | 1 | 23 |
| Lane Flow Rate | 187 | 248 | 3 | 190 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.251 | 0.343 | 0.005 | 0.251 |
| Departure Headway (Hd) | 4.828 | 4.978 | 5.126 | 4.748 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 740 | 719 | 692 | 752 |
| Service Time | 2.882 | 3.033 | 3.206 | 2.802 |
| HCM Lane V/C Ratio | 0.253 | 0.345 | 0.004 | 0.253 |
| HCM Control Delay | 9.5 | 10.6 | 8.2 | 9.4 |
| HCM Lane LOS | A | B | A | A |
| HCM 95th-tile Q | 1 | 1.5 | 0 | 1 |

# Appendix F
# Synchro Calculation Worksheets
# Existing with Project Conditions



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 41 | 353 | 18 | 3 | 10 | 0 | 0 | 18 | 9 |
| Future Volume (veh/h) | 0 | 0 | 0 | 41 | 353 | 18 | 3 | 10 | 0 | 0 | 18 | 9 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.99 | 0.97 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 49 | 420 | 20 | 4 | 12 | 0 | 0 | 21 | 10 |
| Peak Hour Factor | | | | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 168 | 1515 | 75 | 214 | 207 | 0 | 0 | 165 | 78 |
| Arrive On Green | | | | 0.48 | 0.48 | 0.48 | 0.14 | 0.14 | 0.00 | 0.00 | 0.14 | 0.14 |
| Sat Flow, veh/h | | | | 351 | 3155 | 157 | 272 | 1475 | 0 | 0 | 1173 | 558 |
| Grp Volume(v), veh/h | | | | 257 | 0 | 232 | 16 | 0 | 0 | 0 | 0 | 31 |
| Grp Sat Flow(s),veh/h/ln | | | | 1838 | 0 | 1825 | 1746 | 0 | 0 | 0 | 0 | 1731 |
| Q Serve(g_s), s | | | | 2.2 | 0.0 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 |
| Cycle Q Clear(g_c), s | | | | 2.2 | 0.0 | 1.9 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 |
| Prop In Lane | | | | 0.19 | | 0.09 | 0.25 | | 0.00 | 0.00 | | 0.32 |
| Lane Grp Cap(c), veh/h | | | | 883 | 0 | 876 | 421 | 0 | 0 | 0 | 0 | 243 |
| V/C Ratio(X) | | | | 0.29 | 0.00 | 0.27 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 |
| Avail Cap(c_a), veh/h | | | | 2897 | 0 | 2876 | 1503 | 0 | 0 | 0 | 0 | 1354 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 4.0 | 0.0 | 4.0 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 9.6 |
| Incr Delay (d2), s/veh | | | | 0.2 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 0.4 | 0.0 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 4.2 | 0.0 | 4.1 | 9.6 | 0.0 | 0.0 | 0.0 | 0.0 | 9.9 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 489 | | | 16 | | | 31 | |
| Approach Delay, s/veh | | | | | 4.2 | | | 9.6 | | | 9.9 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | 4 | 6 | 8 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.2 | 17.4 | 8.2 |
| Change Period (Y+Rc), s | 4.6 | 5.1 | 4.6 |
| Max Green Setting (Gmax), s | 20.0 | 40.3 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 2.4 | 4.2 | 2.2 |
| Green Ext Time (p_c), s | 0.1 | 3.4 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 4.6 |
| HCM 6th LOS | A |

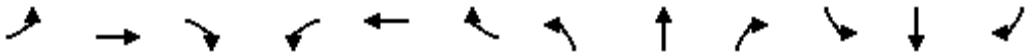
| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 451 | 20 | 0 | 0 | 145 | 0 | 0 | 6 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 451 | 20 | 0 | 0 | 145 | 0 | 0 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 501 | 22 | 0 | 0 | 161 | 0 | 0 | 7 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 273 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 722 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 714 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 10.1 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 714 |
| HCM Lane V/C Ratio | - | - | 0.009 |
| HCM Control Delay (s) | - | - | 10.1 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 13 | 121 | 7 | 206 | 440 | 224 | 33 | 32 | 275 | 193 | 48 | 9 |
| Future Volume (veh/h) | 13 | 121 | 7 | 206 | 440 | 224 | 33 | 32 | 275 | 193 | 48 | 9 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.90 | 1.00 | | 0.97 | 1.00 | | 0.97 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 14 | 132 | 8 | 224 | 478 | 195 | 36 | 35 | 245 | 136 | 156 | 10 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 204 | 697 | 42 | 408 | 1140 | 726 | 175 | 170 | 291 | 262 | 255 | 16 |
| Arrive On Green | 0.12 | 0.21 | 0.21 | 0.23 | 0.32 | 0.32 | 0.19 | 0.19 | 0.19 | 0.15 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1767 | 3354 | 201 | 1767 | 3526 | 1526 | 918 | 892 | 1532 | 1767 | 1722 | 110 |
| Grp Volume(v), veh/h | 14 | 69 | 71 | 224 | 478 | 195 | 71 | 0 | 245 | 136 | 0 | 166 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1792 | 1767 | 1763 | 1526 | 1810 | 0 | 1532 | 1767 | 0 | 1832 |
| Q Serve(g_s), s | 0.6 | 2.8 | 2.8 | 9.7 | 9.2 | 6.7 | 2.9 | 0.0 | 13.3 | 6.2 | 0.0 | 7.3 |
| Cycle Q Clear(g_c), s | 0.6 | 2.8 | 2.8 | 9.7 | 9.2 | 6.7 | 2.9 | 0.0 | 13.3 | 6.2 | 0.0 | 7.3 |
| Prop In Lane | 1.00 | | 0.11 | 1.00 | | 1.00 | 0.51 | | 1.00 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 204 | 366 | 372 | 408 | 1140 | 726 | 344 | 0 | 291 | 262 | 0 | 271 |
| V/C Ratio(X) | 0.07 | 0.19 | 0.19 | 0.55 | 0.42 | 0.27 | 0.21 | 0.00 | 0.84 | 0.52 | 0.00 | 0.61 |
| Avail Cap(c_a), veh/h | 306 | 814 | 828 | 612 | 2239 | 1202 | 418 | 0 | 354 | 708 | 0 | 734 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.1 | 28.3 | 28.3 | 29.3 | 22.9 | 13.9 | 29.6 | 0.0 | 33.8 | 34.0 | 0.0 | 34.6 |
| Incr Delay (d2), s/veh | 0.1 | 0.3 | 0.4 | 0.9 | 0.9 | 0.7 | 0.4 | 0.0 | 15.4 | 2.3 | 0.0 | 3.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 1.2 | 1.3 | 4.2 | 3.9 | 3.2 | 1.3 | 0.0 | 6.1 | 2.8 | 0.0 | 3.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 34.3 | 28.6 | 28.7 | 30.2 | 23.8 | 14.6 | 30.0 | 0.0 | 49.2 | 36.3 | 0.0 | 37.7 |
| LnGrp LOS | C | C | C | C | C | B | C | A | D | D | A | D |
| Approach Vol, veh/h | | 154 | | | 897 | | | 316 | | | 302 | |
| Approach Delay, s/veh | | 29.1 | | | 23.4 | | | 44.9 | | | 37.1 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 33.4 | | 21.1 | 24.7 | 23.4 | | 17.4 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.6 | 11.2 | | 15.3 | 11.7 | 4.8 | | 9.3 | | | | |
| Green Ext Time (p_c), s | 0.0 | 12.4 | | 0.8 | 0.4 | 1.2 | | 2.1 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 6th Ctrl Delay | | 30.5 | |
| HCM 6th LOS | | C | |

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 543 | 41 | 227 | 848 | 683 | 32 | 0 | 222 | 110 | 87 | 64 |
| Future Volume (veh/h) | 0 | 543 | 41 | 227 | 848 | 683 | 32 | 0 | 222 | 110 | 87 | 64 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.88 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 578 | 44 | 241 | 902 | 0 | 34 | 0 | 213 | 105 | 110 | 55 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 754 | 57 | 292 | 1762 | | 0 | 0 | 0 | 316 | 332 | 248 |
| Arrive On Green | 0.00 | 0.24 | 0.24 | 0.17 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.25 | 0.25 |
| Sat Flow, veh/h | 0 | 3277 | 242 | 1710 | 3410 | 1521 | | 0 | | 1266 | 1329 | 992 |
| Grp Volume(v), veh/h | 0 | 306 | 316 | 241 | 902 | 0 | | 0.0 | | 105 | 110 | 55 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1738 | 1710 | 1705 | 1521 | | | | 1266 | 1329 | 992 |
| Q Serve(g_s), s | 0.0 | 8.8 | 8.8 | 7.1 | 9.1 | 0.0 | | | | 3.5 | 3.5 | 2.3 |
| Cycle Q Clear(g_c), s | 0.0 | 8.8 | 8.8 | 7.1 | 9.1 | 0.0 | | | | 3.5 | 3.5 | 2.3 |
| Prop In Lane | 0.00 | | 0.14 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 400 | 411 | 292 | 1762 | | | | | 316 | 332 | 248 |
| V/C Ratio(X) | 0.00 | 0.77 | 0.77 | 0.83 | 0.51 | | | | | 0.33 | 0.33 | 0.22 |
| Avail Cap(c_a), veh/h | 0 | 1297 | 1332 | 1474 | 5928 | | | | | 606 | 637 | 475 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 18.6 | 18.6 | 20.9 | 8.3 | 0.0 | | | | 16.0 | 16.0 | 15.6 |
| Incr Delay (d2), s/veh | 0.0 | 1.2 | 1.1 | 2.3 | 0.1 | 0.0 | | | | 0.2 | 0.2 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 3.3 | 3.4 | 2.7 | 2.4 | 0.0 | | | | 1.0 | 1.0 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 19.7 | 19.7 | 23.1 | 8.4 | 0.0 | | | | 16.2 | 16.2 | 15.7 |
| LnGrp LOS | A | B | B | C | A | | | | | B | B | B |
| Approach Vol, veh/h | | 622 | | | 1143 | | | | | | 270 | |
| Approach Delay, s/veh | | 19.7 | | | 11.5 | | | | | | 16.1 | |
| Approach LOS | | B | | | B | | | | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.6 | 18.4 | | 19.1 | | 33.1 | | | |
| Change Period (Y+Rc), s | * 5.7 | 6.1 | | 6.1 | | 6.1 | | | |
| Max Green Setting (Gmax), s | * 15 | 40.0 | | 25.0 | | 90.7 | | | |
| Max Q Clear Time (g_c+I1), s | 10.1 | 10.8 | | 5.5 | | 11.1 | | | |
| Green Ext Time (p_c), s | 0.1 | 1.5 | | 0.3 | | 2.5 | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 14.6 |
| HCM 6th LOS | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 105 | 407 | 0 | 0 | 1209 | 195 | 0 | 0 | 450 | 0 | 0 | 549 |
| Future Vol, veh/h | 105 | 407 | 0 | 0 | 1209 | 195 | 0 | 0 | 450 | 0 | 0 | 549 |
| Conflicting Peds, #/hr | 20 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 109 | 424 | 0 | 0 | 1259 | 203 | 0 | 0 | 469 | 0 | 0 | 572 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1482 | 0 | - | - | - | 0 | - | - | 212 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 445 | - | 0 | 0 | - | - | 0 | 0 | 790 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 445 | - | - | - | - | - | - | - | 790 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 3.2 | 0 | 16 | 0 |
| HCM LOS | | | C | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 790 | 445 | - | - | - | - |
| HCM Lane V/C Ratio | 0.593 | 0.246 | - | - | - | - |
| HCM Control Delay (s) | 16 | 15.7 | - | - | - | 0 |
| HCM Lane LOS | C | C | - | - | - | A |
| HCM 95th %tile Q(veh) | 4 | 1 | - | - | - | - |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 7 | 162 | 10 | 0 | 0 | 0 | 0 | 8 | 13 | 19 | 37 | 0 |
| Future Vol, veh/h | 7 | 162 | 10 | 0 | 0 | 0 | 0 | 8 | 13 | 19 | 37 | 0 |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 9 | 205 | 13 | 0 | 0 | 0 | 0 | 10 | 16 | 24 | 47 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 8.3 | 7.3 | 8 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 8% | 0% | 34% |
| Vol Thru, % | 38% | 92% | 89% | 66% |
| Vol Right, % | 62% | 0% | 11% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 21 | 88 | 91 | 56 |
| LT Vol | 0 | 7 | 0 | 19 |
| Through Vol | 8 | 81 | 81 | 37 |
| RT Vol | 13 | 0 | 10 | 0 |
| Lane Flow Rate | 27 | 111 | 115 | 71 |
| Geometry Grp | 2 | 7 | 7 | 2 |
| Degree of Util (X) | 0.031 | 0.147 | 0.149 | 0.09 |
| Departure Headway (Hd) | 4.195 | 4.761 | 4.644 | 4.582 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 858 | 747 | 766 | 787 |
| Service Time | 2.198 | 2.527 | 2.41 | 2.583 |
| HCM Lane V/C Ratio | 0.031 | 0.149 | 0.15 | 0.09 |
| HCM Control Delay | 7.3 | 8.4 | 8.2 | 8 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.5 | 0.5 | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 55 | 143 | 9 | 25 | 0 | 57 | 0 | 19 | 21 | 0 | 0 | 0 |
| Future Vol, veh/h | 55 | 143 | 9 | 25 | 0 | 57 | 0 | 19 | 21 | 0 | 0 | 0 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 71 | 183 | 12 | 32 | 0 | 73 | 0 | 24 | 27 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 8.9 | 7.7 | 7.8 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 30% |
| Vol Thru, % | 47% | 0% | 94% | 0% |
| Vol Right, % | 53% | 0% | 6% | 70% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 40 | 55 | 152 | 82 |
| LT Vol | 0 | 55 | 0 | 25 |
| Through Vol | 19 | 0 | 143 | 0 |
| RT Vol | 21 | 0 | 9 | 57 |
| Lane Flow Rate | 51 | 71 | 195 | 105 |
| Geometry Grp | 2 | 7 | 7 | 5 |
| Degree of Util (X) | 0.064 | 0.102 | 0.252 | 0.119 |
| Departure Headway (Hd) | 4.467 | 5.196 | 4.654 | 4.091 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 806 | 687 | 768 | 880 |
| Service Time | 2.472 | 2.949 | 2.406 | 2.1 |
| HCM Lane V/C Ratio | 0.063 | 0.103 | 0.254 | 0.119 |
| HCM Control Delay | 7.8 | 8.5 | 9 | 7.7 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.2 | 0.3 | 1 | 0.4 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 118 | 1 | 28 | 0 | 0 | 0 | 9 | 179 | 0 | 1 | 141 | 75 |
| Future Vol, veh/h | 118 | 1 | 28 | 0 | 0 | 0 | 9 | 179 | 0 | 1 | 141 | 75 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 146 | 1 | 35 | 0 | 0 | 0 | 11 | 221 | 0 | 1 | 174 | 93 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 10 | 0 | 9.9 | 9.8 |
| HCM LOS | A | - | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 5% | 80% | 0% | 0% |
| Vol Thru, % | 95% | 1% | 100% | 65% |
| Vol Right, % | 0% | 19% | 0% | 35% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 188 | 147 | 0 | 217 |
| LT Vol | 9 | 118 | 0 | 1 |
| Through Vol | 179 | 1 | 0 | 141 |
| RT Vol | 0 | 28 | 0 | 75 |
| Lane Flow Rate | 232 | 181 | 0 | 268 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.305 | 0.258 | 0 | 0.335 |
| Departure Headway (Hd) | 4.738 | 5.119 | 5.365 | 4.496 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 757 | 699 | 0 | 796 |
| Service Time | 2.786 | 3.178 | 3.448 | 2.54 |
| HCM Lane V/C Ratio | 0.306 | 0.259 | 0 | 0.337 |
| HCM Control Delay | 9.9 | 10 | 8.4 | 9.8 |
| HCM Lane LOS | A | A | N | A |
| HCM 95th-tile Q | 1.3 | 1 | 0 | 1.5 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.3 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 24 | 121 | 19 | 0 | 0 |
| Future Vol, veh/h | 0 | 24 | 121 | 19 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 26 | 132 | 21 | 0 | 0 |

| Major/Minor | Minor1 | | Major1 | |
|---|---|---|---|---|
| Conflicting Flow All | - | 77 | 0 | 0 |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |
| Critical Hdwy | - | 6.96 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - |
| Follow-up Hdwy | - | 3.33 | - | - |
| Pot Cap-1 Maneuver | 0 | 965 | - | - |
| Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
| Platoon blocked, % | | | - | - |
| Mov Cap-1 Maneuver | - | 965 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |

| Approach | WB | NB |
|---|---|---|
| HCM Control Delay, s | 8.8 | 0 |
| HCM LOS | A | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 965 |
| HCM Lane V/C Ratio | - | - | 0.027 |
| HCM Control Delay (s) | - | - | 8.8 |
| HCM Lane LOS | - | - | A |
| HCM 95th %tile Q(veh) | - | - | 0.1 |

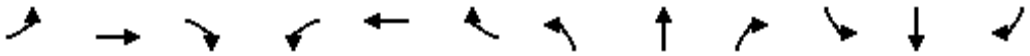
| Intersection | |
|---|---|
| Int Delay, s/veh | 1 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 36 | 3 | 7 | 290 | 249 | 12 |
| Future Vol, veh/h | 36 | 3 | 7 | 290 | 249 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 39 | 3 | 8 | 315 | 271 | 13 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 609 | 278 | 284 | 0 | - | 0 |
| Stage 1 | 278 | - | - | - | - | - |
| Stage 2 | 331 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.13 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.227 | - | - | - |
| Pot Cap-1 Maneuver | 457 | 758 | 1273 | - | - | - |
| Stage 1 | 767 | - | - | - | - | - |
| Stage 2 | 725 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 453 | 758 | 1273 | - | - | - |
| Mov Cap-2 Maneuver | 453 | - | - | - | - | - |
| Stage 1 | 761 | - | - | - | - | - |
| Stage 2 | 725 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 13.5 | 0.2 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1273 | - | 467 | - | - |
| HCM Lane V/C Ratio | 0.006 | - | 0.091 | - | - |
| HCM Control Delay (s) | 7.8 | 0 | 13.5 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.3 | - | - |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 52 | 388 | 34 | 11 | 36 | 0 | 0 | 32 | 22 |
| Future Volume (veh/h) | 0 | 0 | 0 | 52 | 388 | 34 | 11 | 36 | 0 | 0 | 32 | 22 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.94 | 0.97 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 53 | 396 | 34 | 11 | 37 | 0 | 0 | 33 | 21 |
| Peak Hour Factor | | | | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 172 | 1343 | 121 | 193 | 342 | 0 | 0 | 225 | 143 |
| Arrive On Green | | | | 0.45 | 0.45 | 0.45 | 0.22 | 0.22 | 0.00 | 0.00 | 0.22 | 0.22 |
| Sat Flow, veh/h | | | | 381 | 2976 | 267 | 189 | 1585 | 0 | 0 | 1042 | 663 |
| Grp Volume(v), veh/h | | | | 255 | 0 | 228 | 48 | 0 | 0 | 0 | 0 | 54 |
| Grp Sat Flow(s),veh/h/ln | | | | 1836 | 0 | 1788 | 1774 | 0 | 0 | 0 | 0 | 1706 |
| Q Serve(g_s), s | | | | 2.6 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Cycle Q Clear(g_c), s | | | | 2.6 | 0.0 | 2.3 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Prop In Lane | | | | 0.21 | | 0.15 | 0.23 | | 0.00 | 0.00 | | 0.39 |
| Lane Grp Cap(c), veh/h | | | | 829 | 0 | 807 | 535 | 0 | 0 | 0 | 0 | 368 |
| V/C Ratio(X) | | | | 0.31 | 0.00 | 0.28 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| Avail Cap(c_a), veh/h | | | | 2538 | 0 | 2472 | 1328 | 0 | 0 | 0 | 0 | 1170 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 5.1 | 0.0 | 5.0 | 9.2 | 0.0 | 0.0 | 0.0 | 0.0 | 9.3 |
| Incr Delay (d2), s/veh | | | | 0.2 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 0.6 | 0.0 | 0.5 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 5.3 | 0.0 | 5.2 | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 | 9.4 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 483 | | | 48 | | | 54 | |
| Approach Delay, s/veh | | | | | 5.3 | | | 9.3 | | | 9.4 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | | | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | | | 10.9 | | 18.3 | | 10.9 | | | | |
| Change Period (Y+Rc), s | | | | 4.6 | | 5.1 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | | | | 20.0 | | 40.3 | | 20.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | | 2.7 | | 4.6 | | 2.6 | | | | |
| Green Ext Time (p_c), s | | | | 0.2 | | 3.4 | | 0.1 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 6.0 |
| HCM 6th LOS | | A |

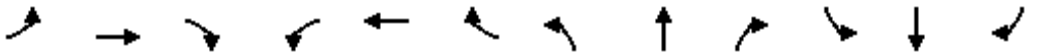
| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 478 | 12 | 0 | 0 | 135 | 0 | 0 | 6 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 478 | 12 | 0 | 0 | 135 | 0 | 0 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 7 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 503 | 13 | 0 | 0 | 142 | 0 | 0 | 6 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 277 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 717 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 704 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 10.2 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 704 |
| HCM Lane V/C Ratio | - | - | 0.009 |
| HCM Control Delay (s) | - | - | 10.2 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 129 | 3 | 186 | 469 | 249 | 28 | 47 | 344 | 447 | 37 | 15 |
| Future Volume (veh/h) | 10 | 129 | 3 | 186 | 469 | 249 | 28 | 47 | 344 | 447 | 37 | 15 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.91 | 1.00 | | 0.96 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 11 | 140 | 3 | 202 | 510 | 223 | 30 | 51 | 320 | 530 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 184 | 659 | 14 | 367 | 1026 | 749 | 140 | 238 | 319 | 695 | 365 | 0 |
| Arrive On Green | 0.10 | 0.19 | 0.19 | 0.21 | 0.29 | 0.29 | 0.21 | 0.21 | 0.21 | 0.20 | 0.00 | 0.00 |
| Sat Flow, veh/h | 1767 | 3521 | 75 | 1767 | 3526 | 1511 | 675 | 1147 | 1536 | 3534 | 1856 | 0 |
| Grp Volume(v), veh/h | 11 | 70 | 73 | 202 | 510 | 223 | 81 | 0 | 320 | 530 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1833 | 1767 | 1763 | 1511 | 1822 | 0 | 1536 | 1767 | 1856 | 0 |
| Q Serve(g_s), s | 0.5 | 3.2 | 3.3 | 9.8 | 11.5 | 8.5 | 3.5 | 0.0 | 20.0 | 13.6 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.5 | 3.2 | 3.3 | 9.8 | 11.5 | 8.5 | 3.5 | 0.0 | 20.0 | 13.6 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 1.00 | 0.37 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 184 | 330 | 343 | 367 | 1026 | 749 | 379 | 0 | 319 | 695 | 365 | 0 |
| V/C Ratio(X) | 0.06 | 0.21 | 0.21 | 0.55 | 0.50 | 0.30 | 0.21 | 0.00 | 1.00 | 0.76 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 275 | 733 | 762 | 551 | 2015 | 1173 | 379 | 0 | 319 | 1274 | 669 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 38.9 | 33.1 | 33.1 | 34.1 | 28.3 | 14.8 | 31.6 | 0.0 | 38.1 | 36.5 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.5 | 0.4 | 1.0 | 1.4 | 0.8 | 0.4 | 0.0 | 50.9 | 2.5 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 1.4 | 1.5 | 4.3 | 5.1 | 4.4 | 1.6 | 0.0 | 12.0 | 6.1 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 39.0 | 33.6 | 33.6 | 35.0 | 29.6 | 15.6 | 32.0 | 0.0 | 89.0 | 39.0 | 0.0 | 0.0 |
| LnGrp LOS | D | C | C | D | C | B | C | A | F | D | A | A |
| Approach Vol, veh/h | | 154 | | | 935 | | | 401 | | | 530 | |
| Approach Delay, s/veh | | 33.9 | | | 27.5 | | | 77.5 | | | 39.0 | |
| Approach LOS | | C | | | C | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 33.4 | | 24.6 | 24.7 | 23.4 | | 23.5 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.5 | 13.5 | | 22.0 | 11.8 | 5.3 | | 15.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 13.5 | | 0.0 | 0.4 | 1.2 | | 3.0 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 6th Ctrl Delay | | 40.9 | |
| HCM 6th LOS | | D | |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 910 | 28 | 76 | 909 | 488 | 13 | 0 | 64 | 119 | 10 | 107 |
| Future Volume (veh/h) | 0 | 910 | 28 | 76 | 909 | 488 | 13 | 0 | 64 | 119 | 10 | 107 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 978 | 30 | 82 | 977 | 0 | 14 | 0 | 45 | 136 | 0 | 102 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 1210 | 37 | 189 | 2014 | | 0 | 0 | 0 | 394 | 0 | 168 |
| Arrive On Green | 0.00 | 0.36 | 0.36 | 0.11 | 0.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.16 |
| Sat Flow, veh/h | 0 | 3441 | 103 | 1710 | 3410 | 1521 | | 0 | | 2532 | 0 | 1082 |
| Grp Volume(v), veh/h | 0 | 494 | 514 | 82 | 977 | 0 | | 0.0 | | 136 | 0 | 102 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1763 | 1710 | 1705 | 1521 | | | | 1266 | 0 | 1082 |
| Q Serve(g_s), s | 0.0 | 12.6 | 12.6 | 2.2 | 7.9 | 0.0 | | | | 2.3 | 0.0 | 4.2 |
| Cycle Q Clear(g_c), s | 0.0 | 12.6 | 12.6 | 2.2 | 7.9 | 0.0 | | | | 2.3 | 0.0 | 4.2 |
| Prop In Lane | 0.00 | | 0.06 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 611 | 636 | 189 | 2014 | | | | | 394 | 0 | 168 |
| V/C Ratio(X) | 0.00 | 0.81 | 0.81 | 0.43 | 0.49 | | | | | 0.35 | 0.00 | 0.61 |
| Avail Cap(c_a), veh/h | 0 | 1762 | 1835 | 890 | 5731 | | | | | 1318 | 0 | 563 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 13.8 | 13.8 | 19.9 | 5.6 | 0.0 | | | | 18.1 | 0.0 | 18.9 |
| Incr Delay (d2), s/veh | 0.0 | 1.0 | 0.9 | 0.6 | 0.1 | 0.0 | | | | 0.2 | 0.0 | 1.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 4.2 | 4.4 | 0.8 | 1.6 | 0.0 | | | | 0.6 | 0.0 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 14.8 | 14.8 | 20.5 | 5.7 | 0.0 | | | | 18.3 | 0.0 | 20.2 |
| LnGrp LOS | A | B | B | C | A | | | | | B | A | C |
| Approach Vol, veh/h | | 1008 | | | 1059 | | | | | | 238 | |
| Approach Delay, s/veh | | 14.8 | | | 6.9 | | | | | | 19.1 | |
| Approach LOS | | B | | | A | | | | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 23.4 | | 13.6 | | 34.5 | | | |
| Change Period (Y+Rc), s | * 5.7 | 6.1 | | 6.1 | | 6.1 | | | |
| Max Green Setting (Gmax), s | * 5.3 | 50.0 | | 25.0 | | 80.7 | | | |
| Max Q Clear Time (g_c+I1), s | 4.2 | 14.6 | | 6.2 | | 9.9 | | | |
| Green Ext Time (p_c), s | 0.0 | 2.7 | | 0.2 | | 2.7 | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 11.6 |
| HCM 6th LOS | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 28.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 92 | 606 | 0 | 0 | 855 | 100 | 0 | 0 | 700 | 0 | 0 | 618 |
| Future Vol, veh/h | 92 | 606 | 0 | 0 | 855 | 100 | 0 | 0 | 700 | 0 | 0 | 618 |
| Conflicting Peds, #/hr | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 98 | 645 | 0 | 0 | 910 | 106 | 0 | 0 | 745 | 0 | 0 | 657 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1021 | 0 | - | - | - | 0 | - | - | 323 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 669 | - | 0 | 0 | - | - | 0 | 0 | ~ 670 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 669 | - | - | - | - | - | - | - | ~ 670 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 1.5 | 0 | 93 | 0 |
| HCM LOS | | | F | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 670 | 669 | - | - | - | - |
| HCM Lane V/C Ratio | 1.111 | 0.146 | - | - | - | - |
| HCM Control Delay (s) | 93 | 11.3 | - | - | - | 0 |
| HCM Lane LOS | F | B | - | - | - | A |
| HCM 95th %tile Q(veh) | 22 | 0.5 | - | - | - | - |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 29 | 274 | 8 | 0 | 0 | 0 | 0 | 16 | 12 | 45 | 52 | 0 |
| Future Vol, veh/h | 29 | 274 | 8 | 0 | 0 | 0 | 0 | 16 | 12 | 45 | 52 | 0 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 34 | 322 | 9 | 0 | 0 | 0 | 0 | 19 | 14 | 53 | 61 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 9.4 | 7.9 | 8.9 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 17% | 0% | 46% |
| Vol Thru, % | 57% | 83% | 94% | 54% |
| Vol Right, % | 43% | 0% | 6% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 28 | 166 | 145 | 97 |
| LT Vol | 0 | 29 | 0 | 45 |
| Through Vol | 16 | 137 | 137 | 52 |
| RT Vol | 12 | 0 | 8 | 0 |
| Lane Flow Rate | 33 | 195 | 171 | 114 |
| Geometry Grp | 2 | 7 | 7 | 2 |
| Degree of Util (X) | 0.043 | 0.271 | 0.231 | 0.156 |
| Departure Headway (Hd) | 4.684 | 5.004 | 4.877 | 4.925 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 765 | 719 | 737 | 729 |
| Service Time | 2.709 | 2.725 | 2.598 | 2.945 |
| HCM Lane V/C Ratio | 0.043 | 0.271 | 0.232 | 0.156 |
| HCM Control Delay | 7.9 | 9.6 | 9.1 | 8.9 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 1.1 | 0.9 | 0.6 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 109 | 225 | 5 | 12 | 0 | 32 | 0 | 8 | 7 | 0 | 0 | 0 |
| Future Vol, veh/h | 109 | 225 | 5 | 12 | 0 | 32 | 0 | 8 | 7 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 117 | 242 | 5 | 13 | 0 | 34 | 0 | 9 | 8 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 9.2 | 7.3 | 7.7 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 27% |
| Vol Thru, % | 53% | 0% | 98% | 0% |
| Vol Right, % | 47% | 0% | 2% | 73% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 15 | 109 | 230 | 44 |
| LT Vol | 0 | 109 | 0 | 12 |
| Through Vol | 8 | 0 | 225 | 0 |
| RT Vol | 7 | 0 | 5 | 32 |
| Lane Flow Rate | 16 | 117 | 247 | 47 |
| Geometry Grp | 2 | 7 | 7 | 5 |
| Degree of Util (X) | 0.021 | 0.166 | 0.315 | 0.053 |
| Departure Headway (Hd) | 4.583 | 5.102 | 4.587 | 4.061 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 786 | 704 | 784 | 886 |
| Service Time | 2.584 | 2.822 | 2.307 | 2.065 |
| HCM Lane V/C Ratio | 0.02 | 0.166 | 0.315 | 0.053 |
| HCM Control Delay | 7.7 | 8.8 | 9.4 | 7.3 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.6 | 1.4 | 0.2 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.2 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 224 | 0 | 19 | 2 | 0 | 1 | 4 | 176 | 0 | 0 | 158 | 47 |
| Future Vol, veh/h | 224 | 0 | 19 | 2 | 0 | 1 | 4 | 176 | 0 | 0 | 158 | 47 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 238 | 0 | 20 | 2 | 0 | 1 | 4 | 187 | 0 | 0 | 168 | 50 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 11 | 8.3 | 9.7 | 9.7 |
| HCM LOS | B | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 2% | 92% | 67% | 0% |
| Vol Thru, % | 98% | 0% | 0% | 77% |
| Vol Right, % | 0% | 8% | 33% | 23% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 180 | 243 | 3 | 205 |
| LT Vol | 4 | 224 | 2 | 0 |
| Through Vol | 176 | 0 | 0 | 158 |
| RT Vol | 0 | 19 | 1 | 47 |
| Lane Flow Rate | 191 | 259 | 3 | 218 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.261 | 0.363 | 0.005 | 0.287 |
| Departure Headway (Hd) | 4.899 | 5.053 | 5.226 | 4.732 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 728 | 708 | 676 | 755 |
| Service Time | 2.962 | 3.118 | 3.322 | 2.792 |
| HCM Lane V/C Ratio | 0.262 | 0.366 | 0.004 | 0.289 |
| HCM Control Delay | 9.7 | 11 | 8.3 | 9.7 |
| HCM Lane LOS | A | B | A | A |
| HCM 95th-tile Q | 1 | 1.7 | 0 | 1.2 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 16 | 119 | 34 | 0 | 0 |
| Future Vol, veh/h | 0 | 16 | 119 | 34 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 17 | 129 | 37 | 0 | 0 |

| Major/Minor | Minor1 | | Major1 | |
|---|---|---|---|---|
| Conflicting Flow All | - | 83 | 0 | 0 |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |
| Critical Hdwy | - | 6.96 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - |
| Follow-up Hdwy | - | 3.33 | - | - |
| Pot Cap-1 Maneuver | 0 | 957 | - | - |
| Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
| Platoon blocked, % | | | - | - |
| Mov Cap-1 Maneuver | - | 957 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |

| Approach | WB | NB |
|---|---|---|
| HCM Control Delay, s | 8.8 | 0 |
| HCM LOS | A | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 957 |
| HCM Lane V/C Ratio | - | - | 0.018 |
| HCM Control Delay (s) | - | - | 8.8 |
| HCM Lane LOS | - | - | A |
| HCM 95th %tile Q(veh) | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.7 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 25 | 2 | 12 | 389 | 205 | 22 |
| Future Vol, veh/h | 25 | 2 | 12 | 389 | 205 | 22 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 27 | 2 | 13 | 423 | 223 | 24 |

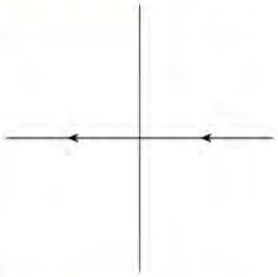
| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 684 | 235 | 247 | 0 | - | 0 |
| Stage 1 | 235 | - | - | - | - | - |
| Stage 2 | 449 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.13 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.227 | - | - | - |
| Pot Cap-1 Maneuver | 413 | 802 | 1313 | - | - | - |
| Stage 1 | 802 | - | - | - | - | - |
| Stage 2 | 641 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 408 | 802 | 1313 | - | - | - |
| Mov Cap-2 Maneuver | 408 | - | - | - | - | - |
| Stage 1 | 792 | - | - | - | - | - |
| Stage 2 | 641 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 14.1 | 0.2 | 0 |
| HCM LOS | B | | |

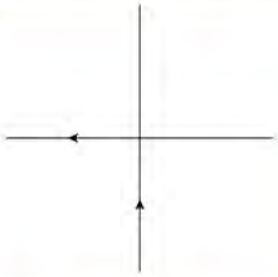
| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1313 | - | 423 | - | - |
| HCM Lane V/C Ratio | 0.01 | - | 0.069 | - | - |
| HCM Control Delay (s) | 7.8 | 0 | 14.1 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.2 | - | - |

# Appendix G
# Cumulative Projects

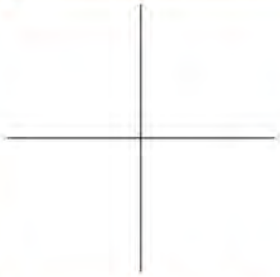
1 N Ditmar Street & Mission Avenue



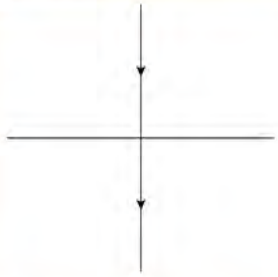
2 N Clementine Street & Mission Avenue



3 N Horne Street & Mission Avenue



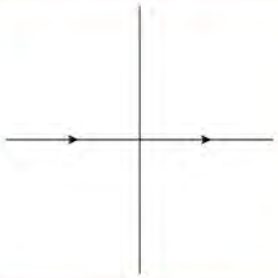
4 I-5 SB Ramps & Mission Avenue



5 I-5 NB Ramps & Mission Avenue



6 S Ditmar Street & Seagaze Drive



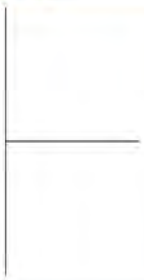
7 S Clementine Street & Seagaze Drive



8 S Horne Street & Seagaze Drive



9 N Clementine Street & Project Driveway #1



10 N Horne Street & Project Driveway #2



No trips added to study intersections

X Study Intersection

Turn Movements

AM / PM Peak Hour Volumes

One-Way Roadway

*Names of North-South cross-streets always listed first

NORTH

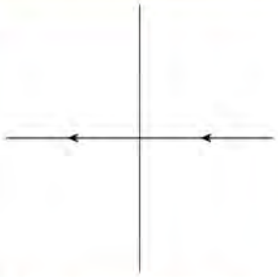
NOT TO SCALE

**901 Mission Avenue**
**Project Information Form**

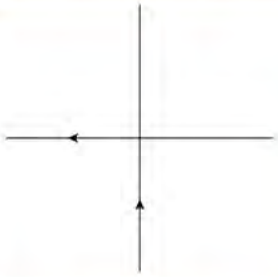
C R

*Project Trip Assignment*
*522 N Tremont Street Condos*

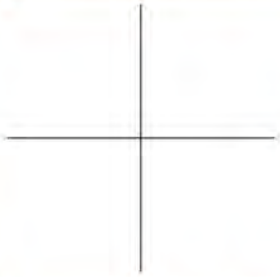
1 N Ditmar Street & Mission Avenue



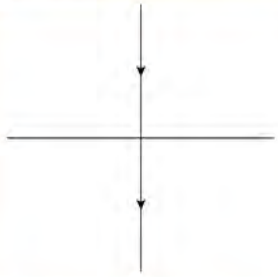
2 N Clementine Street & Mission Avenue



3 N Horne Street & Mission Avenue



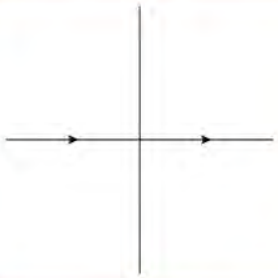
4 I-5 SB Ramps & Mission Avenue



5 I-5 NB Ramps & Mission Avenue



6 S Ditmar Street & Seagaze Drive



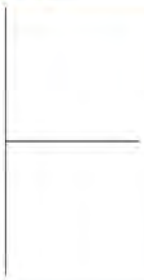
7 S Clementine Street & Seagaze Drive



8 S Horne Street & Seagaze Drive



9 N Clementine Street & Project Driveway #1



10 N Horne Street & Project Driveway #2



No trips added to study intersections

X Study Intersection

Turn Movements

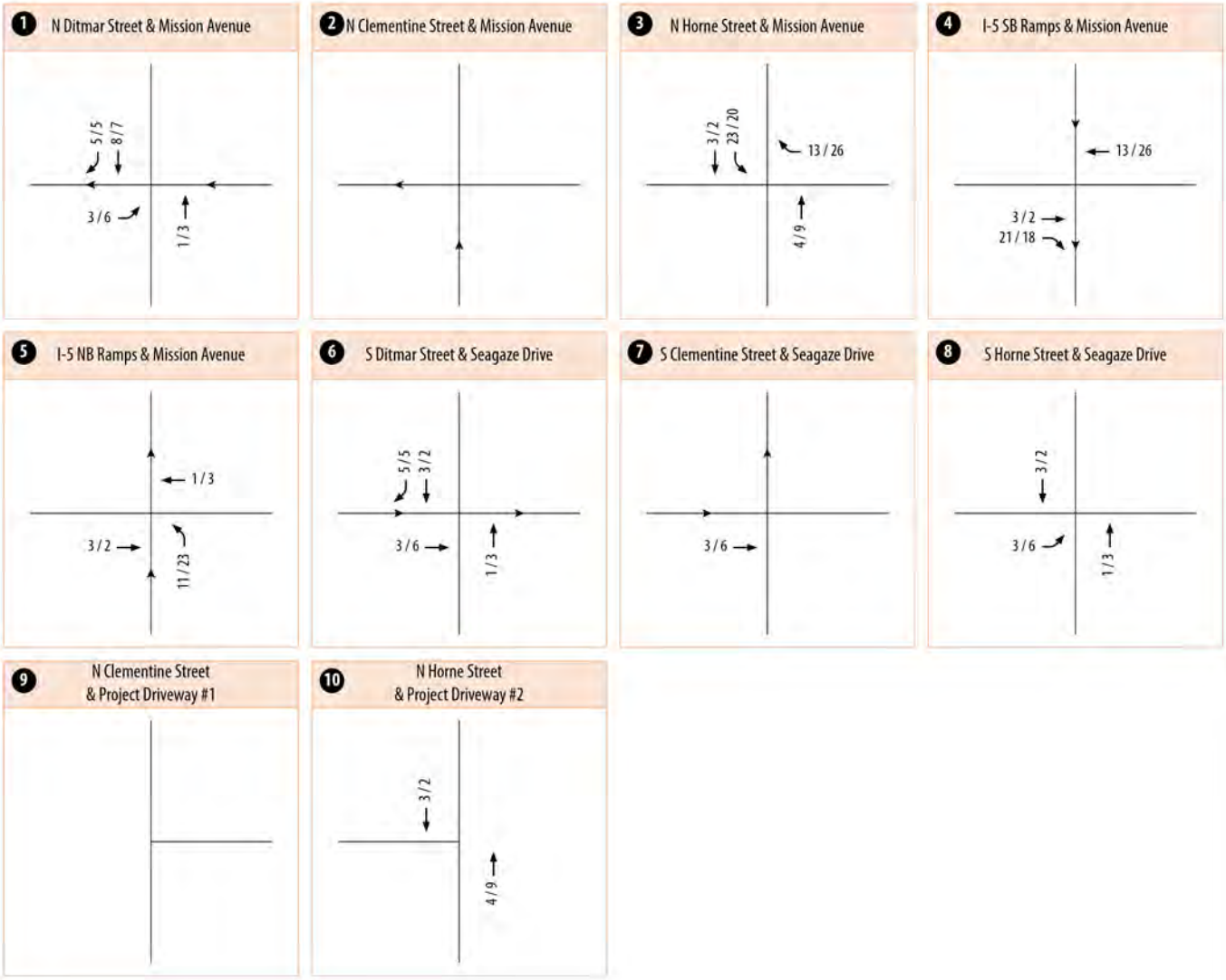
AM / PM Peak Hour Volumes

One-Way Roadway

*Names of North-South cross-streets always listed first

NORTH

NOT TO SCALE




X Study Intersection

Turn Movements

AM / PM Peak Hour Volumes

One-Way Roadway

*Names of North-South cross-streets always listed first

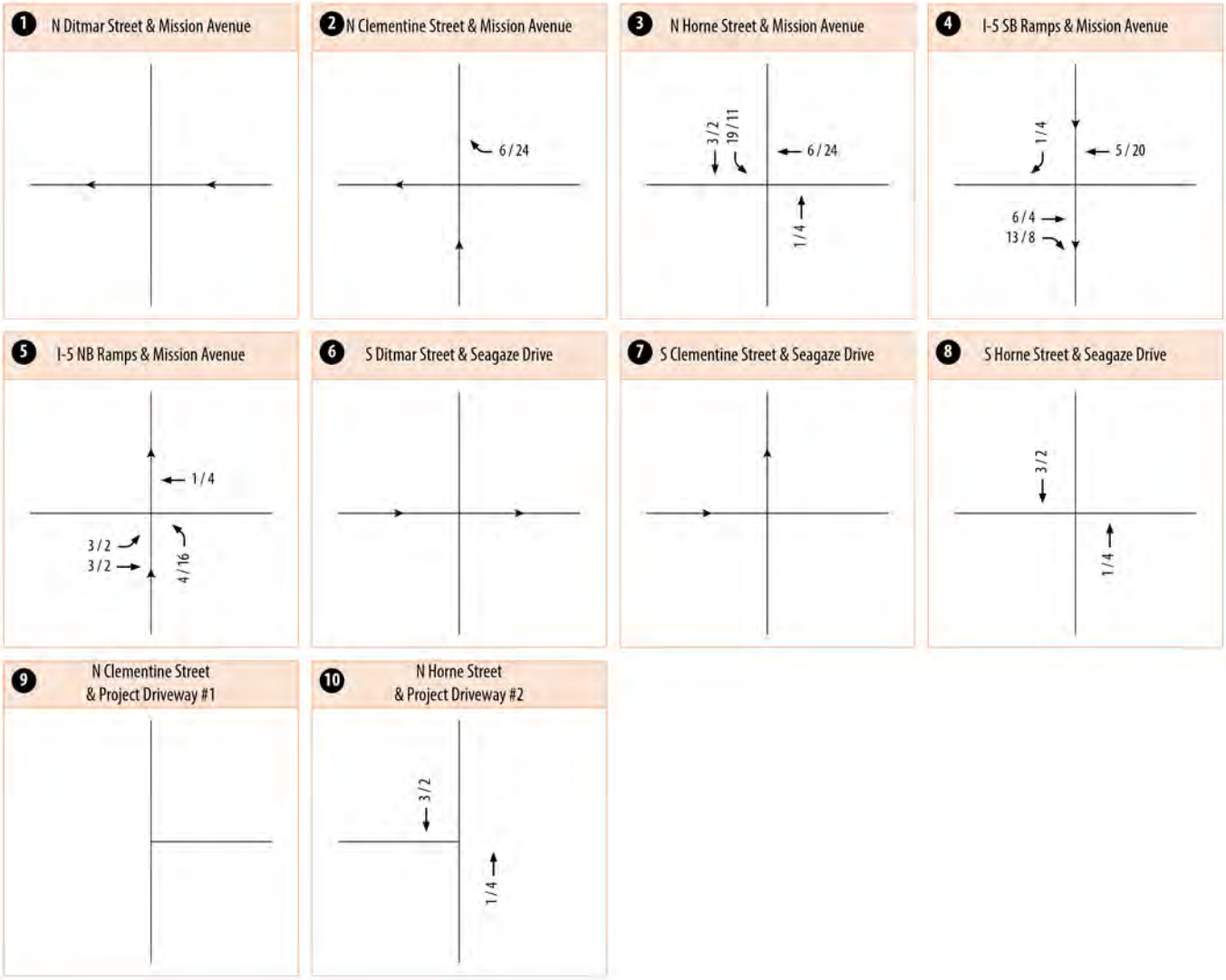
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NOT TO SCALE

**901 Mission Avenue**
**Project Information Form**

C R

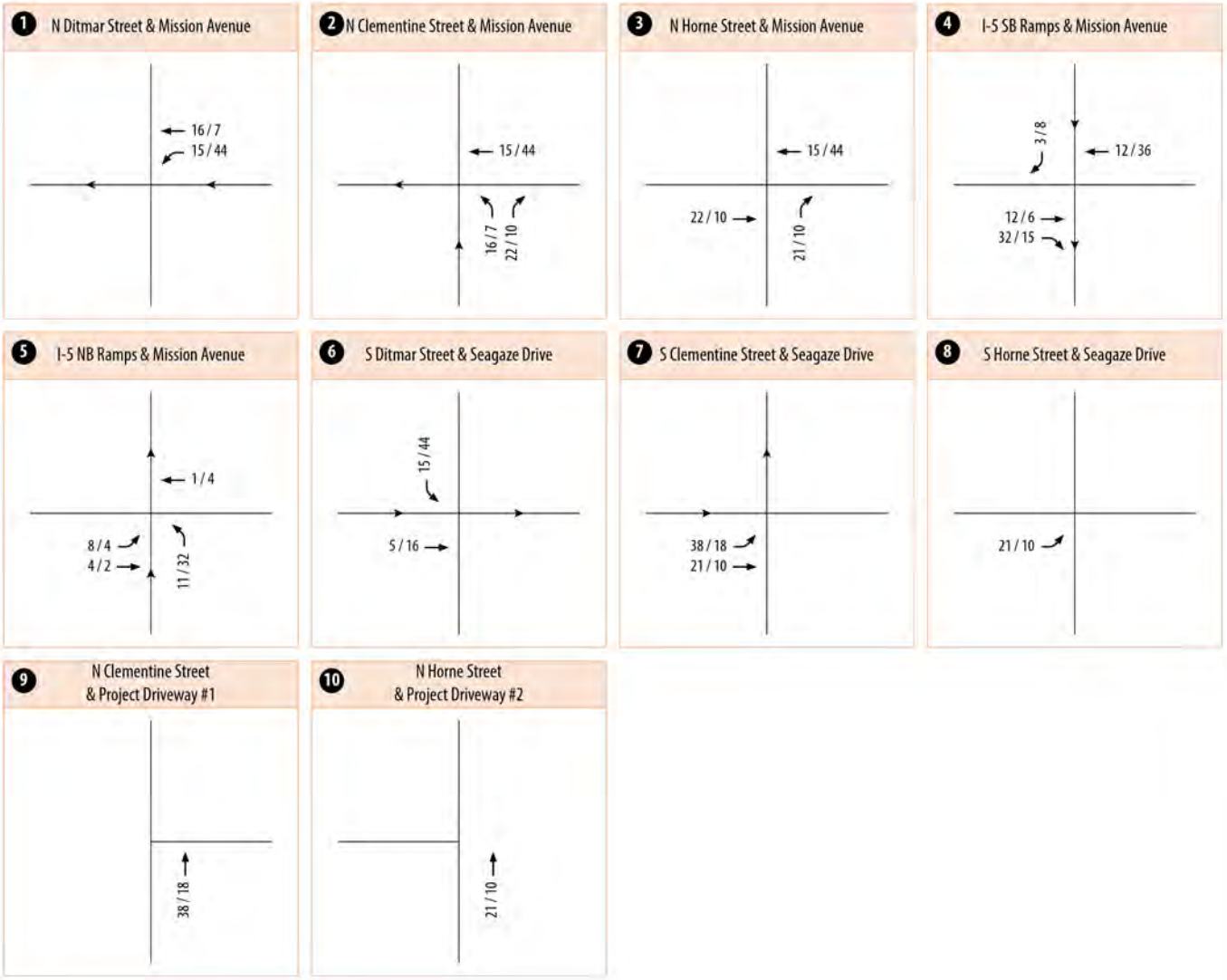
*Project Trip Assignment*
*Sunsets Mixed-Use*




**901 Mission Avenue**
**Project Information Form**

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*Project Trip Assignment*
*Pier View Way Mixed-Use*

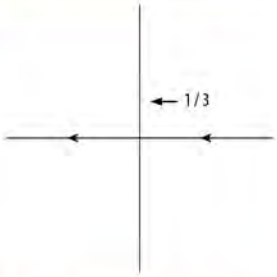



**901 Mission Avenue**
**Project Information Form**

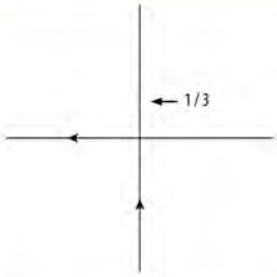
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*Project Trip Assignment*
*716 Seagaze Drive*

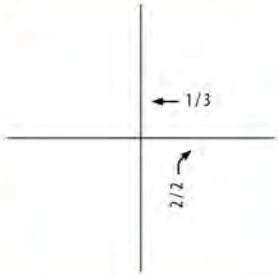
**1** N Ditmar Street & Mission Avenue



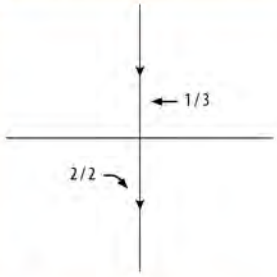

**2** N Clementine Street & Mission Avenue



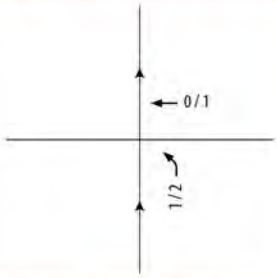

**3** N Horne Street & Mission Avenue



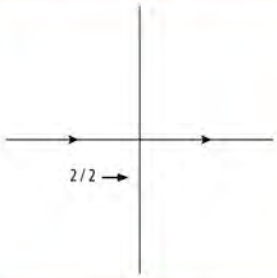

**4** I-5 SB Ramps & Mission Avenue



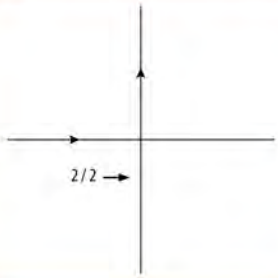

**5** I-5 NB Ramps & Mission Avenue




**6** S Ditmar Street & Seagaze Drive



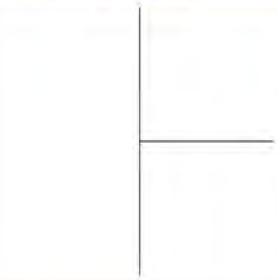

**7** S Clementine Street & Seagaze Drive




**8** S Horne Street & Seagaze Drive




**9** N Clementine Street & Project Driveway #1



**10** N Horne Street & Project Driveway #2




X Study Intersection

Turn Movements

AM / PM Peak Hour Volumes

One-Way Roadway

*Names of North-South cross-streets always listed first

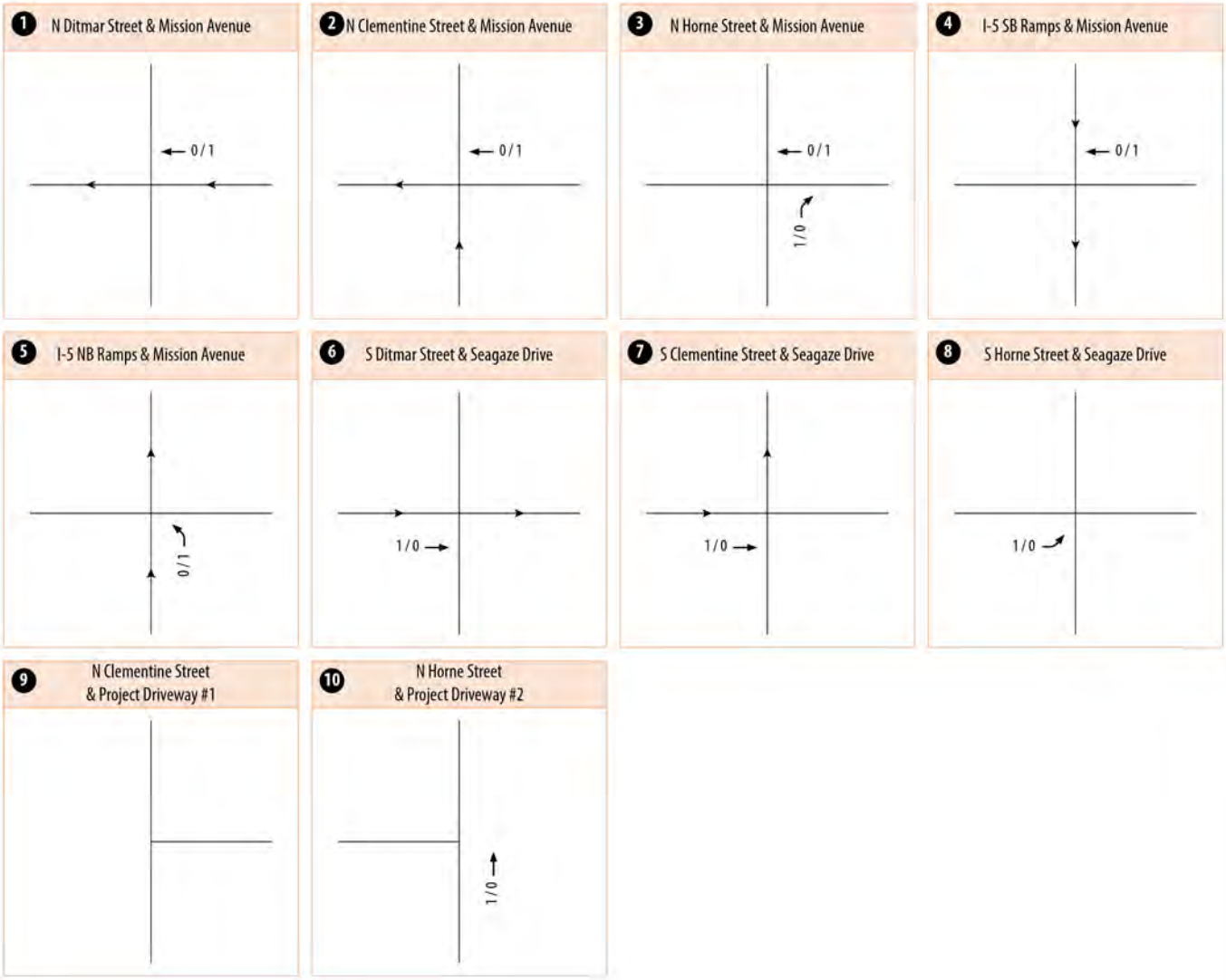
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**901 Mission Avenue**
**Project Information Form**

C+R

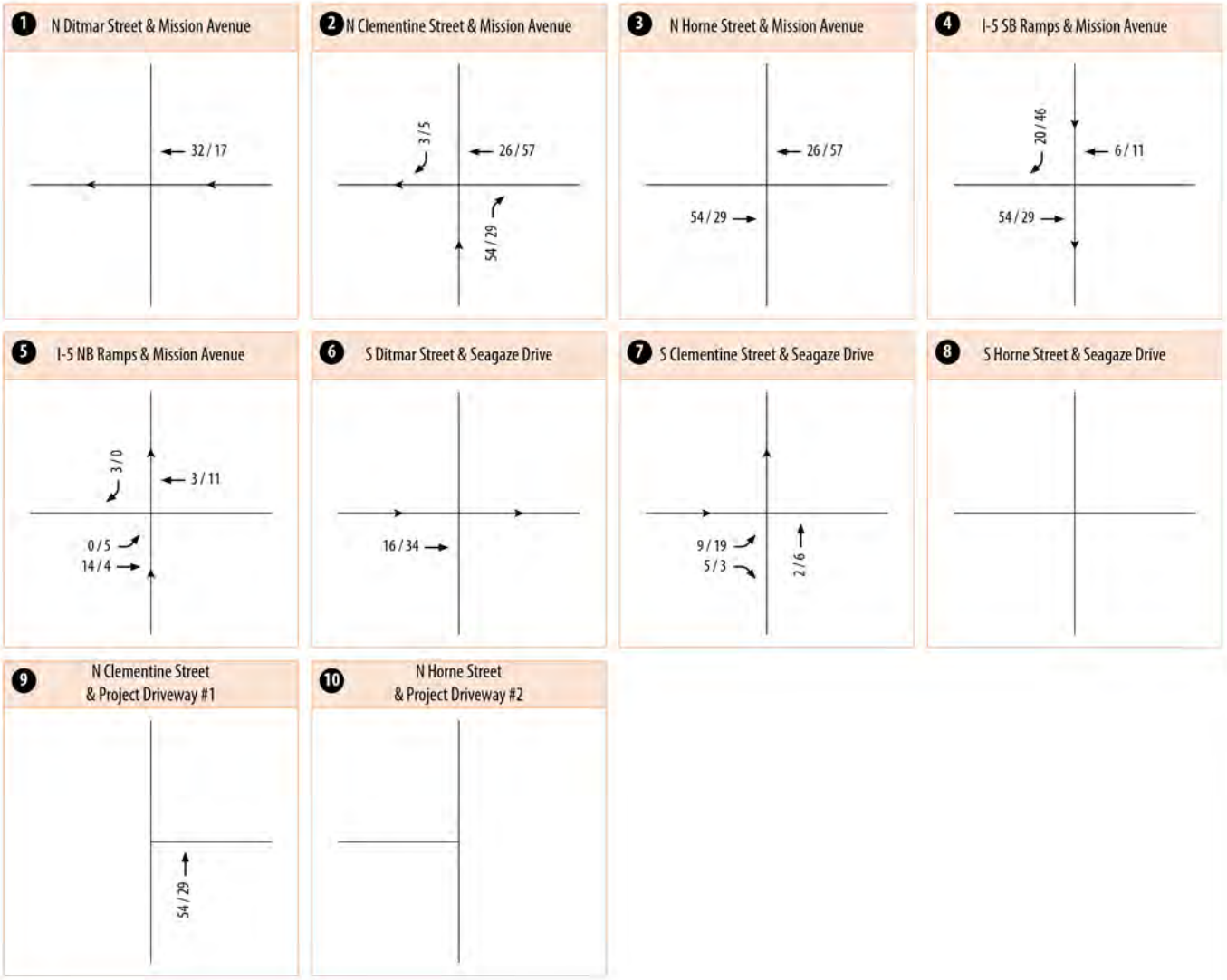
*Project Trip Assignment*
*One 11 S Tremont*




**901 Mission Avenue**
**Project Information Form**

C R

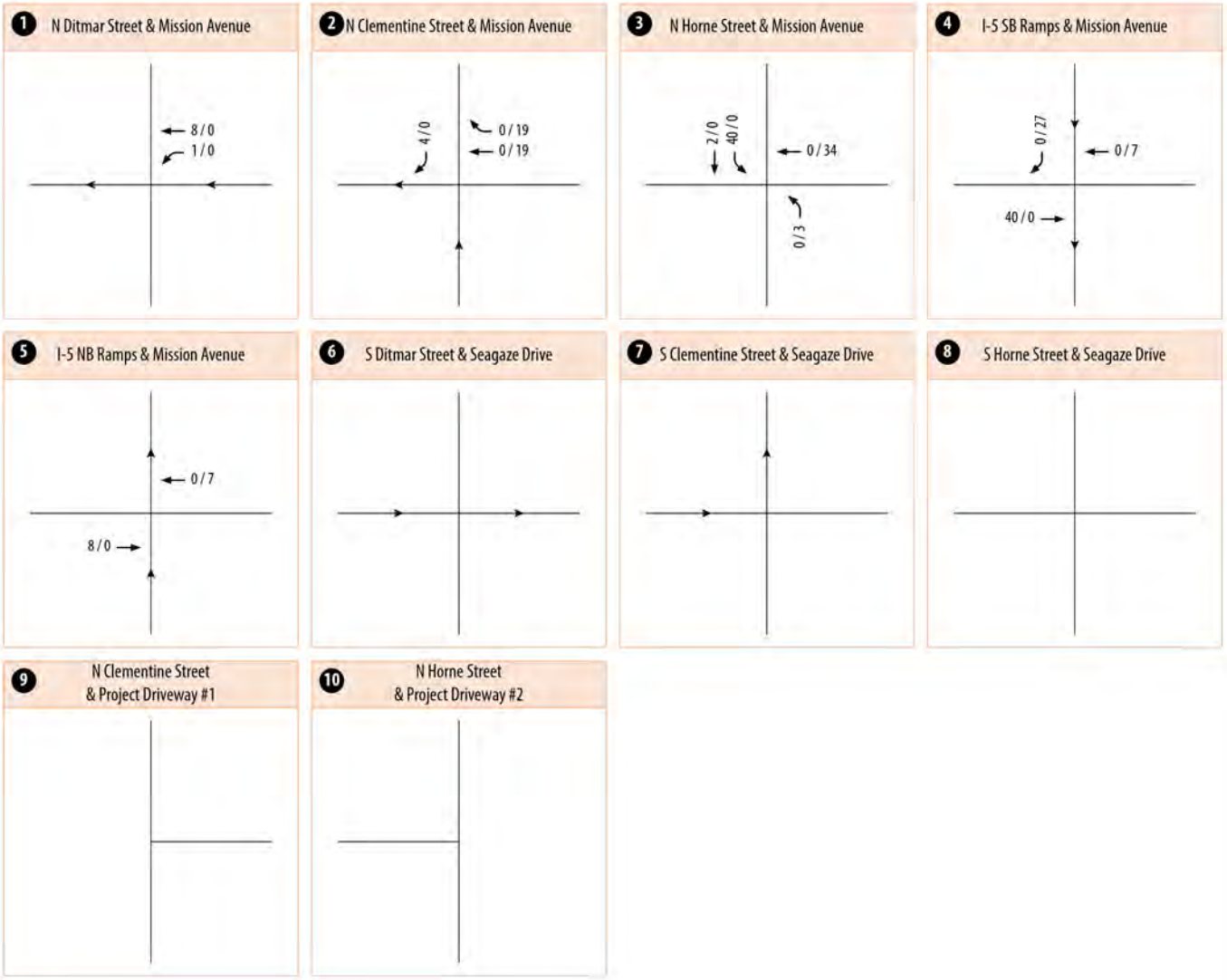
*Project Trip Assignment*
*405 S Tremont Condos*




**901 Mission Avenue**
**Project Information Form**

C R

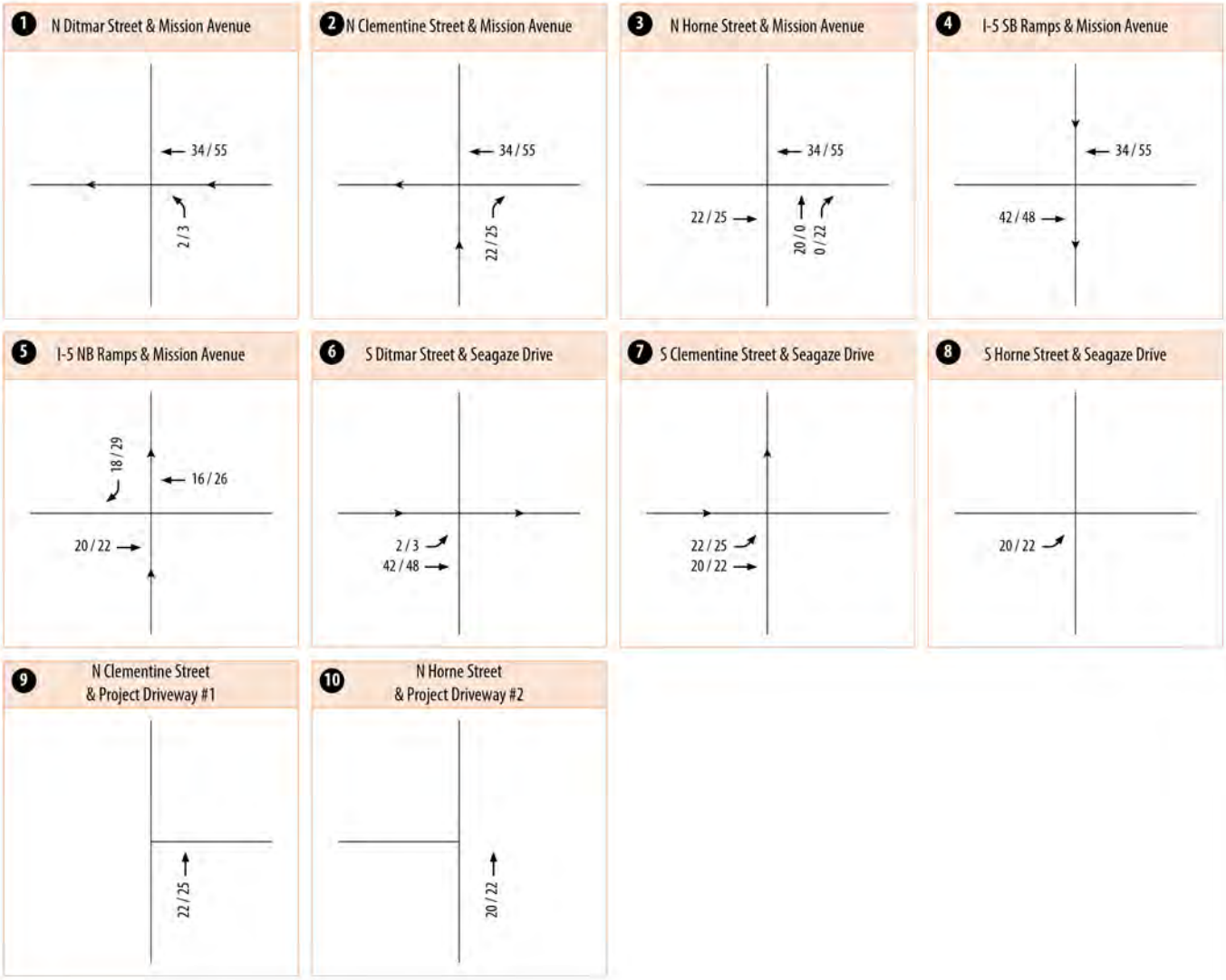
*Project Trip Assignment*
*801 Mission Avenue*




**901 Mission Avenue**
**Project Information Form**

C R

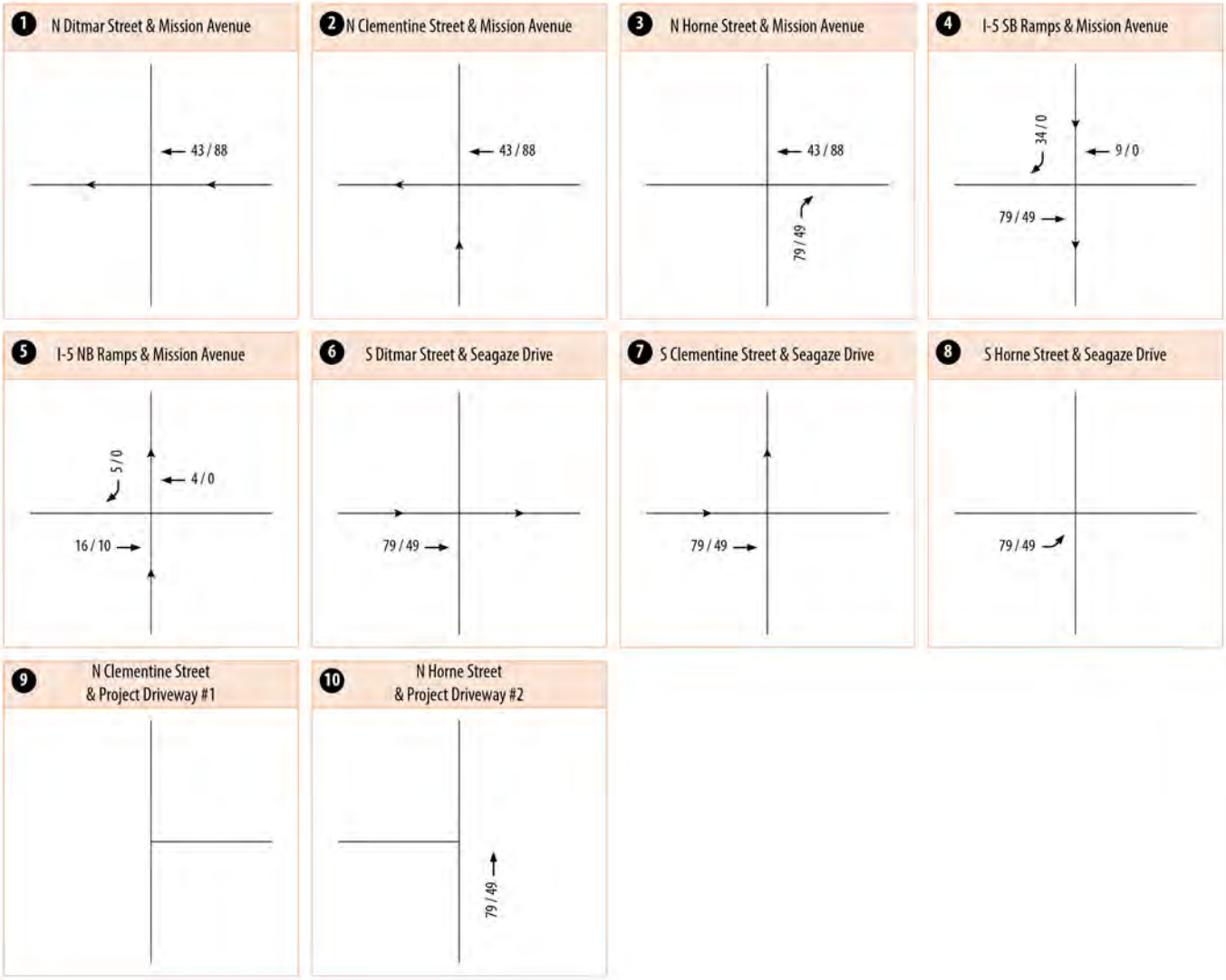
*Project Trip Assignment*
*810 Mission Avenue*




**901 Mission Avenue**
**Project Information Form**

C+R

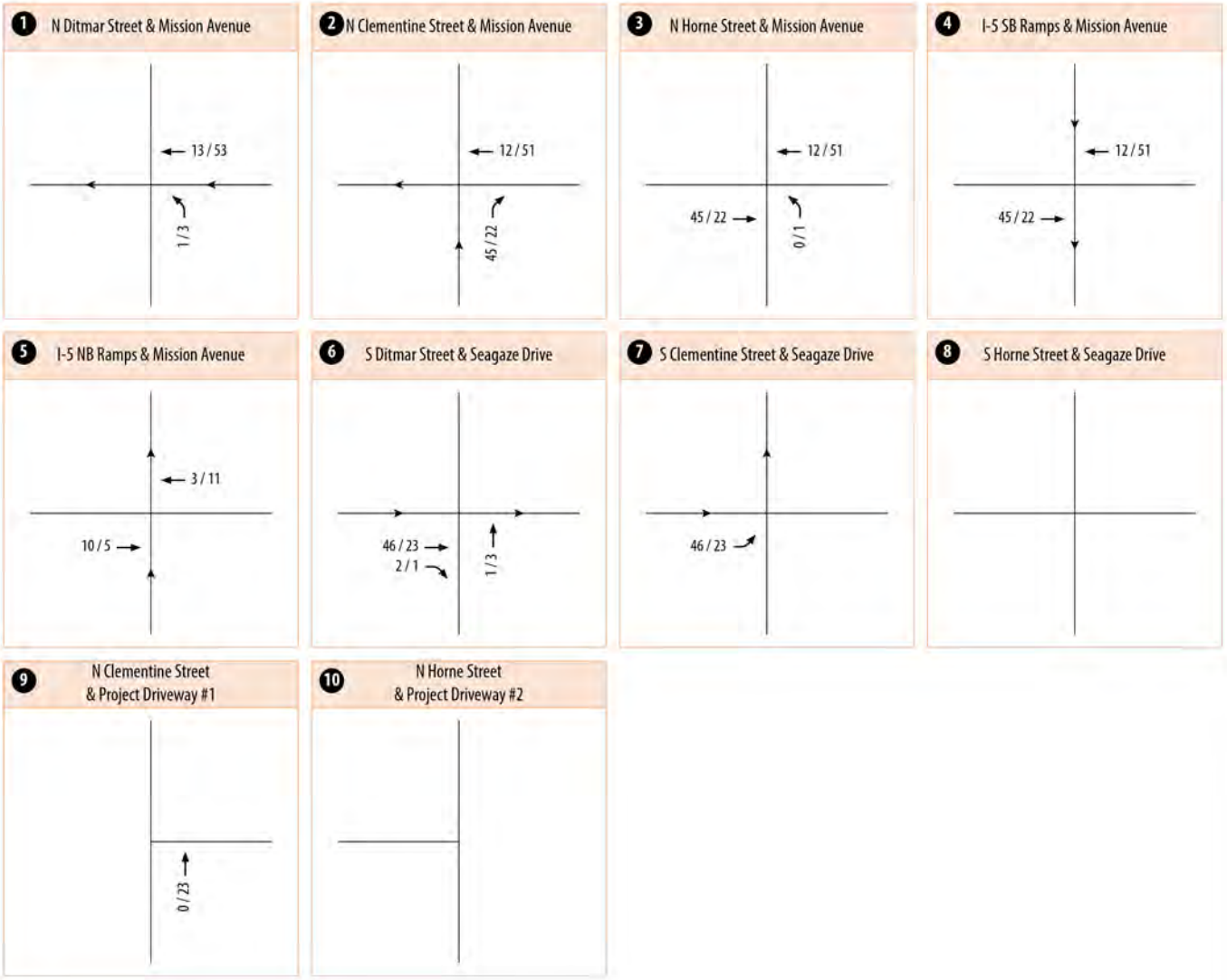
*Project Trip Assignment*
*Oceanside Transit Center*




**901 Mission Avenue**
**Project Information Form**

C+R

*Project Trip Assignment*
*401 Mission Avenue*




X Study Intersection

Turn Movements

AM / PM Peak Hour Volumes

One-Way Roadway

*Names of North-South cross-streets always listed first

NORTH

NOT TO SCALE

**901 Mission Avenue**
**Project Information Form**

C R

*Project Trip Assignment*
*Oceanside Blocks 5 & 20*

# 4 PROJECT TRAFFIC

This section describes the estimated trip generation, trip distribution, and assignment of trips to the adjacent roadway network.

## 4.1 Trip Generation

Trip generation rates published by the SANDAG *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002 were applied to the existing and proposed uses on site in order to estimate the traffic generation characteristics of the site. The trip generation was estimated for the AM and PM peak-hour and daily traffic. **Table 4-1** summarizes the weekday trip generation rates and calculations.

Table 4-1
Project Trip Generation

| TRIP GENERATION RATES[1] | | | | | | |
|---|---|---|---|---|---|---|
| | | AM PEAK | | PM PEAK | | |
| Land Use | Weekday Daily | % ADT | In:Out Ratio | % ADT | In:Out Ratio | |
| Condominium/Multi-family 6-20 du/ac | 8 trips / du | 8% | 0.20 : 0.80 | 10% | 0.70 : 0.30 | |
| Specialty Retail | 40 trips / ksf | 3% | 0.60 : 0.40 | 9% | 0.50 : 0.50 | |

| TRIP GENERATION CALCULATIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AM PEAK | | | PM PEAK | | |
| Land Use | Amount | ADT | In | Out | Total | In | Out | Total |
| **Existing Use** | | | | | | | | |
| Multi-family | 2 du | 16 | 1 | 1 | 2 | 2 | 0 | 2 |
| **Subtotal** | | **16** | **1** | **1** | **2** | **2** | **0** | **2** |
| **Proposed Use** | | | | | | | | |
| Multi-family | 64 du | 512 | 9 | 32 | 41 | 37 | 15 | 52 |
| Specialty Retail | 2.450 ksf | 98 | 2 | 1 | 3 | 5 | 4 | 9 |
| **Subtotal** | | **610** | **11** | **33** | **44** | **42** | **19** | **61** |
| **Net Traffic** | | **594** | **10** | **32** | **42** | **40** | **19** | **59** |

Notes:
ksf: 1,000 sf, du: dwelling unit
1. Based on the data provided in the *SANDAG's Brief Guide of Vehicular Trip Generation Rates for the San Diego Region, April 2002.*

As shown in the table, the existing use is estimated to generate 16 daily trips with 2 AM peak-hour trips and 2 PM peak-hour trips. The Project is estimated to generate 610 daily trips with 44 AM peak-hour trips and 61 PM peak-hour trips at the project driveways and resulting in a net of 594 daily trips with 42 AM peak-hour trips and 59 PM peak-hour trips. It should be noted that no passby trip reductions were applied and the analysis would represent a conservative estimate.

## 4.2 Trip Distribution

Based on existing travel patterns in the study area and on logical connections to the local area, the following list shows the assumed project trip distribution for the proposed project:

- 10 percent to/from the north via Horne Street
- 10 percent to/from the south via Horne Street
- 50 percent to/from the east via Mission Avenue
- 30 percent to/from the west
    - 10 percent via Pier View Way
    - 20 percent via Mission Avenue

**Figure 4-1** display the assumed Project trip distribution through the study intersections.

## 4.3 Trip Assignment

Based on the Project trip generation and distribution, the Project trips were assigned to the study area. **Figure 4-2** illustrates the trip assignment for the Project.

# 10.0 ANALYSIS OF NEAR-TERM CONDITIONS

The following section presents the analysis of study area intersections and street segments under Near-Term conditions without and with the proposed Project.

## 10.1 Near-Term Traffic Volumes

Near-Term without Project traffic volumes were calculated by adding the cumulative projects traffic volumes onto the Existing traffic volumes. Near-Term + Project traffic volumes were calculated by then adding the Project traffic volumes.

***Figure 10–1*** shows the Near-Term traffic volumes. ***Figure 10–2*** shows the Near-Term + Project traffic volumes.

## 10.2 Near-Term without Project Conditions

### 10.2.1 *Peak Hour Intersection Analysis*

***Table 10–1*** summarizes the peak hour intersection operations under Near-Term conditions. As shown, the study area intersections are calculated to operate acceptably at LOS D or better during the AM and PM peak hours.

***Appendix G*** contains the Near-Term intersection analysis worksheets.

### 10.2.2 *Daily Street Segment Operations*

***Table 10–2*** summarizes street segment operations along the study area roadways under Near-Term conditions. As shown, the study area street segments are calculated to operate acceptably at LOS B or better.

## 10.3 Near-Term + Project Conditions

### 10.3.1 *Peak Hour Intersection Analysis*

*Table 10–1* summarizes the peak hour intersection operations under Near-Term + Project conditions. As shown, the study area intersections are calculated to continue to operate acceptably at LOS D or better during the AM and PM peak hours with the addition of Project trips and therefore, based on the City of Oceanside's traffic thresholds and methodology summarized in *Section 4*, roadway improvements are not required.

***Appendix H*** contains the Near-Term + Project intersection analysis worksheets.

### 10.3.2 *Daily Street Segment Operations*

*Table 10–2* summarizes the street segment operations along the study area roadways under Near-Term + Project conditions. As shown, the study area street segments are calculated to continue to operate acceptably at LOS B or better with the addition of Project trips and therefore, based on the City of Oceanside's traffic thresholds and methodology summarized in *Section 4*, roadway improvements are not required.

## TABLE 10–1
## NEAR-TERM INTERSECTION OPERATIONS

| Intersection | Control Type | Peak Hour | Near-Term | | Near-Term + Project | | Delay Δ [c] | Improvement Required? |
|---|---|---|---|---|---|---|---|---|
| | | | Delay[a] | LOS[b] | Delay | LOS | | |
| 1. Mission Ave / Nevada St | MSSC[d] | AM | 15.2 | C | 16.4 | C | 1.2 | No |
| | | PM | 19.6 | C | 22.5 | C | 2.9 | |
| 2. Mission Ave / Horne St | Signal | AM | 27.4 | C | 27.5 | C | 0.1 | No |
| | | PM | 38.0 | D | 38.9 | D | 0.9 | |
| 3. Alley / Ditmar St | MSSC | AM | 7.3 | A | 8.8 | A | 1.5 | No |
| | | PM | 9.6 | A | 9.7 | A | 0.1 | |
| 4. Alley / Nevada St | MSSC | AM | 9.7 | A | 9.8 | A | 0.1 | No |
| | | PM | 9.2 | A | 9.4 | A | 0.2 | |
| 5. Seagaze Dr / Nevada St | MSSC | AM | 10.2 | B | 10.4 | B | 0.2 | No |
| | | PM | 14.7 | B | 14.8 | B | 0.1 | |
| 6. Alley / Future Project Driveway 1 (west)[e] | MSSC | AM | - | - | 8.7 | A | - | No |
| | | PM | - | - | 8.9 | A | - | |
| 7. Alley / Future Project Driveway 2 (east) [e] | MSSC | AM | - | - | 8.6 | A | - | No |
| | | PM | - | - | 8.7 | A | - | |

***Footnotes:***

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes the increase in delay due to Project.
d. MSSC = Minor Street Stop Controlled Intersection. Worst-Case delay reported.
e. Intersection does not exist under "without Project" conditions.

| SIGNALIZED | | UNSIGNALIZED | |
|---|---|---|---|
| DELAY/LOS THRESHOLDS | | DELAY/LOS THRESHOLDS | |
| Delay | LOS | Delay | LOS |
| 0.0 ≤ 10.0 | A | 0.0 ≤ 10.0 | A |
| 10.1 to 20.0 | B | 10.1 to 15.0 | B |
| 20.1 to 35.0 | C | 15.1 to 25.0 | C |
| 35.1 to 55.0 | D | 25.1 to 35.0 | D |
| 55.1 to 80.0 | E | 35.1 to 50.0 | E |
| ≥ 80.1 | F | ≥ 50.1 | F |

# 8.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

## 8.1 Trip Generation

Trip generation rates were obtained from the (Not So) *Brief guide of Vehicular Traffic Generation Rates for the San Diego Region* (April 2002) by SANDAG. The "Residential, Apartment" (6 ADT / DU)" were used for the apartments, and the "Specialty Retail" (40 ADT /KSF)" trip rates were used for the local serving retail to estimate the Project trip generation.

The site is currently developed with approximately 79,805 SF of specialty retail and theater uses. The trip generation of this existing land use was tabulated using the published SANDAG rates for "Specialty Retail". To be conservative, the SANDAG theater trip generation rate was not used due to downtown nature of this particular theater.

### 8.1.1 *Mode Split/Existing Use to be Removed*

The proposed project is a mixed-Use development with easy access to transit and within walking distance to the beach. The Oceanside transit center is within a 5-minute walking distance (150 ft) from the project site. Furthermore, the project site is located within downtown area.

Given the proximity of project to active mode transportation, project trips were adjusted to reflect the characteristics of these mode users. The active user trip credit rates were obtained from Peak Commute Mode Choice rates provided by SANDAG. A copy of SANDAG Jurisdictional Mode Choice Report is provided in ***Appendix E***. Based on the report, 4% for transit, 3% for bicycling, and 2% for walking trip reduction rates were applied to the project trips. These percentages are considered lower than what could occur, providing a conservative analysis.

The site is currently developed with approximately 79,800 sf of various commercial/entertainment uses which will be demolished. A list of existing site uses is provided as ***Appendix A***.

After accounting for the existing retail to be removed and the mode split, the net Project traffic generation is calculated to be 827 ADT, with 196 AM peak hour and 58 PM peak hour trips. ***Table 8–1*** summarizes the trip generation for the Project.

## 8.2 Trip Distribution and Assignment

Project traffic was distributed to the street system based on existing traffic patterns in the area, the Project's proximity to freeways and arterials, locations of retail, places of employment, schools, and other shopping opportunities, and the presence of one-way streets in the study area. The trip distribution was developed in consultation with City staff.

This distribution included 43% of the Project trips assigned to the east and 15% to the west on Mission Avenue. It also included 25% to the north and 10% to the south on N. Coast Highway. The remaining 5% of the Project trips were assigned on N Cleveland Street, north of the site and 2% of the Project trips were assigned on S Tremont Street, south of the site. ***Figure 8–1*** shows the Project trip distribution and ***Figure 8–2*** shows the Project traffic volume.

As discussed earlier, the Project proposes to demolish the existing site uses. It should be noted that the existing site does not have an onsite parking. Based on the observations and proximity to existing site, it is assumed that a public parking lot located at the northeast corner of Mission Avenue and Mayers Street intersection is used by tenants of existing site.

The proposed project is proposing parking within the project site and will be accessed via a driveway on Seagaze Drive. Since the existing site and proposed project have different trip origin / destination and they have different parking access, the trip distribution and assignments will be different . Therefore, in order to calculate the net project trips in the study area, the existing site distribution and assignment were calculated separately and subtracted from the proposed project trips at each study intersection and segment. It should be noted that although the net trips at some approaches were negative, we assumed those trips as zero.

***Figure 8–3*** shows the Existing Site trip distribution and ***Figure 8–4*** shows the Existing Site Project traffic volume.

***Figure 8–5*** shows the net Project traffic volumes. ***Figure 8-6*** shows the Existing + Project traffic volumes.

## TABLE 8-1
## PROJECT TRIP GENERATION

| Land Use | Size | Daily Trip Ends (ADTs) | | AM Peak Hour | | | | | PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate [a] | Volume | % of ADT | In:Out Split | Volume In | Volume Out | Volume Total | % of ADT | In:Out Split | Volume In | Volume Out | Volume Total |
| ***Proposed*** | | | | | | | | | | | | | |
| Apartments | 332 DU | 6 /DU[b] | 1,992 | 8% | 20 : 80 | 32 | 127 | 159 | 9% | 70 : 30 | 125 | 54 | 179 |
| Retail | 8,311 SF | 40 /KSF[c] | 332 | 3% | 60 : 40 | 6 | 4 | 10 | 9% | 50 : 50 | 15 | 15 | 30 |
| Restaurant | 11,109 SF | 160 /KSF[d] | 1,777 | 8% | 50 : 50 | 71 | 71 | 142 | 8% | 60 : 40 | 85 | 57 | 142 |
| **Subtotal** | | | **4,101** | | | **109** | **202** | **311** | | | **225** | **126** | **351** |
| ***Spli Mode[f]*** | | | | | | | | | | | | | |
| Transit | Daily | 4% | (164) | | | (4) | (8) | (12) | | | (9) | (5) | (14) |
| Bicycle | Daily | 3% | (123) | | | (3) | (6) | (9) | | | (7) | (4) | (11) |
| Pedestrian | Daily | 2% | (82) | | | (2) | (4) | (6) | | | (5) | (3) | (8) |
| **Total Trip Reduction** | | | (369) | | | **(10)** | **(18)** | **(28)** | | | **(20)** | **(11)** | **(33)** |
| **Proposed Project Total Trips** | | | **3,732** | | | **99** | **184** | **283** | | | **205** | **115** | **319** |
| ***Existing (to be demolished)*** | | | | | | | | | | | | | |
| Specialty Retail | 79,805 SF | 40 /KSF[e] | 3,192 | 3% | 60 : 40 | 58 | 38 | 96 | 9% | 50 : 50 | 144 | 143 | 287 |
| **Subtotal** | | | **3,192** | | | **58** | **38** | **96** | | | **144** | **143** | **287** |
| ***Split Mode[f]*** | | | | | | | | | | | | | |
| Transit | Daily | 4% | (128) | | | (2) | (2) | (4) | | | (6) | (6) | (1) |
| Bicycle | Daily | 3% | (96) | | | (2) | (1) | (3) | | | (4) | (4) | (9) |
| Pedestrian | Daily | 2% | (64) | | | (1) | (1) | (2) | | | (3) | (3) | (6) |
| **Total Trip Reduction** | | | **(287)** | | | **(5)** | **(3)** | **(9)** | | | **(13)** | **(13)** | **(16)** |
| **Exiting Site Total Trips** | | | **2,905** | | | **53** | **35** | **87** | | | **131** | **130** | **261** |
| ***Net Trips*** | | | ***827*** | | | ***46*** | ***149*** | ***196*** | | | ***74*** | ***(15)*** | ***58*** |

***Footnotes:***

a. Rates are based on SANDAG's *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002.

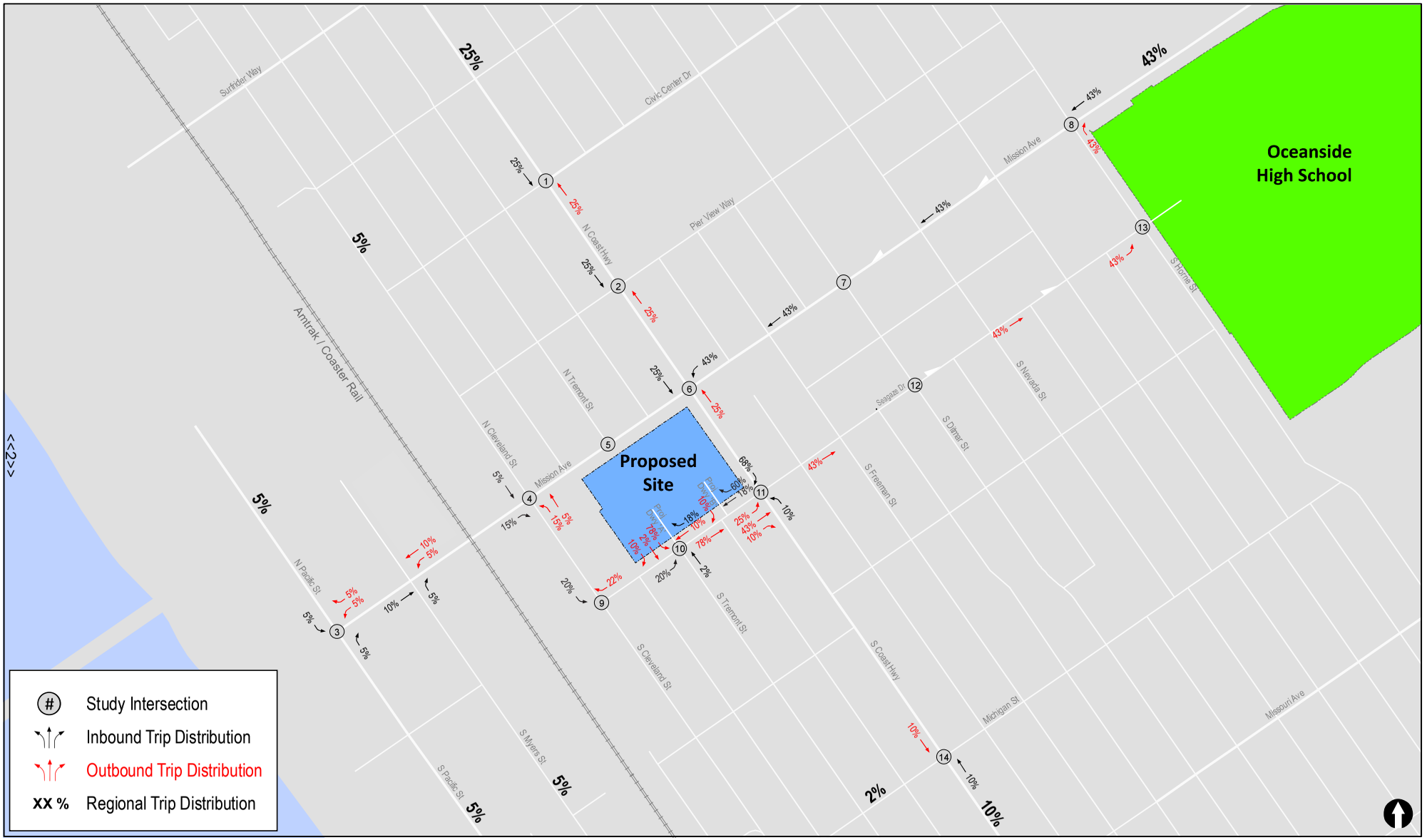
b. Based on apartment rate of 6/DU.

c. Based on specialty retail/strip commercial rate of 40/KSF.

d. Based on sit-down,high turnover rate of 160/KSF.

e. To be conservative, a general retail/restaurant/cinema rate of 40/KSF was used given the amount of vehicular traffic generated in the downtown area compared to a more suburban area.

f. Percentage obtained from SANDAG's Jurisdictional Mode Choice Report.

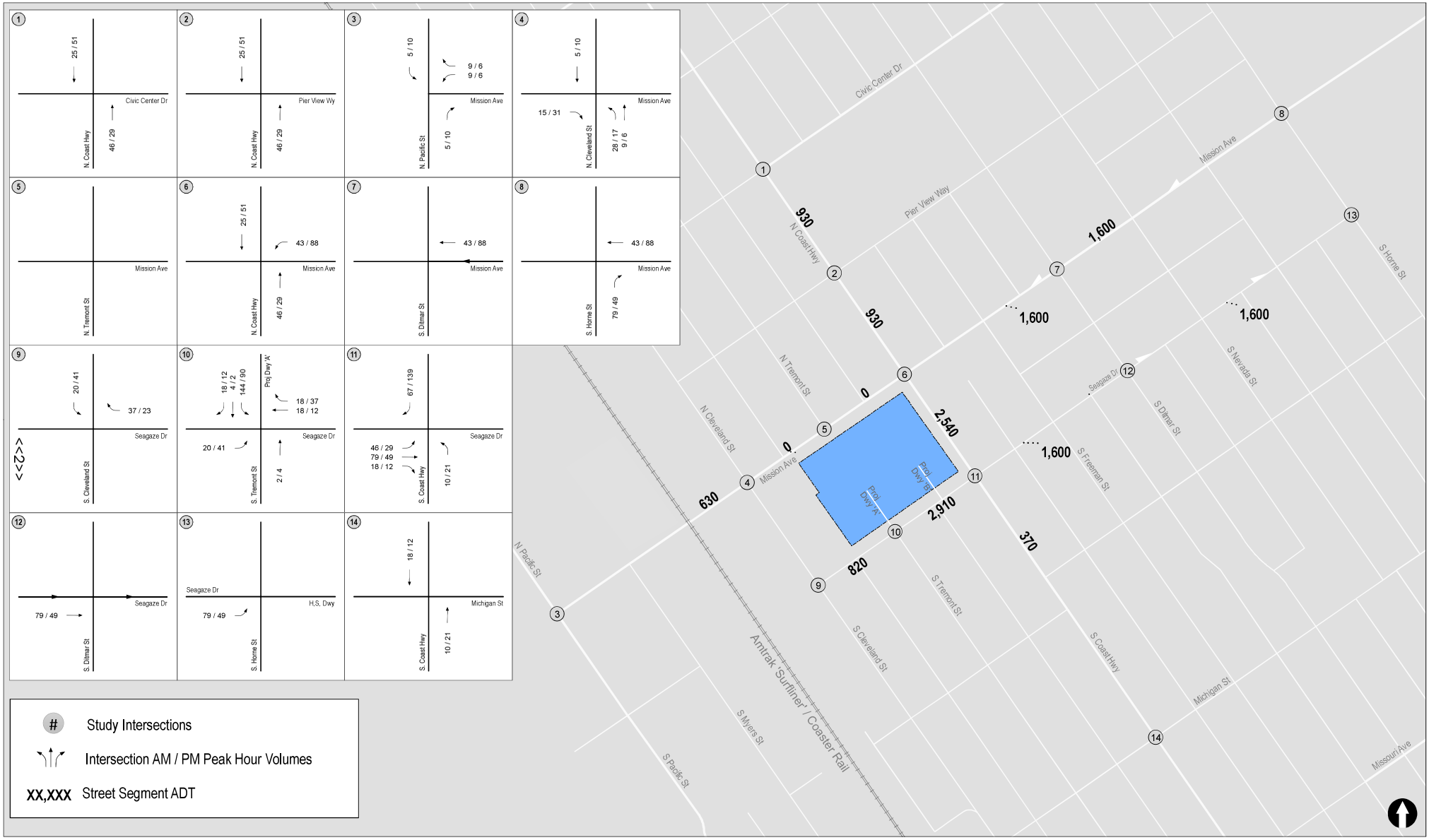



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Figure 8-1

**Proposed Project Trip Distribution**

401 Mission Avenue Project



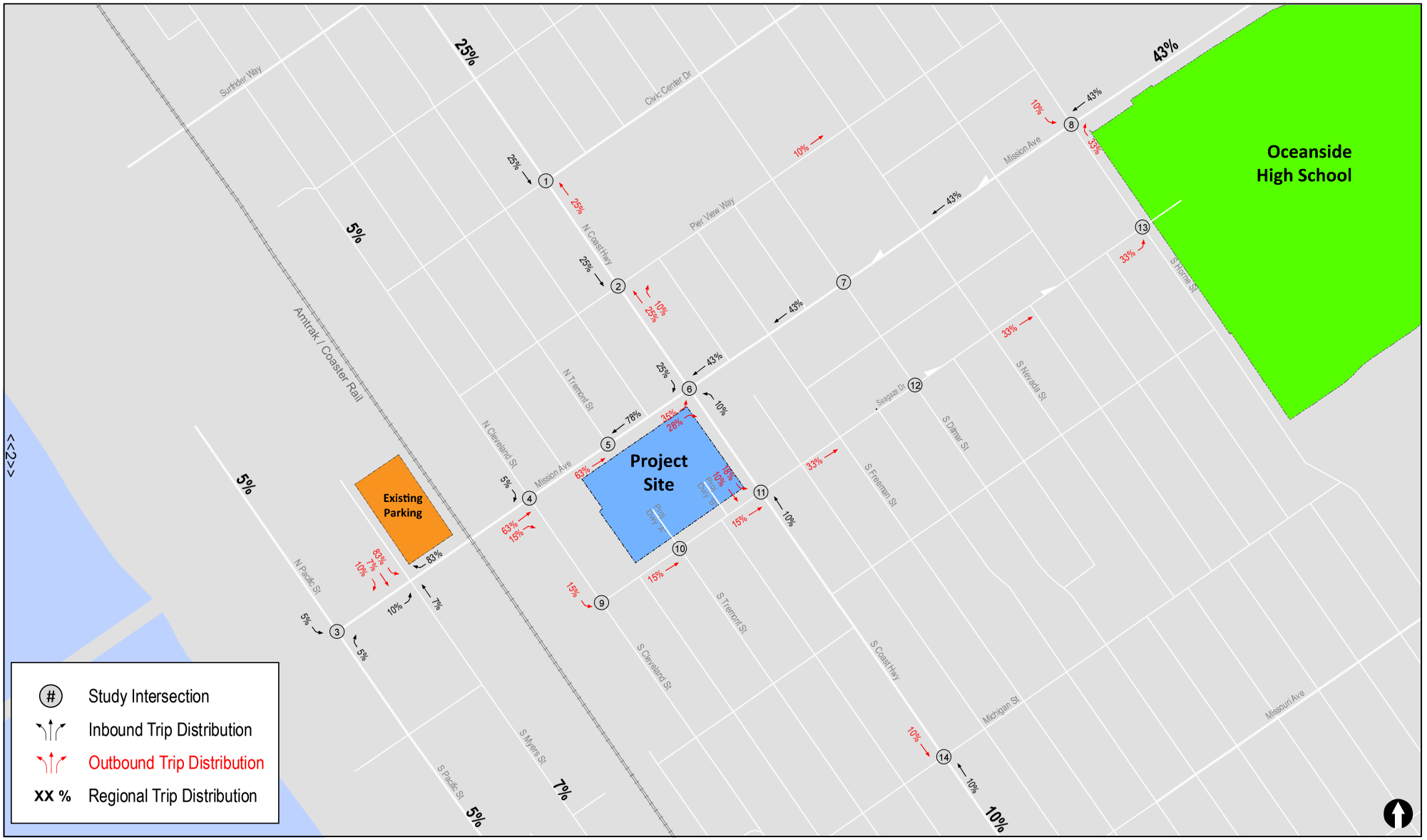

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Figure 8-2

**Proposed Project Traffic Volumes**

401 Mission Avenue Project




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Figure 8-3

**Existing Site Trip Distribution**

401 Mission Avenue Project

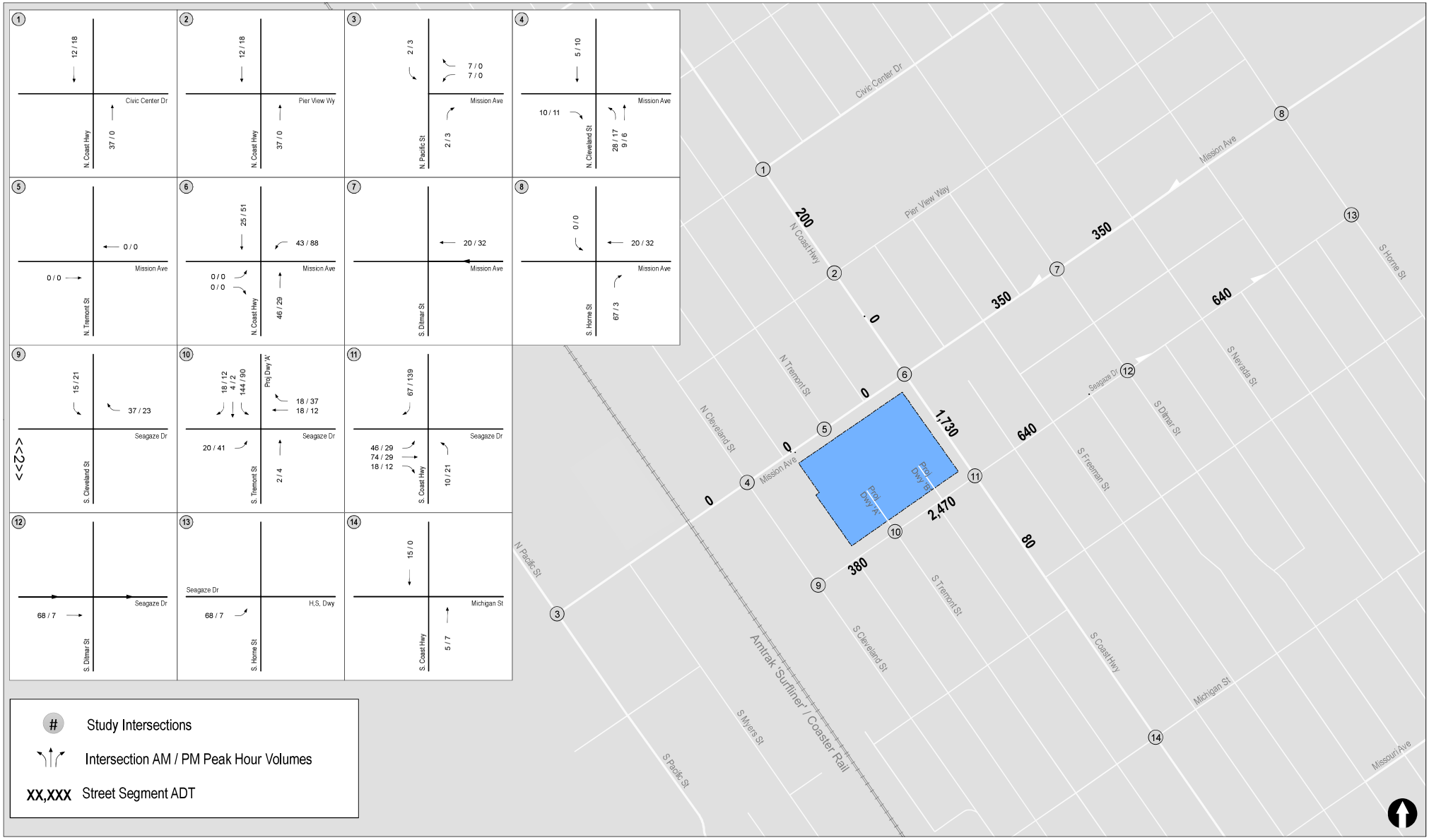



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Figure 8-4

**Existing Site (To Be Demolished) Traffic Volumes**

401 Mission Avenue Project




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Figure 8-5

## Net Project Traffic Volumes

401 Mission Avenue Project




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Time: 10:23 AM

Figure 8-6

## Existing + Net Project Traffic Volumes

401 Mission Avenue Project

## PROJECT INFORMATION FORM (PIF)

**THE FOLLOWING IS TO BE COMPLETED BY THE PROJECT APPLICANT:**

| PROJECT INFORMATION FORM | | | |
|---|---|---|---|
| 1. | **PROJECT DESCRIPTION:** | The project proposes to construct approximately 230 residential units and approximately 6,000 sf of retail / restaurant space. | |
| 2. | **PROJECT LOCATION:** | 801/815 Mission Avenue, Oceanside, CA 92054<br>Downtown District - Sub district 1 | |
| 3. | **LAND USE:** Multi-family residential, commercial/retail (100% restaurant assumed for traffic analysis)<br>**SIZE/DENSITY:** 230 DU / 6 KSF Retail/Restaurant | | |
| 4. | **ZONING AND LAND USE CONSISTENT WITH ADOPTED GENERAL PLAN?** | ☑ Yes | ☐ No |
| 5. | **PROJECT LOCATED IN TRANSIT PRIORITY AREA[1], SMART GROWTH AREA[2], OR LOW VMT AREA[3]?** | ☑ Yes | ☐ No |
| 6. | **PROJECT TRIP GENERATION:** 1,989 **ADT** | ☐ < 200 ADT<br>☐ ≥ 200 ADT<br>☑ ≥ 1,000 ADT<br>☐ ≥ 2,400 ADT | |
| | **ATTACHMENTS** | | |
| A. | **PROJECT LOCATION MAP** | ☑ Attached | |
| B. | **PROJECT TRIP DISTRIBUTION** | ☑ Attached | |
| C. | **PROJECT TRIP ASSIGNMENT** | ☑ Attached | |

1) Projects located in a TPA must be able to access the transit station within a ½ mile walking distance or 6 minute walk continuously without discontinuity of sidewalk or obstructions to the route. Qualifying transit stops means a site containing an existing rail transit station served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (OPR, 2017). A high-quality transit corridor may also be considered if a corridor with fixed route bus service has service intervals no longer than 15 minutes during peak commute hours (OPR, 2017).
(2) See Appendix B.
(3) Based on the most recent SANDAG SB 743 Screening Map. Example shown in Appendix C.

**TO BE COMPLETED BY CITY STAFF AND RETURNED TO PROJECT APPLICANT**

| | PROJECT STUDY REQUIREMENTS | | | |
|---|---|---|---|---|
| **1)** | **Does the project require a CEQA VMT analysis?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |
| | **A. If yes, does the project require a SANDAG Model Run?** | ☐ Yes | ☐ No | |
| **2a)** | **Does the project require a Local Transportation Study?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |
| | **OR** | | | |
| **2b)** | **Does the project require a Local Transportation Assessment?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |

[(1)] Incomplete application or additional information is needed to determine study requirements.

Planning Division Date Transportation Engineering Section Date

## Table 1

### Proposed Project Trip Generation

| Land Use Description | Size | Daily Trip Ends (ADTs) [a] | | AM Peak Hour | | | | | PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate [b] | Volume | % of ADT | In:Out Split | Volume | | | % of ADT | In:Out Split | Volume | | |
| | | | | | | In | Out | Total | | | In | Out | Total |
| High Turnover Restaurant | 6.000 KSF | 160 /KSF | 960 | 8% | 50% : 50% | 39 | 38 | 77 | 8% | 60% : 40% | 46 | 31 | 77 |
| Multi-Family Residential (>20 DU/acre) | 230 DU | 6 /DU | 1,380 | 8% | 20% : 80% | 22 | 88 | 110 | 9% | 70% : 30% | 87 | 37 | 124 |
| **Total** | | | **2,340** | | | **61** | **126** | **187** | | | **133** | **68** | **201** |
| *Mixed Use (10%) Reduction* | | | *234* | | | *6* | *13* | *19* | | | *13* | *7* | *20* |
| *Transit Use (5%) Reduction* | | | *117* | | | *3* | *6* | *9* | | | *7* | *3* | *10* |
| **NET TOTAL TRIP GENERATION** | | | **1,989** | | | **52** | **107** | **159** | | | **113** | **58** | **171** |

***Footnotes:***

a. ADT = Average Daily Traffic

b. Rates are based on SANDAG's *(Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region,* April 2002.

***General Notes:***

1. KSF = 1,000 sq ft
2. DU = Dwelling Units




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Date: 01/29/24

Figure A

**Project Area Map**

801/815 Mission Avenue



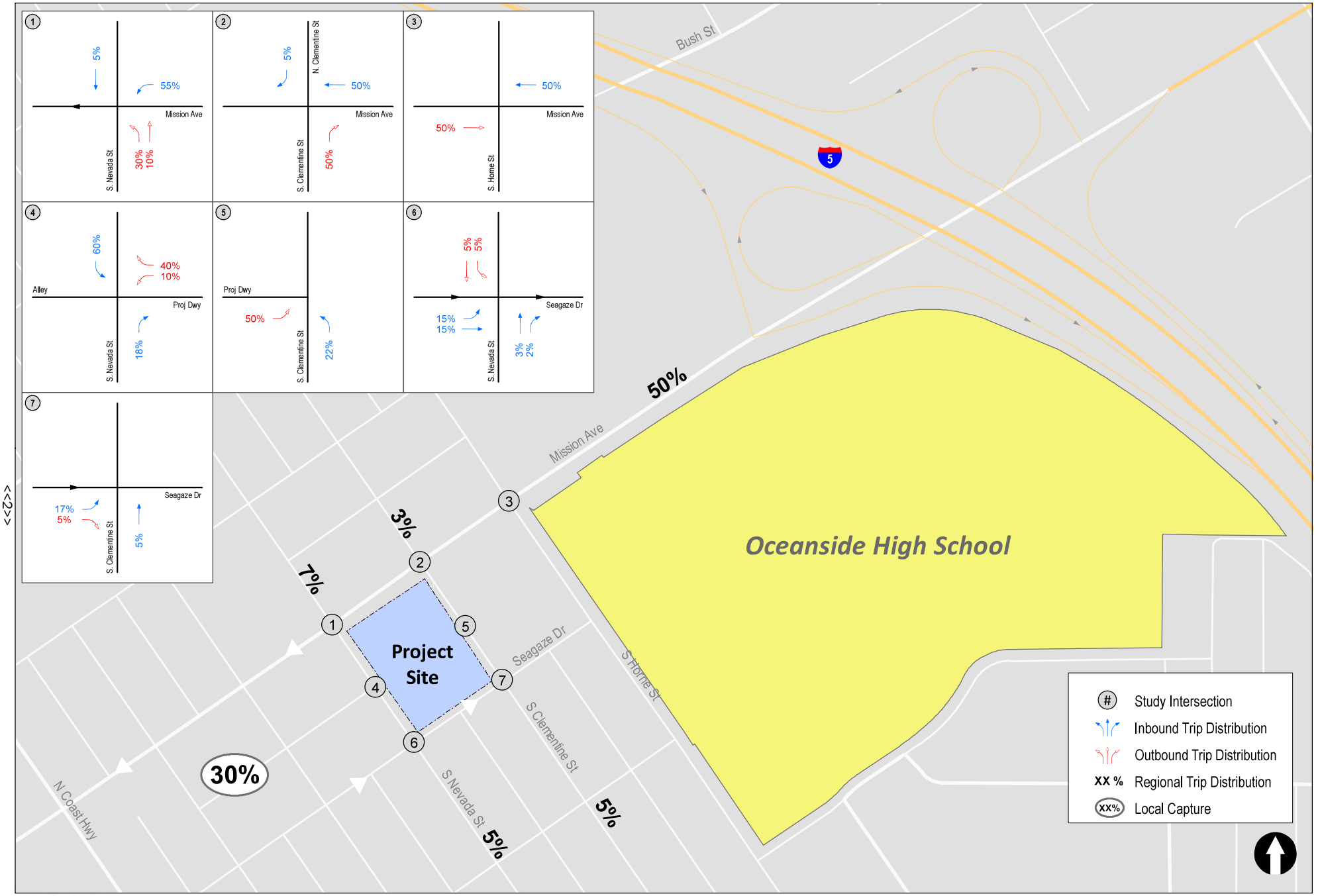

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Figure B

**Site Plan**

801/815 Mission Avenue



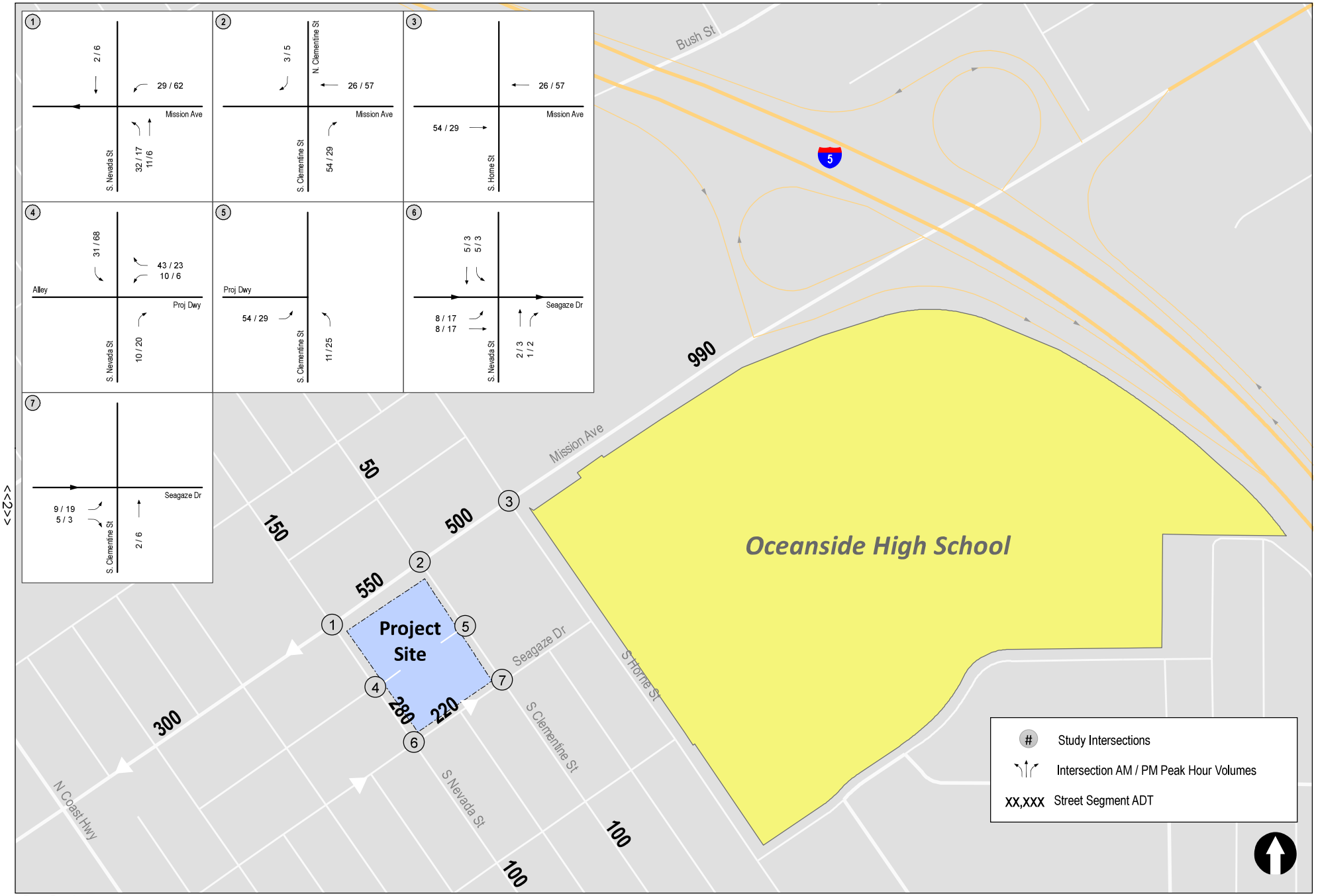

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Date: 5/6/2024
Time: 10:57 AM

Figure C

## Project Traffic Distribuition

801/815 Mission Avenue




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Time: 10:57 AM

Figure D

# Project Traffic Volumes

801/815 Mission Avenue

## PROJECT INFORMATION FORM (PIF)

**THE FOLLOWING IS TO BE COMPLETED BY THE PROJECT APPLICANT:**

| PROJECT INFORMATION FORM | | | |
|---|---|---|---|
| 1. | **PROJECT DESCRIPTION:** | Multifamily Residential - 206 Residential Units (incl. 5 Live/Work units) replacing an existing office building | |
| 2. | **PROJECT LOCATION:** | 810 Mission Ave, Oceanside, CA | |
| 3. | **LAND USE:** Multifamily Residential<br>**SIZE/DENSITY:** 206 DU / 1.4 ACs = 147 DU/AC | | |
| 4. | **ZONING AND LAND USE CONSISTENT WITH ADOPTED GENERAL PLAN?** | ☑ Yes | ☐ No |
| 5. | **PROJECT LOCATED IN TRANSIT PRIORITY AREA[1], SMART GROWTH AREA[2], OR LOW VMT AREA[3]?** | ☑ Yes | ☐ No |
| 6. | **PROJECT TRIP GENERATION:** 680 (net) **ADT** | ☐ < 200 ADT<br>☑ ≥ 200 ADT<br>☐ ≥ 1,000 ADT<br>☐ ≥ 2,400 ADT | |
| | **ATTACHMENTS** | | |
| A. | **PROJECT LOCATION MAP** | ☑ Attached | |
| B. | **PROJECT TRIP DISTRIBUTION** | ☑ Attached | |
| C. | **PROJECT TRIP ASSIGNMENT** | ☑ Attached | |

1) Projects located in a TPA must be able to access the transit station within a ½ mile walking distance or 6 minute walk continuously without discontinuity of sidewalk or obstructions to the route. Qualifying transit stops means a site containing an existing rail transit station served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (OPR, 2017). A high-quality transit corridor may also be considered if a corridor with fixed route bus service has service intervals no longer than 15 minutes during peak commute hours (OPR, 2017).
(2) See Appendix B.
(3) Based on the most recent SANDAG SB 743 Screening Map. Example shown in Appendix C.

**TO BE COMPLETED BY CITY STAFF AND RETURNED TO PROJECT APPLICANT**

| | PROJECT STUDY REQUIREMENTS | | | |
|---|---|---|---|---|
| **1)** | **Does the project require a CEQA VMT analysis?**<br>**A. If yes, does the project require a SANDAG Model Run?** | ☐ Yes<br>☐ Yes | ☐ No<br>☐ No | ☐ Incomplete[(1)] |
| **2a)** | **Does the project require a Local Transportation Study?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |
| | **OR** | | | |
| **2b)** | **Does the project require a Local Transportation Assessment?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |

[(1)] Incomplete application or additional information is needed to determine study requirements.

Planning Division Date Transportation Engineering Section Date

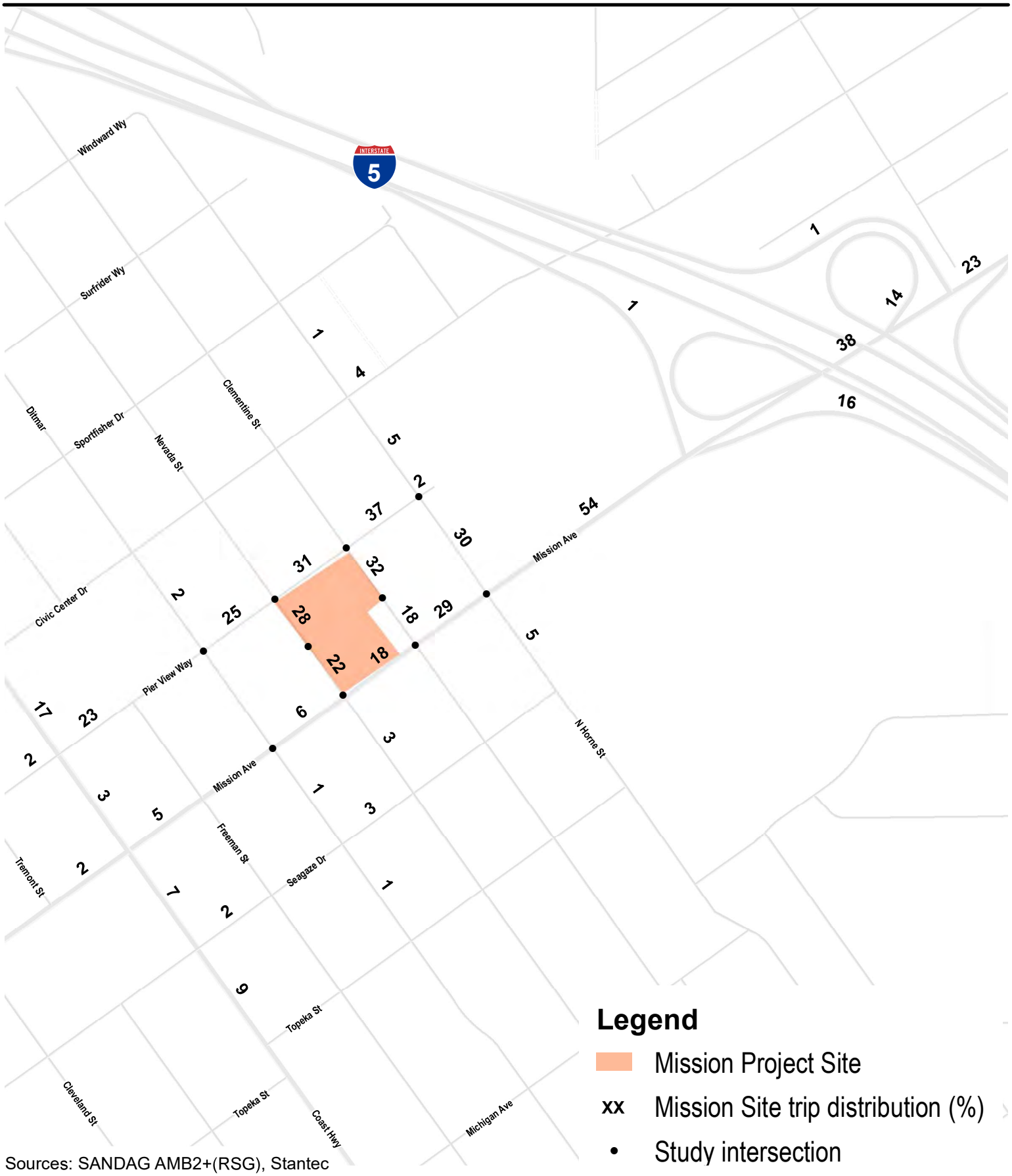
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**Table 1 Trip Generation Summary - 810 Mission Ave Site**

| Land Use | Amount | Trip Rate | ADT | AM Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Peak % | Vol. | In % | Out % | Vol. In | Vol. Out | Peak % | Vol. | In % | Out % | Vol. In | Vol. Out |
| **Proposed Project** | | | | | | | | | | | | | | | |
| Multi-family Residential | 201 DU | 6 | 1,206 | 8% | 96 | 20% | 80% | 19 | 77 | 9% | 109 | 70% | 30% | 76 | 33 |
| Live/Work Units | | | | | | | | | | | | | | | |
| Live Space | 5 DU | 6 | 30 | 8% | 2 | 20% | 80% | 0 | 2 | 9% | 3 | 70% | 30% | 2 | 1 |
| Work Space | 2.2 TSF | 20 | 44 | 14% | 6 | 90% | 10% | 5 | 1 | 13% | 6 | 20% | 80% | 1 | 5 |
| Total Site Trips | | | 1,280 | - | 104 | - | - | 24 | 80 | - | 118 | - | - | 79 | 39 |
| **Existing Use** | | | | | | | | | | | | | | | |
| Office | 30 TSF | 20 | 600 | 14% | 84 | 90% | 10% | 76 | 8 | 13% | 78 | 20% | 80% | 16 | 62 |
| **Net New Trips** | | | **680** | - | **20** | - | - | **-52** | **72** | - | **40** | - | - | **63** | **-23** |

DU = Dwelling Unit
TSF = Thousand Square Feet
SANDAG = San Diego Association of Governments
Work area square footage estimated to be 50% of the total square footage of Live/Work units. Work trip generation based on standard commercial office trip rates.
Existing office use on-site to be removed (square footage is approximate).
Trip Rate Sources - *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region,* SANDAG (2002):
Multi-family Residential = SANDAG land use category "Apartment"
Work Space/Office = SANDAG land use category "Standard Commercial Office"


810 Mission Site
0.5 Miles
235 Tremont Site
Oceanside Transit Center
NCTD-OTC
Oceanside Transportation Center
Oceanside Transit Center
Mission Ave
S Tremont St
S Freeman St
S Nevada St
S Clementine St
S Horne St
S Melvin St
Michigan Ave
Washington Ave
Grant St
Center Ave
Civic Center Dr
N Clementine St
N Cleveland St
Sunrider Way
N Tremont St
Seagaze Dr
S Pacific St
1st St
The Strand
S21
San Diego Fwy
N
1000 ft
Google Earth




Sources: SANDAG AMB2+(RSG), Stantec
(Distribution percentages represent the average of each direction of travel based on average daily trips.
Peak Hour distribution percentages may vary due to differences in directionality and route choices.)

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**Figure 1**
Mission Site Project Trip Distribution

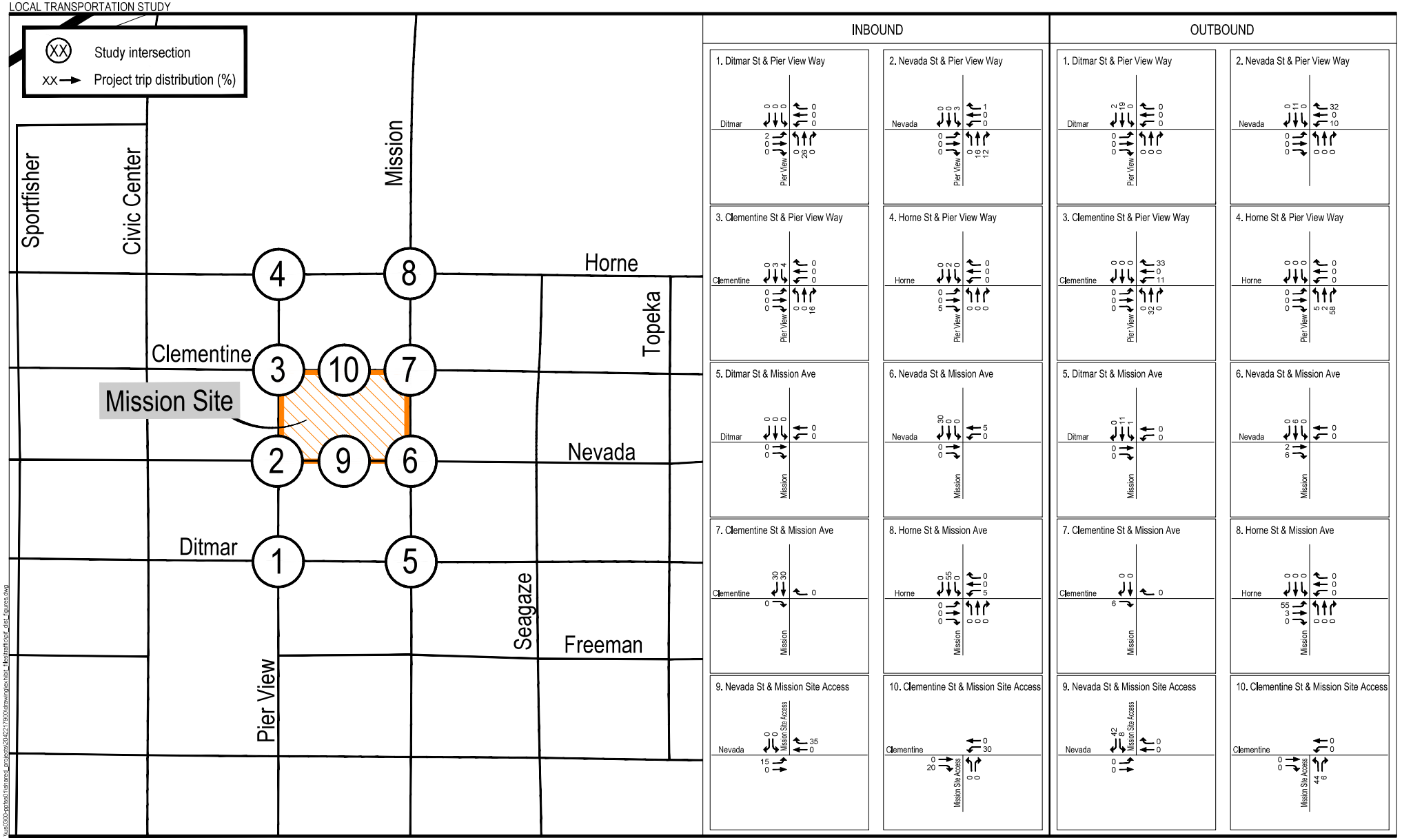



**Figure 2**
Mission Site Project Trip Distribution Percentages
x,x

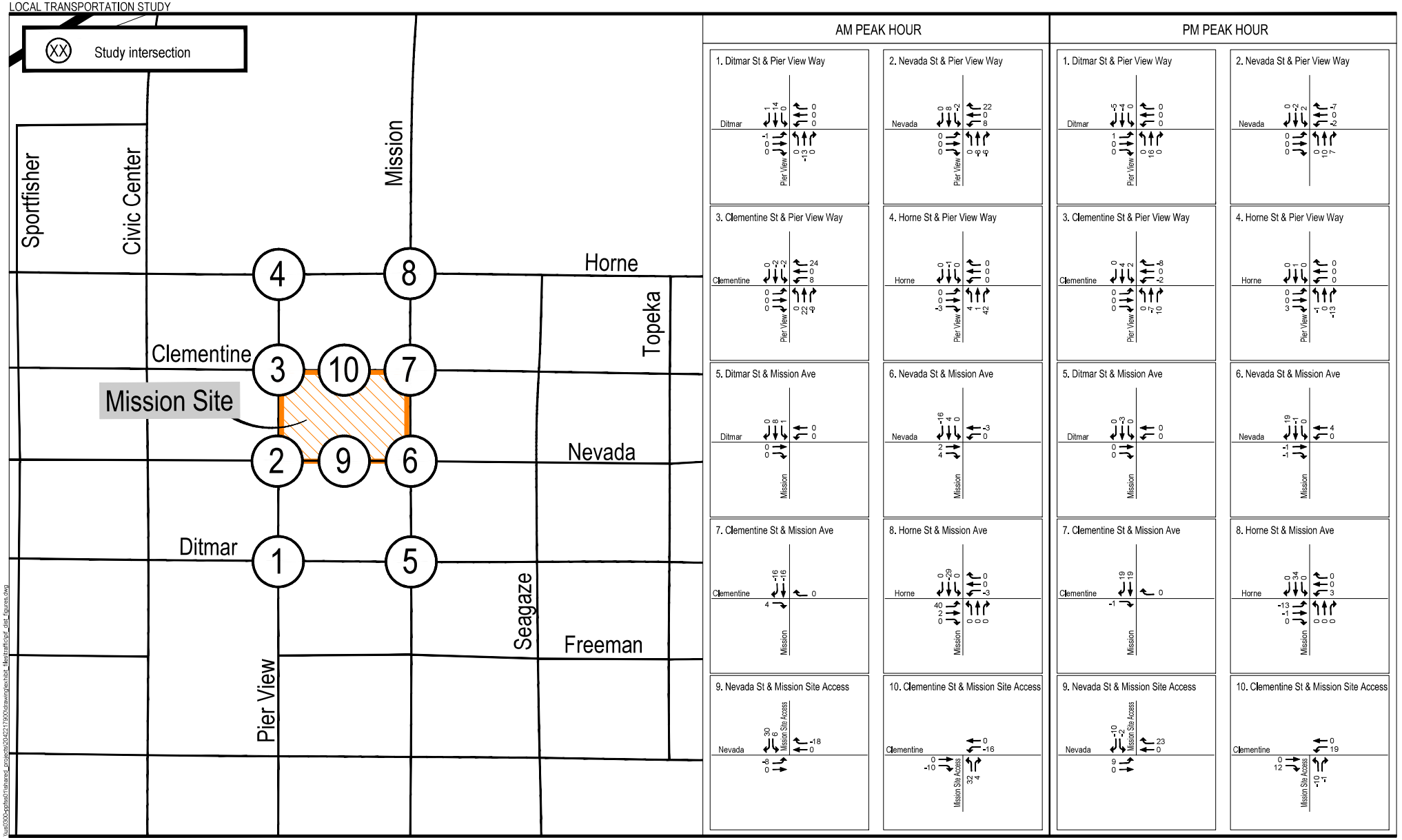



**Figure 3**
Mission Site Project-Only Peak Hour Intersection Volumes
x,x

## PROJECT INFORMATION FORM (PIF)

**THE FOLLOWING IS TO BE COMPLETED BY THE PROJECT APPLICANT:**

| PROJECT INFORMATION FORM | | | |
|---|---|---|---|
| 1. | **PROJECT DESCRIPTION:** | Mixed Use Transit Oriented Design project including, a bus / rail transit station, hotel, office, retail, multifamily residential, and associated amenity spaces. | |
| 2. | **PROJECT LOCATION:** | Oceanside Transit Center, 235 S. Tremont St., Oceanside, CA | |
| 3. | **LAND USE:** Oceanside Transit Center (OTC) Specific Plan<br>**SIZE/DENSITY:** 10.06 ACs / Density consistent with OTC Specific Plan | | |
| 4. | **ZONING AND LAND USE CONSISTENT WITH ADOPTED GENERAL PLAN?** | ☑ Yes | ☐ No |
| 5. | **PROJECT LOCATED IN TRANSIT PRIORITY AREA[1], SMART GROWTH AREA[2], OR LOW VMT AREA[3]?** | ☑ Yes | ☐ No |
| 6. | **PROJECT TRIP GENERATION:** 6,022 **ADT** | ☐ < 200 ADT<br>☐ ≥ 200 ADT<br>☐ ≥ 1,000 ADT<br>☑ ≥ 2,400 ADT | |
| | **ATTACHMENTS** | | |
| A. | **PROJECT LOCATION MAP** | ☑ Attached | |
| B. | **PROJECT TRIP DISTRIBUTION** | ☐ Attached | |
| C. | **PROJECT TRIP ASSIGNMENT** | ☐ Attached | |

1) Projects located in a TPA must be able to access the transit station within a ½ mile walking distance or 6 minute walk continuously without discontinuity of sidewalk or obstructions to the route. Qualifying transit stops means a site containing an existing rail transit station served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (OPR, 2017). A high-quality transit corridor may also be considered if a corridor with fixed route bus service has service intervals no longer than 15 minutes during peak commute hours (OPR, 2017).
(2) See Appendix B.
(3) Based on the most recent SANDAG SB 743 Screening Map. Example shown in Appendix C.

**TO BE COMPLETED BY CITY STAFF AND RETURNED TO PROJECT APPLICANT**

| | PROJECT STUDY REQUIREMENTS | | | |
|---|---|---|---|---|
| **1)** | **Does the project require a CEQA VMT analysis?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |
| | **A. If yes, does the project require a SANDAG Model Run?** | ☐ Yes | ☐ No | |
| **2a)** | **Does the project require a Local Transportation Study?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |
| | **OR** | | | |
| **2b)** | **Does the project require a Local Transportation Assessment?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |

[(1)] Incomplete application or additional information is needed to determine study requirements.

Planning Division Date Transportation Engineering Section Date


810 Mission Site
0.5 Miles
235 Tremont Site
Oceanside Transit Center
NCTD-OTC
Oceanside Transportation Center
Oceanside Transit Center
Mission Ave
S Tremont St
S Freeman St
S Nevada St
S Horne St
S Melrose St
S Clementine St
Seagaze Dr
Michigan Ave
Washington Ave
Grant St
Center Ave
S Pacific St
S The Strand
N Pacific St
1st St
S21
Google Earth
1000 ft
N

## PROJECT INFORMATION FORM (PIF)

**THE FOLLOWING IS TO BE COMPLETED BY THE PROJECT APPLICANT:**

| PROJECT INFORMATION FORM | | | |
|---|---|---|---|
| 1. | **PROJECT DESCRIPTION:** | The Project is a 373-unit mixed-use redevelopment on two downtown city blocks. Block 5, north of Pier View Way, includes 193 total units & 1,474 sf of ground floor | |
| 2. | **PROJECT LOCATION:** | 300 N Meyers Street & 200-298 N Meyers Street, Oceanside, CA 92054<br>Downtown District - Sub district 1 | |
| 3. | **LAND USE:** | Multifamily residential, commercial/retail (100% restaurant assumed for traffic analysis) | |
| | **SIZE/DENSITY:** | 3.52 gross ac, 373 total units; Block 5: 1.05 net ac, 193 total units, 1.47 KSF comm.; Block 20 | |
| 4. | **ZONING AND LAND USE CONSISTENT WITH ADOPTED GENERAL PLAN?** | ☑ Yes | ☐ No |
| 5. | **PROJECT LOCATED IN TRANSIT PRIORITY AREA[1], SMART GROWTH AREA[2], OR LOW VMT AREA[3]?** | ☑ Yes | ☐ No |
| 6. | **PROJECT TRIP GENERATION:** 2,249 **ADT** | ☐ < 200 ADT<br>☐ ≥ 200 ADT<br>☑ ≥ 1,000 ADT<br>☐ ≥ 2,400 ADT | |
| | **ATTACHMENTS** | | |
| A. | **PROJECT LOCATION MAP** | ☑ Attached | |
| B. | **PROJECT TRIP DISTRIBUTION** | ☑ Attached | |
| C. | **PROJECT TRIP ASSIGNMENT** | ☑ Attached | |

1) Projects located in a TPA must be able to access the transit station within a ½ mile walking distance or 6 minute walk continuously without discontinuity of sidewalk or obstructions to the route. Qualifying transit stops means a site containing an existing rail transit station served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (OPR, 2017). A high-quality transit corridor may also be considered if a corridor with fixed route bus service has service intervals no longer than 15 minutes during peak commute hours (OPR, 2017).
(2) See Appendix B.
(3) Based on the most recent SANDAG SB 743 Screening Map. Example shown in Appendix C.

**TO BE COMPLETED BY CITY STAFF AND RETURNED TO PROJECT APPLICANT**

| | PROJECT STUDY REQUIREMENTS | | | |
|---|---|---|---|---|
| **1)** | **Does the project require a CEQA VMT analysis?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |
| | **A. If yes, does the project require a SANDAG Model Run?** | ☐ Yes | ☐ No | |
| **2a)** | **Does the project require a Local Transportation Study?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |
| | **OR** | | | |
| **2b)** | **Does the project require a Local Transportation Assessment?** | ☐ Yes | ☐ No | ☐ Incomplete[(1)] |

[(1)] Incomplete application or additional information is needed to determine study requirements.

Planning Division Date Transportation Engineering Section Date

## Table 1

## Proposed Project Trip Generation

| Block | Land Use Description | Size | Daily Trip Ends (ADTs) [a] | | AM Peak Hour | | | | | PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Rate [b] | Volume | % of ADT | In:Out Split | Volume | | | % of ADT | In:Out Split | Volume | | |
| | | | | | | | In | Out | Total | | | In | Out | Total |
| Block 5 | Quality Restaurant | 1.47 KSF | 100 /KSF | 147 | 1% | 60% : 40% | 1 | 0 | 1 | 8% | 70% : 30% | 8 | 4 | 12 |
| | Multi-Family Residential (>20 DU/acre) | 193 DU | 6 /DU | 1,158 | 8% | 20% : 80% | 19 | 74 | 93 | 9% | 70% : 30% | 73 | 31 | 104 |
| | **Subtotal Block 5** | | | **1,305** | | | **20** | **74** | **94** | | | **81** | **35** | **116** |
| Block 20 | Quality Restaurant | 2.61 KSF | 100 /KSF | 261 | 1% | 60% : 40% | 2 | 1 | 3 | 8% | 70% : 30% | 15 | 6 | 21 |
| | Multi-Family Residential (>20 DU/acre) | 180 DU | 6 /DU | 1,080 | 8% | 20% : 80% | 17 | 69 | 86 | 9% | 70% : 30% | 68 | 29 | 97 |
| | **Subtotal Block 20** | | | **1,341** | | | **19** | **70** | **89** | | | **83** | **35** | **118** |
| TOTAL | **Total Block 5 & 20** | | | **2,646** | | | **39** | **144** | **183** | | | **164** | **70** | **234** |
| | *Mixed Use (10%) Reduction* | | | *265* | | | *4* | *14* | *18* | | | *16* | *7* | *23* |
| | *Transit Use (5%) Reduction* | | | *132* | | | *2* | *7* | *9* | | | *8* | *4* | *12* |
| | **NET TOTAL TRIP GENERATION** | | | **2,249** | | | **33** | **122** | **156** | | | **139** | **60** | **199** |



***Footnotes:***

a. ADT = Average Daily Traffic

b. Rates are based on SANDAG's *(Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region,* April 2002.

***General Notes:***

1. KSF = 1,000 sq ft
2. DU = Dwelling Units




LINSCOTT LAW & GREENSPAN engineers

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Time: 5:20 PM

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Figure A
Project Area Map

Oceanside Blocks 5 & 20




LINSCOTT LAW & GREENSPAN engineers

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Date: 12/15/2023
Time: 9:42 AM

Figure B
Project Distribution

Oceanside Blocks 5 & 20



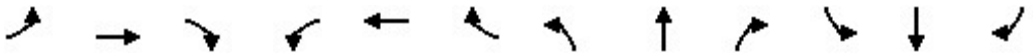

LINSCOTT LAW & GREENSPAN engineers

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Figure C
Project Assignment

Oceanside Blocks 5 & 20

# Appendix H
# Synchro Calculation Worksheets
# Opening Year (2030) Conditions



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 53 | 494 | 15 | 6 | 11 | 0 | 0 | 19 | 9 |
| Future Volume (veh/h) | 0 | 0 | 0 | 53 | 494 | 15 | 6 | 11 | 0 | 0 | 19 | 9 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.99 | 0.97 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 63 | 588 | 17 | 7 | 13 | 0 | 0 | 23 | 10 |
| Peak Hour Factor | | | | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 158 | 1548 | 47 | 243 | 195 | 0 | 0 | 177 | 77 |
| Arrive On Green | | | | 0.48 | 0.48 | 0.48 | 0.15 | 0.15 | 0.00 | 0.00 | 0.15 | 0.15 |
| Sat Flow, veh/h | | | | 331 | 3246 | 98 | 372 | 1334 | 0 | 0 | 1211 | 527 |
| Grp Volume(v), veh/h | | | | 350 | 0 | 318 | 20 | 0 | 0 | 0 | 0 | 33 |
| Grp Sat Flow(s),veh/h/ln | | | | 1839 | 0 | 1836 | 1706 | 0 | 0 | 0 | 0 | 1738 |
| Q Serve(g_s), s | | | | 3.2 | 0.0 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 |
| Cycle Q Clear(g_c), s | | | | 3.2 | 0.0 | 2.8 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 |
| Prop In Lane | | | | 0.18 | | 0.05 | 0.35 | | 0.00 | 0.00 | | 0.30 |
| Lane Grp Cap(c), veh/h | | | | 877 | 0 | 876 | 439 | 0 | 0 | 0 | 0 | 255 |
| V/C Ratio(X) | | | | 0.40 | 0.00 | 0.36 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 |
| Avail Cap(c_a), veh/h | | | | 2878 | 0 | 2874 | 1463 | 0 | 0 | 0 | 0 | 1350 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 4.4 | 0.0 | 4.3 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 9.6 |
| Incr Delay (d2), s/veh | | | | 0.3 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 0.5 | 0.0 | 0.5 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 4.6 | 0.0 | 4.5 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 9.8 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 668 | | | 20 | | | 33 | |
| Approach Delay, s/veh | | | | | 4.6 | | | 9.5 | | | 9.8 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | | | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | | | 8.4 | | 17.4 | | 8.4 | | | | |
| Change Period (Y+Rc), s | | | | 4.6 | | 5.1 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | | | | 20.0 | | 40.3 | | 20.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | | 2.4 | | 5.2 | | 2.2 | | | | |
| Green Ext Time (p_c), s | | | | 0.1 | | 4.9 | | 0.0 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 5.0 |
| HCM 6th LOS | | A |

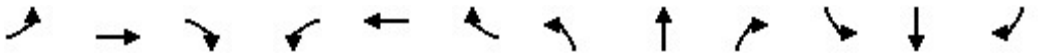
| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 571 | 23 | 16 | 0 | 250 | 0 | 0 | 11 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 571 | 23 | 16 | 0 | 250 | 0 | 0 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 634 | 26 | 18 | 0 | 278 | 0 | 0 | 12 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 341 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 652 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 645 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 10.7 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 645 |
| HCM Lane V/C Ratio | - | - | 0.019 |
| HCM Control Delay (s) | - | - | 10.7 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0.1 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 11 | 231 | 4 | 183 | 579 | 237 | 17 | 51 | 377 | 276 | 51 | 9 |
| Future Volume (veh/h) | 11 | 231 | 4 | 183 | 579 | 237 | 17 | 51 | 377 | 276 | 51 | 9 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.90 | 1.00 | | 0.97 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 12 | 251 | 4 | 199 | 629 | 181 | 18 | 55 | 313 | 348 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 187 | 792 | 13 | 374 | 1161 | 737 | 96 | 292 | 325 | 526 | 276 | 0 |
| Arrive On Green | 0.11 | 0.22 | 0.22 | 0.21 | 0.33 | 0.33 | 0.21 | 0.21 | 0.21 | 0.15 | 0.00 | 0.00 |
| Sat Flow, veh/h | 1767 | 3545 | 56 | 1767 | 3526 | 1527 | 452 | 1381 | 1535 | 3534 | 1856 | 0 |
| Grp Volume(v), veh/h | 12 | 125 | 130 | 199 | 629 | 181 | 73 | 0 | 313 | 348 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1838 | 1767 | 1763 | 1527 | 1833 | 0 | 1535 | 1767 | 1856 | 0 |
| Q Serve(g_s), s | 0.6 | 5.6 | 5.6 | 9.5 | 13.8 | 6.6 | 3.1 | 0.0 | 19.1 | 8.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.6 | 5.6 | 5.6 | 9.5 | 13.8 | 6.6 | 3.1 | 0.0 | 19.1 | 8.8 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 0.25 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 187 | 394 | 411 | 374 | 1161 | 737 | 388 | 0 | 325 | 526 | 276 | 0 |
| V/C Ratio(X) | 0.06 | 0.32 | 0.32 | 0.53 | 0.54 | 0.25 | 0.19 | 0.00 | 0.96 | 0.66 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 281 | 746 | 778 | 561 | 2052 | 1123 | 388 | 0 | 325 | 1298 | 682 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 38.0 | 30.7 | 30.7 | 33.1 | 25.9 | 14.6 | 30.6 | 0.0 | 36.9 | 37.9 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.6 | 0.6 | 0.9 | 1.4 | 0.6 | 0.3 | 0.0 | 40.2 | 2.0 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 2.4 | 2.6 | 4.1 | 5.9 | 3.2 | 1.4 | 0.0 | 10.7 | 3.9 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 38.1 | 31.3 | 31.3 | 34.0 | 27.3 | 15.2 | 30.9 | 0.0 | 77.1 | 40.0 | 0.0 | 0.0 |
| LnGrp LOS | D | C | C | C | C | B | C | A | E | D | A | A |
| Approach Vol, veh/h | | 267 | | | 1009 | | | 386 | | | 348 | |
| Approach Delay, s/veh | | 31.6 | | | 26.4 | | | 68.4 | | | 40.0 | |
| Approach LOS | | C | | | C | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 36.5 | | 24.6 | 24.7 | 26.5 | | 18.7 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.6 | 15.8 | | 21.1 | 11.5 | 7.6 | | 10.8 | | | | |
| Green Ext Time (p_c), s | 0.0 | 15.3 | | 0.0 | 0.4 | 2.3 | | 2.0 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 37.5 |
| HCM 6th LOS | | D |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 816 | 83 | 227 | 923 | 683 | 32 | 0 | 222 | 110 | 87 | 118 |
| Future Volume (veh/h) | 0 | 816 | 83 | 227 | 923 | 683 | 32 | 0 | 222 | 110 | 87 | 118 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.87 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 868 | 79 | 241 | 982 | 0 | 34 | 0 | 165 | 105 | 110 | 106 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 1021 | 93 | 285 | 1975 | | 0 | 0 | 0 | 298 | 312 | 231 |
| Arrive On Green | 0.00 | 0.33 | 0.33 | 0.17 | 0.58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 | 0.24 | 0.24 |
| Sat Flow, veh/h | 0 | 3226 | 285 | 1710 | 3410 | 1521 | | 0 | | 1266 | 1329 | 985 |
| Grp Volume(v), veh/h | 0 | 468 | 479 | 241 | 982 | 0 | | 0.0 | | 105 | 110 | 106 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1730 | 1710 | 1705 | 1521 | | | | 1266 | 1329 | 985 |
| Q Serve(g_s), s | 0.0 | 16.9 | 16.9 | 9.0 | 11.2 | 0.0 | | | | 4.5 | 4.5 | 6.1 |
| Cycle Q Clear(g_c), s | 0.0 | 16.9 | 16.9 | 9.0 | 11.2 | 0.0 | | | | 4.5 | 4.5 | 6.1 |
| Prop In Lane | 0.00 | | 0.17 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 551 | 563 | 285 | 1975 | | | | | 298 | 312 | 231 |
| V/C Ratio(X) | 0.00 | 0.85 | 0.85 | 0.85 | 0.50 | | | | | 0.35 | 0.35 | 0.46 |
| Avail Cap(c_a), veh/h | 0 | 1031 | 1054 | 1172 | 4714 | | | | | 482 | 506 | 375 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 20.6 | 20.6 | 26.5 | 8.2 | 0.0 | | | | 20.9 | 20.9 | 21.5 |
| Incr Delay (d2), s/veh | 0.0 | 1.4 | 1.4 | 2.7 | 0.1 | 0.0 | | | | 0.3 | 0.3 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 6.5 | 6.6 | 3.6 | 3.2 | 0.0 | | | | 1.3 | 1.4 | 1.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 22.1 | 22.1 | 29.2 | 8.2 | 0.0 | | | | 21.2 | 21.2 | 22.0 |
| LnGrp LOS | A | C | C | C | A | | | | | C | C | C |
| Approach Vol, veh/h | | 947 | | | 1223 | | | | | | 321 | |
| Approach Delay, s/veh | | 22.1 | | | 12.4 | | | | | | 21.5 | |
| Approach LOS | | C | | | B | | | | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.6 | 27.5 | | 21.5 | | 44.1 | | | |
| Change Period (Y+Rc), s* | 5.7 | 6.1 | | 6.1 | | 6.1 | | | |
| Max Green Setting (Gmax), s | 4.5 | 40.0 | | 25.0 | | 90.7 | | | |
| Max Q Clear Time (g_c+I1), s | 11.0 | 18.9 | | 8.1 | | 13.2 | | | |
| Green Ext Time (p_c), s | 0.1 | 2.4 | | 0.3 | | 2.7 | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 17.2 |
| HCM 6th LOS | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.9 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 110 | 484 | 0 | 0 | 1237 | 195 | 0 | 0 | 450 | 0 | 0 | 596 |
| Future Vol, veh/h | 110 | 484 | 0 | 0 | 1237 | 195 | 0 | 0 | 450 | 0 | 0 | 596 |
| Conflicting Peds, #/hr | 20 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 115 | 504 | 0 | 0 | 1289 | 203 | 0 | 0 | 469 | 0 | 0 | 621 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1512 | 0 | - | - | - | 0 | - | - | 252 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 433 | - | 0 | 0 | - | - | 0 | 0 | 745 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 433 | - | - | - | - | - | - | - | 745 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 3 | 0 | 17.7 | 0 |
| HCM LOS | | | C | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 745 | 433 | - | - | - | - |
| HCM Lane V/C Ratio | 0.629 | 0.265 | - | - | - | - |
| HCM Control Delay (s) | 17.7 | 16.3 | - | - | - | 0 |
| HCM Lane LOS | C | C | - | - | - | A |
| HCM 95th %tile Q(veh) | 4.5 | 1.1 | - | - | - | - |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 9 | 349 | 12 | 0 | 0 | 0 | 0 | 10 | 11 | 31 | 37 | 0 |
| Future Vol, veh/h | 9 | 349 | 12 | 0 | 0 | 0 | 0 | 10 | 11 | 31 | 37 | 0 |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 11 | 442 | 15 | 0 | 0 | 0 | 0 | 13 | 14 | 39 | 47 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 9.7 | 8 | 8.8 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 5% | 0% | 46% |
| Vol Thru, % | 48% | 95% | 94% | 54% |
| Vol Right, % | 52% | 0% | 6% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 21 | 184 | 187 | 68 |
| LT Vol | 0 | 9 | 0 | 31 |
| Through Vol | 10 | 175 | 175 | 37 |
| RT Vol | 11 | 0 | 12 | 0 |
| Lane Flow Rate | 27 | 232 | 236 | 86 |
| Geometry Grp | 2 | 5 | 5 | 2 |
| Degree of Util (X) | 0.035 | 0.315 | 0.315 | 0.122 |
| Departure Headway (Hd) | 4.772 | 4.881 | 4.811 | 5.094 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 751 | 741 | 751 | 705 |
| Service Time | 2.799 | 2.581 | 2.511 | 3.115 |
| HCM Lane V/C Ratio | 0.036 | 0.313 | 0.314 | 0.122 |
| HCM Control Delay | 8 | 9.8 | 9.7 | 8.8 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 1.4 | 1.4 | 0.4 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.6 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 151 | 279 | 14 | 22 | 0 | 44 | 0 | 20 | 20 | 0 | 0 | 0 |
| Future Vol, veh/h | 151 | 279 | 14 | 22 | 0 | 44 | 0 | 20 | 20 | 0 | 0 | 0 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 194 | 358 | 18 | 28 | 0 | 56 | 0 | 26 | 26 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 11.2 | 7.9 | 8.4 |
| HCM LOS | B | A | A |

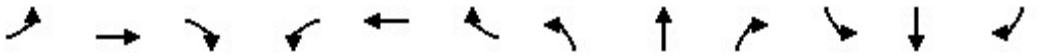
| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 33% |
| Vol Thru, % | 50% | 0% | 95% | 0% |
| Vol Right, % | 50% | 0% | 5% | 67% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 40 | 151 | 293 | 66 |
| LT Vol | 0 | 151 | 0 | 22 |
| Through Vol | 20 | 0 | 279 | 0 |
| RT Vol | 20 | 0 | 14 | 44 |
| Lane Flow Rate | 51 | 194 | 376 | 85 |
| Geometry Grp | 2 | 5 | 5 | 4a |
| Degree of Util (X) | 0.071 | 0.279 | 0.485 | 0.103 |
| Departure Headway (Hd) | 5.011 | 5.186 | 4.652 | 4.381 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 718 | 687 | 770 | 821 |
| Service Time | 3.019 | 2.954 | 2.419 | 2.392 |
| HCM Lane V/C Ratio | 0.071 | 0.282 | 0.488 | 0.104 |
| HCM Control Delay | 8.4 | 10 | 11.8 | 7.9 |
| HCM Lane LOS | A | A | B | A |
| HCM 95th-tile Q | 0.2 | 1.1 | 2.7 | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 12.2 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 253 | 1 | 28 | 0 | 0 | 0 | 8 | 179 | 0 | 1 | 141 | 59 |
| Future Vol, veh/h | 253 | 1 | 28 | 0 | 0 | 0 | 8 | 179 | 0 | 1 | 141 | 59 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 312 | 1 | 35 | 0 | 0 | 0 | 10 | 221 | 0 | 1 | 174 | 73 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 13.9 | 0 | 11.1 | 10.9 |
| HCM LOS | B | - | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 4% | 90% | 0% | 0% |
| Vol Thru, % | 96% | 0% | 100% | 70% |
| Vol Right, % | 0% | 10% | 0% | 29% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 187 | 282 | 0 | 201 |
| LT Vol | 8 | 253 | 0 | 1 |
| Through Vol | 179 | 1 | 0 | 141 |
| RT Vol | 0 | 28 | 0 | 59 |
| Lane Flow Rate | 231 | 348 | 0 | 248 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.341 | 0.516 | 0 | 0.353 |
| Departure Headway (Hd) | 5.319 | 5.334 | 5.831 | 5.128 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 676 | 679 | 0 | 702 |
| Service Time | 3.35 | 3.346 | 3.875 | 3.151 |
| HCM Lane V/C Ratio | 0.342 | 0.513 | 0 | 0.353 |
| HCM Control Delay | 11.1 | 13.9 | 8.9 | 10.9 |
| HCM Lane LOS | B | B | N | B |
| HCM 95th-tile Q | 1.5 | 3 | 0 | 1.6 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 94 | 609 | 32 | 17 | 39 | 0 | 0 | 31 | 22 |
| Future Volume (veh/h) | 0 | 0 | 0 | 94 | 609 | 32 | 17 | 39 | 0 | 0 | 31 | 22 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.94 | 0.97 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 96 | 621 | 30 | 17 | 40 | 0 | 0 | 32 | 20 |
| Peak Hour Factor | | | | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 202 | 1373 | 69 | 216 | 326 | 0 | 0 | 231 | 144 |
| Arrive On Green | | | | 0.45 | 0.45 | 0.45 | 0.22 | 0.22 | 0.00 | 0.00 | 0.22 | 0.22 |
| Sat Flow, veh/h | | | | 448 | 3048 | 154 | 260 | 1484 | 0 | 0 | 1051 | 657 |
| Grp Volume(v), veh/h | | | | 393 | 0 | 354 | 57 | 0 | 0 | 0 | 0 | 52 |
| Grp Sat Flow(s),veh/h/ln | | | | 1833 | 0 | 1817 | 1744 | 0 | 0 | 0 | 0 | 1708 |
| Q Serve(g_s), s | | | | 4.4 | 0.0 | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Cycle Q Clear(g_c), s | | | | 4.4 | 0.0 | 3.9 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Prop In Lane | | | | 0.24 | | 0.08 | 0.30 | | 0.00 | 0.00 | | 0.38 |
| Lane Grp Cap(c), veh/h | | | | 826 | 0 | 818 | 542 | 0 | 0 | 0 | 0 | 375 |
| V/C Ratio(X) | | | | 0.48 | 0.00 | 0.43 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 |
| Avail Cap(c_a), veh/h | | | | 2514 | 0 | 2492 | 1300 | 0 | 0 | 0 | 0 | 1162 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 5.6 | 0.0 | 5.5 | 9.2 | 0.0 | 0.0 | 0.0 | 0.0 | 9.2 |
| Incr Delay (d2), s/veh | | | | 0.4 | 0.0 | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 1.0 | 0.0 | 0.9 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 6.1 | 0.0 | 5.9 | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 | 9.4 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 747 | | | 57 | | | 52 | |
| Approach Delay, s/veh | | | | | 6.0 | | | 9.3 | | | 9.4 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | | | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | | | 11.0 | | 18.3 | | 11.0 | | | | |
| Change Period (Y+Rc), s | | | | 4.6 | | 5.1 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | | | | 20.0 | | 40.3 | | 20.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | | 2.7 | | 6.4 | | 2.7 | | | | |
| Green Ext Time (p_c), s | | | | 0.2 | | 5.7 | | 0.2 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | 6.4 | |
| HCM 6th LOS | A | |

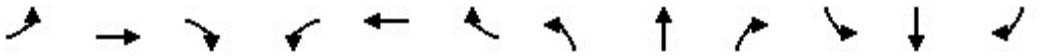
| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 791 | 53 | 7 | 0 | 199 | 0 | 0 | 8 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 791 | 53 | 7 | 0 | 199 | 0 | 0 | 8 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 7 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 833 | 56 | 7 | 0 | 209 | 0 | 0 | 8 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 464 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 542 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 532 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 11.9 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 532 |
| HCM Lane V/C Ratio | - | - | 0.016 |
| HCM Control Delay (s) | - | - | 11.9 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 9 | 196 | 1 | 146 | 830 | 275 | 21 | 50 | 423 | 479 | 36 | 15 |
| Future Volume (veh/h) | 9 | 196 | 1 | 146 | 830 | 275 | 21 | 50 | 423 | 479 | 36 | 15 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.94 | 1.00 | | 0.97 | 1.00 | | 0.97 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 10 | 213 | 1 | 159 | 902 | 209 | 23 | 54 | 345 | 563 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 151 | 1074 | 5 | 302 | 1354 | 889 | 93 | 219 | 262 | 688 | 361 | 0 |
| Arrive On Green | 0.09 | 0.30 | 0.30 | 0.17 | 0.38 | 0.38 | 0.17 | 0.17 | 0.17 | 0.19 | 0.00 | 0.00 |
| Sat Flow, veh/h | 1767 | 3597 | 17 | 1767 | 3526 | 1518 | 546 | 1282 | 1533 | 3534 | 1856 | 0 |
| Grp Volume(v), veh/h | 10 | 104 | 110 | 159 | 902 | 209 | 77 | 0 | 345 | 563 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1851 | 1767 | 1763 | 1518 | 1828 | 0 | 1533 | 1767 | 1856 | 0 |
| Q Serve(g_s), s | 0.6 | 5.2 | 5.2 | 9.6 | 24.8 | 7.9 | 4.3 | 0.0 | 20.0 | 17.9 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.6 | 5.2 | 5.2 | 9.6 | 24.8 | 7.9 | 4.3 | 0.0 | 20.0 | 17.9 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.01 | 1.00 | | 1.00 | 0.30 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 151 | 526 | 552 | 302 | 1354 | 889 | 313 | 0 | 262 | 688 | 361 | 0 |
| V/C Ratio(X) | 0.07 | 0.20 | 0.20 | 0.53 | 0.67 | 0.24 | 0.25 | 0.00 | 1.32 | 0.82 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 227 | 603 | 633 | 453 | 1658 | 1020 | 313 | 0 | 262 | 1048 | 550 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 49.2 | 30.6 | 30.6 | 44.2 | 29.8 | 12.0 | 42.0 | 0.0 | 48.5 | 45.1 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.3 | 0.2 | 1.1 | 2.1 | 0.5 | 0.6 | 0.0 | 166.8 | 4.0 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 2.3 | 2.4 | 4.3 | 10.9 | 4.3 | 2.0 | 0.0 | 19.8 | 8.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 49.3 | 30.9 | 30.8 | 45.2 | 31.9 | 12.5 | 42.5 | 0.0 | 215.3 | 49.2 | 0.0 | 0.0 |
| LnGrp LOS | D | C | C | D | C | B | D | A | F | D | A | A |
| Approach Vol, veh/h | | 224 | | | 1270 | | | 422 | | | 563 | |
| Approach Delay, s/veh | | 31.7 | | | 30.4 | | | 183.8 | | | 49.2 | |
| Approach LOS | | C | | | C | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 50.3 | | 24.6 | 24.7 | 40.3 | | 27.4 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.6 | 26.8 | | 22.0 | 11.6 | 7.2 | | 19.9 | | | | |
| Green Ext Time (p_c), s | 0.0 | 18.1 | | 0.0 | 0.3 | 1.9 | | 2.9 | | | | |

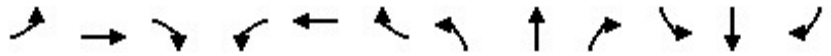
| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 60.9 |
| HCM 6th LOS | | E |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1063 | 53 | 76 | 1089 | 488 | 13 | 0 | 64 | 119 | 10 | 185 |
| Future Volume (veh/h) | 0 | 1063 | 53 | 76 | 1089 | 488 | 13 | 0 | 64 | 119 | 10 | 185 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 1143 | 52 | 82 | 1171 | 0 | 14 | 0 | 49 | 136 | 0 | 162 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 1337 | 61 | 170 | 2048 | | 0 | 0 | 0 | 496 | 0 | 213 |
| Arrive On Green | 0.00 | 0.41 | 0.41 | 0.10 | 0.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.20 |
| Sat Flow, veh/h | 0 | 3386 | 150 | 1710 | 3410 | 1521 | | 0 | | 2532 | 0 | 1088 |
| Grp Volume(v), veh/h | 0 | 587 | 608 | 82 | 1171 | 0 | | 0.0 | | 136 | 0 | 162 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1754 | 1710 | 1705 | 1521 | | | | 1266 | 0 | 1088 |
| Q Serve(g_s), s | 0.0 | 18.9 | 18.9 | 2.7 | 12.5 | 0.0 | | | | 2.7 | 0.0 | 8.4 |
| Cycle Q Clear(g_c), s | 0.0 | 18.9 | 18.9 | 2.7 | 12.5 | 0.0 | | | | 2.7 | 0.0 | 8.4 |
| Prop In Lane | 0.00 | | 0.09 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 686 | 712 | 170 | 2048 | | | | | 496 | 0 | 213 |
| V/C Ratio(X) | 0.00 | 0.85 | 0.86 | 0.48 | 0.57 | | | | | 0.27 | 0.00 | 0.76 |
| Avail Cap(c_a), veh/h | 0 | 1414 | 1466 | 714 | 4600 | | | | | 1058 | 0 | 455 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 16.2 | 16.2 | 25.5 | 7.3 | 0.0 | | | | 20.5 | 0.0 | 22.7 |
| Incr Delay (d2), s/veh | 0.0 | 1.2 | 1.2 | 0.8 | 0.1 | 0.0 | | | | 0.1 | 0.0 | 2.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 6.7 | 7.0 | 1.1 | 3.2 | 0.0 | | | | 0.8 | 0.0 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 17.4 | 17.4 | 26.3 | 7.4 | 0.0 | | | | 20.6 | 0.0 | 24.8 |
| LnGrp LOS | A | B | B | C | A | | | | | C | A | C |
| Approach Vol, veh/h | | 1195 | | | 1253 | | | | | | 298 | |
| Approach Delay, s/veh | | 17.4 | | | 8.6 | | | | | | 22.9 | |
| Approach LOS | | B | | | A | | | | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.7 | 30.4 | | 17.8 | | 42.0 | | | |
| Change Period (Y+Rc), s* | 5.7 | 6.1 | | 6.1 | | 6.1 | | | |
| Max Green Setting (Gmax), s | 6.0 | 50.0 | | 25.0 | | 80.7 | | | |
| Max Q Clear Time (g_c+I1), s | 4.7 | 20.9 | | 10.4 | | 14.5 | | | |
| Green Ext Time (p_c), s | 0.0 | 3.4 | | 0.2 | | 3.5 | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 14.0 |
| HCM 6th LOS | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 31.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 99 | 652 | 0 | 0 | 919 | 100 | 0 | 0 | 700 | 0 | 0 | 734 |
| Future Vol, veh/h | 99 | 652 | 0 | 0 | 919 | 100 | 0 | 0 | 700 | 0 | 0 | 734 |
| Conflicting Peds, #/hr | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 105 | 694 | 0 | 0 | 978 | 106 | 0 | 0 | 745 | 0 | 0 | 781 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1089 | 0 | - | - | - | 0 | - | - | 347 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 631 | - | 0 | 0 | - | - | 0 | 0 | ~ 646 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 631 | - | - | - | - | - | - | - | ~ 646 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 1.6 | 0 | 108.8 | 0 |
| HCM LOS | | | F | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 646 | 631 | - | - | - | - |
| HCM Lane V/C Ratio | 1.153 | 0.167 | - | - | - | - |
| HCM Control Delay (s) | 108.8 | 11.8 | - | - | - | 0 |
| HCM Lane LOS | F | B | - | - | - | A |
| HCM 95th %tile Q(veh) | 24 | 0.6 | - | - | - | - |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.8 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 32 | 439 | 9 | 0 | 0 | 0 | 0 | 22 | 9 | 86 | 52 | 0 |
| Future Vol, veh/h | 32 | 439 | 9 | 0 | 0 | 0 | 0 | 22 | 9 | 86 | 52 | 0 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 38 | 516 | 11 | 0 | 0 | 0 | 0 | 26 | 11 | 101 | 61 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 11.2 | 8.6 | 10.1 |
| HCM LOS | B | A | B |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 13% | 0% | 62% |
| Vol Thru, % | 71% | 87% | 96% | 38% |
| Vol Right, % | 29% | 0% | 4% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 31 | 252 | 229 | 138 |
| LT Vol | 0 | 32 | 0 | 86 |
| Through Vol | 22 | 220 | 220 | 52 |
| RT Vol | 9 | 0 | 9 | 0 |
| Lane Flow Rate | 36 | 296 | 269 | 162 |
| Geometry Grp | 2 | 5 | 5 | 2 |
| Degree of Util (X) | 0.053 | 0.423 | 0.377 | 0.241 |
| Departure Headway (Hd) | 5.237 | 5.142 | 5.05 | 5.343 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 681 | 698 | 710 | 671 |
| Service Time | 3.293 | 2.883 | 2.792 | 3.384 |
| HCM Lane V/C Ratio | 0.053 | 0.424 | 0.379 | 0.241 |
| HCM Control Delay | 8.6 | 11.6 | 10.8 | 10.1 |
| HCM Lane LOS | A | B | B | B |
| HCM 95th-tile Q | 0.2 | 2.1 | 1.8 | 0.9 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.2 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 179 | 309 | 8 | 10 | 0 | 9 | 0 | 12 | 5 | 0 | 0 | 0 |
| Future Vol, veh/h | 179 | 309 | 8 | 10 | 0 | 9 | 0 | 12 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 192 | 332 | 9 | 11 | 0 | 10 | 0 | 13 | 5 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 10.4 | 7.5 | 8.1 |
| HCM LOS | B | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 53% |
| Vol Thru, % | 71% | 0% | 97% | 0% |
| Vol Right, % | 29% | 0% | 3% | 47% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 17 | 179 | 317 | 19 |
| LT Vol | 0 | 179 | 0 | 10 |
| Through Vol | 12 | 0 | 309 | 0 |
| RT Vol | 5 | 0 | 8 | 9 |
| Lane Flow Rate | 18 | 192 | 341 | 20 |
| Geometry Grp | 2 | 5 | 5 | 4a |
| Degree of Util (X) | 0.025 | 0.272 | 0.433 | 0.025 |
| Departure Headway (Hd) | 4.943 | 5.093 | 4.575 | 4.405 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 728 | 706 | 787 | 817 |
| Service Time | 2.945 | 2.815 | 2.297 | 2.409 |
| HCM Lane V/C Ratio | 0.025 | 0.272 | 0.433 | 0.024 |
| HCM Control Delay | 8.1 | 9.7 | 10.8 | 7.5 |
| HCM Lane LOS | A | A | B | A |
| HCM 95th-tile Q | 0.1 | 1.1 | 2.2 | 0.1 |

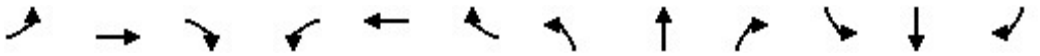
| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.3 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 306 | 0 | 19 | 2 | 0 | 1 | 2 | 178 | 0 | 0 | 158 | 23 |
| Future Vol, veh/h | 306 | 0 | 19 | 2 | 0 | 1 | 2 | 178 | 0 | 0 | 158 | 23 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 326 | 0 | 20 | 2 | 0 | 1 | 2 | 189 | 0 | 0 | 168 | 24 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 12.8 | 8.5 | 10.1 | 10 |
| HCM LOS | B | A | B | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 1% | 94% | 67% | 0% |
| Vol Thru, % | 99% | 0% | 0% | 87% |
| Vol Right, % | 0% | 6% | 33% | 13% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 180 | 325 | 3 | 181 |
| LT Vol | 2 | 306 | 2 | 0 |
| Through Vol | 178 | 0 | 0 | 158 |
| RT Vol | 0 | 19 | 1 | 23 |
| Lane Flow Rate | 191 | 346 | 3 | 193 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.272 | 0.485 | 0.005 | 0.269 |
| Departure Headway (Hd) | 5.114 | 5.047 | 5.446 | 5.037 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 695 | 709 | 661 | 707 |
| Service Time | 3.195 | 3.122 | 3.446 | 3.119 |
| HCM Lane V/C Ratio | 0.275 | 0.488 | 0.005 | 0.273 |
| HCM Control Delay | 10.1 | 12.8 | 8.5 | 10 |
| HCM Lane LOS | B | B | A | A |
| HCM 95th-tile Q | 1.1 | 2.7 | 0 | 1.1 |

# Appendix I
# Synchro Calculation Worksheets
# Opening Year (2030) with Project Conditions



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 58 | 500 | 18 | 6 | 11 | 0 | 0 | 21 | 9 |
| Future Volume (veh/h) | 0 | 0 | 0 | 58 | 500 | 18 | 6 | 11 | 0 | 0 | 21 | 9 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.99 | 0.97 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 69 | 595 | 19 | 7 | 13 | 0 | 0 | 25 | 10 |
| Peak Hour Factor | | | | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 169 | 1527 | 51 | 243 | 199 | 0 | 0 | 185 | 74 |
| Arrive On Green | | | | 0.48 | 0.48 | 0.48 | 0.15 | 0.15 | 0.00 | 0.00 | 0.15 | 0.15 |
| Sat Flow, veh/h | | | | 354 | 3211 | 107 | 367 | 1340 | 0 | 0 | 1246 | 498 |
| Grp Volume(v), veh/h | | | | 358 | 0 | 325 | 20 | 0 | 0 | 0 | 0 | 35 |
| Grp Sat Flow(s),veh/h/ln | | | | 1838 | 0 | 1834 | 1707 | 0 | 0 | 0 | 0 | 1744 |
| Q Serve(g_s), s | | | | 3.3 | 0.0 | 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 |
| Cycle Q Clear(g_c), s | | | | 3.3 | 0.0 | 2.9 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 |
| Prop In Lane | | | | 0.19 | | 0.06 | 0.35 | | 0.00 | 0.00 | | 0.29 |
| Lane Grp Cap(c), veh/h | | | | 874 | 0 | 873 | 442 | 0 | 0 | 0 | 0 | 259 |
| V/C Ratio(X) | | | | 0.41 | 0.00 | 0.37 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 |
| Avail Cap(c_a), veh/h | | | | 2870 | 0 | 2864 | 1460 | 0 | 0 | 0 | 0 | 1352 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 4.4 | 0.0 | 4.3 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 9.5 |
| Incr Delay (d2), s/veh | | | | 0.3 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 0.6 | 0.0 | 0.5 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 4.7 | 0.0 | 4.6 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 9.8 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 683 | | | 20 | | | 35 | |
| Approach Delay, s/veh | | | | | 4.6 | | | 9.5 | | | 9.8 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | 4 | 6 | 8 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.4 | 17.4 | 8.4 |
| Change Period (Y+Rc), s | 4.6 | 5.1 | 4.6 |
| Max Green Setting (Gmax), s | 20.0 | 40.3 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 2.5 | 5.3 | 2.2 |
| Green Ext Time (p_c), s | 0.1 | 5.1 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 5.0 |
| HCM 6th LOS | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 584 | 26 | 16 | 0 | 274 | 0 | 0 | 13 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 584 | 26 | 16 | 0 | 274 | 0 | 0 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 649 | 29 | 18 | 0 | 304 | 0 | 0 | 14 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 350 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 643 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 636 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 10.8 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 636 |
| HCM Lane V/C Ratio | - | - | 0.023 |
| HCM Control Delay (s) | - | - | 10.8 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 13 | 250 | 7 | 206 | 579 | 237 | 33 | 53 | 396 | 276 | 53 | 9 |
| Future Volume (veh/h) | 13 | 250 | 7 | 206 | 579 | 237 | 33 | 53 | 396 | 276 | 53 | 9 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.90 | 1.00 | | 0.97 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 14 | 272 | 8 | 224 | 629 | 181 | 36 | 58 | 327 | 350 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 187 | 778 | 23 | 374 | 1160 | 738 | 148 | 238 | 325 | 528 | 277 | 0 |
| Arrive On Green | 0.11 | 0.22 | 0.22 | 0.21 | 0.33 | 0.33 | 0.21 | 0.21 | 0.21 | 0.15 | 0.00 | 0.00 |
| Sat Flow, veh/h | 1767 | 3485 | 102 | 1767 | 3526 | 1527 | 697 | 1123 | 1535 | 3534 | 1856 | 0 |
| Grp Volume(v), veh/h | 14 | 137 | 143 | 224 | 629 | 181 | 94 | 0 | 327 | 350 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1824 | 1767 | 1763 | 1527 | 1821 | 0 | 1535 | 1767 | 1856 | 0 |
| Q Serve(g_s), s | 0.7 | 6.2 | 6.2 | 10.8 | 13.8 | 6.6 | 4.1 | 0.0 | 20.0 | 8.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.7 | 6.2 | 6.2 | 10.8 | 13.8 | 6.6 | 4.1 | 0.0 | 20.0 | 8.8 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.06 | 1.00 | | 1.00 | 0.38 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 187 | 394 | 407 | 374 | 1160 | 738 | 385 | 0 | 325 | 528 | 277 | 0 |
| V/C Ratio(X) | 0.07 | 0.35 | 0.35 | 0.60 | 0.54 | 0.25 | 0.24 | 0.00 | 1.01 | 0.66 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 280 | 746 | 772 | 561 | 2051 | 1123 | 385 | 0 | 325 | 1297 | 681 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 38.1 | 30.9 | 30.9 | 33.7 | 25.9 | 14.6 | 31.0 | 0.0 | 37.3 | 38.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.7 | 0.7 | 1.1 | 1.4 | 0.6 | 0.5 | 0.0 | 51.8 | 2.0 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 2.7 | 2.8 | 4.7 | 6.0 | 3.2 | 1.8 | 0.0 | 12.1 | 4.0 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 38.2 | 31.7 | 31.7 | 34.8 | 27.3 | 15.2 | 31.5 | 0.0 | 89.1 | 40.0 | 0.0 | 0.0 |
| LnGrp LOS | D | C | C | C | C | B | C | A | F | D | A | A |
| Approach Vol, veh/h | | 294 | | | 1034 | | | 421 | | | 350 | |
| Approach Delay, s/veh | | 32.0 | | | 26.8 | | | 76.2 | | | 40.0 | |
| Approach LOS | | C | | | C | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 36.5 | | 24.6 | 24.7 | 26.5 | | 18.7 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.7 | 15.8 | | 22.0 | 12.8 | 8.2 | | 10.8 | | | | |
| Green Ext Time (p_c), s | 0.0 | 15.3 | | 0.0 | 0.4 | 2.5 | | 2.0 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 6th Ctrl Delay | | 39.7 | |
| HCM 6th LOS | | D | |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 829 | 109 | 227 | 942 | 683 | 32 | 0 | 222 | 110 | 87 | 122 |
| Future Volume (veh/h) | 0 | 829 | 109 | 227 | 942 | 683 | 32 | 0 | 222 | 110 | 87 | 122 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.87 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 882 | 104 | 241 | 1002 | 0 | 34 | 0 | 165 | 105 | 110 | 109 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 1028 | 121 | 284 | 2003 | | 0 | 0 | 0 | 294 | 309 | 229 |
| Arrive On Green | 0.00 | 0.34 | 0.34 | 0.17 | 0.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.23 | 0.23 |
| Sat Flow, veh/h | 0 | 3138 | 360 | 1710 | 3410 | 1521 | | 0 | | 1266 | 1329 | 983 |
| Grp Volume(v), veh/h | 0 | 489 | 497 | 241 | 1002 | 0 | | 0.0 | | 105 | 110 | 109 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1717 | 1710 | 1705 | 1521 | | | | 1266 | 1329 | 983 |
| Q Serve(g_s), s | 0.0 | 18.3 | 18.3 | 9.3 | 11.6 | 0.0 | | | | 4.7 | 4.7 | 6.5 |
| Cycle Q Clear(g_c), s | 0.0 | 18.3 | 18.3 | 9.3 | 11.6 | 0.0 | | | | 4.7 | 4.7 | 6.5 |
| Prop In Lane | 0.00 | | 0.21 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 570 | 579 | 284 | 2003 | | | | | 294 | 309 | 229 |
| V/C Ratio(X) | 0.00 | 0.86 | 0.86 | 0.85 | 0.50 | | | | | 0.36 | 0.36 | 0.48 |
| Avail Cap(c_a), veh/h | 0 | 1000 | 1014 | 1136 | 4568 | | | | | 467 | 491 | 363 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 20.9 | 20.9 | 27.4 | 8.2 | 0.0 | | | | 21.7 | 21.7 | 22.4 |
| Incr Delay (d2), s/veh | 0.0 | 1.5 | 1.5 | 2.7 | 0.1 | 0.0 | | | | 0.3 | 0.3 | 0.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 7.0 | 7.1 | 3.7 | 3.3 | 0.0 | | | | 1.4 | 1.4 | 1.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 22.4 | 22.4 | 30.2 | 8.2 | 0.0 | | | | 22.0 | 22.0 | 23.0 |
| LnGrp LOS | A | C | C | C | A | | | | | C | C | C |
| Approach Vol, veh/h | | 986 | | | 1243 | | | | | | 324 | |
| Approach Delay, s/veh | | 22.4 | | | 12.5 | | | | | | 22.3 | |
| Approach LOS | | C | | | B | | | | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.9 | 28.9 | | 21.9 | | 45.9 | | | |
| Change Period (Y+Rc), s* | 5.7 | 6.1 | | 6.1 | | 6.1 | | | |
| Max Green Setting (Gmax), s | 11.5 | 40.0 | | 25.0 | | 90.7 | | | |
| Max Q Clear Time (g_c+I1), s | 11.3 | 20.3 | | 8.5 | | 13.6 | | | |
| Green Ext Time (p_c), s | 0.1 | 2.6 | | 0.3 | | 2.8 | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 17.6 |
| HCM 6th LOS | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 116 | 490 | 0 | 0 | 1241 | 195 | 0 | 0 | 450 | 0 | 0 | 611 |
| Future Vol, veh/h | 116 | 490 | 0 | 0 | 1241 | 195 | 0 | 0 | 450 | 0 | 0 | 611 |
| Conflicting Peds, #/hr | 20 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 121 | 510 | 0 | 0 | 1293 | 203 | 0 | 0 | 469 | 0 | 0 | 636 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1516 | 0 | - | - | - | 0 | - | - | 255 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 432 | - | 0 | 0 | - | - | 0 | 0 | 741 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 432 | - | - | - | - | - | - | - | 741 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 3.2 | 0 | 17.8 | 0 |
| HCM LOS | | | C | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 741 | 432 | - | - | - | - |
| HCM Lane V/C Ratio | 0.633 | 0.28 | - | - | - | - |
| HCM Control Delay (s) | 17.8 | 16.5 | - | - | - | 0 |
| HCM Lane LOS | C | C | - | - | - | A |
| HCM 95th %tile Q(veh) | 4.6 | 1.1 | - | - | - | - |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.6 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 9 | 353 | 12 | 0 | 0 | 0 | 0 | 10 | 13 | 35 | 40 | 0 |
| Future Vol, veh/h | 9 | 353 | 12 | 0 | 0 | 0 | 0 | 10 | 13 | 35 | 40 | 0 |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 11 | 447 | 15 | 0 | 0 | 0 | 0 | 13 | 16 | 44 | 51 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 9.8 | 8 | 8.9 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 5% | 0% | 47% |
| Vol Thru, % | 43% | 95% | 94% | 53% |
| Vol Right, % | 57% | 0% | 6% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 23 | 186 | 189 | 75 |
| LT Vol | 0 | 9 | 0 | 35 |
| Through Vol | 10 | 177 | 177 | 40 |
| RT Vol | 13 | 0 | 12 | 0 |
| Lane Flow Rate | 29 | 235 | 239 | 95 |
| Geometry Grp | 2 | 5 | 5 | 2 |
| Degree of Util (X) | 0.039 | 0.319 | 0.32 | 0.135 |
| Departure Headway (Hd) | 4.772 | 4.892 | 4.823 | 5.111 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 751 | 737 | 747 | 703 |
| Service Time | 2.8 | 2.613 | 2.544 | 3.133 |
| HCM Lane V/C Ratio | 0.039 | 0.319 | 0.32 | 0.135 |
| HCM Control Delay | 8 | 9.9 | 9.8 | 8.9 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 1.4 | 1.4 | 0.5 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.6 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 156 | 284 | 14 | 25 | 0 | 57 | 0 | 21 | 21 | 0 | 0 | 0 |
| Future Vol, veh/h | 156 | 284 | 14 | 25 | 0 | 57 | 0 | 21 | 21 | 0 | 0 | 0 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 200 | 364 | 18 | 32 | 0 | 73 | 0 | 27 | 27 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 11.3 | 8 | 8.5 |
| HCM LOS | B | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 30% |
| Vol Thru, % | 50% | 0% | 95% | 0% |
| Vol Right, % | 50% | 0% | 5% | 70% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 42 | 156 | 298 | 82 |
| LT Vol | 0 | 156 | 0 | 25 |
| Through Vol | 21 | 0 | 284 | 0 |
| RT Vol | 21 | 0 | 14 | 57 |
| Lane Flow Rate | 54 | 200 | 382 | 105 |
| Geometry Grp | 2 | 5 | 5 | 4a |
| Degree of Util (X) | 0.076 | 0.289 | 0.495 | 0.128 |
| Departure Headway (Hd) | 5.07 | 5.2 | 4.667 | 4.378 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 710 | 684 | 764 | 821 |
| Service Time | 3.08 | 2.979 | 2.445 | 2.391 |
| HCM Lane V/C Ratio | 0.076 | 0.292 | 0.5 | 0.128 |
| HCM Control Delay | 8.5 | 10.1 | 12 | 8 |
| HCM Lane LOS | A | B | B | A |
| HCM 95th-tile Q | 0.2 | 1.2 | 2.8 | 0.4 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 12.6 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 259 | 1 | 28 | 0 | 0 | 0 | 9 | 180 | 0 | 1 | 144 | 75 |
| Future Vol, veh/h | 259 | 1 | 28 | 0 | 0 | 0 | 9 | 180 | 0 | 1 | 144 | 75 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 320 | 1 | 35 | 0 | 0 | 0 | 11 | 222 | 0 | 1 | 178 | 93 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 14.4 | 0 | 11.3 | 11.4 |
| HCM LOS | B | - | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 5% | 90% | 0% | 0% |
| Vol Thru, % | 95% | 0% | 100% | 65% |
| Vol Right, % | 0% | 10% | 0% | 34% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 189 | 288 | 0 | 220 |
| LT Vol | 9 | 259 | 0 | 1 |
| Through Vol | 180 | 1 | 0 | 144 |
| RT Vol | 0 | 28 | 0 | 75 |
| Lane Flow Rate | 233 | 356 | 0 | 272 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.349 | 0.533 | 0 | 0.387 |
| Departure Headway (Hd) | 5.391 | 5.394 | 5.939 | 5.136 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 667 | 668 | 0 | 701 |
| Service Time | 3.423 | 3.42 | 3.985 | 3.166 |
| HCM Lane V/C Ratio | 0.349 | 0.533 | 0 | 0.388 |
| HCM Control Delay | 11.3 | 14.4 | 9 | 11.4 |
| HCM Lane LOS | B | B | N | B |
| HCM 95th-tile Q | 1.6 | 3.2 | 0 | 1.8 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 24 | 197 | 19 | 0 | 0 |
| Future Vol, veh/h | 0 | 24 | 197 | 19 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 26 | 214 | 21 | 0 | 0 |

| Major/Minor | Minor1 | | Major1 | |
|---|---|---|---|---|
| Conflicting Flow All | - | 118 | 0 | 0 |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |
| Critical Hdwy | - | 6.96 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - |
| Follow-up Hdwy | - | 3.33 | - | - |
| Pot Cap-1 Maneuver | 0 | 908 | - | - |
| Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
| Platoon blocked, % | | | - | - |
| Mov Cap-1 Maneuver | - | 908 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |

| Approach | WB | NB |
|---|---|---|
| HCM Control Delay, s | 9.1 | 0 |
| HCM LOS | A | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 908 |
| HCM Lane V/C Ratio | - | - | 0.029 |
| HCM Control Delay (s) | - | - | 9.1 |
| HCM Lane LOS | - | - | A |
| HCM 95th %tile Q(veh) | - | - | 0.1 |

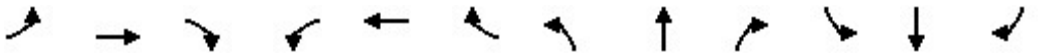
| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 37 | 3 | 7 | 389 | 249 | 12 |
| Future Vol, veh/h | 37 | 3 | 7 | 389 | 249 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 40 | 3 | 8 | 423 | 271 | 13 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 717 | 278 | 284 | 0 | - | 0 |
| Stage 1 | 278 | - | - | - | - | - |
| Stage 2 | 439 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.13 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.227 | - | - | - |
| Pot Cap-1 Maneuver | 395 | 758 | 1273 | - | - | - |
| Stage 1 | 767 | - | - | - | - | - |
| Stage 2 | 648 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 392 | 758 | 1273 | - | - | - |
| Mov Cap-2 Maneuver | 392 | - | - | - | - | - |
| Stage 1 | 761 | - | - | - | - | - |
| Stage 2 | 648 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 14.9 | 0.1 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1273 | - | 407 | - | - |
| HCM Lane V/C Ratio | 0.006 | - | 0.107 | - | - |
| HCM Control Delay (s) | 7.8 | 0 | 14.9 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.4 | - | - |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 100 | 613 | 34 | 17 | 39 | 0 | 0 | 34 | 22 |
| Future Volume (veh/h) | 0 | 0 | 0 | 100 | 613 | 34 | 17 | 39 | 0 | 0 | 34 | 22 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.94 | 0.97 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 102 | 626 | 32 | 17 | 40 | 0 | 0 | 35 | 20 |
| Peak Hour Factor | | | | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 212 | 1367 | 73 | 214 | 327 | 0 | 0 | 240 | 137 |
| Arrive On Green | | | | 0.45 | 0.45 | 0.45 | 0.22 | 0.22 | 0.00 | 0.00 | 0.22 | 0.22 |
| Sat Flow, veh/h | | | | 468 | 3018 | 161 | 258 | 1486 | 0 | 0 | 1091 | 624 |
| Grp Volume(v), veh/h | | | | 400 | 0 | 360 | 57 | 0 | 0 | 0 | 0 | 55 |
| Grp Sat Flow(s),veh/h/ln | | | | 1832 | 0 | 1815 | 1744 | 0 | 0 | 0 | 0 | 1715 |
| Q Serve(g_s), s | | | | 4.5 | 0.0 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 |
| Cycle Q Clear(g_c), s | | | | 4.5 | 0.0 | 4.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 |
| Prop In Lane | | | | 0.26 | | 0.09 | 0.30 | | 0.00 | 0.00 | | 0.36 |
| Lane Grp Cap(c), veh/h | | | | 830 | 0 | 822 | 542 | 0 | 0 | 0 | 0 | 378 |
| V/C Ratio(X) | | | | 0.48 | 0.00 | 0.44 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| Avail Cap(c_a), veh/h | | | | 2487 | 0 | 2463 | 1287 | 0 | 0 | 0 | 0 | 1155 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 5.7 | 0.0 | 5.5 | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 | 9.3 |
| Incr Delay (d2), s/veh | | | | 0.4 | 0.0 | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 1.0 | 0.0 | 0.9 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 6.1 | 0.0 | 5.9 | 9.4 | 0.0 | 0.0 | 0.0 | 0.0 | 9.5 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 760 | | | 57 | | | 55 | |
| Approach Delay, s/veh | | | | | 6.0 | | | 9.4 | | | 9.5 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | | | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | | | 11.1 | | 18.6 | | 11.1 | | | | |
| Change Period (Y+Rc), s | | | | 4.6 | | 5.1 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | | | | 20.0 | | 40.3 | | 20.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | | 2.8 | | 6.5 | | 2.7 | | | | |
| Green Ext Time (p_c), s | | | | 0.2 | | 5.8 | | 0.2 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 6.5 |
| HCM 6th LOS | | A |

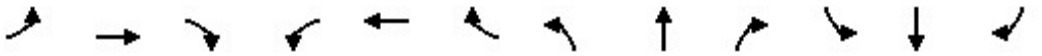
| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 800 | 55 | 7 | 0 | 215 | 0 | 0 | 11 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 800 | 55 | 7 | 0 | 215 | 0 | 0 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 7 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 842 | 58 | 7 | 0 | 226 | 0 | 0 | 12 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 469 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 538 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 528 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 12 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 528 |
| HCM Lane V/C Ratio | - | - | 0.022 |
| HCM Control Delay (s) | - | - | 12 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0.1 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 209 | 3 | 187 | 830 | 275 | 32 | 51 | 436 | 479 | 39 | 15 |
| Future Volume (veh/h) | 10 | 209 | 3 | 187 | 830 | 275 | 32 | 51 | 436 | 479 | 39 | 15 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.94 | 1.00 | | 0.97 | 1.00 | | 0.97 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 11 | 227 | 3 | 203 | 902 | 209 | 35 | 55 | 353 | 565 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 151 | 1062 | 14 | 302 | 1353 | 889 | 121 | 190 | 262 | 690 | 362 | 0 |
| Arrive On Green | 0.09 | 0.30 | 0.30 | 0.17 | 0.38 | 0.38 | 0.17 | 0.17 | 0.17 | 0.20 | 0.00 | 0.00 |
| Sat Flow, veh/h | 1767 | 3559 | 47 | 1767 | 3526 | 1518 | 708 | 1112 | 1533 | 3534 | 1856 | 0 |
| Grp Volume(v), veh/h | 11 | 112 | 118 | 203 | 902 | 209 | 90 | 0 | 353 | 565 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1843 | 1767 | 1763 | 1518 | 1820 | 0 | 1533 | 1767 | 1856 | 0 |
| Q Serve(g_s), s | 0.7 | 5.6 | 5.6 | 12.6 | 24.8 | 7.9 | 5.0 | 0.0 | 20.0 | 17.9 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.7 | 5.6 | 5.6 | 12.6 | 24.8 | 7.9 | 5.0 | 0.0 | 20.0 | 17.9 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 0.39 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 151 | 526 | 550 | 302 | 1353 | 889 | 311 | 0 | 262 | 690 | 362 | 0 |
| V/C Ratio(X) | 0.07 | 0.21 | 0.21 | 0.67 | 0.67 | 0.23 | 0.29 | 0.00 | 1.35 | 0.82 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 226 | 602 | 630 | 453 | 1656 | 1020 | 311 | 0 | 262 | 1048 | 550 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 49.3 | 30.8 | 30.8 | 45.5 | 29.9 | 12.0 | 42.3 | 0.0 | 48.5 | 45.1 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.3 | 0.3 | 1.9 | 2.1 | 0.5 | 0.7 | 0.0 | 179.9 | 4.1 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 2.5 | 2.6 | 5.7 | 10.9 | 4.3 | 2.4 | 0.0 | 20.8 | 8.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 49.4 | 31.1 | 31.1 | 47.4 | 32.0 | 12.5 | 43.1 | 0.0 | 228.4 | 49.2 | 0.0 | 0.0 |
| LnGrp LOS | D | C | C | D | C | B | D | A | F | D | A | A |
| Approach Vol, veh/h | | 241 | | | 1314 | | | 443 | | | 565 | |
| Approach Delay, s/veh | | 31.9 | | | 31.3 | | | 190.8 | | | 49.2 | |
| Approach LOS | | C | | | C | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 50.3 | | 24.6 | 24.7 | 40.3 | | 27.4 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.7 | 26.8 | | 22.0 | 14.6 | 7.6 | | 19.9 | | | | |
| Green Ext Time (p_c), s | 0.0 | 18.1 | | 0.0 | 0.4 | 2.0 | | 2.9 | | | | |

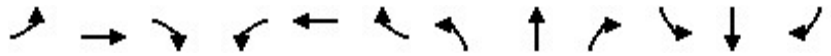
| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 62.9 |
| HCM 6th LOS | | E |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1072 | 70 | 76 | 1123 | 488 | 13 | 0 | 64 | 119 | 10 | 192 |
| Future Volume (veh/h) | 0 | 1072 | 70 | 76 | 1123 | 488 | 13 | 0 | 64 | 119 | 10 | 192 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 1153 | 67 | 82 | 1208 | 0 | 14 | 0 | 49 | 136 | 0 | 167 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 1341 | 78 | 168 | 2057 | | 0 | 0 | 0 | 503 | 0 | 216 |
| Arrive On Green | 0.00 | 0.41 | 0.41 | 0.10 | 0.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.20 |
| Sat Flow, veh/h | 0 | 3340 | 189 | 1710 | 3410 | 1521 | | 0 | | 2532 | 0 | 1088 |
| Grp Volume(v), veh/h | 0 | 600 | 620 | 82 | 1208 | 0 | | 0.0 | | 136 | 0 | 167 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1747 | 1710 | 1705 | 1521 | | | | 1266 | 0 | 1088 |
| Q Serve(g_s), s | 0.0 | 19.8 | 19.9 | 2.8 | 13.4 | 0.0 | | | | 2.8 | 0.0 | 8.9 |
| Cycle Q Clear(g_c), s | 0.0 | 19.8 | 19.9 | 2.8 | 13.4 | 0.0 | | | | 2.8 | 0.0 | 8.9 |
| Prop In Lane | 0.00 | | 0.11 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 698 | 721 | 168 | 2057 | | | | | 503 | 0 | 216 |
| V/C Ratio(X) | 0.00 | 0.86 | 0.86 | 0.49 | 0.59 | | | | | 0.27 | 0.00 | 0.77 |
| Avail Cap(c_a), veh/h | 0 | 1375 | 1420 | 695 | 4474 | | | | | 1029 | 0 | 442 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 16.4 | 16.5 | 26.3 | 7.5 | 0.0 | | | | 20.9 | 0.0 | 23.3 |
| Incr Delay (d2), s/veh | 0.0 | 1.2 | 1.2 | 0.8 | 0.1 | 0.0 | | | | 0.1 | 0.0 | 2.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 7.1 | 7.3 | 1.1 | 3.5 | 0.0 | | | | 0.8 | 0.0 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 17.7 | 17.7 | 27.1 | 7.6 | 0.0 | | | | 21.0 | 0.0 | 25.6 |
| LnGrp LOS | A | B | B | C | A | | | | | C | A | C |
| Approach Vol, veh/h | | 1220 | | | 1290 | | | | | | 303 | |
| Approach Delay, s/veh | | 17.7 | | | 8.8 | | | | | | 23.5 | |
| Approach LOS | | B | | | A | | | | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.7 | 31.5 | | 18.3 | | 43.2 | | | |
| Change Period (Y+Rc), s* | 5.7 | 6.1 | | 6.1 | | 6.1 | | | |
| Max Green Setting (Gmax), s | 6.0 | 50.0 | | 25.0 | | 80.7 | | | |
| Max Q Clear Time (g_c+I1), s | 4.8 | 21.9 | | 10.9 | | 15.4 | | | |
| Green Ext Time (p_c), s | 0.0 | 3.5 | | 0.2 | | 3.6 | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 14.3 |
| HCM 6th LOS | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 32.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 103 | 656 | 0 | 0 | 926 | 100 | 27 | 0 | 700 | 0 | 0 | 734 |
| Future Vol, veh/h | 103 | 656 | 0 | 0 | 926 | 100 | 27 | 0 | 700 | 0 | 0 | 734 |
| Conflicting Peds, #/hr | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 110 | 698 | 0 | 0 | 985 | 106 | 29 | 0 | 745 | 0 | 0 | 781 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1096 | 0 | - | - | - | 0 | 1411 | - | 349 | - | - | - |
| Stage 1 | - | - | - | - | - | - | 918 | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | 493 | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | 7.56 | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.56 | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.56 | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | 3.53 | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 627 | - | 0 | 0 | - | - | 97 | 0 | ~ 644 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 290 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 524 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 627 | - | - | - | - | - | 84 | - | ~ 644 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 84 | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | 239 | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | 524 | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 1.6 | 0 | 110.2 | 0 |
| HCM LOS | | | F | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 644 | 627 | - | - | - | - |
| HCM Lane V/C Ratio | 1.156 | 0.175 | - | - | - | - |
| HCM Control Delay (s) | 110.2 | 12 | - | - | - | 0 |
| HCM Lane LOS | F | B | - | - | - | A |
| HCM 95th %tile Q(veh) | 24.1 | 0.6 | - | - | - | - |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 32 | 446 | 9 | 0 | 0 | 0 | 0 | 22 | 12 | 93 | 54 | 0 |
| Future Vol, veh/h | 32 | 446 | 9 | 0 | 0 | 0 | 0 | 22 | 12 | 93 | 54 | 0 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 38 | 525 | 11 | 0 | 0 | 0 | 0 | 26 | 14 | 109 | 64 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 11.4 | 8.6 | 10.3 |
| HCM LOS | B | A | B |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 13% | 0% | 63% |
| Vol Thru, % | 65% | 87% | 96% | 37% |
| Vol Right, % | 35% | 0% | 4% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 34 | 255 | 232 | 147 |
| LT Vol | 0 | 32 | 0 | 93 |
| Through Vol | 22 | 223 | 223 | 54 |
| RT Vol | 12 | 0 | 9 | 0 |
| Lane Flow Rate | 40 | 300 | 273 | 173 |
| Geometry Grp | 2 | 5 | 5 | 2 |
| Degree of Util (X) | 0.058 | 0.432 | 0.386 | 0.258 |
| Departure Headway (Hd) | 5.236 | 5.179 | 5.088 | 5.37 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 680 | 693 | 704 | 668 |
| Service Time | 3.296 | 2.924 | 2.834 | 3.413 |
| HCM Lane V/C Ratio | 0.059 | 0.433 | 0.388 | 0.259 |
| HCM Control Delay | 8.6 | 11.8 | 11 | 10.3 |
| HCM Lane LOS | A | B | B | B |
| HCM 95th-tile Q | 0.2 | 2.2 | 1.8 | 1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.3 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 188 | 318 | 8 | 12 | 0 | 33 | 0 | 14 | 7 | 0 | 0 | 0 |
| Future Vol, veh/h | 188 | 318 | 8 | 12 | 0 | 33 | 0 | 14 | 7 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 202 | 342 | 9 | 13 | 0 | 35 | 0 | 15 | 8 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 10.6 | 7.5 | 8.2 |
| HCM LOS | B | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 27% |
| Vol Thru, % | 67% | 0% | 98% | 0% |
| Vol Right, % | 33% | 0% | 2% | 73% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 21 | 188 | 326 | 45 |
| LT Vol | 0 | 188 | 0 | 12 |
| Through Vol | 14 | 0 | 318 | 0 |
| RT Vol | 7 | 0 | 8 | 33 |
| Lane Flow Rate | 23 | 202 | 351 | 48 |
| Geometry Grp | 2 | 5 | 5 | 4a |
| Degree of Util (X) | 0.031 | 0.287 | 0.448 | 0.057 |
| Departure Headway (Hd) | 5.004 | 5.115 | 4.597 | 4.225 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 719 | 703 | 782 | 852 |
| Service Time | 3.007 | 2.845 | 2.327 | 2.23 |
| HCM Lane V/C Ratio | 0.032 | 0.287 | 0.449 | 0.056 |
| HCM Control Delay | 8.2 | 9.9 | 11 | 7.5 |
| HCM Lane LOS | A | A | B | A |
| HCM 95th-tile Q | 0.1 | 1.2 | 2.3 | 0.2 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.8 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 316 | 0 | 19 | 4 | 0 | 2 | 4 | 180 | 0 | 0 | 160 | 47 |
| Future Vol, veh/h | 316 | 0 | 19 | 4 | 0 | 2 | 4 | 180 | 0 | 0 | 160 | 47 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 336 | 0 | 20 | 4 | 0 | 2 | 4 | 191 | 0 | 0 | 170 | 50 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 13.5 | 8.6 | 10.4 | 10.4 |
| HCM LOS | B | A | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 2% | 94% | 67% | 0% |
| Vol Thru, % | 98% | 0% | 0% | 77% |
| Vol Right, % | 0% | 6% | 33% | 23% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 184 | 335 | 6 | 207 |
| LT Vol | 4 | 316 | 4 | 0 |
| Through Vol | 180 | 0 | 0 | 160 |
| RT Vol | 0 | 19 | 2 | 47 |
| Lane Flow Rate | 196 | 356 | 6 | 220 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.283 | 0.508 | 0.01 | 0.308 |
| Departure Headway (Hd) | 5.201 | 5.129 | 5.579 | 5.036 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 683 | 695 | 645 | 705 |
| Service Time | 3.295 | 3.218 | 3.579 | 3.127 |
| HCM Lane V/C Ratio | 0.287 | 0.512 | 0.009 | 0.312 |
| HCM Control Delay | 10.4 | 13.5 | 8.6 | 10.4 |
| HCM Lane LOS | B | B | A | B |
| HCM 95th-tile Q | 1.2 | 2.9 | 0 | 1.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 16 | 196 | 34 | 0 | 0 |
| Future Vol, veh/h | 0 | 16 | 196 | 34 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 17 | 213 | 37 | 0 | 0 |

| Major/Minor | Minor1 | | Major1 | |
|---|---|---|---|---|
| Conflicting Flow All | - | 125 | 0 | 0 |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |
| Critical Hdwy | - | 6.96 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - |
| Follow-up Hdwy | - | 3.33 | - | - |
| Pot Cap-1 Maneuver | 0 | 899 | - | - |
| Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
| Platoon blocked, % | | | - | - |
| Mov Cap-1 Maneuver | - | 899 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |

| Approach | WB | NB |
|---|---|---|
| HCM Control Delay, s | 9.1 | 0 |
| HCM LOS | A | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 899 |
| HCM Lane V/C Ratio | - | - | 0.019 |
| HCM Control Delay (s) | - | - | 9.1 |
| HCM Lane LOS | - | - | A |
| HCM 95th %tile Q(veh) | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.7 |

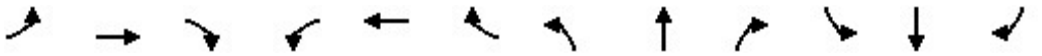
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 25 | 2 | 12 | 460 | 205 | 22 |
| Future Vol, veh/h | 25 | 2 | 12 | 460 | 205 | 22 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 27 | 2 | 13 | 500 | 223 | 24 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 761 | 235 | 247 | 0 | - | 0 |
| Stage 1 | 235 | - | - | - | - | - |
| Stage 2 | 526 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.13 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.227 | - | - | - |
| Pot Cap-1 Maneuver | 372 | 802 | 1313 | - | - | - |
| Stage 1 | 802 | - | - | - | - | - |
| Stage 2 | 591 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 367 | 802 | 1313 | - | - | - |
| Mov Cap-2 Maneuver | 367 | - | - | - | - | - |
| Stage 1 | 791 | - | - | - | - | - |
| Stage 2 | 591 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 15.2 | 0.2 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1313 | - | 382 | - | - |
| HCM Lane V/C Ratio | 0.01 | - | 0.077 | - | - |
| HCM Control Delay (s) | 7.8 | 0 | 15.2 | - | - |
| HCM Lane LOS | A | A | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.2 | - | - |

# Appendix J
# Synchro Calculation Worksheets
# Horizon Year (2050) Conditions



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 50 | 430 | 20 | 10 | 20 | 0 | 0 | 20 | 20 |
| Future Volume (veh/h) | 0 | 0 | 0 | 50 | 430 | 20 | 10 | 20 | 0 | 0 | 20 | 20 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.99 | 0.97 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 53 | 453 | 19 | 11 | 21 | 0 | 0 | 21 | 20 |
| Peak Hour Factor | | | | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 165 | 1481 | 65 | 241 | 224 | 0 | 0 | 141 | 134 |
| Arrive On Green | | | | 0.47 | 0.47 | 0.47 | 0.16 | 0.16 | 0.00 | 0.00 | 0.16 | 0.16 |
| Sat Flow, veh/h | | | | 354 | 3173 | 139 | 349 | 1364 | 0 | 0 | 857 | 816 |
| Grp Volume(v), veh/h | | | | 275 | 0 | 250 | 32 | 0 | 0 | 0 | 0 | 41 |
| Grp Sat Flow(s),veh/h/ln | | | | 1838 | 0 | 1828 | 1713 | 0 | 0 | 0 | 0 | 1673 |
| Q Serve(g_s), s | | | | 2.5 | 0.0 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Cycle Q Clear(g_c), s | | | | 2.5 | 0.0 | 2.2 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Prop In Lane | | | | 0.19 | | 0.08 | 0.34 | | 0.00 | 0.00 | | 0.49 |
| Lane Grp Cap(c), veh/h | | | | 858 | 0 | 853 | 466 | 0 | 0 | 0 | 0 | 275 |
| V/C Ratio(X) | | | | 0.32 | 0.00 | 0.29 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| Avail Cap(c_a), veh/h | | | | 2815 | 0 | 2800 | 1435 | 0 | 0 | 0 | 0 | 1272 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 4.4 | 0.0 | 4.3 | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 | 9.4 |
| Incr Delay (d2), s/veh | | | | 0.2 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 0.4 | 0.0 | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 4.6 | 0.0 | 4.5 | 9.4 | 0.0 | 0.0 | 0.0 | 0.0 | 9.7 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 525 | | | 32 | | | 41 | |
| Approach Delay, s/veh | | | | | 4.6 | | | 9.4 | | | 9.7 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | | | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | | | 8.9 | | 17.4 | | 8.9 | | | | |
| Change Period (Y+Rc), s | | | | 4.6 | | 5.1 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | | | | 20.0 | | 40.3 | | 20.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | | 2.6 | | 4.5 | | 2.4 | | | | |
| Green Ext Time (p_c), s | | | | 0.1 | | 3.7 | | 0.1 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 5.2 |
| HCM 6th LOS | | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 540 | 30 | 0 | 0 | 150 | 0 | 0 | 10 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 540 | 30 | 0 | 0 | 150 | 0 | 0 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 568 | 32 | 0 | 0 | 158 | 0 | 0 | 11 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 311 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 682 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 675 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 10.4 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 675 |
| HCM Lane V/C Ratio | - | - | 0.016 |
| HCM Control Delay (s) | - | - | 10.4 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 40 | 170 | 30 | 190 | 520 | 250 | 60 | 70 | 260 | 220 | 90 | 40 |
| Future Volume (veh/h) | 40 | 170 | 30 | 190 | 520 | 250 | 60 | 70 | 260 | 220 | 90 | 40 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.90 | 1.00 | | 0.97 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 42 | 179 | 29 | 200 | 547 | 184 | 63 | 74 | 192 | 182 | 164 | 38 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 211 | 645 | 101 | 422 | 1180 | 785 | 118 | 138 | 591 | 307 | 252 | 58 |
| Arrive On Green | 0.12 | 0.22 | 0.22 | 0.24 | 0.33 | 0.33 | 0.14 | 0.14 | 0.14 | 0.17 | 0.17 | 0.17 |
| Sat Flow, veh/h | 1767 | 2999 | 472 | 1767 | 3526 | 1528 | 834 | 980 | 1525 | 1767 | 1450 | 336 |
| Grp Volume(v), veh/h | 42 | 103 | 105 | 200 | 547 | 184 | 137 | 0 | 192 | 182 | 0 | 202 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1708 | 1767 | 1763 | 1528 | 1814 | 0 | 1525 | 1767 | 0 | 1786 |
| Q Serve(g_s), s | 1.8 | 4.1 | 4.3 | 8.1 | 10.2 | 5.6 | 5.9 | 0.0 | 7.5 | 7.9 | 0.0 | 8.8 |
| Cycle Q Clear(g_c), s | 1.8 | 4.1 | 4.3 | 8.1 | 10.2 | 5.6 | 5.9 | 0.0 | 7.5 | 7.9 | 0.0 | 8.8 |
| Prop In Lane | 1.00 | | 0.28 | 1.00 | | 1.00 | 0.46 | | 1.00 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 211 | 379 | 367 | 422 | 1180 | 785 | 256 | 0 | 591 | 307 | 0 | 311 |
| V/C Ratio(X) | 0.20 | 0.27 | 0.29 | 0.47 | 0.46 | 0.23 | 0.53 | 0.00 | 0.32 | 0.59 | 0.00 | 0.65 |
| Avail Cap(c_a), veh/h | 317 | 843 | 816 | 634 | 2317 | 1278 | 434 | 0 | 740 | 733 | 0 | 741 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.2 | 27.4 | 27.5 | 27.3 | 21.9 | 11.5 | 33.4 | 0.0 | 18.4 | 31.8 | 0.0 | 32.2 |
| Incr Delay (d2), s/veh | 0.3 | 0.5 | 0.6 | 0.6 | 1.0 | 0.6 | 2.5 | 0.0 | 0.5 | 2.6 | 0.0 | 3.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 1.8 | 1.8 | 3.5 | 4.3 | 2.8 | 2.7 | 0.0 | 2.6 | 3.6 | 0.0 | 4.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 33.6 | 27.9 | 28.1 | 27.9 | 23.0 | 12.0 | 35.8 | 0.0 | 18.8 | 34.4 | 0.0 | 35.4 |
| LnGrp LOS | C | C | C | C | C | B | D | A | B | C | A | D |
| Approach Vol, veh/h | | 250 | | | 931 | | | 329 | | | 384 | |
| Approach Delay, s/veh | | 28.9 | | | 21.9 | | | 25.9 | | | 34.9 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 33.4 | | 16.4 | 24.7 | 23.4 | | 19.2 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.8 | 12.2 | | 9.5 | 10.1 | 6.3 | | 10.8 | | | | |
| Green Ext Time (p_c), s | 0.0 | 13.8 | | 1.5 | 0.4 | 1.9 | | 2.7 | | | | |

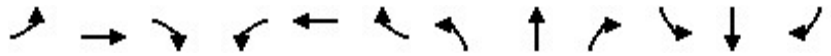
| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 26.2 |
| HCM 6th LOS | | C |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 530 | 40 | 270 | 910 | 760 | 50 | 0 | 250 | 120 | 100 | 110 |
| Future Volume (veh/h) | 0 | 530 | 40 | 270 | 910 | 760 | 50 | 0 | 250 | 120 | 100 | 110 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.88 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 558 | 38 | 284 | 958 | 0 | 53 | 0 | 184 | 116 | 120 | 78 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 726 | 49 | 335 | 1796 | | 0 | 0 | 0 | 316 | 332 | 248 |
| Arrive On Green | 0.00 | 0.23 | 0.23 | 0.20 | 0.53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.25 | 0.25 |
| Sat Flow, veh/h | 0 | 3305 | 219 | 1710 | 3410 | 1521 | | 0 | | 1266 | 1329 | 992 |
| Grp Volume(v), veh/h | 0 | 293 | 303 | 284 | 958 | 0 | | 0.0 | | 116 | 120 | 78 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1742 | 1710 | 1705 | 1521 | | | | 1266 | 1329 | 992 |
| Q Serve(g_s), s | 0.0 | 8.8 | 8.9 | 8.7 | 10.1 | 0.0 | | | | 4.1 | 4.1 | 3.5 |
| Cycle Q Clear(g_c), s | 0.0 | 8.8 | 8.9 | 8.7 | 10.1 | 0.0 | | | | 4.1 | 4.1 | 3.5 |
| Prop In Lane | 0.00 | | 0.13 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 382 | 393 | 335 | 1796 | | | | | 316 | 332 | 248 |
| V/C Ratio(X) | 0.00 | 0.77 | 0.77 | 0.85 | 0.53 | | | | | 0.37 | 0.36 | 0.32 |
| Avail Cap(c_a), veh/h | 0 | 1242 | 1279 | 1412 | 5676 | | | | | 581 | 610 | 455 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 19.8 | 19.8 | 21.1 | 8.5 | 0.0 | | | | 16.9 | 16.9 | 16.7 |
| Incr Delay (d2), s/veh | 0.0 | 1.2 | 1.2 | 2.3 | 0.1 | 0.0 | | | | 0.3 | 0.2 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 3.3 | 3.4 | 3.3 | 2.7 | 0.0 | | | | 1.1 | 1.2 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 21.0 | 21.0 | 23.4 | 8.6 | 0.0 | | | | 17.2 | 17.1 | 16.9 |
| LnGrp LOS | A | C | C | C | A | | | | | B | B | B |
| Approach Vol, veh/h | | 596 | | | 1242 | | | | | | 314 | |
| Approach Delay, s/veh | | 21.0 | | | 12.0 | | | | | | 17.1 | |
| Approach LOS | | C | | | B | | | | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.4 | 18.4 | | 19.7 | | 34.8 |
| Change Period (Y+Rc), s* | 5.7 | 6.1 | | 6.1 | | 6.1 |
| Max Green Setting (Gmax), s | 4.5 | 40.0 | | 25.0 | | 90.7 |
| Max Q Clear Time (g_c+I1), s | 10.7 | 10.9 | | 6.1 | | 12.1 |
| Green Ext Time (p_c), s | 0.1 | 1.4 | | 0.3 | | 2.7 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 15.2 |
| HCM 6th LOS | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 120 | 420 | 0 | 0 | 1410 | 410 | 0 | 0 | 480 | 0 | 0 | 530 |
| Future Vol, veh/h | 120 | 420 | 0 | 0 | 1410 | 410 | 0 | 0 | 480 | 0 | 0 | 530 |
| Conflicting Peds, #/hr | 20 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 126 | 442 | 0 | 0 | 1484 | 432 | 0 | 0 | 505 | 0 | 0 | 558 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1936 | 0 | - | - | - | 0 | - | - | 221 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 296 | - | 0 | 0 | - | - | 0 | 0 | 780 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 296 | - | - | - | - | - | - | - | 780 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 5.8 | 0 | 17.7 | 0 |
| HCM LOS | | | C | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 780 | 296 | - | - | - | - |
| HCM Lane V/C Ratio | 0.648 | 0.427 | - | - | - | - |
| HCM Control Delay (s) | 17.7 | 25.9 | - | - | - | 0 |
| HCM Lane LOS | C | D | - | - | - | A |
| HCM 95th %tile Q(veh) | 4.8 | 2 | - | - | - | - |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 10 | 200 | 20 | 0 | 0 | 0 | 0 | 10 | 20 | 20 | 50 | 0 |
| Future Vol, veh/h | 10 | 200 | 20 | 0 | 0 | 0 | 0 | 10 | 20 | 20 | 50 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 11 | 211 | 21 | 0 | 0 | 0 | 0 | 11 | 21 | 21 | 53 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 8.3 | 7.4 | 8.1 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 9% | 0% | 29% |
| Vol Thru, % | 33% | 91% | 83% | 71% |
| Vol Right, % | 67% | 0% | 17% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 30 | 110 | 120 | 70 |
| LT Vol | 0 | 10 | 0 | 20 |
| Through Vol | 10 | 100 | 100 | 50 |
| RT Vol | 20 | 0 | 20 | 0 |
| Lane Flow Rate | 32 | 116 | 126 | 74 |
| Geometry Grp | 2 | 5 | 5 | 2 |
| Degree of Util (X) | 0.037 | 0.154 | 0.162 | 0.094 |
| Departure Headway (Hd) | 4.204 | 4.778 | 4.616 | 4.609 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 856 | 743 | 769 | 782 |
| Service Time | 2.207 | 2.551 | 2.389 | 2.611 |
| HCM Lane V/C Ratio | 0.037 | 0.156 | 0.164 | 0.095 |
| HCM Control Delay | 7.4 | 8.4 | 8.3 | 8.1 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.5 | 0.6 | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 70 | 170 | 20 | 30 | 0 | 60 | 0 | 30 | 30 | 0 | 0 | 0 |
| Future Vol, veh/h | 70 | 170 | 20 | 30 | 0 | 60 | 0 | 30 | 30 | 0 | 0 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 74 | 179 | 21 | 32 | 0 | 63 | 0 | 32 | 32 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 8.9 | 7.7 | 7.9 |
| HCM LOS | A | A | A |

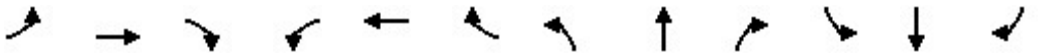
| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 33% |
| Vol Thru, % | 50% | 0% | 89% | 0% |
| Vol Right, % | 50% | 0% | 11% | 67% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 60 | 70 | 190 | 90 |
| LT Vol | 0 | 70 | 0 | 30 |
| Through Vol | 30 | 0 | 170 | 0 |
| RT Vol | 30 | 0 | 20 | 60 |
| Lane Flow Rate | 63 | 74 | 200 | 95 |
| Geometry Grp | 2 | 5 | 5 | 4a |
| Degree of Util (X) | 0.079 | 0.107 | 0.258 | 0.109 |
| Departure Headway (Hd) | 4.482 | 5.212 | 4.637 | 4.151 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 803 | 684 | 770 | 867 |
| Service Time | 2.487 | 2.974 | 2.399 | 2.162 |
| HCM Lane V/C Ratio | 0.078 | 0.108 | 0.26 | 0.11 |
| HCM Control Delay | 7.9 | 8.6 | 9 | 7.7 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.3 | 0.4 | 1 | 0.4 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.2 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 140 | 10 | 40 | 0 | 0 | 0 | 10 | 220 | 0 | 10 | 170 | 80 |
| Future Vol, veh/h | 140 | 10 | 40 | 0 | 0 | 0 | 10 | 220 | 0 | 10 | 170 | 80 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 147 | 11 | 42 | 0 | 0 | 0 | 11 | 232 | 0 | 11 | 179 | 84 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 10.3 | 0 | 10.2 | 10.1 |
| HCM LOS | B | - | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 4% | 74% | 0% | 4% |
| Vol Thru, % | 96% | 5% | 100% | 65% |
| Vol Right, % | 0% | 21% | 0% | 31% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 230 | 190 | 0 | 260 |
| LT Vol | 10 | 140 | 0 | 10 |
| Through Vol | 220 | 10 | 0 | 170 |
| RT Vol | 0 | 40 | 0 | 80 |
| Lane Flow Rate | 242 | 200 | 0 | 274 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.323 | 0.286 | 0 | 0.349 |
| Departure Headway (Hd) | 4.799 | 5.141 | 5.446 | 4.59 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 746 | 694 | 0 | 780 |
| Service Time | 2.857 | 3.208 | 3.544 | 2.645 |
| HCM Lane V/C Ratio | 0.324 | 0.288 | 0 | 0.351 |
| HCM Control Delay | 10.2 | 10.3 | 8.5 | 10.1 |
| HCM Lane LOS | B | B | N | B |
| HCM 95th-tile Q | 1.4 | 1.2 | 0 | 1.6 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 70 | 520 | 50 | 20 | 50 | 0 | 0 | 40 | 30 |
| Future Volume (veh/h) | 0 | 0 | 0 | 70 | 520 | 50 | 20 | 50 | 0 | 0 | 40 | 30 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.94 | 0.97 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 74 | 547 | 48 | 21 | 53 | 0 | 0 | 42 | 29 |
| Peak Hour Factor | | | | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 169 | 1308 | 120 | 213 | 351 | 0 | 0 | 236 | 163 |
| Arrive On Green | | | | 0.44 | 0.44 | 0.44 | 0.23 | 0.23 | 0.00 | 0.00 | 0.23 | 0.23 |
| Sat Flow, veh/h | | | | 383 | 2967 | 273 | 249 | 1494 | 0 | 0 | 1006 | 695 |
| Grp Volume(v), veh/h | | | | 354 | 0 | 315 | 74 | 0 | 0 | 0 | 0 | 71 |
| Grp Sat Flow(s),veh/h/ln | | | | 1836 | 0 | 1786 | 1744 | 0 | 0 | 0 | 0 | 1701 |
| Q Serve(g_s), s | | | | 4.0 | 0.0 | 3.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Cycle Q Clear(g_c), s | | | | 4.0 | 0.0 | 3.6 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Prop In Lane | | | | 0.21 | | 0.15 | 0.28 | | 0.00 | 0.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | | | | 810 | 0 | 788 | 564 | 0 | 0 | 0 | 0 | 399 |
| V/C Ratio(X) | | | | 0.44 | 0.00 | 0.40 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 |
| Avail Cap(c_a), veh/h | | | | 2474 | 0 | 2407 | 1278 | 0 | 0 | 0 | 0 | 1138 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 5.8 | 0.0 | 5.7 | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | 9.1 |
| Incr Delay (d2), s/veh | | | | 0.4 | 0.0 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 1.0 | 0.0 | 0.8 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 6.2 | 0.0 | 6.0 | 9.2 | 0.0 | 0.0 | 0.0 | 0.0 | 9.3 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 669 | | | 74 | | | 71 | |
| Approach Delay, s/veh | | | | | 6.1 | | | 9.2 | | | 9.3 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | | | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | | | 11.6 | | 18.3 | | 11.6 | | | | |
| Change Period (Y+Rc), s | | | | 4.6 | | 5.1 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | | | | 20.0 | | 40.3 | | 20.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | | 3.0 | | 6.0 | | 3.0 | | | | |
| Green Ext Time (p_c), s | | | | 0.3 | | 5.0 | | 0.3 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 6.7 |
| HCM 6th LOS | | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 640 | 20 | 0 | 0 | 170 | 0 | 0 | 10 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 640 | 20 | 0 | 0 | 170 | 0 | 0 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 7 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 674 | 21 | 0 | 0 | 179 | 0 | 0 | 11 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 367 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 627 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 616 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 10.9 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 616 |
| HCM Lane V/C Ratio | - | - | 0.017 |
| HCM Control Delay (s) | - | - | 10.9 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 40 | 180 | 30 | 170 | 590 | 260 | 70 | 120 | 360 | 500 | 120 | 90 |
| Future Volume (veh/h) | 40 | 180 | 30 | 170 | 590 | 260 | 70 | 120 | 360 | 500 | 120 | 90 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.92 | 1.00 | | 0.96 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 42 | 189 | 29 | 179 | 621 | 192 | 74 | 126 | 265 | 369 | 346 | 86 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 157 | 638 | 96 | 314 | 1055 | 887 | 110 | 188 | 531 | 489 | 395 | 98 |
| Arrive On Green | 0.09 | 0.21 | 0.21 | 0.18 | 0.30 | 0.30 | 0.16 | 0.16 | 0.16 | 0.28 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1767 | 3035 | 454 | 1767 | 3526 | 1511 | 674 | 1148 | 1532 | 1767 | 1427 | 355 |
| Grp Volume(v), veh/h | 42 | 108 | 110 | 179 | 621 | 192 | 200 | 0 | 265 | 369 | 0 | 432 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1726 | 1767 | 1763 | 1511 | 1822 | 0 | 1532 | 1767 | 0 | 1782 |
| Q Serve(g_s), s | 2.5 | 5.8 | 6.1 | 10.4 | 16.9 | 6.9 | 11.6 | 0.0 | 15.5 | 21.5 | 0.0 | 26.1 |
| Cycle Q Clear(g_c), s | 2.5 | 5.8 | 6.1 | 10.4 | 16.9 | 6.9 | 11.6 | 0.0 | 15.5 | 21.5 | 0.0 | 26.1 |
| Prop In Lane | 1.00 | | 0.26 | 1.00 | | 1.00 | 0.37 | | 1.00 | 1.00 | | 0.20 |
| Lane Grp Cap(c), veh/h | 157 | 371 | 363 | 314 | 1055 | 887 | 299 | 0 | 531 | 489 | 0 | 493 |
| V/C Ratio(X) | 0.27 | 0.29 | 0.30 | 0.57 | 0.59 | 0.22 | 0.67 | 0.00 | 0.50 | 0.76 | 0.00 | 0.88 |
| Avail Cap(c_a), veh/h | 236 | 627 | 614 | 471 | 1723 | 1174 | 324 | 0 | 552 | 545 | 0 | 549 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.8 | 37.4 | 37.5 | 42.3 | 33.5 | 11.6 | 44.2 | 0.0 | 29.5 | 37.2 | 0.0 | 38.9 |
| Incr Delay (d2), s/veh | 0.7 | 0.6 | 0.7 | 1.2 | 1.9 | 0.4 | 5.5 | 0.0 | 1.0 | 6.0 | 0.0 | 14.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 2.6 | 2.7 | 4.7 | 7.5 | 4.3 | 5.7 | 0.0 | 5.9 | 10.1 | 0.0 | 13.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 48.5 | 38.0 | 38.1 | 43.5 | 35.4 | 12.0 | 49.7 | 0.0 | 30.5 | 43.2 | 0.0 | 53.4 |
| LnGrp LOS | D | D | D | D | D | B | D | A | C | D | A | D |
| Approach Vol, veh/h | | 260 | | | 992 | | | 465 | | | 801 | |
| Approach Delay, s/veh | | 39.8 | | | 32.4 | | | 38.8 | | | 48.7 | |
| Approach LOS | | D | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 39.1 | | 23.0 | 24.7 | 29.1 | | 35.7 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 4.5 | 18.9 | | 17.5 | 12.4 | 8.1 | | 28.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 14.8 | | 0.8 | 0.3 | 2.0 | | 3.1 | | | | |

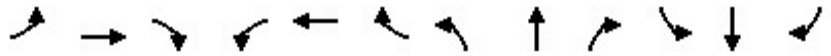
| Intersection Summary | | | |
|---|---|---|---|
| HCM 6th Ctrl Delay | | 39.5 | |
| HCM 6th LOS | | D | |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1120 | 40 | 250 | 1050 | 490 | 40 | 0 | 90 | 350 | 50 | 150 |
| Future Volume (veh/h) | 0 | 1120 | 40 | 250 | 1050 | 490 | 40 | 0 | 90 | 350 | 50 | 150 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 1179 | 38 | 263 | 1105 | 0 | 42 | 0 | 67 | 406 | 0 | 111 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 1330 | 43 | 301 | 2206 | | 0 | 0 | 0 | 497 | 0 | 213 |
| Arrive On Green | 0.00 | 0.40 | 0.40 | 0.18 | 0.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.20 |
| Sat Flow, veh/h | 0 | 3435 | 108 | 1710 | 3410 | 1521 | | 0 | | 2532 | 0 | 1088 |
| Grp Volume(v), veh/h | 0 | 596 | 621 | 263 | 1105 | 0 | | 0.0 | | 406 | 0 | 111 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1762 | 1710 | 1705 | 1521 | | | | 1266 | 0 | 1088 |
| Q Serve(g_s), s | 0.0 | 25.5 | 25.5 | 11.6 | 13.2 | 0.0 | | | | 11.9 | 0.0 | 7.1 |
| Cycle Q Clear(g_c), s | 0.0 | 25.5 | 25.5 | 11.6 | 13.2 | 0.0 | | | | 11.9 | 0.0 | 7.1 |
| Prop In Lane | 0.00 | | 0.06 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 672 | 700 | 301 | 2206 | | | | | 497 | 0 | 213 |
| V/C Ratio(X) | 0.00 | 0.89 | 0.89 | 0.87 | 0.50 | | | | | 0.82 | 0.00 | 0.52 |
| Avail Cap(c_a), veh/h | 0 | 1089 | 1134 | 550 | 3542 | | | | | 815 | 0 | 350 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 21.8 | 21.8 | 31.2 | 7.2 | 0.0 | | | | 29.9 | 0.0 | 28.0 |
| Incr Delay (d2), s/veh | 0.0 | 3.3 | 3.2 | 3.1 | 0.1 | 0.0 | | | | 1.3 | 0.0 | 0.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 10.1 | 10.6 | 4.8 | 3.7 | 0.0 | | | | 3.6 | 0.0 | 1.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 25.1 | 25.0 | 34.3 | 7.2 | 0.0 | | | | 31.2 | 0.0 | 28.7 |
| LnGrp LOS | A | C | C | C | A | | | | | C | A | C |
| Approach Vol, veh/h | | 1217 | | | 1368 | | | | | | 517 | |
| Approach Delay, s/veh | | 25.0 | | | 12.4 | | | | | | 30.6 | |
| Approach LOS | | C | | | B | | | | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.4 | 37.0 | | 21.3 | | 56.4 | | | |
| Change Period (Y+Rc), s* | 5.7 | 6.1 | | 6.1 | | 6.1 | | | |
| Max Green Setting (Gmax), s | 13.5 | 50.0 | | 25.0 | | 80.7 | | | |
| Max Q Clear Time (g_c+I1), s | 13.6 | 27.5 | | 13.9 | | 15.2 | | | |
| Green Ext Time (p_c), s | 0.1 | 3.4 | | 0.4 | | 3.2 | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 20.4 |
| HCM 6th LOS | C |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 75.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 160 | 840 | 0 | 0 | 980 | 200 | 0 | 0 | 820 | 0 | 0 | 810 |
| Future Vol, veh/h | 160 | 840 | 0 | 0 | 980 | 200 | 0 | 0 | 820 | 0 | 0 | 810 |
| Conflicting Peds, #/hr | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 168 | 884 | 0 | 0 | 1032 | 211 | 0 | 0 | 863 | 0 | 0 | 853 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1248 | 0 | - | - | - | 0 | - | - | 442 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 548 | - | 0 | 0 | - | - | 0 | 0 | ~ 560 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 548 | - | - | - | - | - | - | - | ~ 560 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 2.3 | 0 | 272.1 | 0 |
| HCM LOS | | | F | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 560 | 548 | - | - | - | - |
| HCM Lane V/C Ratio | 1.541 | 0.307 | - | - | - | - |
| HCM Control Delay (s) | 272.1 | 14.5 | - | - | - | 0 |
| HCM Lane LOS | F | B | - | - | - | A |
| HCM 95th %tile Q(veh) | 45.1 | 1.3 | - | - | - | - |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.8 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 40 | 360 | 20 | 0 | 0 | 0 | 0 | 30 | 20 | 60 | 70 | 0 |
| Future Vol, veh/h | 40 | 360 | 20 | 0 | 0 | 0 | 0 | 30 | 20 | 60 | 70 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 42 | 379 | 21 | 0 | 0 | 0 | 0 | 32 | 21 | 63 | 74 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 10.1 | 8.3 | 9.4 |
| HCM LOS | B | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 18% | 0% | 46% |
| Vol Thru, % | 60% | 82% | 90% | 54% |
| Vol Right, % | 40% | 0% | 10% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 50 | 220 | 200 | 130 |
| LT Vol | 0 | 40 | 0 | 60 |
| Through Vol | 30 | 180 | 180 | 70 |
| RT Vol | 20 | 0 | 20 | 0 |
| Lane Flow Rate | 53 | 232 | 211 | 137 |
| Geometry Grp | 2 | 5 | 5 | 2 |
| Degree of Util (X) | 0.072 | 0.329 | 0.29 | 0.194 |
| Departure Headway (Hd) | 4.898 | 5.121 | 4.959 | 5.11 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 730 | 702 | 724 | 702 |
| Service Time | 2.936 | 2.855 | 2.693 | 3.141 |
| HCM Lane V/C Ratio | 0.073 | 0.33 | 0.291 | 0.195 |
| HCM Control Delay | 8.3 | 10.4 | 9.7 | 9.4 |
| HCM Lane LOS | A | B | A | A |
| HCM 95th-tile Q | 0.2 | 1.4 | 1.2 | 0.7 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 140 | 300 | 10 | 20 | 0 | 20 | 0 | 10 | 10 | 0 | 0 | 0 |
| Future Vol, veh/h | 140 | 300 | 10 | 20 | 0 | 20 | 0 | 10 | 10 | 0 | 0 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 147 | 316 | 11 | 21 | 0 | 21 | 0 | 11 | 11 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 10.2 | 7.6 | 7.9 |
| HCM LOS | B | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 50% |
| Vol Thru, % | 50% | 0% | 97% | 0% |
| Vol Right, % | 50% | 0% | 3% | 50% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 20 | 140 | 310 | 40 |
| LT Vol | 0 | 140 | 0 | 20 |
| Through Vol | 10 | 0 | 300 | 0 |
| RT Vol | 10 | 0 | 10 | 20 |
| Lane Flow Rate | 21 | 147 | 326 | 42 |
| Geometry Grp | 2 | 5 | 5 | 4a |
| Degree of Util (X) | 0.028 | 0.209 | 0.416 | 0.051 |
| Departure Headway (Hd) | 4.765 | 5.109 | 4.587 | 4.349 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 755 | 703 | 786 | 827 |
| Service Time | 2.768 | 2.836 | 2.312 | 2.354 |
| HCM Lane V/C Ratio | 0.028 | 0.209 | 0.415 | 0.051 |
| HCM Control Delay | 7.9 | 9.2 | 10.6 | 7.6 |
| HCM Lane LOS | A | A | B | A |
| HCM 95th-tile Q | 0.1 | 0.8 | 2.1 | 0.2 |

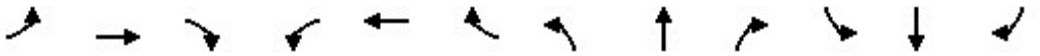
| Intersection | |
|---|---|
| Intersection Delay, s/veh | 12.9 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 290 | 0 | 30 | 10 | 0 | 10 | 10 | 240 | 0 | 0 | 220 | 40 |
| Future Vol, veh/h | 290 | 0 | 30 | 10 | 0 | 10 | 10 | 240 | 0 | 0 | 220 | 40 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 305 | 0 | 32 | 11 | 0 | 11 | 11 | 253 | 0 | 0 | 232 | 42 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 14.5 | 9.1 | 12 | 12 |
| HCM LOS | B | A | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 4% | 91% | 50% | 0% |
| Vol Thru, % | 96% | 0% | 0% | 85% |
| Vol Right, % | 0% | 9% | 50% | 15% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 250 | 320 | 20 | 260 |
| LT Vol | 10 | 290 | 10 | 0 |
| Through Vol | 240 | 0 | 0 | 220 |
| RT Vol | 0 | 30 | 10 | 40 |
| Lane Flow Rate | 263 | 337 | 21 | 274 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.397 | 0.519 | 0.034 | 0.405 |
| Departure Headway (Hd) | 5.435 | 5.551 | 5.847 | 5.326 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 661 | 650 | 610 | 676 |
| Service Time | 3.473 | 3.585 | 3.903 | 3.363 |
| HCM Lane V/C Ratio | 0.398 | 0.518 | 0.034 | 0.405 |
| HCM Control Delay | 12 | 14.5 | 9.1 | 12 |
| HCM Lane LOS | B | B | A | B |
| HCM 95th-tile Q | 1.9 | 3 | 0.1 | 2 |

# Appendix K
# Synchro Calculation Worksheets
# Horizon Year (2050) with Project Conditions



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 55 | 436 | 23 | 10 | 20 | 0 | 0 | 22 | 20 |
| Future Volume (veh/h) | 0 | 0 | 0 | 55 | 436 | 23 | 10 | 20 | 0 | 0 | 22 | 20 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.99 | 0.97 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 58 | 459 | 22 | 11 | 21 | 0 | 0 | 23 | 19 |
| Peak Hour Factor | | | | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 176 | 1459 | 73 | 241 | 226 | 0 | 0 | 153 | 126 |
| Arrive On Green | | | | 0.47 | 0.47 | 0.47 | 0.17 | 0.17 | 0.00 | 0.00 | 0.17 | 0.17 |
| Sat Flow, veh/h | | | | 377 | 3128 | 157 | 347 | 1366 | 0 | 0 | 923 | 762 |
| Grp Volume(v), veh/h | | | | 283 | 0 | 256 | 32 | 0 | 0 | 0 | 0 | 42 |
| Grp Sat Flow(s),veh/h/ln | | | | 1837 | 0 | 1825 | 1714 | 0 | 0 | 0 | 0 | 1685 |
| Q Serve(g_s), s | | | | 2.6 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Cycle Q Clear(g_c), s | | | | 2.6 | 0.0 | 2.3 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Prop In Lane | | | | 0.21 | | 0.09 | 0.34 | | 0.00 | 0.00 | | 0.45 |
| Lane Grp Cap(c), veh/h | | | | 857 | 0 | 851 | 467 | 0 | 0 | 0 | 0 | 279 |
| V/C Ratio(X) | | | | 0.33 | 0.00 | 0.30 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| Avail Cap(c_a), veh/h | | | | 2810 | 0 | 2792 | 1433 | 0 | 0 | 0 | 0 | 1279 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 4.4 | 0.0 | 4.4 | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 | 9.4 |
| Incr Delay (d2), s/veh | | | | 0.2 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 0.5 | 0.0 | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 4.7 | 0.0 | 4.6 | 9.4 | 0.0 | 0.0 | 0.0 | 0.0 | 9.7 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 539 | | | 32 | | | 42 | |
| Approach Delay, s/veh | | | | | 4.6 | | | 9.4 | | | 9.7 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | 4 | 6 | 8 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.0 | 17.4 | 9.0 |
| Change Period (Y+Rc), s | 4.6 | 5.1 | 4.6 |
| Max Green Setting (Gmax), s | 20.0 | 40.3 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 2.6 | 4.6 | 2.4 |
| Green Ext Time (p_c), s | 0.1 | 3.8 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 5.2 |
| HCM 6th LOS | A |

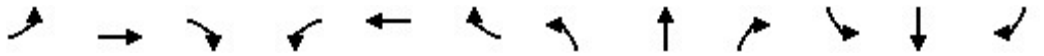
| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 553 | 33 | 0 | 0 | 174 | 0 | 0 | 12 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 553 | 33 | 0 | 0 | 174 | 0 | 0 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 582 | 35 | 0 | 0 | 183 | 0 | 0 | 13 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 320 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 673 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 666 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 10.5 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 666 |
| HCM Lane V/C Ratio | - | - | 0.019 |
| HCM Control Delay (s) | - | - | 10.5 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0.1 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 42 | 189 | 33 | 213 | 520 | 250 | 76 | 72 | 279 | 220 | 92 | 40 |
| Future Volume (veh/h) | 42 | 189 | 33 | 213 | 520 | 250 | 76 | 72 | 279 | 220 | 92 | 40 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.90 | 1.00 | | 0.97 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 44 | 199 | 32 | 224 | 547 | 184 | 80 | 76 | 206 | 183 | 165 | 38 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 209 | 639 | 100 | 418 | 1168 | 779 | 138 | 131 | 598 | 307 | 252 | 58 |
| Arrive On Green | 0.12 | 0.21 | 0.21 | 0.24 | 0.33 | 0.33 | 0.15 | 0.15 | 0.15 | 0.17 | 0.17 | 0.17 |
| Sat Flow, veh/h | 1767 | 3001 | 470 | 1767 | 3526 | 1527 | 928 | 881 | 1526 | 1767 | 1452 | 334 |
| Grp Volume(v), veh/h | 44 | 115 | 116 | 224 | 547 | 184 | 156 | 0 | 206 | 183 | 0 | 203 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1708 | 1767 | 1763 | 1527 | 1809 | 0 | 1526 | 1767 | 0 | 1786 |
| Q Serve(g_s), s | 1.9 | 4.6 | 4.9 | 9.4 | 10.4 | 5.7 | 6.8 | 0.0 | 8.1 | 8.1 | 0.0 | 9.0 |
| Cycle Q Clear(g_c), s | 1.9 | 4.6 | 4.9 | 9.4 | 10.4 | 5.7 | 6.8 | 0.0 | 8.1 | 8.1 | 0.0 | 9.0 |
| Prop In Lane | 1.00 | | 0.27 | 1.00 | | 1.00 | 0.51 | | 1.00 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 209 | 375 | 364 | 418 | 1168 | 779 | 268 | 0 | 598 | 307 | 0 | 311 |
| V/C Ratio(X) | 0.21 | 0.31 | 0.32 | 0.54 | 0.47 | 0.24 | 0.58 | 0.00 | 0.34 | 0.60 | 0.00 | 0.65 |
| Avail Cap(c_a), veh/h | 314 | 834 | 808 | 627 | 2294 | 1267 | 428 | 0 | 733 | 725 | 0 | 733 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.7 | 28.0 | 28.1 | 28.2 | 22.4 | 11.8 | 33.6 | 0.0 | 18.5 | 32.2 | 0.0 | 32.5 |
| Incr Delay (d2), s/veh | 0.4 | 0.6 | 0.7 | 0.8 | 1.1 | 0.6 | 2.8 | 0.0 | 0.5 | 2.6 | 0.0 | 3.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 2.0 | 2.0 | 4.0 | 4.4 | 2.9 | 3.2 | 0.0 | 2.9 | 3.6 | 0.0 | 4.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 34.1 | 28.6 | 28.8 | 29.0 | 23.4 | 12.3 | 36.4 | 0.0 | 19.0 | 34.8 | 0.0 | 35.8 |
| LnGrp LOS | C | C | C | C | C | B | D | A | B | C | A | D |
| Approach Vol, veh/h | | 275 | | | 955 | | | 362 | | | 386 | |
| Approach Delay, s/veh | | 29.6 | | | 22.6 | | | 26.5 | | | 35.3 | |
| Approach LOS | | C | | | C | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 33.4 | | 17.1 | 24.7 | 23.4 | | 19.3 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.9 | 12.4 | | 10.1 | 11.4 | 6.9 | | 11.0 | | | | |
| Green Ext Time (p_c), s | 0.0 | 13.8 | | 1.7 | 0.4 | 2.1 | | 2.7 | | | | |

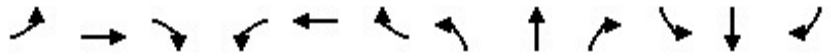
| Intersection Summary | | | |
|---|---|---|---|
| HCM 6th Ctrl Delay | | 26.8 | |
| HCM 6th LOS | | C | |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 543 | 65 | 270 | 929 | 760 | 50 | 0 | 250 | 120 | 100 | 114 |
| Future Volume (veh/h) | 0 | 543 | 65 | 270 | 929 | 760 | 50 | 0 | 250 | 120 | 100 | 114 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.88 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 572 | 62 | 284 | 978 | 0 | 53 | 0 | 184 | 116 | 120 | 84 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 732 | 79 | 334 | 1825 | | 0 | 0 | 0 | 312 | 328 | 244 |
| Arrive On Green | 0.00 | 0.24 | 0.24 | 0.20 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.25 | 0.25 |
| Sat Flow, veh/h | 0 | 3170 | 333 | 1710 | 3410 | 1521 | | 0 | | 1266 | 1329 | 991 |
| Grp Volume(v), veh/h | 0 | 314 | 320 | 284 | 978 | 0 | | 0.0 | | 116 | 120 | 84 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1721 | 1710 | 1705 | 1521 | | | | 1266 | 1329 | 991 |
| Q Serve(g_s), s | 0.0 | 9.7 | 9.8 | 9.0 | 10.5 | 0.0 | | | | 4.3 | 4.2 | 3.9 |
| Cycle Q Clear(g_c), s | 0.0 | 9.7 | 9.8 | 9.0 | 10.5 | 0.0 | | | | 4.3 | 4.2 | 3.9 |
| Prop In Lane | 0.00 | | 0.19 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 402 | 409 | 334 | 1825 | | | | | 312 | 328 | 244 |
| V/C Ratio(X) | 0.00 | 0.78 | 0.78 | 0.85 | 0.54 | | | | | 0.37 | 0.37 | 0.34 |
| Avail Cap(c_a), veh/h | 0 | 1210 | 1231 | 1375 | 5530 | | | | | 566 | 594 | 443 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 20.0 | 20.0 | 21.7 | 8.5 | 0.0 | | | | 17.5 | 17.4 | 17.3 |
| Incr Delay (d2), s/veh | 0.0 | 1.3 | 1.3 | 2.3 | 0.1 | 0.0 | | | | 0.3 | 0.3 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 3.7 | 3.8 | 3.4 | 2.8 | 0.0 | | | | 1.2 | 1.2 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 21.2 | 21.2 | 24.0 | 8.6 | 0.0 | | | | 17.7 | 17.7 | 17.6 |
| LnGrp LOS | A | C | C | C | A | | | | | B | B | B |
| Approach Vol, veh/h | | 634 | | | 1262 | | | | | | 320 | |
| Approach Delay, s/veh | | 21.2 | | | 12.0 | | | | | | 17.7 | |
| Approach LOS | | C | | | B | | | | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.6 | 19.4 | | 19.9 | | 36.0 | | | |
| Change Period (Y+Rc), s* | 5.7 | 6.1 | | 6.1 | | 6.1 | | | |
| Max Green Setting (Gmax), s | 4.5 | 40.0 | | 25.0 | | 90.7 | | | |
| Max Q Clear Time (g_c+I1), s | 11.0 | 11.8 | | 6.3 | | 12.5 | | | |
| Green Ext Time (p_c), s | 0.1 | 1.5 | | 0.3 | | 2.7 | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 15.5 |
| HCM 6th LOS | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 126 | 426 | 0 | 0 | 1414 | 410 | 0 | 0 | 480 | 0 | 0 | 545 |
| Future Vol, veh/h | 126 | 426 | 0 | 0 | 1414 | 410 | 0 | 0 | 480 | 0 | 0 | 545 |
| Conflicting Peds, #/hr | 20 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 133 | 448 | 0 | 0 | 1488 | 432 | 0 | 0 | 505 | 0 | 0 | 574 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1940 | 0 | - | - | - | 0 | - | - | 224 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 295 | - | 0 | 0 | - | - | 0 | 0 | 776 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 295 | - | - | - | - | - | - | - | 776 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 6.1 | 0 | 17.9 | 0 |
| HCM LOS | | | C | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 776 | 295 | - | - | - | - |
| HCM Lane V/C Ratio | 0.651 | 0.45 | - | - | - | - |
| HCM Control Delay (s) | 17.9 | 26.8 | - | - | - | 0 |
| HCM Lane LOS | C | D | - | - | - | A |
| HCM 95th %tile Q(veh) | 4.9 | 2.2 | - | - | - | - |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.3 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 10 | 204 | 20 | 0 | 0 | 0 | 0 | 10 | 22 | 24 | 53 | 0 |
| Future Vol, veh/h | 10 | 204 | 20 | 0 | 0 | 0 | 0 | 10 | 22 | 24 | 53 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 11 | 215 | 21 | 0 | 0 | 0 | 0 | 11 | 23 | 25 | 56 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 8.4 | 7.4 | 8.2 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 9% | 0% | 31% |
| Vol Thru, % | 31% | 91% | 84% | 69% |
| Vol Right, % | 69% | 0% | 16% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 32 | 112 | 122 | 77 |
| LT Vol | 0 | 10 | 0 | 24 |
| Through Vol | 10 | 102 | 102 | 53 |
| RT Vol | 22 | 0 | 20 | 0 |
| Lane Flow Rate | 34 | 118 | 128 | 81 |
| Geometry Grp | 2 | 5 | 5 | 2 |
| Degree of Util (X) | 0.039 | 0.157 | 0.165 | 0.104 |
| Departure Headway (Hd) | 4.21 | 4.795 | 4.635 | 4.626 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 855 | 740 | 765 | 779 |
| Service Time | 2.214 | 2.574 | 2.414 | 2.628 |
| HCM Lane V/C Ratio | 0.04 | 0.159 | 0.167 | 0.104 |
| HCM Control Delay | 7.4 | 8.5 | 8.3 | 8.2 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.6 | 0.6 | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.6 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 75 | 175 | 20 | 33 | 0 | 73 | 0 | 31 | 31 | 0 | 0 | 0 |
| Future Vol, veh/h | 75 | 175 | 20 | 33 | 0 | 73 | 0 | 31 | 31 | 0 | 0 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 79 | 184 | 21 | 35 | 0 | 77 | 0 | 33 | 33 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 9 | 7.8 | 7.9 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 31% |
| Vol Thru, % | 50% | 0% | 90% | 0% |
| Vol Right, % | 50% | 0% | 10% | 69% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 62 | 75 | 195 | 106 |
| LT Vol | 0 | 75 | 0 | 33 |
| Through Vol | 31 | 0 | 175 | 0 |
| RT Vol | 31 | 0 | 20 | 73 |
| Lane Flow Rate | 65 | 79 | 205 | 112 |
| Geometry Grp | 2 | 5 | 5 | 4a |
| Degree of Util (X) | 0.082 | 0.115 | 0.265 | 0.129 |
| Departure Headway (Hd) | 4.537 | 5.225 | 4.652 | 4.153 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 793 | 681 | 766 | 867 |
| Service Time | 2.544 | 2.992 | 2.419 | 2.161 |
| HCM Lane V/C Ratio | 0.082 | 0.116 | 0.268 | 0.129 |
| HCM Control Delay | 7.9 | 8.7 | 9.1 | 7.8 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.3 | 0.4 | 1.1 | 0.4 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.4 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 146 | 10 | 40 | 0 | 0 | 0 | 11 | 221 | 0 | 10 | 173 | 96 |
| Future Vol, veh/h | 146 | 10 | 40 | 0 | 0 | 0 | 11 | 221 | 0 | 10 | 173 | 96 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 154 | 11 | 42 | 0 | 0 | 0 | 12 | 233 | 0 | 11 | 182 | 101 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 10.5 | 0 | 10.3 | 10.4 |
| HCM LOS | B | - | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 5% | 74% | 0% | 4% |
| Vol Thru, % | 95% | 5% | 100% | 62% |
| Vol Right, % | 0% | 20% | 0% | 34% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 232 | 196 | 0 | 279 |
| LT Vol | 11 | 146 | 0 | 10 |
| Through Vol | 221 | 10 | 0 | 173 |
| RT Vol | 0 | 40 | 0 | 96 |
| Lane Flow Rate | 244 | 206 | 0 | 294 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.329 | 0.298 | 0 | 0.375 |
| Departure Headway (Hd) | 4.846 | 5.195 | 5.621 | 4.595 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 738 | 687 | 0 | 778 |
| Service Time | 2.909 | 3.269 | 3.621 | 2.654 |
| HCM Lane V/C Ratio | 0.331 | 0.3 | 0 | 0.378 |
| HCM Control Delay | 10.3 | 10.5 | 8.6 | 10.4 |
| HCM Lane LOS | B | B | N | B |
| HCM 95th-tile Q | 1.4 | 1.2 | 0 | 1.7 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.1 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 24 | 160 | 19 | 0 | 0 |
| Future Vol, veh/h | 0 | 24 | 160 | 19 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 25 | 168 | 20 | 0 | 0 |

| Major/Minor | Minor1 | | Major1 | |
|---|---|---|---|---|
| Conflicting Flow All | - | 94 | 0 | 0 |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |
| Critical Hdwy | - | 6.96 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - |
| Follow-up Hdwy | - | 3.33 | - | - |
| Pot Cap-1 Maneuver | 0 | 941 | - | - |
| Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
| Platoon blocked, % | | | - | - |
| Mov Cap-1 Maneuver | - | 941 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |

| Approach | WB | NB |
|---|---|---|
| HCM Control Delay, s | 8.9 | 0 |
| HCM LOS | A | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 941 |
| HCM Lane V/C Ratio | - | - | 0.027 |
| HCM Control Delay (s) | - | - | 8.9 |
| HCM Lane LOS | - | - | A |
| HCM 95th %tile Q(veh) | - | - | 0.1 |

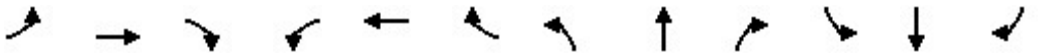
| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 36 | 3 | 7 | 360 | 326 | 12 |
| Future Vol, veh/h | 36 | 3 | 7 | 360 | 326 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 38 | 3 | 7 | 379 | 343 | 13 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 743 | 350 | 356 | 0 | - | 0 |
| Stage 1 | 350 | - | - | - | - | - |
| Stage 2 | 393 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.13 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.227 | - | - | - |
| Pot Cap-1 Maneuver | 381 | 691 | 1197 | - | - | - |
| Stage 1 | 711 | - | - | - | - | - |
| Stage 2 | 680 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 378 | 691 | 1197 | - | - | - |
| Mov Cap-2 Maneuver | 378 | - | - | - | - | - |
| Stage 1 | 706 | - | - | - | - | - |
| Stage 2 | 680 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 15.3 | 0.2 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1197 | - | 392 | - | - |
| HCM Lane V/C Ratio | 0.006 | - | 0.105 | - | - |
| HCM Control Delay (s) | 8 | 0 | 15.3 | - | - |
| HCM Lane LOS | A | A | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.3 | - | - |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 76 | 524 | 52 | 20 | 50 | 0 | 0 | 43 | 30 |
| Future Volume (veh/h) | 0 | 0 | 0 | 76 | 524 | 52 | 20 | 50 | 0 | 0 | 43 | 30 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 0.94 | 0.97 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1856 | 1856 | 1856 | 1856 | 1856 | 0 | 0 | 1856 | 1856 |
| Adj Flow Rate, veh/h | | | | 80 | 552 | 50 | 21 | 53 | 0 | 0 | 45 | 29 |
| Peak Hour Factor | | | | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | | | | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | 3 |
| Cap, veh/h | | | | 179 | 1292 | 123 | 213 | 353 | 0 | 0 | 245 | 158 |
| Arrive On Green | | | | 0.44 | 0.44 | 0.44 | 0.24 | 0.24 | 0.00 | 0.00 | 0.24 | 0.24 |
| Sat Flow, veh/h | | | | 406 | 2935 | 278 | 249 | 1495 | 0 | 0 | 1038 | 669 |
| Grp Volume(v), veh/h | | | | 361 | 0 | 321 | 74 | 0 | 0 | 0 | 0 | 74 |
| Grp Sat Flow(s),veh/h/ln | | | | 1835 | 0 | 1785 | 1743 | 0 | 0 | 0 | 0 | 1707 |
| Q Serve(g_s), s | | | | 4.1 | 0.0 | 3.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Cycle Q Clear(g_c), s | | | | 4.1 | 0.0 | 3.7 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Prop In Lane | | | | 0.22 | | 0.16 | 0.28 | | 0.00 | 0.00 | | 0.39 |
| Lane Grp Cap(c), veh/h | | | | 808 | 0 | 786 | 565 | 0 | 0 | 0 | 0 | 403 |
| V/C Ratio(X) | | | | 0.45 | 0.00 | 0.41 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 |
| Avail Cap(c_a), veh/h | | | | 2469 | 0 | 2401 | 1276 | 0 | 0 | 0 | 0 | 1140 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 5.8 | 0.0 | 5.7 | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | 9.1 |
| Incr Delay (d2), s/veh | | | | 0.4 | 0.0 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 1.0 | 0.0 | 0.8 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | | | | 6.2 | 0.0 | 6.1 | 9.2 | 0.0 | 0.0 | 0.0 | 0.0 | 9.4 |
| LnGrp LOS | | | | A | A | A | A | A | A | A | A | A |
| Approach Vol, veh/h | | | | | 682 | | | 74 | | | 74 | |
| Approach Delay, s/veh | | | | | 6.2 | | | 9.2 | | | 9.4 | |
| Approach LOS | | | | | A | | | A | | | A | |

| Timer - Assigned Phs | | | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | | | 11.7 | | 18.3 | | 11.7 | | | | |
| Change Period (Y+Rc), s | | | | 4.6 | | 5.1 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | | | | 20.0 | | 40.3 | | 20.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | | 3.0 | | 6.1 | | 3.0 | | | | |
| Green Ext Time (p_c), s | | | | 0.3 | | 5.1 | | 0.3 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 6.7 |
| HCM 6th LOS | | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 649 | 22 | 0 | 0 | 186 | 0 | 0 | 13 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 649 | 22 | 0 | 0 | 186 | 0 | 0 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 7 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Free | Free | Free | Yield | Yield | Yield | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 1 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 683 | 23 | 0 | 0 | 196 | 0 | 0 | 14 |

| Major/Minor | Major2 | | | Minor2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | - | - | 0 | - | - | 372 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | - | - | - | - | 6.96 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | 3.33 |
| Pot Cap-1 Maneuver | 0 | - | - | 0 | 0 | 622 |
| Stage 1 | 0 | - | - | 0 | 0 | - |
| Stage 2 | 0 | - | - | 0 | 0 | - |
| Platoon blocked, % | | - | - | | | |
| Mov Cap-1 Maneuver | - | - | - | - | 0 | 611 |
| Mov Cap-2 Maneuver | - | - | - | - | 0 | - |
| Stage 1 | - | - | - | - | 0 | - |
| Stage 2 | - | - | - | - | 0 | - |

| Approach | WB | SB |
|---|---|---|
| HCM Control Delay, s | 0 | 11 |
| HCM LOS | | B |

| Minor Lane/Major Mvmt | WBT | WBR | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 611 |
| HCM Lane V/C Ratio | - | - | 0.022 |
| HCM Control Delay (s) | - | - | 11 |
| HCM Lane LOS | - | - | B |
| HCM 95th %tile Q(veh) | - | - | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 41 | 193 | 32 | 210 | 590 | 260 | 81 | 121 | 373 | 500 | 123 | 90 |
| Future Volume (veh/h) | 41 | 193 | 32 | 210 | 590 | 260 | 81 | 121 | 373 | 500 | 123 | 90 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.92 | 1.00 | | 0.96 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 43 | 203 | 31 | 221 | 621 | 192 | 85 | 127 | 275 | 370 | 347 | 86 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 156 | 637 | 95 | 312 | 1051 | 885 | 122 | 182 | 534 | 488 | 394 | 98 |
| Arrive On Green | 0.09 | 0.21 | 0.21 | 0.18 | 0.30 | 0.30 | 0.17 | 0.17 | 0.17 | 0.28 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1767 | 3036 | 453 | 1767 | 3526 | 1511 | 729 | 1090 | 1532 | 1767 | 1428 | 354 |
| Grp Volume(v), veh/h | 43 | 116 | 118 | 221 | 621 | 192 | 212 | 0 | 275 | 370 | 0 | 433 |
| Grp Sat Flow(s),veh/h/ln | 1767 | 1763 | 1726 | 1767 | 1763 | 1511 | 1819 | 0 | 1532 | 1767 | 0 | 1782 |
| Q Serve(g_s), s | 2.6 | 6.3 | 6.6 | 13.3 | 17.0 | 7.0 | 12.5 | 0.0 | 16.3 | 21.7 | 0.0 | 26.3 |
| Cycle Q Clear(g_c), s | 2.6 | 6.3 | 6.6 | 13.3 | 17.0 | 7.0 | 12.5 | 0.0 | 16.3 | 21.7 | 0.0 | 26.3 |
| Prop In Lane | 1.00 | | 0.26 | 1.00 | | 1.00 | 0.40 | | 1.00 | 1.00 | | 0.20 |
| Lane Grp Cap(c), veh/h | 156 | 370 | 362 | 312 | 1051 | 885 | 304 | 0 | 534 | 488 | 0 | 492 |
| V/C Ratio(X) | 0.28 | 0.31 | 0.33 | 0.71 | 0.59 | 0.22 | 0.70 | 0.00 | 0.52 | 0.76 | 0.00 | 0.88 |
| Avail Cap(c_a), veh/h | 234 | 622 | 609 | 468 | 1710 | 1167 | 321 | 0 | 548 | 541 | 0 | 545 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.3 | 37.9 | 38.0 | 43.9 | 33.9 | 11.8 | 44.5 | 0.0 | 29.8 | 37.6 | 0.0 | 39.2 |
| Incr Delay (d2), s/veh | 0.7 | 0.7 | 0.7 | 2.2 | 1.9 | 0.4 | 6.9 | 0.0 | 1.1 | 6.2 | 0.0 | 15.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 2.8 | 2.9 | 6.1 | 7.6 | 4.4 | 6.2 | 0.0 | 6.2 | 10.2 | 0.0 | 13.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 49.0 | 38.6 | 38.7 | 46.2 | 35.8 | 12.2 | 51.3 | 0.0 | 30.9 | 43.7 | 0.0 | 54.2 |
| LnGrp LOS | D | D | D | D | D | B | D | A | C | D | A | D |
| Approach Vol, veh/h | | 277 | | | 1034 | | | 487 | | | 803 | |
| Approach Delay, s/veh | | 40.3 | | | 33.7 | | | 39.8 | | | 49.4 | |
| Approach LOS | | D | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 39.2 | | 23.6 | 24.7 | 29.2 | | 35.9 | | | | |
| Change Period (Y+Rc), s | * 4.7 | 5.4 | | 4.6 | * 4.7 | 5.4 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | * 15 | 55.0 | | 20.0 | * 30 | 40.0 | | 34.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 4.6 | 19.0 | | 18.3 | 15.3 | 8.6 | | 28.3 | | | | |
| Green Ext Time (p_c), s | 0.0 | 14.8 | | 0.6 | 0.4 | 2.1 | | 3.0 | | | | |

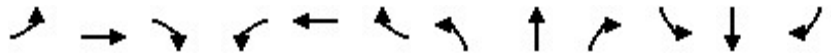
| Intersection Summary | | | |
|---|---|---|---|
| HCM 6th Ctrl Delay | | 40.4 | |
| HCM 6th LOS | | D | |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1129 | 57 | 250 | 1084 | 490 | 40 | 0 | 90 | 350 | 50 | 157 |
| Future Volume (veh/h) | 0 | 1129 | 57 | 250 | 1084 | 490 | 40 | 0 | 90 | 350 | 50 | 157 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1781 | 1781 | 1795 | 1795 | 1795 | 1856 | 0 | 1856 | 1329 | 1329 | 1329 |
| Adj Flow Rate, veh/h | 0 | 1188 | 54 | 263 | 1141 | 0 | 42 | 0 | 67 | 406 | 0 | 116 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 |
| Cap, veh/h | 0 | 1333 | 61 | 300 | 2223 | | 0 | 0 | 0 | 494 | 0 | 212 |
| Arrive On Green | 0.00 | 0.40 | 0.40 | 0.18 | 0.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.20 |
| Sat Flow, veh/h | 0 | 3386 | 150 | 1710 | 3410 | 1521 | | 0 | | 2532 | 0 | 1088 |
| Grp Volume(v), veh/h | 0 | 609 | 633 | 263 | 1141 | 0 | | 0.0 | | 406 | 0 | 116 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1692 | 1754 | 1710 | 1705 | 1521 | | | | 1266 | 0 | 1088 |
| Q Serve(g_s), s | 0.0 | 26.7 | 26.7 | 11.9 | 13.9 | 0.0 | | | | 12.2 | 0.0 | 7.6 |
| Cycle Q Clear(g_c), s | 0.0 | 26.7 | 26.7 | 11.9 | 13.9 | 0.0 | | | | 12.2 | 0.0 | 7.6 |
| Prop In Lane | 0.00 | | 0.09 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 684 | 710 | 300 | 2223 | | | | | 494 | 0 | 212 |
| V/C Ratio(X) | 0.00 | 0.89 | 0.89 | 0.88 | 0.51 | | | | | 0.82 | 0.00 | 0.55 |
| Avail Cap(c_a), veh/h | 0 | 1063 | 1102 | 537 | 3457 | | | | | 795 | 0 | 342 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 22.1 | 22.1 | 32.0 | 7.3 | 0.0 | | | | 30.7 | 0.0 | 28.9 |
| Incr Delay (d2), s/veh | 0.0 | 4.2 | 4.2 | 3.2 | 0.1 | 0.0 | | | | 1.6 | 0.0 | 0.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 10.8 | 11.2 | 5.0 | 4.0 | 0.0 | | | | 3.8 | 0.0 | 2.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 26.3 | 26.2 | 35.2 | 7.3 | 0.0 | | | | 32.4 | 0.0 | 29.7 |
| LnGrp LOS | A | C | C | D | A | | | | | C | A | C |
| Approach Vol, veh/h | | 1242 | | | 1404 | | | | | | 522 | |
| Approach Delay, s/veh | | 26.3 | | | 12.5 | | | | | | 31.8 | |
| Approach LOS | | C | | | B | | | | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.7 | 38.3 | | 21.6 | | 58.0 | | | |
| Change Period (Y+Rc), s* | 5.7 | 6.1 | | 6.1 | | 6.1 | | | |
| Max Green Setting (Gmax), s | 14.0 | 50.0 | | 25.0 | | 80.7 | | | |
| Max Q Clear Time (g_c+I1), s | 13.9 | 28.7 | | 14.2 | | 15.9 | | | |
| Green Ext Time (p_c), s | 0.1 | 3.5 | | 0.4 | | 3.4 | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 21.1 |
| HCM 6th LOS | C |

**Notes**

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 75.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 164 | 844 | 0 | 0 | 987 | 200 | 0 | 0 | 820 | 0 | 0 | 837 |
| Future Vol, veh/h | 164 | 844 | 0 | 0 | 987 | 200 | 0 | 0 | 820 | 0 | 0 | 837 |
| Conflicting Peds, #/hr | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Yield | - | - | Free |
| Storage Length | 110 | - | - | - | - | - | - | - | 0 | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 173 | 888 | 0 | 0 | 1039 | 211 | 0 | 0 | 863 | 0 | 0 | 881 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1255 | 0 | - | - | - | 0 | - | - | 444 | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.16 | - | - | - | - | - | - | - | 6.96 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | 2.23 | - | - | - | - | - | - | - | 3.33 | - | - | - |
| Pot Cap-1 Maneuver | 545 | - | 0 | 0 | - | - | 0 | 0 | ~ 559 | 0 | 0 | 0 |
| Stage 1 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Stage 2 | - | - | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | 0 |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 545 | - | - | - | - | - | - | - | ~ 559 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 2.4 | 0 | 273.4 | 0 |
| HCM LOS | | | F | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 559 | 545 | - | - | - | - |
| HCM Lane V/C Ratio | 1.544 | 0.317 | - | - | - | - |
| HCM Control Delay (s) | 273.4 | 14.6 | - | - | - | 0 |
| HCM Lane LOS | F | B | - | - | - | A |
| HCM 95th %tile Q(veh) | 45.2 | 1.4 | - | - | - | - |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 40 | 367 | 20 | 0 | 0 | 0 | 0 | 30 | 23 | 67 | 72 | 0 |
| Future Vol, veh/h | 40 | 367 | 20 | 0 | 0 | 0 | 0 | 30 | 23 | 67 | 72 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 42 | 386 | 21 | 0 | 0 | 0 | 0 | 32 | 24 | 71 | 76 | 0 |
| Number of Lanes | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 2 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 2 |
| HCM Control Delay | 10.2 | 8.4 | 9.5 |
| HCM LOS | B | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 18% | 0% | 48% |
| Vol Thru, % | 57% | 82% | 90% | 52% |
| Vol Right, % | 43% | 0% | 10% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 53 | 224 | 204 | 139 |
| LT Vol | 0 | 40 | 0 | 67 |
| Through Vol | 30 | 184 | 184 | 72 |
| RT Vol | 23 | 0 | 20 | 0 |
| Lane Flow Rate | 56 | 235 | 214 | 146 |
| Geometry Grp | 2 | 5 | 5 | 2 |
| Degree of Util (X) | 0.076 | 0.337 | 0.297 | 0.209 |
| Departure Headway (Hd) | 4.908 | 5.152 | 4.993 | 5.135 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 727 | 696 | 720 | 698 |
| Service Time | 2.953 | 2.89 | 2.731 | 3.17 |
| HCM Lane V/C Ratio | 0.077 | 0.338 | 0.297 | 0.209 |
| HCM Control Delay | 8.4 | 10.5 | 9.8 | 9.5 |
| HCM Lane LOS | A | B | A | A |
| HCM 95th-tile Q | 0.2 | 1.5 | 1.2 | 0.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 148 | 308 | 10 | 22 | 0 | 43 | 0 | 12 | 12 | 0 | 0 | 0 |
| Future Vol, veh/h | 148 | 308 | 10 | 22 | 0 | 43 | 0 | 12 | 12 | 0 | 0 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 156 | 324 | 11 | 23 | 0 | 45 | 0 | 13 | 13 | 0 | 0 | 0 |
| Number of Lanes | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | | NB | EB |
| Conflicting Lanes Left | 0 | 1 | 2 |
| Conflicting Approach Right | NB | | WB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 10.3 | 7.6 | 8 |
| HCM LOS | B | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 |
|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 34% |
| Vol Thru, % | 50% | 0% | 97% | 0% |
| Vol Right, % | 50% | 0% | 3% | 66% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 24 | 148 | 318 | 65 |
| LT Vol | 0 | 148 | 0 | 22 |
| Through Vol | 12 | 0 | 308 | 0 |
| RT Vol | 12 | 0 | 10 | 43 |
| Lane Flow Rate | 25 | 156 | 335 | 68 |
| Geometry Grp | 2 | 5 | 5 | 4a |
| Degree of Util (X) | 0.034 | 0.222 | 0.428 | 0.081 |
| Departure Headway (Hd) | 4.842 | 5.129 | 4.606 | 4.247 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 743 | 699 | 780 | 848 |
| Service Time | 2.847 | 2.865 | 2.342 | 2.251 |
| HCM Lane V/C Ratio | 0.034 | 0.223 | 0.429 | 0.08 |
| HCM Control Delay | 8 | 9.3 | 10.8 | 7.6 |
| HCM Lane LOS | A | A | B | A |
| HCM 95th-tile Q | 0.1 | 0.8 | 2.2 | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 13.5 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 300 | 0 | 30 | 10 | 0 | 10 | 12 | 242 | 0 | 0 | 222 | 64 |
| Future Vol, veh/h | 300 | 0 | 30 | 10 | 0 | 10 | 12 | 242 | 0 | 0 | 222 | 64 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 316 | 0 | 32 | 11 | 0 | 11 | 13 | 255 | 0 | 0 | 234 | 67 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 15.3 | 9.3 | 12.4 | 12.7 |
| HCM LOS | C | A | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 5% | 91% | 50% | 0% |
| Vol Thru, % | 95% | 0% | 0% | 78% |
| Vol Right, % | 0% | 9% | 50% | 22% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 254 | 330 | 20 | 286 |
| LT Vol | 12 | 300 | 10 | 0 |
| Through Vol | 242 | 0 | 0 | 222 |
| RT Vol | 0 | 30 | 10 | 64 |
| Lane Flow Rate | 267 | 347 | 21 | 301 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.411 | 0.545 | 0.035 | 0.447 |
| Departure Headway (Hd) | 5.531 | 5.644 | 5.987 | 5.347 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 650 | 639 | 595 | 671 |
| Service Time | 3.579 | 3.684 | 4.056 | 3.393 |
| HCM Lane V/C Ratio | 0.411 | 0.543 | 0.035 | 0.449 |
| HCM Control Delay | 12.4 | 15.3 | 9.3 | 12.7 |
| HCM Lane LOS | B | C | A | B |
| HCM 95th-tile Q | 2 | 3.3 | 0.1 | 2.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.7 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 16 | 171 | 34 | 0 | 0 |
| Future Vol, veh/h | 0 | 16 | 171 | 34 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 0 | 17 | 180 | 36 | 0 | 0 |

| Major/Minor | Minor1 | | Major1 | |
|---|---|---|---|---|
| Conflicting Flow All | - | 108 | 0 | 0 |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |
| Critical Hdwy | - | 6.96 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - |
| Follow-up Hdwy | - | 3.33 | - | - |
| Pot Cap-1 Maneuver | 0 | 922 | - | - |
| Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
| Platoon blocked, % | | | - | - |
| Mov Cap-1 Maneuver | - | 922 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |

| Approach | WB | NB |
|---|---|---|
| HCM Control Delay, s | 9 | 0 |
| HCM LOS | A | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | 922 |
| HCM Lane V/C Ratio | - | - | 0.018 |
| HCM Control Delay (s) | - | - | 9 |
| HCM Lane LOS | - | - | A |
| HCM 95th %tile Q(veh) | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.7 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 25 | 2 | 12 | 550 | 344 | 22 |
| Future Vol, veh/h | 25 | 2 | 12 | 550 | 344 | 22 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 26 | 2 | 13 | 579 | 362 | 23 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 979 | 374 | 385 | 0 | - | 0 |
| Stage 1 | 374 | - | - | - | - | - |
| Stage 2 | 605 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.13 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.227 | - | - | - |
| Pot Cap-1 Maneuver | 276 | 670 | 1168 | - | - | - |
| Stage 1 | 693 | - | - | - | - | - |
| Stage 2 | 543 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 272 | 670 | 1168 | - | - | - |
| Mov Cap-2 Maneuver | 272 | - | - | - | - | - |
| Stage 1 | 682 | - | - | - | - | - |
| Stage 2 | 543 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 19 | 0.2 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1168 | - | 285 | - | - |
| HCM Lane V/C Ratio | 0.011 | - | 0.1 | - | - |
| HCM Control Delay (s) | 8.1 | 0 | 19 | - | - |
| HCM Lane LOS | A | A | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.3 | - | - |

# Biological Resources Assessment

## 901 Mission Avenue, Oceanside, California

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**April 2025**

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# Executive Summary

**Introduction:** This report includes the findings of a Biological Resources Assessment (BRA) conducted by South Environmental where developments have been proposed (project site) in the City of Oceanside, California.

**Proposed Development:** The applicant proposes to develop a new mixed used (zoning) development with residential units structurally atop retail businesses and parking levels. The proposed development footprint is equal to the project site and is approximately 1.47-acres in size.

**Plant Communities/ Land Cover:** The project would be constructed on developed / ornamentally landscaped and mixed non-native grassland land cover. The proposed development footprint is equal to the project site and is approximately 1.47-acres in size and does not have any impact on native plant communities or habitats. These land covers for the proposed development do not have the potential to support special-status species as described in Section 2.6. The entirety of the areas surrounding the project site is already developed and lacks habitat due to urbanization and disturbance. The project site has no native habitats and is defined by ruderal, non-native, and landscaped plant species. No impacts would occur to native plant communities as a result. No impacts to sensitive natural communities would result from the project development because none are present.

**MHCP Consistency Analysis**: The MHCP contains a list of covered plant species and covered natural communities that require conservation and/or mitigation measures if disturbed (CDFW 2024d). The City of Oceanside does not have an adopted Subarea Plan. The City of Oceanside draft Subarea Plan has a covered species list applicable to the Oceanside Subarea Plan, as well as preservation designs for existing natural communities listed within the broader MHCP plan (Oceanside 2010). The project site does not contain natural communities or species covered by the MHCP or the draft Subarea Plan.

**Nesting Birds and Raptors:** The proposed development would require potential removal of trees, shrubs, and herbaceous plants that could provide potential nesting habitat for birds and raptors protected by the MBTA, MBPA, and the Fish and Game Code. If present at the time of vegetation removal, active nests, eggs, or young could be destroyed or otherwise disturbed to a point at which the young do not survive, which would be a violation of the MBTA, MBPA, and the Fish and Game Code. In addition, indirect impacts from noise or vibration has the potential to disturb an active bird nest that may occur in adjacent landscaping to the point of failure if the nest is within immediate proximity to project activities, and this would also be a violation of the MBTA and Fish and Game Code. To avoid impacts to active bird nests, eggs, or young, preconstruction nesting

bird surveys and monitoring is required per the MBTA and Fish and Game Code as described in BIO-1.

**Special-Status Plants:** No special-status plants were found during the survey, and none would occur on the site due to a lack of habitat resulting from urban development and disturbance. Therefore, the project would not have any impact on special-status plants.

**Special-Status Wildlife:** No special-status wildlife was found during the survey, and none would occur on the site due to a lack of habitat resulting from urban development, lack of habitat connectivity, and disturbance.

**Protected Trees:** There are no protected trees on the project site, and therefore none would be impacted by the project.

**Water Resources:** There are no water resources on the project site, and therefore none would be impacted by the project.

**Wildlife Movement Corridors and Habitat Linkages:** The project site and the study area are entirely developed/disturbed and do not contain a wildlife movement area. The proposed development will not alter any movement areas or have any new affects to the urban/wildlands interface because the resultant development is 1.) distal to wildlife movement areas and 2.) will be similar in scope to the existing surrounding developments.

**Cumulative Impacts:** The project is not expected to result in impacts to sensitive or protected biological resources and with the implementation of the nesting bird preconstruction surveys (BIO-1) described in this report, the project would have no effect on biological resources. The project site and surrounding areas are currently urbanized. There will be no cumulative impacts from the project.

# 1 Introduction

This report includes the findings of a Biological Resources Assessment (BRA) conducted by South Environmental for new developments for the 901 Mission Avenue Project (project site) in the City of Oceanside, California. The purpose of this report is to identify and characterize biological resources that occur on the project site and surrounding 500 feet (study area), quantify and assess potential impacts to protected biological resources, and propose measures to reduce impacts to a less than significant level. The scope of this report includes a description of the proposed development, methods used to assess the biological resources, the environmental setting including technical characterizations and maps of vegetation communities, an assessment of the potential for special-status plants and animals to occur on the study area, a description of the regulatory setting, an analysis of the potential for the project to impact biological resources according to the thresholds of the California Environmental Quality Act (CEQA), and detailed recommendations for avoiding or mitigating impacts. Representative photographs of the study area are in Appendix A.

## 1.1 Project Description

### 1.1.1 Location and Setting

The project site includes Assessor Identification Number [AIN] 1471-961-000 and is on the Oceanside USGS 7.5-minute quad in Section 26 of Township 11 South and Range 05 West. The project site includes 1.5-acres located northeast of N. Clementine Street, southwest of North Horne Street southeast of Mission Avenue, and northwest of Seagaze Drive. More broadly, the project site is approximately 0.26-miles southwest of Interstate Highway 5 and is within the City of Oceanside, California (attached Figure 1 and Figure 2). Developments and ornamental landscaping surround the project site in all directions.

### 1.1.2 Proposed Development

As shown in Figure 3, the applicant proposes to develop a new mixed-use development with residential units structurally atop retail businesses and parking levels. The proposed development footprint includes the entire project site and is approximately 1.5-acres in size. The Site Plan is attached in Appendix C.




Source: ESRI USA Topo Maps and World Topo Map 2024

901 Mission Avenue Project

# Figure 1. Regional Location

Project Site

Study Area (500-Foot Buffer)



0 1,000 2,000 Feet

Scale: 1:24,000

N

Project Location is within Oceanside, California, in San Diego County on the USGS Oceanside 7.5-minute quadrangle map in Section 26 of Township 11 South and Range 05 West

Center Coordinate (Decimal Degrees):
Latitude: 33.1975010N Longitude: -117.3757811W

SOUTH ENVIRONMENTAL




Source: BING Map 2024

901 Mission Avenue Project

# Figure 2. Project Vicinity

0 175 350 Feet

N

Scale: 1:3,500

- Project Site
- Study Area (500-Foot Buffer)
- California Protected Area Database (CPAD)

SOUTH ENVIRONMENTAL




Source: BING Map 2024

901 Mission Avenue Project

# Figure 3. Proposed Development

0 38.75 77.5 Feet

N

Scale: 1:750

Project Site

Mixed Use Development

SOUTH ENVIRONMENTAL

## 1.2 Methodology

This biological resource assessment is based on information compiled through a reconnaissance survey and a literature review involving an assessment of appropriate reference materials and literature regarding the biological resources of the region.

### 1.2.1 Literature Review

The assessment of the project began with a review of literature relating to the natural resources — flora, fauna, and water resources — that are possibly within the study area and project site. The following were consulted:

Flora and Fauna

- The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) was reviewed to identify special-status plants and animals that have previously recorded in the United States Geological Survey (USGS) Oceanview 7.5" quad in which the project site is located, and the five surrounding USGS 7.5" quads: San Onofre Bluff, Las Pulgas Canyon, Morro Hill, San Luis Rey, and Encinitas (CDFW 2024a).
- CDFW California Wildlife Habitat Relationships (CWHR) life history accounts and range maps (CDFW 2024b)
- United States Fish and Wildlife Service (USFWS) Environmental Conservation Online System (ECOS) Information for Planning and Consultation (IPaC) (USFWS 2024a)
- USFWS Designated and Proposed Critical Habitat GIS data (USFWS 2024b)
- California Native Plant Society (CNPS) online Inventory of Rare and Endangered Plants of California (CNPS 2024a)

Water Resources

- National Hydrography Dataset (USGS 2024a)
- National Wetlands Inventory (USFWS 2024c)
- California Protected Areas Database (CPAD 2024)

Soil Resources

- US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soils Database (USDA 2024)

### 1.2.2 Field Reconnaissance

South Environmental biologist Dana Briggs conducted a field reconnaissance on April 26, 2024 and, to record plants and animals observed on the site, characterize and map plant communities, and assess the potential for special-status species to occur. Biologist Justin Strauss conducted a follow-up site visit on April 17, 2025 to confirm the site conditions remain the same. The findings described in the reports are cited in the Literature Review, and results are referenced throughout the analysis in this report.

# 2 Environmental Setting

The project site has the physical address of 901 Mission Avenue. Broadly, the project site is approximately 0.26 miles southwest of Interstate Highway 5, and is within the City of Oceanside, California. Developments and ornamental landscaping surround the project site in all directions.

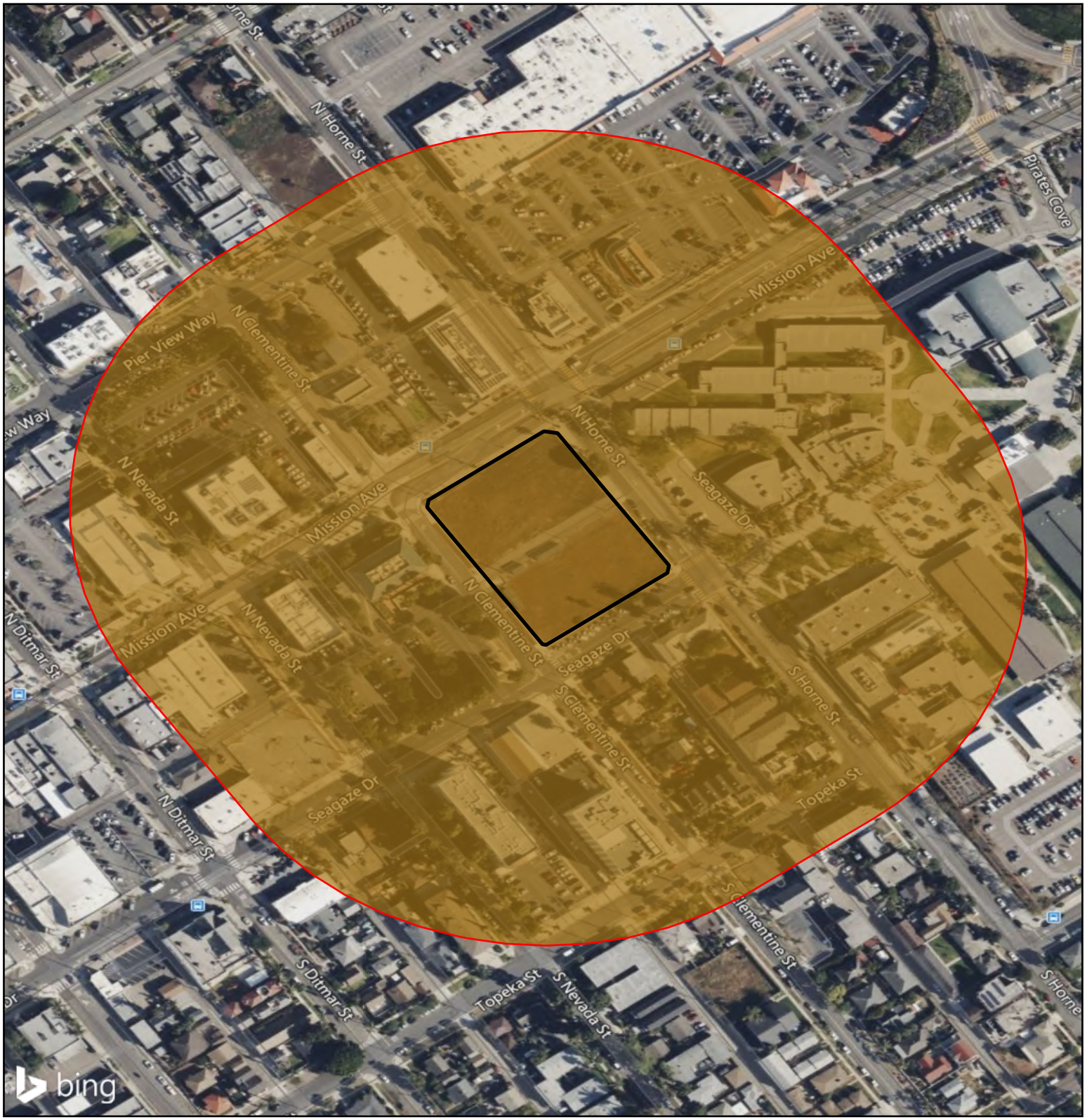
## 2.1 Topography and Climate

The topography for the project site and study area dips to the southwest and follows a regional dip towards the Pacific Ocean. The highest elevation for the project site is approximately 120 ft above mean sea level (amsl) at the northeastern border. The lowest elevation for the project site is approximately 102 ft amsl within at the southwestern border (USGS 2024). The climate in the region is temperate, with average summer high temperatures in the low 70s and average winter lows in the mid-40s. Average yearly rainfall is approximately 10.32-inches, and the wettest months are December – March. There is almost no precipitation between June-September.

## 2.2 Soils

One soil type occurs on the project site/ study area as shown in Figure 4 (USDA/NRCS 2024):

- **Tujunga sand, 0 to 5 percent slopes** occurs within the entire study area and project site. This is a floodplain soil and is somewhat excessively drained.




Source: BING Map 2024

901 Mission Avenue Project

# Figure 4. Soils

0 135 270 Feet

N

Scale: 1:2,700

- Project Site
- Study Area (500-Foot Buffer)
- Tujunga sand, 0 to 5 percent slopes

SOUTH ENVIRONMENTAL

## 2.3 Plants

A total of 23 plant species were identified on the project site. One species, coastal morning glory, is native to this region of California and the remaining 22 are non-native/ruderal species and landscaping plants. A list of the species observed on the site is presented below in Table 1.

**Table 1. List of plant species at the project site in Oceanside, California.**

| Scientific name | Common name | Habit | On project site? | CRPR* |
|---|---|---|---|---|
| *Araucaria heterophylla* | Norfolk Island pine | Perennial tree* | No | NR |
| *Calystegia macrostegia* | coastal morning glory | Perennial herb | Yes | NR |
| *Carissa macrocarpa* | natal plum | Perennial shrub* | Yes | NR |
| *Ceratonia siliqua* | carob tree | Perennial tree* | No | NR |
| *Chenopodiastrum murale* | nettle-leaved goosefoot | Annual herb* | Yes | NR |
| *Cynodon dactylon* | Bermuda grass | Perennial grass* | Yes | NR |
| *Erigeron canadensis* | horseweed | Annual herb* | Yes | NR |
| *Erodium botrys* | broadleaf filaree | Annual herb* | Yes | NR |
| *Ficus benghalensis* | banyan tree | Perennial tree* | No | NR |
| *Heterotheca grandiflora* | telegraph weed | Perennial/ annual herb* | Yes | NR |
| *Hirschfeldia incana* | shortpod mustard | Perennial/ annual herb* | Yes | NR |
| *Horedeum murinum* | mouse barley | Annual grass* | Yes | NR |
| *Hypochaeris glabra* | smooth cat's ear | Annual herb* | Yes | NR |
| *Lysimachia arvensis* subsp. *arvensis* | scarlet pimpernel | Annual herb* | Yes | NR |
| *Magnolia grandiflora* | southern magnolia | Perennial tree* | No | NR |
| *Malva parviflora* | cheeseweed | Perennial/ annual herb* | Yes | NR |
| *Medicago polymorpha* | bur clover | Perennial/ annual herb* | Yes | NR |
| *Melilotus indicus* | sweet clover | Annual herb* | Yes | NR |
| *Phoenix canariensis* | Canary Island date palm | Palm* | No | NR |
| *Pinus elliottii* | slash pine | Perennial tree* | No | NR |
| *Syagrus romanzoffiana* | queen palm | Palm* | No | NR |
| *Vulpia myuros* | rat's-tail fescue | Annual grass* | Yes | NR |
| *Washingtonia robusta* | Mexican fan palm | Palm* | No | NR |
| *= Non-native species; NR= Not Ranked | | | | |

## 2.4 Plant Communities and Land Cover

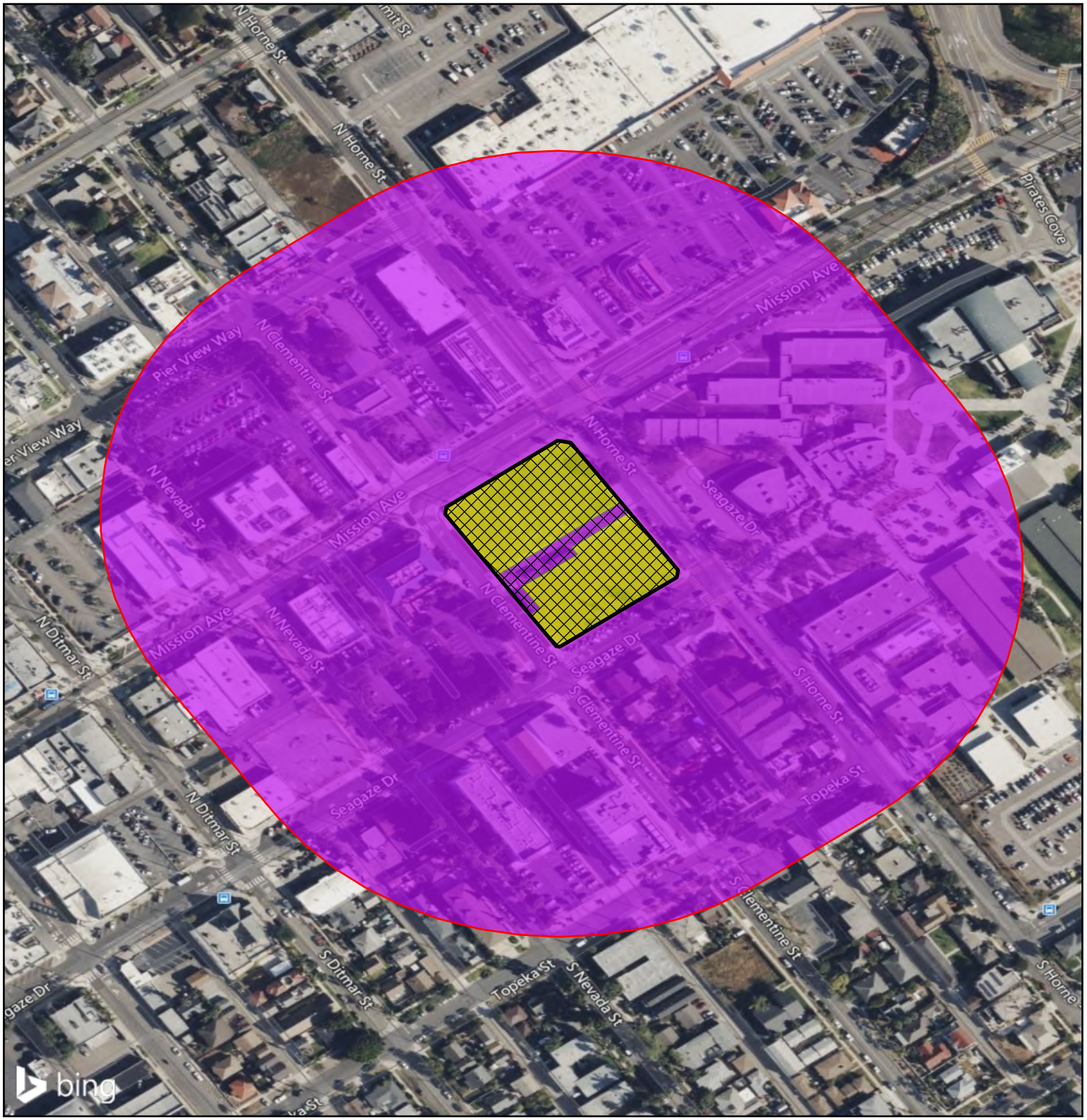
There are two land cover types and no plant communities in the study area and the project site. They are shown in Figure 5 below and acres of each is summarized in Table 2 below.

**Table 2. Summary of Plant Communities on the Study Area and Project Site**

| Community or Cover Type | Acres on Study Area | Acres on Project Site | Acres Permanently Impacted by Project |
|---|---|---|---|
| Developed / Ornamental Landscaped | 29.67 | 0.17 | 0.17 |
| Mixed Non-Native Grassland | 0 | 1.30 | 1.30 |
| **Total** | **29.67** | **1.47** | **1.47** |

- **Developed / Ornamental Landscaped** areas occur outside of the project site on 29.67-acres of the study area and 0.17-acres of the project site. The land cover includes existing single-family house developments with ornamental landscaping, driveways, garages, swimming pool, patios, walkways, and roadways. Mission Avenue, Seagaze Drive, Topeka Street, North Horne Street, Clementine Street, and North Nevada Street are roadways in the study area. Ornamental landscaped vegetation observed in the study area and project site include Norfolk Island pine (*Araucaria heterophylla*), natal plum (*Carissa macrocarpa*), carob tree (*Ceratonia siliqua*), banyan tree (*Ficus benghalensis*), southern magnolia (*Magnolia grandiflora*), Canary Island date palm (*Phoenix canariensis*), slash pine (*Pinus elliotti*), queen palm (*Syagrus romanzoffiana*), and Mexican fan palm (*Washingtonia robusta*). Developed and landscaped areas are not considered habitat for native plants and animals.

- **Mixed Non-Native Grassland** occurs on 1.30-acres project site and is not within the study area outside the project site. Plants observed within this land cover include coastal morning glory (*Calystegia macrostegia*), nettle-leafed goosefoot (*Chenopdiastrum murale*), Bermuda grass (*Cynodon dactylon),* horseweed (*Erigeron canadensis*), broadleaf filaree (*Erodium botrys*), telegraph weed (*Heterotheca grandiflora*), shortpod mustard (*Hirschfeldia incana*), mouse barley (*Hordeum murinum*), smooth cat's ear (*Hypochaeris glabra*), scarlet pimpernel (*Lysimachia arvensis* subsp. *arvensis*), cheeseweed (*Malva parviflora*), bur clover (*Medicago polymorpha*), sweet clover (*Melilotus indicus*), and rat's tail fescue (*Vulpia myuros*). Mixed Non-Native Grassland areas are not considered habitat for special-status plants and animals.




Source: BING Map 2024

901 Mission Avenue Project

# Figure 5. Plant Communities and Land Cover

0 140 280 Feet

Scale: 1:2,800

N

Project Site

Study Area (500-Foot Buffer)

Proposed Deveopment Footprint

## Plant Communities and Land Cover

Developed / Ornamental Lanscaped

Mixed Non-Native Grassland

SOUTH ENVIRONMENTAL

## 2.5 Wildlife

Five bird species were observed during the site visit on April 26, 2024, and are listed in Table 3 below.

**Table 3. List of wildlife at the project site in Oceanside, California.**

| Scientific name | Common name | Status |
|---|---|---|
| **Birds** | | |
| *Corvus brachyrhynchos* | American crow | None |
| *Haemorhous mexicanus* | House finch | None |
| *Psaltriparus minimus* | Bushtit | None |
| *Streptopelia decaocto* | Eurasian collard-dove | None |
| *Tyrannus vociferans* | Cassin's kingbird | None |

Table 4 below shows records for wildlife occurrences near the project site (iNaturalist, 2024).

**Table 4. Summary of Wildlife Observed on iNaturalist within the Study Area**

| Scientific name | Common name | Status |
|---|---|---|
| **Mammals** | | |
| *Genus Peromyscus* | North American deer mice | None |
| **Reptiles** | | |
| *Sceloporus occidentalis* | Western fence lizard | None |

## 2.6 Special-Status Species

The literature analysis of the CNDDB, CNPS, and IPAC databases for special-status species with the potential to inhabit the project site resulted in 150 special-status species, including 64 animals and 86 plants. The list includes rare, threatened, endangered species at a federal and state level. In the case of plants, it also includes California Rare Plant Rank (CRPR) species with a classification of 1-4.

Special-Status Plants

The 86 special-status plant species that CNDDB, CNPS, and IPAC identify as occurring in the region of the project and an assessment of their likelihood to inhabit the project site are presented in Appendix B. No special-status plant species were observed during the survey. Based on the analysis in Appendix B, none of the special-status plants have the potential to occur in the project site due to a lack of native habitats and high level of disturbance. The site lacks native habitats that are required for special-status plant species to occur.

Special-Status Wildlife

The 64 special-status animal species that CNDDB, CNPS, and IPAC identify as occurring in the region of the project and an assessment of their likelihood to inhabit the project site are presented in Appendix B. No special-status animal species were observed during the survey. Based on the analysis in Appendix B, none of the special-status animals have the potential to occur on the project site due to a lack of native habitats and high level of disturbance. The site lacks native habitats that are required for special-status animal species to occur.

## 2.7 Sensitive Natural Communities

CDFW 2018 *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* defines sensitive natural communities as those that are "of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects." CDFW considers a natural community sensitive if it has a Global or State rarity rank of 1-3, which includes communities that are vulnerable (G3/S3), imperiled (G2/S2), and critically imperiled (G1/S1). CDFW uses the alliances and groups described in the California Natural Community List (CDFW 2024c) and the California Natural Communities List from A Manual of California Vegetation Online (CNPS 2024b) to characterize California's natural communities. The current global and state rarity rank for natural communities of California are listed in these resources. The entire study area and project site is developed / ornamentally landscaped or a mixed non-native grassland and does not have a Global or State rarity rank; therefore, no sensitive natural communities occur on the study area or project site.

## 2.8 Protected Trees

The City of Oceanside has a sub area plan under the San Diego County MHCP that lists Nuttail's scrub oak (*Quercus Dumosa*) as a protected tree within the context of the MHCP (City of Oceanside 2010). Scrub oak is absent from the project site; therefore, there are no protected trees on the project site.

## 2.9 Hydrology Features

The project site is located within the San Luis Rey-Escondido watershed (HUC8) and within the Loma Alta Creek-Frontal Gulf of Santa Catalina sub-watershed (HUC12). There is no hydrology feature within either the study area or the project site.

During the South Environmental field visit the survey area was inspected for the presence of potential jurisdictional features such as wetlands, streams, lakes, or other water features. No formal delineation of jurisdictional waters was performed, only a preliminary investigation was conducted.

Based on the field visit and the literature review, no hydrology features exist on the project site or the survey area.

## 2.10 Habitat Linkages and Wildlife Migration Corridors

The assessment of the potential for wildlife movement to and from the project site consisted of consulting the following resources:

- United States Fish and Wildlife Service (USFWS) Environmental Conservation Online System (ECOS) Information for Planning and Consultation (IPaC) (USFWS 2024a)
- USFWS Designated and Proposed Critical Habitat GIS data online (USFWS 2024b)
- GreenInfo Network, Park Information online (2024)
- California Protected Areas Database Map online (CPAD 2024)
- City of Oceanside: Sub Area Plan for the San Diego County Multiple Habitat Conservation Plan (MHCP) (Oceanside 2024).

Aerial photographs were used to assess the level of connectivity of habitat to the site. The foremost considerations were whether there was a direct connection of high-quality habitat to the site — without interference from development — and whether the connecting habitat linked to large habitat tracts.

During the South Environmental field visit, the project site and surrounding 500-ft survey area were assessed for their potential use as a wildlife corridor or habitat linkage. The level of disturbance of the site and surrounding areas are by way of development that includes roads, house and commercial structures, fences, and lighting. No adjacent higher quality habitat exists in the study area and only dense urban development occurs; therefore, the project site lacks a wildlife corridor or habitat linkage. The only expected wildlife movement on the project site would be from common urban species known to inhabit the Oceanside area.

# 3 Impacts Analysis

For the purposes of this report, impacts to protected biological resources are analyzed within the context of the regulatory setting. Below is an overview of the federal, state, and local regulations pertaining to protected biological resources in the study area, and an analysis of impacts to those resources that may occur as a result of the proposed development follows.

## 3.1 Regulatory Setting

### 3.1.1 Federal Regulations

*Migratory Bird Treaty Act*

The Migratory Bird Treaty Act (MBTA) protects individuals as well as any part, nest, or eggs of any bird listed as migratory. In practice, federal permits issued for activities that potentially impact migratory birds typically have conditions that require pre-disturbance surveys for nesting birds. In the event nesting is observed, a buffer area with a specified radius must be established, within which no disturbance or intrusion is allowed until the young have fledged and left the nest, or it has been determined that the nest has failed. If not otherwise specified in the permit, the size of the buffer area varies with species and local circumstances (e.g., presence of busy roads, intervening topography, etc.), and is based on the professional judgment of a monitoring biologist. A list of migratory bird species protected under the MBTA is published by USFWS.

### 3.1.2 California Regulations

*California Environmental Quality Act (CEQA)*

The California Environmental Quality Act (CEQA) is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. CEQA applies to certain activities of state and local public agencies. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project." A project is an activity undertaken by a public agency or a private activity which must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval) from a government agency which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment.

*State of California Fish and Game Code Section 3500*

Section 3503.5 of the California Fish and Game Code states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Activities that result in the abandonment of an active bird of prey nest may also be considered in violation of this code. In addition, California Fish and Game Code, Section 3511 prohibits the taking of any bird listed as fully protected, and California Fish and Game Code, Section 3515 states that is it unlawful to take any non-game migratory bird protected under the MBTA.

*California Migratory Bird Protection Act*

The California Migratory Bird Protect Act (MBPA) was enacted in September 2019 to reinforce the MBTA at the state level. The Act states:

- "It is unlawful to take or possess any migratory nongame bird as designated in the federal Migratory Bird Treaty Act (16 U.S.C. Sec. 703 et seq.) before January 1, 2017, any additional migratory nongame bird that may be designated in that federal act after that date, or any part of a migratory nongame bird described in this section, except as provided by rules and regulations adopted by the United States Secretary of the Interior under that federal act before January 1, 2017, or subsequent rules or regulations adopted pursuant to that federal act, unless those rules or regulations are inconsistent with this code." This section is inactive on January 20, 2025 and the following language below will be adopted.

- "It is unlawful to take or possess any migratory nongame bird as designated in the federal Migratory Bird Treaty Act (16 U.S.C. Sec. 703 et seq.), or any part of a migratory nongame bird described in this section, except as provided by rules and regulations adopted by the United States Secretary of the Interior under that federal act." This section is operative starting on January 20, 2025.

### 3.1.3 Local Regulations

*City of Oceanside Sub Area Plan for the San Diego County Multiple Habitat Conservation Plan (MHCP)*

The San Diego County MHCP "is a comprehensive conservation planning process that addresses the needs of multiple plant and animal species in Northwestern San Diego County. The MHCP encompasses the cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista. Its goal is to conserve approximately 19,000 acres of habitat, of which roughly 8,800 acres (46 percent) are already in public ownership and contribute toward the habitat preserve system for the protection of more than 80 rare, threatened, or endangered species. MHCP Subregional Plan and

Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) were adopted and certified by the Sand Diego Associated Governments (SANDAG) Board of Directors on March 28, 2003. Each MCHP-encompassing cities must adopt subarea plans and implement agreements with the California Department of Fish and Game and U.S. Fish and Wildlife Service before incidental take permits can be issued" (SANDAG 2024).

The MHCP contains a list of covered plant species and covered natural communities that require conservation and/or mitigation measures for a sub area plan (CDFW 2024d). The City of Oceanside has a covered species list that is narrowed for the Oceanside sub area plan, as well as preservation designs for existing natural communities listed within the broad MHCP plan (Oceanside 2010).

An application with mitigation fees and/or replacement requirements is required for damaging or removing plants and natural communities covered within the MHCP.

## 3.2 Project Impacts

### 3.2.1 Impacts to Plant Communities/Habitat/Sensitive Natural Communities

The project would be constructed on developed / ornamentally landscaped and mixed non-native grassland land cover. The proposed development footprint is equal to the project site and is approximately 1.47-acres in size and does not have any impact on native plant communities or habitats. These land covers for the proposed development do not have the potential to support special-status species as described in Section 2.6. The entirety of the areas surrounding the project site is already developed and lacks habitat due to urbanization and disturbance. The project site has no native habitats and is defined by ruderal, non-native, and landscaped plant species. No impacts would occur to native plant communities as a result. No impacts to sensitive natural communities would result from the project development because none are present.

**MHCP Consistency Analysis**: The MHCP contains a list of covered plant species and covered natural communities that require conservation and/or mitigation measures if disturbed (CDFW 2024d). The City of Oceanside does not have an adopted Subarea Plan. The City of Oceanside draft Subarea Plan has a covered species list applicable to the Oceanside Subarea Plan, as well as preservation designs for existing natural communities listed within the broader MHCP plan (Oceanside 2010). The project site does not contain natural communities or species covered by the MHCP or the draft Subarea Plan.

### 3.2.2 Impacts to Nesting Birds and Raptors

The proposed development would require potential removal of trees, shrubs, and herbaceous plants in the landscaping that, during specific times of the year, could provide potential nesting habitat for birds and raptors protected by the MBTA, MBPA, and the Fish and Game Code. If present at the

time of vegetation removal, active nests, eggs, or young could be destroyed or otherwise disturbed to a point at which the young do not survive, which would be a violation of the MBTA, MBPA, and the Fish and Game Code. In addition, indirect impacts from noise or vibration has the potential to disturb an active bird nest that may occur in adjacent landscaping to the point of failure if the nest is within immediate proximity to project activities, and this would also be a violation of the MBTA and Fish and Game Code. To ensure compliance with the applicable laws, the MBTA, MBPA and Fish and Game Code require that the project take the following steps as part of the construction process:

- If possible, limit ground disturbing activities and vegetation removal to September 1 – January 31, which is outside the bird and raptor nesting season.

- In accordance with applicable law, if ground disturbing activities are scheduled prior to vegetation removal or vegetation removal (including tree trimming) is scheduled to occur during bird nesting season between February 1 – August 31, the developer must contract a qualified biologist to perform a preconstruction survey for active nests within 72 hours prior to the start of construction and take remedial measures required by the MBTA, MBPA and Fish and Game Code to comply with applicable law. The survey should be conducted by a qualified biologist with prior experience conducting nesting bird surveys for construction projects. The study area should include the affected area and suitable habitat within a 500-foot buffer, or a buffer size determined by the qualified biologist based on level of proposed disturbance and access. If no active nests are found, no additional measures are required.

- If active nests are found the biologist will map the location and document the species and nesting stage. A no-work buffer will be established around the active nest as determined by the qualified biologist and based on the species sensitivity to disturbance and the type and duration of the disturbance. No construction activities shall occur within the no-work buffer until the biologist has determined the nest is no longer active.

### 3.2.3 Impacts to Special-Status Species

No special-status plants were found during the survey, and none would occur on the site due to a lack of habitat resulting from urban development and disturbance. No special-status wildlife was found during the survey, and none would occur on the site due to a lack of habitat resulting from urban development and disturbance. Cumulatively, no impacts (direct or indirect) to special-status species would be expected from the project because the study area and project site lack native habitats that could support special-status species. No impacts to special-status species would result from the project.

### 3.2.4 Impacts to Water Resources

No jurisdictional waters are on the study area or project site; therefore, the proposed project will have no permanent or temporary impact on jurisdictional waters.

### 3.2.5 Impacts to Protected Trees

The project site does not contain trees protected by the Oceanside sub area plan for the San Diego County MHCP; therefore, no protected trees are on the project site, and none would be impacted by the project.

### 3.2.6 Impacts to Wildlife Movement Corridors and Habitat Linkages

The project site and the study area are entirely developed/disturbed and do not contain a wildlife movement area. The proposed development will not alter any movement areas or have any new affects to the urban/wildlands interface because the resultant development is 1.) distal to wildlife movement areas and 2.) will be similar in scope to the existing surrounding developments.

### 3.2.7 Cumulative Impacts

The project is not expected to result in impacts to sensitive or protected biological resources and with the implementation of the nesting bird preconstruction surveys described in this report, the project would have no effect on biological resources. There will be no cumulative impacts from the project.

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# Appendix A

Photograph Log




**Image 1)** View of northern parcel at 901 Mission Ave. from Mission Ave. facing southeast; lot has no developments and contains ruderal, non-native herbaceous flora.




**Image 2)** View of northern parcel from North Clementine St. facing northeast.




**Image 3)** View of southern parcel at 901 Mission Ave. from N. Clementine St. facing northeast; lot has no developments and contains ruderal, non-native herbaceous flora.




**Image 4)** View of southern parcel from Seagaze Dr. facing northwest.




**Image 5)** View of southern parcel from North Horne St. facing southwest.

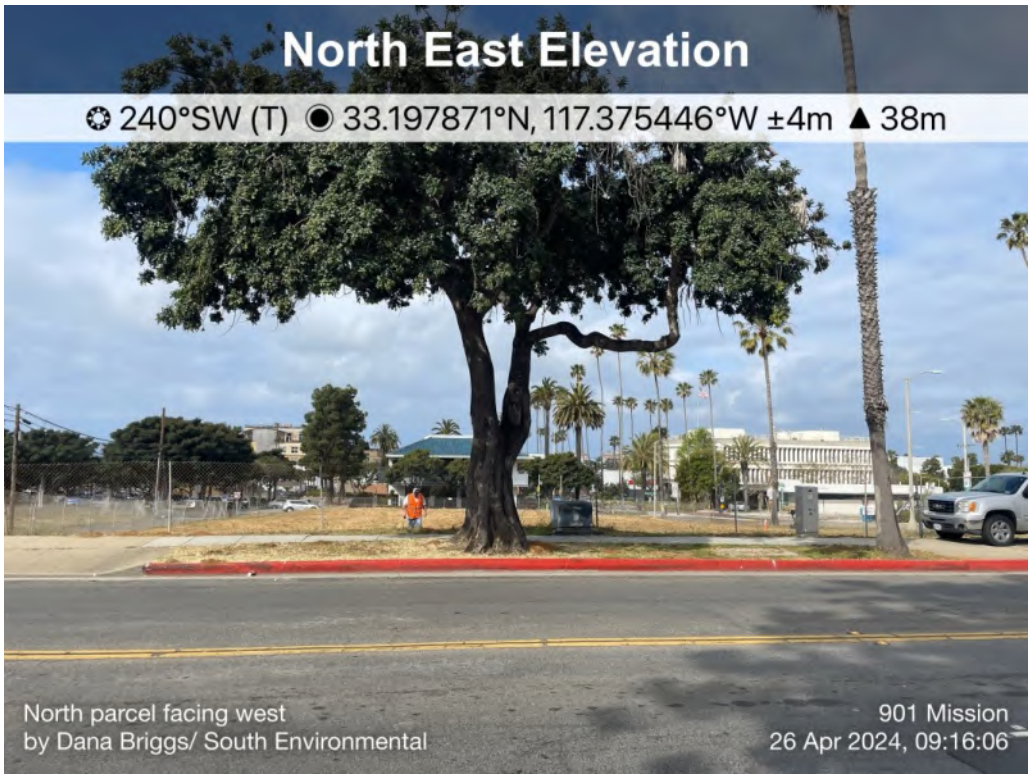



**Image 6)** View of northern parcel from North Horne St. facing southwest; a few ornamental palms and trees surround the site on the street.




**Image 7)** Depicts small burrows found throughout the site of common small mammal species typically found in disturbed areas. Ruderal vegetation also visible.

# Appendix B

## Special-Status Species Analysis

## Special-Status Species

Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies as under threat from human-associated developments. Some of these species receive specific protection that is defined by federal or state endangered species legislation. Others have been designated as special-status based on adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. Special-status species include:

- Plants or wildlife listed or proposed for listing as threatened or endangered, or are candidates for possible future listing as threatened or endangered, under the federal Endangered Species Act or the California Endangered Species Act;
- Plants or wildlife that meet the definitions of rare or endangered under CEQA Guidelines Section 15380.
- Plants or wildlife covered under an adopted NCCP/HCP;
- Plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered (List 1A, 1B and 2 plants) in California;
- Plants listed by the CNPS as plants in which there is limited information about distribution (List 3);
- Plants listed as rare under the California Native Plant Protection Act (Fish and Game Code 1900 et seq.);
- Wildlife designated by CDFW as species of special concern;
- Wildlife "fully protected" in California (California Fish and Game Code Sections 3511, 4700, and 5050); and
- Wildlife protected by the Migratory Bird Treaty Act (MTBA).

## Federally-Protected Status

All references to Federally-protected species in this BRA include the most current published status or candidate category to which each species has been assigned by USFWS. For purposes of this assessment the following acronyms are used for Federal status species, as applicable:

**FE** Federally-listed as Endangered
**FT** Federally-listed as Threatened
**FPE** Federally proposed for listing as Endangered
**FPT** Federally proposed for listing as Threatened
**FPD** Federally proposed for delisting
**FC** Federal candidate species (former C1 species)

## State-Protected Status

For the purposes of this BRA, the following acronyms are used for State status species, as applicable:

**SE** State-listed as Endangered
**ST** State-listed as Threatened
**SR** State-listed as Rare
**SCE** State candidate for listing as Endangered
**SCT** State candidate for listing as Threatened
**SFP** State Fully Protected
**SSC** California Species of Special Concern

## California Rare Plant Rank

The CNPS is a private plant conservation organization dedicated to the monitoring and protection of special-status species in California. CNPS has compiled an inventory comprised of the information focusing on geographic distribution and qualitative characterization of Rare, Threatened, or Endangered vascular plant species of California (CNPS 2018). The list serves as the candidate list for listing as Threatened and Endangered by CDFW. CNPS has developed six categories of rarity known as the California Rare Plant Rank (CRPR), of which Ranks 1A, 1B, 2A, and 2B are particularly considered sensitive:

**Rank 1A** Presumed extinct in California.
**Rank 1B** Plants Rare, Threatened, or Endangered in California and elsewhere.
**Rank 2A** Presumed extinct in California, but more common elsewhere.
**Rank 2B** Plants Rare, Threatened, or Endangered in California, but more common elsewhere.
**Rank 3** Plants about which we need more information – a review list.
**Rank 4** Plants of limited distribution – a watch list.

The CNPS recently added "threat ranks" which parallel the ranks used by the CNDDB. These ranks are added as a decimal code after the CNPS List (e.g., Rank 1B.1). The threat codes are as follows:

**.1** Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat);
**.2** Moderately threatened in California (20-80% occurrences threatened);
**.3** Not very threatened in California (<20% of occurrences threatened or no current threats known).

## Potential to Occur Assessment

Special-status species that **present** or are **likely** (high or medium potential) to occur within the parcel are a based on one or more of the following:

- the direct observation of the species within the parcel during any field surveys;
- a record reported in the CNDDB, CNPS, or IPAC; and
- the parcel is within known distribution of a species and contains appropriate habitat.

Special-status species that are **unlikely** (low potential) to occur are based on one of the following:

- the parcel has the general habitat types but lacks necessary habitat elements such as suitable microhabitat or soils; or
- the parcel is outside the known elevation range or distribution of the species, and has otherwise suitable habitats;

Special-status species that have no potential to occur on the parcel are labeled as **none** due to the absence of suitable habitat.

## Special-Status Animals

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| *Accipiter cooperii* | Coopers hawk | Birds | None | None | CDFW_WL-Watch List | Woodlands and forests, or suburban areas with mature trees | Requires tall trees for nesting and open areas such as meadows or forest edges for hunting | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Actinemys pallida* | southwestern pond turtle | Reptiles | Proposed Threatened | None | | Found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, and either rocky or muddy bottoms, in woodland, forest, and grassland. In streams, prefers pools to shallower areas. Logs, rocks, cattail mats, and exposed banks are required for basking. May enter brackish water and even seawater. | | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Agelaius tricolor* | tricolored blackbird | Birds | None | Threatened | BLM_S-Sensitive \| CDFW_SSC-Species of Special Concern \| IUCN_EN-Endangered \| USFWS_BCC-Birds of Conservation Concern | Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. | Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| *Aimophila ruficeps canescens* | southern California rufous-crowned sparrow | Birds | None | None | CDFW_WL-Watch List | Resident in Southern California coastal sage scrub and sparse mixed chaparral. | Frequents relatively steep, often rocky hillsides with grass and forb patches. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Anaxyrus californicus* | arroyo toad | Amphibians | Endangered | None | CDFW_SSC-Species of Special Concern \| IUCN_EN-Endangered | Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc. | Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Anniella stebbinsi* | Southern California legless lizard | Reptiles | None | None | CDFW_SSC-Species of Special Concern \| USFS_S-Sensitive | Generally, south of the Transverse Range, extending to northwestern Baja California. Occurs in sandy or loose loamy soils under sparse vegetation. Disjunct populations in the Tehachapi and Piute Mountains in Kern County. | Variety of habitats; generally, in moist, loose soil. They prefer soils with a high moisture content. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Antrozous pallidus* | pallid bat | Mammals | None | None | BLM_S-Sensitive \| CDFW_SSC-Species of Special Concern \| IUCN_LC-Least Concern \| USFS_S-Sensitive \| WBWG_H-High Priority | Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. | Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| *Aquila chrysaetos* | golden eagle | Birds | None | None | BLM_S-Sensitive \| CDF_S-Sensitive \| CDFW_FP-Fully Protected \| CDFW_WL-Watch List \| IUCN_LC-Least Concern \| USFWS_BCC-Birds of Conservation Concern | Rolling foothills, mountain areas, sage-juniper flats, and desert. | Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Arizona elegans occidentalis* | California glossy snake | Reptiles | None | None | CDFW_SSC-Species of Special Concern | Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, | Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Aspidoscelis hyperythra* | orange-throated whiptail | Reptiles | None | None | CDFW_WL-Watch List \| IUCN_LC-Least Concern \| USFS_S-Sensitive | Inhabits low-elevation coastal scrub, chaparral, and valley-foothill hardwood habitats. | Prefers washes and other sandy areas with patches of brush and rocks. Perennial plants necessary for its major food: termites. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Aspidoscelis tigris stejnegeri* | coastal whiptail | Reptiles | None | None | CDFW_SSC-Species of Special Concern | Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland and riparian areas. | Ground may be firm soil, sandy, or rocky. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| *Bombus crotchii* | Crotch Bumble Bee | Insects | None | Candidate Endangered | IUCN_EN-Endangered | Coastal California east to the Sierra-Cascade crest and south into Mexico. | Food plant genera include Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum. | None. The project site lacks habitat and food resources for the species. |
| *Branchinecta lynchi* | vernal pool fairy shrimp | Crustaceans | Threatened | None | IUCN_VU-Vulnerable | Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. | Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Branchinecta sandiegonensis* | San Diego fairy shrimp | Crustaceans | Endangered | None | IUCN_EN-Endangered | Endemic to San Diego and Orange County mesas. | Vernal Pools | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Buteo swainsoni* | Swainson's Hawk | Birds | None | Threatened | BLM_S-Sensitive \| IUCN_LC-Least Concern | Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. | Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Campylorhynchus brunneicapillus sandiegensis* | coastal cactus wren | Birds | None | None | CDFW_SSC-Species of Special Concern \| USFS_S-Sensitive \| USFWS_BCC-Birds of Conservation Concern | Southern California coastal sage scrub. | Wrens require tall opuntia cactus for nesting and roosting. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| *Chaetodipus fallax fallax* | northwestern San Diego pocket mouse | Mammal | None | None | | Coastal scrub, chaparral, grasslands, sagebrush, etc. in western San Diego, Riverside, San Bernardino, and Los Angeles Counties, inclusive of Orange County. | Sandy, herbaceous areas, usually in association with rocks or coarse gravel. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Charadrius nivosus nivosus* | western snowy plover | Birds | Threatened | None | CDFW_SSC-Species of Special Concern | Sandy beaches, salt pond levees and shores of large alkali lakes. | Needs sandy, gravelly or friable soils for nesting. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Chaetodipus californicus femoralis* | Dulzura pocket mouse | Mammals | None | None | | Variety of habitats including coastal scrub, chaparral, and grassland primarily in San Diego County. | Attracted to grass-chaparral edges. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Choeronycteris Mexicana* | Mexican tong-tongued bat | Mammals | None | None | CDFW_SSC-Species of Special Concern \| IUCN_NT-Near Threatened | Occasionally found in San Diego County, which is on the periphery of their range. | Feeds on nectar and pollen of night-blooming succulents. Roosts in relatively well-lit caves, and in and around buildings. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| *Cicindela senilis frosti* | senile tiger beetle | Insects | None | Noneq | | Inhabits marine shoreline, from Central California coast south to salt marshes of San Diego. Also found at Lake Elsinore. | Inhabits dark-colored mud in the lower zone and dried salt pans in the upper zone. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Circus hudsonius* | northern harrier | Birds | None | None | CDFW_SSC-Species of Special Concern \| IUCN_LC-Least Concern \| USFWS_BCC-Birds of Conservation Concern | Coastal salt and freshwater marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas. | Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Coelus globosus* | globose dune beetle | Insects | None | None | Inhabitant of coastal sand dune habitat; erratically distributed from Ten Mile Creek in Mendocino County south to Ensenada, Mexico. | Inhabits foredunes and sand hummocks; it burrows beneath the sand surface and is most common beneath dune vegetation. | | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Crotalus ruber* | red-diamond rattlesnake | Reptiles | None | None | CDFW_SSC-Species of Special Concern \| IUCN_LC-Least Concern \| USFS_S-Sensitive | Chaparral, woodland, grassland, and desert areas from coastal San Diego County to the eastern slopes of the mountains. | Occurs in rocky areas and dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Danaus Plexippus* | monarch butterfly | Insects | Candidate for Listing | | | Monarch butterflies live mainly in prairies, meadows, grasslands and along roadsides. | | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| *Danaus Plexippus* pop 1 | monarch butterfly | Insects | Candidate for Listing | | | Monarch butterflies live mainly in prairies, meadows, grasslands and along roadsides. | | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Diadophis punctatus similis* | San Diego ringneck snake | Reptiles | None | None | USFS_S-Sensitive | Open, fairly rocky areas. Use boards, flat rocks, woodpiles, stable talus, rotting logs and small ground holes for cover. | Prefer areas with surface litter or herbaceous vegetation. Often in somewhat moist areas near intermittent streams. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Dipodomys stephensi* | Stephens' kangaroo rat | Mammals | Threatened | Threatened | IUCN_VU-Vulnerable | Primarily annual and perennial grasslands, but also occurs in coastal scrub and sagebrush with sparse canopy cover. | Prefers buckwheat, chamise, brome grass and filaree. Will burrow into firm soil. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Elanus leucurus* | white-tailed kite | Birds | None | None | BLM_S-Sensitive \| CDFW_FP-Fully Protected \| IUCN_LC-Least Concern | Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. | Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Empidonax traillii extimus* | southwestern willow flycatcher | Birds | Endangered | Endangered | NABCI_RWL-Red Watch List | Riparian woodlands in Southern California. | | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| *Emys marmorata* | western pond turtle | Reptiles | None | None | BLM_S-Sensitive \| CDFW_SSC-Species of Special Concern \| IUCN_VU-Vulnerable \| USFS_S-Sensitive | A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. | Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Eremophila alpestris actia* | California horned lark | Birds | None | None | CDFW_WL-Watch List \| IUCN_LC-Least Concern | Coastal regions, chiefly from Sonoma County to San Diego County. Also main part of San Joaquin Valley and east to foothills. | Short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Eucyclogobius newberryi* | tidewater goby | Fish | Endangered | None | AFS_EN-Endangered \| CDFW_SSC-Species of Special Concern \| IUCN_NT-Near Threatened | Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. | Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Eumops perotis californicus* | western mastiff bat | Mammals | None | None | BLM_S-Sensitive \| CDFW_SSC-Species of Special Concern \| WBWG_H-High Priority | Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc. | Roosts in crevices in cliff faces, high buildings, trees and tunnels. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Euphydryas editha quino* | quino checkerspot butterfly | Insects | Endangered | None | | Sunny openings within chaparral and coastal sage shrublands in parts of Riverside and San Diego counties. | Hills and mesas near the coast. Need high densities of food plants Plantago erecta, P. insularis, and Orthocarpus purpurescens. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Gila orcuttii* | arroyo chub | Fish | None | None | AFS_VU-Vulnerable \| CDFW_SSC-Species of Special Concern \| USFS_S-Sensitive | Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, | Slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Mojave and San Diego river basins. | | |
| *Haliaeetus leucocephalus* | bald eagle | Birds | Delisted | Endangered | BLM_S-Sensitive \| CDF_S-Sensitive \| CDFW_FP-Fully Protected \| IUCN_LC-Least Concern \| USFS_S-Sensitive | Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. | Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Icteria virens* | yellow-breasted chat | Birds | None | None | CDFW_SSC-Species of Special Concern | Brushy tangles, briars, stream thickets with dense vegetation | | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Lasiurus xanthinus* | western yellow bat | Mammals | None | None | CDFW_SSC-Species of Special Concern \| IUCN_VU-Vulnerable | Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. | Roosts in trees, particularly palms. Forages over water and among trees. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Laterallus jamaicensis coturniculus* | California black rail | Birds | None | Threatened | BLM_S-Sensitive \| CDFW_FP-Fully Protected \| IUCN_NT-Near Threatened \| NABCI_RWL-Red Watch List \| USFWS_BCC-Birds of Conservation Concern | Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. | None. The site lacks habitat for the species. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| *Leptonycteris yerbabuenae* | lesser long-nosed bat | Mammals | Delisted | None | CDFW_SSC-Species of Special Concern \| IUCN_NT-Near Threatened | Arid regions such as desert grasslands and shrub land. Suitable day roosts (caves, mines) and suitable concentrations of food plants (columnar cacti, agaves) are critical resources. No maternity roosts known from California; may only be vagrant. | Caves and mines are used as day roosts. Caves, mines, rock crevices, trees and shrubs, and abandoned buildings are used as night roosts for digesting meals. Nectar, pollen, and fruit eating bat; primarily feeding on agaves, saguaro, and organ pipe cactus. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Lepus californicus bennettii* | San Diego black-tailed jackrabbit | Mammals | None | None | - | open grasslands, agricultural fields, and sparse coastal scrub. | | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Lycaena Hermes* | Hermes copper butterfly | Insects | None | None | IUCN_VU-Vulnerable \| USFS_S-Sensitive | Found in southern mixed chaparral and coastal sage scrub at western edge of Laguna Mountains. | Host plant is Rhamnus crocea. Although R. crocea is widespread throughout the coast range, Lycaena hermes is not. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Myotis yumanensis* | Yuma myotis | Mammals | None | None | BLM_S-Sensitive \| IUCN_LC-Least Concern \| WBWG_LM-Low-Medium Priority | Optimal habitats are open forests and woodlands with sources of water over which to feed. | Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings or crevices. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Neotoma lepida intermedia* | San Diego desert woodrat | Mammals | None | None | CDFW_SSC-Species of Special Concern | Coastal scrub of Southern California from San Diego County to San Luis Obispo County. | Moderate to dense canopies preferred. They are particularly abundant in rock outcrops, rocky cliffs, and slopes. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| *Nyctinomops femorosaccus* | pocketed free-tailed bat | Mammals | None | None | CDFW_SSC-Species of Special Concern \| IUCN_LC-Least Concern | Variety of arid areas in Southern California; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian, etc. | Rocky areas with high cliffs. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Passerculus sandwichensis beldingi* | Belding's savannah sparrow | Birds | None | Endangered | USFWS_BCC-Birds of Conservation Concern | Inhabits coastal salt marshes, from Santa Barbara south through San Diego County. | Nests in Salicornia on and about margins of tidal flats. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Perognathus longimembris pacificus* | Pacific pocket mouse | Mammals | Endangered | None | CDFW_SSC-Species of Special Concern | Inhabits the narrow coastal plains from the Mexican border north to El Segundo, Los Angeles County. | Seems to prefer soils of fine alluvial sands near the ocean, but much remains to be learned. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Phoebastria albatrus* | short-tailed albatross | Birds | Endangered | None | CDFW_SSC-Species of Special Concern \| IUCN_VU-Vulnerable | | | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Phrynosoma blainvillii* | coast horned lizard | Reptiles | None | None | BLM_S-Sensitive \| CDFW_SSC-Species of Special Concern \| IUCN_LC-Least Concern | Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. | Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Plegadis chihi* | white-faced ibis | Birds | None | None | CDFW_WL-Watch List \| IUCN_LC-Least Concern | Shallow freshwater marsh. | Dense tule thickets for nesting, interspersed with areas of shallow water for foraging. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Plestiodon skiltonianus interparietalis* | Coronado skink | Retiles | None | None | BLM_S-Sensitive \| CDFW_WL-Watch List | Grassland, chaparral, pinon-juniper and juniper sage woodland, pine-oak and pine forests in Coast Ranges of Southern California. | Prefers early successional stages or open areas. Found in rocky areas close to streams and on dry hillsides. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Polioptila californica californica* | Coastal California Gnatcatcher | Birds | Threatened | None | CDFW_SSC-Species of Special Concern \| | Obligate, permanent resident of coastal sage scrub below 2500 | Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas | None. The project site is entirely developed / ornamental landscaped or non-native mixed |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| | | | | | NABCI_YWL-Yellow Watch List | ft in Southern California. | classified as coastal sage scrub are occupied. | grassland; therefore, it lacks habitat for the species. |
| *Rallus obsoletus levipes* | light-footed Ridgway's rail | Birds | Endangered | Endangered | CDFW_FP-Fully Protected | Found in salt marshes traversed by tidal sloughs, where cordgrass and pickleweed are the dominant vegetation. | Requires dense growth of either pickleweed or cordgrass for nesting or escape cover; feeds on molluscs and crustaceans. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Riparia riparia* | bank swallow | Birds | None | Threatened | BLM_S-Sensitive \| IUCN_LC-Least Concern | Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. | Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Salvadora hexalepis virgultea* | coast patch-nose snake | Reptiles | None | None | CDFW_SSC-Species of Special Concern | Brushy or shrubby vegetation in coastal Southern California. | Require small mammal burrows for refuge and overwintering sites. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Setophaga petechia* | yellow warbler | Birds | None | None | CDFW_SSC-Species of Special Concern | montane chaparral, riparian woodland, open ponderosa pine and mixed conifer habitats with substantial amounts of brush | | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Spea hammondii* | western spadefoot | Amphibians | Proposed Threatened | None | BLM_S-Sensitive \| CDFW_SSC-Species of Special Concern \| IUCN_NT-Near Threatened | Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands. | Vernal pools are essential for breeding and egg-laying. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Sternula antillarum browni* | California least tern | Birds | Endangered | Endangered | CDFW_FP-Fully Protected | Nests along the coast from San Francisco Bay south to northern Baja California. | Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, land fills, or paved areas. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Streptocephalus woottoni* | Riverside fairy shrimp | Crustaceans | Endangered | None | IUCN_EN-Endangered | Endemic to Western Riverside, Orange, and San Diego counties in | Inhabit seasonally astatic pools filled by winter/spring rains. Hatch | None. The project site is entirely developed / ornamental landscaped or non-native mixed |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Project Site |
|---|---|---|---|---|---|---|---|---|
| | | | | | | areas of tectonic swales/earth slump basins in grassland and coastal sage scrub. | in warm water later in the season. | grassland; therefore, it lacks habitat for the species. |
| *Thamnophis hammondii* | two-striped gartersnake | Reptiles | None | None | BLM_S-Sensitive \| CDFW_SSC-Species of Special Concern \| IUCN_LC-Least Concern \| USFS_S-Sensitive | Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 ft elevation. | Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Thamnophis sirtalis pop. 1* | South coast gartersnake | Reptiles | None | None | CDFW_SSC-Species of Special Concern | Southern California coastal plain from Ventura County to San Diego County, and from sea level to about 850 m. | Marsh and upland habitats near permanent water with good strips of riparian vegetation. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Tryonia imitator* | mimic tryonia (=California brackishwater snail) | Mollusks | None | None | IUCN_DD-Data Deficient | Inhabits coastal lagoons, estuaries and salt marshes, from Sonoma County south to San Diego County. | Found only in permanently submerged areas in a variety of sediment types; able to withstand a wide range of salinities. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Vireo bellii pusillus* | Least Bell's Vireo | Birds | Endangered | Endangered | IUCN_NT-Near Threatened \| NABCI_YWL-Yellow Watch List | Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft. | Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

## Special-Status Plants

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Abronia maritima* | red sand-verbena | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Coastal dunes. | Dune plant. 0-100 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Ambrosia pumila* | San Diego ambrosia | Plants | Endangered | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, coastal scrub, valley and foothill grassland. | Sandy loam or clay soil; sometimes alkaline. In valleys; persists where disturbance has been superficial. Sometimes on margins or near vernal pools. 3-580 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Abronia villosa var. aurita* | chaparral sand-verbena | Plants | None | None | BLM_S-Sensitive \| SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| USFS_S-Sensitive | Chaparral, coastal scrub, desert dunes. | Sandy areas. -60-1570 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Acanthomintha ilicifolia* | San Diego thorn-mint | Plants | Threatened | Endangered | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, coastal scrub, valley and foothill grassland, vernal pools. | Endemic to active vertisol clay soils of mesas and valleys. Usually on clay lenses within grassland or chaparral communities. 25-945 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Acmispon prostratus* | Nuttail' s acmispon | Plants | None | None | IUCN_EN-Endangered \| SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| SB_USDA-US Dept of Agriculture | Coastal dunes, coastal scrub. | On sand dunes. 0-20 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Adolphia californica* | California adolphia | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, coastal sage scrub, valley and foothill grassland. | From sandy/gravelly to clay soils within grassland, coastal sage scrub, or chaparral; various exposures. 5-335 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Agave shawii var. shawii* | Shaw' s agave | Plants | None | None | IUCN_EN-Endangered \| SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_SBBG-Santa Barbara Botanic Garden | Coastal bluff scrub, coastal scrub. | Coastal bluffs and slopes within coastal sage scrub. 10-120 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Ambrosia pumila* | San Diego ambrosia | Plants | Endangered | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, coastal scrub, valley and foothill grassland. | Sandy loam or clay soil; sometimes alkaline. In valleys; persists where disturbance has been superficial. Sometimes on margins or near vernal pools. 3-580 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Aphanisma blitoides* | aphanisma | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| SB_SBBG-Santa Barbara Botanic Garden | Coastal bluff scrub, coastal dunes, coastal scrub. | On bluffs and slopes near the ocean in sandy or clay soils. 3-305 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Arctostaphylos glandulosa ssp. crassifolia* | Del Mar manzanita | Plants | Endangered | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral. | Sandy coastal mesas and ocean bluffs; in chaparral or Torrey pine forest. 30-365 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Arctostaphylos rainbowensis* | rainbow manzanita | Plants | None | None | BLM_S-Sensitive \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| USFS_S-Sensitive | Chaparral. | Usually found in gabbro chaparral. 100-870 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Artemisia palmeri* | San Diego sagewort | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal scrub, chaparral, riparian forest, riparian woodland, riparian scrub. | In drainages and riparian areas in sandy soil within chaparral and other habitats. 15-915 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Astragalus tener var. titi* | coastal dune milk-vetch | Plants | Endangered | Endangered | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Coastal bluff scrub, coastal dunes, coastal prairie. | Moist, sandy depressions of bluffs or dunes along and near the Pacific Ocean; one site on a clay terrace. 1-45 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Atriplex coulteri* | Coulter's saltbush | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland. | Ocean bluffs, ridgetops, as well as alkaline low places. Alkaline or clay soils. 2-460 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Atriplex pacifica* | south coast saltscale | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal scrub, coastal bluff scrub, playas, coastal dunes. | Alkali soils. 1-400 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Baccharis vanessae* | Encinitas baccharis | Plants | Threatened | Endangered | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, cismontane woodland. | On sandstone soils in steep, open, rocky areas with chaparral associates. 60-900 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Berberis nevinii* | Nevin's Barberry | Plants | Endangered | Endangered | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_SBBG-Santa Barbara Botanic Garden | Chaparral, cismontane woodland, coastal scrub, riparian scrub. | On steep, N-facing slopes or in low grade sandy washes. 90-1590 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Bloomeria clevelandii* | San Diego goldenstar | Plants | None | None | BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| SB_UCBG-UC Botanical Garden at Berkeley | Chaparral, coastal scrub, valley and foothill grassland, vernal pools. | Mesa grasslands, scrub edges; clay soils. Often on mounds between vernal pools in fine, sandy loam. 60-465 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Brodiaea filifolia* | three-leaved brodiaea | Plants | Threatened | Endangered | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral (openings), cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools. | Usually associated with annual grassland and vernal pools; often surrounded by shrubland habitats. Occurs in openings on clay soils. 15-1030 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Brodiaea orcuttii* | Orcutt's brodiaea | Plants | None | None | BLM_S-Sensitive \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| USFS_S-Sensitive | Vernal pools, valley and foothill grassland, closed-cone coniferous forest, cismontane woodland, chaparral, meadows and seeps. | Mesic, clay habitats; usually in vernal pools and small drainages. 30-1615 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Camissoniopsis lewisii* | Lewis' evening-primrose | Plants | None | None | | Valley and foothill grassland, coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub. | Sandy or clay soil. 0-300 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Caulanthus simulans* | Payson's jewelflower | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| USFS_S-Sensitive | Chaparral, coastal scrub. | Frequently in burned areas, or in disturbed sites such as streambeds; also on rocky, steep slopes. Sandy, granitic soils. 90-2200 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Ceanothus verrucosus* | wart-stemmed ceanothus | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| SB_UCBG-UC Botanical Garden at Berkeley | Chaparral, coastal scrub. | 25-470 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Centromadia parryi ssp. australis* | southern tarplant | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| SB_SBBG-Santa Barbara Botanic Garden | Marshes and swamps (margins), valley and foothill grassland, vernal pools. | Often in disturbed sites near the coast at marsh edges; also in alkaline soils sometimes with saltgrass. Sometimes on vernal pool margins. 0-975 m | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Centromadia pungens ssp. laevis* | smooth tarplant | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Valley and foothill grassland, chenopod scrub, meadows and seeps, playas, riparian woodland. | Alkali meadow, alkali scrub; also in disturbed places. 5-1170 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Chaenactis glabriuscula var. orcuttiana* | Orcutt's pincushion | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal bluff scrub, coastal dunes. | Sandy sites. 3-80 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Chamaebatia australis* | southern mountain misery | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral. | Gabbro or metavolcanic soils. 300-1020 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Chorizanthe orcuttiana* | Orcutt's spineflower | Plants | Endangered | Endangered | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Coastal scrub, chaparral, closed-cone coniferous forest. | Sandy sites and openings; sometimes in transition zones. 3-125 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Chorizanthe polygonoides var. longispina* | long-spined spinefloweer | Plants | None | None | BLM_S-Sensitive \| SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools. | Gabbroic clay. 30-1630 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Cistanthe maritima* | seaside cistanthe | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_SBBG-Santa Barbara Botanic Garden | Coastal bluff scrub, coastal scrub, valley and foothill grassland. | Sea bluffs; sandy sites. 5-300 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Comarostaphylis diversifolia ssp. diversifolia* | summer holly | Plants | None | None | BLM_S-Sensitive \| SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, cismontane woodland. | Often in mixed chaparral in California, sometimes post-burn. 30-855 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Convolvulus simulans* | small-flowered morning glory | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, coastal scrub, valley and foothill grassland. | Wet clay, serpentine ridges. 30-700 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Corethrogyne filaginifolia var. linifolia* | Del Mar Mesa sand aster | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, coastal scrub, coastal bluff scrub. | In coastal, shrubby communities on maritime sediments and conglomerates; in openings. 15-140 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Cryptantha wigginsii* | Wiggins' cryptantha | Plants | None | None | | Coastal scrub. | Often on clay soils. 45-110 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Deinandra paniculata* | panticulate tarplant | Plants | None | None | | Coastal scrub, valley and foothill grassland, vernal pools. | Usually in vernally mesic sites. Sometimes in vernal pools or on mima mounds near them. 25-940 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Dichondra occidentalis* | western dichondra | Plants | None | None | | Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. | On sandy loam, clay, and rocky soils. 50-500 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Dudleya blochmaniae ssp. blochmaniae* | Blochman's dudleya | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Coastal scrub, coastal bluff scrub, chaparral, valley and foothill grassland. | Open, rocky slopes; often in shallow clays over serpentine or in rocky areas with little soil. 5-290 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Dudleya multicaulis* | many-stemmed dudleya | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| USFS_S-Sensitive | Chaparral, coastal scrub, valley and foothill grassland. | In heavy, often clayey soils or grassy slopes. 1-910 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Dudleya variegata* | variegated dudleya | Plants | None | None | BLM_S-Sensitive \| SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, coastal scrub, cismontane woodland, valley and foothill grassland. | In rocky or clay soils; sometimes associated with vernal pool margins. 3-550 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Dudleya viscida* | sticky dudleya | Plants | None | None | BLM_S-Sensitive \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| USFS_S-Sensitive | Coastal scrub, coastal bluff scrub, chaparral, cismontane woodland. | On north and south-facing cliffs and banks. 20-870 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Ericameria palmeri var. palmeri* | Palmer's goldenbush | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal scrub, chaparral. | On granitic soils, on steep hillsides. Mesic sites. 5-625 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Eryngium aristulatum var. parishii* | San Diego button-celery | Plants | Endangered | Endangered | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Vernal pools, coastal scrub, valley and foothill grassland. | San Diego mesa hardpan and claypan vernal pools and southern interior basalt flow vernal pools; usually surrounded by scrub. 15-880 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Eryngium pendletonense* | Pendleton button-celery | Plants | None | None | | Coastal bluff scrub, valley and foothill grassland, vernal pools. | Clay. Vernally mesic sites. 20-30 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Erysimum ammophilum* | sand-loving wallflower | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| SB_SBBG-Santa Barbara Botanic Garden | Chaparral (maritime), coastal dunes, coastal scrub. | Sandy openings. 3-320 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Erythranthe diffusa* | Palomar monkeyflower | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Chaparral, lower montane coniferous forest. | Sandy or gravelly soils. 1220-1830 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Euphorbia misera* | cliff spurge | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal bluff scrub, coastal scrub, Mojavean desert scrub. | Rocky sites. 3-430 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Ferocactus viridescens* | San Diego barrel cactus | Plants | None | None | IUCN_LC-Least Concern \| SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chapparal, coastal scrub, valley and foothill grassland. | Often on exposed, level or south-sloping areas; often in coastal scrub near crest of slopes. 3-490 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Harpagonella palmeri* | Palmer's grapplinghook | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, coastal scrub, valley and foothill grassland. | Clay soils; open grassy areas within shrubland. 20-955 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Hazardia orcuttii* | Orcutt's hazardia | Plants | None | Threatened | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Chaparral, coastal scrub. | Often on clay; in grassy edges of chaparral and coastal scrub. 5-85 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Heterotheca sessiliflora ssp. sessiliflora* | beach goldenaster | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal dunes, coastal scrub, chaparral (coastal). | Sandy sites. 0-5 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Hordeum intercedens* | vernal barley | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Valley and foothill grassland, vernal pools, coastal dunes, coastal scrub. | Vernal pools, dry, saline streambeds, alkaline flats. 5-1000 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Isocoma menziesii var. decumbens* | decumbent goldenbush | Plants | None | None | BLM_S-Sensitive \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal scrub, chaparral. | Sandy soils; often in disturbed sites. 1-915 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Iva hayesiana* | San Diego marsh-elder | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Marshes and swamps, playas. | Riverwashes. 1-430 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Juglans californica* | Southern California black walnut | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| IUCN_NT-Near Threatened \| SB_USDA-US Dept of Agriculture | Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland | alluvial | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Juncus acutus ssp. leopoldii* | southwestern spiny rush | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garde \|n SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Salt marshes, alkaline seeps, coastal dunes (mesic sites). | Moist saline places. 3-900 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Lasthenia glabrata ssp. coulteri* | Coulter's goldfields | Plants | None | None | BLM_S-Sensitive \| SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_SBBG-Santa Barbara Botanic Garden | Coastal salt marshes, playas, vernal pools. | Usually found on alkaline soils in playas, sinks, and grasslands. 1-1375 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Lepidium virginicum var. robinsonii* | Robinson's pepper-grass | Plants | None | None | | Chaparral, coastal scrub. | Dry soils, shrubland. 4-1435 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Leptosiphon grandiflorus* | Large-flowered leptosiphon | Plants | None | None | | Coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, valley and foothill grassland. | Open, grassy flats, generally sandy soil. 5-1200 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Leptosyne maritima* | sea dahlia | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal scrub, coastal bluff scrub. | Occurs on a variety of soil types, including sandstone. 5-185 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Lycium californicum* | California box-thorn | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal bluff scrub, coastal scrub. | 5-150 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Microseris douglasii ssp. platycarpha* | small-flowered microseris | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Cismontane woodland, valley and foothill grassland, coastal scrub, vernal pools. | Alkaline clay in river bottoms. 15-1070 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Monardella viminea* | Willowy monardella | Plants | Endangered | Endangered | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal scrub, chaparral, riparian forest, riparian scrub, riparian woodland. | In canyons, in rocky and sandy places, sometimes in washes or floodplains; with Baccharis, Iva, etc. Alluvial, ephemeral washes with adjacent coastal scrub. 45-230 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Myosurus minimus ssp. apus* | little mousetail | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Vernal pools, valley and foothill grassland. | Alkaline soils. 20-640 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Nama stenocarpa* | mud nama | Plants | None | None | | Marshes and swamps. | Lake shores, river banks, intermittently wet areas. 15-815 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Navarretia fossalis* | spreading navarretia | Plants | Threatened | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Vernal pools, chenopod scrub, marshes and swamps, playas. | San Diego hardpan and San Diego claypan vernal pools; in swales and vernal pools, often surrouded by other habitat types. 15-850 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Nemacaulis denudata var. denudata* | Coast woolly-heads | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal dunes. | 0-5 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Nemacaulis denudata var. gracilis* | slender cottonheads | Plants | None | None | | Coastal dunes, desert dunes, Sonoran desert scrub. | In dunes or sand. -45-745 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Ophioglossum californicum* | California adder's tongue | Plants | None | None | | Chaparral, vernal pool areas, valley and foothill grassland. | Grassy pastures, vernal pool margins, chaparral. Mesic sites. 60-525 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Orcuttia californica* | California Orcutt grass | Plants | Endangered | Endangered | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Vernal pools. | 10-660 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Orobanche parishii ssp. brachyloba* Or *Aphyllon parishii ssp. brachylobum* | short-lobed broomrape | Plants | None | None | Coastal bluff scrub, coastal dunes, coastal scrub. | Sandy soil near beaches; reported to grow on Isocoma menziesii and other shrubs. 3-305 m. | | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Pentachaeta aurea ssp. aurea* | golden-rayed pentachaeta | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, valley and foothill grassland, riparian woodland. | 80-1850 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Phacelia stellaris* | Brand's star phacelia | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | Coastal scrub, coastal dunes. | Open areas. 3-370 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Pinus torreyana ssp. torreyana* | Torrey pine | Plants | None | None | IUCN_CR-Critically Endangered \| SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Closed-cone coniferous forest, chaparral. | On dry, sandstone slopes. 70-160 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Pogogyne abramsii* | San Diego mesa-mint | Plants | Endangered | Endangered | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Vernal pools. | Vernal pools within grasslands, chamise chaparral, or coastal sage scrub communities. 70-195 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Pseudognaphalium leucocephalum* | white rabbit-tobacco | Plants | None | None | | Riparian woodland, cismontane woodland, coastal scrub, chaparral. | Sandy, gravelly sites. 35-515 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

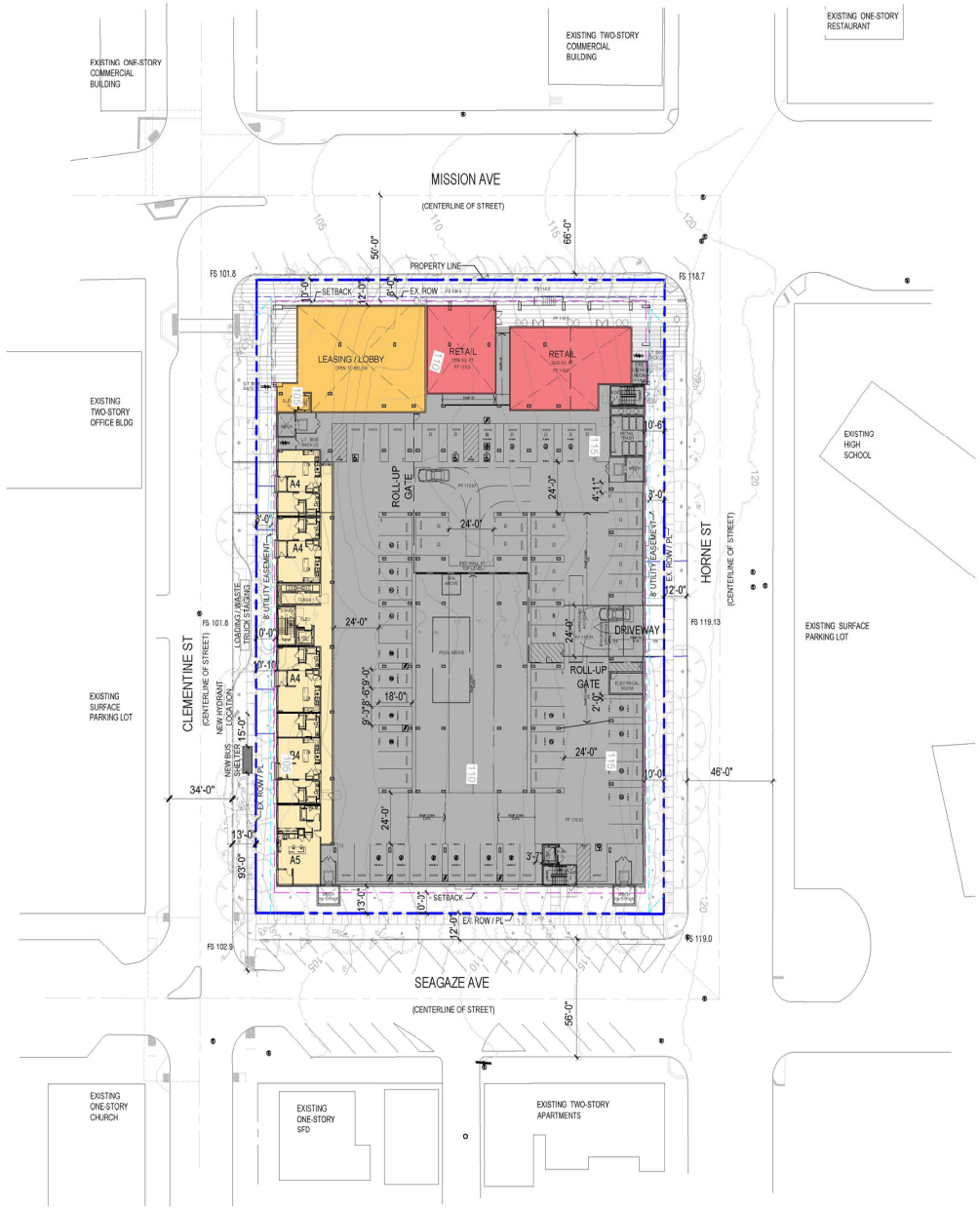
| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Polygala cornuta var. fishiae* | Fish's milkwort | Plants | None | None | | Cismontane woodland, riparian woodland, chaparral. | Scree slopes, brushy ridges, and along creeks; often with oaks. 100-1000 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Quercus dumosa* | Nuttail' s scrub oak | Plants | None | None | BLM_S-Sensitive \| IUCN_EN-Endangered \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| USFS_S-Sensitive | Closed-cone coniferous forest, chaparral, coastal scrub. | Generally on sandy soils near the coast; sometimes on clay loam. 15-640 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Quercus engelmannii* | Engelmann oak | Plants | None | None | IUCN_EN-Endangered \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Cismontane woodland, chaparral, riparian woodland, valley and foothill grassland. | 50-1300 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Selaginella cinerascens* | ashy spike-moss | Plants | None | None | | Chaparral, coastal scrub. | 20-640 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Senecio aphanactis* | chaparral ragwort | Plants | None | None | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, cismontane woodland, coastal scrub. | Drying alkaline flats. 20-1020 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Sidalcea neomexicana* | salt spring checkerbloom | Plants | None | None | USFS_S-Sensitive | Playas, chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub. | Alkali springs and marshes. 3-2380 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Sphenopholis interrupta ssp. californica* | false prairie oat | Plants | None | None | | Chaparral (coastal). | Friable clay lenses. 87 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Stipa diegoensis* | San Diego needlegrass | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Chaparral, coastal scrub. | Rocky slopes, sea cliffs and stream banks; often in mesic sites. 10-800 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Suaeda esteroa* | estuary seablite | Plants | None | None | | Marshes and swamps. | Coastal salt marshes in clay, silt, and sand substrates. 0-80 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |
| *Suaeda taxifolia* | woolly seablite | Plants | None | None | SB_CRES-San Diego Zoo CRES Native Gene Seed Bank | Coastal bluff scrub, coastal dunes, marshes and swamps. | Margins of salt marshes. 0-50 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

| Scientific Name | Common Name | Taxonomic Group | Federal Listing | State Listing | Other Status | General Habitat | Microhabitat | Potential to Occur on Study area |
|---|---|---|---|---|---|---|---|---|
| *Tetracoccus dioicus* | Parry's tetracoccus | Plants | None | None | BLM_S-Sensitive \| SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden \| SB_CRES-San Diego Zoo CRES Native Gene Seed Bank \| USFS_S-Sensitive | Chaparral, coastal scrub. | Stony, decomposed gabbro soil. 135-705 m. | None. The project site is entirely developed / ornamental landscaped or non-native mixed grassland; therefore, it lacks habitat for the species. |

# Appendix C

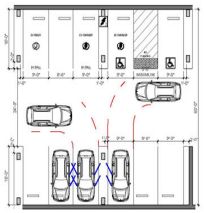
Site Plan




## LEGEND

- RETAIL
- LEASING AND AMENITIES
- RESIDENTIAL
- PARKING

## PARKING PLAN



Notes:

1. The proposed dimensions provide equivalent access and maneuverability to allow parking within standard or column obstructed stalls.
2. The proposed dimensions provide equivalent or greater dimensions and access for passenger loading and unloading at column obstructed stalls than what is provided at standard stalls.
3. The proposed stall dimensions are 8'-6" X 18' with (9' X 18' ADA & EV) for both standard and column obstructed stalls (1' of additional width is proposed next to columns, 2' next to walls).
4. All spaces shall have wheel stops 2.5 feet from wall or walkway.

NOTE: SEE SHEET C1.0 FOR BOUNDARY DIMENSIONS, BENCHMARK INFORMATION AND EXISTING EASEMENTS

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

MIXED-USE BUILDING
SITE PLAN

1"=30'

0 30' 60' 90' 120'

A1.0

JOB NO. 2023-0939
DATE 02-14-2025

# Appendix D

Biologist Qualifications

Email: jmcnutt@southenvironmental.com
Mobile: 818-201-7689

## EDUCATION

M.S., Earth, Environmental, and Physical Science, Wichita State University, 2012

B.S., Bachelor of Science, Biology, Wichita State University, 2004

## PROFESSIONAL EXPERIENCE

South Environmental (2021-Present), Senior Biologist

AGEISS, Inc. (2020-2021), Environmental Scientist

Timberwolf Environmental (2019), Senior Project Manager

Nebraska Oil and Gas Conservation Commission (2018-2019), Project Manager

Stelbar Oil Corporation, Inc. (2006-2018), Project Manager

## GIS

ESRI ArcGIS Pro, ArcCollector, Survey123, AccGIS online

Trimble GPS

# James McNutt, M.S.

### SENIOR BIOLOGIST AND LEAD WATERS DELINEATOR

James McNutt is a Senior Environmental Scientist and Lead Delineator with 19 years of professional experience in environmental project management, jurisdictional and wetland delineations, environmental permitting, technical documents, biological resource and community identification, and geology. Mr. McNutt brings over 15 years of experience completing jurisdictional and wetland delineations as a lead delineator in accordance with the U.S. Army Corps of Engineers (USACE) 1987 Delineation Manual Protocols. Mr. McNutt brings 5 years of experience identifying non-wetland features using the Arid West OHWM Identification Manual.

Since starting at South Environmental in early 2021, Mr. McNutt has completed dozens of jurisdictional and wetland delineations throughout Southern California. This experience includes utility project for Southern California Gas (SoCal Gas) and Southern California Edison (SCE) as well as private enterprise developments, and local government projects. He has been responsible for determining the boundary of jurisdictional features using Trimble GIS to accurately collect data, while using modules such as ArcCollector and Survey123 to validate all data collection processes. He is also a GIS analyst that creates figures for data packages regarding jurisdictional delineation reporting and permitting documents.

As a project manager, environmental scientist, and geologist for oil and gas companies, environmental consultants, and agencies in the west and Midwest, he oversaw wetland investigations and delineations on client assets such as leaseholds and drill-sites using the Criteria Determination Methodologies for Vegetation, Soil, and Hydrology. In these roles, he has also completed permit applications and successfully negotiated wetlands and non-wetland permits for dozens of projects, while closely coordinating with clients, agencies, and managers. This includes projects requiring compliance with the implementation of Mitigation Monitoring Reporting Plans, regulatory compliance, and data management processes.

### EXPERTISE

- Environmental Regulations and Permitting
- Environmental Project Management
- Jurisdictional and Wetland Delineations
- Biological Habitat Assessment Reporting
- USACE Section 401/404 Compliance
- Biological Data Collection and Assessment Methods

## SELECT WATERS DELINEATION PROJECT EXPERIENCE

**Southern California Gas On-Call Waters Delineation Services.** Conducted standard jurisdictional and wetland delineation work, as well emergency repair jurisdictional and wetland delineation work, for biological resource assistance regarding construction and maintenance projects throughout southern California. Activities have included data collection near protected resources for conducting wetland and jurisdictional delineations, jurisdictional delineation and habitat assessment reporting, and permit generation for RWQCB, USACE, and CDFW compliance.

*Notable SGC Delineation Projects:*

- Aliso Canyon Facility,
- L-85 Line north of Castaic,
- L-404 Line near Oak Park,
- L-127 Line in Montecito,
- Sylmar Gould Canyon, and
- L324 near Salt Canyon Creek

**Southern California Edison On-Call Waters Delineation Services.** Conducted standard jurisdictional and wetland delineation work, as well emergency repair jurisdictional and wetland delineation work, for biological resource assistance regarding construction and maintenance projects throughout southern California. Activities have included data collection near protected resources for conducting wetland and jurisdictional delineations, jurisdictional delineation and habitat assessment reporting, and permit generation for RWQCB, USACE, and CDFW compliance.

*Notable SCE Delineation Projects:*

- Dozens of utility projects throuhgout Los Angeles County, San Bernardino County, Riverside County, Ventura County, Kern County, and Santa Barbara County.

**Private Development Waters Delineation Services in Southern California.** Conducted standard jurisdictional and wetland delineation work and habitat assessment work for biological resource assistance regarding industrial, commercial, and residential projects throughout southern California. Activities have included data collection for conducting wetland and jurisdictional delineations, jurisdictional delineation and habitat assessment reporting, and permit generation for RWQCB, USACE, and CDFW compliance.

*Notable Private Development Delineation Projects:*

- Trader Joes' Warehouse in Palmdale,
- TTM 48307 housing development near Lakeview Drive in Palmdale,
- land for truck stop developments in Temescal Valley,
- land for housing developments in Lake Elsinore,
- land for industrial development near the Los Angeles River in Long Beach,
- Avenue I and 30$^{th}$ Street in Lancaster,
- Silverlake Equestrian Park in Norco, and

- land for housing developments in San Bernardino County.

**Local Government Environmental Services in Southern California.** Conducted standard jurisdictional and wetland delineation work and habitat assessment work for biological resource assistance regarding municipal and county projects throughout southern California. Activities have included data collection for conducting wetland and jurisdictional delineations, jurisdictional delineation and habitat assessment reporting, and permit generation for RWQCB, USACE, and CDFW compliance.

*Notable Local Government Delineation Projects:*

- Bell Canyon Creek for City of Los Angeles Recreation and Parks Department,
- Bronson Canyon Playground in Griffith Park for City of Los Angeles Recreation and Parks Department,
- Rice Canyon for EVMWD,
- Almond Street Road extension in Rancho Cucamonga, and
- land near Santa Clara River for city of Oxnard Fire Station.

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Mobile: 714-330-6290

# Dana Briggs Wyler

BIOLOGIST

Dana Briggs Wyler is a current environmental professional and recent graduate from University of California, Irvine's Masters in Conservation and Restoration Science program. Here, she specialized in project management, restoration design, and field monitoring in areas with sensitive species. She has extensive field data collection and restoration experience in central and southern California learned while in school. While at UCI, she was involved with a project monitoring a fuel modification zone using native plant species to support regional biodiversity, especially Least Bell's Vireo and California Gnatcatcher. She also participated in a restoration and monitoring program of native grasslands in Irvine aimed to provide data for community resilience to fire. More recently, she worked for Southern California Coastal Water Research Project as a toxicologist where she conducted research and assessments of southern California's water resources.

## EXPERTISE

- **Field Data Collection.** Dana has extensive experience collecting data in diverse terrestrial and aquatic habitats in both southern and central California.
- **Biological Monitoring.** Dana has diverse experience identifying wildlife species throughout the Southern California region.
- **Plant Identification.** Dana is proficient in identifying native, non-native, and invasive plant species throughout southern California, specifically in coastal, wetland, riparian, and chaparral.
- **Technical Writing.** Dana has prepared numerous biological resource assessments reports for the city of Los Angeles. Reports include detail-oriented descriptions of biological resources, surveys for special-status species, biological resources maps, and assessments of potential impacts to biological resources from development.
- **Data Management and Analysis.** Dana has significant expertise in statistical analyses as well as producing statistical figures through R Studio. She has extensive experience working with both single data sets as well as large databases.

## EDUCATION

B.S., Ecology, Evolution, & Organismal Biology, California State University, Monterey Bay, 2017

M.S., Conservation and Restoration Science, University of California, Irvine, 2022

## SKILLS

-Scientific collection and management of field data

-Technical writing

-Project management and risk assessment

-Plant and animal identification through dichotomous keys, field guides, and experience

-Statistical analyses through R Studio

## CERTIFICATIONS

-Wilderness First Aid Certification

## SELECT PROJECT EXPERIENCE

**South Environmental, Monitoring Biologist. Ramona Expressway (2023-present).** As a Biologist for South Environmental, Dana's responsibilities were to provide WEAP trainings and biological monitoring for the Ramona Expressway project with First Carbon. Duties included:

- Conduct Worker Environmental Awareness Program (WEAP) training to all onsite construction personnel to describe species of concern and requirements to protect them under the Endangered Species Act and the Western Riverside Multi-Species Habitat Conservation Plan and mitigation measures being implemented on the project site to conserve the species of concern.
- Monitoring construction activities for the duration of project activities to ensure that all practicable measures are being employed to avoid incidental disturbance of habitat and species:
    - establish environmentally sensitive areas around sensitive biological resources on the project site during the construction phase.
    - ensure that vegetation clearance activities limit disturbance to the smallest practical area and that construction personnel and activities do not enter environmentally sensitive areas.
    - perform daily pre-construction sweeps of work areas prior to initiation of daily construction activities.
    - inspect open trenches, pits, and pipes or other materials within which a covered species or other sensitive species may become entrapped or hide within.
    - Summarize relevant findings in a letter report that will be prepared at the completion of ground disturbing activities.

**Aliso Canyon Emergency Monitoring Project Southern California Gas (2023-present).** Dana is the lead monitor for a long-term project that includes the removal of sediment from catch basins where sensitive wetlands and wildlife such as coast range newt occurs. Dana is responsible for overseeing the monitoring effort, daily reports, and overall project compliance.

**City of LA Recreation and Parks City Park Brush Clearance Monitoring within Riparian Areas (2023).** Dana was the primary monitor that conducted nesting bird surveys and compliance monitoring at White Point Park where brush clearance is performed annually to meet LA Fire Department requirements. The work was within and near riparian areas and wetland and riparian vegetation and wildlife were the target species. Also, Dana monitored nesting coastal California gnatcatchers at this site and protected the nest during the project.

**City of Los Angeles Biological Resources Assessments (2023 – present).** Dana conducts site assessments for biological resources, surveys for special-status plants and animals, maps and characterizes plant communities and wetlands/streams, and assesses potential impacts to biological resources from proposed developments. Dana has worked on the following reports:

- 41 Mar Vista Biological Resources Report in the Santa Monica Mountains Local Coastal Program (LCP)
- 4801 Knob Hill Drive Biologist's Statement of Biological Resources
- 1746 Mandeville SB9 Statement of Habitat
- 2460 Sunset Plaza SB9 Statement of Habitat
- 21050 San Miguel SB9 Statement of Habitat
- 11496 Orum SB9 Statement of Habitat & California Wildlife Habitat Relationship (CWHR) Assessment



- 230 Carolwood Biologist's Statement of Biological Resources
- 2383 Mandeville Canyon Biologist's Statement of Biological Resources
- 4960 Calvin SB9 Statement of Habitat
- 8152 Ellenbogen SB9 Statement of Habitat
- 10826 Tuxford Statement of Habitat

Dana has also conducted the following monitoring projects:

- Ramona Expressway monitoring biologist
- Glenoaks/ SoCal Edison compliance monitoring
- White Point nesting bird survey and monitoring

**Southern California Coastal Water Research Project (2021 – 2022).** Dana was a laboratory and field assistant for coastal wetlands project. Dana later was promoted to research technician in the toxicology department where she coordinated and implemented a water toxicology experiment that support southern California wetlands and waters.

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Mobile: 303-818-3632

## EDUCATION

B.S., Wildlife Ecology, University of Wisconsin-Madison, 2004

## CERTIFICATIONS

Certified Wildlife Biologist, The Wildlife Society 2014

Certified Technical Service Provider (TSP) for Fish and Wildlife Management Plans, USDA NRCS 2017

Authorized Desert Tortoise Biologist – Numerous BOs

Unmanned Aircraft System Pilot Certification, FAA #4177603

## TRAINING

Wetland Delineation Training Course – The Wetland Institute (2014)

Southwest Willow Flycatcher Workshop, 2017

USGS Desert Tortoise Health Assessment and Tissue Collection Techniques Training, 2009

# Matthew South

PRINCIPAL BIOLOGIST

Matthew South founded South Environmental in 2018. He is a certified wildlife biologist with over 17 years of professional experience providing natural resources consulting services for a wide variety of clients that include residential, commercial, government, utility, infrastructure, research, and non-profit projects. For the last 14 years, Mr. South has been an environmental consultant in southern California acting as a Wildlife Biologist and Geographic Information System (GIS) Analyst. In early 2018 he started South Environmental and has since been supporting clients in Los Angeles, Ventura, Santa Barbara, San Bernardino, and Riverside Counties.

Mr. South's background in ecology has led to a passion for conservation planning and resources assessments for the purpose of preservation and management. The integration of the latest technologies such as advanced GIS systems, mobile computing, and drone sensing allows him to innovate new data collection, analysis, and collaboration tools for the environmental sciences that produce more accurate data and better-informed resource managers.

## EXPERTISE

- **Conservation and Management Planning.** Mr. South's has extensive experience preparing mitigation and monitoring plans, habitat conservation plans, and technical biological resources management plans that are compliant with federal, state, and local regulations. Mr. South is the only active NRCS TSP for Fish and Wildlife Plans Certified in California.
- **Biological Resources Assessment.** Mr. South has completed dozens of biological resources assessments throughout southern California.
- **Rare Plants and Arborist Services.** Mr. South has surveyed and assessed thousands of native and landscaped trees in southern California. He is a certified arborist with 5-years of tree survey experience working closely with some of the most experienced arborists in California. In addition, he has performed hundreds of hours of rare plant surveys and habitat assessments.
- **Wetland & Jurisdictional Delineations.** Mr. South has conducted dozens of jurisdictional and wetland delineations per the guidelines and methods from the US Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), and the state Regional Water Quality Control Boards (RWQCB).
- **GIS.** Mr. South is an expert at spatial data collection and analysis using ESRI mobile and desktop software products and Trimble hardware.

## SELECT PROJECT EXPERIENCE

**Moreno Valley Dracaea Street Improvements Plan Tract 32834, Moreno Vally, Riverside County, California (2023).** South Environmental completed a jurisdictional delineation for the project and obtained permits from the CDFW and RWQCB for the road improvements project. Mr. South was the lead biologist that conducted the field survey, prepared the reports, and negotiated the permits.

**EVMWD Rice Canyon Reservoir Access Road and New Conduit Project, City of Lake Elsinore, Riverside County, California (2022).** South Environmental was retained to complete biological and cultural resources services. Biological resources work included a Jurisdictional Delineation Report, a Biological Resources Assessment/MSHCP Consistency Analysis, Rare Plant Surveys, Burrowing Owl Surveys, and mitigation planning. Matthew South was the Principal Biologist on the project.

**Southern California Edison (SCE) Permitting and Jurisdictional Delineations (2021-ongoing).** As a subconsultant on this contract for multiple Primes (SWCA, EI, Rincon, Cardno, and ERM), South Environmental has focused its biological resources services on wetland delineations and permitting efforts for SCE throughout all its regions. From single pole delineations in roadside ditches to several hundred poles through miles of wet meadows in the Sierras, the projects vary in size and complexity as well as location. Primarily, delineations have been in the Sierras with the largest and most complex projects in Inyo and Mono Counties and several in Kern and Tulare. A few of the specific projects include

- Pickle Meadow: Aquatic Resources Delineation Report and Permitting for 300-poles located in a wet meadow behind Bridgeport Reservoir.
- Kern River: Wetland Delineation and Permitting for 15 pole replacements in Kernville.
- June Lake to Tom's Place: Wetland Delineation and Permitting for 40 poles spread through Inyo and Mono Counties.
- Cajon Wash: Jurisdictional Delineation and SBKR Assessment and Permitting for 10 pole replacements and realignment for a capital project located in SBKR Critical Habitat.
- Pipes Wash: Delineation and Permitting for 25-poles that are within Pipes Wash, a large ephemeral wash in the San Bernardino desert.

**City of Palmdale - Palmdale Warehouse Project (2022-on going).** South Environmental prepared a jurisdictional delineation and permit applications to CDFW and RWQCB for the project. Services included EPIMS application and RWQCB Dredge and Fill Application and coordination including for mitigation management and alternatives analysis and permit negotiations. Currently South Environmental is overseeing the compliance monitoring for the project.

**Private Development Waters Delineation Services in Southern California.** Oversaw and managed jurisdictional and wetland delineation work and habitat assessment work for biological resource assistance regarding industrial, commercial, and residential projects throughout southern California. Activities have included overseeing data collection for conducting wetland and jurisdictional delineations, jurisdictional delineation and habitat assessment reporting.

*Notable Private Development Delineation Projects:*

- TTM 48307 housing development near Lakeview Drive in Palmdale,
- land for truck stop developments in Temescal Valley,

- land for housing developments in Lake Elsinore,
- land for industrial development near the Los Angeles River in Long Beach,
- Avenue I and 30th Street in Lancaster,
- Silverlake Equestrian Park in Norco, and

**Wendy's in Calimesa Project, Riverside County, California (2023).** South Environmental was retained to complete a Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis Report. Mr. South served as the Principal Biologist on the Project.

**Southern California Gas (SCG) As-Needed Biological and Cultural Resources Services (2022-ongoing).** As a subconsultant on this contract Mr. South has overseen the assessment numerous resources from single point locations to many miles of pipelines. More recently he has begun to conduct biological assessment in the coastal zone in Santa Barbara County as well as endangered species Biological Assessments (BAs) in support of Coastal Development Permits for SCG. Wetland delineation and permitting, biological resources assessments, and resources surveys and monitoring are services that Mr. South both provides personally and oversees a team of specialists that support the environmental impacts analysis and permitting for SCG.

*Notable SGC Delineation Projects:*

- Aliso Canyon Facility,
- L-85 Line north of Castaic,
- L-404 Line near Oak Park,
- L-127 Line in Montecito,
- Sylmar Gould Canyon, and
- L324 near Salt Canyon Creek

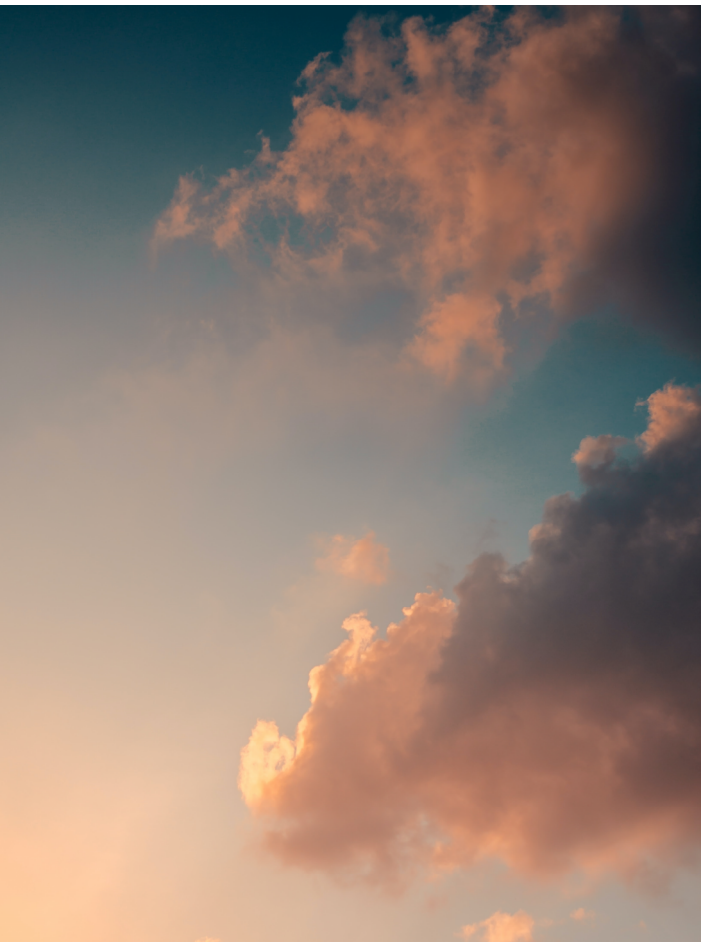
**Local Government Environmental Services in Southern California.** Oversaw and managed jurisdictional and wetland delineation work and habitat assessment work for biological resource assistance regarding municipal and county projects throughout southern California. Activities have included data collection for conducting wetland and jurisdictional delineations, jurisdictional delineation and habitat assessment reporting, and permit generation for RWQCB, USACE, and CDFW compliance.

*Notable Local Government Delineation Projects:*

- Bell Canyon Creek for City of Los Angeles Recreation and Parks Department,
- Bronson Canyon Playground in Griffith Park for City of Los Angeles Recreation and Parks Department,
- Almond Street Road extension in Rancho Cucamonga, and
- City of Oxnard at the Oxnard Fire Station.







# 901 MISSION AVENUE

*PRELIMINARY STORM WATER QUALITY MANAGEMENT PLAN (SWQMP)*

*PREPARED FOR:*
*JPI COMPANY*
*11988 EL CAMINO REAL, SUITE 200*
*SAN DIEGO, CA 92130*


PROJECT MANAGER
JULIAN BLEVINS


DATE PREPARED: AUGUST 2024

PROJECT NUMBER: 557-017


**FUSCOE ENGINEERING, INC.**
6390 GREENWICH DR. STE: 170
SAN DIEGO, CA 92122

**fuscoe.com**

(RD24-00002)

CITY OF OCEANSIDE
ENGINEERING DIVISION

**PRIORITY DEVELOPMENT PROJECT**

**STORM WATER QUALITY MANAGEMENT PLAN**

**FOR**

# 901 Mission Ave

ENGINEER OF WORK

Wet Signature, Wet Date, Stamp

**PREPARED FOR:**


## JPI COMPANY

**11988 El Camino Real Suite 200,**

**San Diego, CA 92130**

**(314) 302-2469**


**PREPARED BY:**


## FUSCOE ENGINEERING, INC.

**6390 Greenwich Dr #170**

**San Diego, CA 92122**

**858.554.4500**

## How to Use This Template

This template, assembled by GHD Inc. on behalf of the City of Oceanside, is for the development of Storm Water Quality Management Plans (SWQMPs) for Priority Development Projects (PDPs) proposed within Oceanside, CA. It is based on requirements set forth in the Regional Water Quality Control Board's National Pollutant Discharge Elimination System MS4 Permit that covers the San Diego Region (Order No. R9-2013-0001).

All references within the template refer to the City of Oceanside BMP Design Manual dated February 2016 (Manual). Use of this template in conjunction with the Manual is intended to help a project applicant develop a SWQMP compliant with City of Oceanside and MS4 Permit requirements.

**Template Date:** February 16, 2016

**Assembled By:**

**Quick Reference Guide**

| Item | Project Information |
|---|---|
| Project Name | 901 Mission Ave |
| Application Number(s) | RD24-00002 |
| Project Address | 901 Mission Ave, Oceanside, CA 92054 |
| Total Parcel Area | 65,910 sq. ft. |
| Project Description | The project consists of redevelopment of an approximately 1.5ac site in downtown Oceanside. The site was previously developed but site improvements were demoed approximately 20-years ago and the site has been vacant ever since. The vacant lot is bisected by a paved alley way that connects Horne St to Clementine St. Existing site improvements include a 2-3' masonry retaining wall along the property line on Mission Ave, Clementine St, and Seagaze Dr, and various public utilities located in the alley including water, sewer, gas and underground/overhead electrical. . Proposed improvements include demolition of existing improvements, re-route of the alley way utilities around the site, and construction of a multi-story, multi-use podium style building. The proposed building will contain retail space at ground level, residential units at and above grade, and underground parking. The proposed building will cover almost the entire property.<br><br>Offsite improvements consist of removal and replacement of curb & gutter, sidewalks and driveways along portions of the project frontage. |
| Proposed Disturbed Area | 65,910 sq. ft. |
| Created or Replaced Impervious | 53,960 sq. ft. |
| Project Hydrologic Unit Watershed | ☐ Santa Maria<br>☒ San Luis Rey<br>☐ Carlsbad |
| Required to implement HMP | ☐ Yes<br>☒ No |

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**CERTIFICATION PAGE**

**Project Name:** 901 Mission Ave
**Permit Application Number:** RD24-00002

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the requirements of the City of Oceanside BMP Design Manual, which is based on the requirements of San Diego Regional Water Quality Control Board Order No. R9-2013-0001 (MS4 Permit).

I have read and understand that the City has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. I certify that this SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable source control and site design BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this SWQMP by City staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

As Engineer of Work, I agree to indemnify, defend, and hold harmless the City of Oceanside, its officers, agents, and employees from any and all liability, claims, damages, or injuries to any person or property which might arise from the negligent acts, errors, or omissions of the Engineer of Work, my employees, agents or consultants.



RCE 75822 Exp. 6-30-2024

Engineer of Work's Signature

Eric Armstrong PE, RCE 36083

Engineer of Work

Fuscoe Engineering, Inc.

Company

10/25/2024

Date

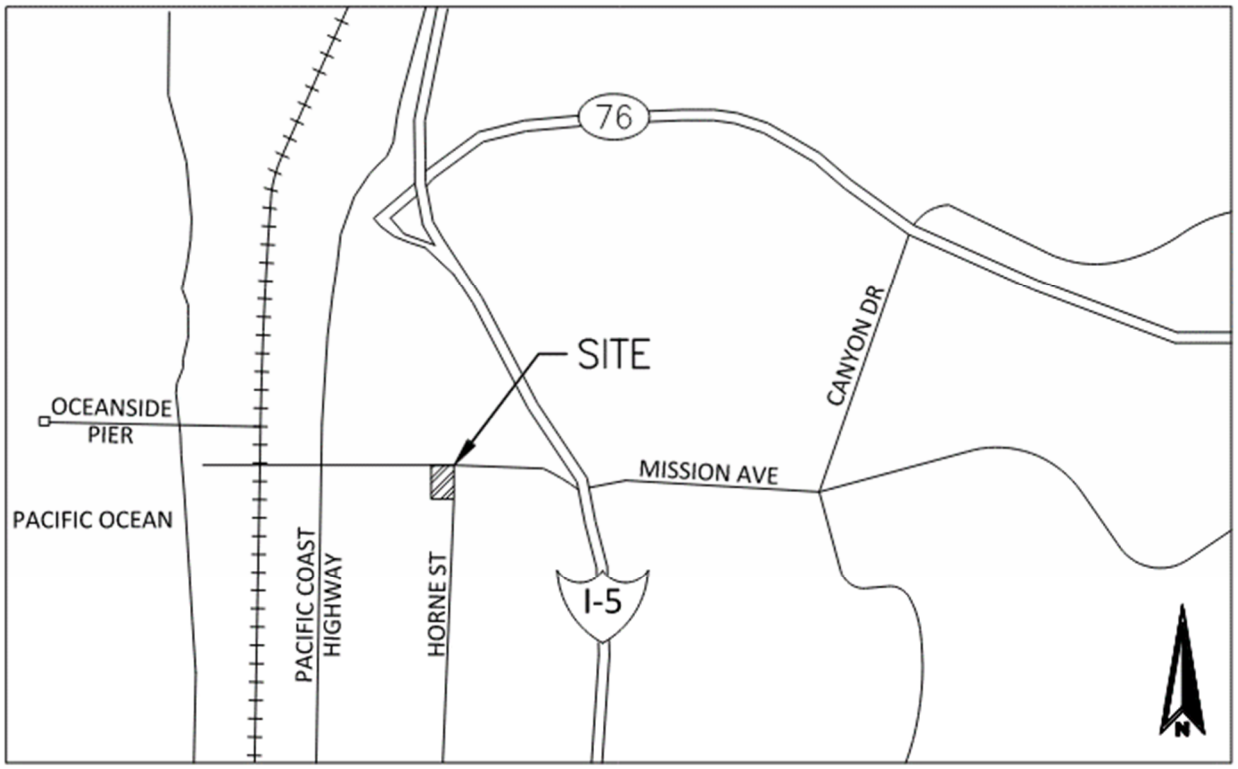
Engineer's Seal:



## SUBMITTAL RECORD

Use this Table to keep a record of submittals of this SWQMP. Each time the SWQMP is re-submitted, provide the date and status of the project. In last column indicate changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

| Submittal Number | Date | Project Status | Changes |
|---|---|---|---|
| 1 | 5/17/2024 | ☒ Preliminary Design/ Planning/ CEQA<br>☐ Final Design | Initial Submittal |
| 2 | 8/17/2024 | ☒ Preliminary Design/ Planning/ CEQA<br>☐ Final Design | 2nd Submittal |
| 3 | 10/31/2024 | ☒ Preliminary Design/ Planning/ CEQA<br>☐ Final Design | 3rd Submittal |
| 4 | [MM/DD/YY] | ☐ Preliminary Design/ Planning/ CEQA<br>☐ Final Design | Click here to enter text. |




VICINITY MAP

NTS

| Applicability of Permanent, Post-Construction Storm Water BMP Requirements<br>(Storm Water Intake Form for all Development Permit Applications) | Form I-1 |
|---|---|

**Project Identification**

| | |
|---|---|
| Project Name: 901 Mission Ave | |
| Permit Application Number: RD24-00002 | Date: 5/17/2024 |

**Determination of Requirements**

The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop".
Refer to the manual sections and/or separate forms referenced in each step below.

| Step | Answer | Progression |
|---|---|---|
| **Step 1:** Is the project a "development project"?<br>See Section 1.3 of the manual for guidance. | ☒Yes | Go to Step 2. |
| | ☐No | Stop.<br>Permanent BMP requirements do not apply. No SWQMP will be required.<br>Provide discussion below. |
| Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building): | | |
| **Step 2:** Is the project a Standard Project, PDP, or exception to PDP definitions?<br>To answer this item, see Section 1.4 of the manual *in its entirety* for guidance, AND complete Form I-2, Project Type Determination. | ☐Standard Project | Stop.<br>Standard Project requirements apply, including Standard Project SWQMP. |
| | ☒PDP | PDP requirements apply, including PDP SWQMP.<br>Go to Step 3. |
| | ☐ Exception to PDP definitions | Stop.<br>Standard Project requirements apply.<br>Provide discussion and list any additional requirements below. Prepare Standard Project SWQMP. |
| Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable: | | |

| Form I-1 Page 2 of 2 | | |
|---|---|---|
| **Step** | **Answer** | **Progression** |
| **Step 3.** Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the manual for guidance. | ☐Yes | Consult the [City Engineer] to determine requirements. Provide discussion and identify requirements below. Go to Step 4. |
| | ☒No | BMP Design Manual PDP requirements apply.Go to Step 4. |
| Discussion / justification of prior lawful approval, and identify requirements (*not required if prior lawful approval does not apply*): | | |
| **Step 4.** Do hydromodification control requirements apply? See Section 1.6 of the manual for guidance. | ☐Yes | PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to Step 5. |
| | ☒No | Stop. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below. |
| Discussion / justification if hydromodification control requirements do not apply:<br>Stormwater from the site is conveyed via concrete conveyance channels (curb and gutter) and underground storm drains discharging directly to the Pacific Ocean.<br>Storm water runoff from the site collects in the curb-and-gutter along Clementine St and travels northwest to confluence with flows on Mission Ave. Flow travels down the curb-and-gutter in Mission Ave and through a series of flow-through planters until entering the public storm drain system via a curb inlet just before the intersection with Coast Highway. The public storm drain discharges directly into the Pacific Ocean at Surfrider Way and The Strand N.<br>The existing public storm drain system that conveys the site's flow to the Pacific Ocean is deemed inadequate for the 10, 25 & 100-year storm event according to, "The City of Oceanside Master Plan of Drainage, Update 2013," prepared by Torrey Walker Engineering, Inc. (TWE). Per conversation with TWE, this storm drain system is part of the Cleveland St Storm Drain upgrades, but they have not been constructed yet. The project will not result in increased 100-yr peak flow rates in the proposed condition after mitigation of the 100-year runoff. An underground detention vault located in the basement level parking garage is proposed to mitigate proposed flows from the site and attenuate the 100yr storm event. A pump is proposed to drain the detention vault through a sidewalk underdrain to the curb and gutter along Clementine St.<br>If the upgrades to the downstream public storm drain system that are required to adequately convey stormwater runoff from the site have been completed by the project's proposed construction date then the need for the detention system will be reconsidered and it can be removed with city approval. | | |
| **Step 5.** Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual for guidance. | ☐Yes | Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). Stop. |
| | ☐No | Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop. |
| Discussion / justification if protection of critical coarse sediment yield areas does not apply:<br>Step 5 is N/A per above (No HMP, No PCCSYAs) | | |

| Project Type Determination Checklist | | | Form I-2 |
|---|---|---|---|
| **Project Information** | | | |
| Project Name: 901 Mission Ave | | | |
| Permit Application Number: RD24-00002 | | | |
| **Project Type Determination: Standard Project or PDP** | | | |
| The project is (select one): New Development X Redevelopment | | | |
| The total proposed newly created or replaced impervious area is: 65,910 ft² (1.5 acres) | | | |
| Is the project in any of the following categories,H (a) through (f)? | | | |
| Yes ☐ | No ☒ | (a) | New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. |
| Yes ☒ | No ☐ | (b) | Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. |
| Yes ☒ | No ☐ | (c) | New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:<br><br>(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption SIC code 5812).<br><br>(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.<br><br>(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.<br><br>(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles. |

| Form I-2 Page 2 of 2 | | | |
|---|---|---|---|
| Yes<br>☐ | No<br>☒ | (d) | New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).<br>Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See manual Section 1.4.2 for additional guidance. |
| Yes<br>☐ | No<br>☒ | (e) | New development projects that support one or more of the following uses:<br>(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.<br>(ii) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day. |
| Yes<br>☒ | No<br>☐ | (f) | New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.<br>*Note: See manual Section 1.4.2 for additional guidance.* |

Does the project meet the definition of one or more of the PDP categories (a) through (f) listed above?

☐ No – the project is not a PDP (Standard Project).

☒ Yes – the project is a PDP.

The following is for redevelopment PDPs only:

The area of existing (pre-project) impervious area at the project site is: 54,710 ft² (A)
The total proposed newly created or replaced impervious area is: 65,910 ft² (B)
Percent impervious surface created or replaced (A/B)*100: 83%
The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – only new impervious areas are considered PDP

OR

☒ greater than fifty percent (50%) – the entire project site is a PDP

| Site Information Checklist For PDPs | Form I-3B (PDPs) |
|---|---|
| **Project Summary Information** | |
| Project Name | 901 Mission Ave |
| Project Address | 901 Mission Ave, Oceanside, CA 92054 |
| Assessor's Parcel Number(s) | 147-196-10 |
| Permit Application Number | RD24-00002 |
| Project Watershed (Hydrologic Unit) | Select One:<br>☐Santa Margarita 902<br>☒San Luis Rey 903<br>☐Carlsbad 904 |
| Parcel Area<br>(total area of Assessor's Parcel(s) associated with the project) | 1.47 Acres (64,150 Square Feet) |
| Area to be disturbed by the project<br>(Project Area) | 1.85 Acres (80,907 Square Feet) |
| Project Proposed Impervious Area<br>(subset of Project Area) | 1.52 Acres (66,235 Square Feet) |
| Project Proposed Pervious Area<br>(subset of Project Area) | 0.33 Acres (14,340 Square Feet) |
| Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area. | |

| Hydrologic Unit | Hydrologic Area | Hydrologic Sub-Area |
|---|---|---|
| Santa Margarita 902.00 | ☐ Ysidora 902.10 | ☐ Lower Ysidora 902.11 |
| San Luis Rey 903.00 | ☒ Lower San Luis 903.10 | ☒ Mission 903.11 |
| | | ☐ Bonsall 903.12 |
| Carlsbad 904.00 | ☐ Loma Alta 904.10 | Not Applicable |
| | ☐ Buena Vista Creek 904.20 | ☐ El Salto 904.21 |
| | | ☐ Vista 904.22 |
| | ☐ Agua Hedionda 4.30 | ☐ Los Monos 904.31 |

**Description of Existing Site Condition and Drainage Patterns**

Current Status of the Site (select all that apply):

☐Existing development

☒Previously graded but not built out

☐Agricultural or other non-impervious use

☐Vacant, undeveloped/natural

Description / Additional Information:
Vacant and bisected by a paved alley way. The site has been vacant for roughly 20-years. Previous development had existed on the site but has been demolished, based on historic aerial photography improvements consisted of multiple buildings and a paved parking lot.

Existing Land Cover Includes (select all that apply):

☒Vegetative Cover

☐Non-Vegetated Pervious Areas

☒Impervious Areas

Description / Additional Information:
Mostly vacant lot bisected by a paved alley way. Vegetation includes weeds, grasses and small shrubs.

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):

☒NRCS Type A

☐NRCS Type B

☐NRCS Type C

☐NRCS Type D

Approximate Depth to Groundwater:

☐Groundwater Depth < 5 feet

☐5 feet < Groundwater Depth < 10 feet

☐10 feet < Groundwater Depth < 20 feet

☒Groundwater Depth > 20 feet

Description of Existing Site Topography and Drainage [How is storm water runoff conveyed from the site? At a minimum, this description should answer (1) whether existing drainage conveyance is natural or urban; (2) describe existing constructed storm water conveyance systems, if applicable; and (3) is runoff from offsite conveyed through the site? If so, describe]:

Existing drainage is urban. The site drains from east to west via sheet flow. All site runoff confluences in the public right-of-way in the curb-and-gutter along the north side of Clementine St – there are no underground storm drains in the immediate site vicinity. Flow travels via curb and gutter from Clementine St northwest to Mission Ave, then southwest along Mission Ave and through a series of green street planters and finally into a curb inlet at the south side of Mission Ave just before its intersection with PCH. Flows from the curb inlet enter the underground storm drain system and are conveyed northwest to Surfrider Way and The Strand N discharging directly into the Pacific Ocean. No offsite runoff is conveyed through the site.

The existing public storm drain system that conveys the site's flow to the Pacific Ocean is deemed inadequate for the 10, 25 & 100-year storm event according to, "The City of Oceanside Master Plan of Drainage, Update 2013," prepared by Torrey Walker Engineering, Inc. (TWE). Per conversation with TWE, this storm drain system is part of the Cleveland St Storm Drain upgrades, but they have not been constructed yet. The project will not result in increased 100-yr peak flow rates in the proposed condition after mitigation of the 100-year runoff. An underground detention vault located in the basement level parking garage is proposed to mitigate proposed flows from the site and attenuate the 100yr storm event. A pump is proposed to drain the detention vault through a sidewalk underdrain to the curb and gutter along Clementine St.

If the upgrades to the downstream public storm drain system that are required to adequately convey stormwater runoff from the site have been completed by the project's proposed construction date then the need for the detention system will be reconsidered and it can be removed with city approval.

Mission Ave contains green street BMP planters along its frontages from Clementine St to Coast Highway. In the existing condition, the green street BMPs treat runoff tributary to Mission Ave, including onsite and offsite runoff from the project site and its frontages. Runoff from the project site eventually travels down the southern side of Mission Ave and enters the green street planters. Flows that exceed the capacity of the planters overflow back into the curb and gutter along Mission Ave and travel to the curb inlet at Coast Highway. The proposed project will treat all onsite runoff; proposed improvements to the project's frontage includes removal and replacement of curb, gutter, sidewalk and landscape resulting in a net decrease of impervious area along the frontage in the public right of way. No adverse impacts to the existing green street planters along Mission Ave are anticipated.

**Description of Proposed Site Development and Drainage Patterns**

Project Description / Proposed Land Use and/or Activities:
Podium style building, 7 residential stories over retail space with at grade and underground parking.
Offsite improvements consist of removal and replacement of curb & gutter, sidewalks and driveways along portions of the project frontage.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
Roof, common area hardscape, amenity decks on levels 3 including pool/spa and hardscape.

List/describe proposed pervious features of the project (e.g., landscape areas):
Scattered landscaping planters and pots on level 3 courtyard, landscape planters and trees along building perimeter at ground level.

Does the project include grading and changes to site topography?
☒Yes
☐No
Description / Additional Information:
Podium style building with underground parking. Temporary shoring required. Basement retaining walls required for underground parking.

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?
☐Yes
☒No
Description / Additional Information:

The site intends to mimic existing drainage patterns to the maximum extent possible. Runoff from the roof and level 3 courtyard will be directed to dispersion area planters and area drains and be piped to an underground detention vault located in the underground parking structure. Runoff from most of the ground level impervious areas is also directed to the detention vault. The detentions vault (HMP 1) mitigates proposed flows from the site and attenuates the 100yr storm event. From the detention vault flows pass through a flood control structure containing a high-flow diversion weir. Flows requiring treatment will continue to a modular wetland system and then to a pump. Excess flows not requiring treatment get diverted straight to the pump. The pump drains flow from the detention vault & MWS through a sidewalk underdrain to the curb and gutter along Clementine St. The flow rate of the pump will be set such that the site's existing 100-yr peak discharge is not exceeded.

Runoff from ground level areas that is not captured and directed to the system described above will be treated by the existing green street planters along Mission Ave (as is the case in existing conditions). Flows will travel via cub and gutter and confluence with flows at the corner of Mission Ave and Clementine St and continue down Mission Ave, through the series of green street planters, into the public storm drain system and discharge into the Pacific Ocean as previously described. The existing public storm drain system that conveys the site's flow to the Pacific Ocean is deemed inadequate for the 10, 25 & 100-year storm event according to, "The City of Oceanside Master Plan of Drainage, Update 2013," prepared by Torrey Walker Engineering, Inc. (TWE). Per conversation with TWE, this storm drain system is part of the Cleveland St storm drain upgrades but they have not yet been constructed. If the upgrades to the downstream public storm drain system that are required to adequately convey stormwater runoff from the site are completed by the project's proposed construction date then the need for the detention system will be reconsidered and it can be removed with city approval.

**Form I-3B Page 5 of 10**

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):

☒Onsite storm drain inlets

☒Interior floor drains and elevator shaft sump pumps

☒Interior parking garages

☒Need for future indoor & structural pest control

☒Landscape/outdoor pesticide use

☒Pools, spas, ponds, decorative fountains, and other water features

☒Food service

☒Refuse areas

☐Industrial processes

☐Outdoor storage of equipment or materials

☐Vehicle and equipment cleaning

☐Vehicle/equipment repair and maintenance

☐Fuel dispensing areas

☐Loading docks

☐Fire sprinkler test water

☒Miscellaneous drain or wash water

☒Plazas, sidewalks, and parking lots

| Form I-3B Page 6 of 10 | | |
|---|---|---|
| **Identification of Receiving Water Pollutants of Concern** | | |
| Describe path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):<br>The site drains from east to west via sheet flow. All site runoff confluences in the public right-of-way in the curb and gutter along Clementine St – there are no underground storm drains in the immediate site vicinity. Flow travels via curb-and-gutter from Clementine St northwest to Mission Ave, then southwest along Mission Ave and through a series of flow-thru planters to a curb inlet just before the intersection of Mission Ave and PCH. From the curb inlet flows enter the public underground storm drain system. The storm drain conveys flows northwest to Surfrider Way and The Strand N discharging directly into the Pacific Ocean. No offsite runoff is conveyed through the site | | |
| List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs for the impaired water bodies: | | |
| **303(d) Impaired Water Body** | **Pollutant(s)/Stressor(s)** | **TMDLs** |
| Pacific Ocean Shoreline @ Surfrider Way | | Status: Active<br>Indicator Bacteria |
| | | |
| | | |
| | | |

| Form I-3B Page 7 of 10 | | | |
|---|---|---|---|
| **Identification of Project Site Pollutants*** <br> ***Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated)** | | | |
| Identify pollutants expected from the project site based on all proposed use(s) of the site (see manual Appendix B.6): <br> This table is not applicable per instructions in header (no flow through BMPs proposed). | | | |
| **Pollutant** | **Not Applicable to the Project Site** | **Expected from the Project Site** | **Also a Receiving Water Pollutant of Concern** |
| Sediment | | | |
| Nutrients | | | |
| Heavy Metals | | | |
| Organic Compounds | | | |
| Trash & Debris | | | |
| Oxygen Demanding Substances | | | |
| Oil & Grease | | | |
| Bacteria & Viruses | | | |
| Pesticides | | | |

**<u>Note:</u> Indicator Bacteria shall be addressed as a Pollutant of Concern (POC) for projects located in the Lower San Luis Hydrologic Area <u>and</u> for projects that discharge to the Pacific Ocean Shoreline within the boundaries of the City of Oceanside.**

**<u>Note:</u> Nutrients shall be addressed as a Pollutant of Concern (POC) for projects located in the Loma Alta Hydrologic Area.**

| Form I-3B Page 8 of 10 |
|---|
| **Hydromodification Management Requirements** |
| Do hydromodification management requirements apply (see Section 1.6 of the manual)?<br>☐Yes, hydromodification management flow control structural BMPs required.<br>☒No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.<br>☐No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.<br>☐No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.<br><br>Description / Additional Information (to be provided if a 'No' answer has been selected above):<br>The existing public storm drain system that conveys the site's flow to the Pacific Ocean is deemed inadequate for the 10, 25 & 100-year storm event according to, "The City of Oceanside Master Plan of Drainage, Update 2013," prepared by Torrey Walker Engineering, Inc. (TWE). Per conversation with TWE, this storm drain system is part of the Cleveland St Storm Drain upgrades but they have not yet been constructed. If the upgrades to the downstream public storm drain system that are required to adequately convey stormwater runoff from the site have been completed by the project's proposed construction date then the need for the detention system will be reconsidered and it can be removed with city approval. |
| **Critical Coarse Sediment Yield Areas*<br>*This Section only required if hydromodification management requirements apply** |
| Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?<br>☐Yes<br>☐No, no critical coarse sediment yield areas to be protected based on WMAA maps<br><br>If yes, have any of the optional analyses presented in Section 6.2 of the manual been performed?<br>☐6.2.1 Verification of GLUs Onsite<br>☐6.2.2 Downstream Systems Sensitivity to Coarse Sediment<br>☐6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite<br>☐No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps<br><br>If optional analyses were performed, what is the final result?<br>☐No critical coarse sediment yield areas to be protected based on verification of GLUs onsite.<br>☐Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 8 of the SWQMP.<br>☐Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.<br><br>Discussion / Additional Information:<br>NA |

**Flow Control for Post-Project Runoff***

***This Section only required if hydromodification management requirements apply**

List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.

NA

Has a geomorphic assessment been performed for the receiving channel(s)?

☐No, the low flow threshold is 0.1Q2 (default low flow threshold)

☐Yes, the result is the low flow threshold is 0.1Q2

☐Yes, the result is the low flow threshold is 0.3Q2

☐Yes, the result is the low flow threshold is 0.5Q2

If a geomorphic assessment has been performed, provide title, date, and preparer:

NA

Discussion / Additional Information: (optional)

NA

**Other Site Requirements and Constraints**

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

The existing public storm drain system that conveys the site's flow to the Pacific Ocean is deemed inadequate for the 10, 25 & 100-year storm event according to, "The City of Oceanside Master Plan of Drainage, Update 2013," prepared by Torrey Walker Engineering, Inc. (TWE). Per conversation with TWE, this storm drain system is part of the Cleveland St Storm Drain upgrades but they have not yet been constructed. An increase in runoff from the sites existing condition would further impact the storm drain system, therefore detention is required to attenuate runoff generated from large storm events. Un underground detention vault is proposed in the basement level parking garage along with a pump. The pump will drain the detention vault through a sidewalk underdrain to the curb and gutter along Clementine street.

If the upgrades to the downstream public storm drain system that are required to adequately convey stormwater runoff from the site have not been completed by the project's proposed construction date then the need for the detention system will be reconsidered and it can be removed with city approval.

Mission Ave contains green street BMP planters along its frontages from Clementine St to Coast Highway. In the existing condition, the green street BMPs treat runoff tributary to Mission Ave, including onsite and offsite runoff from the project site and its frontages. Runoff from the project site eventually travels down the southern side of Mission Ave and enters the green street planters. Flows that exceed the capacity of the planters overflow back into the curb and gutter along Mission Ave and travel to the curb inlet at Coast Highway. The proposed project will treat all onsite runoff; proposed improvements to the project's frontage includes removal and replacement of curb, gutter, sidewalk and landscape resulting in a net decrease of impervious area along the frontage in the public right of way. No adverse impacts to the existing green street planters along Mission Ave are anticipated.

**Optional Additional Information or Continuation of Previous Sections As Needed**

This space provided for additional information or continuation of information from previous sections as needed.

| Source Control BMP Checklist for All Development Projects (Standard Projects and PDPs) | Form I-4 |
|---|---|

**Project Identification**

Project Name: 901 Mission Ave

Permit Application Number: RD24-00002

**Source Control BMPs**

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

| Source Control Requirement | Implemented? | | |
|---|---|---|---|
| **SC-1** Prevention of Illicit Discharges into the MS4 | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SC-1 not implemented:<br><br>This may involve a suite of housekeeping BMPs which could include effective irrigation, dispersion of non-storm water discharges into landscaping for infiltration, and controlling wash water from vehicle washing. | | | |
| **SC-2** Storm Drain Stenciling or Signage | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SC-2 not implemented:<br><br>Stamping or placards shall be provided for all storm water conveyance system inlets and catch basins within the project area | | | |
| **SC-3** Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | ☐ Yes | ☐ No | ☒ N/A |
| Discussion / justification if SC-3 not implemented:<br><br>No Outdoor material storage planned for the project. | | | |

| Form I-4 Page 2 of 3 | | | |
|---|---|---|---|
| **Source Control Requirement** | **Implemented?** | | |
| **SC-4** Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | ☐ Yes | ☐ No | ☒ N/A |
| Discussion / justification if SC-4 not implemented:<br><br>No outdoor work areas planned for this project. | | | |
| **SC-5** Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SC-5 not implemented:<br><br>Trash container areas will be designed so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. Trash container areas will be screened or walled to prevent offsite transport of trash. Trash enclosures will be provide with roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers. | | | |

| Form I-4 Page 3 of 3 | | | |
|---|---|---|---|
| **SC-6** Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below) | **Implemented?** | | |
| Onsite storm drain inlets | ☒ Yes | ☐ No | ☐ N/A |
| Interior floor drains and elevator shaft sump pumps | ☒ Yes | ☐ No | ☐ N/A |
| Interior parking garages | ☒ Yes | ☐ No | ☐ N/A |
| Need for future indoor & structural pest control | ☒ Yes | ☐ No | ☐ N/A |
| Landscape/outdoor pesticide use | ☒ Yes | ☐ No | ☐ N/A |
| Pools, spas, ponds, decorative fountains, and other water features | ☒ Yes | ☐ No | ☐ N/A |
| Food service | ☒ Yes | ☐ No | ☐ N/A |
| Refuse area | ☒ Yes | ☐ No | ☐ N/A |
| Industrial processes | ☐ Yes | ☐ No | ☒ N/A |
| Outdoor storage of equipment or materials | ☐ Yes | ☐ No | ☒ N/A |
| Vehicle and equipment cleaning | ☐ Yes | ☐ No | ☒ N/A |
| Vehicle/equipment repair and maintenance | ☐ Yes | ☐ No | ☒ N/A |
| Fuel dispensing areas | ☐ Yes | ☐ No | ☒ N/A |
| Loading docks | ☐ Yes | ☐ No | ☒ N/A |
| Fire sprinkler test water | ☐ Yes | ☐ No | ☒ N/A |
| Miscellaneous drain or wash water | ☒ Yes | ☐ No | ☐ N/A |
| Plazas, sidewalks, and parking lots | ☒ Yes | ☐ No | ☐ N/A |

Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.

SC-6 implemented for all applicable Potential Sources of Runoff Pollutants.

| Site Design BMP Checklist for All Development Projects (Standard Projects and PDPs) | Form I-5 |
|---|---|

**Project Identification**

Project Name: 901 Mission Ave

Permit Application Number: RD24-00002

**Site Design BMPs**

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

| Site Design Requirement | Applied? | | |
|---|---|---|---|
| **SD-1** Maintain Natural Drainage Pathways and Hydrologic Features | ☐ Yes | ☐ No | ☒ N/A |
| Discussion / justification if SD-1 not implemented:<br><br>No natural drainage pathways or hydrologic features exist. | | | |
| **SD-2** Conserve Natural Areas, Soils, and Vegetation | ☐ Yes | ☐ No | ☒ N/A |
| Discussion / justification if SD-2 not implemented:<br><br>Redevelopment project. Existing development does not contain natural areas, CCSYAs, and vegetation. Trees planted in the adjacent R/W are not natural some will be protected in place, some will be removed, see demolition and landscape plan. | | | |
| **SD-3** Minimize Impervious Area | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-3 not implemented:<br><br>Project includes minimizing impervious areas by provided ground level and level 3 courtyard landscaping, proposed sidewalks constructed to minimum widths, and a high floor area ratio by design of a compact and tall structure with underground parking. | | | |
| **SD-4** Minimize Soil Compaction | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-4 not implemented:<br><br>Implemented by avoiding disturbance in planned landscaped areas where feasible during construction. In areas planned for landscaping where compaction can not be avoided, re-tilling the soil surface and amending the soils to allow for better infiltration capacity is proposed. | | | |

| Form I-5 Page 2 of 2 | | | |
|---|---|---|---|
| **Site Design Requirement** | **Applied?** | | |
| **SD-5** Impervious Area Dispersion | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-5 not implemented:<br><br>Impervious area dispersion is proposed on the level 3 courtyard to treat and retain portions of the roof, they are also proposed at ground level to treat/retain portions of hardscape. | | | |
| **SD-6** Runoff Collection | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-6 not implemented:<br><br>The use of small collection strategies located as close as possible to the sources of pollution are proposed to minimize transport of runoff and pollutants to the receiving waters (storage and treatment proposed directly below the structure). Additionally, portions of runoff from the roof and level 3 courtyard are routed directly to planters on level 3 for treatment and retention and ground level runoff is routed to adjacent landscape areas and tree wells. | | | |
| **SD-7** Landscaping with Native or Drought Tolerant Species | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-7 not implemented:<br><br>Native/drought tolerant species will be used in landscape area, see landscape architect plans. | | | |
| **SD-8** Harvesting and Using Precipitation | ☐ Yes | ☒ No | ☐ N/A |
| Discussion / justification if SD-8 not implemented:<br><br>Per attachment 1C the habitable structure is not greater than 9 stories and therefore Harvest & Use is deemed infeasible. | | | |

| Summary of PDP Structural BMPs | Form I-6 (PDPs) |
|---|---|
| **Project Identification** | |
| Project Name: 901 Mission Ave | |
| Permit Application Number: RD24-00002 | |
| **PDP Structural BMPs** | |
| All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).<br><br>PDP structural BMPs must be verified by the local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative to certify construction of the structural BMPs (see Section 1.12 of the manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 7 of the manual).<br><br>Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP). | |
| Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.<br><br>As outlined below, the steps in Section 5.1 of the City of Oceanside BMP Design Manual were followed to aid in the selection of the proposed BMPS.<br><br>The site is exempt from hydromodification requirements because runoff from the site is conveyed via curb & gutter and pipe flow to its discharge point into the Pacific Ocean. Detention is required to attenuate the 100yr storm and mitigate proposed runoff to not increase runoff from the site in its existing condition.<br><br>The Geotechnical Engineer has classified the site as a No Infiltration Condition due to fill soils onsite, see the Infiltration Letter included in Attachment 1e. Infiltration BMPs are considered infeasible due to Hydraulic Soil Type D.<br><br>Harvest & Use for toilet demand was considered infeasible due to the habitable structure being less than 9 stories.<br><br>Rainfall depth of 0.59" was determined using Figure B.1-1: 85th Percentile 24-Hour Isopluvial Map.<br>(Continued on next page) | |

(Continued from pervious page)

Tributary areas were determined and plotted on the DMA exhibit included in this report as Attachment 1A. The main separation is the proposed building's roof and level 3 courtyard and the ground level areas. Further description of the DMAs is included below.

Runoff factors were determined for the tributary areas using Table B.1-1. Amended soils and landscape areas were assigned a runoff factor of 0.10 while roof and hardscape areas were assigned a runoff factor of 0.90.

DCV and retention requirements were determined using County of San Diego Worksheet B, included as Attachment 1C of this report. It was determined that roughly 50 cf of volume retention is required. Retention requirements will be met using impervious area dispersion over amended soils. 300 cf of retention is provided by draining portions of the roof to raised planters on the Level 3 courtyard.

DMA 1 includes the roof and level 3 courtyard. The impermeable area dispersion over amended soils is not sufficient for treating all of DMA 1's DCV so a Modular Wetland System (MWS) is proposed in the underground parking Level B2 Parking to treat the remaining DCV. Flow first travels to an underground detention vault (HMP-1) located in the underground parking Level B1 Parking. The detentions vault mitigates proposed flows from the site and attenuates the 100yr storm event. From the detention vault flows pass through a flood control structure containing a high-flow diversion weir. Flows requiring treatment will continue to a modular wetland system and then to a pump. Excess flows not requiring treatment get diverted straight to the pump. The pump drains the detention vault and the MWS through a sidewalk underdrain to the curb and gutter along Clementine St. The flow rate of the pump will be set such that the site's existing 100-yr peak discharge is not exceeded.

The MWS uses a flow-based design, County worksheet B.6-1 was used in determining the required treatment flow rate and is included as Attachment 1f of this report.

DMA 2 includes the ground level hardscape at the north corner of the site. Runoff is collected in area drains and piped to the underground parking level for detention and treatment as described in DMA 1.

DMA 3 includes ground level hardscape and landscape at the west corner of site. Runoff is collected in area drains and piped to the underground parking level for detention and treatment as described in DMA 1.

DMA 4 includes landscape along Clementine St and is considered self-mitigating.

DMA 5 includes landscape and incidental hardscape at the building's perimeter along Clementine St, Horne St and Seagaze Dr and is considered self-mitigating.

DMA 6 includes landscape and incidental hardscape at the building's perimeter along Horne St and is considered self-mitigating.

(Continued on next page)

(Continued from pervious page)

DMA 7 includes onsite De Minimis* areas along the project's frontage and offsite areas disturbed by the project including removal and replacement of curb and gutter, sidewalk, driveways and. DMA 9 is treated by the existing green street features along Mission Ave. As previously discussed, Mission Ave contains green street BMP planters along its frontages from Clementine St to Coast Highway. In the existing condition, the green street BMPs treat runoff tributary to Mission Ave, including onsite and offsite runoff from the project site and its frontages. Runoff from the project site eventually travels down the southern side of Mission Ave and enters the green street planters. Flows that exceed the capacity of the planters overflow back into the curb and gutter along Mission Ave and travel to the curb inlet at Coast Highway. The proposed project will treat all onsite runoff; proposed improvements to the project's frontage includes removal and replacement of curb, gutter, sidewalk and landscape resulting in a net decrease of impervious area along the frontage in the public right of way. No adverse impacts to the existing green street planters along Mission Ave are anticipated.

*Several De Minimis areas exist around the site's perimeter, and they include all the characteristics eligible for exclusions as outlined in Section 5.2.2 of the City BMP Design Manual. The De Minis areas were incorporated into DMA 7 as requested per the 2nd Entitlement Review Comments from Torrey Walker Engineering.

| Form I-6 Page 3 of 4 (Copy as many as needed) | |
|---|---|
| **Structural BMP Summary Information**<br>**(Copy this page as needed to provide information for each individual proposed structural BMP)** | |
| Structural BMP ID No. BMP-1 | |
| Construction Plan Sheet No. 4 | |
| Type of structural BMP:<br>☐Retention by harvest and use (HU-1)<br>☐Retention by infiltration basin (INF-1)<br>☐Retention by bioretention (INF-2)<br>☐Retention by permeable pavement (INF-3)<br>☐Partial retention by biofiltration with partial retention (PR-1)<br>☐Biofiltration (BF-1)<br>☐Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)<br>☐Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)<br>☐Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)<br>☐Detention pond or vault for hydromodification management<br>☒Other (describe in discussion section below)<br>Proprietary Biofiltration BF-3 | |
| Purpose:<br>☒Pollutant control only<br>☐Hydromodification control only<br>☐Combined pollutant control and hydromodification control<br>☐Pre-treatment/forebay for another structural BMP<br>☐Other (describe in discussion section below) | |
| Who will certify construction of this BMP?<br>Provide name and contact information for the party responsible to sign BMP verification forms if required by the [City Engineer] (See Section 1.12 of the manual) | Eric Armstrong PE<br>Fuscoe Engineering, Inc.<br>6390 Greenwich Dr, Suite 170<br>San Diego, CA 92117 |
| Who will be the final owner of this BMP? | JPI Company<br>12250 El Camino Ral, Suite 200<br>San Diego, CA 92108 |
| Who will maintain this BMP into perpetuity? | JPI Company |
| What is the funding mechanism for maintenance? | JPI Company |

| Form I-6 Page 4 of 4 (Copy as many needed) |
|---|
| **Structural BMP Summary Information**<br>**(Copy this page as needed to provide information for each individual proposed structural BMP)** |
| Discussion (as needed):<br><br>This is a high-flow proprietary biofiltration system designed to treat 1.5xDCV using a flow-based design. The MWS will treat the DCV from DMAs 1-6 as previously described. Roof drains and hardscape area drains will collect and convey runoff via pipe flow to the detention vault on underground parking Level B1 and from there to the MWS structure located on underground parking level B2.. Treated flows will flow to the proposed pump located adjacent to the MWS on Level B2. The pump will discharge through a sidewalk under drain to the curb and gutter along Clementine St.<br><br>(proposed Model No MWS-L-8-16.) |

| Form I-6 Page 3 of 4 (Copy as many as needed) | |
|---|---|
| **Structural BMP Summary Information**<br>**(Copy this page as needed to provide information for each individual proposed structural BMP)** | |
| Structural BMP ID No. HMP-1 | |
| Construction Plan Sheet No. 4 | |
| Type of structural BMP:<br>☐Retention by harvest and use (HU-1)<br>☐Retention by infiltration basin (INF-1)<br>☐Retention by bioretention (INF-2)<br>☐Retention by permeable pavement (INF-3)<br>☐Partial retention by biofiltration with partial retention (PR-1)<br>☐Biofiltration (BF-1)<br>☐Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)<br>☐Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)<br>☐Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)<br>☐Detention pond or vault for hydromodification management<br>☒Other (describe in discussion section below)<br>Detention vault for 100yr storm attenuation. | |
| Purpose:<br>☐Pollutant control only<br>☐Hydromodification control only<br>☐Combined pollutant control and hydromodification control<br>☐Pre-treatment/forebay for another structural BMP<br>☒Other (describe in discussion section below)<br>Detention vault for 100yr storm attenuation. | |
| Who will certify construction of this BMP?<br>Provide name and contact information for the party responsible to sign BMP verification forms if required by the [City Engineer] (See Section 1.12 of the manual) | Eric Armstrong PE<br>Fuscoe Engineering, Inc.<br>6390 Greenwich Dr, Suite 170<br>San Diego, CA 92117 |
| Who will be the final owner of this BMP? | JPI Company<br>12250 El Camino Ral, Suite 200<br>San Diego, CA 92108 |
| Who will maintain this BMP into perpetuity? | JPI Company |
| What is the funding mechanism for maintenance? | JPI Company |

| Form I-6 Page 4 of 4 (Copy as many needed) |
| --- |
| **Structural BMP Summary Information**<br>**(Copy this page as needed to provide information for each individual proposed structural BMP)** |
| Discussion (as needed):<br><br>This detention vault is proposed in the basement to attenuate the 100yr storm. Flow control will be provided by the pump rate of the pump proposed to drain the structure. |

| | | | |
|---|---|---|---|
| | City of Oceanside<br>300 N Coast Highway<br>Oceanside, CA 92054 | **Permanent BMP Construction**<br>**Self Certification Form** | February 2016 |

| | |
|---|---|
| Date Prepared: May 17, 2024 | Project No.: Click here to enter text. |
| Project Applicant: Click here to enter text. | Phone: Click here to enter text. |
| Project Address: Click here to enter text. | |
| Project Engineer: Click here to enter text. | Phone: Click here to enter text. |

The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Storm Water Quality Management Plan (SWQMP) documents and drawings.

This form must be completed by the engineer and installing contractor and submitted prior to final inspection of the construction permit. Completion and submittal of this form is required for all new development and redevelopment projects in order to comply with the City's Storm Water ordinances and NDPES Permit Order No. R9-2013-0001. Final inspection for occupancy and/or release of grading or public improvement bonds may be delayed if this form is not submitted and approved by the City of Oceanside.

**ENGINEER'S CERTIFICATION:**

As the professional in responsible charge for the design of the above project, I certify that I have inspected all constructed Low Impact Development (LID) site design, source control and treatment control BMP's required per the approved SWQMP and Construction Permit No. Click here to enter text.; and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and Order No. R9-2013-0001 of the San Diego Regional Water Quality Control Board.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

**Signature:** _____

**Date of Signature: _** Click here to enter text.___

**Printed Name: _** Click here to enter text._____

**Title: _** Click here to enter text._____

**Phone No. _** Click here to enter text. _____

Engineer's Stamp

**CONTRACTOR'S CERTIFICATION:**

As the professional in responsible charge for construction of the above project, I certify that all constructed Low Impact Development (LID) site design, source control and treatment control BMP's required per the approved SWQMP and Construction Permit No. Click here to enter text.; have been constructed in compliance with the approved plans and all applicable specifications, permits, and ordinances.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

**Signature: _____**

**Date of Signature: _** Click here to enter text.___

**Printed Name: _** Click here to enter text._____

**Title: _** Click here to enter text._____

**Phone No. _** Click here to enter text. _____

## ATTACHMENT 1

## BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

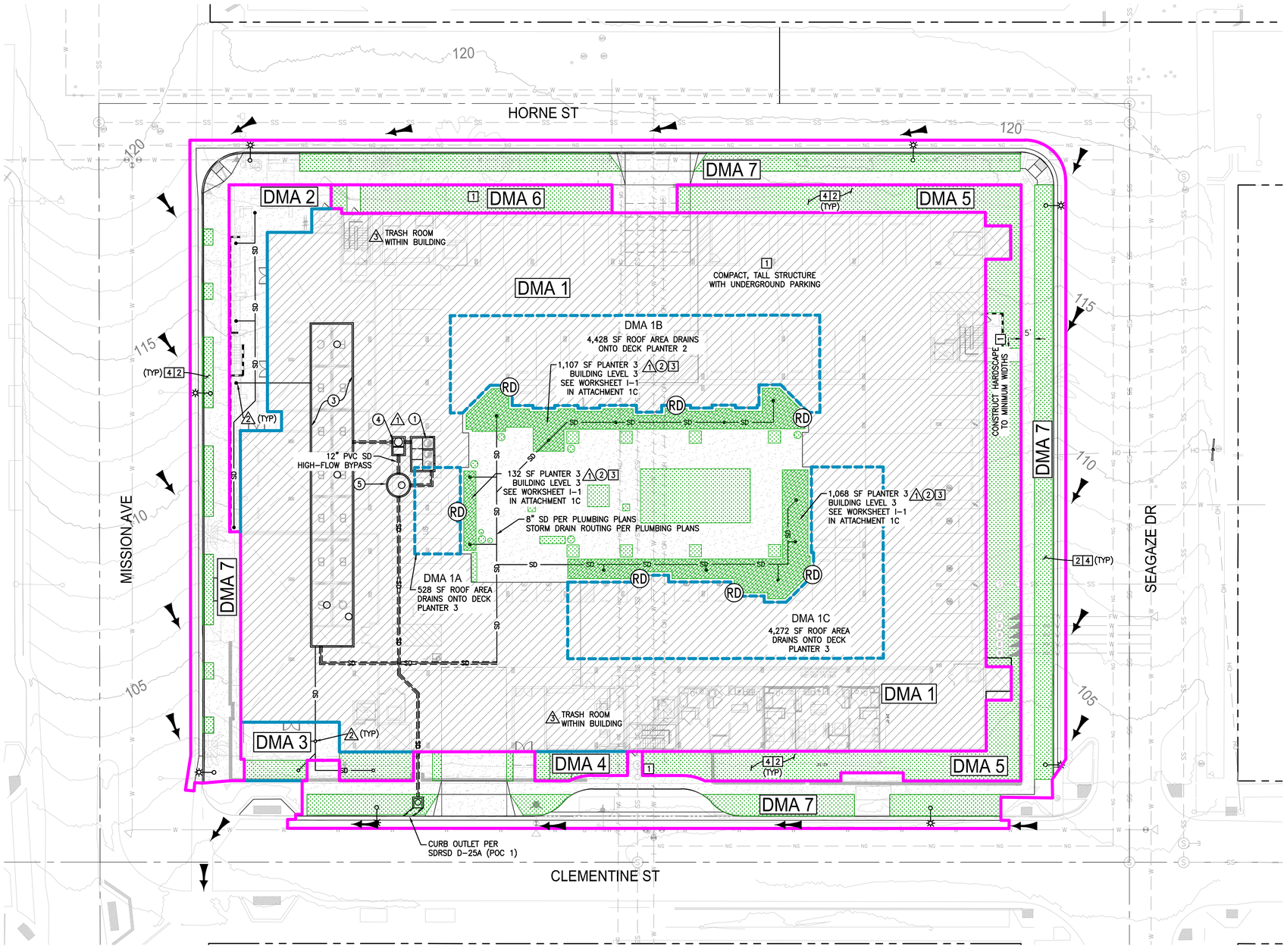
**Indicate which Items are Included:**

| Attachment Sequence | Contents | Checklist |
|---|---|---|
| Attachment 1a | DMA Exhibit (Required)<br><br>See DMA Exhibit Checklist. | ☒Included |
| Attachment 1b | Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)*<br>*Provide table in this Attachment OR on DMA Exhibit in Attachment 1a | ☒Included on DMA Exhibit in Attachment 1a<br>☒Included as Attachment 1b, separate from DMA Exhibit |
| Attachment 1c | Design Capture Volume Worksheet | ☒Included |
| Attachment 1d | Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs)<br>Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7. | ☐Included<br>☒Not included because the habitable structure is under 9 stories tall. |
| Attachment 1e | Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs)<br>Refer to Appendices C and D of the BMP Design Manual to complete Form I-8. | ☒Included<br>☐Not included because the entire project will use harvest and use BMPs |
| Attachment 1f | Pollutant Control BMP Design Worksheets / Calculations (Required)<br>Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines | ☒Included |

**Use this checklist to ensure the required information has been included on the DMA Exhibit:**

The DMA Exhibit must identify:

☒Underlying hydrologic soil group
☒Approximate depth to groundwater
☒Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☒Critical coarse sediment yield areas to be protected
☒Existing topography and impervious areas
☒Existing and proposed site drainage network and connections to drainage offsite
☒Proposed grading
☒Proposed impervious features
☒Proposed design features and surface treatments used to minimize imperviousness
☒Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☒Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
☒Structural BMPs (identify location, type of BMP, and size/detail)




20' 0' 10' 20' 40'

SCALE: 1" = 20'

## ATTCHMENT 1b - TABULAR SUMMARY OF ONSITE DMAs

| DMA | TOTAL AREA (AC) | TOTAL AREA (SF) | PERVIOUS AREA (SF) | IMPERVIOUS AREA - ROOFS, CONCRETE (SF) | % IMPERVIOUS | WATER QUALITY WEIGHTED AREA (SF) | WEIGHTED C FACTOR | INITIAL DCV (CF) | POLLUTANT CONTROL TREATMENT METHOD |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.96 | 41,963 | 1,160 | 40,803 | 97% | 45,375 | 0.85 | 2,231 | BMP 1 (MWS) |
| 1A | 0.02 | 660 | 132 | 528 | 80% | | | | BMP 1 (MWS) |
| 1B | 0.13 | 5,535 | 1,107 | 4,428 | 80% | | | | BMP 1 (MWS) |
| 1C | 0.12 | 5,340 | 1,068 | 4,272 | 80% | | | | BMP 1 (MWS) |
| 2 | 0.04 | 1,802 | 0 | 1,802 | 100% | 1,622 | 0.90 | 80 | BMP 1 (MWS) |
| 3 | 0.03 | 1,113 | 387 | 726 | 65% | 692 | 0.62 | 34 | BMP 1 (MWS) |
| 4 | 0.01 | 332 | 0 | 0 | 0% | 0 | 0.00 | 0 | SELF MITIGATING |
| 5 | 0.12 | 5,070 | 4,900 | 170 | 3% | 643 | 0.13 | 32 | SELF MITIGATING |
| 6 | 0.02 | 1,075 | 1,023 | 52 | 5% | 149 | 0.14 | 7 | SELF MITIGATING |
| TOTALS | 1.44 | 62,890 | 9,777 | 52,781 | 84% | 48,481 | 0.77 | 2,384 | |

## ATTCHMENT 1b - TABULAR SUMMARY OF OFFSITE DMAs

| DMA | TOTAL AREA (AC) | TOTAL AREA (SF) | PERVIOUS AREA (SF) | IMPERVIOUS AREA - ROOFS, CONCRETE (SF) | % IMPERVIOUS | WATER QUALITY WEIGHTED AREA (SF) | WEIGHTED C FACTOR | INITIAL DCV (CF) | POLLUTANT CONTROL TREATMENT METHOD |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 0.41 | 18,017 | 4,563 | 13,454 | 75% | 12,565 | 0.70 | 618 | Existing Green Street Features on Mission Ave |
| TOTALS | 0.41 | 18,017 | 4,563 | 13,454 | 75% | 12,565 | 0.70 | 618 | |

NOTE:
RUNOFF FORM ALL DRAINAGE MANAGEMENT AREAS ARE COLLECTED AND CONVEYED TO A POLLUTANT CONTROL BMP 1 (BF-3) LOCATED ON ABOVE GROUND PARKING LEVEL 2. FLOWS FROM THE BMP WILL BE DISCHARGED OUT VIA A PROPOSED CURB OUTLET ON CLEMENTINE ST AND ULTIMATELY CONFLUENCES WITH THE PUBLIC STORM DRAIN SYSTEM AT THE EXISTING CURB INLET AT THE CORNER OF MISSION AVE AND COAST HIGHWAY.

## LEGEND

- RIGHT-OF-WAY
- STREET CENTERLINE
- ONSITE DRAINAGE MANAGEMENT AREA (DMA) LIMITS
- OFFSITE DRAINAGE MANAGEMENT AREA (DMA) LIMITS
- 260 EXISTING CONTOUR
- PERVIOUS AREA
- LANDSCAPE PLANTER TO MEET VOLUME RETENTION REQUIREMENTS
- HARDSCAPE (IMPERMEABLE)
- ROOF (IMPERMEABLE)
- FLOW DIRECTION
- BIOFILTRATION UNIT, BF-3
- SD BUILDING DRAINAGE SYSTEM (SHOWN DIAGRAMMATICALLY)
- RD ROOF DRAIN DOWN SPOUT TO PLANTER

## PERMANENT STORM WATER BMP NOTES

1. POLLUTANT CONTROL BMP (BF-1, BIOFILTRATION UNIT)
   MODULAR WETLAND SYSTEM
   MODEL NO. MWS-L-8-16
   (AT LEVEL B2 – UNDERGROUND PARKING)
   TREATMENT FLOWRATE PROVIDED: 0.462 CFS
   SEE DETAIL ON DETAIL SHEET
2. IMPERVIOUS AREA DISPERSION BMPs (SD-B)
   SEE LANDSCAPE PLANTER DETAIL ON DETAIL SHEET
3. UNDERGROUND DETENTION VAULT (HMP 1)
   (AT LEVEL B1 – UNDERGROUND PARKING)
   VOLUME PROVIDED: 5,625 CF
   SEE DETAIL ON DETAIL SHEET
4. STORM DRAIN CLEANOUT W/ HIGH-FLOW BYPASS WEIR
   (AT LEVEL B2 – UNDERGROUND PARKING)
5. PUMP (AT LEVEL B2)
   SEE DETAIL ON DETAIL SHEET

## SITE DESIGN BMPs

1. SD-3 MINIMIZE IMPERVIOUS AREA
2. SD-4 MINIMIZE SOIL COMPACTION
3. SD-5 IMPERVIOUS AREA DISPERSION
4. SD-7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

## SOURCE CONTROL BMPs

1. SC-1 PREVENTION OF ILLICIT DISCHARGE INTO THE MS-4
2. SC-2 STORM DRAIN STENCILING OR SIGNAGE
3. SC-5 PROTECT TRASH STORAGE AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL

## PROJECT SITE INFO

UNDERLYING HYDROLOGIC SOIL: D
APPROXIMATE DEPTH TO GROUNDWATER: >20 FT
EXISTING NATURAL HYDROLOGIC FEATURES (WATERCOURSES, SEEPS, SPRINGS, WETLANDS): NONE
CRITICAL COARSE SEDIMENT YEILD AREAS TO BE PROTECTED: NONE
EXISTING IMPERVIOUS AREA: 4,400 SF
DISTURBED AREA (ONSITE ONLY): 64,150 SF
PROPOSED IMPERVIOUS AREA: 53,558 SF
PROPOSED PERVIOUS AREA: 10,592 SF

## DESIGN CAPTURE VOLUME

SEE WORKSHEET B.1 INCLUDED IN ATTACHMENT 1C OF THIS REPORT FOR DESIGN CAPTURE VOLUME CALCULATION.

# 901 MISSION AVE

## ATTACHMENT 1a & 1b
## DMA EXHIBIT

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500
fuscoe.com

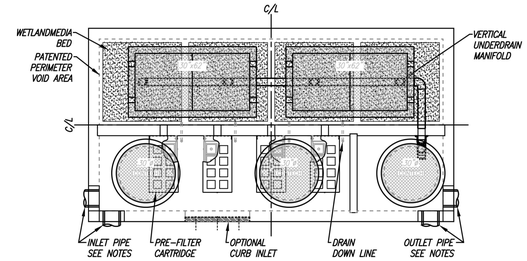
JOB NO. 557-017
DRAWN BY: JGB
SHEET 1 of 3

C:\PROJECTS\557-017\1_SUPPORT FILES\REPORTS\DRAINAGE\PRELIMINARY DRAINAGE\ATTACHMENTS\ATTACHMENT 1A & 1B - DMA EXHIBIT.DWG (10-31-2024 10:09 AM) Plotted by: JBlackmer

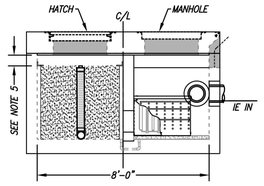
## SITE SPECIFIC DATA

| | | | |
|---|---|---|---|
| PROJECT NUMBER | | 557-017 | |
| PROJECT NAME | | 901 Mission Ave | |
| PROJECT LOCATION | | Oceanside, CA | |
| STRUCTURE ID | | BMP 1 | |
| TREATMENT REQUIRED | | | |
| TREATMENT FLOW (CFS) | | | 0.405 |
| PRETREATMENT LOADING RATE (GPM/SF) | | | 2.1 GPM/SF |
| WETLAND MEDIA LOADING RATE (GPM/SF) | | | 1.0 |
| PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE | | | OFFLINE |
| PIPE DATA | I.E. | MATERIAL | DIAMETER |
| INLET PIPE 1 | | | |
| INLET PIPE 2 | | | |
| OUTLET PIPE | | | |
| | PRETREATMENT | BIOFILTRATION | DISCHARGE |
| RIM ELEVATION | | 83.67 | |
| SURFACE LOAD | OTHER | | |
| NOTES: | | | |

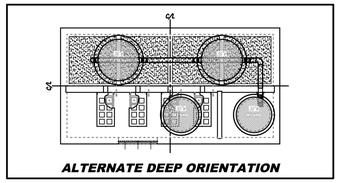
* PRELIMINARY ONLY - NOT FOR CONSTRUCTION



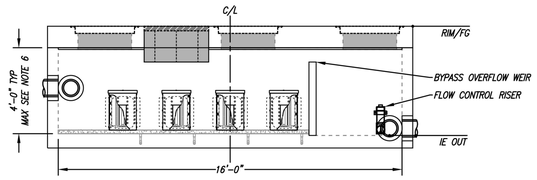

**PLAN VIEW**



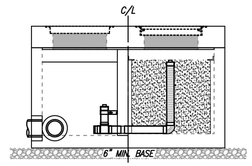

**LEFT END VIEW**




**ALTERNATE DEEP ORIENTATION**




**ELEVATION VIEW**




**RIGHT END VIEW**

## INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
4. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.
5. ALTERNATE DEEP FRAME & COVER ORIENTATION USED WHEN CEILING TO MEDIA DISTANCE IS 2.5' OR GREATER.
6. VERTICAL HEIGHT VARIES BASED ON SITE SPECIFIC REQUIREMENTS.

R:\LA\DASCOTT\SEITECH

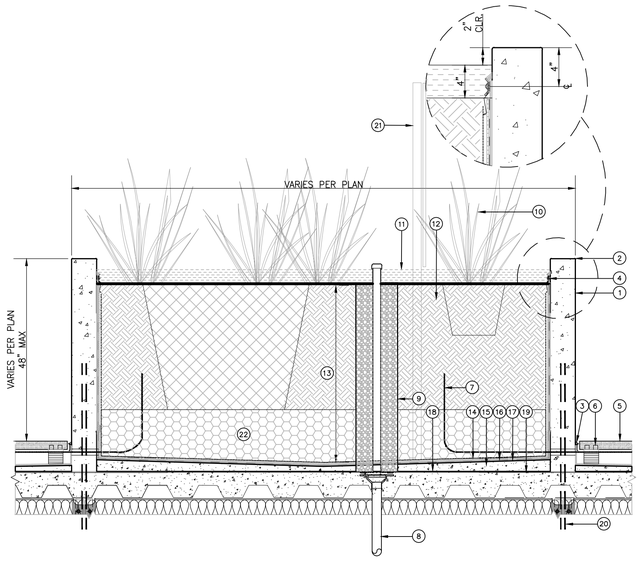
MODULAR WETLANDS — FOR PATENT INFORMATION, GO TO www.Contech5.com/IP

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www.ContechES.com

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

BMP 1 - MODULAR WETLAND SYSTEM (BIOFILTRATION)
NOT TO SCALE




DETAIL: VOLUME RETENTION - RAISED LANDSCAPE PLANTER SECTION
NOT TO SCALE

NOTES:

1. C.I.P. CONCRETE WALL, COLOR AND FINISH PER HARDSCAPE LEGEND. WALL PER STRUCTURAL DETAIL
2. 1/4" TOOLED RADIUS ON ALL EXPOSED CONCRETE EDGES
3. TERMINATION BAR PER ARCHITECTURE DETAIL
4. STAINLESS STEEL REGLET & COUNTER FLASHING PER ARCHITECTURE DETAIL
5. PEDESTAL PAVER SYSTEM PER ARCHITECT
6. ADJUSTABLE PEDESTAL PER ARCHITECT
7. IRRIGATION PVC LATERAL LINE WITH PVC MALE ADAPTER BY IRRIGATION CONTRACTOR, SEE IRRIGATION DRAWINGS
8. PLANTER DRAIN ASSEMBLY PER PLUMBING
9. INSPECTION PORT, TYPICAL FOR ALL PLANTER DRAINS, PER ARCHITECT'S DRAWINGS
10. PLANTING PER PLANTING PLAN
11. MULCH LAYER PER PLAN AND SPECIFICATION
12. AMENDED SOIL MIX PER SPECIFICATIONS
13. CLEAR SOIL DEPTH IS DEFINED BY DISTANCE FROM TOP OF DRAINAGE PROTECTION BOARD TO TERMINUS OF WATERPROOFING PER ARCHITECT
14. FILTER FABRIC PER SPECIFICATIONS
15. DRAINAGE BOARD PER ARCHITECT
16. ROOT BARRIER, CLIP TO FLASHING
17. AIR/PROTECTION LAYER PER ARCHITECT
18. WATER PROOFING LAYER PER ARCHITECT
19. FOAM BLOCKING AS NEEDED AT SHRUB PLANTING
20. FOOTING AND REINFORCEMENT TO STRUCTURAL DECK PER STRUCTURAL
21. SCREEN WALL PER HARDSCAPE PLAN AND LEGEND
22. PLASTIC WATER HOLDING CELL FOR DRAINAGE MITIGATION PER WATERPROOFING CONSULTANT, 12" MIN. DEPTH PER CIVIL CALCULATIONS

901 MISSION AVE

ATTACHMENT 1a & 1b
DMA DETAILS

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500 fuscoe.com

JOB NO. 557-017
DRAWN BY: JGB
SHEET 2 of 3

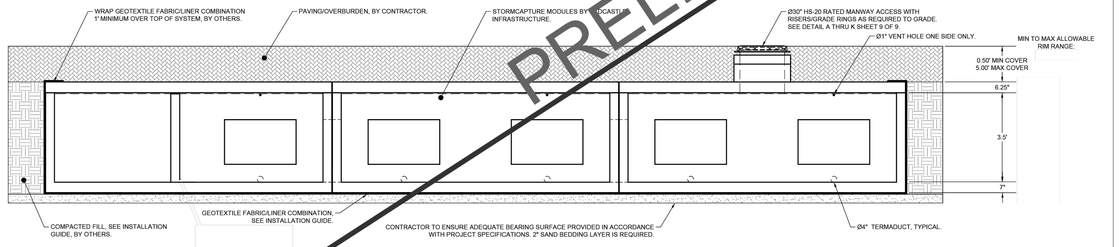
P:\PROJECTS\557-017\1_SUPPORT FILES\REPORTS\DRAINAGE\PRELIMINARY DRAINAGE\ATTACHMENTS\ATTACHMENT 1A & 1B - DMA EXHIBITS.DWG (10-28-2024 3:51:06PM) Plotted by: @bsaunder

REVIEWING NOTES

1. THIS SYSTEM HAS BEEN DESIGNED PER THE DESIGN PARAMETERS SPECIFIED IN THE DESIGN NOTES. REVIEWING ENGINEER SHALL VERIFY THAT THESE PARAMETERS MEET OR EXCEED PROJECT SPECIFIC REQUIREMENTS. IF SITE CONDITIONS DIFFER FROM NOTED DESIGN PARAMETERS, REVIEWING ENGINEER SHALL NOTIFY OLDCASTLE FOR POTENTIAL REDESIGN AND/OR PRICING ADJUSTMENTS.
2. REVIEWING ENGINEER SHALL VERIFY ALL PIPE PENETRATION LOCATIONS, SIZES, AND INVERTS.
3. REVIEWING ENGINEER SHALL VERIFY ALL MANWAY ACCESS LOCATIONS AND RIM ELEVATIONS.
4. THIS SYSTEM IS DESIGNED FOR A GROUNDWATER TABLE ELEVATION PER NOTE 2C, SHEET 1. REVIEWING ENGINEER SHALL VERIFY THAT THE DESIGN GROUNDWATER ELEVATION MEETS OR EXCEEDS SITE CONDITION REQUIREMENTS. NOTIFY OLDCASTLE IF SITE CONDITIONS VARY FROM WHAT HAS BEEN SPECIFIED FOR POTENTIAL SYSTEM DESIGN CHANGES AND/OR PRICING ADJUSTMENTS.
5. THIS SYSTEM HAS BEEN DESIGNED WITH A CONTAINMENT MEMBRANE. IF WATERTIGHT REQUIREMENTS ARE NOT NEEDED, REVIEWING ENGINEER SHALL NOTIFY OLDCASTLE FOR POTENTIAL DESIGN CHANGES AND/OR PRICING ADJUSTMENTS.
6. DESIGN OF THE STORMCAPTURE PRECAST MODULE SYSTEM ASSUMES NO ADJACENT BUILDING(S), WALL(S), OR STRUCTURAL FOUNDATION(S) WITHIN A 1:1 INFLUENCE LINE FROM THE BOTTOM EDGE OF ANY SYSTEM MODULE. ANY SITE ELEMENTS BEYOND THIS ZONE OF INFLUENCE ARE ASSUMED TO HAVE NO IMPACT ON THE SYSTEM AND EXERT ZERO LATERAL SURCHARGE ONTO THE MODULES. THE CONTRACTOR SHALL VERIFY THAT ANY ADJACENT BUILDING(S), WALL(S), OR STRUCTURAL FOUNDATION(S) DO NOT LIE WITHIN THIS INFLUENCE ZONE OR DO NOT SURCHARGE THE PRECAST MODULES.
7. WRITTEN APPROVAL OF SUBMITTAL DRAWINGS ALONG WITH SIGNED PURCHASE ORDER REQUIRED FOR BEGINNING OF PRODUCT FABRICATION. ANY SYSTEM MODIFICATION POST-APPROVAL MAY RESULT IN CHANGE ORDER(S) AND/OR POTENTIAL DELIVERY DELAYS.
8. ALL SAND FILTER MEDIA, DRAIN ROCK AGGREGATE, PIPE, AND FITTINGS PROVIDED BY CONTRACTOR.

PRELIMINARY

WATERPROOFING BY OTHERS




TYPICAL ELEVATION
NTS

NOTE:
TERMADUCT INSERTS TO BE KNOCKED OUT AT SPECIFIED LOCATIONS ONLY (BY OTHERS).

VOLUMES
Storage Volume Required: 5,356 cf
Storage Volume Provided: 5,625 cf
(~375cf volume per unit)

| REV | DESCRIPTION | DATE |
|---|---|---|

Oldcastle Infrastructure
A CRH COMPANY
Ph: 800.579.8019 | www.oldcastleinfrastructure.com/stormwater

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| STORMCAPTURE ® DETENTION SYSTEM | DETAIL # HMP-1 |
|---|---|

Detention/ Infiltration

HMP 1 - UNDERGROUND DETENTION VAULT
NOT TO SCALE

**PACKAGED TRIPLEX LIFT STATION -**
**MANUFACTURED BY PACIFIC SOUTHWEST INDUSTRIES**

Lift Station model #PSI-TWE072221 as manufactured by Pacific Southwest Industries (national phone # 800-358-9095)

**NOTE: Due to the specific nature of this pump station/ equipment and its operational sequence, any contractor not intending to purchase and supply as specified, by model number, must provide full submittals for review and approval prior to ordering, no exceptions. send full submittals to, www.submittalapproval.com, allow one week for a response.**

The pre-packaged Lift Station shall incorporate a quick removal system manufactured by the pump manufacturer. The pump(s) shall be guided to the discharge base elbow by stainless steel guide rails. The rails shall extend from the discharge base elbow to the upper guide bracket mounted on fiberglass channel just below the basin cover. Stainless steel lifting chain or cable shall be supplied and properly installed to remove the pump from the wet well. The internal discharge piping shall be completely pre-plumbed in PVC pipe and extend 12" beyond the wet well side wall for contractor connection to the force main piping. The pump(s) discharge pipe shall have a check and ball valve installed on each discharge line. The Lift Station shall include three liquid level controls on a removable float tree and a control panel suitable for surface mounting. The pump(s), quick removal system and the level sensors shall be housed in a fiberglass wet well (basin) and shall be of sufficient length to maintain the rim of the wet well at grade.

**PUMP(S):HIGH FLOW/100YR EVENT**

Pump performance shall not exceed 1,360 GPM at 13.74 TDH.

**MATERIALS OF CONSTRUCTION:**
All major parts of the pumping unit(s) including casing, Impeller, discharge elbow, and motor frame shall be manufactured from gray cast iron, ASTM A48 CLASS 35B. Internal and external surfaces coming into contact with the pumpage shall be protected by a fused polymer coating. All exposed fasteners shall be stainless steel. All units shall be furnished with a discharge elbow with 125 lb. ANSI B16.1 flat face discharge port. Impellers shall be of the enclosed solids handling design and shall be slip fit to the shaft and key driven.

**MECHANICAL SEAL:**
All units shall be furnished with a dual tandem mechanical shaft seal located completely out of the pumpage, running in a separate oil filled chamber and further protected by an exclusionary oil seal located between the bottom seal faces and the fluid being pumped. silicon carbide/silicon carbide pump side and carbon/silicon carbide bearing side Mechanical seals shall be rated to preclude the incursion of water up to 42.6 PSI. (98.4 Ft.). Units shall be equipped with seal failure probes that will be required to be installed to the. Mechanical seal hardware shall be stainless steel.

**PUMP MOTORS:**
The main pump motor(s) shall be 9 HP, 230V, 60 Hz, 3 Phase and shall be NEMA MG-1, Design Type B equivalent. Motor(s) shall be rated at 23 full load amps. Motor(s) shall have a 1.15 service factor and shall be rated for 30 starts per hour. Motor(s) shall be air filled, copper wound, class H insulated with built in SensThermNo thermal protection for each winding. Motor shall shall be 420 stainless steel and shall be supported by two permanently lubricated, high temperature ball bearings.

**POWER CABLE AND CABLE ENTRANCE:**
The pump power cable shall be suitable for submersible pump applications and shall be field replaceable utilizing standard submersible pump cable. The cable entrance shall incorporate built in strain relief and a combination three way mechanical compression sealing with a fatigue reducing/thermal expansion boot. The cable entrance assembly shall contain an anti-wicking block to eliminate water incursion into the motor due to capillary wicking should the power cable be accidentally damaged.

**QUICK REMOVAL SYSTEM:**
The pumping unit(s) shall be equipped with quick removal system (QRS). The construction shall be such that the pump(s) will automatically connect to the discharge piping when lowered into place on the discharge connector. There shall be no need for personnel to enter the wet well to accomplish installation or removal of the pump(s). The pumping unit(s) shall be fitted with stainless steel lifting chain(s) of sufficient length and strength to permit the raising and lowering of the unit(s). The chain(s) shall be fastened at the top of the structure near the access opening. All parts of the QRS system including base elbow, sliding guide bracket, and guide support shall be manufactured from recyclable, application appropriate resins. The need for a protective coating shall not be required. A sliding guide bracket shall be an integral part of the pumping unit and the pump casing shall have a machined connection with a bracket to connect with the discharge connection. Sealing of the pumping unit to the discharge connection shall be accomplished by a single linear downward motion of the pump with the entire weight of the pumping unit guided by a pawl, thereby wedging the pumping unit tightly against the discharge connector. No portion of the pump shall bear directly on the floor of the sump nor shall a rotary motion of the pump be required for sealing. All fasteners coming into contact with the pumpage shall be stainless steel. Two corrosion resistant guide pipes shall be furnished and installed for each pump to permit raising and lowering of the pump. Guide cables shall be inch diameter and shall be of adequate length to extend from the lower guide holder to the upper guide bar bracket(s) mounted on the access frame.

**DUPLEX ALTERNATING CONTROL PANEL:**
The control panel shall have a NEMA 3R door in -door dead front lockable steel enclosure suitable for pedestal installation. A motor circuit protector shall be provided for each pump and magnetic starter with three leg overload protection for each pump. A Smart relay shall be provided with automatic load selector to alternate pumps on each successive cycle of operation, exercise timers, elapsed time meters, and cycle counters. The starter shall have auxiliary contacts to operate both pumps in an override condition. The control circuit shall not be affected in the event that either pump trips the pump circuit breaker. H.O.A. switches and run lights shall be supplied for each pump. A inner door disconnect shall be provided to terminate all incoming power, pump level sensors and remote alarm wiring. A 120VA control transformer shall be provided to supply reduced voltage to the control circuit of 120 Volts. The control panel shall offer a high water alarm light, top mounted for 360 degree visibility. An external push button shall be provided to silence the audible alarm. U.L. 508 listed shop wired, non-powered contact shall be supplied in the main control panel to interface with the owners computerized security system. This contact is to normally open. The contact will close when the high level alarm float is activated or upon power loss.

**FIBERGLASS WET WELL:**
The fiberglass wet well shall be suitable for direct burial installation. The wet well shall be no less than 72 inches in diameter and will be 168 inches in length and contain an anti-flotation flange. The tank will have re-inforcing ribs for extra structural support. The laminate shall have a barcol hardness of a least 90% of the resin manufactures minimum specified hardness for cured resin on both the interior and exterior surfaces. The minimum wall thickness of the wet well shall not be less than 3/8". The wet well manufacturer shall encapsulate a steel base plate with stainless steel studs for the mounting of the quick removal system. The wet well will be provided with a (12") inlet fitting for field installation by the contractor at the elevation and location as indicated on the plans. All other penetrations shall be sealed by using "Uniseal" fittings, "Flex boot" fittings, or "Link-Seal" fittings.

**ALUMINUM DIAMOND TREAD FOOT TRAFFIC COVERS:**
The wet well will be covered with a solid 1/4" thick aluminum diamond tread cover suitable for load up to 300 psf. The cover will be solid with no penetrations through it. The cover will be gasketed and bolted to the rim flange of the fiberglass tank using 7/16" stainless steel hex head bolts. No covers using epoxy paint will be acceptable.

**PACKAGED TRIPLEX LIFT STATION -**
**MANUFACTURED BY PACIFIC SOUTHWEST INDUSTRIES**

**PUMP(S) 1 AND 3: LOW FLOW EVENTS**
Furnish and install Tsurumi, VANC15 Model 50PU2.4S submersible pump(s). Each unit shall be capable of delivering 60 GPM at 12.00 Feet TDH. The pump(s) shall be designed to pump waste water, sewage or effluent containing 1.5 inch (50mm) diameter solids without damage during operation. The pump(s) shall be designed so that the shaft power required (BHP)/(kW) shall not exceed the motor rated output throughout the entire operating range of the pump performance curve. A two year warranty 'out of the box" shall be standard.

**PUMP(S) 1 AND 3-MECHANICAL SEAL:**
All units shall be furnished with a dual inside mechanical shaft seal located completely out of the pumpage, running in a separate oil filled chamber. Units shall be fitted with a device that shall provide positive lubrication of top mechanical seal, (down to one third of the standard oil level). The device shall not consume any additional electrical power. Units shall have silicon carbide mechanical seal faces. Mechanical seal hardware shall be Stainless steel.

**PUMP(S) 1 AND 3-MOTOR:**
The pump motor(s) shall be 1/2 HP, .40 KW, 220 V, 60 Hz, 3 Phase and shall be NEMA MG-1, Design Type B equivalent. Motor(s) shall be rated at 2.0 full load amps. Motor(s) shall have a 1.15 service factor and shall be rated for 6 starts per hour. Motor(s) shall be air filled, copper wound, class E insulated with built-in thermal protection. Motor shaft shall be 403 stainless steel and shall be supported by two permanently lubricated, high temperature ball bearings, with a B-10 life rating at best efficiency point of 60,000 hours. The bearings shall be single row, double shielded, C3, deep groove type ball bearings. Bearing seats shall be rolled carbon steel or aluminum die casting. Motor housing shall be 304 stainless steel. Motors shall be suitable variable speed applications, utilizing a properly sized variable frequency drive. (Only for 3 phase.)

**PUMP(S) 1 AND 3-POWER CABLE AND CABLE ENTRANCE:**
The pump cable shall be suitable for submersible pump applications. The cable entrance shall incorporate built in strain relief, a one piece, three way mechanical compression seal with a fatigue reducing cable boot. The cable entrance assembly shall contain an anti-wicking block to eliminate water incursion into the motor due to Capilary wicking should the power cable be accidentally damaged.

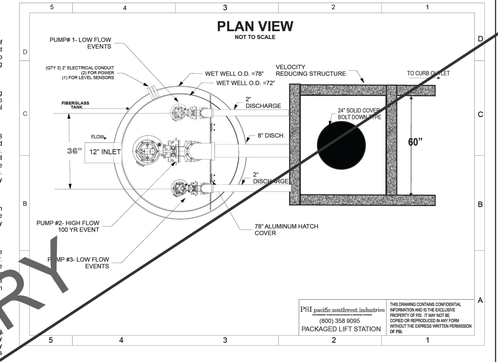
**PUMP(S) 1 AND 3-QUICK REMOVAL SYSTEM:**
The pumping unit(s) shall be equipped with quick removal system (QRS). The construction shall be such that the pump(s) will automatically connect to the discharge piping when lowered into place on the discharge connector. There shall be no need for personnel to enter the wet well to accomplish installation or removal of the pump(s). The pumping unit(s) shall be fitted with stainless steel lifting chain(s) of sufficient length and strength to permit the raising and lowering of the unit(s). The chain(s) shall be fastened at the top of the structure near the access opening. All parts of the QRS system including base elbow, sliding guide bracket, and guide support shall be manufactured from recyclable, application appropriate resins. The need for a protective coating shall not be required.

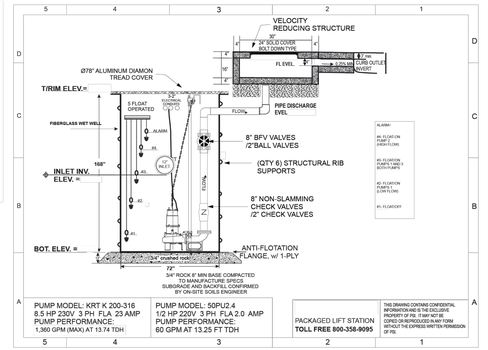
A sliding guide bracket shall be an integral part of the pumping unit and the pump casing shall have a machined connection with a bracket to connect with the discharge connection.

Sealing of the pumping unit to the discharge connection shall be accomplished by a single linear downward motion of the pump with the entire weight of the pumping unit guided by a pawl, thereby wedging the pumping unit tightly against the discharge connector. No portion of the pump shall bear directly on the floor of the sump nor shall a rotary motion of the pump be required for sealing. All fasteners coming into contact with the pumpage shall be stainless steel.

Two corrosion resistant guide pipes shall be furnished and installed for each pump to permit raising and lowering of the pump. Guide pipes shall be 3/4 inch (20 mm) in diameter and shall be of adequate length to extend from the lower guide holder to the upper guide bar bracket(s) mounted on the access frame.

PRELIMINARY




PUMP DETAIL
NOT TO SCALE

STORM WATER PUMP SYSTEM

PSI pacific southwest industries
ENGINEERED, ASSEMBLED AND INSTALLED, A VERTICAL SYSTEM
FOR MORE INFORMATION CONTACT PACIFIC SOUTHWEST INDUSTRIES

| No. | Date | Revision Description |
|---|---|---|

LIFT STATION DETAILS

Date:
Scale: No Scale
Checked by:

LSD-1

901 MISSION AVE

ATTACHMENT 1a & 1b
DMA DETAILS

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
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JOB NO. 557-017
DRAWN BY: JGB
SHEET 3 of 3

F:\PROJECTS\557-017\T_SUPPORT FILES\REPORTS\DRAINAGE\PRELIMINARY DRAINAGE\ATTACHMENTS\ATTACHMENT 1A & 1B - DMA EXHIBIT.DWG (10-28-2024 1:51:15PM) Plotted by: dbackwater

Placeholder – **Tabular Summary of DMAs (if separate from DMA Exhibit)**

Leave placeholder intact if not applicable.

☒Not Applicable – Tabular Summary included on DMA Exhibit

**ATTACHMENT 1c**
**Automated Worksheet B.1: Calculation of Design Capture Volume (V2.0)**

| Category | # | Description | *i* | *ii* | *iii* | *iv* | *v* | *vi* | *vii* | *viii* | *ix* | *x* | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard Drainage Basin Inputs | 1 | Drainage Basin ID or Name | DMA 1 | DMA 2 | DMA 3 | DMA 4 | DMA 5 | DMA 6 | | | | | unitless |
| | 2 | 85th Percentile 24-hr Storm Depth | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 | | | | | inches |
| | 3 | Impervious Surfaces Not Directed to Dispersion Area (C=0.90) | 40,803 | 1,802 | 726 | 45 | 170 | 52 | | | | | sq-ft |
| | 4 | Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | sq-ft |
| | 5 | Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10) | 1,160 | 0 | 387 | 830 | 4,900 | 1,023 | | | | | sq-ft |
| | 6 | Natural Type A Soil Not Serving as Dispersion Area (C=0.10) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | sq-ft |
| | 7 | Natural Type B Soil Not Serving as Dispersion Area (C=0.14) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | sq-ft |
| | 8 | Natural Type C Soil Not Serving as Dispersion Area (C=0.23) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | sq-ft |
| | 9 | Natural Type D Soil Not Serving as Dispersion Area (C=0.30) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | sq-ft |
| Dispersion Area, Tree Well & Rain Barrel Inputs (Optional) | 10 | Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels? | Yes | No | n/a | No | No | No | | | No | No | yes/no |
| | 11 | Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90) | 9,228 | | | | | | | | | | sq-ft |
| | 12 | Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30) | 0 | | | | | | | | | | sq-ft |
| | 13 | Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10) | 2,307 | | | | | | | | | | sq-ft |
| | 14 | Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10) | 0 | | | | | | | | | | sq-ft |
| | 15 | Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14) | 0 | | | | | | | | | | sq-ft |
| | 16 | Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23) | 0 | | | | | | | | | | sq-ft |
| | 17 | Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30) | 0 | | | | | | | | | | sq-ft |
| | 18 | Number of Tree Wells Proposed per SD-A | 0 | | | | | | | | | | # |
| | 19 | Average Mature Tree Canopy Diameter | 0 | | | | | | | | | | ft |
| | 20 | Number of Rain Barrels Proposed per SD-E | 0 | | | | | | | | | | # |
| | 21 | Average Rain Barrel Size | 0 | | | | | | | | | | gal |
| Initial Runoff Factor Calculation | 22 | Total Tributary Area | 53,498 | 1,802 | 1,113 | 875 | 5,070 | 1,075 | 0 | 0 | 0 | 0 | sq-ft |
| | 23 | Initial Runoff Factor for Standard Drainage Areas | 0.88 | 0.90 | 0.62 | 0.14 | 0.13 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 24 | Initial Runoff Factor for Dispersed & Dispersion Areas | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 25 | Initial Weighted Runoff Factor | 0.85 | 0.90 | 0.62 | 0.14 | 0.13 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 26 | Initial Design Capture Volume | 2,236 | 80 | 34 | 6 | 32 | 7 | 0 | 0 | 0 | 0 | cubic-feet |
| Dispersion Area Adjustments | 27 | Total Impervious Area Dispersed to Pervious Surface | 9,228 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | sq-ft |
| | 28 | Total Pervious Dispersion Area | 2,307 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | sq-ft |
| | 29 | Ratio of Dispersed Impervious Area to Pervious Dispersion Area | 4.00 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | ratio |
| | 30 | Adjustment Factor for Dispersed & Dispersion Areas | 0.32 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | ratio |
| | 31 | Runoff Factor After Dispersion Techniques | 0.74 | 0.90 | 0.62 | 0.14 | 0.13 | 0.14 | n/a | n/a | n/a | n/a | unitless |
| | 32 | Design Capture Volume After Dispersion Techniques | 1,946 | 80 | 34 | 6 | 32 | 7 | 0 | 0 | 0 | 0 | cubic-feet |
| Tree & Barrel Adjustments | 33 | Total Tree Well Volume Reduction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 34 | Total Rain Barrel Volume Reduction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| Results | 35 | Final Adjusted Runoff Factor | 0.74 | 0.90 | 0.62 | 0.14 | 0.13 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 36 | Final Effective Tributary Area | 39,589 | 1,622 | 690 | 123 | 659 | 151 | 0 | 0 | 0 | 0 | sq-ft |
| | 37 | Initial Design Capture Volume Retained by Site Design Elements | 290 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 38 | Final Design Capture Volume Tributary to BMP | 1,946 | 80 | 34 | 6 | 32 | 7 | 0 | 0 | 0 | 0 | cubic-feet |

**No Warning Messages**

**ATTACHMENT 1c**

**Automated Worksheet B.2: Retention Requirements (V2.0)**

| Category | # | Description | *i* | *ii* | *iii* | *iv* | *v* | *vi* | *vii* | *viii* | *ix* | *x* | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Analysis | 1 | Drainage Basin ID or Name | DMA 1 | DMA 2 | DMA 3 | DMA 4 | DMA 5 | DMA 6 | - | - | - | - | unitless |
| | 2 | 85th Percentile Rainfall Depth | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 | - | - | - | - | inches |
| | 3 | Predominant NRCS Soil Type Within BMP Location | D | D | D | D | D | D | | | | | unitless |
| | 4 | Is proposed BMP location Restricted or Unrestricted for Infiltration Activities? | Restricted | Restricted | Restricted | Restricted | Restricted | Restricted | | | | | unitless |
| | 5 | Nature of Restriction | Fill Depths | Fill Depths | Fill Depths | Fill Depths | Fill Depths | Fill Depths | | | | | unitless |
| | 6 | Do Minimum Retention Requirements Apply to this Project? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | yes/no |
| | 7 | Are Habitable Structures Greater than 9 Stories Proposed? | No | No | No | No | No | No | | | | | yes/no |
| Advanced Analysis | 8 | Has Geotechnical Engineer Performed an Infiltration Analysis? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | yes/no |
| | 9 | Design Infiltration Rate Recommended by Geotechnical Engineer | 0.680 | 0.680 | 0.680 | 0.680 | 0.680 | 0.680 | | | | | in/hr |
| Result | 10 | Design Infiltration Rate Used To Determine Retention Requirements | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | in/hr |
| | 11 | Percent of Average Annual Runoff that Must be Retained within DMA | 4.5% | 4.5% | 4.5% | 4.5% | 4.5% | 4.5% | - | - | - | - | percentage |
| | 12 | Fraction of DCV Requiring Retention | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | - | - | - | - | ratio |
| | 13 | Required Retention Volume | 39 | 2 | 1 | 0 | 1 | 0 | - | - | - | - | cubic-feet |

**No Warning Messages**

| SSD-BMP Automated Worksheet I-1: Step 1. Calculation of Design Capture Volume (V1.0) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Category** | **#** | **Description** | *i* | *ii* | *iii* | *iv* | *v* | *vi* | *vii* | *viii* | *ix* | *x* | **Units** |
| **Standard Drainage Basin Inputs** | 1 | Drainage Basin ID or Name | DMA 1 | DMA 2 | DMA 3 | DMA 4 | DMA 5 | DMA 6 | | | | | unitless |
| | 2 | 85th Percentile 24-hr Storm Depth | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 | | | | | inches |
| | 3 | Is Hydromodification Control Applicable? | No | No | No | No | No | No | | | | | yes/no |
| | 4 | Impervious Surfaces Not Directed to Dispersion Area (C=0.90) | 40,803 | 1,802 | 726 | 45 | 170 | 52 | | | | | sq-ft |
| | 5 | Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | sq-ft |
| | 6 | Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10) | 1,160 | 0 | 387 | 830 | 4,900 | 1,023 | | | | | sq-ft |
| | 7 | Natural Type A Soil Not Serving as Dispersion Area (C=0.10) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | sq-ft |
| | 8 | Natural Type B Soil Not Serving as Dispersion Area (C=0.14) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | sq-ft |
| | 9 | Natural Type C Soil Not Serving as Dispersion Area (C=0.23) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | sq-ft |
| | 10 | Natural Type D Soil Not Serving as Dispersion Area (C=0.30) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | sq-ft |
| **SSD-BMPs Proposed** | 11 | Does Tributary Incorporate Dispersion and/or Rain Barrels? | Yes | No | No | No | No | No | | | | | yes/no |
| | 12 | Does Tributary Incorporate Tree Wells? | No | No | No | No | No | No | | | | | yes/no |
| **Dispersion Area & Rain Barrel Inputs (Optional)** | 13 | Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90) | 9,228 | | | | | | | | | | sq-ft |
| | 14 | Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30) | 0 | | | | | | | | | | sq-ft |
| | 15 | Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10) | 2,307 | | | | | | | | | | sq-ft |
| | 16 | Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10) | 0 | | | | | | | | | | sq-ft |
| | 17 | Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14) | 0 | | | | | | | | | | sq-ft |
| | 18 | Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23) | 0 | | | | | | | | | | sq-ft |
| | 19 | Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30) | 0 | | | | | | | | | | sq-ft |
| | 20 | Number of Rain Barrels Proposed per SD-E | 0 | | | | | | | | | | # |
| | 21 | Average Rain Barrel Size | 0 | | | | | | | | | | gal |
| **Initial Runoff Factor Calculation** | 22 | Total Tributary Area | 53,498 | 1,802 | 1,113 | 875 | 5,070 | 1,075 | 0 | 0 | 0 | 0 | sq-ft |
| | 23 | Initial Runoff Factor for Standard Drainage Areas | 0.88 | 0.90 | 0.62 | 0.14 | 0.13 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 24 | Initial Runoff Factor for Dispersed & Dispersion Areas | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 25 | Initial Weighted Runoff Factor | 0.85 | 0.90 | 0.62 | 0.14 | 0.13 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 26 | Initial Design Capture Volume | 2,236 | 80 | 34 | 6 | 32 | 7 | 0 | 0 | 0 | 0 | cubic-feet |
| **Dispersion Area Adjustment & Rain Barrel Adjustment** | 27 | Total Impervious Area Dispersed to Pervious Surface | 9,228 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | sq-ft |
| | 28 | Total Pervious Dispersion Area | 2,307 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | sq-ft |
| | 29 | Ratio of Dispersed Impervious Area to Pervious Dispersion Area for DCV Reduction | 4.00 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | ratio |
| | 30 | Adjustment Factor for Dispersed & Dispersion Areas | 0.32 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | ratio |
| | 31 | Runoff Factor After Dispersion Techniques | 0.74 | 0.90 | 0.62 | 0.14 | 0.13 | 0.14 | n/a | n/a | n/a | n/a | unitless |
| | 32 | Design Capture Volume After Dispersion Techniques | 1,946 | 80 | 34 | 6 | 32 | 7 | 0 | 0 | 0 | 0 | cubic-feet |
| | 33 | Total Rain Barrel Volume Reduction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| **Results** | 34 | Final Adjusted Runoff Factor | 0.74 | 0.90 | 0.62 | 0.14 | 0.13 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 35 | Final Effective Tributary Area | 39,589 | 1,622 | 690 | 123 | 659 | 151 | 0 | 0 | 0 | 0 | sq-ft |
| | 36 | Initial Design Capture Volume Retained by Dispersion Area and Rain Barrel(s) | 290 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 37 | Remaining Design Capture Volume Tributary to Tree Well(s) | 1,946 | 80 | 34 | 6 | 32 | 7 | 0 | 0 | 0 | 0 | cubic-feet |

**No Warning Messages**

## SSD-BMP Automated Worksheet I-2: Step 2. Dispersion Area Validation (V1.0)

| Category | # | Description | *i* | *ii* | *iii* | *iv* | *v* | *vi* | *vii* | *viii* | *ix* | *x* | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard Dispersion Area Inputs | 1 | Drainage Basin ID or Name | DMA 1 | - | - | - | - | - | - | - | - | - | unitless |
| | 2 | Final Design Capture Volume (DCV) | 1,946 | - | - | - | - | - | - | - | - | - | cubic-feet |
| | 3 | Is Hydromodification Control Applicable? | No | - | - | - | - | - | - | - | - | - | yes/no |
| | 4 | Total Impervious Area Dispersed to Pervious Surface | 9,228 | - | - | - | - | - | - | - | - | - | sq-ft |
| | 5 | Total Engineered Pervious Surface and/or Natural Soil Dispersion Area (Does Not Include Semi-Pervious Surfaces Serving as Dispersion Area) | 2,307 | - | - | - | - | - | - | - | - | - | sq-ft |
| | 6 | Ratio of Dispersed Impervious Area to Total Engineered Pervious Surface and/or Natural Soil Dispersion Area | 4.00 | - | - | - | - | - | - | - | - | - | unitless |
| | 7 | Dispersion Area Length (Length of Sheet Flow Across Dispersion Area) | 10 | | | | | | | | | | feet |
| | 8 | Dispersion Area Slope | 2.0 | | | | | | | | | | % |
| | 9 | Thickness of Amended Soil | 11 | | | | | | | | | | inches |
| | 10 | How is Flow Dispersed Across Width of Dispersion Area (definitions below*)? | Roof Drains | | | | | | | | | | unitless |
| Results | 11 | Is DCV Requirement Fully Satisfied by Dispersion Area? | No | - | - | - | - | - | - | - | - | - | yes/no |
| | 12 | Is Hydromodification Control Requirement Satisfied by Dispersion Area? | n/a | - | - | - | - | - | - | - | - | - | yes/no |
| | 13 | Are Dispersion Area Length, Slope, and Thickness of Amended Soil (when applicable) Adequate? | Yes | - | - | - | - | - | - | - | - | - | yes/no |

**Attention!**

- [Line 2, Line 11] If Line 2 is not 0, DCV requirement is not satisfied by the dispersion area. Increase pervious dispersion area in Step 1. DCV or continue to Step 3. Tree Well

**Notes:**

***How is Flow Dispersed Across Width of Pervious Dispersion Area?**

| | |
|---|---|
| Sheet Flow: | Flow arrives as sheet flow across the width of the adjacent impervious area |
| Spreader(s): | Flow is discharged from flow spreader(s) across the width of the pervious area |
| Roof Drains: | Discharge from roof drains distributed across the width of the pervious area |
| Curb Cuts: | Discharge from curb cuts distributed across the width of the pervious area |
| Other: | Other (Describe in PDP SWQMP) |

**ATTACHMENT 1d**

Not Applicable. Habitable structure is less than 9 stories tall.

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Project No. G3303-42-01
May 16, 2024

JPI
11988 El Camino Real, Suite 200
San Diego, California 92130

Attention: Mr. Conner Kloeppel

Subject: INFILTRATION FEASIBILITY CONDITION LETTER
901 MISSION AVENUE MIXED-USE
OCEANSIDE, CALIFORNIA

References
1. *Geotechnical Investigation, 901 Mission Avenue Mixed-Use, Oceanside, California,* prepared by Geocon Incorporated, dated May 15, 2024 (Project No. G3303-42-01).
2. Geocon Incorporated (2004), *Geotechnical Investigation, Mission Avenue Mixed-use Project, Mission Avenue at Horne Street, Oceanside, California*, Project No. 07213-22-01, dated January 9, 2004.

Dear Mr. Kloeppel:

In accordance with the request of Fusco Engineering, Inc., we have prepared this letter regarding storm water management for the subject project. The property is located at 901 Mission Avenue and is bounded by Horne Street to the east, Clementine Street to the west, Mission Avenue to the north, and Seagaze Drive to the south. We understand plans are to construct a 6-story apartment building over two podium levels and two levels of subterranean parking.

Due to the presence of undocumented fills, and the proposed below grade basement that will extend across the majority of the site, it is our opinion that infiltration could result in lateral water seepage behind basement walls and to adjacent streets and utilities.

## GEOTECHNICAL STUDIES

A geotechnical investigation report was recently issued for the property (see Geocon 2024). The field work for the geotechnical investigation was performed during a previous study (Geocon 2004). The

site is underlain by approximately 2 to 9 feet of undocumented fill overlying old paralic deposits. The geologic map provided in Geocon 2024 is appended as Figure 1. Geologic Cross sections are provided on Figure 2.

As shown on the cross sections, the building footprint covers the entirety of the property, except for approximately 8 to 12 feet around the site perimeter. Infiltration in this perimeter area will migrate laterally behind basement retaining walls and to adjacent streets and utility lines. There is not a sufficient setback from structures or existing streets to enable infiltration to occur on the property.

## CONCLUSIONS AND RECOMMENDATIONS

It is our opinion that the site should be considered as having a "no infiltration" condition due to the below grade basement and perimeter basement retaining walls, and the proximity of existing streets and utilities. There is not sufficient room to provide setbacks from infiltration BMPs.

Liners and subdrains should be incorporated into the design and construction of the planned storm water devices. The liners should be impermeable (e.g. High-density polyethylene, HDPE, with a thickness of about 30 mil or equivalent Polyvinyl Chloride, PVC) to prevent water migration. The subdrains should be perforated within the liner area, installed at the base and above the liner, be at least 3 inches in diameter and consist of Schedule 40 PVC pipe. The subdrains outside of the liner should consist of solid pipe. The penetration of the liners at the subdrains should be properly waterproofed. The subdrains should be connected to a proper outlet. The devices should also be installed in accordance with the manufacturer's recommendations.

Should you have any questions regarding this letter, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Rodney C. Mikesell
GE 2533

REGISTERED PROFESSIONAL ENGINEER
RODNEY C. MIKESELL
No.2533
GEOTECHNICAL
STATE OF CALIFORNIA

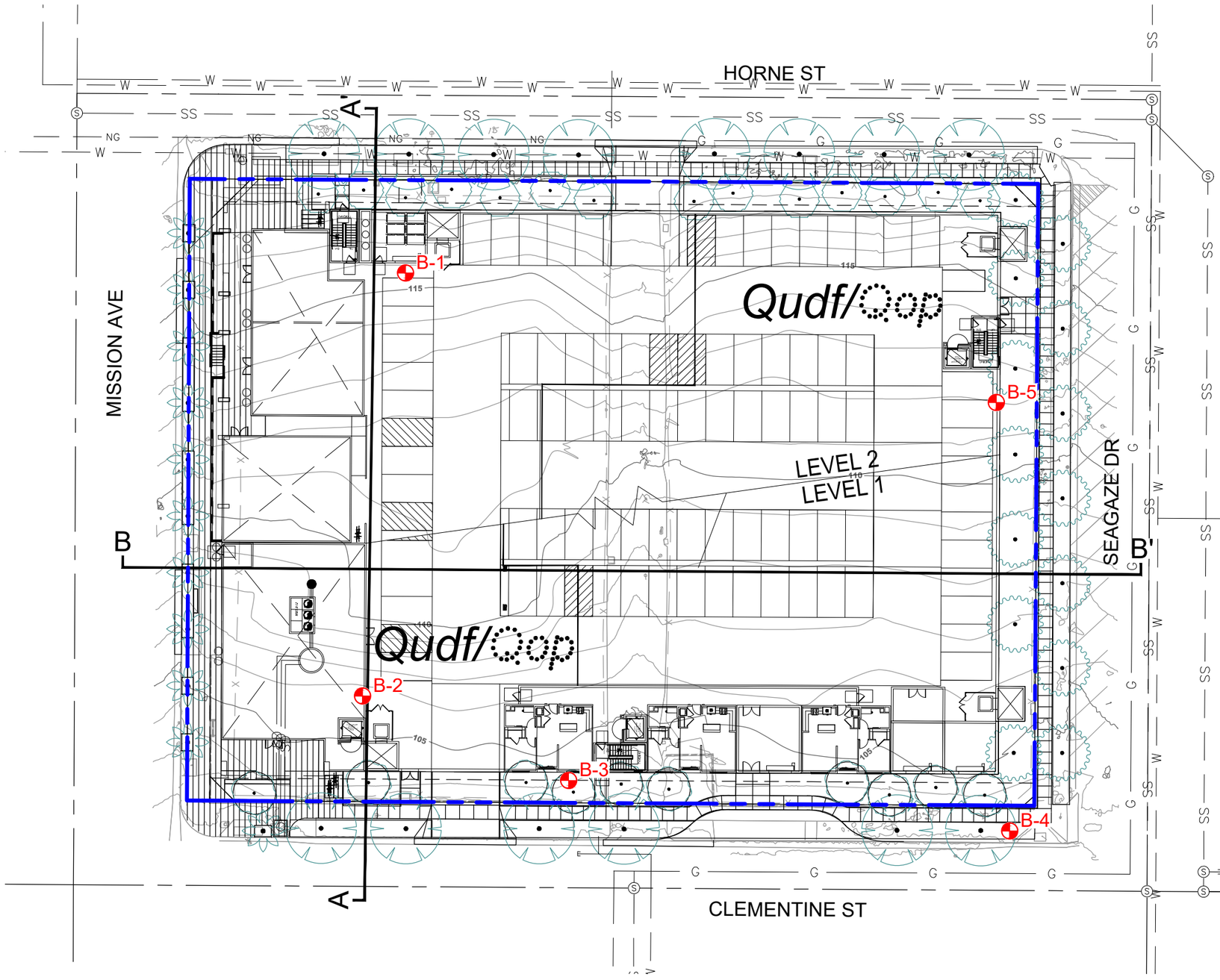
RCM:am

(e-mail) Addressee

## INFILTRATION RESTRICTIONS FOR BASIC INFILTRATION ANALYSIS (FORM 4 OF APPENDIX D)

| Infiltration Restrictions | | Form 4 |
|---|---|---|
| **Retention is required at the project site to the maximum extent practical. Complete this form to summarize applicable infiltration restrictions. Supporting documentation must be provided in the Attachments.** | | |
| **Restriction Element** | | **Applicable?** |
| **Mandatory Considerations** | BMP is within 100’ of Contaminated Soils | No |
| | BMP is within 100’ of Industrial Activities Lacking Source Control | No |
| | BMP is within 100’ of Well/Groundwater Basin | No |
| | BMP is within 50’ of Septic Tanks/Leach Fields | No |
| | BMP is within 10’ of Structures/Tanks/Walls | **Yes** |
| | BMP is within 10’ of Sewer Utilities | No |
| | BMP is within 10’ of Seasonal High Groundwater | No |
| | BMP is within Hydric Soils | No |
| | BMP is within Highly Liquefiable Soils and has Connectivity to Structures | No |
| | BMP is within 1.5 Times the Height of Adjacent Steep Slopes (≥25%) | No |
| | City staff has assigned “Restricted” Infiltration Category | No |
| **Optional Considerations** | BMP is within Predominantly Type D Soil | No |
| | BMP is within 5’ of Property Line | No |
| | BMP is within Fill Depths of ≥5’ (Existing or Proposed) | No |
| | BMP is within 10’ of Underground Utilities | No |
| | BMP is within 250’ of Ephemeral Stream | No |
| | Other (provide detailed geotechnical support in Attachment 6) | No |
| **Result** | **Unrestricted** – No restriction elements are applicable. | |
| | **Restricted** – One or more restriction elements are applicable | **X** |

# 901 MISSION AVENUE
# SAN DIEGO, CALIFORNIA




0' 20' 40' 60' 80'

SCALE 1"=40'(on 11x17)

## GEOCON LEGEND

Qudf .....UNDOCUMENTED FILL

Qop .....OLD PARALIC DEPOSITS (Dotted Where Buried)

B-5 .....APPROX. LOCATION OF BORING

A A' .....APPROX. LOCATION OF GEOLOGIC CROSS SECTION


GEOCON INCORPORATED

GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974

PHONE 858 558-6900 - FAX 858 558-6159


PROJECT NO. G3303 - 42 - 01

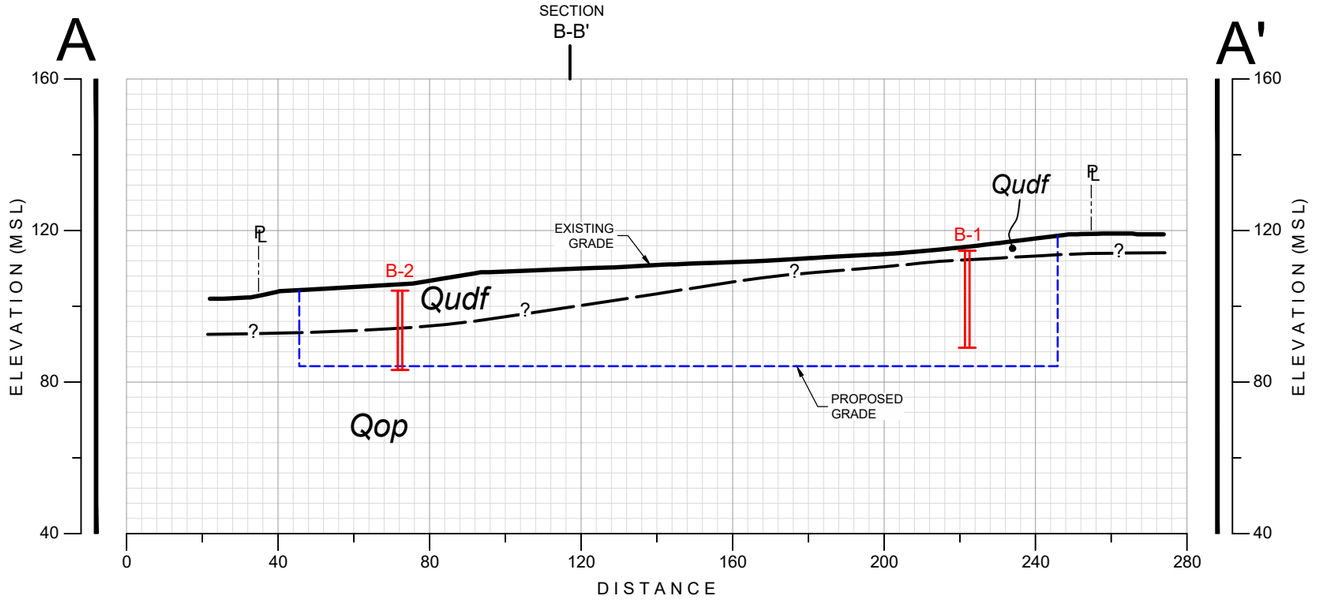
FIGURE 1

DATE 05 - 15 - 2024

# GEOLOGIC MAP

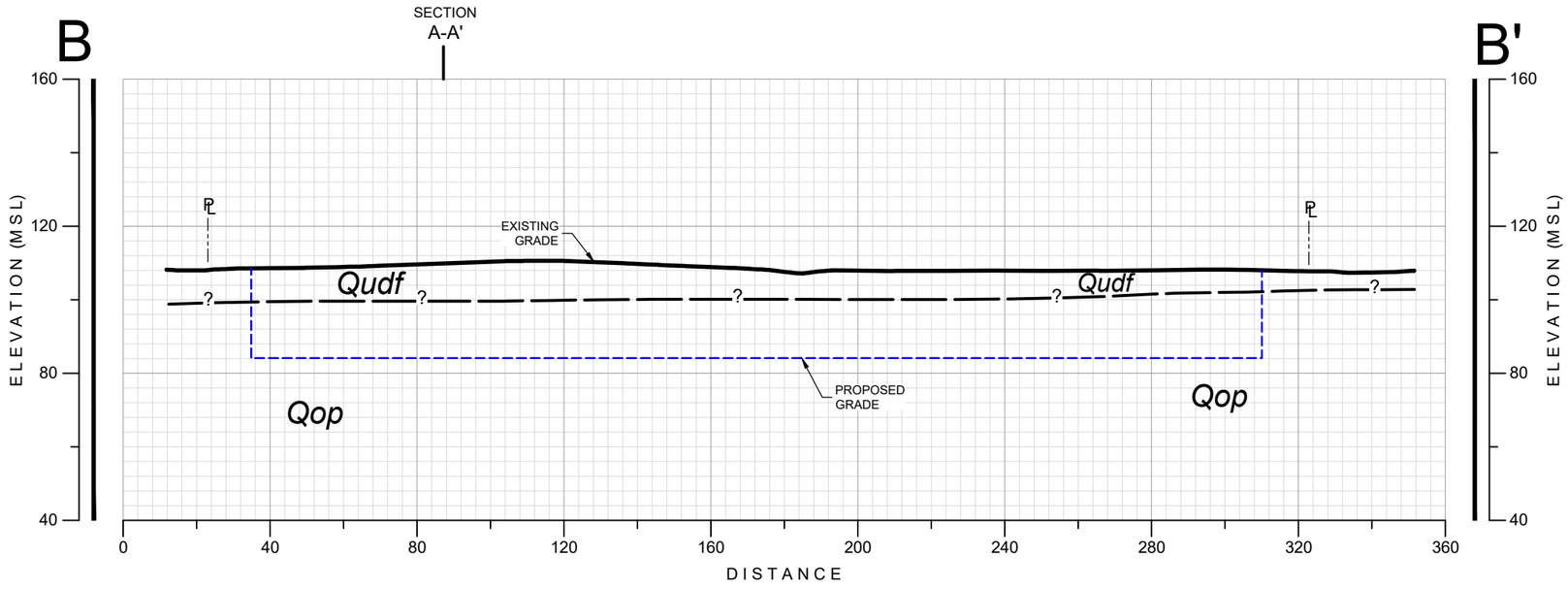

Plotted:05/15/2024 7:52AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G3303-42-01 (901 Mission Avenue)\SHEETS\G3303-42-01 Geo Map.dwg

901 MISSION AVENUE
SAN DIEGO, CALIFORNIA




## GEOLOGIC CROSS-SECTION A-A'

SCALE: 1" = 40' (Vert. = Horiz.)




## GEOLOGIC CROSS-SECTION B-B'

SCALE: 1" = 40' (Vert. = Horiz.)

### GEOCON LEGEND

*Qudf* .....UNDOCUMENTED FILL

*Qop* .....OLD PARALIC DEPOSITS

B-2 .....APPROX. LOCATION OF BORING

?2 .....APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOCON INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

PROJECT NO. G3303 - 42 - 01
FIGURE 2
DATE 05 - 15 - 2024

GEOLOGIC CROSS SECTION

Plotted:05/15/2024 7:44AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G3303-42-01 (901 Mission Avenue)\SHEETS\G3303-42-01 XSections.dwg

# ATTACHMENT 1f

Appendix B: Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods

Worksheet B.6-1: Flow-Thru Design Flows

| Flow-Thru Design Flows | | Worksheet B.6-1 | | |
|---|---|---|---|---|
| | | | DMA 1-6 | Units |
| 1 | DCV* | DCV | 2,105 | cubic-feet |
| 2 | DCV retained** | DCV retained | | cubic-feet |
| 3 | DCV biofiltered | DCV biofiltered | | cubic-feet |
| 4 | DCV requiring flow-thru (Line 1 - Line 2 - 0.67 * Line 3) | DCV flow-thru | 2,105 | cubic-feet |
| 5 | Adjustment Factor (Line 4 / Line 1)* | AF= | 1.00 | unitless |
| 6 | Design rainfall intensity | i= | 0.20 | in/hr |
| 7 | Area tributary to BMP (s) | A= | 1.5 | acres |
| 8 | Area-weighted runoff factor (estimate using Appendix B.2) | C= | 0.90 | unitless |
| 9 | Calculate Flow Rate = AF x (C x i x A) | Q= | 0.270 | cfs |
| | TREATMENT FLOW REQUIRED (1.5 X FLOW RATE) | Q= | 0.405 | cfs |

*DCV as calculated per County of San Diego Worksheet B.1 in SWQMP Attachment 1c

**Although retention will be provided via level 3 courtyard planters, each MWS is sized for its entire DMA

considerations to provide for continued effectiveness of pollutant and flow control functions.

## Biofiltration Criteria Checklist

The applicant shall provide documentation of compliance with each criterion in this checklist as part of the project submittal. The right column of this checklist identifies the submittal information that is recommended to document compliance with each criterion. Biofiltration BMPs that substantially meet all aspects of Fact Sheets PR-1 or BF-1 should still use this checklist; however additional documentation (beyond what is already required for project submittal) should not be required.

**1. Biofiltration BMPs shall be allowed to be used only as described in the BMP selection process based on a documented feasibility analysis.**

Intent: This manual defines a specific prioritization of pollutant treatment BMPs, where BMPs that retain water (retained includes evapotranspired, infiltrated, and/or harvested and used) must be used before considering BMPs that have a biofiltered discharge to the MS4 or surface waters. Use of a biofiltration BMP in a manner in conflict with this prioritization (i.e., without a feasibility analysis justifying its use) is not permitted, regardless of the adequacy of the sizing and design of the system.

| | | |
|---|---|---|
| ☒ | The project applicant has demonstrated that it is not technically feasible to retain the full DCV onsite. | Document feasibility analysis and findings in project submittalSWQMP per Appendix C. See selection process described in SWQMP Form I-6 p28 |

**2. Biofiltration BMPs must be sized using acceptable sizing methods.**

Intent: The MS4 Permit and this manual defines specific sizing methods that must be used to size biofiltration BMPs. Sizing of biofiltration BMPs is a fundamental factor in the amount of storm water that can be treated and also influences volume and pollutant retention processes.

| | | |
|---|---|---|
| ☒ | The project applicant has demonstrated that biofiltration BMPs are sized to meet one of the biofiltration sizing options available (Appendix B.5). | Submit sizing worksheets (Appendix B.5) or other equivalent documentation with the SWQMP. Sizing calculation provided using County fo SD Worksheet B.6-1: Flow-Thru Design Flows included as Attachment 1f |

**3. Biofiltration BMPs must be sited and designed to achieve maximum feasible infiltration and evapotranspiration.**

Intent: Various decisions about BMP placement and design influence how much water is retained via infiltration and evapotranspiration. The MS4 Permit requires that biofiltration BMPs achieve maximum feasible retention (evapotranspiration and infiltration) of storm water volume.

| | | |
|---|---|---|
| ☒ | The biofiltration BMP is sited to allow for maximum infiltration of runoff volume based on the feasibility factors considered in site planning efforts. It is also designed to maximize evapotranspiration through the use of amended media and plants (biofiltration designs without amended media and plants may be permissible; see Item 5). | See SWQMP<br>Document site planning and feasibility analyses in SWQMP per Section 5.4. |
| N/A ☐ | For biofiltration BMPs categorized as "Partial Infiltration Condition" the infiltration storage depth in the biofiltration design has been selected to drain in 36 hours (+/-25%) or an alternative value shown to maximize infiltration on the site. | Included documentation of estimated infiltration rate per Appendix D; provide calculations using Appendix B.4 and B.5 to show that the infiltration storage depth meets this criterion. Note, depths that are too shallow or too deep may not be acceptable. |
| N/A ☐ | For biofiltration BMP locations categorized as "Partial Infiltration Condition," the infiltration storage is over the entire bottom of the biofiltration BMP footprint. | Document on plans that the infiltration storage covers the entire bottom of the BMP (i.e., not just underdrain trenches); or an equivalent footprint elsewhere on the site. |
| N/A ☐ | For biofiltration BMP locations categorized as "Partial Infiltration Condition," the sizing factor used for the infiltration storage area is not less than the minimum biofiltration BMP sizing factors calculated using Worksheet B.5.1 to achieve 40% average annual percent capture within the BMP or downstream of the BMP. . | Provide a table that compares the minimum sizing factor per Appendix B.5 to the provided sizing factor. Note: The infiltration storage area could be a separate storage feature located downstream of the biofiltration BMP, not necessarily within the same footprint. |
| N/A ☐ | An impermeable liner or other hydraulic restriction layer is only used when needed to avoid geotechnical and/or subsurface contamination issues in locations identified as "No Infiltration Condition." | If using an impermeable liner or hydraulic restriction layer, provide documentation of feasibility findings per Appendix C that recommend the use of this feature. |
| ☒ | The use of "compact" biofiltration BMP design[2] is permitted only in conditions identified as "No Infiltration Condition" and where site-specific documentation demonstrates that the use of larger footprint biofiltration BMPs would be infeasible. | Provide documentation of feasibility findings that recommend no infiltration is feasible. Provide site-specific information to demonstrate that a larger footprint biofiltration BMP would not be feasible.<br>See SWQMP, no infiltration due to hydraulic soil type D. |

[2] Compact biofiltration BMPs are defined as features with infiltration storage footprint less than the minimum sizing factors required to achieve 40% volume retention. Note that if a biofiltration BMP is accompanied by an infiltrating area downstream that has a footprint equal to at least the minimum sizing factors calculated using

**4. Biofiltration BMPs must be designed with a hydraulic loading rate to maximize pollutant retention, preserve pollutant control processes, and minimize potential for pollutant washout.**

Intent: Various decisions about biofiltration BMP design influence the degree to which pollutants are retained. The MS4 Permit requires that biofiltration BMPs achieve maximum feasible retention of storm water pollutants.

| | | |
|---|---|---|
| ☐ | Media selected for the biofiltration BMP meets minimum quality and material specifications per 2021 City of San Diego Storm Water Standards or County BMP Design Manual, including the maximum allowable design filtration rate and minimum thickness of media.<br>**OR** | Provide documentation that media meets the specifications in 2021 City of San Diego Storm Water Standards or County BMP Design Manual. |
| ☒ | Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the 2021 City of San Diego Storm Water Standards or County BMP Design Manual, field scale testing data are provided to demonstrate that proposed media meets the pollutant treatment performance criteria in Section F.1 below. | Provide documentation of performance information as described in Section F.1.<br>See TAPE certification. |
| ☒ | To the extent practicable, filtration rates are outlet controlled (e.g., via an underdrain and orifice/weir) instead of controlled by the infiltration rate of the media. | Include outlet control in designs or provide documentation of why outlet control is not practicable. Inherently satisfied by the MWS |
| N/A☐ | The water surface drains to at least 12 inches below the media surface within 24 hours from the end of storm event flow to preserve plant health and promote healthy soil structure. | Include calculations to demonstrate that drawdown rate is adequate.<br>Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the City Engineer if certified by a landscape architect or agronomist. MWS located in the parking garage and not vegetated. |

Worksheet B.5.1 assuming a partial infiltration condition, then it is not considered to be a compact biofiltration BMP for the purpose of Item 4 of the checklist. For potential configurations with a higher rate biofiltration BMP upstream of an larger footprint infiltration area, the BMP would still need to comply with Item 5 of this checklist for pollutant treatment effectiveness.

| | | |
|---|---|---|
| N/A ☐ | If nutrients are a pollutant of concern, design of the biofiltration BMP follows nutrient-sensitive design criteria. | Follow specifications for nutrient sensitive design in Fact Sheet BF-2. Or provide alternative documentation that nutrient treatment is addressed and potential for nutrient release is minimized. TAPE certification satisfies this |
| N/A☐ | Media gradation calculations or geotextile selection calculations demonstrate that migration of media between layers will be prevented and permeability will be preserved. | Follow specification for choking layer or geotextile in Fact Sheet PR-1 or BF-1. Or include calculations to demonstrate that choking layer is appropriately specified. TAPE certification satisfies this |

N/A **5. Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes.**

Intent: Biological processes are an important element of biofiltration performance and longevity.

| | | |
|---|---|---|
| ☐ | Plants have been selected to be tolerant of project climate, design ponding depths and the treatment media composition. | Provide documentation justifying plant selection. Refer to the plant list in Appendix E.20. |
| ☐ | Plants have been selected to minimize irrigation requirements. | Provide documentation describing irrigation requirements for establishment and long term operation. TAPE certification satisfies this. |
| ☐ | Plant location and growth will not impede expected long-term media filtration rates and will enhance long term infiltration rates to the extent possible. | Provide documentation justifying plant selection. Refer to the plant list in Appendix E.20. |
| ☐ | If plants are not part of the biofiltration design, other biological processes are supported as needed to sustain treatment processes (e.g., biofilm in a subsurface flow wetland). | For biofiltration designs without plants, describe the biological processes that will support effective treatment and how they will be sustained. |

N/A **6. Biofiltration BMPs must be designed with a hydraulic loading rate to prevent erosion, scour, and channeling within the BMP.**

Intent: Erosion, scour, and/or channeling can disrupt treatment processes and reduce biofiltration effectiveness. pre-cast vault, no erosion possible

| | | |
|---|---|---|
| ☐ | Scour protection has been provided for both sheet flow and pipe inflows to the BMP, where needed. | Provide documentation of scour protection as described in Fact Sheets PR-1 or BF-1 or approved equivalent. |
| ☐ | Where scour protection has not been provided, flows into and within the BMP are kept to non-erosive velocities. | Provide documentation of design checks for erosive velocities as described in Fact Sheets PR-1 or BF-1 or approved equivalent. |

| | | |
|---|---|---|
| ☐ | For proprietary BMPs, the BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification[3] (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable). | Provide copy of manufacturer recommendations and conditions of third-party certification. |

**7. Biofiltration BMP must include operations and maintenance design features and planning considerations for continued effectiveness of pollutant and flow control functions.**

Intent: Biofiltration BMPs require regular maintenance in order provide ongoing function as intended. Additionally, it is not possible to foresee and avoid potential issues as part of design; therefore plans must be in place to correct issues if they arise.

| | | |
|---|---|---|
| ☒ | The biofiltration BMP O&M plan describes specific inspection activities, regular/periodic maintenance activities and specific corrective actions relating to scour, erosion, channeling, media clogging, vegetation health, and inflow and outflow structures. | Include O&M plan with project submittal as described in Chapter 7. O&M brochure provided |
| ☒ | Adequate site area and features have been provided for BMP inspection and maintenance access. | Illustrate maintenance access routes, setbacks, maintenance features as needed on project water quality plans. Located in parking garage with space for maintenance. Vactor truck needs to access for maintenance, might not have clearance in the garage so hose extensions may be necessary |
| ☒ | For proprietary biofiltration BMPs, the BMP maintenance plan is consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies). | Provide copy of manufacturer recommendations and conditions of third-party certification. O&M brochure provided |

[3] Certifications or verifications issued by the Washington Technology Acceptance Protocol-Ecology program and the New Jersey Corporation for Advanced Technology programs are typically accompanied by a set of guidelines regarding appropriate design and maintenance conditions that would be consistent with the certification/verification

WASHINGTON STATE DEPARTMENT OF ECOLOGY

**January 2024**

# GENERAL USE LEVEL DESIGNATION FOR BASIC (TSS) METALS AND PHOSPHORUS TREATMENT

## For

## Contech Engineered Solutions, LLC (Contech) Modular Wetlands Linear

### Ecology's Decision

Based on Modular Wetland Systems, Inc, application submissions, including the Technical Evaluation Report, dated April 1, 2014, Ecology hereby issues the following use level designation:

1. General Use Level Designation (GULD) for the Modular Wetlands Linear Stormwater Treatment System for Basic, Phosphorus, and Metals treatment
    - Sized at a hydraulic loading rate of:
        - 1 gallon per minute (gpm) per square foot (sq ft) of Wetland Cell Surface Area
        - Prefilter box (approved at either 22 inches or 33 inches tall)
            - 3.0 gpm/sq ft of prefilter box surface area for moderate pollutant loading rates (low to medium density residential basins).
            - 2.1 gpm/sq ft of prefilter box surface area for high pollutant loading rates (commercial and industrial basins).
2. Ecology approves the Modular Wetlands Linear Stormwater Treatment System units for Basic, Phosphorus, and Metals treatment at the hydraulic loading rate listed above. Designers shall calculate the water quality design flow rates using the following procedures:
    - Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute water quality treatment design flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology- approved continuous runoff model.

- Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute water quality treatment design flow rate as calculated using one of the three methods described in Chapter 2.7.6 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
- Entire State: For treatment installed downstream of detention, the water quality treatment design flow rate is the full 2-year release rate of the detention facility.

3. These use level designations have no expiration date but may be amended or revoked by Ecology, and are subject to the conditions specified below.

**Ecology's Conditions of Use**

Applicants shall comply with the following conditions:

1) Design, assemble, install, operate, and maintain the Modular Wetlands Linear Stormwater Treatment System units, in accordance with Contech's. applicable manuals and documents and the Ecology Decision.
2) Each site plan must undergo Contech review and approval before site installation. This ensures that site grading and slope are appropriate for use of a Modular Wetlands Linear Stormwater Treatment System unit.
3) Modular Wetlands Linear Stormwater Treatment System media shall conform to the specifications submitted to and approved by Ecology.
4) The applicant tested the Modular Wetlands Linear Stormwater Treatment System with an external bypass weir. This weir limited the depth of water flowing through the media, and therefore the active treatment area, to below the root zone of the plants. This GULD applies to Modular Wetlands Linear Stormwater Treatment Systems whether plants are included in the final product or not.
5) Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of stormwater treatment technology.
    - Typically, Contech designs Modular Wetland systems for a target prefilter media life of 6 to 12 months.
    - Indications of the need for maintenance include effluent flow decreasing to below the design flow rate or decrease in treatment below required levels.
    - Owners/operators must inspect Modular Wetland systems for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to the SWMMEW, the wet

season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.

- Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.
- When inspections are performed, the following findings typically serve as maintenance triggers:
    - Standing water remains in the vault between rain events, or
    - Bypass occurs during storms smaller than the design storm.
    - If excessive floatables (trash and debris) are present (but no standing water or excessive sedimentation), perform a minor maintenance consisting of gross solids removal, not prefilter media replacement.
    - Additional data collection will be used to create a correlation between pretreatment chamber sediment depth and pre-filter clogging (see *Issues to be Addressed by the Company* section below)

6) Discharges from the Modular Wetlands Linear Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

| | |
|---|---|
| **Applicant:** | Contech Engineered Solutions, LLC |
| **Applicant's Address:** | 11815 NE Glenn Widing Dr.<br>Portland, OR 97220 |

**Application Documents:**

*Original Application for Conditional Use Level Designation,* Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., January 2011

*Quality Assurance Project Plan:* Modular Wetland System – Linear Treatment System Performance Monitoring Project, draft, January 2011

*Revised Application for Conditional Use Level Designation,* Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., May 2011

*Memorandum: Modular Wetland System-Linear GULD Application Supplementary Data,* April 2014

*Technical Evaluation Report: Modular Wetland System Stormwater Treatment System Performance Monitoring,* April 2014

**Applicant's Use Level Request:**

- General Use Level Designation as a Basic, Metals, and Phosphorus treatment device in accordance with Ecology's Guidance for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE) January 2011 Revision.

**Applicant's Performance Claims:**

- The Modular Wetlands Linear is capable of removing a minimum of 80-percent of TSS from stormwater with influent concentrations between 100 and 200 mg/L.
- The Modular Wetlands Linear is capable of removing a minimum of 50-percent of total phosphorus from stormwater with influent concentrations between 0.1 and 0.5 mg/L.
- The Modular Wetlands Linear is capable of removing a minimum 30-percent of dissolved copper from stormwater with influent concentrations between 0.005 and 0.020 mg/L.
- The Modular Wetlands Linear is capable of removing a minimum 60-percent of dissolved zinc from stormwater with influent concentrations between 0.02 and 0.30 mg/L.

**Ecology's Recommendations:**

- Contech has shown Ecology, through laboratory and field-testing, that the Modular Wetlands Linear Stormwater Treatment System filter system is capable of attaining Ecology's Basic, Phosphorus, and Metals treatment goals.

**Findings of Fact:**

<u>Laboratory Testing</u>

The Modular Wetlands Linear Stormwater Treatment System has the:

- Capability to remove 99 percent of total suspended solids (using Sil-Co-Sil 106) in a quarter-scale model with influent concentrations of 270 mg/L.
- Capability to remove 91 percent of total suspended solids (using Sil-Co-Sil 106) in laboratory conditions with influent concentrations of 84.6 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 93 percent of dissolved Copper in a quarter-scale model with influent concentrations of 0.757 mg/L.
- Capability to remove 79 percent of dissolved Copper in laboratory conditions with influent concentrations of 0.567 mg/L at a flow rate of 3.0 gpm per square foot of media.

- Capability to remove 80.5-percent of dissolved Zinc in a quarter-scale model with influent concentrations of 0.95 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 78-percent of dissolved Zinc in laboratory conditions with influent concentrations of 0.75 mg/L at a flow rate of 3.0 gpm per square foot of media.

Field Testing

- Modular Wetland Systems, Inc. conducted monitoring of an MWS-Linear (Model # MWS-L-4-13) from April 2012 through May 2013, at a transportation maintenance facility in Portland, Oregon. The manufacturer collected flow-weighted composite samples of the system's influent and effluent during 28 separate storm events. The system treated approximately 75 percent of the runoff from 53.5 inches of rainfall during the monitoring period. The applicant sized the system at 1 gpm/sq ft. (wetland media) and 3gpm/sq ft. (prefilter).
- Influent TSS concentrations for qualifying sampled storm events ranged from 20 to 339 mg/L. Average TSS removal for influent concentrations greater than 100 mg/L (n=7) averaged 85 percent. For influent concentrations in the range of 20-100 mg/L (n=18), the upper 95 percent confidence interval about the mean effluent concentration was 12.8 mg/L.
- Total phosphorus removal for 17 events with influent TP concentrations in the range of 0.1 to 0.5 mg/L averaged 65 percent. A bootstrap estimate of the lower 95 percent confidence limit (LCL95) of the mean total phosphorus reduction was 58 percent.
- The lower 95 percent confidence limit of the mean percent removal was 60.5 percent for dissolved zinc for influent concentrations in the range of 0.02 to 0.3 mg/L (n=11). The lower 95 percent confidence limit of the mean percent removal was 32.5 percent for dissolved copper for influent concentrations in the range of 0.005 to 0.02 mg/L (n=14) at flow rates up to 28 gpm (design flow rate 41 gpm). Laboratory test data augmented the data set, showing dissolved copper removal at the design flow rate of 41 gpm (93 percent reduction in influent dissolved copper of 0.757 mg/L).

**Issues to be addressed by the Company:**

1. Contech should collect maintenance and inspection data for the first year on all installations in the Northwest in order to assess standard maintenance requirements for various land uses in the region. Contech should use these data to establish required maintenance cycles.
2. Contech should collect pre-treatment chamber sediment depth data for the first year of operation for all installations in the Northwest. Contech will use these data to create a correlation between sediment depth and pre-filter clogging.

**Technology Description:**

Download at https://www.conteches.com/modular-wetlands

**Contact Information:**


Applicant: Jeremiah Lehman
Contech Engineered Solutions, LLC
11815 NE Glenn Widing Dr.
Portland, OR 97220
Jeremiah.Lehman@ContechES.com

Applicant website: http://www.conteches.com

Ecology web link: http://www.ecy.wa.gov/programs/wg/stormwater/newtech/index.html

Ecology: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
(360) 870-0983
douglas.howie@ecy.wa.gov


**Revision History**

| Date | Revision |
|---|---|
| June 2011 | Original use-level-designation document |
| September 2012 | Revised dates for TER and expiration |
| January 2013 | Modified Design Storm Description, added Revision Table, added maintenance discussion, modified format in accordance with Ecology standard |
| December 2013 | Updated name of Applicant |
| April 2014 | Approved GULD designation for Basic, Phosphorus, and Enhanced treatment |
| December 2015 | Updated GULD to document the acceptance of MWS – Linear Modular Wetland installations with or without the inclusion of plants |
| July 2017 | Revised Manufacturer Contact Information (name, address, and email) |
| December 2019 | Revised Manufacturer Contact Address |
| July 2021 | Added additional prefilter sized at 33 inches |
| August 2021 | Changed “Prefilter” to “Prefilter box” |
| November 2022 | Changed Contacts to Contech ES |
| January 2024 | Revised Dissolved Metals (Enhanced) to Metals |

**ATTACHMENT 2**
**BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES**

This is the cover sheet for Attachment 2.

☒Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.




LEGEND

HYDROMODIFICATION EXEMPT FLOW PATH

20' 0' 10' 20' 40'

SCALE: 1" = 20'

# 901 MISSION AVE

## ATTACHMENT 2
## HYDROMODIFICATION EXEMPT FLOW PATH

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500
fuscoe.com

JOB NO. 557-017

DRAWN BY: JGB

SHEET 1 of 1

## ATTACHMENT 3
## STRUCTURAL BMP MAINTENANCE INFORMATION

This is the cover sheet for Attachment 3.

**Indicate which Items are Included:**

| Attachment Sequence | Contents | Checklist |
|---|---|---|
| Attachment 3a | Structural BMP Maintenance Thresholds and Actions (Required) | ☒Included<br><br>See Structural BMP Maintenance Information Checklist. |
| Attachment 3b | Draft Maintenance Agreement (when applicable) | ☐Included<br>☒Not Applicable |

**Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:**

**Preliminary Design / Planning / CEQA level submittal:**

- Attachment 3a must identify:

☒Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual

- Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

**Final Design level submittal:**

Attachment 3a must identify:

☒Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
☒How to access the structural BMP(s) to inspect and perform maintenance
☒Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☒Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☒Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☒Recommended equipment to perform maintenance
☒When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
Attachment 3b: For private entity operation and maintenance, Attachment 3b shall include a draft maintenance agreement in the local jurisdiction's standard format (PDP applicant to contact the City Engineer to obtain the current maintenance agreement forms).

# CITY OF OCEANSIDE

# BEST MANAGEMENT PRACTICES OPERATIONS AND MAINTENANCE PLAN
## FOR PRIORITY PROJECTS

PROJECT NAME: 901 MISSION AVE

PARCEL NUMBER: 147-196-10

PROJECT NUMBER: 557-010

APPLICANT NAME: JPI

DATE: 5/17/2023

***Prepared for:***

City of Oceanside
Engineering Division
300 North Coast Hwy
Oceanside, CA 92054

Deemed Complete by the City of Oceanside
Engineering Division

Name:_____ Date: _____

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TABLE 2 BMP Operation and Maintenance Funding
TABLE 3 Source Control BMPs
TABLE 4 Drainage Management Areas
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1. Organizational Chart
2. Training Program
3. BMP Operation and Maintenance Funding Supplemental Information
4. LID BMPs Inspection Form
5. Source Control BMP Inspection Form
6. Site Map
7. Plans and Other Operation and Maintenance Requirements
8. Treatment Control BMP Inspection and Maintenance Checklist(s)
9. Maintenance Schedule
10. Service Agreement
11. Annual Inspection and Maintenance Reporting Form
12. Copy of Storm water facility maintenance Agreement (SWFMA)
13. Annual Maintenance Cost Estimate

## I. COMPLIANCE WITH STORMWATER BEST MANAGEMENT PRACTICES MAINTENANCE REQUIREMENTS

All applicants are responsible for ensuring that stormwater best management practices (BMPs) or facilities installed on their property are properly maintained and that they function as designed. Tenants shall be aware of their responsibilities regarding stormwater facility maintenance and need to be familiar with the contents of this Operations and Maintenance Plan (O&M Plan). Applicants have signed and agreed to a Standard Storm Water Facilities Maintenance Agreement with Access Rights and Covenants (SWFMA). All other maintenance agreements between the applicant and their maintenance employees associated with this property shall be included in Attachment 10.

## II. DESIGNATION RESPONSIBLE PARTIES

Responsible parties shall be designated and identified in Table 1.

- The Responsible BMP Party is individual, party, or parties that shall have direct responsibility for the maintenance of stormwater controls. This individual shall be the designated contact with City of Oceanside inspectors and should sign self-inspection reports and any correspondence regarding verification of inspections and required maintenance.

- The Duly Authorized Representative is the corporate officer authorized to negotiate and execute any contracts that might be necessary for future changes to operation and maintenance or to implement remedial measures if problems occur.

- The Designated Emergency Respondent is the party responsible for emergencies such as clogged drains, broken irrigation pipes, etc., that would require immediate response should they occur during off-hours.

**TABLE 1 - OWNERSHIP AND MAINTENANCE**

| | Name | Address | Phone / Email |
|---|---|---|---|
| Responsible BMP Party (if different than above) | JPI | 11988 El Camino Real Suite 200, San Diego, CA 92130 | (314) 302-2469 |
| Employees reporting to Responsible BMP Party | Conner Kloeppel | 11988 El Camino Real Suite 200, San Diego, CA 92130 | (314) 302-2469 |
| Duly Authorized Representative | Conner Kloeppel | | |
| Designated Emergency Respondent[1] | Conner Kloeppel | | |

[1] The Designated Emergency Respondent's phone number must be a cellular phone that is reachable 24 hours a day.

Updated contact information must be provided to City of Oceanside immediately whenever a property is sold and whenever designated individuals or contractors change.

A. Maintenance Personnel

Maintenance personnel including Responsible BMP Party, Employees Reporting to Responsible BMP Party, and the Designated Emergency Respondent, must be qualified to properly maintain stormwater BMPs (including treatment and flow-control facilities), especially for restoration or rehabilitation work. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs.

B. Organizational Chart

An organization chart showing the relationships of authority and responsibility between the individuals responsible for maintenance is provided in Attachment 1.

C. Training

Periodic training is conducted by the responsible BMP party for all personnel affiliated with the maintenance of stormwater BMPs. New staff and/or contractors training regarding the purpose, mode of operation, and maintenance requirements for the site's storm water facilities will be provided by the site. Necessary ongoing training for staff and/or contractors will also be provided. The site's Staff Training Program is described in Attachment 2.

| **TABLE 2<br>BMP OPERATION AND MAINTENANCE FUNDING** | |
|---|---|
| Sources of Funding | Site funding based on tenant leases |
| Budget Category for Expenditures | Operations & Maintenance |
| Process for establishing Annual O&M Budget | Budget based on other projects of similar size |
| Process for obtaining unexpected expenditures for major corrective activities | JPI |

D. BMP Maintenance Funding

The funding for BMP operation and maintenance shall be described in Table 2; including sources of funds, budget category for expenditures, process for establishing the annual operations and maintenance budget, and process for obtaining authority should unexpected expenditures for major corrective maintenance be required. Any supplemental information, including calculations and documentation shall be included in Attachment 3.

## III. LOW IMPACT DEVELOPMENT AND SITE DESIGN BMPS

Low Impact Development (LID) and Site Design BMPs have been incorporated into the project to minimize stormwater impacts. LID BMPs collectively minimize directly connected impervious area and promote infiltration on the project site. Site design BMPs are permanent measures and are similar to LID BMPs.

The LID and Site Design BMPs for the project which require maintenance are identified along with their locations, including Drainage Management Areas (DMAs), in the project SWQMP. A LID Inspection form for the site is provided in Attachment 4. In the event that a project use should change or maintenance considerations may require the site to become amended, Table 22 should be referenced for original site constraints and design guidelines.

## IV. SOURCE CONTROL BMPS

Source control BMPs have been selected for the project in order to minimize or prevent pollutant generation. The SWQMP and Table 4 of this O&M identifies the potential pollutant sources and corresponding permanent and operational source controls as well as their locations.

Source control BMPs should be inspected routinely in order to reduce or prevent pollution from accumulating in these areas. Routine inspections of the site's source controls are discussed in the site's maintenance schedule. Source control inspection forms are in Attachment 5.

| TABLE 3<br>SOURCE CONTROL BMPS | | | |
|---|---|---|---|
| **Potential Pollutant Sources** | **Description** | **Operational BMPs** | **Location** |
| ☐On-site storm drain inlets | • All inlets shall be marked with City of Oceanside storm drain markers | • Maintain and periodically replace inlet markers, as necessary.<br>• Review stormwater pollution prevention information applicable to the site.<br>• Adhere to applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com<br>• Do not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains. | No onsite inlets proposed, project drains to existing curb and gutter |
| ☒Interior floor drains and elevator shaft sump pumps | • Interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer. | • Inspect and maintain drains to prevent blockages and overflow.<br>• Regularly clear all associated cleanouts and hand holes. | See grading plans |
| ☒Interior parking garages | • Parking garage floor drains will be plumbed to the sanitary sewer. | • Inspect and maintain drains to prevent blockages and overflow. | See architectural and MEP plans |

| TABLE 3<br>SOURCE CONTROL BMPS | | | |
|---|---|---|---|
| **Potential Pollutant Sources** | **Description** | **Operational BMPs** | **Location** |
| ☒Landscape/ Outdoor Pesticide Use | • Final site landscape plans shall be placed in Attachment 7 and shall be used to maintain the following:<br>o Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.<br>o Minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.<br>o Where landscaped areas are used to retain or detain stormwater, maintain and replace, as necessary, plants that are tolerant of saturated soil conditions.<br>o Consider using pest-resistant plants, especially adjacent to hardscape.<br>o To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions. | • Maintain landscaping using a minimum amount of or no pesticides (consider the use of organic techniques).<br>• Review and adhere to applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com<br>• Review IMP information and provide to landscape and maintenance personnel. | All landscaping areas on site |
| ☒Use efficient irrigation systems | • Employ rain shutoff devices to prevent irrigation after precipitation.<br>• Design irrigation systems to each landscape area's specific water requirements.<br>• Use flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.<br>• Employ other comparable, equally effective, methods to reduce irrigation water runoff. | • Inspect irrigation system for leaks and/or malfunctions.<br>• Inspect that water usage is consistent with vegetation requirements.<br>• Inspect that irrigation shut-off controls operate correctly. | All landscaping areas on site |

| TABLE 3<br>SOURCE CONTROL BMPS | | | |
|---|---|---|---|
| **Potential Pollutant Sources** | **Description** | **Operational BMPs** | **Location** |
| ☒Need for future indoor & structural pest control | • Note building design features that discourage entry of pests. | • Review Integrated Pest Management information and provide to other maintenance personnel. | Within every building on site |
| ☒Pools, spas, ponds, decorative fountains, and other water features. | • Plumb pools to the sanitary sewer in accordance with local requirements. | • Review and adhere to applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | On level 3 and 8, see architectural plans |
| ☒Food service | • Describe the location and features of the designated cleaning area.<br>• Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated. | | On ground level at NW and NE corners of site |

| TABLE 3<br>SOURCE CONTROL BMPS | | | |
|---|---|---|---|
| **Potential Pollutant Sources** | **Description** | **Operational BMPs** | **Location** |
| ☒Refuse areas | • State how site refuse will be handled and provide supporting detail to what is shown on plans.<br>• Prohibitive signs shall be posted on or near dumpsters with the words “Do not dump hazardous materials here” or similar.<br>• Any drains from dumpsters, compactors, and bin areas shall be connected to a grease removal device before discharge to sanitary sewer. | • Provide adequate number of receptacles.<br>• Inspect receptacles regularly; repair or replace leaky receptacles.<br>• Keep receptacles covered at all times.<br>• Prohibit/prevent dumping of liquid or hazardous wastes.<br>• Post and replace, as necessary, “no hazardous materials” signs.<br>• Inspect and pick up litter daily and clean up spills immediately.<br>• Keep spill control materials available on-site. Review Fact Sheet SC-34, “Waste Handling and Disposal” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | |
| ☐Industrial processes. | • Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system in compliance with the applicable municipal waste water district’s requirements (include a copy of the waste acceptance letter from the agency accepting the waste in Attachment 10).<br>• Grade or berm area to prevent run-on from surrounding areas.<br>• Installation of storm drains in areas of equipment repair is prohibited.<br>• Implement other features which are comparable or equally effective. | • Review and adhere to Fact Sheet SC-10, “Non- Stormwater Discharges” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | |

| TABLE 3<br>SOURCE CONTROL BMPS | | | |
|---|---|---|---|
| **Potential Pollutant Sources** | **Description** | **Operational BMPs** | **Location** |
| ☐Outdoor storage of equipment or materials | • Comply with all requirements of local Hazardous Materials Programs for:<br>o Hazardous Waste Generation<br>o Hazardous Materials Release Response and Inventory<br>o California Accidental Release (CalARP)<br>o Aboveground Storage Tank<br>o Uniform Fire Code Article 80 Section 103(b) & (c) 1991<br>• Underground Storage Tank<br>• Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.<br>• Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site. | • Review and adhere to the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC- 33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | |
| | Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. | | |

| TABLE 3<br>SOURCE CONTROL BMPS | | | |
|---|---|---|---|
| **Potential Pollutant Sources** | **Description** | **Operational BMPs** | **Location** |
| ☐Vehicle and Equipment Cleaning | • If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.<br>• Equip wash area with a clarifier, grease trap or other pretreatment facility, as appropriate and properly connect to the sanitary sewer.<br>• Implement other features which are comparable or equally effective<br>• Commercial/ industrial facilities having vehicle/ equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.<br>• Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.<br>• Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed and permitted by proper regulatory authorities (attach permits in Attachment 10, as necessary). | • Follow operational measures to implement the following (if applicable):<br>o Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.<br>o Car dealerships and similar may rinse cars with water only.<br>o Review and adhere to Fact Sheet SC-21, “Vehicle and Equipment Cleaning,” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | . |

| TABLE 3<br>SOURCE CONTROL BMPS | | | |
|---|---|---|---|
| **Potential Pollutant Sources** | **Description** | **Operational BMPs** | **Location** |
| ☐ Vehicle/Equipment Repair and Maintenance | • No vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.<br>• An industrial waste discharge permit will be obtained. For floor drains connected to the sanitary sewer; design will meet the permitting agency's requirements.<br>• An industrial waste discharge permit will be obtained for tanks, containers or sinks to be used for parts cleaning or rinsing; design will meet the permitting agency's requirements.<br>• Accommodate all vehicle equipment repair and maintenance indoors or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.<br>• Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. | • The following restrictions apply to use the site:<br>○ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinse water from parts cleaning into storm drains.<br>○ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.<br>○ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. | |

| TABLE 3<br>SOURCE CONTROL BMPS | | | |
|---|---|---|---|
| **Potential Pollutant Sources** | **Description** | **Operational BMPs** | **Location** |
| ☐Fuel Dispensing Areas | • Fueling areas[1] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are:<br>○ Graded at the minimum slope necessary to prevent ponding<br>○ Separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.<br>• Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1]. The canopy [or cover] shall not drain onto the fueling area. | • The fueling area is to be dry swept routinely.<br>• Review and adhere to the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | |

[1] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

| TABLE 3<br>SOURCE CONTROL BMPS | | | |
|---|---|---|---|
| **Potential Pollutant Sources** | **Description** | **Operational BMPs** | **Location** |
| ☐Loading Docks | • Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.<br>• Provide a roof overhang over the loading area or install door skirts cowling) at each bay that enclose the end of the trailer.<br>• Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. | • Move loaded and unloaded items indoors as soon as possible.<br>• Review and adhere to Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | |
| ☐Fire Sprinkler Test Water | • Provide a means to drain fire sprinkler test water to the sanitary sewer. | • Review the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | |

| TABLE 3<br>SOURCE CONTROL BMPS | | | |
|---|---|---|---|
| **Potential Pollutant Sources** | **Description** | **Operational BMPs** | **Location** |
| ☐ Miscellaneous Drain or Wash Water<br>• Boiler drain lines Condensate drain lines<br>• Rooftop equipment Drainage sumps<br>• Roofing, gutters, and trim | • Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.<br>• Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.<br>• Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment.<br>• Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.<br>• Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. | | |
| ☐ Plazas, sidewalks, and parking lots | | • Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain. | |

## V. DRAINAGE AREAS

Table 5 summarizes the drainage management areas (DMAs) on site.

| TABLE 4<br>DRAINAGE MANAGEMENT AREAS | | |
|---|---|---|
| **DMA No.** | **Designation** | **Description** |
| 1 | DMA 1 | Entire site; BMP 1 |
| | | |
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| | | |

The site map in Attachment 6 shows the DMAs and their flow patterns. The map indicates, using flow patterns, how the flow from each DMA is routed to the corresponding storm water facility. Impervious and pervious areas are shown on the map.

## VI. STORMWATER TREATMENT CONTROL BMPS

Treatment control BMPs treating runoff from DMAs are summarized in Table 5.

| TABLE 5<br>STORMWATER TREATMENT CONTROL BMPS | | | |
|---|---|---|---|
| **Treatment Control BMP Type** | **Description** | **Size or Treatment Control BMP Capacity** | **Area Drained or Water Quality Flow** |
| MWS – 8-16 | Modular wetland for Pollutant Control | >4,377 CF (MWS 1) | 1.5 AC |
| | | | |
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The location and type of each of the project's stormwater facilities on site are shown on the site map in Attachment 6.
The as-built drawings[2], manufacturer's data, cut-sheets, manuals, and specific operation and maintenance requirements for each treatment control BMP shall be provided in Attachment 7.

[2] As-built drawings must be included after construction is complete.

# VII. INSPECTING STORMWATER BMPS

The quality of stormwater entering the waters of the U.S. or waters of the state relies heavily on the proper operation and maintenance of permanent BMPs. LID, source control, and treatment control stormwater BMPs must be periodically inspected to ensure that they are functioning as designed. Inspections will determine the appropriate maintenance that is required for the facility.

## A. Inspection Procedures

All stormwater treatment BMPs are required to be inspected a minimum of once per year. The Inspection and Maintenance Checklist(s) that is applicable to the site is provided in Attachment 8.

## B. Inspection Report

The person(s) conducting the inspection activities (Responsible BMP Party. Employees reporting to Responsible BMP Party, or the Designated Emergency Respondent) shall complete the appropriate inspection checklist for the specific facility. All completed checklists are located in Attachment 8. All facilities are to be inspected on an annual basis at a minimum. A copy of each inspection form shall be kept by the applicant a minimum of 5 years.

### Inspection Scoring

For each inspection item, a score is given to identify the urgency for any required maintenance. The scoring is as follows:

0 = No deficiencies identified.

1 = Monitor – Although maintenance may not be required at this time, a potential problem exists that will most likely need to be addressed in the future. This can include items like minor erosion, concrete cracks/spalling, or minor sediment accumulation. This item should be revisited at the next inspection.

2 = Routine Maintenance Required – Some inspection items can be addressed through the routine maintenance program. This can include items like vegetation management or debris/trash removal.

3 = Immediate Repair Necessary – This item needs immediate attention because failure is imminent or has already occurred. This could include items such as structural failure of a feature (outlet, weir, manhole, etc.), significant erosion, or significant sediment accumulation. This score should be given to an item that can significantly affect the function of the facility.

N/A = This is checked by an item that may not exist in a facility. Not all facilities have all of the features identified on the form (outlet, weir, manhole, etc.).

Overall Facility Rating

An overall rating is given for each facility inspected. The overall facility rating should correspond with the highest score (0, 1, 2, 3) given to any feature on the inspection form.

C. Verification of Inspection and Checklist Submittal

The Stormwater BMP Inspection and Maintenance Checklist (in Attachment 8) provides a record of inspections and the need for maintenance activities at the facility. Verification of the inspection of the stormwater facilities and the facility inspection checklist(s) shall be available to the City of Oceansideif requested.

## VIII. MAINTENANCE SCHEDULE FOR STORMWATER BMPS

A maintenance schedule for the stormwater source control and treatment control BMPs on site is provided in Attachment 9. Attachment 9 includes schedules for routine inspection and maintenance, annual inspection and maintenance, and inspection and maintenance after major storm events.

A service agreement with any contractors hired to perform stormwater treatment control BMP maintenance is also provided in Attachment 10.

## IX. MAINTAINING STORMWATER BMPS

Stormwater BMPs must be properly maintained to ensure that they operate correctly and provide the water quality treatment for which they were designed. Routine maintenance performed on a frequently scheduled basis, can help avoid more costly rehabilitative maintenance that results when facilities are not adequately maintained.

A. Maintenance Categories

Stormwater BMP maintenance programs are separated into three broad categories of work: routine, restoration, and rehabilitation. The categories are separated based upon the magnitude and type of the maintenance activities performed. A description of each category follows:

Routine Work

This work includes items such as the removal of debris/material that may be clogging the outlet structure well screens and trash racks. It also includes activities such as road and parking lot sweeping, weed control, mosquito treatment, and algae treatment. These activities normally will be performed

numerous times during the year. These items can be completed without any prior correspondence; however, inspection and maintenance forms shall be completed.

Restoration Work

This work consists of a variety of isolated or small-scale maintenance and work needed to address operational problems. Most of this work can be completed by a small crew, with minor tools, and small equipment. These items do not require prior correspondence. However, completed maintenance forms are required.

Rehabilitation Work

This work consists of large-scale maintenance and major improvements needed to address failures within the stormwater BMP. This work requires consultation with the City of Oceanside and may require an engineering design with construction plans to be prepared for review and approval.

B. Maintenance Forms

The Stormwater BMP Inspection and Maintenance Form provides a record of maintenance activities and includes general cost information to assist in budgeting for future maintenance. Maintenance Forms for each facility type are provided in Appendix 3. Maintenance Forms shall be completed by the responsible BMP party. The form shall then be reviewed by the applicant or an authorized agent of the applicant and made available for review upon inspection by the City of Oceanside.

## X. PREVENTATIVE MEASURES TO REDUCE MAINTENANCE COSTS

The most effective way to maintain a stormwater quality facility is to prevent pollutants from entering the facility. Common pollutants include sediment, trash & debris, chemicals, pet wastes, runoff from stored materials, illicit discharges into the storm drainage system and many others. This maintenance program includes measures to address these potential contaminants at the source and save time and money in the long run. The maintenance program will consider the following:

- Educate employees and patrons to be aware of how their actions affect water quality and how they can help reduce maintenance costs.
- Keep properties, streets, gutters, and parking lots free of trash, debris, and lawn clippings.
- Ensure the proper use, storage, and disposal of hazardous wastes and chemicals. Promptly clean up spilled materials and dispose of properly.

- Plan landscape care to minimize and properly use chemicals and pesticides.
- Sweep paved surfaces and put the sweepings back on the lawn.
- Be aware of automobiles leaking fluids. Use absorbents such as cat litter to soak up drippings – dispose of properly.
- Encourage pet owners to clean up pet wastes.
- Re-vegetate disturbed and bare areas to maintain vegetative stabilization.
- Clean any private storm drainage system components, including inlets, storm drains, and outfalls.
- Do not store materials outdoors (including landscaping materials) unless properly protected from runoff.

## XI. INSPECTION & MAINTENANCE – ANNUAL REPORTING

The tenant is responsible for providing verification that the stormwater treatment control BMPs have been properly inspected and maintained unless otherwise noted. Verification includes records of inspections and maintenance performed on site. Any maintenance required will be identified and described.
Records should be available at the City of Oceanside's request.

# ATTACHMENT 1

# ORGANIZATIONAL CHART

# DEVELOPMENT ORGANIZATION CHART



# ATTACHMENT 2

# TRAINING PROGRAM

# 901 MISSION AVE

## TRAINING / EDUCATIONAL LOG

Date of Training/Educational Activity: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

Training/Educational Activity

The following people have been trained on onsite facility maintenance and inspections per the O&M guidelines outlined in the following BMP fact sheets and maintenance manual.

| Name of Participant | Signature of Participant |
|---|---|
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# ATTACHMENT 3

# BMP OPERATION AND MAINTENANCE FUNDING SUPPLEMENTAL INFORMATION

# ATTACHMENT 4

# LID BMPS INSPECTION FORM

| LID BMP INSPECTION FORM | | | | | |
|---|---|---|---|---|---|
| **Date:** | **Inspector:** | | **Weather:** | | |
| **Reason for Inspection:** | | | **Comments:** | | |
| **LID BMP Type** | **Description** | **Location** | **Operational BMPs** | **Maintenance Required** | **Maintenance Performed/Comments** |
| ☐Bioretention | | | ☐Regularly weed and water during plant establishment phase | ☐No ☐ Yes | |
| | | | ☐Area is free of litter and excess sediment | ☐No ☐ Yes | |
| | | | ☐Area free of erosion and stabilized | ☐No ☐ Yes | |
| | | | ☐Plants are healthy and thriving | ☐No ☐ Yes | |
| | | | ☐Plant types are those from original design | ☐No ☐ Yes | |
| ☐Filter Strips | | | ☐Regularly weed and water during plant establishment phase | ☐No ☐ Yes | |
| | | | ☐Plants are healthy and thriving | ☐No ☐ Yes | |
| | | | ☐Area free of erosion and stabilized | ☐No ☐ Yes | |
| | | | ☐Area is free of litter and excess sediment | ☐No ☐ Yes | |
| | | | ☐Plant types are those from original design | ☐No ☐ Yes | |
| | | | ☐Flow spreader is free of debris and is not clogged | ☐No ☐ Yes | |

| **LID BMP INSPECTION FORM** | | | | | |
|---|---|---|---|---|---|
| **Date:** | **Inspector:** | | **Weather:** | | |
| **Reason for Inspection:** | | | **Comments:** | | |
| **LID BMP Type** | **Description** | **Location** | **Operational BMPs** | **Maintenance Required** | **Maintenance Performed/Comments** |
| ☐Vegetated Buffers | | | ☐Regularly weed and water during plant establishment phase | ☐No ☐ Yes | |
| | | | ☐Plants are healthy and thriving | ☐No ☐ Yes | |
| | | | ☐Area free of erosion and stabilized | ☐No ☐ Yes | |
| | | | ☐Area is free of litter and excess sediment | ☐No ☐ Yes | |
| | | | ☐Plant types are those from original design | ☐No ☐ Yes | |
| | | | ☐Flow spreader is free of debris and is not clogged | ☐No ☐ Yes | |
| ☐Bioswale/Grassed Swale | | | ☐Regularly weed and water during plant establishment phase | ☐No ☐ Yes | |
| | | | ☐Plants are healthy and thriving | ☐No ☐ Yes | |
| | | | ☐Area free of erosion and stabilized | ☐No ☐ Yes | |
| | | | ☐Area is free of litter and excess sediment | ☐No ☐ Yes | |
| | | | ☐Plant types are those from original design | ☐No ☐ Yes | |
| ☐Green Roofs | | | ☐Regularly weed and water during plant establishment phase | ☐No ☐ Yes | |

| **LID BMP INSPECTION FORM** | | | | | |
|---|---|---|---|---|---|
| **Date:** | **Inspector:** | | **Weather:** | | |
| **Reason for Inspection:** | | | **Comments:** | | |
| **LID BMP Type** | **Description** | **Location** | **Operational BMPs** | **Maintenance Required** | **Maintenance Performed/Comments** |
| ☐*Green Roofs Cont'd* | | | ☐Plants are healthy and thriving | ☐No ☐ Yes | |
| ☐Rain Barrels / Cisterns | | | ☐Roof catchment and gutters are free of debris and sediment | ☐No ☐ Yes | |
| | | | ☐Downspouts are free of leaks and obstructions | ☐No ☐ Yes | |
| | | | ☐Rain barrel, top, and seal are free of leaks | ☐No ☐ Yes | |
| | | | ☐Overflow pipe is not causing erosion | ☐No ☐ Yes | |
| ☐Porous Pavement | | | ☐Pavement is free of debris and sediment | ☐No ☐ Yes | |
| | | | ☐Pavement is swept monthly | ☐No ☐ Yes | |
| | | | ☐Pavement is in good condition and stabilized | ☐No ☐ Yes | |
| | | | ☐Area is dry swept regularly | ☐No ☐ Yes | |
| ☐Soil Structure Enhancement (use of compost) | | | ☐Area is protected from compaction | ☐No ☐ Yes | |
| | | | ☐Limited foot traffic | ☐No ☐ Yes | |
| | | | ☐2 to 1 ratio of compost soil and existing soil is present | ☐No ☐ Yes | |

# ATTACHMENT 5

# SOURCE CONTROL BMP INSPECTION FORM

## SOURCE CONTROL BMP INSPECTION FORM

| **Date:** | **Inspector:** | **Weather:** |
|---|---|---|
| **Reason for Inspection:** | | **Comments:** |

| **Potential Pollutant Sources** | **Location** | **Operational BMPs** | **Maintenance Required** | **Maintenance Performed/Comments** |
|---|---|---|---|---|
| ☐On-site storm drain inlets | | ☐Maintain and periodically replace inlet markers, if necessary. | ☐No ☐ Yes | |
| | | ☐Review stormwater pollution prevention information applicable to the site. | ☐No ☐ Yes | |
| | | ☐Adhere to applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | ☐No ☐ Yes | |
| | | ☐Do not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains. | ☐No ☐ Yes | |
| ☒Interior floor drains and elevator shaft sump pumps | | ☐Inspect and maintain drains to prevent blockages and overflow. | ☐No ☐ Yes | |
| ☒Interior parking garages | | ☐Inspect and maintain drains to prevent blockages and overflow. | ☐No ☐ Yes | |
| ☒Landscape/ Outdoor Pesticide Use | | ☐Maintain landscaping using minimum or no pesticides. | ☐No ☐ Yes | |
| | | ☐Review and adhere to applicable operational BMPs in Fact Sheet SC-41, `"Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | ☐No ☐ Yes | |

## SOURCE CONTROL BMP INSPECTION FORM

| **Date:** | **Inspector:** | **Weather:** |
|---|---|---|
| **Reason for Inspection:** | | **Comments:** |

| **Potential Pollutant Sources** | **Location** | **Operational BMPs** | **Maintenance Required** | **Maintenance Performed/Comments** |
|---|---|---|---|---|
| *Landscape/Outdoor pesticide Use Continued* | | ☐Review IMP information and provide to landscape and maintenance personnel. | ☐No ☐ Yes | |
| ☒Use efficient irrigation systems | | ☐Inspect irrigation system for leaks and/or malfunctions. | ☐No ☐ Yes | |
| ☒Need for future indoor & structural pest control | | ☐Review Integrated Pest Management information and provide to other maintenance personnel. | ☐No ☐ Yes | |
| ☒Pools, spas, ponds, decorative fountains, and other water features. | | ☐Review and adhere to applicable operational BMPs in Fact Sheet SC-72, “Fountain and Pool Maintenance,” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | ☐No ☐ Yes | |
| ☒Food service | | ☐Grease traps cleaned, as necessary.<br>☐See Refuse Areas. | ☐No ☐ Yes | |
| ☒Refuse areas | | ☐Provide adequate number of receptacles. | ☐No ☐ Yes | |
| | | ☐Inspect receptacles regularly; repair or replace leaky receptacles. | ☐No ☐ Yes | |
| | | ☐Keep receptacles covered at all times. | ☐No ☐ Yes | |
| | | ☐Prohibit/prevent dumping of liquid or hazardous wastes. | ☐No ☐ Yes | |
| | | ☐Post “no hazardous materials” signs. | ☐No ☐ Yes | |

## SOURCE CONTROL BMP INSPECTION FORM

| **Date:** | **Inspector:** | **Weather:** |
|---|---|---|
| **Reason for Inspection:** | | **Comments:** |

| **Potential Pollutant Sources** | **Location** | **Operational BMPs** | **Maintenance Required** | **Maintenance Performed/Comments** |
|---|---|---|---|---|
| *Refuse areas- Continued* | | ☐Inspect and pick up litter daily and clean up spills immediately. | ☐No ☐ Yes | |
| | | ☐Keep spill control materials available on- site. Review Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | ☐No ☐ Yes | |
| ☐Industrial processes. | | ☐Review and adhere to Fact Sheet SC-10, "Non- Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | ☐No ☐ Yes | |
| ☐Outdoor storage of equipment or materials | | ☐Review and adhere to the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC- 33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | ☐No ☐ Yes | |
| ☐Vehicle and Equipment Cleaning | | **Follow operational measures to implement the following (if applicable):** | | |
| | | ☐Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. | ☐No ☐ Yes | |

## SOURCE CONTROL BMP INSPECTION FORM

| **Date:** | **Inspector:** | **Weather:** |
|---|---|---|
| **Reason for Inspection:** | | **Comments:** |

| **Potential Pollutant Sources** | **Location** | **Operational BMPs** | **Maintenance Required** | **Maintenance Performed/Comments** |
|---|---|---|---|---|
| *Vehicle and Equipment Cleaning Continued* | | ☐Car dealerships and similar may rinse cars with potable water only. Any excess water shall be drained through landscaping and dechlorinated prior to discharge to the storm drain system. | ☐No ☐ Yes | |
| | | ☐Review and adhere to Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | ☐No ☐ Yes | |
| ☐Vehicle/Equipment Repair and Maintenance | | **The following restrictions apply to use the site:** | | |
| | | ☐No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinse water from parts cleaning into storm drains. | ☐No ☐ Yes | |
| | | ☐No vehicle fluid removal shall be performed outside a building, Nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. | ☐No ☐ Yes | |

## SOURCE CONTROL BMP INSPECTION FORM

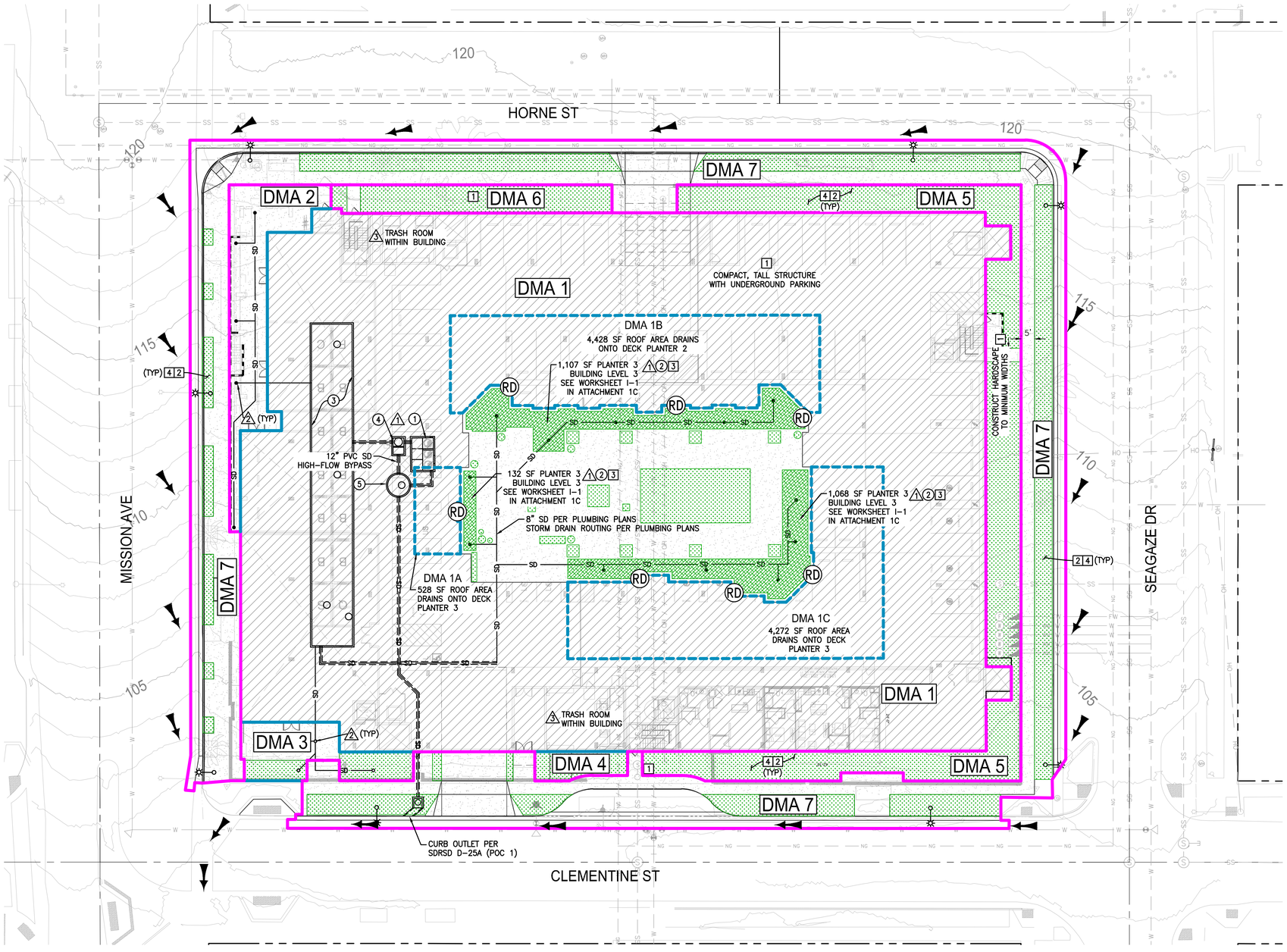
| **Date:** | **Inspector:** | **Weather:** |
|---|---|---|
| **Reason for Inspection:** | | **Comments:** |

| **Potential Pollutant Sources** | **Location** | **Operational BMPs** | **Maintenance Required** | **Maintenance Performed/Comments** |
|---|---|---|---|---|
| *Vehicle/Equipment Repair and Maintenance Continued* | | ☐No person shall leave unattended drip parts or other open containers of chemicals such as vehicle fluid, unless such containers are in use or in an area of secondary containment. | ☐No ☐ Yes | |
| ☐Fuel Dispensing Areas | | ☐The fueling area is to be dry swept routinely. | ☐No ☐ Yes | |
| | | ☐Review and adhere to the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | ☐No ☐ Yes | |
| | | ☐Fueling areas are covered by a canopy. | ☐No ☐ Yes | |
| | | ☐The canopy does not drain onto the fueling area. | ☐No ☐ Yes | |
| | | ☐Grading of the area prevents run-on of stormwater to the maximum extent practicable. | ☐No ☐ Yes | |
| ☐Loading Docks | | ☐Move loaded and unloaded items indoors as soon as possible. | ☐No ☐ Yes | |
| | | ☐Review and adhere to Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | ☐No ☐ Yes | |

| **SOURCE CONTROL BMP INSPECTION FORM** | | | | |
|---|---|---|---|---|
| **Date:** | **Inspector:** | | **Weather:** | |
| **Reason for Inspection:** | | | **Comments:** | |
| **Potential Pollutant Sources** | **Location** | **Operational BMPs** | **Maintenance Required** | **Maintenance Performed/Comments** |
| ☒Fire Sprinkler Test Water | | ☐Review the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com | ☐No ☐ Yes | |
| ☒Miscellaneous Drain or Wash Water<br>• Boiler drain lines Condensate drain lines<br>• Rooftop equipment Drainage sumps<br>• Roofing, gutters, and trim | | | ☐No ☐ Yes | |
| ☒Plazas, sidewalks, and parking lots | | ☐Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain. | ☐No ☐ Yes | |

# ATTACHMENT 6

# SITE MAP




20' 0' 10' 20' 40'

SCALE: 1" = 20'

## ATTCHMENT 1b - TABULAR SUMMARY OF ONSITE DMAs

| DMA | TOTAL AREA (AC) | TOTAL AREA (SF) | PERVIOUS AREA (SF) | IMPERVIOUS AREA - ROOFS, CONCRETE (SF) | % IMPERVIOUS | WATER QUALITY WEIGHTED AREA (SF) | WEIGHTED C FACTOR | INITIAL DCV (CF) | POLLUTANT CONTROL TREATMENT METHOD |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.96 | 41,963 | 1,160 | 40,803 | 97% | 45,375 | 0.85 | 2,231 | BMP 1 (MWS) |
| 1A | 0.02 | 660 | 132 | 528 | 80% | | | | BMP 1 (MWS) |
| 1B | 0.13 | 5,535 | 1,107 | 4,428 | 80% | | | | BMP 1 (MWS) |
| 1C | 0.12 | 5,340 | 1,068 | 4,272 | 80% | | | | BMP 1 (MWS) |
| 2 | 0.04 | 1,802 | 0 | 1,802 | 100% | 1,622 | 0.90 | 80 | BMP 1 (MWS) |
| 3 | 0.03 | 1,113 | 387 | 726 | 65% | 692 | 0.62 | 34 | BMP 1 (MWS) |
| 4 | 0.01 | 332 | 0 | 0 | 0% | 0 | 0.00 | 0 | SELF MITIGATING |
| 5 | 0.12 | 5,070 | 4,900 | 170 | 3% | 643 | 0.13 | 32 | SELF MITIGATING |
| 6 | 0.02 | 1,075 | 1,023 | 52 | 5% | 149 | 0.14 | 7 | SELF MITIGATING |
| TOTALS | 1.44 | 62,890 | 9,777 | 52,781 | 84% | 48,481 | 0.77 | 2,384 | |

## ATTCHMENT 1b - TABULAR SUMMARY OF OFFSITE DMAs

| DMA | TOTAL AREA (AC) | TOTAL AREA (SF) | PERVIOUS AREA (SF) | IMPERVIOUS AREA - ROOFS, CONCRETE (SF) | % IMPERVIOUS | WATER QUALITY WEIGHTED AREA (SF) | WEIGHTED C FACTOR | INITIAL DCV (CF) | POLLUTANT CONTROL TREATMENT METHOD |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 0.41 | 18,017 | 4,563 | 13,454 | 75% | 12,565 | 0.70 | 618 | Existing Green Street Features on Mission Ave |
| TOTALS | 0.41 | 18,017 | 4,563 | 13,454 | 75% | 12,565 | 0.70 | 618 | |

NOTE:
RUNOFF FORM ALL DRAINAGE MANAGEMENT AREAS ARE COLLECTED AND CONVEYED TO A POLLUTANT CONTROL BMP 1 (BF-3) LOCATED ON ABOVE GROUND PARKING LEVEL 2. FLOWS FROM THE BMP WILL BE DISCHARGED OUT VIA A PROPOSED CURB OUTLET ON CLEMENTINE ST AND ULTIMATELY CONFLUENCES WITH THE PUBLIC STORM DRAIN SYSTEM AT THE EXISTING CURB INLET AT THE CORNER OF MISSION AVE AND COAST HIGHWAY.

## LEGEND

- RIGHT-OF-WAY
- STREET CENTERLINE
- ONSITE DRAINAGE MANAGEMENT AREA (DMA) LIMITS
- OFFSITE DRAINAGE MANAGEMENT AREA (DMA) LIMITS
- 260 EXISTING CONTOUR
- PERVIOUS AREA
- LANDSCAPE PLANTER TO MEET VOLUME RETENTION REQUIREMENTS
- HARDSCAPE (IMPERMEABLE)
- ROOF (IMPERMEABLE)
- FLOW DIRECTION
- BIOFILTRATION UNIT, BF-3
- SD BUILDING DRAINAGE SYSTEM (SHOWN DIAGRAMMATICALLY)
- RD ROOF DRAIN DOWN SPOUT TO PLANTER

## PERMANENT STORM WATER BMP NOTES

1. POLLUTANT CONTROL BMP (BF-1, BIOFILTRATION UNIT)
   MODULAR WETLAND SYSTEM
   MODEL NO. MWS-L-8-16
   (AT LEVEL B2 – UNDERGROUND PARKING)
   TREATMENT FLOWRATE PROVIDED: 0.462 CFS
   SEE DETAIL ON DETAIL SHEET
2. IMPERVIOUS AREA DISPERSION BMPs (SD-B)
   SEE LANDSCAPE PLANTER DETAIL ON DETAIL SHEET
3. UNDERGROUND DETENTION VAULT (HMP 1)
   (AT LEVEL B1 – UNDERGROUND PARKING)
   VOLUME PROVIDED: 5,625 CF
   SEE DETAIL ON DETAIL SHEET
4. STORM DRAIN CLEANOUT W/ HIGH-FLOW BYPASS WEIR
   (AT LEVEL B2 – UNDERGROUND PARKING)
5. PUMP (AT LEVEL B2)
   SEE DETAIL ON DETAIL SHEET

## SITE DESIGN BMPs

1. SD-3 MINIMIZE IMPERVIOUS AREA
2. SD-4 MINIMIZE SOIL COMPACTION
3. SD-5 IMPERVIOUS AREA DISPERSION
4. SD-7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

## SOURCE CONTROL BMPs

1. SC-1 PREVENTION OF ILLICIT DISCHARGE INTO THE MS-4
2. SC-2 STORM DRAIN STENCILING OR SIGNAGE
3. SC-5 PROTECT TRASH STORAGE AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL

## PROJECT SITE INFO

UNDERLYING HYDROLOGIC SOIL: D
APPROXIMATE DEPTH TO GROUNDWATER: >20 FT
EXISTING NATURAL HYDROLOGIC FEATURES (WATERCOURSES, SEEPS, SPRINGS, WETLANDS): NONE
CRITICAL COARSE SEDIMENT YEILD AREAS TO BE PROTECTED: NONE
EXISTING IMPERVIOUS AREA: 4,400 SF
DISTURBED AREA (ONSITE ONLY): 64,150 SF
PROPOSED IMPERVIOUS AREA: 53,558 SF
PROPOSED PERVIOUS AREA: 10,592 SF

## DESIGN CAPTURE VOLUME

SEE WORKSHEET B.1 INCLUDED IN ATTACHMENT 1C OF THIS REPORT FOR DESIGN CAPTURE VOLUME CALCULATION.

# 901 MISSION AVE

## ATTACHMENT 1a & 1b
## DMA EXHIBIT

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500
fuscoe.com

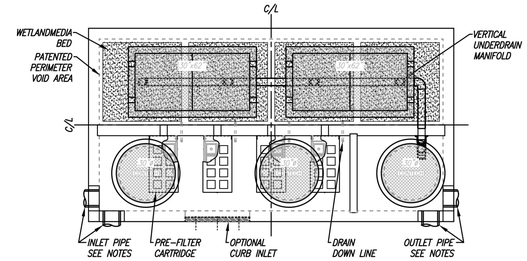
JOB NO. 557-017
DRAWN BY: JGB
SHEET 1 of 3

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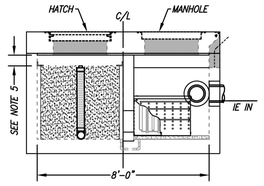
## SITE SPECIFIC DATA

| | | | |
|---|---|---|---|
| PROJECT NUMBER | | 557-017 | |
| PROJECT NAME | | 901 Mission Ave | |
| PROJECT LOCATION | | Oceanside, CA | |
| STRUCTURE ID | | BMP 1 | |
| TREATMENT REQUIRED | | | |
| TREATMENT FLOW (CFS) | | | 0.405 |
| PRETREATMENT LOADING RATE (GPM/SF) | | | 2.1 GPM/SF |
| WETLAND MEDIA LOADING RATE (GPM/SF) | | | 1.0 |
| PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE | | | OFFLINE |
| PIPE DATA | I.E. | MATERIAL | DIAMETER |
| INLET PIPE 1 | | | |
| INLET PIPE 2 | | | |
| OUTLET PIPE | | | |
| | PRETREATMENT | BIOFILTRATION | DISCHARGE |
| RIM ELEVATION | | 83.67 | |
| SURFACE LOAD | OTHER | | |
| NOTES: | | | |

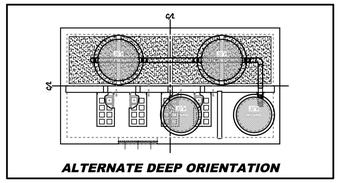
* PRELIMINARY ONLY - NOT FOR CONSTRUCTION



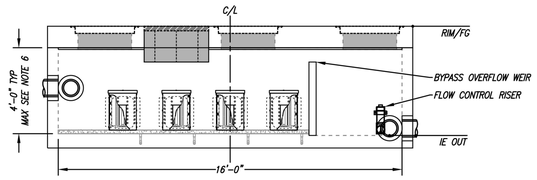

**PLAN VIEW**



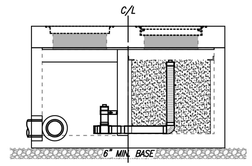

**LEFT END VIEW**




**ALTERNATE DEEP ORIENTATION**




**ELEVATION VIEW**




**RIGHT END VIEW**

## INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
4. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.
5. ALTERNATE DEEP FRAME & COVER ORIENTATION USED WHEN CEILING TO MEDIA DISTANCE IS 2.5' OR GREATER.
6. VERTICAL HEIGHT VARIES BASED ON SITE SPECIFIC REQUIREMENTS.

R:\LA\DASCOTT\SEITECH

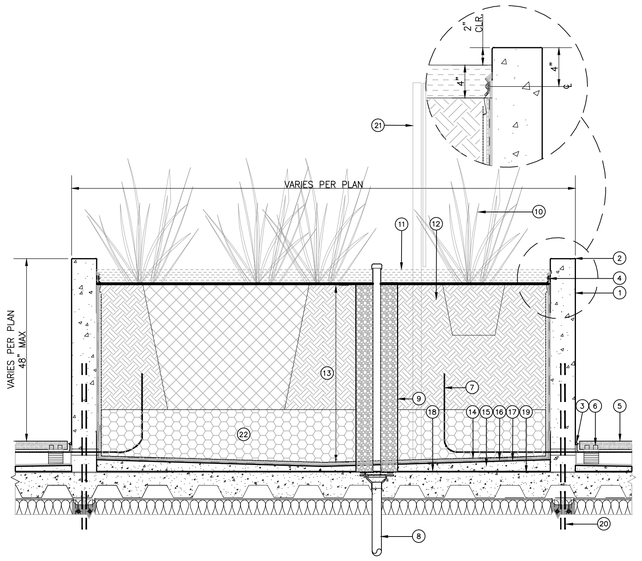
MODULAR WETLANDS — FOR PATENT INFORMATION, GO TO www.Contech5.com/IP

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CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com

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

BMP 1 - MODULAR WETLAND SYSTEM (BIOFILTRATION)
NOT TO SCALE




DETAIL: VOLUME RETENTION - RAISED LANDSCAPE PLANTER SECTION
NOT TO SCALE

NOTES:

1. C.I.P. CONCRETE WALL, COLOR AND FINISH PER HARDSCAPE LEGEND. WALL PER STRUCTURAL DETAIL
2. 1/4" TOOLED RADIUS ON ALL EXPOSED CONCRETE EDGES
3. TERMINATION BAR PER ARCHITECTURE DETAIL
4. STAINLESS STEEL REGLET & COUNTER FLASHING PER ARCHITECTURE DETAIL
5. PEDESTAL PAVER SYSTEM PER ARCHITECT
6. ADJUSTABLE PEDESTAL PER ARCHITECT
7. IRRIGATION PVC LATERAL LINE WITH PVC MALE ADAPTER BY IRRIGATION CONTRACTOR, SEE IRRIGATION DRAWINGS
8. PLANTER DRAIN ASSEMBLY PER PLUMBING
9. INSPECTION PORT, TYPICAL FOR ALL PLANTER DRAINS, PER ARCHITECT'S DRAWINGS
10. PLANTING PER PLANTING PLAN
11. MULCH LAYER PER PLAN AND SPECIFICATION
12. AMENDED SOIL MIX PER SPECIFICATIONS
13. CLEAR SOIL DEPTH IS DEFINED BY DISTANCE FROM TOP OF DRAINAGE PROTECTION BOARD TO TERMINUS OF WATERPROOFING PER ARCHITECT
14. FILTER FABRIC PER SPECIFICATIONS
15. DRAINAGE BOARD PER ARCHITECT
16. ROOT BARRIER, CLIP TO FLASHING
17. AIR/PROTECTION LAYER PER ARCHITECT
18. WATER PROOFING LAYER PER ARCHITECT
19. FOAM BLOCKING AS NEEDED AT SHRUB PLANTING
20. FOOTING AND REINFORCEMENT TO STRUCTURAL DECK PER STRUCTURAL
21. SCREEN WALL PER HARDSCAPE PLAN AND LEGEND
22. PLASTIC WATER HOLDING CELL FOR DRAINAGE MITIGATION PER WATERPROOFING CONSULTANT, 12" MIN. DEPTH PER CIVIL CALCULATIONS

901 MISSION AVE

ATTACHMENT 1a & 1b
DMA DETAILS

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500 fuscoe.com

JOB NO. 557-017
DRAWN BY: JGB
SHEET 2 of 3

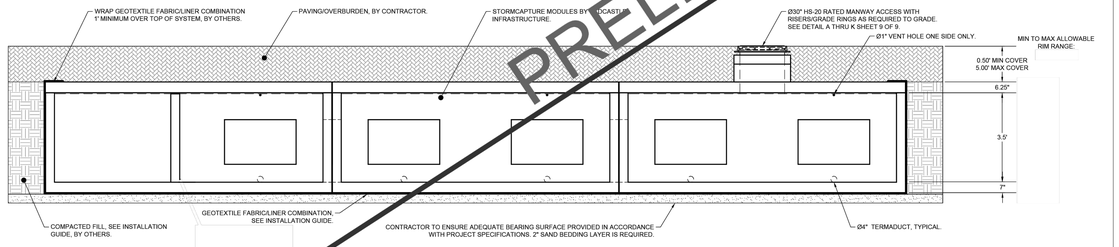
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REVIEWING NOTES

1. THIS SYSTEM HAS BEEN DESIGNED PER THE DESIGN PARAMETERS SPECIFIED IN THE DESIGN NOTES. REVIEWING ENGINEER SHALL VERIFY THAT THESE PARAMETERS MEET OR EXCEED PROJECT SPECIFIC REQUIREMENTS. IF SITE CONDITIONS DIFFER FROM NOTED DESIGN PARAMETERS, REVIEWING ENGINEER SHALL NOTIFY OLDCASTLE FOR POTENTIAL REDESIGN AND/OR PRICING ADJUSTMENTS.
2. REVIEWING ENGINEER SHALL VERIFY ALL PIPE PENETRATION LOCATIONS, SIZES, AND INVERTS.
3. REVIEWING ENGINEER SHALL VERIFY ALL MANWAY ACCESS LOCATIONS AND RIM ELEVATIONS.
4. THIS SYSTEM IS DESIGNED FOR A GROUNDWATER TABLE ELEVATION PER NOTE 2C, SHEET 1. REVIEWING ENGINEER SHALL VERIFY THAT THE DESIGN GROUNDWATER ELEVATION MEETS OR EXCEEDS SITE CONDITION REQUIREMENTS. NOTIFY OLDCASTLE IF SITE CONDITIONS VARY FROM WHAT HAS BEEN SPECIFIED FOR POTENTIAL SYSTEM DESIGN CHANGES AND/OR PRICING ADJUSTMENTS.
5. THIS SYSTEM HAS BEEN DESIGNED WITH A CONTAINMENT MEMBRANE. IF WATERTIGHT REQUIREMENTS ARE NOT NEEDED, REVIEWING ENGINEER SHALL NOTIFY OLDCASTLE FOR POTENTIAL DESIGN CHANGES AND/OR PRICING ADJUSTMENTS.
6. DESIGN OF THE STORMCAPTURE PRECAST MODULE SYSTEM ASSUMES NO ADJACENT BUILDING(S), WALL(S), OR STRUCTURAL FOUNDATION(S) WITHIN A 1:1 INFLUENCE LINE FROM THE BOTTOM EDGE OF ANY SYSTEM MODULE. ANY SITE ELEMENTS BEYOND THIS ZONE OF INFLUENCE ARE ASSUMED TO HAVE NO IMPACT ON THE SYSTEM AND EXERT ZERO LATERAL SURCHARGE ONTO THE MODULES. THE CONTRACTOR SHALL VERIFY THAT ANY ADJACENT BUILDING(S), WALL(S), OR STRUCTURAL FOUNDATION(S) DO NOT LIE WITHIN THIS INFLUENCE ZONE OR DO NOT SURCHARGE THE PRECAST MODULES.
7. WRITTEN APPROVAL OF SUBMITTAL DRAWINGS ALONG WITH SIGNED PURCHASE ORDER REQUIRED FOR BEGINNING OF PRODUCT FABRICATION. ANY SYSTEM MODIFICATION POST-APPROVAL MAY RESULT IN CHANGE ORDER(S) AND/OR POTENTIAL DELIVERY DELAYS.
8. ALL SAND FILTER MEDIA, DRAIN ROCK AGGREGATE, PIPE, AND FITTINGS PROVIDED BY CONTRACTOR.

PRELIMINARY

WATERPROOFING BY OTHERS




TYPICAL ELEVATION
NTS

NOTE:
TERMADUCT INSERTS TO BE KNOCKED OUT AT SPECIFIED LOCATIONS ONLY (BY OTHERS).

VOLUMES
Storage Volume Required: 5,356 cf
Storage Volume Provided: 5,625 cf
(~375cf volume per unit)

| REV | DESCRIPTION | DATE |
|---|---|---|

Oldcastle Infrastructure
A CRH COMPANY
Ph: 800.579.8019 | www.oldcastleinfrastructure.com/stormwater

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| STORMCAPTURE ® DETENTION SYSTEM | DETAIL # HMP-1 |
|---|---|

Detention/ Infiltration

HMP 1 - UNDERGROUND DETENTION VAULT
NOT TO SCALE

**PACKAGED TRIPLEX LIFT STATION -**
**MANUFACTURED BY PACIFIC SOUTHWEST INDUSTRIES**

Lift Station model #PSI-TWE072221 as manufactured by Pacific Southwest Industries (national phone # 800-358-9095)

**NOTE: Due to the specific nature of this pump station/ equipment and its operational sequence, any contractor not intending to purchase and supply as specified, by model number, must provide full submittals for review and approval prior to ordering, no exceptions. send full submittals to, www.submittalapproval.com, allow one week for a response.**

The pre-packaged Lift Station shall incorporate a quick removal system manufactured by the pump manufacturer. The pump(s) shall be guided to the discharge base elbow by stainless steel guide rails. The rails shall extend from the discharge base elbow to the upper guide bracket mounted on fiberglass channel just below the basin cover. Stainless steel lifting chain or cable shall be supplied and properly installed to remove the pump from the wet well. The internal discharge piping shall be completely pre-plumbed in PVC pipe and extend 12" beyond the wet well side wall for contractor connection to the force main piping. The pump(s) discharge pipe shall have a check and ball valve installed on each discharge line. The Lift Station shall include three liquid level controls on a removable float tree and a control panel suitable for surface mounting. The pump(s), quick removal system and the level sensors shall be housed in a fiberglass wet well (basin) and shall be of sufficient length to maintain the rim of the wet well at grade.

**PUMP(S):HIGH FLOW/100YR EVENT**

Pump performance shall not exceed 1,360 GPM at 13.74 TDH.

**MATERIALS OF CONSTRUCTION:**
All major parts of the pumping unit(s) including casing, Impeller, discharge elbow, and motor frame shall be manufactured from gray cast iron, ASTM A48 CLASS 35B. Internal and external surfaces coming into contact with the pumpage shall be protected by a fused polymer coating. All exposed fasteners shall be stainless steel. All units shall be furnished with a discharge elbow with 125 lb. ANSI B16.1 flat face discharge port. Impellers shall be of the enclosed solids handling design and shall be slip fit to the shaft and key driven.

**MECHANICAL SEAL:**
All units shall be furnished with a dual tandem mechanical shaft seal located completely out of the pumpage, running in a separate oil filled chamber and further protected by an exclusionary oil seal located between the bottom seal faces and the fluid being pumped. silicon carbide/silicon carbide pump side and carbon/silicon carbide bearing side Mechanical seals shall be rated to preclude the incursion of water up to 42.6 PSI. (98.4 Ft.). Units shall be equipped with seal failure probes that will be required to be installed to the. Mechanical seal hardware shall be stainless steel.

**PUMP MOTORS:**
The main pump motor(s) shall be 9 HP, 230V, 60 Hz, 3 Phase and shall be NEMA MG-1, Design Type B equivalent. Motor(s) shall be rated at 23 full load amps. Motor(s) shall have a 1.15 service factor and shall be rated for 30 starts per hour. Motor(s) shall be air filled, copper wound, class H insulated with built in SensThermNo thermal protection for each winding. Motor shall shall be 420 stainless steel and shall be supported by two permanently lubricated, high temperature ball bearings.

**POWER CABLE AND CABLE ENTRANCE:**
The pump power cable shall be suitable for submersible pump applications and shall be field replaceable utilizing standard submersible pump cable. The cable entrance shall incorporate built in strain relief and a combination three way mechanical compression sealing with a fatigue reducing/thermal expansion boot. The cable entrance assembly shall contain an anti-wicking block to eliminate water incursion into the motor due to capillary wicking should the power cable be accidentally damaged.

**QUICK REMOVAL SYSTEM:**
The pumping unit(s) shall be equipped with quick removal system (QRS). The construction shall be such that the pump(s) will automatically connect to the discharge piping when lowered into place on the discharge connector. There shall be no need for personnel to enter the wet well to accomplish installation or removal of the pump(s). The pumping unit(s) shall be fitted with stainless steel lifting chain(s) of sufficient length and strength to permit the raising and lowering of the unit(s). The chain(s) shall be fastened at the top of the structure near the access opening. All parts of the QRS system including base elbow, sliding guide bracket, and guide support shall be manufactured from recyclable, application appropriate resins. The need for a protective coating shall not be required. A sliding guide bracket shall be an integral part of the pumping unit and the pump casing shall have a machined connection with a bracket to connect with the discharge connection. Sealing of the pumping unit to the discharge connection shall be accomplished by a single linear downward motion of the pump with the entire weight of the pumping unit guided by a pawl, thereby wedging the pumping unit tightly against the discharge connector. No portion of the pump shall bear directly on the floor of the sump nor shall a rotary motion of the pump be required for sealing. All fasteners coming into contact with the pumpage shall be stainless steel. Two corrosion resistant guide pipes shall be furnished and installed for each pump to permit raising and lowering of the pump. Guide cables shall be inch diameter and shall be of adequate length to extend from the lower guide holder to the upper guide bar bracket(s) mounted on the access frame.

**DUPLEX ALTERNATING CONTROL PANEL:**
The control panel shall have a NEMA 3R door in -door dead front lockable steel enclosure suitable for pedestal installation. A motor circuit protector shall be provided for each pump and magnetic starter with three leg overload protection for each pump. A Smart relay shall be provided with automatic load selector to alternate pumps on each successive cycle of operation, exercise timers, elapsed time meters, and cycle counters. The starter shall have auxiliary contacts to operate both pumps in an override condition. The control circuit shall not be affected in the event that either pump trips the pump circuit breaker. H.O.A. switches and run lights shall be supplied for each pump. A inner door disconnect shall be provided to terminate all incoming power, pump level sensors and remote alarm wiring. A 120VA control transformer shall be provided to supply reduced voltage to the control circuit of 120 Volts. The control panel shall offer a high water alarm light, top mounted for 360 degree visibility. An external push button shall be provided to silence the audible alarm. U.L. 508 listed shop wired, non-powered contact shall be supplied in the main control panel to interface with the owners computerized security system. This contact is to normally open. The contact will close when the high level alarm float is activated or upon power loss.

**FIBERGLASS WET WELL:**
The fiberglass wet well shall be suitable for direct burial installation. The wet well shall be no less than 72 inches in diameter and will be 168 inches in length and contain an anti-flotation flange. The tank will have re-inforcing ribs for extra structural support. The laminate shall have a barcol hardness of a least 90% of the resin manufactures minimum specified hardness for cured resin on both the interior and exterior surfaces. The minimum wall thickness of the wet well shall not be less than 3/8". The wet well manufacturer shall encapsulate a steel base plate with stainless steel studs for the mounting of the quick removal system. The wet well will be provided with a (12") inlet fitting for field installation by the contractor at the elevation and location as indicated on the plans. All other penetrations shall be sealed by using "Uniseal" fittings, "Flex boot" fittings, or "Link-Seal" fittings.

**ALUMINUM DIAMOND TREAD FOOT TRAFFIC COVERS:**
The wet well will be covered with a solid 1/4" thick aluminum diamond tread cover suitable for load up to 300 psf. The cover will be solid with no penetrations through it. The cover will be gasketed and bolted to the rim flange of the fiberglass tank using 7/16" stainless steel hex head bolts. No covers using epoxy paint will be acceptable.

**PACKAGED TRIPLEX LIFT STATION -**
**MANUFACTURED BY PACIFIC SOUTHWEST INDUSTRIES**

**PUMP(S) 1 AND 3: LOW FLOW EVENTS**
Furnish and install Tsurumi, VANC15 Model 50PU2.4S submersible pump(s). Each unit shall be capable of delivering 60 GPM at 12.00 Feet TDH. The pump(s) shall be designed to pump waste water, sewage or effluent containing 1.5 inch (50mm) diameter solids without damage during operation. The pump(s) shall be designed so that the shaft power required (BHP)/(kW) shall not exceed the motor rated output throughout the entire operating range of the pump performance curve. A two year warranty 'out of the box" shall be standard.

**PUMP(S) 1 AND 3-MECHANICAL SEAL:**
All units shall be furnished with a dual inside mechanical shaft seal located completely out of the pumpage, running in a separate oil filled chamber. Units shall be fitted with a device that shall provide positive lubrication of top mechanical seal, (down to one third of the standard oil level). The device shall not consume any additional electrical power. Units shall have silicon carbide mechanical seal faces. Mechanical seal hardware shall be Stainless steel.

**PUMP(S) 1 AND 3-MOTOR:**
The pump motor(s) shall be 1/2 HP, .40 KW, 220 V, 60 Hz, 3 Phase and shall be NEMA MG-1, Design Type B equivalent. Motor(s) shall be rated at 2.0 full load amps. Motor(s) shall have a 1.15 service factor and shall be rated for 6 starts per hour. Motor(s) shall be air filled, copper wound, class E insulated with built-in thermal protection. Motor shaft shall be 403 stainless steel and shall be supported by two permanently lubricated, high temperature ball bearings, with a B-10 life rating at best efficiency point of 60,000 hours. The bearings shall be single row, double shielded, C3, deep groove type ball bearings. Bearing seats shall be rolled carbon steel or aluminum die casting. Motor housing shall be 304 stainless steel. Motors shall be suitable variable speed applications, utilizing a properly sized variable frequency drive. (Only for 3 phase.)

**PUMP(S) 1 AND 3-POWER CABLE AND CABLE ENTRANCE:**
The pump cable shall be suitable for submersible pump applications. The cable entrance shall incorporate built in strain relief, a one piece, three way mechanical compression seal with a fatigue reducing cable boot. The cable entrance assembly shall contain an anti-wicking block to eliminate water incursion into the motor due to Capilary wicking should the power cable be accidentally damaged.

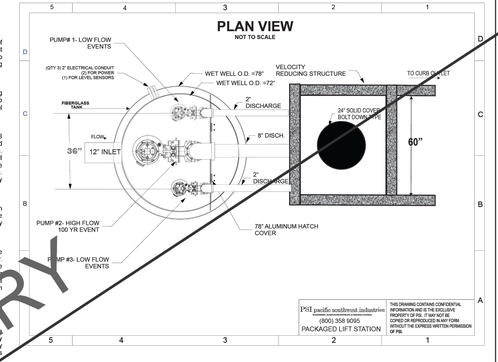
**PUMP(S) 1 AND 3-QUICK REMOVAL SYSTEM:**
The pumping unit(s) shall be equipped with quick removal system (QRS). The construction shall be such that the pump(s) will automatically connect to the discharge piping when lowered into place on the discharge connector. There shall be no need for personnel to enter the wet well to accomplish installation or removal of the pump(s). The pumping unit(s) shall be fitted with stainless steel lifting chain(s) of sufficient length and strength to permit the raising and lowering of the unit(s). The chain(s) shall be fastened at the top of the structure near the access opening. All parts of the QRS system including base elbow, sliding guide bracket, and guide support shall be manufactured from recyclable, application appropriate resins. The need for a protective coating shall not be required.

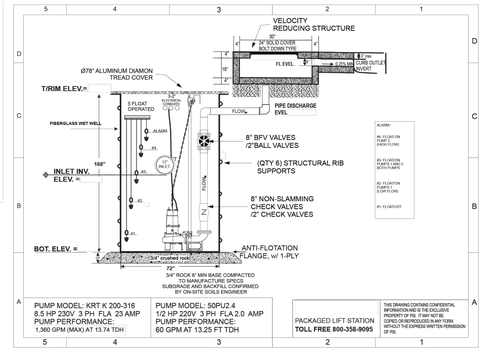
A sliding guide bracket shall be an integral part of the pumping unit and the pump casing shall have a machined connection with a bracket to connect with the discharge connection.

Sealing of the pumping unit to the discharge connection shall be accomplished by a single linear downward motion of the pump with the entire weight of the pumping unit guided by a pawl, thereby wedging the pumping unit tightly against the discharge connector. No portion of the pump shall bear directly on the floor of the sump nor shall a rotary motion of the pump be required for sealing. All fasteners coming into contact with the pumpage shall be stainless steel.

Two corrosion resistant guide pipes shall be furnished and installed for each pump to permit raising and lowering of the pump. Guide pipes shall be 3/4 inch (20 mm) in diameter and shall be of adequate length to extend from the lower guide holder to the upper guide bar bracket(s) mounted on the access frame.

PRELIMINARY




PUMP DETAIL
NOT TO SCALE

STORM WATER PUMP SYSTEM

PSI pacific southwest industries
ENGINEERED, ASSEMBLED AND INSTALLED, A VERTICAL SYSTEM
FOR MORE INFORMATION CONTACT PACIFIC SOUTHWEST INDUSTRIES

| No. | Date | Revision Description |
|---|---|---|

LIFT STATION DETAILS

Date:
Scale: No Scale
Checked by:

LSD-1

901 MISSION AVE

ATTACHMENT 1a & 1b
DMA DETAILS

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500 fuscoe.com

JOB NO. 557-017
DRAWN BY: JGB
SHEET 3 of 3

F:\PROJECTS\557-017\T_SUPPORT FILES\REPORTS\DRAINAGE\PRELIMINARY DRAINAGE\ATTACHMENTS\ATTACHMENT 1A & 1B - DMA EXHIBIT.DWG (10-28-2024 1:51:15PM) Plotted by: dbackwater

# ATTACHMENT 7

# AS-BUILT DRAWINGS

# ATTACHMENT 8

# TREATMENT CONTROL BMP INSPECTION AND MAINTENANCE CHECKLIST(S)

# Manufactured Stormwater Treatment Measure
## INSPECTION AND MAINTENANCE CHECKLIST

Property Applicant: _____ Property Address: _____

Date of Inspection: _____ Type of Inspection: □ Monthly □ Pre-Wet Season □ After heavy runoff □ End of Wet Season

System Type: _____

Installer/Contractor:_____ Overall Facility Score*:_____

Manufacturer: _____ Inspector(s): _____

| Defect | Conditions When Maintenance Is Needed | Maintenance Score** | Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done) | Results Expected When Maintenance Is Performed |
|---|---|---|---|---|
| 1. Sediment, trash and debris accumulation on Filter | Sediment, trash and debris accumulated in the sedimentation basin, riser pipe, retention pipes and filter bed. Filter does not drain as specified. | | | Sediment, trash and debris removed from sedimentation basin, riser pipe and filter bed and disposed of properly. Filter drains per design specifications. Empty cartridge should be reassembled and reinstalled. |
| 2. Standing water | Manufactured treatment measure does not drain within five days after rainfall. | | | Clogs removed from filters, sedimentation basin, riser pipe and filter bed. Filter drains per design specifications. |

| Defect | Conditions When Maintenance Is Needed | Maintenance Score** | Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done) | Results Expected When Maintenance Is Performed |
|---|---|---|---|---|
| 3. Mosquitoes | Evidence of mosquito larvae in manufactured treatment measure. | | | Clogs removed from sedimentation basin, riser pipe and filter bed. Filter drains per design specifications. |
| 4. Miscellaneous | Any condition not covered above that needs attention in order for the manufactured treatment measure to function as designed. | | | Meet the design specifications. |

*Overall Facility Score = Worst Score from all Defect Items Noted.
**Scores: 0 = OK, 1 = Monitor, 2 = Routine Maintenance, 3 = Immediate Repair Necessary.

# Non-Proprietary Media Filter
## INSPECTION AND MAINTENANCE CHECKLIST

Property Address: _____ Property Applicant: _____

Treatment Measure No.: _____ Date of Inspection: _____ Type of Inspection: □ Monthly □ Pre-Wet Season □ After heavy runoff □ End of Wet Season

Inspector(s): _____ Overall Facility Score*:_____ □ Other:_____

| Defect | Conditions When Maintenance Is Needed | Maintenance Score** | Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done) | Results Expected When Maintenance Is Performed | Date Complete / Initial |
|---|---|---|---|---|---|
| 1. Sediment, trash and debris accumulation | Sediment, trash and debris accumulated in the sedimentation basin, riser pipe and filter bed. Filter does not drain as specified. | | | Sediment, trash and debris removed from sedimentation basin, riser pipe and filter bed and disposed of properly. Filter drains per design specifications. | |
| 2. Standing water | Non-proprietary media filter does not drain within three days after rainfall. | | | Clogs removed from sedimentation basin, riser pipe and filter bed. Filter drains per design specifications. | |
| 3. Sediment | Evidence of sedimentation in bioretention area. | | | Material removed so that there is no clogging or blockage. Material is disposed of properly. | |
| 4. Erosion | Channels have formed around inlets; there are areas of bare soil, and/or other evidence of erosion. | | | Obstructions and sediment removed so that water flows freely and disperses over a wide area. Obstructions and sediment are disposed of | |

**Non-Proprietary Media Filter** - Inspection and Maintenance Checklist
Property Address: _____

Date of Inspection:_____
Treatment Measure No.:_____

| Defect | Conditions When Maintenance Is Needed | Maintenance Score** | Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done) | Results Expected When Maintenance Is Performed | Date Complete / Initial |
|---|---|---|---|---|---|
| *Erosion Cont'd* | | | | properly. | |
| 5. Vegetation | Vegetation is dead, diseased and/or overgrown. | | | Vegetation is healthy and attractive in appearance. | |
| 6. Mulch | Mulch is missing or patchy in appearance. Areas of bare earth are exposed, or mulch layer is less than 3 inches in depth. | | | All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even in appearance, at a depth of 3 inches. | |
| 7. Mosquitoes | Evidence of mosquito larvae in non-proprietary media filter. | | | Clogs removed from sedimentation basin, riser pipe and filter bed. Filter drains per design specifications. | |
| 8. Filter bed | Overall media depth 300 millimeters (12 inches) or less. | | | Media depth restored to 450 millimeters (18 inches). | |
| 9. Miscellaneous | Any condition not covered above that needs attention in order for the non-proprietary media filter to function as designed. | | | Meet the design specifications. | |

*Overall Facility Score = Worst Score from all Defect Items Noted.
**Scores: 0 = OK, 1 = Monitor, 2 = Routine Maintenance, 3 = Immediate Repair Necessary

# Tree Well Filter
## INSPECTION AND MAINTENANCE CHECKLIST

Property Address: _____ Property Applicant: _____

Treatment Measure No.: _____ Date of Inspection: _____ Type of Inspection: □ Monthly □ Pre-Wet Season □ After heavy runoff □ End of Wet Season

Inspector(s): _____ Overall Facility Score*:_____ □ Other:_____

| Defect | Conditions When Maintenance Is Needed | Maintenance Score** | Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done) | Results Expected When Maintenance Is Performed | Date Complete / Initial |
|---|---|---|---|---|---|
| 1. Vegetation | Vegetation is dead, diseased and/or overgrown. | | | Vegetation is healthy and attractive in appearance. | |
| 2. Planting Mix | Planting mix too deep or too shallow. | | | Planting mix is at proper depth for optimum filtration and flow. | |
| 3. Mulch | Mulch is missing or patchy in appearance. Areas of bare earth are exposed, or mulch layer is less than 3 inches in depth. | | | All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even in appearance, at a depth of 3 inches. | |
| 4. Trash and Debris Accumulation | Trash and debris accumulated in the tree well filter. Filter does not drain as specified. | | | Trash and debris removed from tree well filter and disposed of properly. Filter drains per design specifications. | |
| 5. Sediment | Evidence of sedimentation in tree well filter. | | | Material removed so that there is no clogging or blockage. Sediment is disposed of properly. | |

**Tree Well Filter** - Inspection and Maintenance Checklist
Property Address: _____

Date of Inspection:_____
Treatment Measure No.:_____

| Defect | Conditions When Maintenance Is Needed | Maintenance Score** | Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done) | Results Expected When Maintenance Is Performed | Date Complete / Initial |
|---|---|---|---|---|---|
| 6. Standing Water | When water stands in the tree well filter between storms and does not drain within five days after rainfall. | | | There should be no areas of standing water once inflow has ceased. Any of the following may apply: sediment or trash blockages removed, overflow pipe repaired. | |
| 7. Overflow Pipe | Does not safely convey excess flows to storm drain. Piping damaged or disconnected. | | | Overflow pipe conveys excess flow to storm drain efficiently. | |
| 8. Miscellaneous | Any condition not covered above that needs attention in order for the tree well filter to function as designed. | | | Meet the design specifications. | |

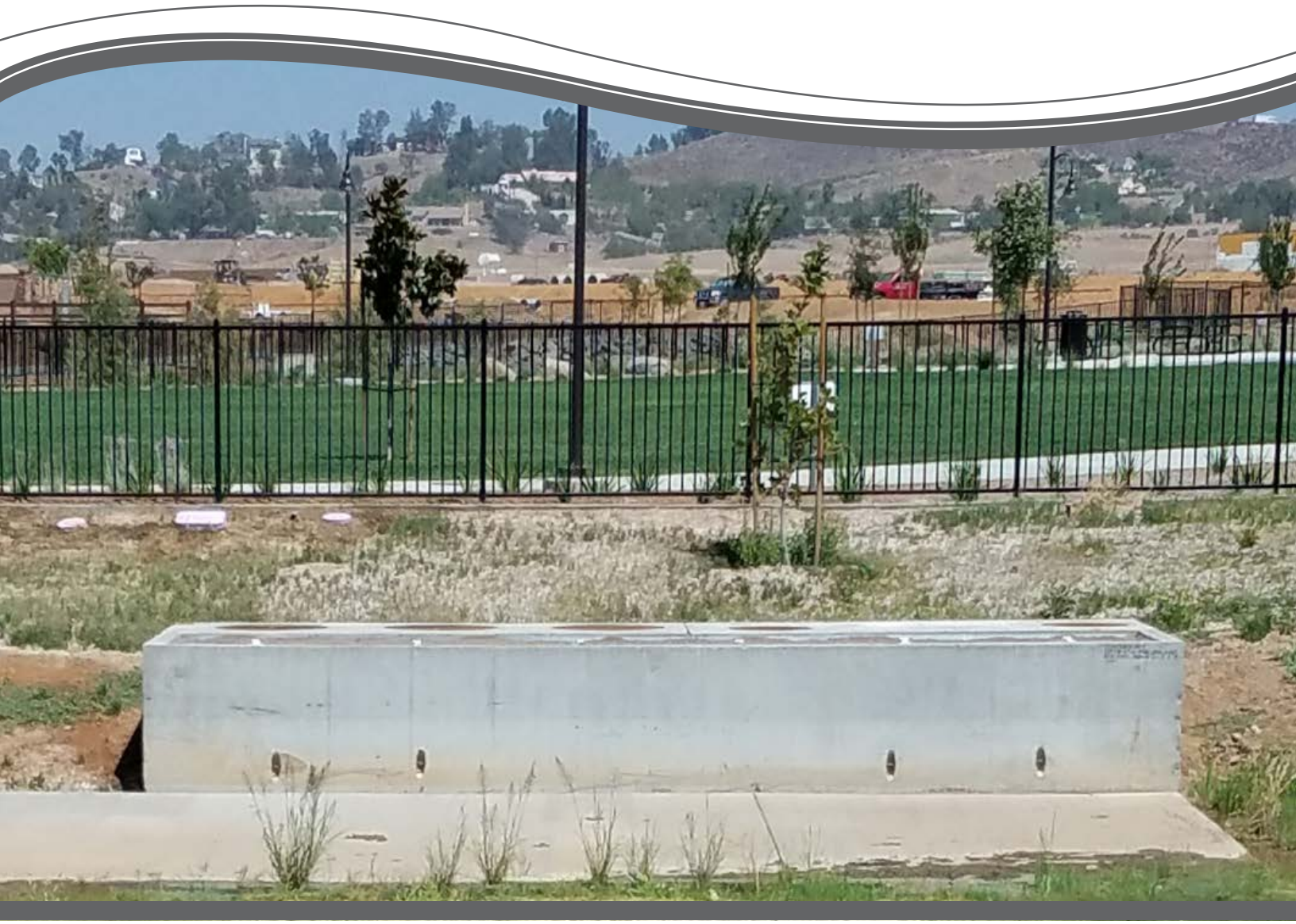
*Overall Facility Score = Worst Score from all Defect Items Noted.
**Scores: 0 = OK, 1 = Monitor, 2 = Routine Maintenance, 3 = Immediate Repair Necessary.

# ATTACHMENT 9

# MAINTENANCE SCHEDULE

CONTECH®
ENGINEERED SOLUTIONS

# Modular Wetlands® Linear Operatons & Maintenance Manual



MODULAR WETLANDS®

# MODULAR WETLANDS LINEAR
# OPERATION & MAINTENANCE MANUAL

## TABLE OF CONTENTS


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## OVERVIEW

This operation and maintenance (O&M) manual is for the Modular Wetlands Linear Biofilter (MWL). Please read the instructions and equipment lists closely prior to starting. It is important to follow all necessary safety procedures associated with state and local regulations. Please contact Contech for more information on pre-authorized third-party service providers who can provide inspection and maintenance services in your area. For a list of service providers in your area, please visit www.conteches.com/maintenance.





## WARNING

Confined space entry may be required. Contractor to obtain all equipment and training to meet applicable local and OSHA regulations regarding confined space entry. It is the Contractor's or entry personnel's responsibility to always proceed safely.

## SAFETY NOTICE & PERSONAL SAFETY EQUIPMENT

Job site safety is a topic and a practice addressed comprehensively by others. The inclusions here are merely reminders to whole areas of Safety Practice that are the responsibility of the Owner(s), Manager(s), and Service Provider(s). OSHA and Canadian OSH, Federal, State/Provincial, and Local Jurisdiction Safety Standards apply on any given site or project. The knowledge and applicability of those responsibilities is the Service Provider's responsibility and outside the scope of Contech Engineered Solutions.



Safety Boots



Gloves



Hard Hat



Eye Protection

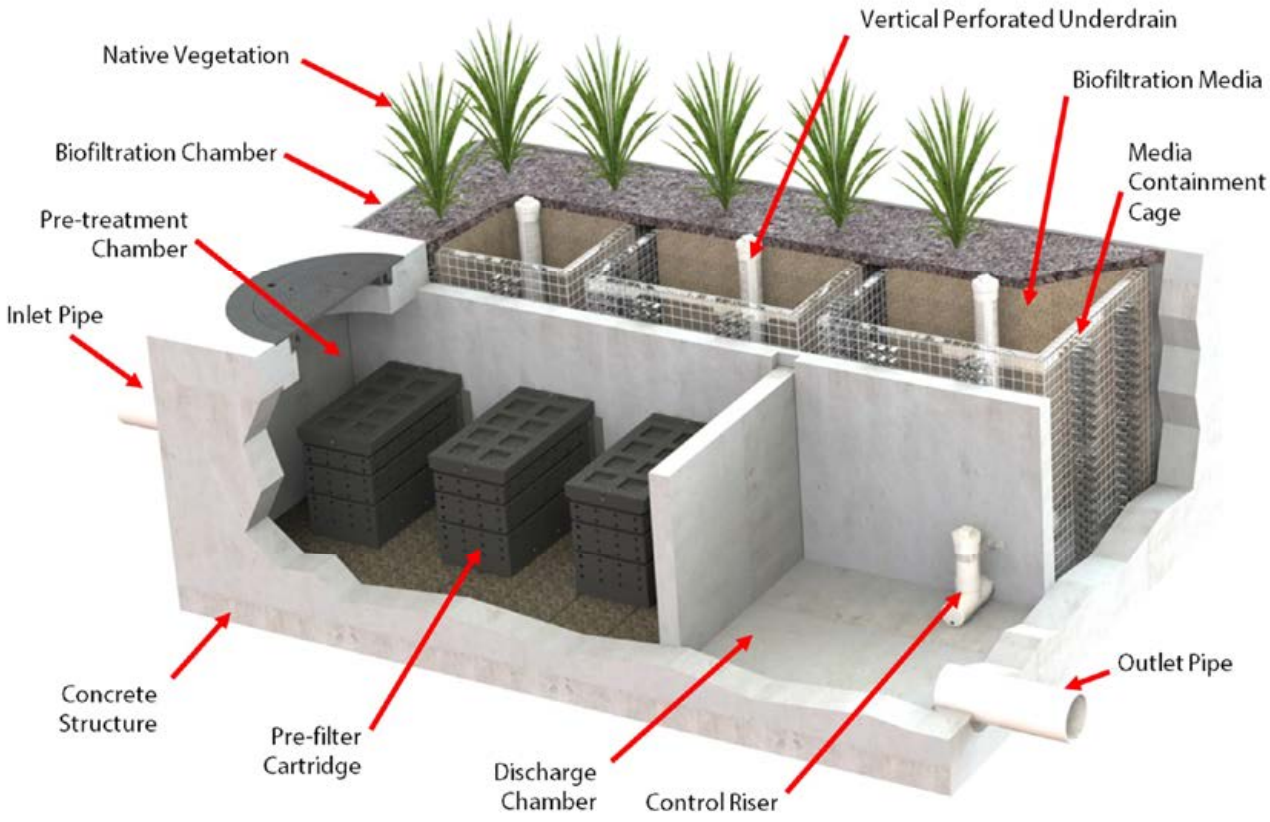


Maintenance and Protection of Traffic Plan

# MODULAR WETLANDS LINEAR COMPONENTS LIST

The MWL system comes in multiple sizes and configurations, including side by side or end to end layouts, both as open planters or underground systems. See shop drawings (plans) for project specific details.

The standard MWL system is comprised of the following components:



# INSPECTION SUMMARY & EQUIPMENT LIST

Stormwater regulations require BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess the site-specific loading conditions. The first year of inspections can be used to set inspection and maintenance intervals for subsequent years to ensure appropriate maintenance is provided.

- Inspect pre-treatment, biofiltration, and discharge chambers an average of once every six to twelve months. Varies based on site specific and local conditions.
- Average inspection time is approximately 15 minutes. Always ensure appropriate safety protocol and procedures are followed.

The following is a list of equipment required to allow for simple and effective inspection of the MWL:



Modular Wetlands Linear Inspection Form



Flashlight



Tape Measure



Access Cover Hook



Ratchet
& 7/16" Socket
(if required for older pre-filter cartridges that have two bolts holding the lids on)

## INSPECTION & MAINTENANCE NOTES

1. Following maintenance and/or inspection, it is recommended that the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.
2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.
3. Transport all debris, trash, organics, and sediments to approved facility for disposal in accordance with local and state requirements.
4. Entry into chambers may require confined space training based on state and local regulations.
5. No fertilizer shall be used in the biofiltration chamber.
6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may not require irrigation after initial establishment.

## INSPECTION PROCESS

1. Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other information (see inspection form).
2. Observe the inside of the system through the access covers. If minimal light is available and vision into the unit is impaired, utilize a flashlight to see inside the system and all chambers.
3. Look for any out of the ordinary obstructions in the inflow pipe, pre-treatment chamber, biofiltration chamber, discharge chamber or outflow pipe. Write down any observations on the inspection form.
4. Through observation and/or digital photographs, estimate the amount of trash, debris accumulated in the pre-treatment chamber. Utilizing a tape measure or measuring stick, estimate the amount of sediment in this chamber. Record this depth on the inspection form.
5. Through visual observation, inspect the condition of the pre-filter cartridges. Look for excessive build-up of sediment on the cartridges, any build-up on the tops of the cartridges, or clogging of the holes. Record this information on the inspection form. The pre-filter cartridges can be further inspected by removing the cartridge tops and assessing the color of the BioMediaGREEN filter cubes (requires entry into pre-treatment chamber - see notes previous notes regarding confined space entry). Record the color of the material. New material is a light green color. As the media becomes clogged, it will turn darker in color, eventually becoming dark brown or black. The closer to black the media is the higher percentage that the media is exhausted and in need of replacement.




6. The biofiltration chamber is generally maintenance-free due to the system's advanced pre-treatment chamber. For units which have open planters with vegetation, it is recommended that the vegetation be inspected. Look for any plants that are dead or showing signs of disease or other negative stressors. Record the general health of the plants on the inspection form and indicate through visual observation or digital photographs if trimming of the vegetation is required.

7. The discharge chamber houses the control riser (if applicable), drain down filter (only in California - older models), and is connected to the outflow pipe. It is important to check to ensure the orifice is in proper operating condition and free of any obstructions. It is also important to assess the condition of the drain down filter media which utilizes a block form of the BioMediaGREEN. Assess in the same manner as the cubes in the pre-filter cartridge as mentioned above.

8. Finalize the inspection report for analysis by the maintenance manager to determine if maintenance is required.

## MAINTENANCE INDICATORS

Based upon the observations made during inspection, maintenance of the system may be required based on the following indicators:

- Missing or damaged internal components or cartridges.
- Obstructions in the system or its inlet and/or outlet pipes.
- Excessive accumulation of floatables in the pre-treatment chamber in which the length and width of the chamber is fully impacted more than 18".
- Excessive accumulation of sediment in the pre-treatment chamber of more than 6" in depth.
- Excessive accumulation of sediment on the BioMediaGREEN media housed within the pretreatment cartridges. When media is more than 85% clogged, replacement is required. The darker the BioMediaGREEN, the more clogged it is and in need of replacement.
- Excessive accumulation of sediment on the BioMediaGREEN media housed within the drain down filter (California only - older models).
- Overgrown vegetation.

## MAINTENANCE SUMMARY & EQUIPMENT LIST

The time has come to maintain your MWL. All necessary pre-maintenance steps must be carried out before maintenance occurs. Once traffic control has been set up per local and state regulations and access covers have been safely opened, the maintenance process can begin. It should be noted that some maintenance activities require confined space entry. All confined space requirements must be strictly followed before entry into the system. In addition, the following is recommended:

- Prepare the maintenance form by writing in the necessary information including project name, location, date & time, unit number and other info (see maintenance form).
- Set up all appropriate safety and maintenance equipment.
- Ensure traffic control is set up and properly positioned.
- Prepared pre-checks (OSHA, safety, confined space entry) are performed.
    - A gas meter should be used to detect the presence of any hazardous gases prior to entering the system. If hazardous gases are present, do not enter the vault. Following appropriate confined space procedures, take steps such as utilizing a venting system to address the hazard. Once it is determined to be safe, enter the system utilizing appropriate entry equipment such as a ladder and tripod with harness.

The following is a list of equipment required for maintenance of the MWL:



Modular Wetlands Linear Maintenance Form



Flashlight



Access Cover Hook



Ratchet
& 7/16" Socket
(if required for older pre-filter cartridges that have two bolts holding the lids on)



Vacuum Assisted Truck with Pressure Washer



Replacement
BioMediaGREEN
(If Required)

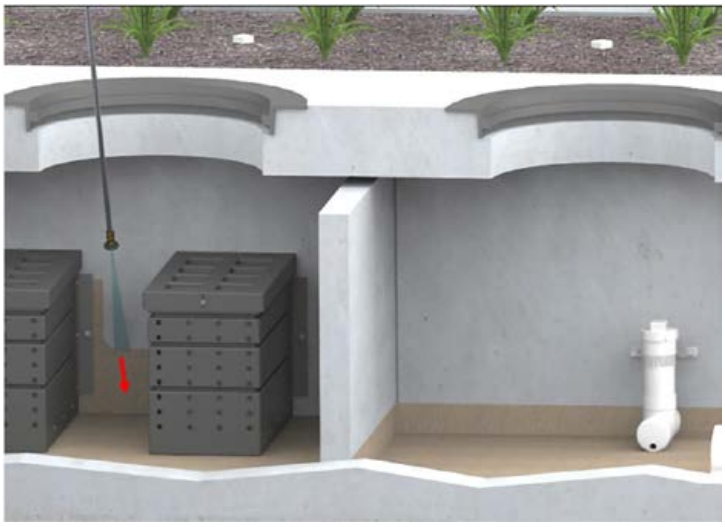
(order BioMediaGREEN from Contech's Maintenance Team members at https://www.conteches.com/maintenance)

# MAINTENANCE INSTRUCTIONS



### 1. ACCESS COVER REMOVAL

Upon determining that the vault is safe for entry, remove all access cover(s) and position the vacuum truck accordingly.



### 2. PRESSURE WASH SYSTEM CHAMBERS

With the pressure washer, spray down pollutants accumulated on the walls and floors of the pre-treatment and discharge chambers. Then wash any accumulated sediment from the pre-filter cartridge(s).



### 3. VACUUM SYSTEM CHAMBERS

Vacuum out pre-treatment and discharge chambers and remove all accumulated pollutants including trash, debris, and sediments. Be sure to vacuum the pre-treatment floor until the pervious pavers are visible and clean. **(MWL systems outside of California may or may not have pervious pavers on the floor in the pre-treatment chamber)** If pre-filter cartridges require media replacement, proceed to **Step 4**. If not, replace the access cover(s) and proceed to **Step 7**.



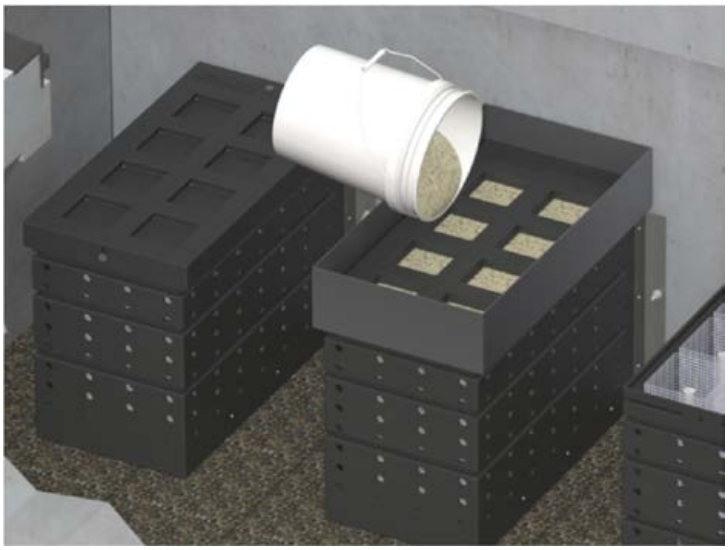
## 4. PRE-FILTER CARTRIDGE LID REMOVAL

After successfully cleaning out the pre-treatment chamber, enter the chamber and remove the lid(s) from the pre-filter cartridge(s) by removing the two thumb screws. (Older pre-filter cartridges have two bolts holding the lids on that require a 7/16" socket to remove)



## 5. VACUUM EXISTING PRE-FILTER MEDIA

Utilize the vacuum truck hose or hose extension to remove the filter media from each of the individual media cages. Once filter media has been sucked out, use a pressure washer to spray down the inside of the cartridge and its media cages. Remove cleaned media cages and place to the side. Once removed, the vacuum hose can be inserted into the cartridge to vacuum out any remaining material near the bottom of the cartridge.



## 6. PRE-FILTER MEDIA REPLACEMENT

Reinstall media cages and fill with new media from the manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase. The easiest way to fill the media cages is to utilize a refilling tray that can also be sourced from the manufacturer. Place the refilling tray on top of the cartridge and fill with new bulk media shaking it down into the cages. Using your hands, lightly compact the media into each filter cage. Once the cages are full (each cartridge will hold five heaping 5gal buckets of bulk media), remove the refilling tray and replace the cartridge top, ensuring fasteners are properly tightened.



## 7. MAINTAINING VEGETATION

In general, the biofiltration chamber is maintenance-free with the exception of maintaining the vegetation. The MWL utilizes vegetation similar to surrounding landscape areas, therefore, trim vegetation to match surrounding vegetation. If any plants have died, replace them with new ones.



## 8. INSPECT UNDERDRAIN SYSTEM

Each vertical under drain on the biofiltration chamber has a removable threaded cap that can be taken off to check for any blockages or root growth. Once removed, a jetting attachment to the pressure washer can be used to clean out the under drain and orifice riser if needed.

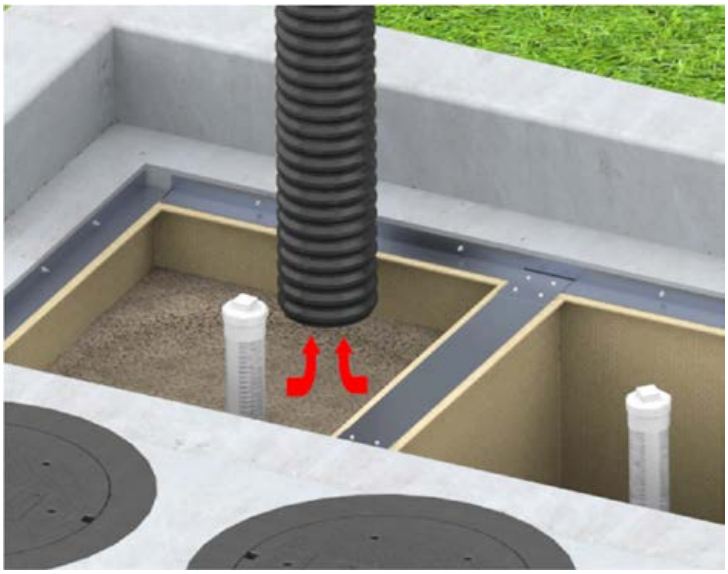


## 9. REPLACE ACCESS COVERS

Once maintenance is complete, replace all access cover(s)

## REPLACING BIOFILTRATION MEDIA IF REQUIRED

As with all biofilter systems, at some point the biofiltration media will need to be replaced, either due to physical clogging or sorptive exhaustion (for dissolved pollutants) of the media ion exchange capacity (to remove dissolved metals and phosphorous). The general life of this media is 10 to 20 years based on site specific conditions and pollutant loading, so replacing the biofiltration media should not be a common occurrence. In the event that the biofiltration media requires replacement, contact one of Contech's Maintenance Team members at https://www.conteches.com/maintenance to order new biofiltration media. The quantity of media needed can be determined by providing the model number and unit depth. Media will be provided in super sacks for easy installation. Each sack will weigh between 1,000 and 2,000 lbs. Biofiltration media replacement can be done following the steps below:



### 1. VACUUM EXISTING BIOFILTRATION MEDIA

Remove the mulch and vegetation to access the biofiltration media, and then position the vacuum truck accordingly. Utilize the vacuum truck to vacuum out all the media. Once all media is removed, use the pressure washer to spray down all the netting and underdrain systems on the inside of the media containment cage. Vacuum out any remaining debris after spraying down netting. Inspect the netting for any damage or holes. If the netting is damaged, it can be repaired or replaced with guidance by the manufacturer.



### 2. INSTALLING NEW BIOFILTRATION MEDIA

Ensure that the chamber is fully cleaned prior to installation of new media into the media containment cage(s). Media will be provided in super sacks for easy installation. A lifting apparatus (forklift, backhoe, boom truck, or other) is recommended to position the super sack over the biofiltration chamber. Add media in lifts to ensure that the riser pipes remain vertical. Be sure to only fill the media cage(s) up to the same level as the old media.



### 3. REPLANT VEGETATION

Once the media has been replaced, replant the vegetation and cover biofiltration chamber with approved mulch (if applicable). If the existing vegetation is not being reused, and new vegetation is being planted, you will need to acquire new plant establishment media that will be installed just below the mulch layer at each plant location. (see plan drawings for details). Contact one of Contech's Maintenance Team members at https://www.conteches.com/maintenance to order new plant establishment media.

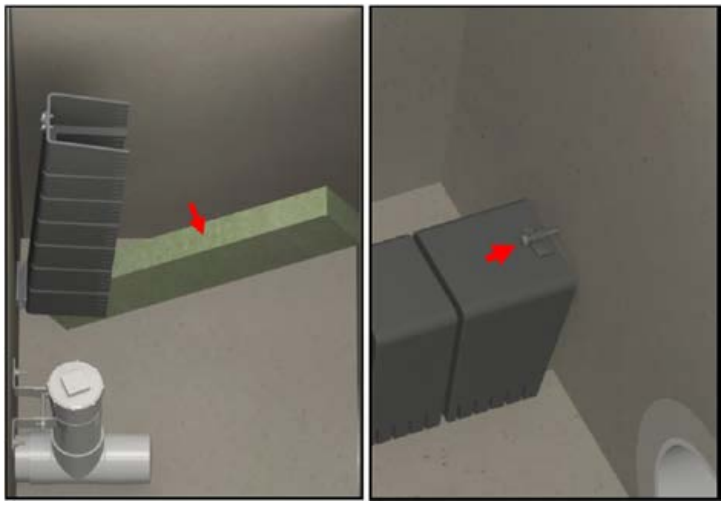
# REPLACING DRAIN DOWN FILTER MEDIA (ONLY ON OLDER CALIFORNIA MODELS)

NOTE: The drain down filter is only found on units installed in California prior to 2023
If during inspection it was determined that the drain down filter media requires replacement, contact one of Contech's Maintenance Team members at https://www.conteches.com/maintenance to order new media.



## 1. REMOVE EXISTING DRAIN DOWN MEDIA

Pull knob back to unlock the locking mechanism and lift the drain down filter housing to remove the used BioMediaGREEN filter block.



## 2. INSTALL NEW DRAIN DOWN MEDIA

Ensure that the chamber and housing are fully cleaned prior to installation of new media, and then insert the new BioMediaGREEN filter block. The media filter block should fit snugly between the chamber walls and be centered under the filter housing. Lower the housing over the filter block and secure the locking mechanism.

## NOTES

CONTECH® ENGINEERED SOLUTIONS

# Inspection Report
# Modular Wetlands Linear

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

| For Office Use Only |
|---|
| (Reviewed By) |
| (Date) |
| Office personnel to complete section to the left. |

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

## Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

| **Structural Integrity:** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure? | | | |
| Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure? | | | |
| Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)? | | | |
| Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly? | | | |
| **Working Condition:** | | | |
| Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit? | | | |
| Is there standing water in inappropriate areas after a dry period? | | | |
| Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system? | | | |
| Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber. | | | Depth: |
| Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber? | | | Chamber: |
| Any signs of improper functioning in the discharge chamber? Note issues in comments section. | | | |
| **Other Inspection Items:** | | | |
| Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)? | | | |
| Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below. | | | |
| Is there a septic or foul odor coming from inside the system? | | | |

| **Waste:** | **Yes** | **No** |
|---|---|---|
| Sediment / Silt / Clay | | |
| Trash / Bags / Bottles | | |
| Green Waste / Leaves / Foliage | | |

| **Recommended Maintenance** | |
|---|---|
| No Cleaning Needed | |
| Schedule Maintenance as Planned | |
| Needs Immediate Maintenance | |

| **Plant Information** | |
|---|---|
| Damage to Plants | |
| Plant Replacement | |
| Plant Trimming | |

Additional Notes: _____

CONTECH®
ENGINEERED SOLUTIONS

# Cleaning and Maintenance Report
# Modular Wetlands Linear

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

| For Office Use Only |
|---|
| (Reviewed By) |
| (Date) |
| Office personnel to complete section to the left. |

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

| Site Map # | GPS Coordinates of Insert | Manufacturer / Description / Sizing | Trash Accumulation | Foliage Accumulation | Sediment Accumulation | Total Debris Accumulation | Condition of Media 25/50/75/100 (will be changed @ 75%) | Operational Per Manufactures' Specifications (If not, why?) |
|---|---|---|---|---|---|---|---|---|
| | Lat:<br>Long: | MWS Catch Basins | | | | | | |
| | | MWS Sedimentation Basin | | | | | | |
| | | Media Filter Condition | | | | | | |
| | | Plant Condition | | | | | | |
| | | Drain Down Media Condition | | | | | | |
| | | Discharge Chamber Condition | | | | | | |
| | | Drain Down Pipe Condition | | | | | | |
| | | Inlet and Outlet Pipe Condition | | | | | | |

Comments:



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## SUPPORT

DRAWINGS AND SPECIFICATIONS ARE AVAILABLE AT WWW.CONTECHES.COM

ModWetLinear OM Manual 03/24

# ATTACHMENT 10

# STORMWATER FACILITIES MAINTENANCE AGREEMENT WITH ACCESS RIGHTS AND COVENANTS (SWFMA)

RECORDING REQUESTED BY AND
WHEN RECORDED RETURN TO:

CITY OF OCEANSIDE
OFFICE OF THE CITY CLERK
300 NORTH COAST HIGHWAY
OCEANSIDE, CA 92054

---

Above Space for Recorder's Use

# STORMWATER FACILITIES MAINTENANCE AGREEMENT WITH ACCESS RIGHTS AND COVENANTS

901 Mission Ave
[ Insert Project Reference Numbers ]

This AGREEMENT for the maintenance and repair of certain Stormwater Management Facilities is entered into between JPI Company (hereinafter referred to as "OWNER") and the City of Oceanside (hereinafter referred to as "CITY") for the benefit of the CITY, the OWNER, the successors in interest to the CITY or the OWNER, and the public generally.

## RECITALS

A. OWNER is the owner of certain real property located in the City of Oceanside, California, more particularly described in Exhibit "A" attached hereto and made a part of (hereinafter referred to as the "PROPERTY"), and has proposed that the PROPERTY be developed as a 268-unit multi story apartment building with ground floor retail and underground parking in accordance with applications for Tentative Map No. _____, Development Plan No. _____, Conditional Use Permit No. _____, Grading Plan (Permit) No. _____which are on file with the CITY. This Agreement is required as a condition of approval for such development as set forth in Resolution No. _____.

B. In accordance with the City of Oceanside's Urban Runoff Regulations, Oceanside City Code, Chapter 40 (the "Stormwater Ordinance"), the City of Oceanside Subdivision Ordinance, the City of Oceanside Zoning Ordinance, The City of Oceanside Grading Ordinance and/or other ordinances or regulations of CITY which regulate land development and urban runoff, OWNER has prepared and submitted to CITY, a Stormwater Quality Mitigation Plan (hereinafter referred to as SWQMP), which is on file at the CITY. The SWQMP proposes that stormwater runoff from the PROPERTY be managed by the use of Stormwater Management Facilities which are identified in the SWQMP as "Best Management Practices" or "BMPs".

The precise location(s) and extent of the post construction BMPs are indicated in the approved SWQMP dated [insert approval date]. The SWQMP specifies the manner and standards by which the BMP's must be repaired and maintained in order to retain their effectiveness, as set forth in the Operation Maintenance Plan (hereinafter referred to as "O&M PLAN"). The approved SWQMP and O&M PLAN containing any revisions thereto are on file with the CITY.

C. The information contained in the SWQMP and OWNER's representations that the BMPs will be maintained pursuant to the SWQMP have been relied upon by CITY in approving OWNER's development applications. It is the purpose of this Agreement to assure that the BMPs are maintained, by creating obligations which are enforceable against the OWNER and the OWNER's successors in interest in the PROPERTY. It is intended that these obligations be enforceable notwithstanding other provisions related to BMP maintenance which are provided by law.

AGREEMENT

NOW, THEREFORE, for consideration of (a) CITY's approval of the above development applications and (b) the mutual covenants set forth herein, IT IS HEREBY AGREED AS FOLLOWS:

1. **Maintenance of Stormwater Management Facilities.** OWNER agrees, for itself and its successors in interest, to all or any portion of the PROPERTY, to comply in all respects with the requirements of the Stormwater Ordinance and the SWQMP with regards to the maintenance of BMPs designated in the SWQMP, and in particular agrees to perform, at its sole cost, expense and liability, the following "MAINTENANCE ACTIVITIES": all inspections, cleaning, repairs, servicing, maintenance and other actions specified in the O&M PLAN, with respect to all of the BMPs listed at Recital "B" above, at the times and in the manner specified in the O&M PLAN. OWNER shall initiate, perform and complete all MAINTENANCE ACTIVITIES at the required time, without request or demand from CITY or any other agency. OWNER further agrees that "MAINTENANCE ACTIVITIES" shall include replacement or modification of the BMPs in the event that said BMPs do not function as intended. Replacement shall be with an identical type, size and model of BMP, except that:

(a) The CITY Engineer may authorize substitution of an alternative BMP if he or she determines that it will function as well or better than the original BMP; and

(b) Pursuant to Section 40.2.3(c) of the Stormwater Ordinance, if the failure of the BMP, in the judgment of the CITY Engineer indicates that the BMP in use is inappropriate or inadequate to the circumstances, the BMP must be modified or replaced with an upgraded BMP to prevent future failure.

2. **Notices.** OWNER further agrees that it shall, prior to transferring ownership of any land on which any of the above BMPs are located, and also prior to transferring ownership of any such BMP, provide clear written notice of the above maintenance obligations associated with that BMP to the transferee. OWNER further agrees to provide evidence to CITY that OWNER has requested the California Department of Real Estate to include in the public report issued for the development of the PROPERTY, a notification regarding the BMP maintenance requirements described herein.

3. **CITY's Right to Perform Maintenance.** It is agreed that CITY shall have the right, but not the obligation, to elect to perform any or all of the MAINTENANCE ACTIVITIES if, in the CITY's sole judgment, OWNER has failed to perform the same. It is recognized and understood that the CITY makes no representation that it intends to or will perform any of the MAINTENANCE ACTIVITIES and any election by CITY to perform any of the MAINTENANCE ACTIVITIES, shall in no way relieve OWNER of its continuing maintenance obligations under this agreement. If CITY elects to perform any of the MAINTENANCE ACTIVITIES, it is understood that CITY shall be deemed to be acting as the agent of the OWNER and said work shall be without warranty or representation by CITY as to safety or effectiveness, shall be deemed to be accepted by OWNER "as is", and shall be covered by OWNER's indemnity provisions below.

If CITY performs any of the MAINTENANCE ACTIVITIES, after CITY has demanded that OWNER perform the same and OWNER has failed to do so within a reasonable time stated in the CITY's demand, then OWNER shall pay all of CITY's costs incurred in performing the MAINTENANCE ACTIVITIES. OWNER's obligation to pay CITY's costs of performing MAINTENANCE ACTIVITIES is a continuing obligation and shall apply whether or not CITY has utilized all or any portion of the security provided pursuant to Paragraph 5.

4. **CITY'S Access Rights.** OWNER hereby authorizes the CITY to access perpetually over, under and across [insert either "all of the PROPERTY" or "that portion of the PROPERTY described in Exhibit "B" hereto"] , for purposes of accessing the BMPs and performing any of the MAINTENANCE ACTIVITIES specified in Paragraph 1 above. CITY shall have the right, at any time and without prior notice to OWNER, to enter upon any part of said area as may be necessary or convenient for such purposes. OWNER shall at all times maintain the PROPERTY so as to make CITY's access clear and unobstructed.

5. **Security.** OWNER has provided CITY with non-refundable security to assure the faithful performance of the obligations of this agreement. The security is in the form of a Cash Deposit in the amount of $_____. CITY may utilize the security to provide funding for the cost of CITY performing any of the MAINTENANCE ACTIVITIES under Paragraph 3 above. CITY may utilize all or any part of the security at any time pursuant to this Agreement. Should any portion of the security be used by CITY,

OWNER or a Subsequent Owner, as applicable, shall deposit additional funds in the amount utilized by CITY, thereby restoring the security to the amount initially deposited by OWNER.

6. **Administration of Agreement for CITY.** CITY hereby designates its Engineer as the officer charged with responsibility and authority to administer this Agreement on behalf of CITY. Any notice or communication related to the implementation of this Agreement desired or required to be delivered to CITY shall be addressed to:

City Engineer
City of Oceanside
300 North Coast Highway
Oceanside, CA 92054

The City Engineer is also granted authority to enter into appropriate amendments to this Agreement on behalf of CITY, provided that the amendment is consistent with the purposes of this Agreement as set forth above.

7. **Defense and Indemnity.** CITY shall not be liable for, and OWNER and its successors in interest shall defend and indemnify CITY and the employees and agents of CITY (collectively "CITY PARTIES"), against any and all claims, demands, liability, judgments, awards, fines, mechanic's liens or other liens, labor disputes, losses, damages, expenses, charges or costs of any kind or character, including attorneys' fees and court costs (hereinafter collectively referred to as "CLAIMS"), related to this Agreement and arising either directly or indirectly from any act, error, omission or negligence of OWNER, OWNER's successors, or their contractors, licensees, agents, servants or employees, including, without limitation, claims caused by the concurrent negligent act, error or omission, whether active or passive, of CITY PARTIES. OWNER shall have no obligation, however, to defend or indemnify CITY PARTIES from a claim if it is determined by a court of competent jurisdiction that such claim was caused by the sole negligence or willful misconduct of CITY PARTIES. Nothing in this Agreement, CITY's approval of the subdivision or other applications or plans and specifications, or inspection of the work, is intended to acknowledge responsibility for any such matter, and CITY PARTIES shall have absolutely no responsibility or liability therefor unless otherwise provided by applicable law.

8. **Common Interest Developments.** If the PROPERTY is developed as a "Common Interest Development" as defined in Civil Code section 1351(c) which will include membership in or ownership of an "ASSOCIATION" as defined in Civil Code section 1351(a), then the following provisions of this Paragraph 8 shall apply during such time as the PROPERTY is encumbered by a "DECLARATION" as defined in Civil Code section 1351(h), and the Common Area, as "Common Area" is defined in Civil Code section 1351(b), of the PROPERTY is managed and controlled by the ASSOCIATION:

(a) The ASSOCIATION, through its Board of Directors, shall assume full responsibility to perform the MAINTENANCE ACTIVITIES pursuant to this Agreement, and shall undertake all actions and efforts necessary to accomplish the MAINTENANCE ACTIVITIES, including but not limited to, levying regular or special assessments against each member of the ASSOCIATION sufficient to provide funding for the MAINTENANCE ACTIVITIES, conducting a vote of the membership related to such assessments if required by law. In the event insufficient votes have been obtained to authorize an assessment, the ASSOCIATION shall seek authority from a court of competent jurisdiction for a reduced percentage of affirmative votes necessary to authorize the assessment, re-conducting the vote of the membership in order to obtain the votes necessary to authorize an assessment, and the ASSOCIATION shall take all action authorized by the DECLARATION or California law to collect delinquent assessments, including but not limited to, the recording and foreclosure of assessment liens.

(b) No provision of the DECLARATION, nor any other governing document of the ASSOCIATION or grant of authority to its members, shall grant or recognize a right of any member or other person to alter, improve, maintain or repair any of the PROPERTY in any manner which would impair the functioning of the BMPs to manage drainage or stormwater runoff as described in the SWQMP. In the event of any conflict between the terms of this Agreement and the DECLARATION or other ASSOCIATION governing documents, the provisions of this Agreement shall prevail.

9. **Agreement Binds Successors and Runs with the PROPERTY.** It is understood and agreed that the terms, covenants and conditions herein contained shall constitute covenants running with the land and shall be binding upon the heirs, executors, administrators, successors and assigns of OWNER and CITY, shall be deemed to be for the benefit of all persons owning any interest in the PROPERTY (including the interest of CITY or its successors in the Access Rights authorized herein). It is the intent of the parties hereto that this Agreement may be recorded and shall be binding upon all persons purchasing or otherwise acquiring all or any lot, unit or other portion of the PROPERTY, who shall be deemed to have consented to and become bound by all the provisions hereof.

10. **OWNER's Continuing Responsibilities Where Work Commenced or Permit Obtained.** Notwithstanding any other provision of this Agreement, no transfer or conveyance of the PROPERTY or any portion thereof shall in any way relieve OWNER of

or otherwise affect OWNER's responsibilities for installation or maintenance of BMPs which may have arisen under the ordinances or regulations of CITY referred to in Recital B above, or other federal, state or CITY laws, on account of OWNER having obtained a permit which creates such obligations or having commenced grading, construction or other land disturbance work.

11. **Amendment and Release.** The terms of this Agreement may be modified only by a written amendment approved and signed by the City Council or the CITY Engineer acting on behalf of CITY and by OWNER or OWNER's successor(s) in interest. This Agreement may be terminated and OWNER and the PROPERTY released from the covenants set forth herein, by a Release which CITY may execute if it determines that another mechanism will assure the ongoing maintenance of the BMPs or that it is no longer necessary to assure such maintenance.

12. **Governing Law and Severability.** This Agreement shall be governed by the laws of the State of California. Venue in any action related to this Agreement shall be in the Superior Court of the State of California, County of San Diego, North County Division. In the event that any of the provisions of this Agreement are held to be unenforceable or invalid by any court of competent jurisdiction, the validity, and enforceability of the remaining provisions shall not be affected thereby.

**IN WITNESS WHEREOF,** the parties hereto for themselves, their heirs, executors, administrators, successors and assigns do hereby agree to the full performance of the covenants herein contained and have caused this Agreement to be executed by setting hereunto their signatures on the dates indicated below:

OWNER(s):

By: _____
Name/Title

Date: _____

By: _____
Name/Title

Date: _____

CITY OF OCEANSIDE:

By: _____
City Engineer

Date: _____

APPROVED AS TO FORM:

_____
City Attorney

**NOTARY ACKNOWLEDGEMENT MUST BE ATTACHED**

I:\City Attorney\SWFMA-Stormwater Facilities Maintenance Agreement FORMAT(Rev September 2018)

# ATTACHMENT 11

# ANNUAL INSPECTION AND MAINTENANCE REPORTING FORM

# URBAN STORMWATER MITIGATION PLAN REPORTING FORM
# ANNUAL INSPECTION AND MAINTENANCE OF TREATMENT CONTROL BMPS
# (SIDE A)

Responsible Party for Inspection Maintenance: _____ Signature:_____
Date:_____ Print Name/Title

Facility Name:_____

| BMP Type | Location Lat/Lon or Inlet # | Date of Construction | Inspection Date(s) | Condition of BMP Indicate whether the BMP is present and in working condition, requires cleaning or replacement. | *Maintenance required? (Y/N) If yes, complete reverse side. |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

* Maintenance is to be carried out as needed and in accordance with approved Operation and Maintenance Plan.

## URBAN STORMWATER MITIGATION PLAN REPORTING FORM
## ANNUAL INSPECTION AND MAINTENANCE OF TREATMENT CONTROL BMPS
## (SIDE B)

| BMP Type | BMP Location (lat/lon or Inlet #) | Date of Maintenance Activity | Description of maintenance performed | If applicable, describe any additional work required. |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

* Maintenance is to be carried out as needed and in accordance with the City of Oceanside's Operation and Maintenance Plan.

## ATTACHMENT 4
## Copy of Plan Sheets Showing Permanent Storm Water BMPs

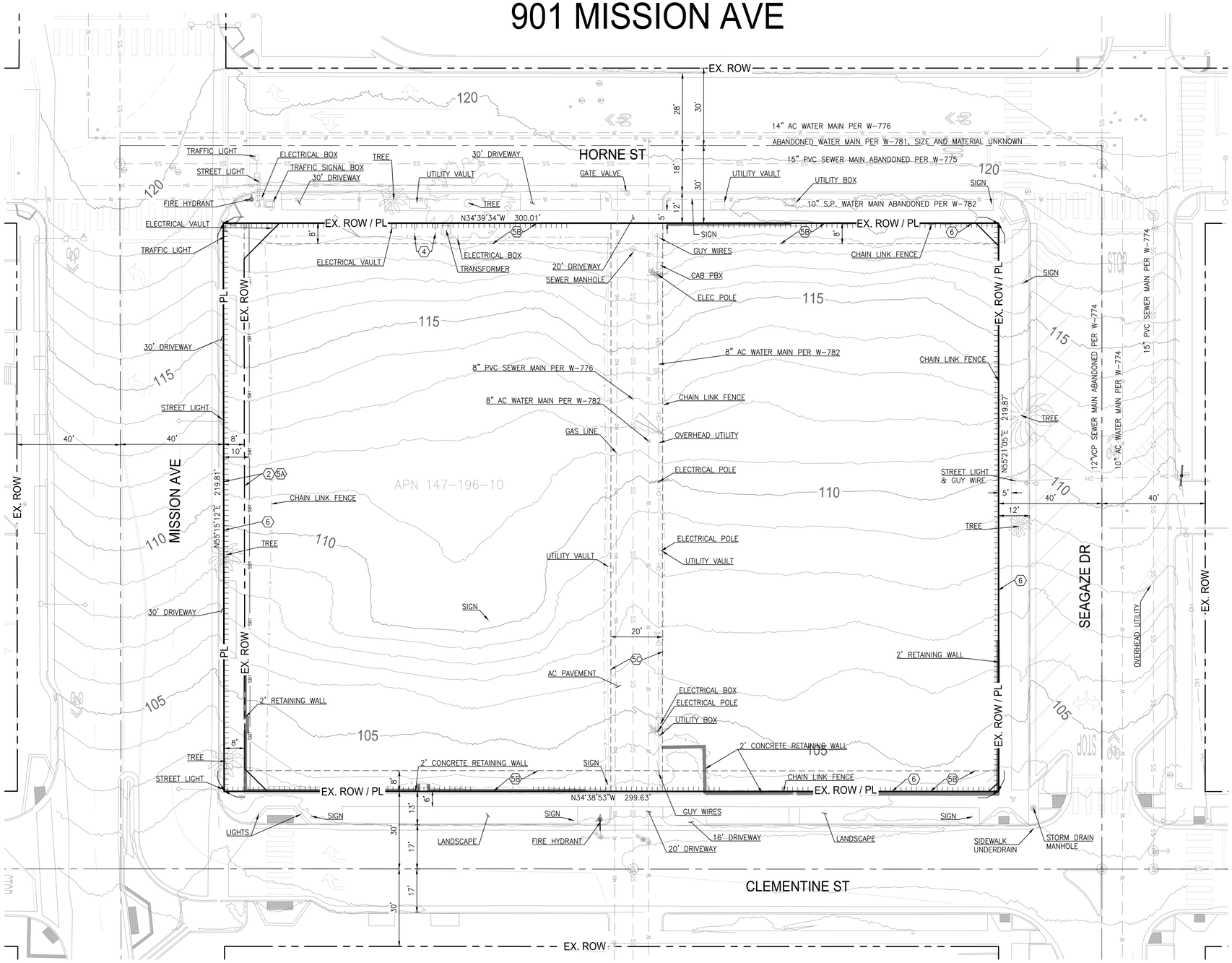
This is the cover sheet for Attachment 4.

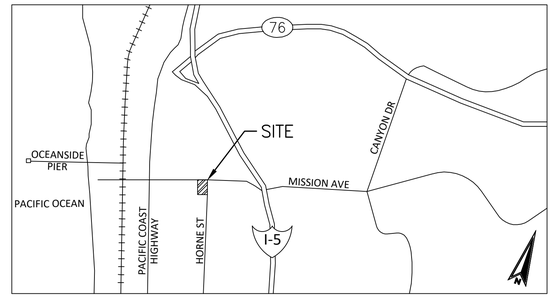
**Use this checklist to ensure the required information has been included on the plans:**

The plans must identify:

☒Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
☒The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☒Details and specifications for construction of structural BMP(s)
☒Signage indicating the location and boundary of structural BMP(s) as required by the City Engineer
☒How to access the structural BMP(s) to inspect and perform maintenance
☒Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☒Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☒Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☒Recommended equipment to perform maintenance
☒When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☒Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☒All BMPs must be fully dimensioned on the plans
☒When propritery BMPs are used, site specific cross section with outflow, inflow and model number shall be provided. Broucher photocopies are not allowed.

# CONCEPTUAL GRADING AND UTILITY PLANS
FOR
# 901 MISSION AVE




VICINITY MAP
NTS

## OWNER/ APPLICANT

AMIDI REAL ESTATE, LLC AND A & J, LLC
RAHIM AMIDHOZOUR
(650) 474-5785
370 CONVENTION WAY, REDWOOD CITY, CALIFORNIA 94063

## SURVEY SOURCE

THE TOPOGRAPHIC MAPPING USED FOR THIS SURVEY IS BASED ON A FIELD SURVEY PERFORMED BY PLSA ENGINEERING PER FLIGHT OF 04/10/2024.
THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM, NAD 83 (CCS83) EPOCH 2011, ZONE 6, AS DETERMINED LOCALLY BY A LINE BETWEEN CONTROL STATIONS 1004 AND 1003 BEING A GRID BEARING OF N78°44'08"W AS DERIVED FROM GEODETIC VALUES SHOWN ON ROS NO. 21787, CITY OF OCEANSIDE SURVEY CONTROL, FILED ON JULY 23, 2007 AS FILE NO. 2007-15581 IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY.
4.ELEVATIONS SHOWN HEREON ARE BASED ON A FOUND 3.5" BRASS DISC IN WELL MONUMENT STAMPED "LS 7959" AS SHOWN ON ROS 21787 AS POINT NO. 1004
ELEVATION:120.59' (NAVD 88)

## ZONING

EXISTING ZONE: D-2

## PARCEL AREA

EXISTING: 1.51 AC
PROPOSED: 1.51 AC

## ASSESSORS PARCEL NUMBER

147-196-10

## EXISTING LEGAL DESCRIPTION

LOT 1 OF THE BELVEDERE MIXED-USE PROJECT, IN THE CITY OF OCEANSIDE, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP NO. 15581, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, JULY 23,2007.

## EASEMENTS NOTES PER PRELIMINARY TITLE REPORT PROVIDED BY CHICAGO TITLE COMPANY ORDER NO. 00203181, DATED FEBRUARY 28, 2024

1 ITEM 1 IS NON MAPPING AND NOT SHOWN HEREON

(2) EASEMENT FOR PUBLIC HIGHWAY IN FAVOR OF THE CITY OF OCEANSIDE BY DOCUMENT RECORDED JUNE 16, 1969 AS FILE/PAGE NO. 106989, 106990, AND 106991 O.R.

3 ITEM 3 IS NON MAPPING AND NOT SHOWN HEREON

(4) AN EASEMENT FOR ELECTRIC POLE LINES AND UNDERGROUND CONDUITS IN FAVOR OF SAN DIEGO GAS & ELECTRIC COMPANY BY DOCUMENT RECORDED MAY 23, 1978 AS FILE/PAGE NO. 78-209943 OF OFFICIAL RECORDS.

(5A) PUBLIC RIGHT-OF-WAY DEDICATED TO THE CITY OF OCEANSIDE PER MAP 15581

(5B) AN EASEMENT FOR 8' PUBLIC ACCESS AND GENERAL UTILITIES AS SHOWN ON MAP NO. 15581.

(5C) 20' PUBLIC UTILITY EASEMENT OVER THE VACATED ALLEY PER MAP 15581 TO BE VACATED PER SEPERATE INSTRUMENT.

(6) THE OWNERSHIP OF SAID LAND DOES NOT INCLUDE RIGHTS OF VEHICULAR ACCESS TO HORNE STREET, SEAGAZE DRIVE, CLEMENTINE STREET AND MISSION AVENUE, EXCEPT THE DRIVEWAY OPENINGS FOR LOT 1 OF MAP NO. 15581.(LIMITS ACCESS TO ABUTTING RIGHT-OF-WAY - PLOTTED AS ) ACCESS RIGHTS TO BE REMANDED AT PROPOSED ACCESS DRIVEWAYS

## SHEET INDEX


TITLE SHEET & EXISTING CONDITIONS PLAN.....C1.0
DEMOLITION PLAN.....C2.0
CONCEPTUAL GRADING PLAN.....C3.0
CONCEPTUAL PUBLIC IMPROVEMENT & UTILITY PLAN.....C4.0
SECTIONS.....C5.0


ENGINEER IN CHARGE — 36083 RCE — DATE

LICENSED LAND SURVEYOR — 8070 PLS — DATE

LEGAL OWNER — DATE

## LEGEND

PROPOSED:
SETBACK — SB1
STREET CENTERLINE
RIGHT OF WAY — R/W
EASEMENT
PROPOSED SEWER — SS
SEWER MANHOLE
SEWER CLEANOUT
FIRE WATER — FW
DOMESTIC WATER — W
FIRE HYDRANT
STORM DRAIN — SD
CONCRETE
ASPHALT CONCRETE
ELECTRICAL — E
GAS
SIDEWALK
CURB AND GUTTER
MODULAR WETLAND SYSTEM (MWS)
DEMOLITION OF UTILITY LINE
STREET LIGHT
AREA DRAIN
SIDEWALK UNDERDRAIN
SHORING WALL
BASEMENT RETAINING WALL
MASONRY RETAINING WALL
UNDERGROUND DETENTION VAULT

EXISTING:
STREET LIGHT
SEWER — SS
SEWER MANHOLE
UTILITY VALVE
FIRE WATER — FW
DOMESTIC WATER — W
STORM DRAIN — SD
FIRE HYDRANT
ELECTRICAL — E
GAS — NG
FENCE — X
RIGHT OF WAY — R/W

## GRADING QUANTITIES

| | |
|---|---|
| TOTAL DISTURBED AREA: | 1.51 AC |
| PROJECT MAX DEPTH OF CUT: | 35.1 FT |
| PROJECT MAX DEPTH OF FILL: | 0 FT |
| MAX CUT SLOPE RATIO: | 2:1 |
| MAX FILL SLOPE RATIO: | 2:1 |

ON-SITE GRADING:

| | |
|---|---|
| DISTURBED AREA: | 1.51 AC |
| AMOUNT OF CUT: | 58,400 CY |
| AMOUNT OF FILL: | 0 CY |
| AMOUNT OF EXPORT: | 58,400 CY |

GRADING QUANTITIES ARE APPROXIMATE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN. QUANTITIES SHALL NOT BE USED FOR BIDDING PURPOSES.

## UTILITIES

ELECTRIC – SDG&E
GAS – SDG&E
TELEPHONE – COX OR AT&T
STORM DRAIN – OCEANSIDE WATER UTILITIES DEPARTMENT
WATER – OCEANSIDE WATER UTILITIES DEPARTMENT
SEWER – OCEANSIDE WATER UTILITIES DEPARTMENT

JPI

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

F:\PROJECTS\557\017\PLANS\ENTITLEMENTS\0557-17-C1-TS.DWG (10-31-2024 10:04:41AM) Plotted by: JBlackwelder

## ENTITLEMENT NUMBER
RD24-00002

REGISTERED PROFESSIONAL ENGINEER ERIC K. ARMSTRONG RCE 36083 Civil STATE OF CALIFORNIA
PRELIMINARY

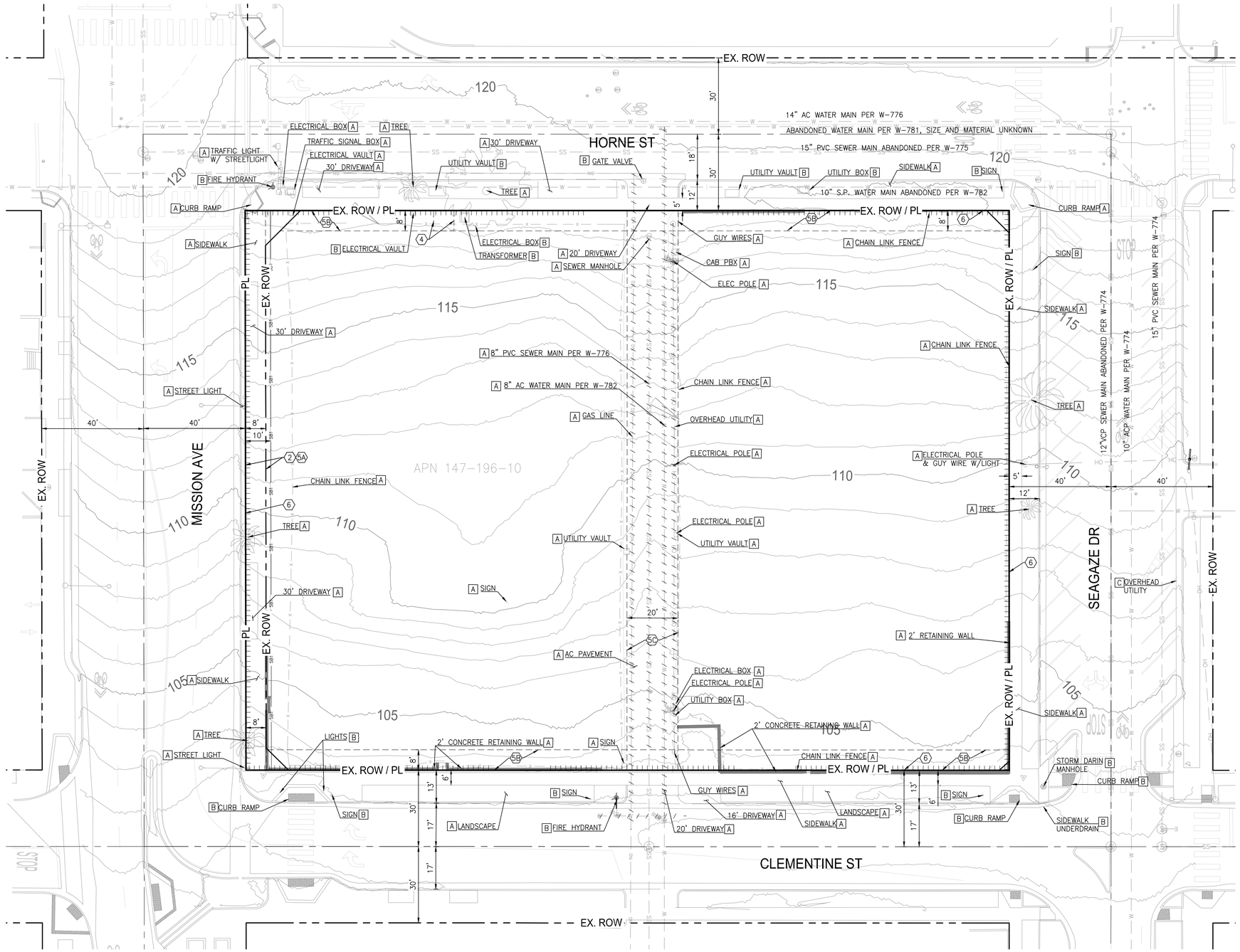
TITLE SHEET & EXISTING CONDITIONS PLAN

NORTH
1"=20'
0 20' 40' 60' 80'

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500 fuscoe.com

C1.0

JOB NO. 0557-017
DATE 08-09-2024




## EASEMENTS NOTES PER PRELIMINARY TITLE REPORT PROVIDED BY CHICAGO TITLE COMPANY ORDER NO. 00203181, DATED FEBRUARY 28, 2024

1 ITEM 1 IS NON MAPPING AND NOT SHOWN HEREON

(2) EASEMENT FOR PUBLIC HIGHWAY IN FAVOR OF THE CITY OF OCEANSIDE BY DOCUMENT RECORDED JUNE 16, 1969 AS FILE/PAGE NO. 106989, 106990, AND 106991 O.R.

3 ITEM 3 IS NON MAPPING AND NOT SHOWN HEREON

(4) AN EASEMENT FOR ELECTRIC POLE LINES AND UNDERGROUND CONDUITS IN FAVOR OF SAN DIEGO GAS & ELECTRIC COMPANY BY DOCUMENT RECORDED MAY 23, 1978 AS FILE/PAGE NO. 78-209943 OF OFFICIAL RECORDS.

(5A) PUBLIC RIGHT-OF-WAY DEDICATED TO THE CITY OF OCEANSIDE PER MAP 15581

(5B) AN EASEMENT FOR 8' PUBLIC ACCESS AND GENERAL UTILITIES AS SHOWN ON MAP NO. 15581.

(5C) 20' PUBLIC UTILITY EASEMENT OVER THE VACATED ALLEY PER MAP 15581 TO BE VACATED PER SEPERATE INSTRUMENT.

(6) THE OWNERSHIP OF SAID LAND DOES NOT INCLUDE RIGHTS OF VEHICULAR ACCESS TO HORNE STREET, SEAGAZE DRIVE, CLEMENTINE STREET AND MISSION AVENUE, EXCEPT THE DRIVEWAY OPENINGS FOR LOT 1 OF MAP NO. 15581.(LIMITS ACCESS TO ABUTTING RIGHT-OF-WAY – PLOTTED AS ) ACCESS RIGHTS TO BE REMANDED AT PROPOSED ACCESS DRIVEWAYS

## DEMOLITION NOTES

| | |
|---|---|
| A | EXISTING TO BE REMOVED |
| B | EXISTING TO REMAIN – PROTECT IN PLACE |
| C | EXISTING TO BE REMOVED AND UNDERGROUNDED |

## NOTICE TO CONTRACTOR

1. ADJUST ALL SURFACE UTILITES WITHIN LIMITS OF WORK TO PROPOSED GRADES
2. THE UPPER 24 INCHES OF SITE SOILS SHOULD BE REMOVED & RE-COMPACTED IN AREAS OF SIDEWALKS & SURFACE PARKING. IF LOOSE, DISTURBED, OR OTHERWISE UNSUITABLE MATERIALS ARE ENCOUNTERED AT THE BOTTOM OF EXCAVATION, DEEPER REMVOAL WILL BE REQUIRED UNTIL FIRM NATIVE SOILS ARE ENCOUNTERED. SEE GEOTECHNICAL REPORT SECTION 7.2 FOR OVER-EXCAVATION INFORMATION.

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

F:\PROJECTS\557\017\PLANS\ENTITLEMENTS\0557-17-C2-DM.DWG (10-31-2024 10:04:49AM) Plotted by: JBlackwelder

## ENTITLEMENT NUMBER
RD24-00002

REGISTERED PROFESSIONAL ENGINEER RICK K. ARMSTRONG RCE 36083 Civil STATE OF CALIFORNIA
PRELIMINARY

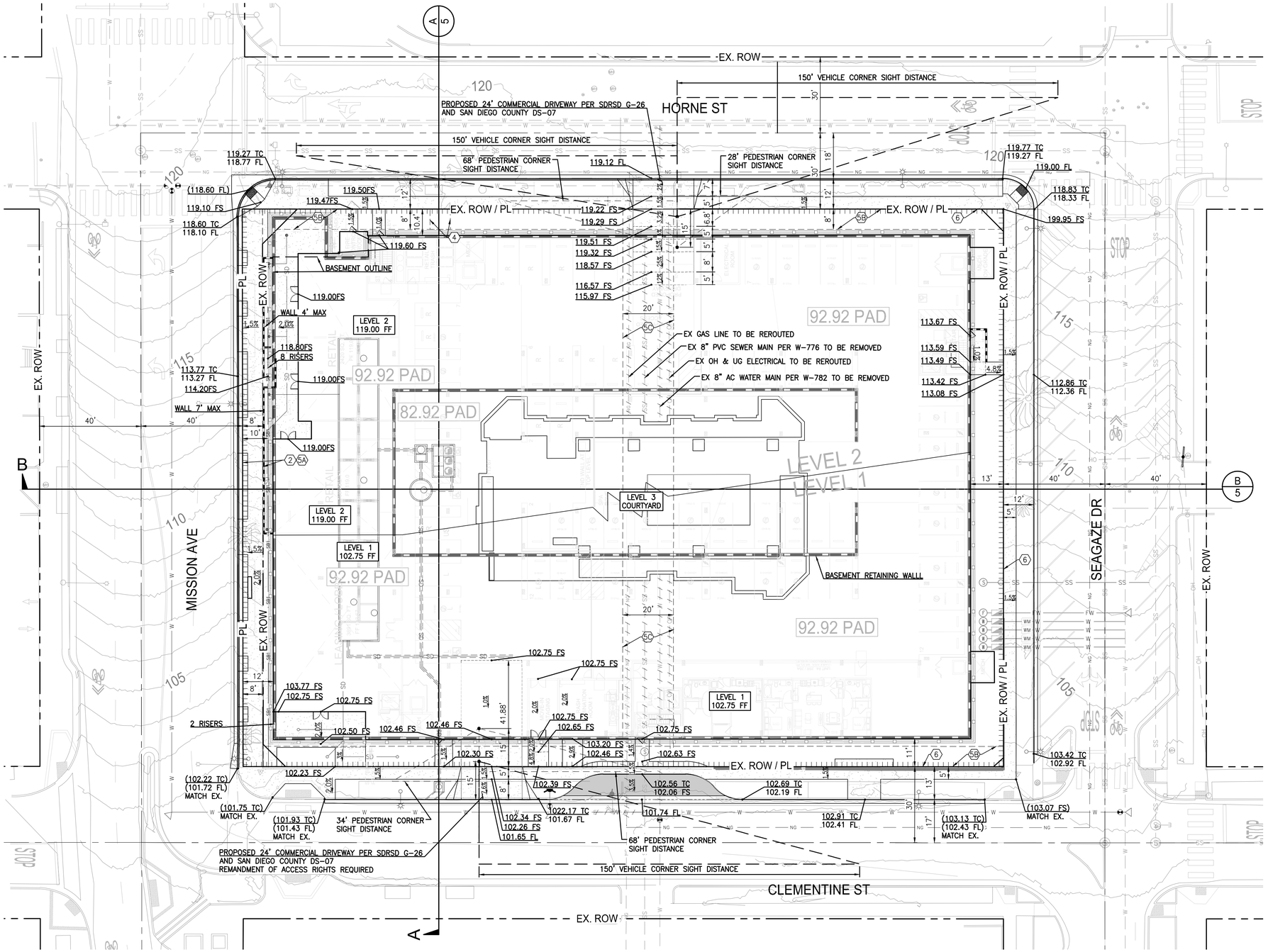
DEMOLITION PLAN

1"=20'
0 20' 40' 60' 80'

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6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500
fuscoe.com

C2.0

JOB NO. 0557-017
DATE 08-09-2024




## EASEMENTS NOTES PER PRELIMINARY TITLE REPORT PROVIDED BY CHICAGO TITLE COMPANY ORDER NO. 00203181

1 ITEM 1 IS NON MAPPING AND NOT SHOWN HEREON

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# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

F:\PROJECTS\557\017\PLANS\ENTITLEMENTS\0557-17-C3-GP.DWG (10-31-2024 10:05:01AM) Plotted by: JBlackwelder

## ENTITLEMENT NUMBER
RD24-00002

REGISTERED PROFESSIONAL ENGINEER ERIC K. ARMSTRONG RCE 36083 Civil STATE OF CALIFORNIA
PRELIMINARY

CONCEPTUAL GRADING PLAN

1"=20'
0 20' 40' 60' 80'

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C3.0

JOB NO. 0557-017
DATE 08-09-2024

## CONSTRUCTION NOTES

(1) PROPOSED STREET LIGHT PER OTHERS. STREET LIGHTS TO BE DECORATIVE BLUE POLES AS REQUIRED PER SPECIAL STANDARDS FOR DOWNTOWN AREA SPECIFIED IN THE CITY'S STREET LIGHT DESIGN MANUAL.

## EASEMENTS NOTES PER PRELIMINARY TITLE REPORT PROVIDED BY CHICAGO TITLE COMPANY ORDER NO. 00203181

1 ITEM 1 IS NON MAPPING AND NOT SHOWN HEREON

(2) EASEMENT FOR PUBLIC HIGHWAY IN FAVOR OF THE CITY OF OCEANSIDE BY DOCUMENT RECORDED JUNE 16, 1969 AS FILE/PAGE NO. 106989, 106990, AND 106991 O.R.

3 ITEM 3 IS NON MAPPING AND NOT SHOWN HEREON

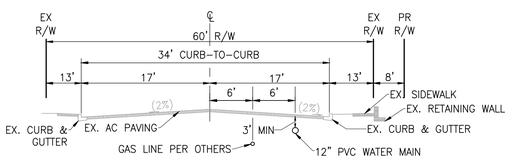
(4) AN EASEMENT FOR ELECTRIC POLE LINES AND UNDERGROUND CONDUITS IN FAVOR OF SAN DIEGO GAS & ELECTRIC COMPANY BY DOCUMENT RECORDED MAY 23, 1978 AS FILE/PAGE NO. 78-209943 OF OFFICIAL RECORDS.

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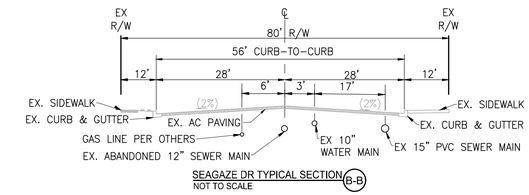
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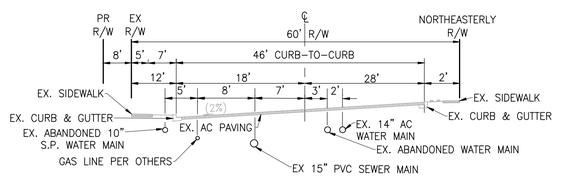
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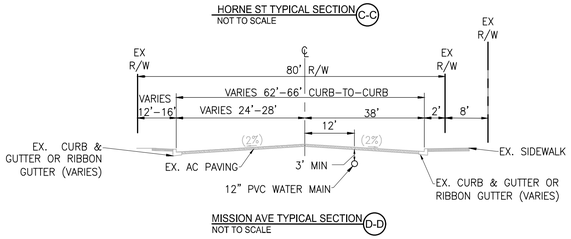

CLEMENTINE ST TYPICAL SECTION (A-A)
NOT TO SCALE




SEAGAZE DR TYPICAL SECTION (B-B)
NOT TO SCALE




HORNE ST TYPICAL SECTION (C-C)
NOT TO SCALE




MISSION AVE TYPICAL SECTION (D-D)
NOT TO SCALE

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

F:\PROJECTS\557\017\PLANS\ENTITLEMENTS\0557-17-C4-IP.DWG (10-31-2024 10:05:13AM) Plotted by: JBlackwelder

## ENTITLEMENT NUMBER
RD24-00002

PRELIMINARY

CONCEPTUAL PUBLIC IMPROVEMENT & UTILITY PLAN

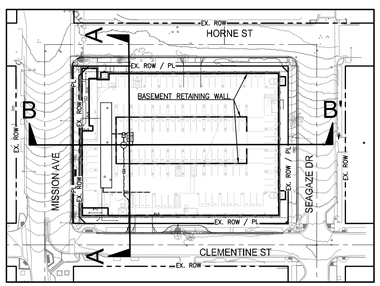
1"=20'

0 20' 40' 60' 80'

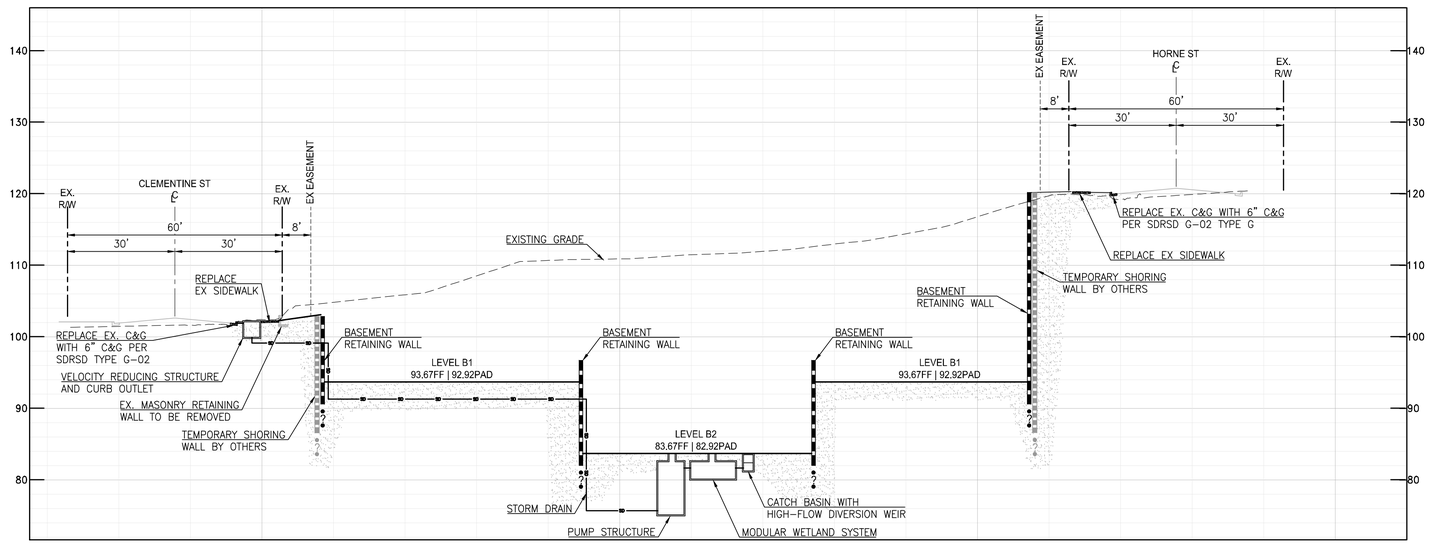

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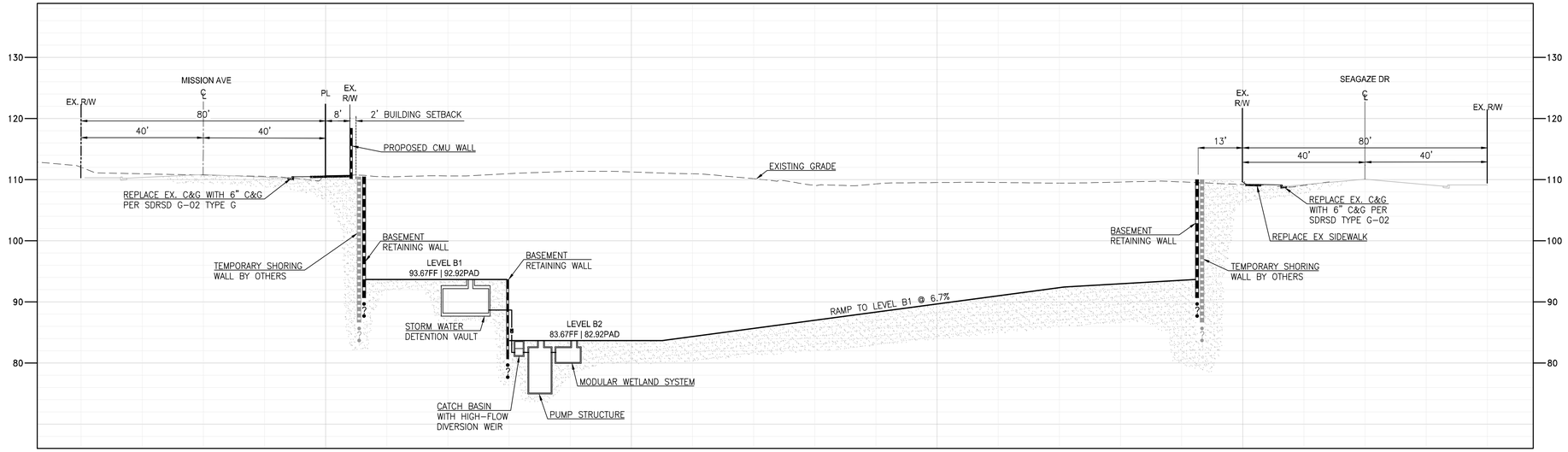
JOB NO. 0557-017
DATE 08-09-2024




KEY MAP
SCALE: 1"=100'




SECTION A
SCALE: HORIZ 1"=20'
VERT 1"=10'




SECTION B
SCALE: HORIZ 1"=20'
VERT 1"=10'

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

F:\PROJECTS\557\017\PLANS\ENTITLEMENTS\0557-17-C6-SCT.DWG (10-31-2024 10:05:23AM) Plotted by: JBlackwelder

## ENTITLEMENT NUMBER
RD24-00002

REGISTERED PROFESSIONAL ENGINEER ERIC K. ARMSTRONG RCE 36083 Civil STATE OF CALIFORNIA
PRELIMINARY

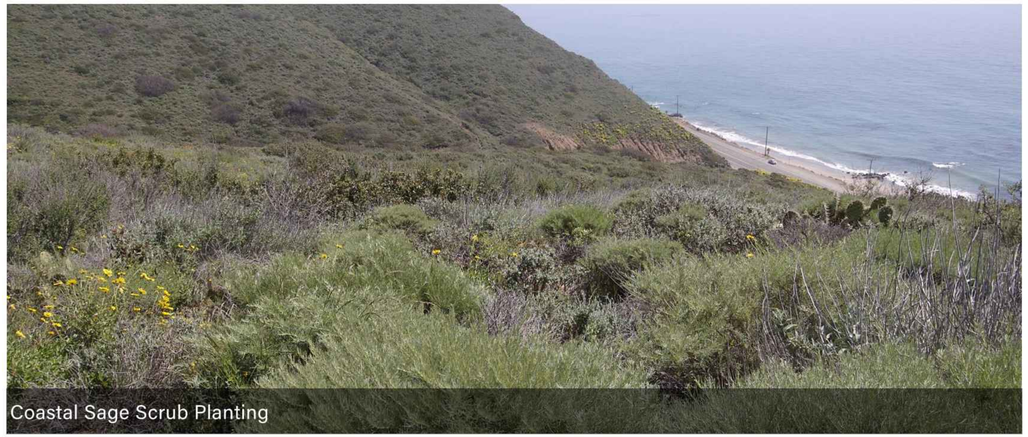
SECTIONS

1"=20'
0 20' 40' 60' 80'

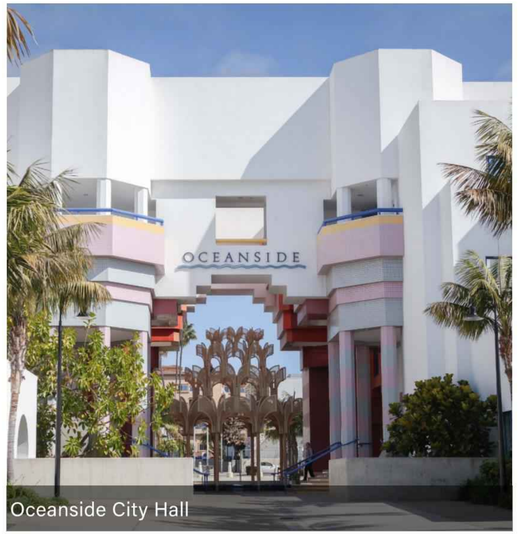
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C5.0

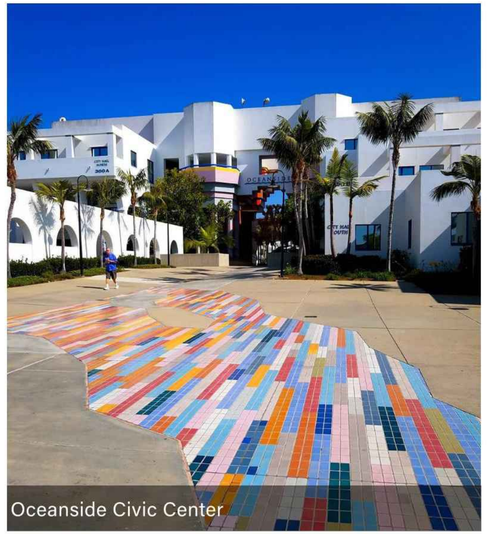
JOB NO. 0557-017
DATE 08-09-2024


Coastal Sage Scrub Planting


Oceanside Pier 1904

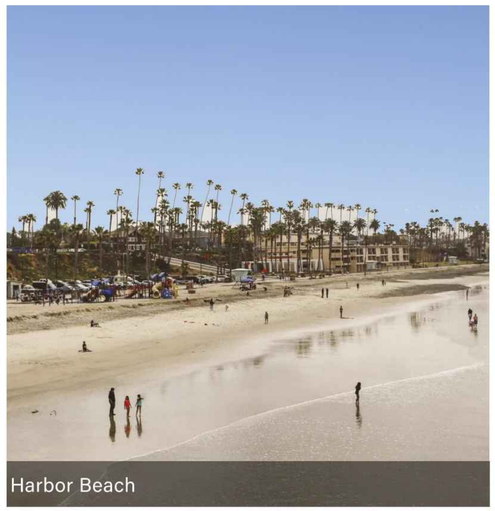


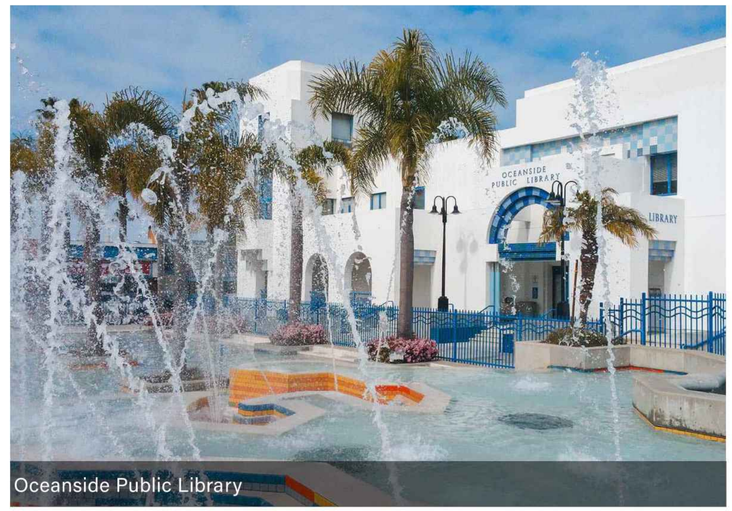
Oceanside City Hall


Oceanside Civic Center

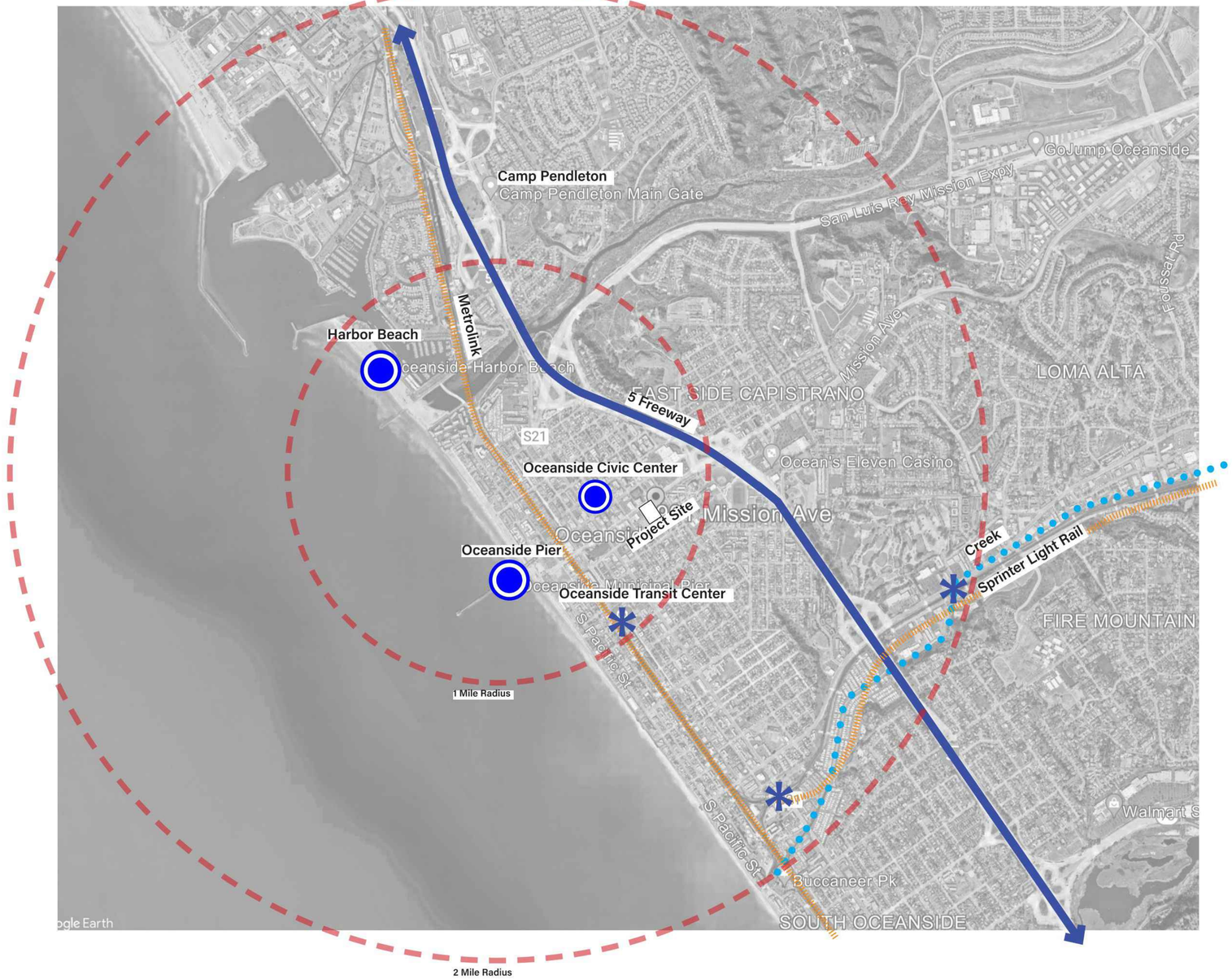
## HISTORIC CONTEXT

Oceanside grew up where the waves met the bluffs and freshwater creeks met the sea. San Luis Rey River, Loma Ala Creek, and Buena Vista Creek all find their way from the hills to the ocean by way of the City of Oceanside, creating a topography of canyons and mesas, and diverse range of associated ecosystems. These canyons, mesa, and creeks all give Oceanside its unique charcater it still has today - leaving remnants of the past waiting to be revealed. As the city grew in the early 20th century, the serene yet playful beach setting, in contrast to the historic gravitas of Spanish mission-style construction, inspired architecture such as Irving Gill's City Hall complex, giving a unique personality to the city's built environment.


Harbor Beach



Oceanside Public Library




## SITE CONTEXT

Recent decades in the development of the city have focused on increased connectivity for residents and visitors, as space has become an increasing commodity. The site currently sits about 0.5 miles of the Metrolink, close to the Oceanside Transit Center which connects all of LA, Orange, and San Diego county, among others. Interstate 5 is even closer, with Mission Blvd being an exit from the adjacent freeway. The project site lies only walking distance away from the Oceanside Civic Center, the cultural hub of the city, and is just over a mile away from the Loma Alta Creek. The creek is mostly channelized today, but has pockets of remaining habitat. On the wild canyon walls still remaining, coastal sage scrub provides a natural surrounding to the site and city overall.

## Legend

**Boardwalk**
Shaded Seating Areas
Enhanced Paving
Lobby/Retail Entry

**Garden Perimeter**
Tree Canopy
Screen Planting

**Bluffs** | Level 3
Amenity Spaces
Lounge Seating
BBQ Grill
Fire Pit
TV Lounge

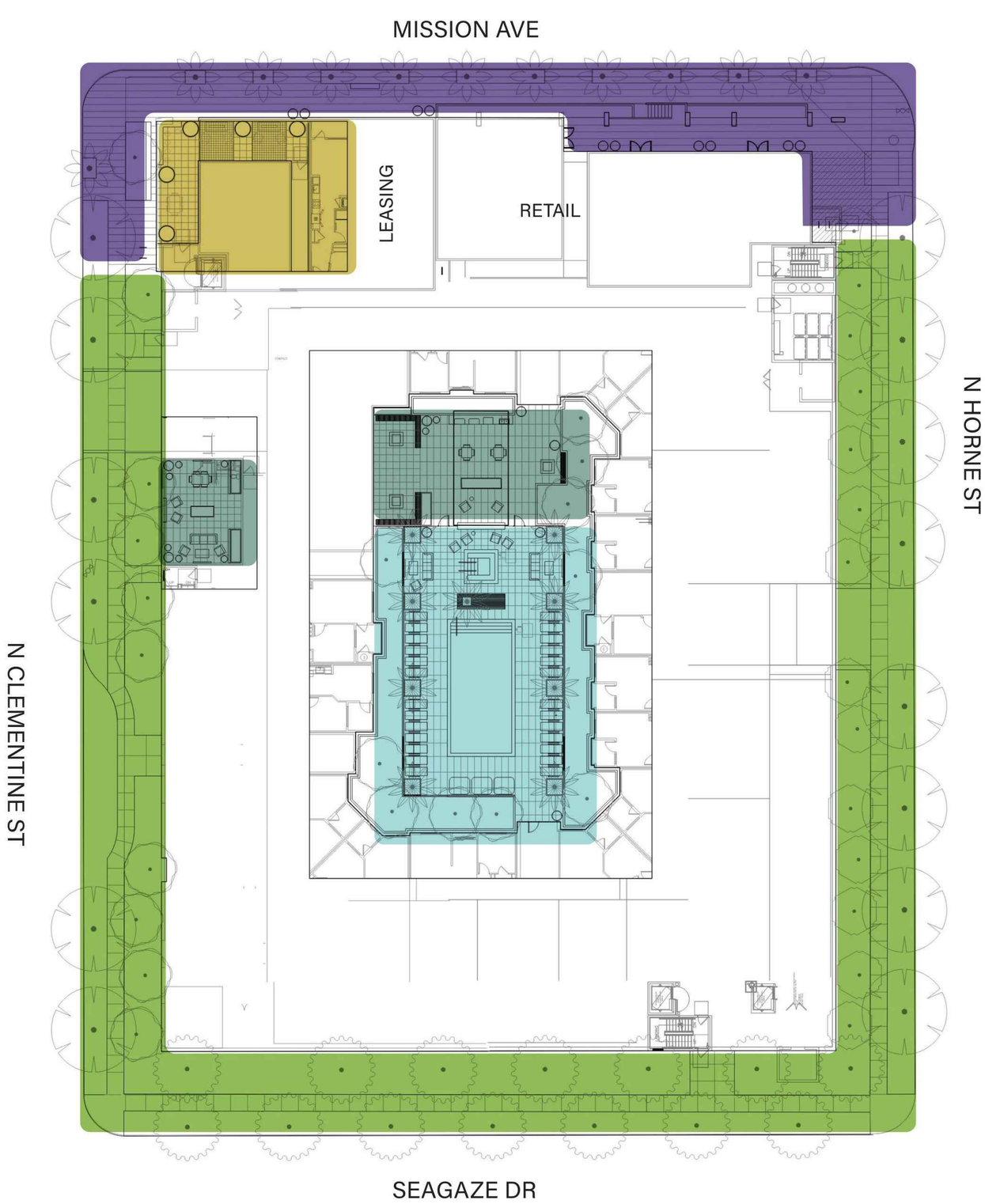
**Lagoon** | Level 3
Pool Deck
TV Lounge
Chaise Lounge

**Pier** | Level 8
Lounge
Fire Pit
View to City

## CONCEPT NARRATIVE

When someone thinks of the city of Oceanside, one word comes to mind: beach. However, the City of Oceanside is much more than that. It is a city that is constantly evolving and adapting to modern times by increasing accessibility and making the city livable while holding onto its natural and cultural roots.

This project will encompass a little piece of everything Oceanside has to offer. A small fragment of this growing city, this project builds an urban experience amongst a contextual coastal setting. From enjoying the Pier, to bathing in the sun in the Lagoon, or relaxing at the Bluffs, this projects aims to create an enhance livable experience for the residents of Oceanside.




# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

EPTDESIGN

CONCEPT DIAGRAM

1"=16'
0 16' 32' 48' 64'

L0.3

DATE 05-15-2024

## Boardwalk

Shaded Seating Areas
Enhanced Paving
Lobby/Retail Entry





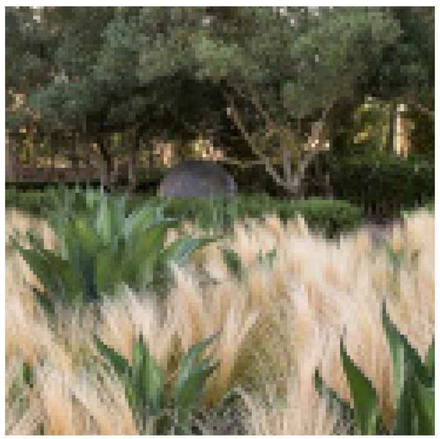


## Garden Perimeter

Tree Canopy
Screen Planting





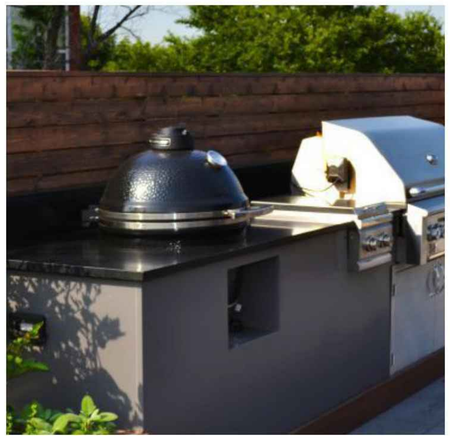


## Bluffs

Amenity Spaces
Lounge Seating
BBQ Grill
Fire Pit
TV Lounge



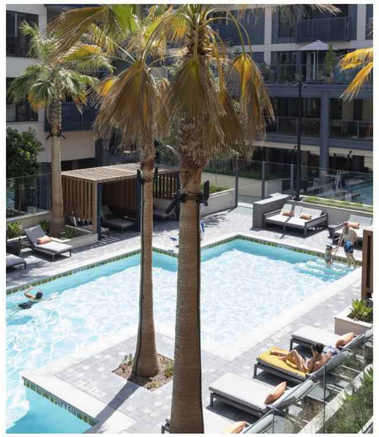






## Lagoon

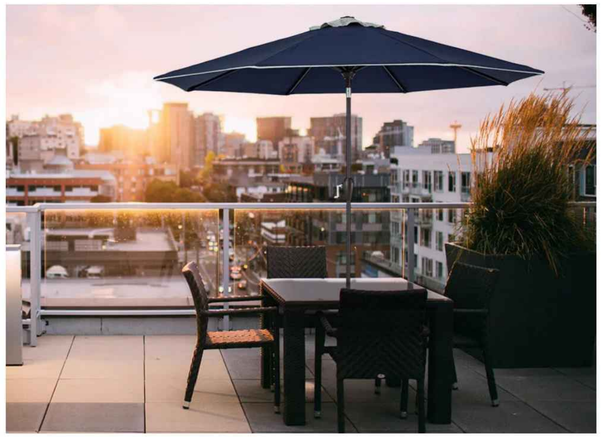
Pool Deck
TV Lounge
Chaise Lounge

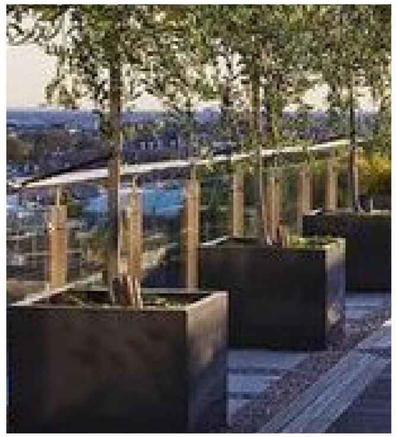





## Pier

Lounge
Fire Pit
View to City





## Legend

1. Enhance Concrete Paving
2. Concrete Paving
3. Concrete Seat Wall
4. Pot, typ.
5. Waste/Move-In Truck Staging
6. Retaining Wall
7. Concrete Steps with Handrails
8. Bike Rack, typ.
9. Tree Well, typ.
10. Driveway
11. Garden Perimeter
12. Lagoon (Level 3)
13. Bluffs (Level 3)
14. Pier (Roof Level)
15. Furniture to be provided by Tenant




NOTE: ALL PEDESTRIAN PAVING (BOTH DECORATIVE AND STANDARD) SHALL COMPLY WITH THE MOST CURRENT EDITION OF THE AMERICAN DISABILITY ACT.

JPI

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

EPTDESIGN

OVERALL SITE PLAN

1"=16'

0 16' 32' 48' 64'

AO

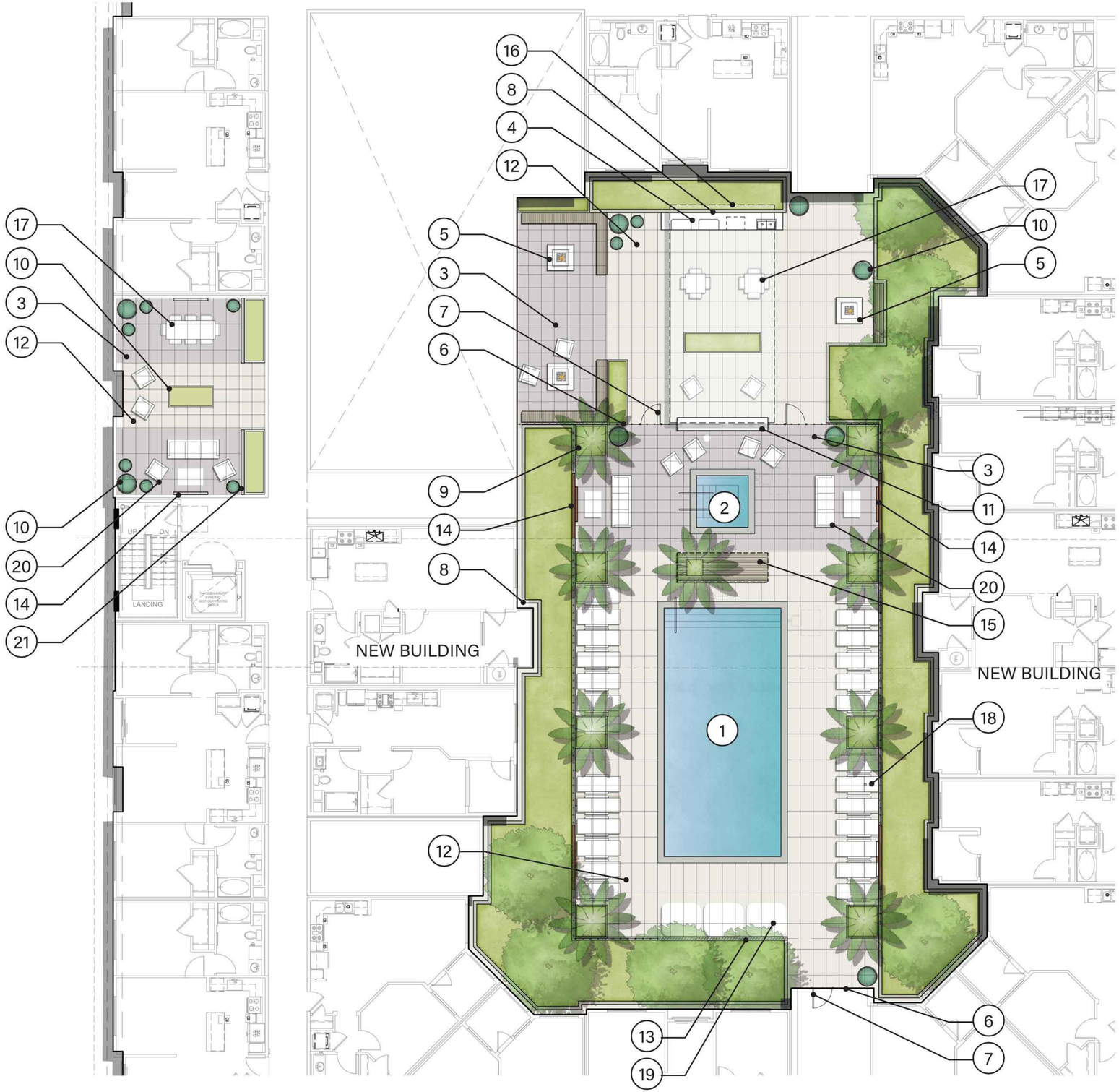
L1.0

DATE 05-15-2024

## Legend

1. Pool
2. Spa
3. Enhanced Concrete Paving
4. BBQ Grill and Countertop
5. Firepit with Built-In Seating
6. Pool Security Fence
7. Pool Security Gate
8. Raised Planter Wall, typ.
9. Palm Tree Planter Pot, typ.
10. Pot, typ.
11. Double-Sided Fireplace
12. Concrete Paving
13. Tile Feature Wall
14. TV Wall
15. Wood Platform Bench
16. Trellis Structure
17. Dining Table, typ.
18. Chaise Lounge, typ.
19. Day Bed, typ.
20. Lounge Furniture, typ.
21. Decorative Screen

NOTE: ALL PEDESTRIAN PAVING (BOTH DECORATIVE AND STANDARD) SHALL COMPLY WITH THE MOST CURRENT EDITION OF THE AMERICAN DISABILITY ACT.




# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

EPTDESIGN

POOL COURTYARD ENLARGEMENT PLAN

1"=8'

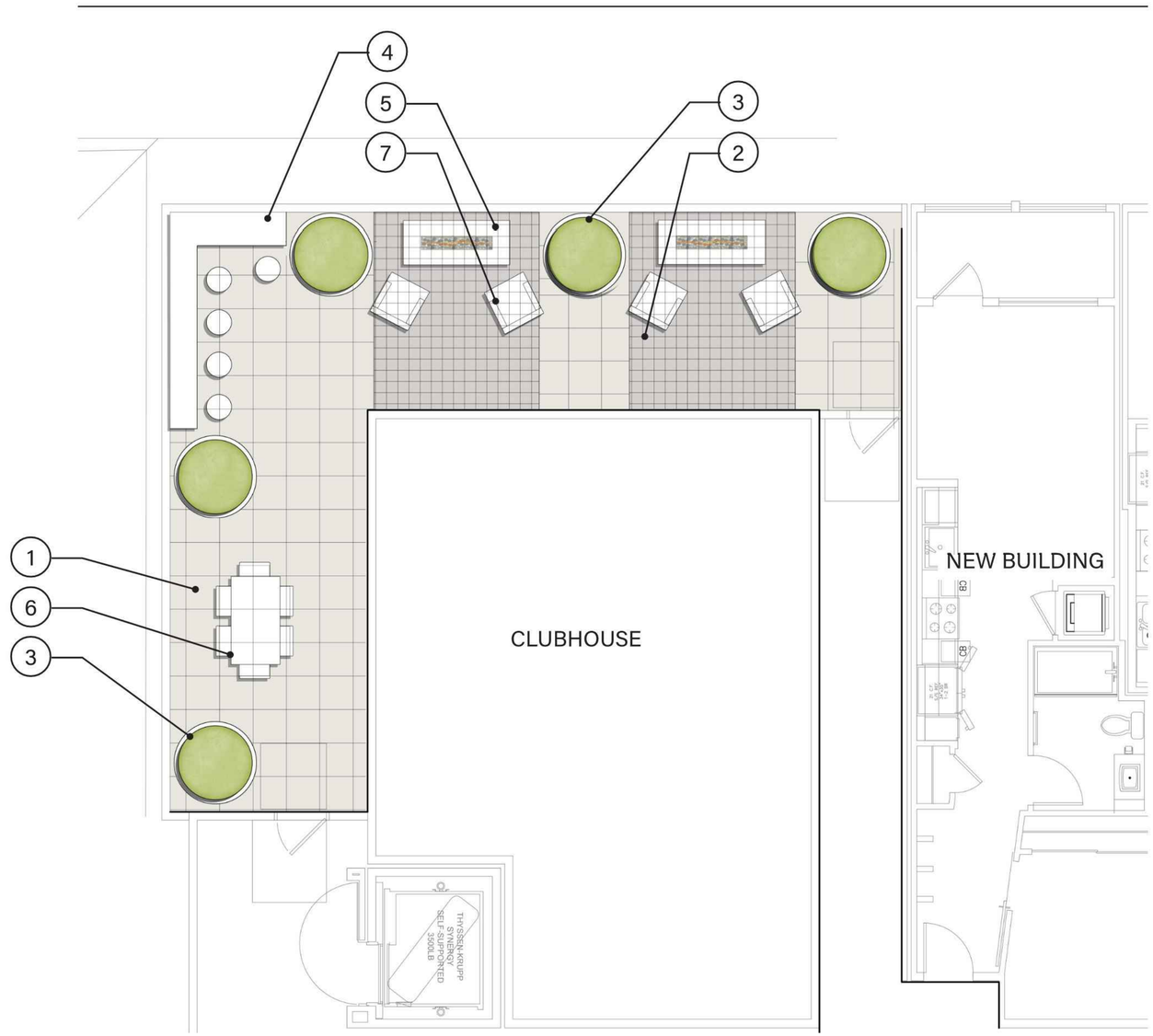
0 8' 16' 24' 32'

L1.1

DATE 05-15-2024

## Legend

1. Pedestal Pavers
2. Decorative Tile Pavers
3. Large Pot
4. Countertop with Seating
5. Fire Pit, typ.
6. Dining Table, typ.
7. Lounge Furniture, typ.




NOTE: ALL PEDESTRIAN PAVING (BOTH DECORATIVE AND STANDARD) SHALL COMPLY WITH THE MOST CURRENT EDITION OF THE AMERICAN DISABILITY ACT.

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

EPTDESIGN

ROOF DECK
ENLARGEMENT PLAN

1"=4'
0 4' 8' 12' 16'

L1.2

DATE 05-15-2024

## PLANTING LEGEND: Trees (Ground Level)

| SYMBOL | NAME | SIZE | WUCOLS WATER REQ.* | QTY |
|---|---|---|---|---|
| | ARBUTUS 'MARINA'<br>MARINA STRAWBERRY TREE | 24" BOX | LOW | 10 |
| | LAGERSTROEMIA INDICA 'NATCHEZ'<br>NATCHEZ CRAPE MYRTLE | 36" BOX | LOW | 14 |
| | PINUS TORREYANA<br>TORREY PINE | 36" BOX | LOW | 14 |
| | PODOCARPUS GRACILIOR<br>AFRICAN FERN PINE | 36" BOX | MED | 14 |
| | WASHINGTONIA FILIFERA<br>CALIFORNIA FAN PALM | 25' BTH | MED | 11 |
| × | EXISTING TREE TO BE REMOVED | - | - | 6 |

## PLANTING LEGEND: Shrub (Ground Level)

| SYMBOL | NAME | SIZE | WUCOLS WATER REQ.* |
|---|---|---|---|
| | AGAVE ATTENUATA 'NOVA'<br>NOVA AGAVE | 5 GAL@ 24" O.C. | LOW |
| | AGAVE AM. VAR. 'MEDIO-PICTA ALBA'<br>WHITE-STRIPED CENTURY PLANT | 15 GAL@ 36" O.C. | LOW |
| | CARISSA M. 'GREEN CARPET'<br>LOW GROWING NATAL PLUM | 5 GAL@ 30" O.C. | LOW |
| | DIETES GRANDIFLORA 'VARIEGATA'<br>STRIPED FORTNIGHT LILY | 5 GAL@ 24" O.C. | LOW |
| | ELAEAGNUS PUNGENS<br>SILVERBERRY | 5 GAL@ 36" O.C. | LOW |
| | ENCELIA CALIFORNICA<br>COAST SUNFLOWER | 1 GAL@ 24" O.C. | LOW |
| | LOMANDRA LONGIFOLIA 'BREEZE'<br>DWARF MAT RUSH | 5 GAL@ 30" O.C. | LOW |
| | PITTOSPORUM CRASSIFOLIUM 'COMPACTUM'<br> | 5 GAL@ 36" O.C. | MED |
| | SALVIA 'ALLEN CHICKERING'<br>ALLEN CHICKERING SAGE | 5 GAL@ 36" O.C. | LOW |
| | SALVIA GREGGII<br>AUTUMN SAGE | 1 GAL@ 36" O.C. | LOW |
| | WESTRINGIA FRUTICOSA 'MUNDI'<br>LOW COAST ROSEMARY | 5 GAL@ 36" O.C. | LOW |
| | WESTRINGIA 'WYNYABBIE GEM'<br>COAST ROSEMARY | 5 GAL@ 36" O.C. | LOW |
| | YUCCA WHIPPLEI<br>CHAPARRAL YUCCA | 5 GAL@ 30" O.C. | LOW |

## PLANTING LEGEND: Trees (Level 3)

| SYMBOL | NAME | SIZE | WUCOLS WATER REQ.* | QTY |
|---|---|---|---|---|
| | ARBUTUS 'MARINA'<br>MARINA STRAWBERRY TREE | 36" BOX | LOW | 8 |
| | PHOENIX DACTYLIFERA<br>DATE PALM | 25' BTH | LOW | 9 |

## PLANTING LEGEND: Shrub (Level 3)

| SYMBOL | NAME | SIZE | WUCOLS WATER REQ.* |
|---|---|---|---|
| | ACACIA COGNATA 'COUSIN ITT'<br>COUSIN ITT ACACIA | 5 GAL@ 48" O.C. | LOW |
| | AGAVE ATTENUATA 'NOVA'<br>NOVA AGAVE | 5 GAL@ 48" O.C. | LOW |
| | AEONIUM 'MINT SAUCER'<br>GREEN AEONIUM | 1 GAL@ 12" O.C. | LOW |
| | CAREX TUMULICOLA<br>BARKELEY SEDGE | 1 GAL@ 24" O.C. | LOW |
| | DIANELLA 'CASSA BLUE'<br>BLUE FLAX LILY | 5 GAL@ 24" O.C. | LOW |
| | DIETES GRANDIFLORA 'VARIEGATA'<br>STRIPED FORTNIGHT LILY | 5 GAL@ 24" O.C. | LOW |
| | LOMANDRA LONGIFOLIA 'BREEZE'<br>DWARF MAT RUSH | 5 GAL@ 30" O.C. | LOW |
| | OLEA EUROPAEA 'MONTRA'<br>LITTLE OLEA | 5 GAL@ 36" O.C. | LOW |
| | PHILODENDRON 'XANADU'<br>XANADU PHILODENDRON | 5 GAL@ 48" O.C. | MED |
| | PITTOSPORUM CRASSIFOLIUM 'COMPACTUM'<br> | 5 GAL@ 36" O.C. | MED |
| | RUSSELIA EQUISETIFORMIS<br>CORAL FOUNTAIN | 5 GAL@ 36" O.C. | MED |
| | SENECIO MANDRALISCAE<br>BLUE CHALKSTICKS | 1 GAL@ 24" O.C. | LOW |

## PLANTING LEGEND: Shrub (Rooftop)

| SYMBOL | NAME | SIZE | WUCOLS WATER REQ.* |
|---|---|---|---|
| | CAREX TUMULICOLA<br>BARKELEY SEDGE | 1 GAL@ 24" O.C. | LOW |
| | CHONDROPETALUM TECTORUM<br>CAPE REED | 5 GAL@ 30" O.C. | LOW |
| | KALANCHOE BEHARENSIS<br>VALVET ELEPHANT EAR | 5 GAL@ 36" O.C. | LOW |
| | SENECIO MANDRALISCAE<br>BLUE CHALKSTICKS | 1 GAL@ 24" O.C. | LOW |

*** WUCOLS WATER REQUIRMENT**

WATER REQUIREMENT PLANT FACTOR IS BASED ON WUCOLS DATABASE AND CAN BE FOUND ONLINE AT: http://ucanr.edu/sites/WUCOLS/

## CITY OF OCEANSIDE PLANTING NOTES/REQUIREMENTS

1. FINAL LANDSCAPE PLANS SHALL ACCURATELY SHOW PLACEMENT OF TREES, SHRUBS, AND GROUNDCOVERS.

2. LANDSCAPE ARCHITECT SHALL BE AWARE OF UTILITY, SEWER, STORM DRAIN EASEMENT AND PLACE PLANTING LOCATIONS ACCORDINGLY TO MEET CITY OF OCEANSIDE REQUIREMENTS.

3. ALL REQUIRED LANDSCAPE AREAS (INCLUDING THE ROW) SHALL BE MAINTAINED BY OWNER OR AS STATED IN ANY LEGAL DOCUMENT SUCH AS BUT NOT LIMITED TO A LEASE AGREEMENT. THE LANDSCAPE AREAS SHALL BE MAINTAINED PER CITY OF OCEANSIDE REQUIREMENTS.

4. AN AUTOMATIC IRRIGATION SYSTEM SHALL BE INSTALLED TO PROVIDE COVERAGE FOR ALL PLANTING AREAS SHOWN ON THE PLAN. LOW VOLUME EQUIPMENT SHALL PROVIDE SUFFICIENT WATER FOR PLANT GROWTH WITH A MINIMUM WATER LOSS DUE TO WATER RUN-OFF. IRRIGATION SYSTEMS SHALL USE HIGH QUALITY, AUTOMATIC CONTROL VALVES, CONTROLLERS AND OTHER NECESSARY IRRIGATION EQUIPMENT. ALL COMPONENTS SHALL BE OF NON-CORROSIVE MATERIAL. ALL DRIP SYSTEMS SHALL BE ADEQUATELY FILTERED AND REGULATED PER THE MANUFACTURER'S RECOMMENDED DESIGN PARAMETERS. ALL IRRIGATION IMPROVEMENTS SHALL FOLLOW THE CITY OF OCEANSIDE GUIDELINES AND WATER CONSERVATION ORDINANCE.

5. THE SELECTION OF PLANT MATERIAL IS BASED ON CULTURAL, AESTHETIC, AND MAINTENANCE CONSIDERATIONS. ALL PLANTING AREAS SHALL BE PREPARED WITH APPROPRIATE SOIL AMENDMENTS, FERTILIZERS, AND APPROPRIATE SUPPLEMENTS BASED UPON A SOILS REPORT FROM AN AGRICULTURAL SUITABILITY SOIL SAMPLE TAKEN FROM THE SITE. GROUND COVERS OR BARK MULCH SHALL FILL IN BETWEEN THE SHRUBS TO SHIELD THE SOIL FROM THE SUN, EVAPOTRANSPORATION AND RUN-OFF. ALL THE FLOWER AND SHRUB BEDS SHALL BE MULCHED TO A 3" DEPTH TO HELP CONSERVE WATER, LOWER THE SOIL TEMPERATURE AND REDUCE WEED GROWTH. THE SHRUBS SHALL BE ALLOWED TO GROW IN THEIR NATURAL FORMS. ALL LANDSCAPE IMPROVEMENTS SHALL FOLLOW THE CITY OF OCEANSIDE GUIDELINES.

6. THE CURRENT GENERAL NOTES BELOW REFER TO THE PLACEMENT OF TREES AND THEIR DISTANCES FROM HARDSCAPE AND OTHER UTILITIES/ STRUCTURES. PLEASE SHOW THE CITY OF OCEANSIDE'S CURRENT TREE PLANTING DISTANCES/SPACING ON THE CLP AND SPACE PROPOSED TREES ACCORDINGLY.

STREET TREES AND OTHER TREES SHALL BE SPACED:
i. 8 FEET (PREVIOUSLY 3 FEET) FROM TRANSFORMERS, CABLE, AND PULL BOXES.
ii. 5 FEET FROM MAILBOXES
iii. 5 FEET FROM FIRE HYDRANTS (ALL SIDES)
iv. 10 FEET FROM CENTERLINE (PREVIOUSLY 7 FEET) OF ALL UTILITY LINES (WITHOUT EASEMENT) (SEWER, WATER, STORM DRAINS, DOUBLE CHECK DETECTORS, AIR RELIEF VALVES AND GAS)
v. 10 FEET FROM EASEMENT BOUNDARIES (SEWER, WATER, STORM DRAINS, ACCESS OR OTHER UTILITIES)
vi. 10 FEET FROM DRIVEWAYS (UNLESS A LINE OF SIGHT IS DETERMINED BY THE TRAFFIC DIVISION TO BE OTHERWISE)
vii. 10 FEET FROM TRAFFIC AND DIRECTIONAL SIGNS
viii. 15 FEET (MINIMUM) FROM STREETLIGHTS, OTHER UTILITY POLES, (DETERMINED BY SPECIFICATIONS)
ix. STREET TREES SHALL BE PLANTED 3' OUTSIDE RIGHT-OF-WAY IF THE RIGHT-OF-WAY DOES NOT A ALLOW SPACE, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
x. LINE OF SIGHT AT ARTERIALS, COLLECTOR AND LOCAL STREETS SHALL BE REVIEWED AND DETERMINED BY TRAFFIC ENGINEER. A MINIMUM OF TWENTY-FIVE FEET (25') FROM STREET INTERSECTION OR AS APPROVED BY THE TRAFFIC ENGINEER.
xi. MINIMUM FIFTEEN FEET (15') STREETLIGHT AND STOP SIGN OR CLEARANCE DETERMINED BY SPECIFICATIONS.
xii. SCREEN ALL UTILITIES ACCORDING TO SPECIFIC AGENCY REQUIREMENTS. ROOT BARRIERS SHALL BE INSTALLED ADJACENT TO ALL PAVING SURFACES WHERE A PAVING SURFACE IS LOCATED WITHIN 6 FEET OF A TREE TRUNK ON SITE (PRIVATE) AND WITHIN 10 FEET OF A TREE TRUNK IN THE RIGHT-OF-WAY (PUBLIC). ROOT BARRIERS SHALL EXTEND 5 FEET IN EACH DIRECTION FROM THE CENTERLINE OF THE TRUNK, FOR A TOTAL DISTANCE OF 19 FEET.

7. ROOT BARRIERS SHALL BE A MINIMUM 24 INCHES IN DEPTH. INSTALLING A ROOT BARRIER AROUND THE TREE'S ROOT BALL IS UNACCEPTABLE.LANDSCAPE IMPROVEMENT PLAN SET AND INSTALLATION ARE REQUIRED TO IMPLEMENT APPROVED FIRE DEPT. REGULATIONS, CODES, AND STANDARDS AT THE TIME OF PROJECT APPROVAL. ALL FIRE HYDRANTS, DOUBLE CHECK DETECTORS, POST INDICATING VALVES, AND FIRE DEPARTMENT CONNECTIONS SHALL BE PROVIDED WITH A 3-FOOT CLEARANCE AROUND ALL FIRE APPARATUSES. ALL TREES AT MATURITY SHALL MEET A HORIZONTAL CLEARANCE ALONG/ALL ROADWAYS FROM CURB TO CURB. HORIZONTAL ROADWAY CLEARANCE FOR A ONE-STORY BUILDING IS 28-FEET WIDE ALL TREES AT MATURITY SHALL MEET A VERTICAL CLEARANCE OF 14-FEET FROM THE TOP OF THE ROADWAY TO THE LOWEST BRANCHES.

8. PERMANENT IRRIGATION (INCLUDING SPRAY AND/OR DRIP) WILL BE PROVIDED, IN THE CONSTRUCTION DOCUMENT PHASE, AND TO BE INSTALLED PER LOCAL CALIFORNIA WATER REGULATION (AB1881).

9. THE PLANT PALETTE LISTED PROVIDES A LIST OF PLANT MATERIAL TO SELECT FROM WHEN PREPARING FINAL LANDSCAPE CONSTRUCTION DOCUMENTS FOR THIS PROJECT. HOWEVER, SUBSTITUTIONS MAY BE REQUIRED DUE TO AVAILABILITY, SOILS TESTS, OR OTHER CONDITIONS.

10. ALL TREES WITHIN 5' OF HARDSCAPE TO BE INSTALLED WITH DEEP ROOT BARRIERS.

11. TRANSFORMERS, BACK-FLOW PREVENTERS & OTHER ABOVE-GROUND UTILITIES TO BE SCREENED WITH LANDSCAPE AS PERMITTED PER LOCAL CODES & REGULATIONS.

12. LANDSCAPE LIGHTING(LANDSCAPE UP-LIGHTS, PATH LIGHTS/BOLLARDS, ETC.) TO BE COORDINATED WITH ELECTRICAL ENGINEER IN FUTURE PHASE.

## PLANTING AREA PROVIDED

GROUND LEVEL: 12,280 SF
ON-SITE PLANTING AREA TOTAL: 7,575 SF

PUBLIC RIGHT-OF-WAY:
OFF-SITE PLANTING AREA TOTAL: 4,705 SF

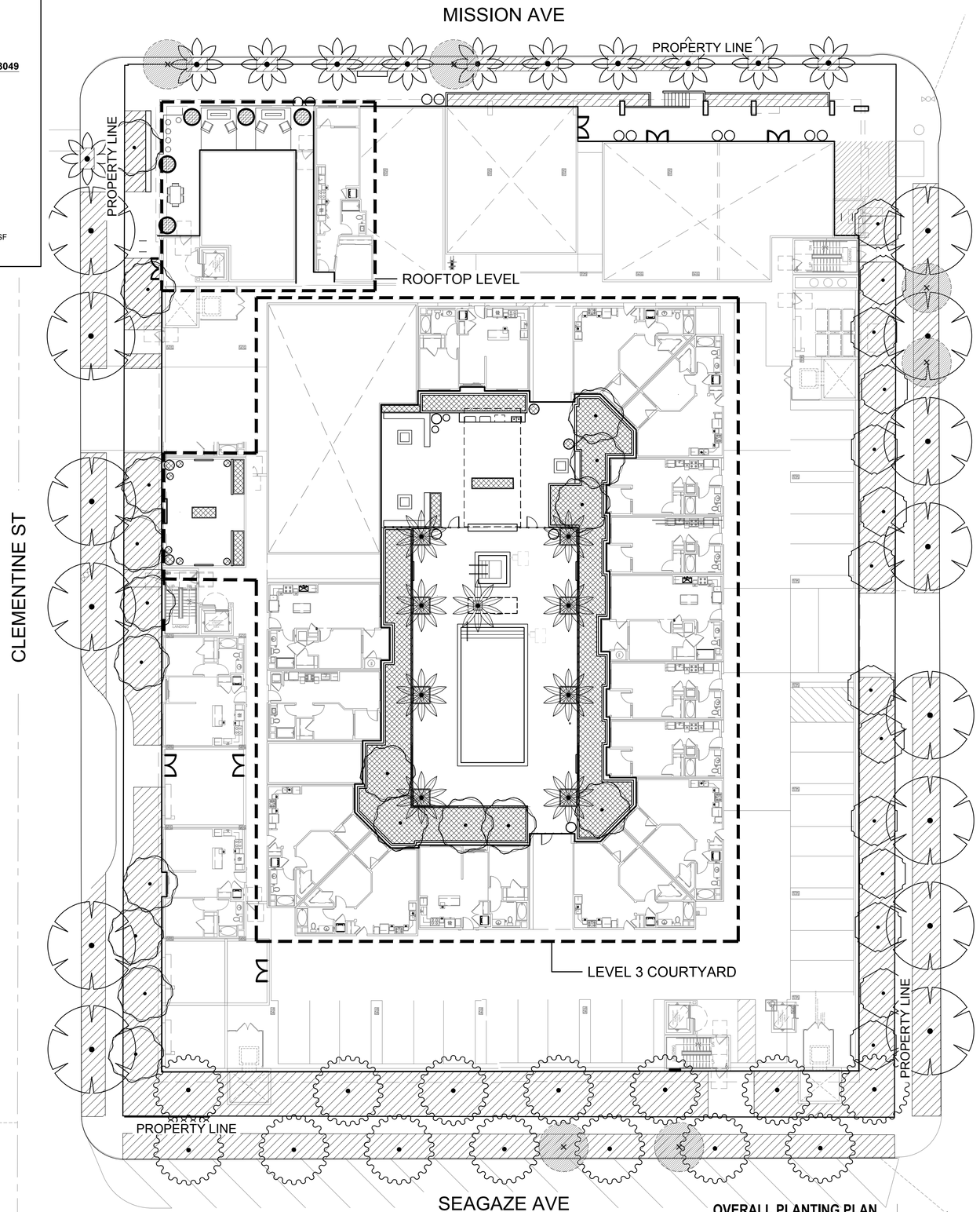
## LANDSCAPE URBAN FORESTRY | OZO 3049

PROJECT TOTAL SITE AREA: 65,912 SF

PROJECT OPEN SPACE: 31,070 SF
LEASING PLAZA: 1,044 SF
RETAIL PLAZA: 2,476 SF
LEVEL 3 POOL COURTYARD: 8,565 SF
LEVEL 3 AMENITIES: 3,383 SF
ROOF DECK: 868 SF
CLUBHOUSE: 946 SF
PRIVATE OPEN SPACE: 13,783 SF

TREE CANOPY TOTAL: 24,409 SF
GROUND LEVEL: 18,443 SF
LEVEL 3 PODIUM LEVEL: 5,966 SF
LEVEL 8 ROOF AMENITY: N/A

**TREE CANOPY AREA CALCULATION**
MINIMUM TREE CANOPY AREA REQUIRED: 7,914 SF
(12% OF TOTAL SITE AREA)
TREE CANOPY AREA PROVIDED: 23,781 SF (36%)




**OVERALL PLANTING PLAN**

1"=16'
0 16' 32' 48' 64'

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

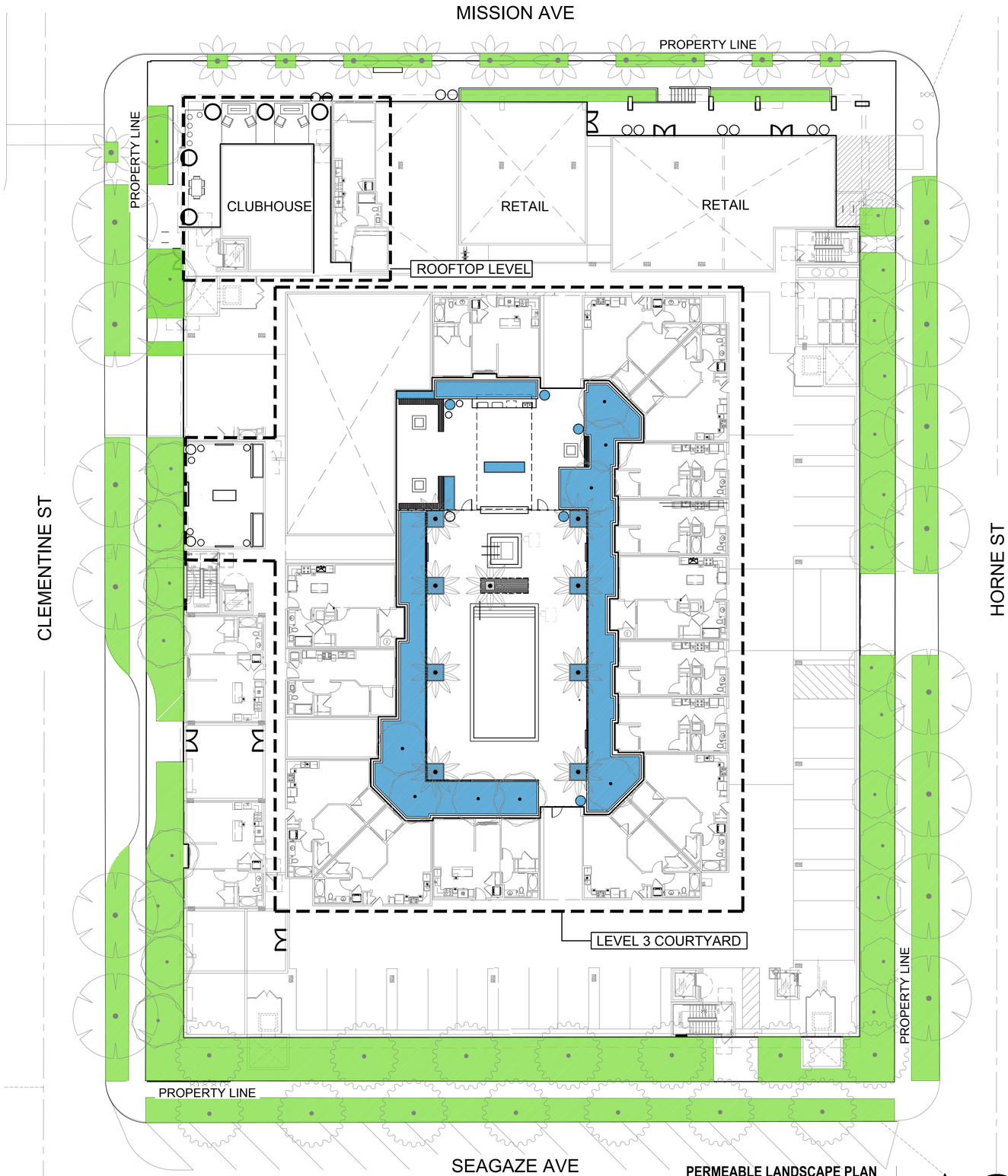
JPI

EPTDESIGN

L3.0

DATE 05-15-2024

| LANDSCAPE LEGEND | | |
|---|---|---|
| SYMBOL | DESCRIPTION | QTY |
| | PERMEABLE LANDSCAPE ON GRADE | 12,246 SF |
| | PERMEABLE LANDSCAPE ON PODIUM | 2,571 SF |
| | **TOTAL LANDSCAPE AREA** | 14,817 SF (23%) |
| | **TOTAL SITE AREA** | 65,912 SF |




# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

EPTDESIGN

PERMEABLE LANDSCAPE PLAN

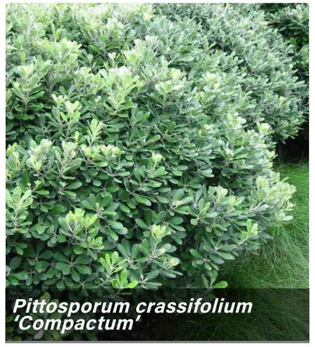
NORTH

1"=16'

0 16' 32' 48' 64'

L3.1

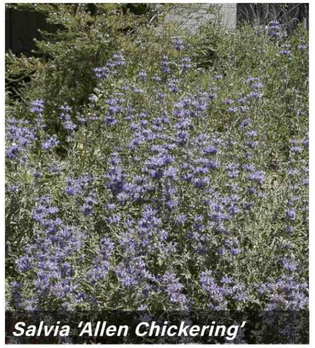
DATE 05-15-2024


Pittosporum crassifolium 'Compactum'


Agave attenuata 'Nova'


Washingtonia filifera

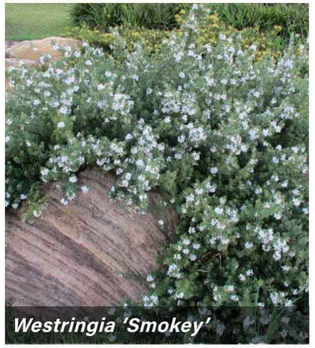

Salvia greggii 'Alba'

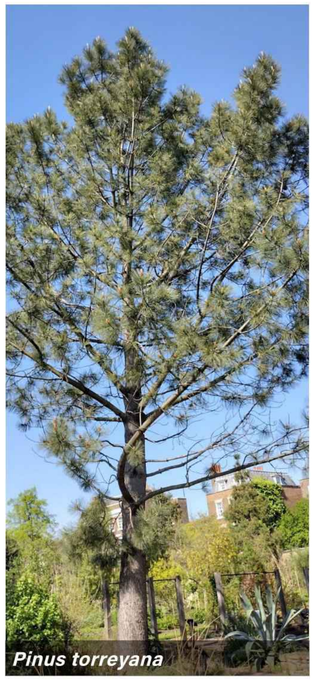

Salvia 'Allen Chickering'


Elaegnus pungens


Dietes grandiflora 'Variegata'


Encelia californica


Westringia 'Smokey'


Pinus torreyana


Arbutus 'Marina'


Lagerstroemia 'Natchez'


Podocarpus gracilior


Carissa macrocarpa 'Green Carpet'


Lomandra longifolia 'Breeze'

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

EPTDESIGN

GROUND FLOOR PLANTING IMAGERY

L3.2

DATE 05-15-2024


Olea europea ‘Montra’


Agave attenuata ‘Nova’


Phoenix dactylifera

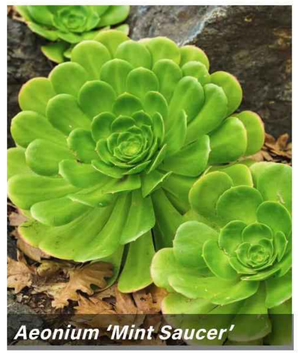

Senecio mandraliscae


Dietes g.‘Variegata’


Russelia equisetiformis


Dianella ‘Cassa Blue’


Carex tumulicola


Aeonium ‘Mint Saucer’


Arbutus ‘Marina’


Acacia cognata ‘Cousin Itt’


Pittosporum c. ‘Compactum’


Philodendron xanadu

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

EPTDESIGN

POOL COURTYARD PLANTING IMAGERY

L3.3

DATE 05-15-2024



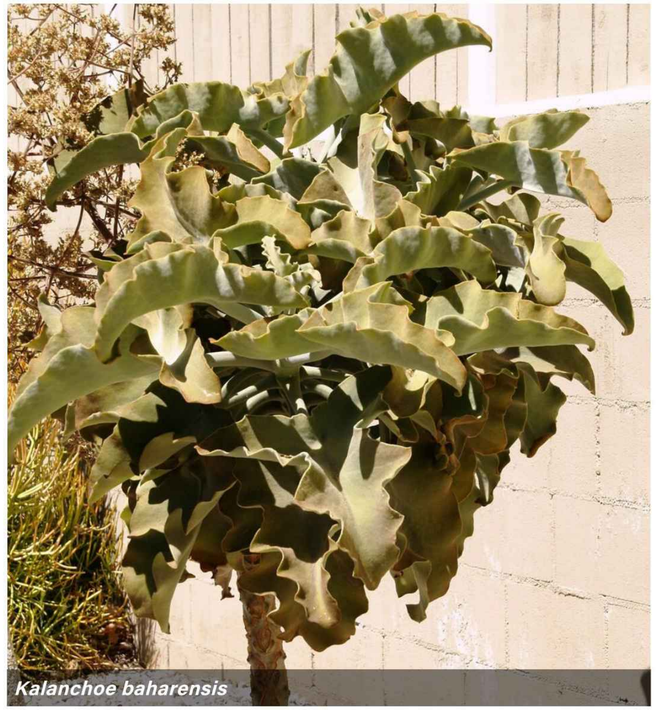
*Senecio mandraliscae*



*Carex tumulicola*



*Chondropetalum tectorum*



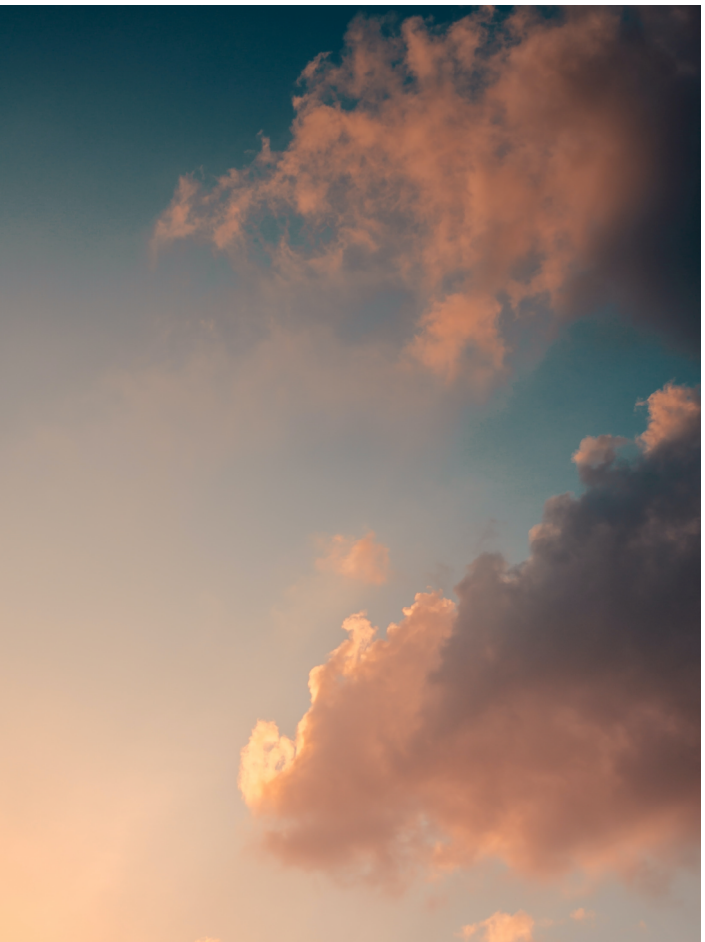
*Kalanchoe baharensis*

**ATTACHMENT 5**
**Drainage Report**

This is the cover sheet for Attachment 5.







FUSCOE ENGINEERING

# 901 MISSION AVENUE

*PRELIMINARY DRAINAGE STUDY*

*PREPARED FOR:*
*JPI DEVELOPMENT COMPANY*
*12250 EL CAMINO REAL, SUITE 380*
*SAN DIEGO, CA 92130*


PROJECT MANAGER
JULIAN BLEVINS


DATE PREPARED: OCTOBER 2024

PROJECT NUMBER: 4178-001


**FUSCOE ENGINEERING, INC.**
6390 GREENWICH DR. STE: 170
SAN DIEGO, CA 92122

**fuscoe.com**

# PRELIMINARY DRAINAGE STUDY

## 901 MISSION AVENUE

OCEANSIDE, CA

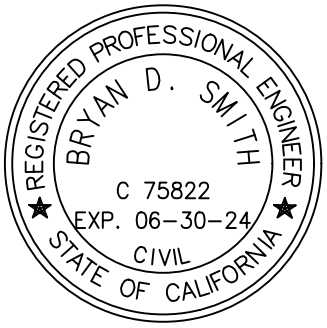
APN#
147-196-10

Prepared by Jaemin Blackwelder, PE 92959 Under the Responsible Charge of:

10/31/2024

Bryan Smith, PE RCE 75822

Fuscoe Engineering, San Diego, Inc.
6390 Greenwich Dr., Ste 170 San Diego, CA 92122
858-554-1500
bsmith@fuscoe.com




For

JPI Development Company
12250 El Camino Real, Suite 380
San Diego, CA 92130

OCOTOBER 2024

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Appendix 1……Existing Hydrology Map
Appendix 2..... Proposed Hydrology Map
Appendix 3…..... Conceptual Grading and Utilities Plans
Appendix 4.....Existing Hydrology Calculations
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Appendix 7.....San Diego County 100-year Isopluvial Map
Appendix 8.....Hydrographs, Storage Curves & Inflow Hydrograph Inputs

# 1. INTRODUCTION

The purpose of this drainage study is to compare the 100-year storm event existing and proposed-development stormwater runoff flows for the 901 Mission Project located at 901 Mission Avenue. This study will verify that the proposed development will not generate an increase of stormwater runoff compared to existing conditions, preventing an impact to the existing storm drainage facilities downstream. Per the City of Oceanside requirements, the criteria used for this drainage study is the San Diego County Hydrology Manual (June 2003) Criteria, City of Oceanside Drainage Ordinance, City of Oceanside Master Plan of Drainage Update 2013 (MPD), FEMA, Army Corp and other applicable agencies.

## 1.1 Project Description

The project proposes entitlements for a mixed-use, transit-oriented development on a 1.5 gross acre site. The site is bordered by Clementine St. to the southwest, Mission Ave. to the northwest, Horne St. to the northeast and Seagaze Dr. to the southeast. The proposed development consists of a 7-story mid-rise building containing 268 dwelling units and approximately 5,550 sf of retail space with a courtyard/amenity space and pool on level 3. The proposed project will also include curb, gutter, and sidewalk improvements to street frontages surrounding the property.

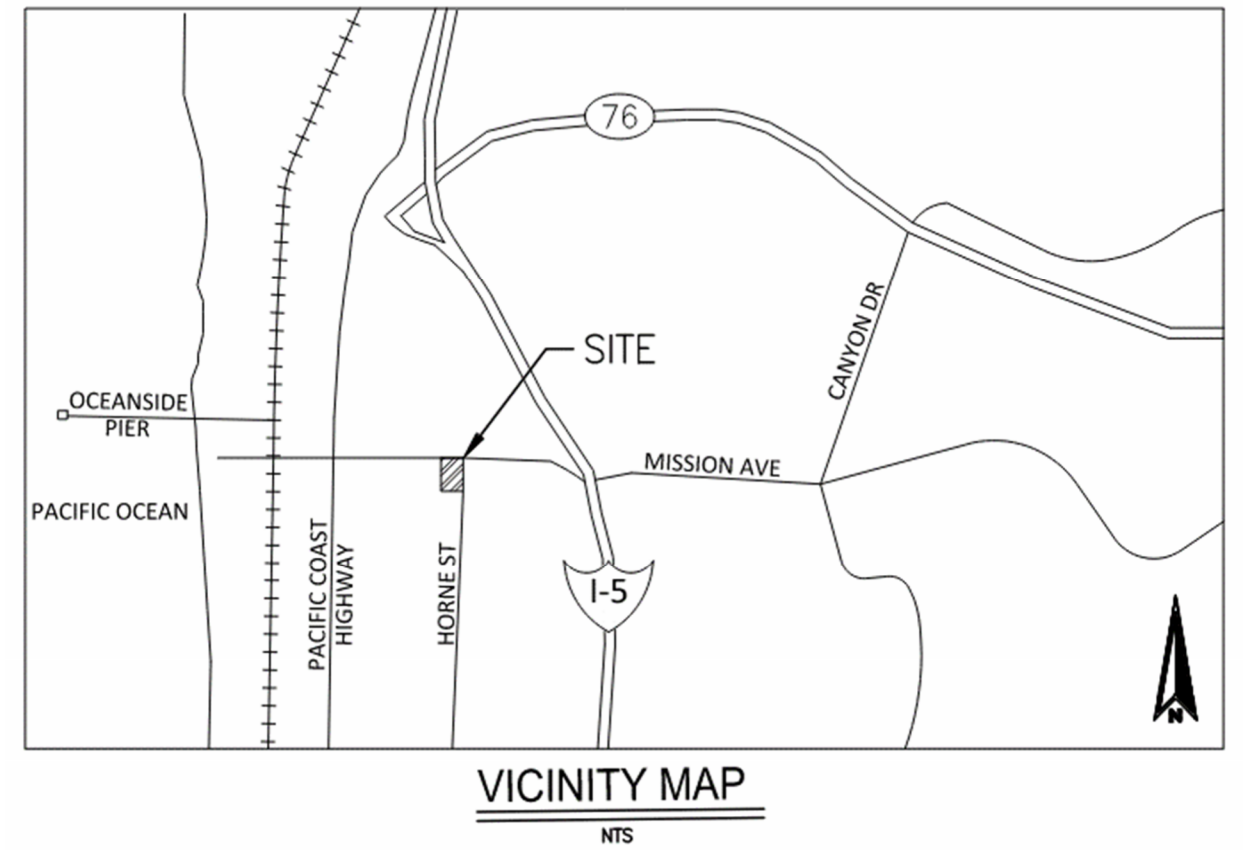



Figure 1. Vicinity Map

## 1.2 Existing Conditions

The project site in its existing condition consists of an approximately 1.5-acre vacant lot. Existing ground cover consists of grasses, weeds and small shrubs with an asphalt concrete alley bisecting the lot running from Horne St to Clementine St. Existing public utilities including sewer, water, gas and underground/overhead electrical exist within the alley. The site slopes from northeast to southwest at an average slope of 6-7%, there is approximately 15' of elevation difference across the site. Based on aerial photographs accessed on historicaerials.com, the site was graded prior to 1938 and has gone through several stages of improvements and occupancies, all of which have been demolished. The site has sat vacant since 2009.

Storm water runoff from the site consists primarily of sheet flow that drains southwest and confluences in the curb and gutter along the northeast side of Clementine St. Flow travels by curb and gutter northwest to Mission Ave and confluences with flows from Mission Ave in a cross gutter. Flows then enter a green street planter at the south corner of the intersection of Mission Ave and Clementine St. Excess flows that bypass the green street planter continue southwest down Mission Ave and pass through a series of green street planters. Flows that bypass the Mission Ave green street planters enter curb inlets located near the east corner of the intersection of Mission Ave and Coast Highway. From the curb inlet, flows enter an existing storm drain system and travel northwest to an outlet at Surfrider St and The Strand North where it discharges directly into the Pacific Ocean.

The existing public storm drain system that conveys the site's flow to the Pacific Ocean is deemed inadequate for the 10, 25 & 100-year storm event according to, "The City of Oceanside Master Plan of Drainage, Update 2013," (MPD) prepared by Torrey Walker Engineering, Inc. The City of Oceanside plans to upgrade the public storm drain system to meet the demands of its watershed however the storm drain upgrades are not yet constructed.

## 1.3 Proposed Conditions

The proposed mixed-use, transit-oriented development will consist of 268 dwelling units, approximately 5,550 SF of commercial/office and commercial/retail space, and associated amenity spaces. The existing site improvements will be demolished and the existing utilities bisecting the site (water, sewer, gas and underground electrical) will be rerouted around the site within the public right-of-way.

The project is not located within the FEMA 100-year Floodplain or Floodway. The project is in an area of minimal flood hazard (Zone X), per FEMA FIRM Map Number 06073C0734J, see Appendix 6. A Conditional Letter of Map Revision (CLOMR) will not be required to be processed with FEMA.

The project will maintain existing drainage patterns to the maximum extent practical. Onsite drainage within series 100 consists of sheet flow and mild concentrated flows that drain south/southwest, having an average slope of 1-2%. Onsite storm water runoff is conveyed to a series of inlets that collect and convey storm water runoff through storm

drains to a detention vault located in the underground parking level B1. Flows then pass through a storm drain cleanout with a flood control weir & orifice. Flows requiring treatment are directed to a proprietary treatment control BMP and then to a pump (both on underground parking level B2); excess flows bypass the treatment control BMP and go to the pump. The pump discharges through a velocity control structure and sidewalk underdrain out to the curb and gutter along the northeast side of Clementine St. As in existing conditions, stormwater runoff from the proposed development will ultimately discharge to the Pacific Ocean via the existing drainage patterns as described in the previous section.

The project will not result in increased 100-yr peak flow rates in the proposed condition after mitigation of the 100-year runoff. As shown in section 3.1 of this report, the Proposed-Mitigated 100-yr peak discharge will be ≤3.3 cfs, the discharge rate will be controlled by the pump. To mitigate the proposed conditions approximately 5,400cf of storage volume is proposed as determined in Appendix 8. Stage storage calculations are in progress and will be included in final engineering. The proposed project is not anticipated to negatively affect the downstream facilities compared to existing conditions including the existing green street planters along Mission Ave.

The site is exempt from hydromodification management because runoff is conveyed by concrete lined surfaces and underground storm drains to its point of discharge to the Pacific Ocean.

# 2. METHODOLOGY

## 2.1 Rational Method

Runoff was calculated using the Modified Rational Method equation below:

$Q = C \times I \times A$

Where:
Q = Flow rate in cubic feet per second (cfs) C = Runoff coefficient
I = Rainfall Intensity in inches per hour (in/hr) A = Drainage basin area in acres, (ac)

Modified Rational Method calculations were performed using the Advanced Engineering Software AES 2014) computer program. To perform the hydrology routing, the total watershed area was divided into sub-areas which discharge at designated nodes. The procedure for the sub-area summation model is as follows:

(1) Subdivide the watershed into an initial sub-area (generally 1 lot) and subsequent sub- areas, which are generally less than 10 acres in size. Assign upstream and downstream node numbers to each sub-area.

(2) Estimate an initial $T_c$ by using the appropriate nomograph or overland flow

velocity estimation. The minimum $T_c$ considered is 5.0 minutes.

(3) Using the initial $T_c$, determine the corresponding values of I. Then Q = CIA.

(4) Using Q, estimate the travel time between this node and the next by Manning's equation as applied to particular channel or conduit linking the two nodes. Then, repeat the calculation for Q based on the revised intensity (which is a function of the revised time of concentration)

The nodes are joined together by links, which may be street gutter flows, drainage swales, drainage ditches, pipe flow, or various channel flows. The AES 2014 computer software sub-area menu is as follows:

SUBAREA HYDROLOGIC PROCESS

1. Confluence analysis at node.
2. Initial sub-area analysis (including time of concentration calculation).
3. Pipe flow travel time (computer estimated).
4. Pipe flow travel time (user specified).
5. Trapezoidal channel travel time.
6. Street flow analysis through sub-area.
7. User-specified information at node.
8. Addition of sub-area runoff to main line.
9. V-gutter flow through area.
10. Copy main stream data to memory bank
11. Confluence main stream data with a memory bank
12. Clear a memory bank

At the confluence point of two or more basins, the following procedure is used to combine peak flow rates to account for differences in the basin's times of concentration. This adjustment is based on the assumption that each basin's hydrographs are triangular in shape.

(1). If the collection streams have the same times of concentration, then the Q values are directly summed,

$$Q_p = Q_a + Q_b;\ T_p = T_a = T_b$$

(2). If the collection streams have different times of concentration, the smaller of the tributary Q values may be adjusted as follows:

(i). The most frequent case is where the collection stream with the longer time of concentration has the larger Q. The smaller Q value is adjusted by a ratio of rainfall intensities.

$$Q_p = Q_b + Q_a\,(I_b/I_a);\ T_p = T_a$$

(ii). In some cases, the collection stream with the shorter time of concentration has the larger Q. Then the smaller Q is adjusted by a ratio of the T values.

$Q_p = Q_b + Q_a (T_b/T_a)$; $T_p = T_b$

## 2.2 Computing Detention Pond Routing

Detention pond routing is the process of passing a flood hydrograph through a storage reservoir or detention pond. This process changes the pattern of flow with respect to time but conserves volume. The purpose of detention pond routing is usually to reduce the peak flow to a predetermined level, or to delay the peak. The routing procedure used by Hydraflow Hydrographs Extension is known as the Storage Indication method and begins with a stage- storage-discharge relationship, an inflow hydrograph, and the following equation:

$$I - O = \frac{ds}{dt}$$

Where:
I = inflow, O = outflow, ds/dt = change in storage

## 2.3 Runoff Coefficient

For existing conditions, the runoff coefficient for the project was calculated using Table 3-1: Runoff Coefficients for Urban Areas, of the 2003 San Diego County Hydrology Manual, and the corresponding percentage of impervious surface for each tributary area. The site contains Hydrologic Soil Group D soils and has a runoff coefficient of 0.35.

For the proposed condition, the runoff coefficient for the project was calculated using Table 3-1: Runoff Coefficients for Urban Areas, of the 2003 San Diego County Hydrology Manual. For roofs and concrete areas a run-off coefficient of 0.90 was used; for landscape areas a run-off coefficient of 0.10 was used. A weighted run-off coefficient was calculated using the corresponding percentage of impervious surface for each tributary area. For a detailed breakdown of tributary areas and runoff coefficients see the DMA Summary Table included in the project SWQMP as Attachment 1b.

## 2.4 Rainfall Intensity

Rainfall intensity was determined by using AES software, which utilizes Figure 3-2: Rainfall Intensity-Duration Design Chart of the San Diego County Hydrology Manual, see Appendix 9.

## 2.5 Tributary Areas

Drainage basins are delineated on the Existing and Proposed Hydrology Condition Maps in Appendix 1 and 2.

## 2.6 Stage Storage

Hydraflow Hydrograph by Autodesk will be used to perform stage storage detention basin routing of the underground storage system (HMP 1) during final engineering. The underground storage system will be modeled to determine the volume capacity and peak flow attenuation of the basin during a 100-year storm event. See Appendix 8 for basin routing calculations (to be provided in final engineering).

The underground storage system outflows obtained from Hydraflow will be used in the AES mitigated conditions to analyze the total cumulative flow at Node 100. 100-year storm attenuation will be performed for HMP 1 during final engineering.

# 3. CALCULATIONS/RESULTS

## 3.1 Peak Flow Comparison

The summary tables below present the comparison between pre- and post-development flows for each point of compliance.

| EXISTING CONDITION HYDROLOGY SUMMARY | | |
|---|---|---|
| **NODE** | **AREA (AC)** | **EXISTING 100-YEAR DISCHARGE (CFS)** |
| **100** | 1.47 | 3.3 |

| PROPOSED CONDITION HYDROLOGY SUMMARY | | |
|---|---|---|
| **NODE** | **AREA (AC)** | **PROPOSED 100-YEAR DISCHARGE (CFS)** |
| **100** | 1.47 | 7.7 |

| PROPOSED-MITIGATED CONDITION HYDROLOGY SUMMARY | | |
|---|---|---|
| **NODE** | **AREA (AC)** | **MITIGATED 100-YEAR DISCHARGE (CFS)** |
| **100** | 1.47 | ≤3.3 |

## 3.2 Public Storm Drain

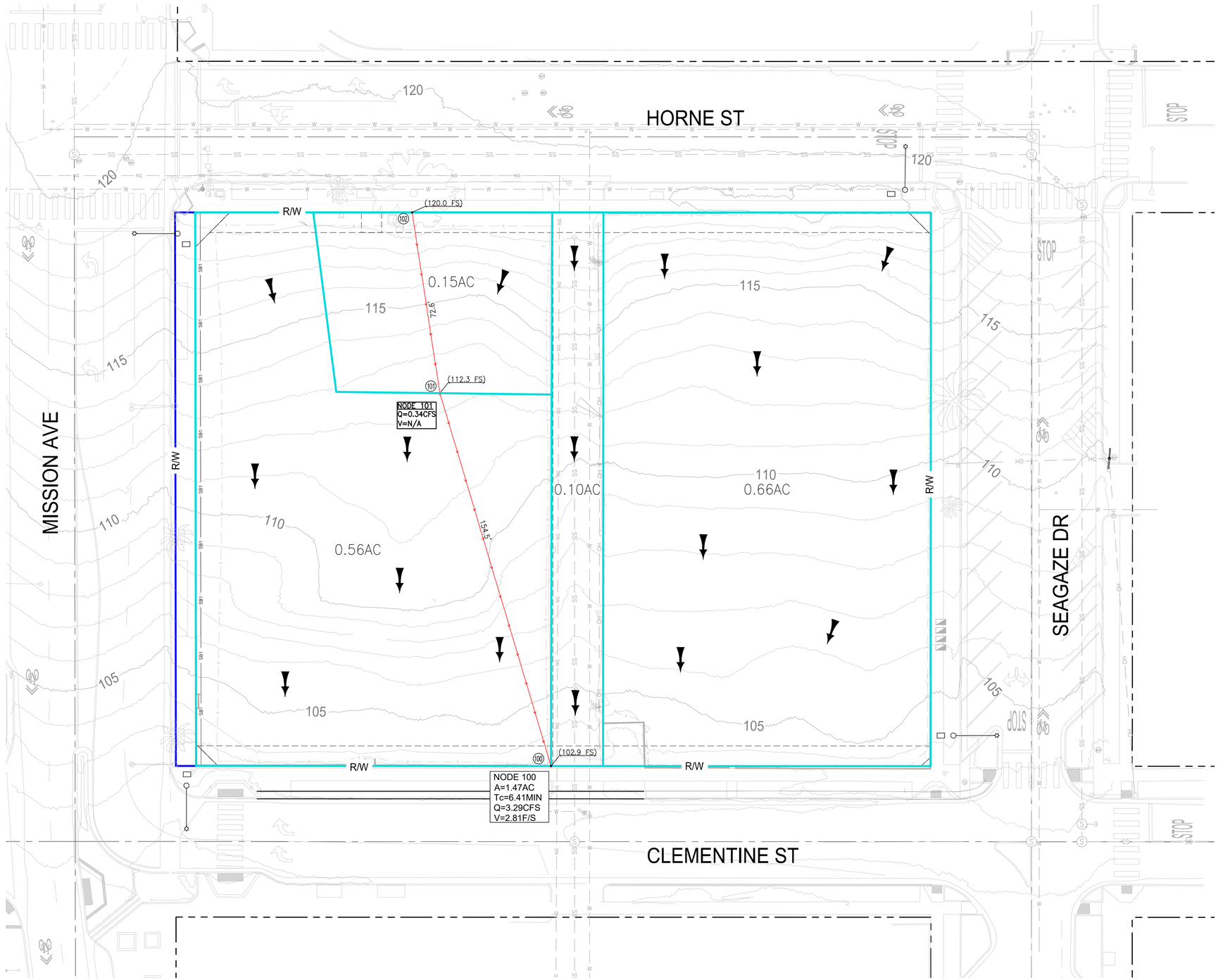
No public storm drains are proposed.

# 4. CONCLUSION

The project will match existing drainage patterns to the maximum extent feasible and will utilize the existing discharge point to the Pacific Ocean. The project will not increase the 100-year peak flow rates after mitigating the 100-year runoff compared to existing conditions. The existing public storm drains downstream of the project site do not have capacity to convey the 100-year storm event runoff generated from their tributary area as stated in "The City of Oceanside Master Plan of Drainage, Update 2013," prepared by Torrey Walker Engineering, Inc. The city proposes to upgrade the deficient storm drains as part of the Cleveland St Storm Drain Project, but they are not yet constructed. Because the proposed development does not increase 100-year peak flows compared to existing conditions, the project is not anticipated to cause any drainage impacts to the existing public drainage facilities or adjacent properties.

# APPENDIX 1

# EXISTING HYDROLOGY MAP




LEGEND

| | |
|---|---|
| HYDROLOGY NODE NUMBER | (117) |
| FLOW PATH | |
| SURFACE FLOW DIRECTION | |
| BASIN LIMIT | |
| EXISTING CONTOUR | 101 |

20' 0' 10' 20' 40'

SCALE: 1" = 20'

# 901 MISSION AVENUE

## EXISTING HYDROLOGY

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500
fuscoe.com

JOB NO. 557-017

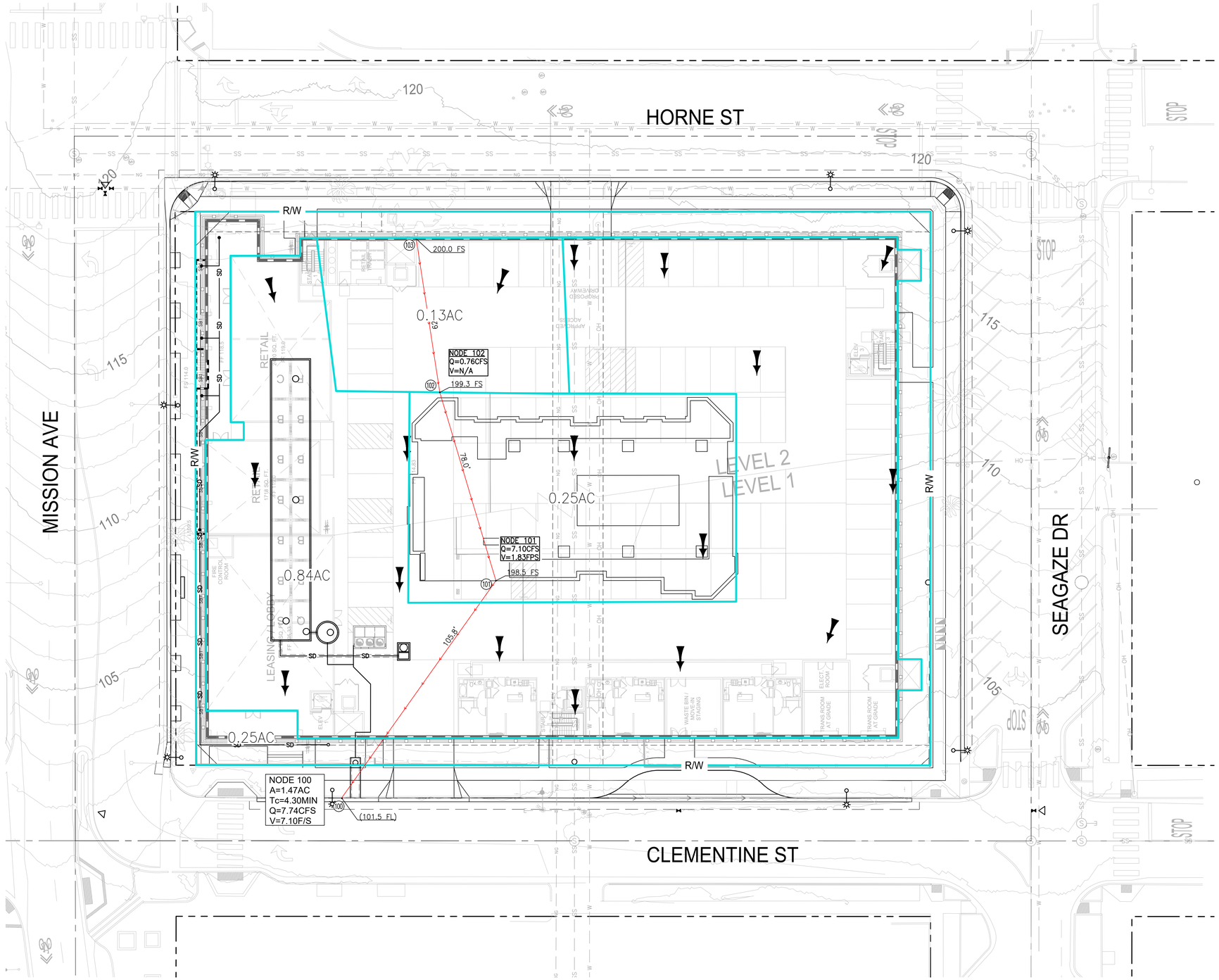
DRAWN BY: JGB

SHEET 1 of 1

K:\PROJECTS\557-017\7_SUPPORT FILES\REPORTS\HYDROLOGY\PRELIMINARY HYDROLOGY\901 MISSION EXISTING HYDROLOGY.DWG [06-Feb-2024 3:10:36PM] Plotted by: dfleckenstein

# APPENDIX 2

# PROPOSED HYDROLOGY MAP




## LEGEND

| | |
|---|---|
| HYDROLOGY NODE NUMBER | (117) |
| FLOW PATH | |
| SURFACE FLOW DIRECTION | |
| BASIN LIMIT | |
| EXISTING CONTOUR | 101 |

N

20' 0' 10' 20' 40'

SCALE: 1" = 20'

# 901 MISSION AVENUE

## PROPOSED HYDROLOGY

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500
fuscoe.com

JOB NO. 557-017

DRAWN BY: JGB

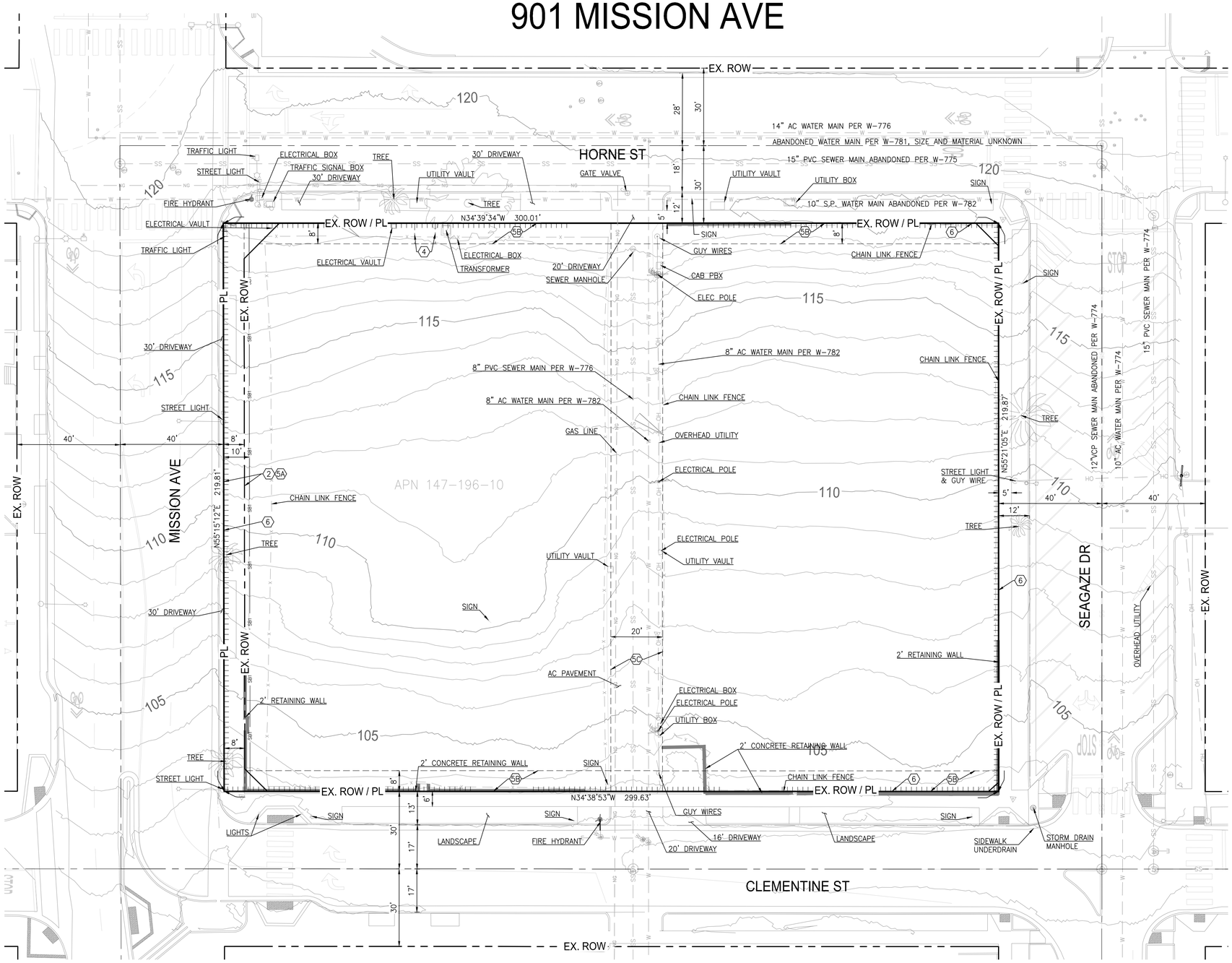
SHEET 1 of 1

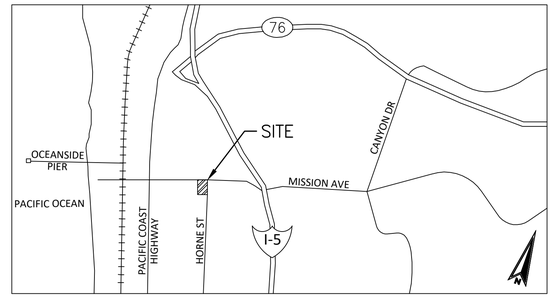
K:\PROJECTS\557-017\T_SUPPORT\FLOOD REPORTS\HYDROLOGY\PRELIMINARY HYDROLOGY\901 MISSION_PROPOSED HYDROLOGY.DWG (08-09-2024 12:32:18PM) Plotted by: dfierro

# APPENDIX 3

# CONCEPTUAL GRADING & UTILITY PLANS

# CONCEPTUAL GRADING AND UTILITY PLANS
FOR
# 901 MISSION AVE




VICINITY MAP
NTS

## OWNER/ APPLICANT

AMIDI REAL ESTATE, LLC AND A & J, LLC
RAHIM AMIDHOZOUR
(650) 474-5785
370 CONVENTION WAY, REDWOOD CITY, CALIFORNIA 94063

## SURVEY SOURCE

THE TOPOGRAPHIC MAPPING USED FOR THIS SURVEY IS BASED ON A FIELD SURVEY PERFORMED BY PLSA ENGINEERING PER FLIGHT OF 04/10/2024.
THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM, NAD 83 (CCS83) EPOCH 2011, ZONE 6, AS DETERMINED LOCALLY BY A LINE BETWEEN CONTROL STATIONS 1004 AND 1003 BEING A GRID BEARING OF N78°44'08"W AS DERIVED FROM GEODETIC VALUES SHOWN ON ROS NO. 21787, CITY OF OCEANSIDE SURVEY CONTROL, FILED ON JULY 23, 2007 AS FILE NO. 2007-15581 IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY.
4.ELEVATIONS SHOWN HEREON ARE BASED ON A FOUND 3.5" BRASS DISC IN WELL MONUMENT STAMPED "LS 7959" AS SHOWN ON ROS 21787 AS POINT NO. 1004
ELEVATION:120.59' (NAVD 88)

## ZONING

EXISTING ZONE: D-2

## PARCEL AREA

EXISTING: 1.51 AC
PROPOSED: 1.51 AC

## ASSESSORS PARCEL NUMBER

147-196-10

## EXISTING LEGAL DESCRIPTION

LOT 1 OF THE BELVEDERE MIXED-USE PROJECT, IN THE CITY OF OCEANSIDE, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP NO. 15581, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, JULY 23,2007.

## EASEMENTS NOTES PER PRELIMINARY TITLE REPORT PROVIDED BY CHICAGO TITLE COMPANY ORDER NO. 00203181, DATED FEBRUARY 28, 2024

1 ITEM 1 IS NON MAPPING AND NOT SHOWN HEREON

(2) EASEMENT FOR PUBLIC HIGHWAY IN FAVOR OF THE CITY OF OCEANSIDE BY DOCUMENT RECORDED JUNE 16, 1969 AS FILE/PAGE NO. 106989, 106990, AND 106991 O.R.

3 ITEM 3 IS NON MAPPING AND NOT SHOWN HEREON

(4) AN EASEMENT FOR ELECTRIC POLE LINES AND UNDERGROUND CONDUITS IN FAVOR OF SAN DIEGO GAS & ELECTRIC COMPANY BY DOCUMENT RECORDED MAY 23, 1978 AS FILE/PAGE NO. 78-209943 OF OFFICIAL RECORDS.

(5A) PUBLIC RIGHT-OF-WAY DEDICATED TO THE CITY OF OCEANSIDE PER MAP 15581

(5B) AN EASEMENT FOR 8' PUBLIC ACCESS AND GENERAL UTILITIES AS SHOWN ON MAP NO. 15581.

(5C) 20' PUBLIC UTILITY EASEMENT OVER THE VACATED ALLEY PER MAP 15581 TO BE VACATED PER SEPERATE INSTRUMENT.

(6) THE OWNERSHIP OF SAID LAND DOES NOT INCLUDE RIGHTS OF VEHICULAR ACCESS TO HORNE STREET, SEAGAZE DRIVE, CLEMENTINE STREET AND MISSION AVENUE, EXCEPT THE DRIVEWAY OPENINGS FOR LOT 1 OF MAP NO. 15581.(LIMITS ACCESS TO ABUTTING RIGHT-OF-WAY - PLOTTED AS ) ACCESS RIGHTS TO BE REMANDED AT PROPOSED ACCESS DRIVEWAYS

## SHEET INDEX


TITLE SHEET & EXISTING CONDITIONS PLAN.....C1.0
DEMOLITION PLAN.....C2.0
CONCEPTUAL GRADING PLAN.....C3.0
CONCEPTUAL PUBLIC IMPROVEMENT & UTILITY PLAN.....C4.0
SECTIONS.....C5.0


ENGINEER IN CHARGE — 36083 RCE — DATE

LICENSED LAND SURVEYOR — 8070 PLS — DATE

LEGAL OWNER — DATE

## LEGEND

PROPOSED:
SETBACK — SB1
STREET CENTERLINE
RIGHT OF WAY — R/W
EASEMENT
PROPOSED SEWER — SS
SEWER MANHOLE
SEWER CLEANOUT
FIRE WATER — FW
DOMESTIC WATER — W
FIRE HYDRANT
STORM DRAIN — SD
CONCRETE
ASPHALT CONCRETE
ELECTRICAL — E
GAS
SIDEWALK
CURB AND GUTTER
MODULAR WETLAND SYSTEM (MWS)
DEMOLITION OF UTILITY LINE
STREET LIGHT
AREA DRAIN
SIDEWALK UNDERDRAIN
SHORING WALL
BASEMENT RETAINING WALL
MASONRY RETAINING WALL
UNDERGROUND DETENTION VAULT

EXISTING:
STREET LIGHT
SEWER — SS
SEWER MANHOLE
UTILITY VALVE
FIRE WATER — FW
DOMESTIC WATER — W
STORM DRAIN — SD
FIRE HYDRANT
ELECTRICAL — E
GAS — NG
FENCE — X
RIGHT OF WAY — R/W

## GRADING QUANTITIES

| | |
|---|---|
| TOTAL DISTURBED AREA: | 1.51 AC |
| PROJECT MAX DEPTH OF CUT: | 35.1 FT |
| PROJECT MAX DEPTH OF FILL: | 0 FT |
| MAX CUT SLOPE RATIO: | 2:1 |
| MAX FILL SLOPE RATIO: | 2:1 |

ON-SITE GRADING:

| | |
|---|---|
| DISTURBED AREA: | 1.51 AC |
| AMOUNT OF CUT: | 58,400 CY |
| AMOUNT OF FILL: | 0 CY |
| AMOUNT OF EXPORT: | 58,400 CY |

GRADING QUANTITIES ARE APPROXIMATE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN. QUANTITIES SHALL NOT BE USED FOR BIDDING PURPOSES.

## UTILITIES

ELECTRIC – SDG&E
GAS – SDG&E
TELEPHONE – COX OR AT&T
STORM DRAIN – OCEANSIDE WATER UTILITIES DEPARTMENT
WATER – OCEANSIDE WATER UTILITIES DEPARTMENT
SEWER – OCEANSIDE WATER UTILITIES DEPARTMENT

JPI

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

F:\PROJECTS\557\017\PLANS\ENTITLEMENTS\0557-17-C1-TS.DWG (10-31-2024 10:04:41AM) Plotted by: JBlackwelder

## ENTITLEMENT NUMBER
RD24-00002

REGISTERED PROFESSIONAL ENGINEER ERIC K. ARMSTRONG RCE 36083 Civil STATE OF CALIFORNIA
PRELIMINARY

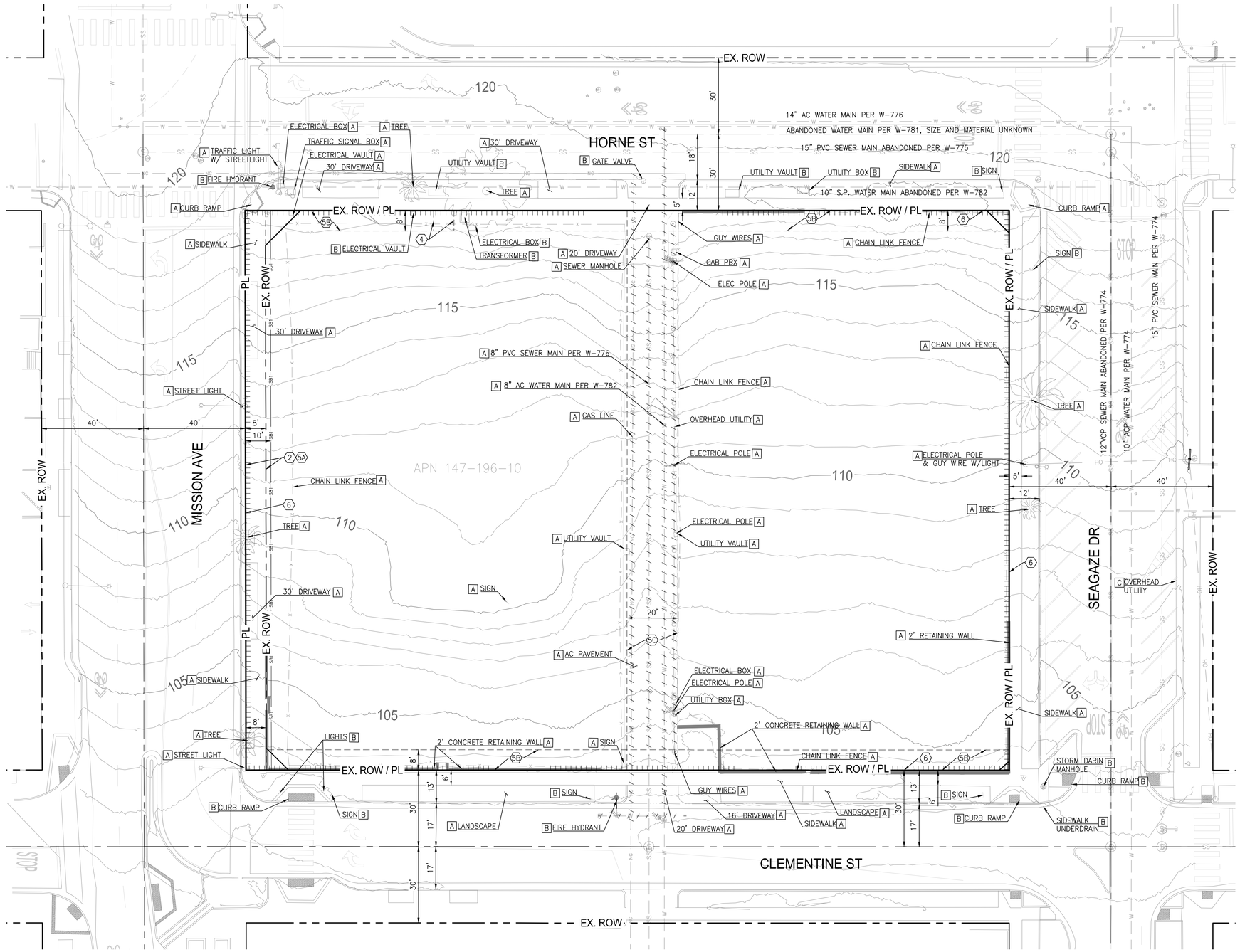
TITLE SHEET & EXISTING CONDITIONS PLAN

NORTH
1"=20'
0 20' 40' 60' 80'

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500 fuscoe.com

C1.0

JOB NO. 0557-017
DATE 08-09-2024




## EASEMENTS NOTES PER PRELIMINARY TITLE REPORT PROVIDED BY CHICAGO TITLE COMPANY ORDER NO. 00203181, DATED FEBRUARY 28, 2024

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## DEMOLITION NOTES

| | |
|---|---|
| A | EXISTING TO BE REMOVED |
| B | EXISTING TO REMAIN – PROTECT IN PLACE |
| C | EXISTING TO BE REMOVED AND UNDERGROUNDED |

## NOTICE TO CONTRACTOR

1. ADJUST ALL SURFACE UTILITES WITHIN LIMITS OF WORK TO PROPOSED GRADES
2. THE UPPER 24 INCHES OF SITE SOILS SHOULD BE REMOVED & RE-COMPACTED IN AREAS OF SIDEWALKS & SURFACE PARKING. IF LOOSE, DISTURBED, OR OTHERWISE UNSUITABLE MATERIALS ARE ENCOUNTERED AT THE BOTTOM OF EXCAVATION, DEEPER REMVOAL WILL BE REQUIRED UNTIL FIRM NATIVE SOILS ARE ENCOUNTERED. SEE GEOTECHNICAL REPORT SECTION 7.2 FOR OVER-EXCAVATION INFORMATION.

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

F:\PROJECTS\557\017\PLANS\ENTITLEMENTS\0557-17-C2-DM.DWG (10-31-2024 10:04:49AM) Plotted by: JBlackwelder

## ENTITLEMENT NUMBER
RD24-00002

REGISTERED PROFESSIONAL ENGINEER RICK K. ARMSTRONG RCE 36083 Civil STATE OF CALIFORNIA
PRELIMINARY

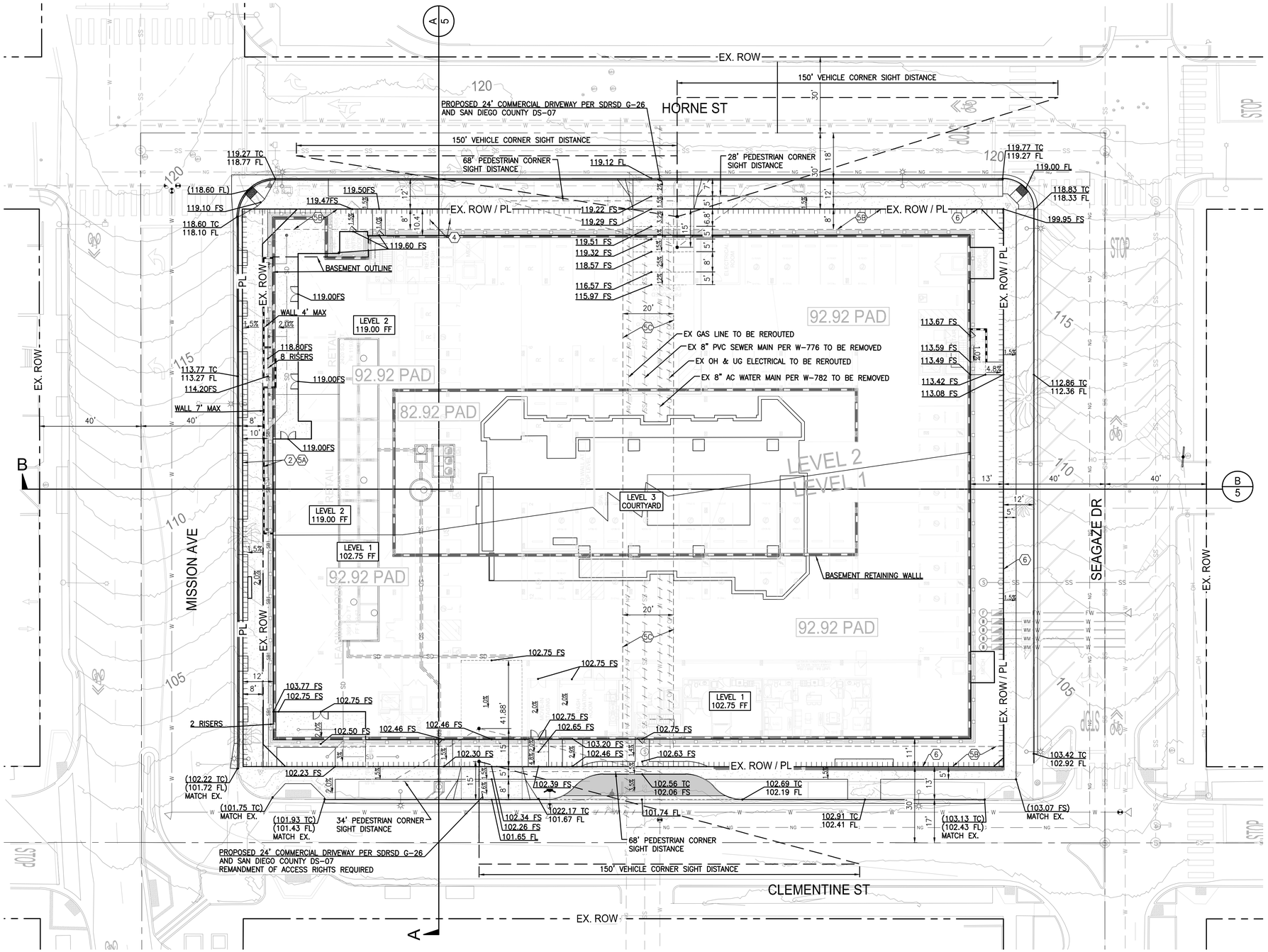
DEMOLITION PLAN

1"=20'
0 20' 40' 60' 80'

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500
fuscoe.com

C2.0

JOB NO. 0557-017
DATE 08-09-2024




## EASEMENTS NOTES PER PRELIMINARY TITLE REPORT PROVIDED BY CHICAGO TITLE COMPANY ORDER NO. 00203181

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# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

F:\PROJECTS\557\017\PLANS\ENTITLEMENTS\0557-17-C3-GP.DWG (10-31-2024 10:05:01AM) Plotted by: JBlackwelder

## ENTITLEMENT NUMBER
RD24-00002

REGISTERED PROFESSIONAL ENGINEER ERIC K. ARMSTRONG RCE 36083 Civil STATE OF CALIFORNIA
PRELIMINARY

CONCEPTUAL GRADING PLAN

1"=20'
0 20' 40' 60' 80'

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6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500
fuscoe.com

C3.0

JOB NO. 0557-017
DATE 08-09-2024

## CONSTRUCTION NOTES

(1) PROPOSED STREET LIGHT PER OTHERS. STREET LIGHTS TO BE DECORATIVE BLUE POLES AS REQUIRED PER SPECIAL STANDARDS FOR DOWNTOWN AREA SPECIFIED IN THE CITY'S STREET LIGHT DESIGN MANUAL.

## EASEMENTS NOTES PER PRELIMINARY TITLE REPORT PROVIDED BY CHICAGO TITLE COMPANY ORDER NO. 00203181

1 ITEM 1 IS NON MAPPING AND NOT SHOWN HEREON

(2) EASEMENT FOR PUBLIC HIGHWAY IN FAVOR OF THE CITY OF OCEANSIDE BY DOCUMENT RECORDED JUNE 16, 1969 AS FILE/PAGE NO. 106989, 106990, AND 106991 O.R.

3 ITEM 3 IS NON MAPPING AND NOT SHOWN HEREON

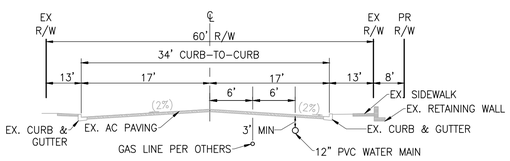
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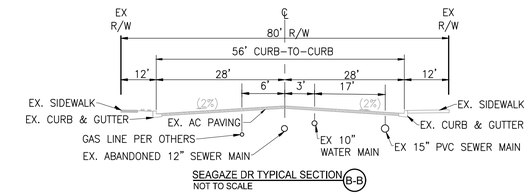
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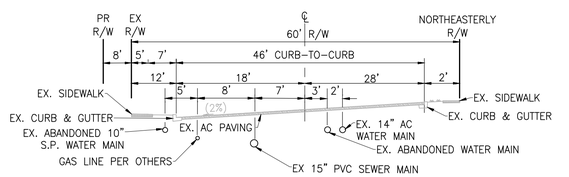
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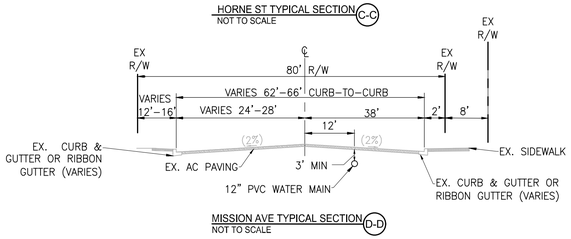

CLEMENTINE ST TYPICAL SECTION (A-A)
NOT TO SCALE




SEAGAZE DR TYPICAL SECTION (B-B)
NOT TO SCALE




HORNE ST TYPICAL SECTION (C-C)
NOT TO SCALE




MISSION AVE TYPICAL SECTION (D-D)
NOT TO SCALE

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

F:\PROJECTS\557\017\PLANS\ENTITLEMENTS\0557-17-C4-IP.DWG (10-31-2024 10:05:13AM) Plotted by: JBlackwelder

## ENTITLEMENT NUMBER
RD24-00002

PRELIMINARY

CONCEPTUAL PUBLIC IMPROVEMENT & UTILITY PLAN

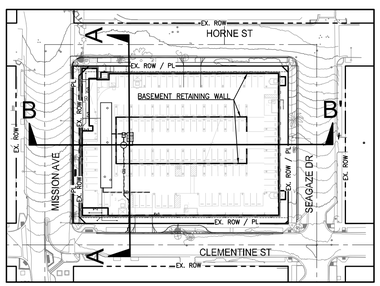
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0 20' 40' 60' 80'

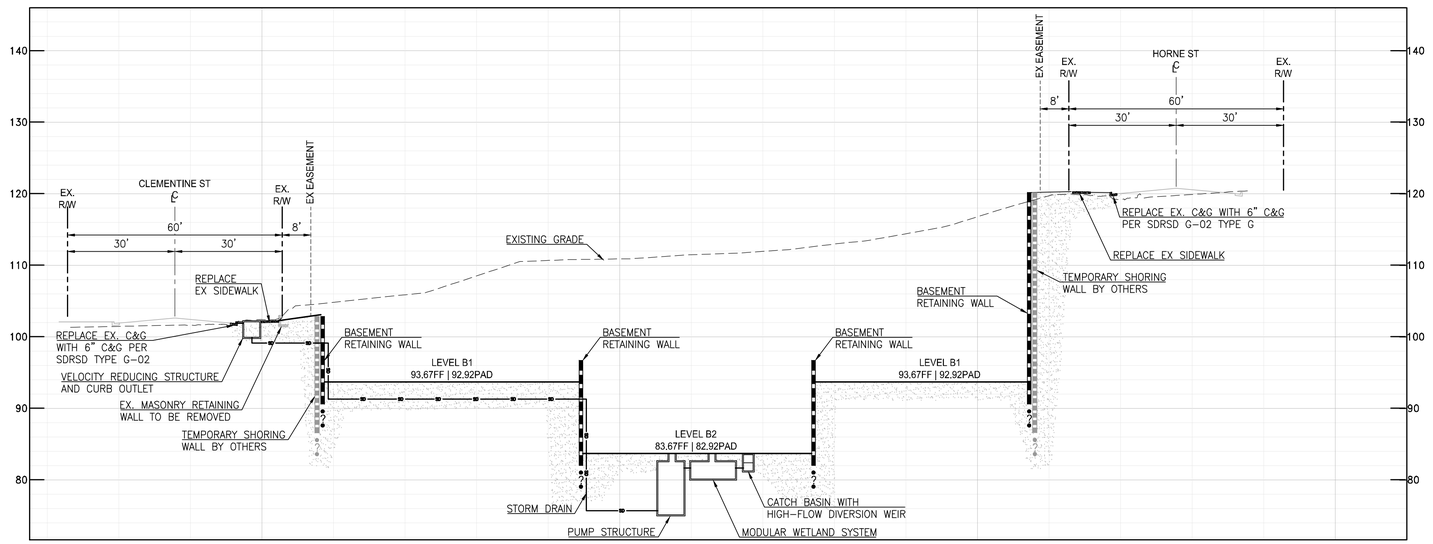

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500
fuscoe.com


C4.0

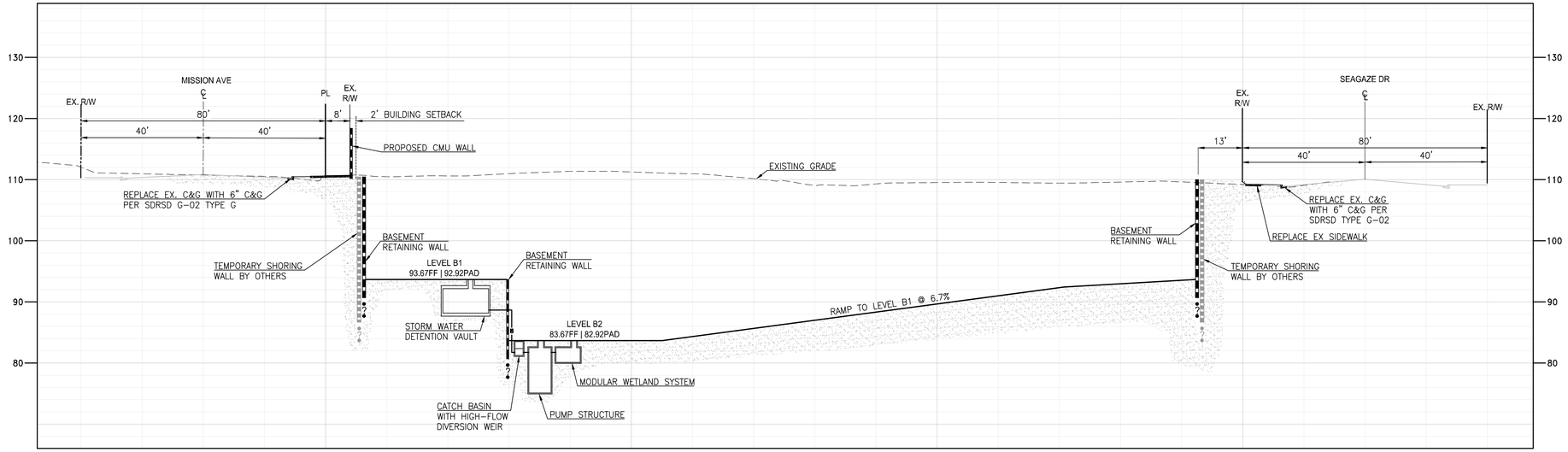
JOB NO. 0557-017
DATE 08-09-2024




KEY MAP
SCALE: 1"=100'




SECTION A
SCALE: HORIZ 1"=20'
VERT 1"=10'




SECTION B
SCALE: HORIZ 1"=20'
VERT 1"=10'

# 901 MISSION AVENUE MIXED-USE

OCEANSIDE, CA

F:\PROJECTS\557\017\PLANS\ENTITLEMENTS\0557-17-C6-SCT.DWG (10-31-2024 10:05:23AM) Plotted by: JBlackwelder

## ENTITLEMENT NUMBER
RD24-00002

REGISTERED PROFESSIONAL ENGINEER ERIC K. ARMSTRONG RCE 36083 Civil STATE OF CALIFORNIA
PRELIMINARY

SECTIONS

1"=20'
0 20' 40' 60' 80'

FUSCOE ENGINEERING
6390 Greenwich Dr, Suite 170
San Diego, Ca 92122
858.554.1500
fuscoe.com

C5.0

JOB NO. 0557-017
DATE 08-09-2024

# APPENDIX 4

# EXISTING HYDROLOGY CALCULATIONS

FUSCOE ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 ◦ fax 858.597.0335
www.fuscoe.com

**Job Name:** 901 Mission Ave
**Job #:** 557-017
**Run Name:** Existing Series 100
**Date:** 7/24/2024
**Notes:**

| Node 1 | Node 2 | Code | Elev 1 (feet) | Elev 2 (feet) | Length (feet) | C Factor | Area (acres) | Comments | BANK 1 | BANK 2 | BANK 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 102 | 101 | 2 | 120.0 | 112.3 | 72.6 | 0.35 | 0.15 | Soil Type D | | | |
| 101 | 100 | 5 | 112.3 | 102.9 | 154.5 | 0.35 | 0.56 | | | | |
| 100 | 100 | 8 | | | | 0.85 | 0.10 | | | | |
| 100 | 100 | 8 | | | | 0.35 | 0.66 | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | Total = | 1.47 | | | | |
| | | | | | | | | | | | |
| | | Area Weighted Runoff Coefficient = | | | | | 0.38 | | | | |

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1355

                              Analysis prepared by:

                             Fuscoe Engineering, Inc.
                                6390 Greenwich Dr.
                                    Suite #170
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* 901 MISSION AVE PRE-DEVELOPMENT REPORT                                 *
* EXISTING SERIES 100                                                    *
* OCEANSIDE, CALIFORNIA                                                  *
 **************************************************************************

  FILE NAME: EX100S1.DAT
  TIME/DATE OF STUDY: 14:58 08/06/2024
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =   4.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.600
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.10
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
```

```
 FLOW PROCESS FROM NODE    102.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    72.60
 UPSTREAM ELEVATION(FEET) =    120.00
 DOWNSTREAM ELEVATION(FEET) =    112.30
 ELEVATION DIFFERENCE(FEET) =      7.70
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.340
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    4 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.566
 SUBAREA RUNOFF(CFS) =      0.34
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.34

****************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    100.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    112.30  DOWNSTREAM(FEET) =    102.90
 CHANNEL LENGTH THRU SUBAREA(FEET) =   154.50   CHANNEL SLOPE =  0.0608
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   5.000
 MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   5.00
    4 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.834
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.92
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.40
 AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   1.07
 Tc(MIN.) =    6.41
 SUBAREA AREA(ACRES) =     0.56       SUBAREA RUNOFF(CFS) =    1.14
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
 TOTAL AREA(ACRES) =        0.7         PEAK FLOW RATE(CFS) =       1.45

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   2.81
 LONGEST FLOWPATH FROM NODE    102.00 TO NODE    100.00 =     227.10 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    4 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.834
 *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4117
  SUBAREA AREA(ACRES) =    0.10   SUBAREA RUNOFF(CFS) =    0.50
  TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       1.95
  TC(MIN.) =    6.41

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
     4 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.834
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3840
  SUBAREA AREA(ACRES) =    0.66   SUBAREA RUNOFF(CFS) =    1.35
  TOTAL AREA(ACRES) =        1.5   TOTAL RUNOFF(CFS) =       3.29
  TC(MIN.) =    6.41
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.5  TC(MIN.) =      6.41
  PEAK FLOW RATE(CFS)   =       3.29
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```



# APPENDIX 5

# PROPOSED HYDROLOGY CALCULATIONS

FUSCOE ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 ◦ fax 858.597.0335
www.fuscoe.com

**Job Name:** 901 Mission Ave
**Job #:** 557-017
**Run Name:** Proposed Series 100
**Date:** 7/24/2024
**Notes:**

| Node 1 | Node 2 | Code | Elev 1 (feet) | Elev 2 (feet) | Length (feet) | C Factor | Area (acres) | Comments | BANK 1 | BANK 2 | BANK 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 103 | 102 | 2 | 200.0 | 199.3 | 62.0 | 0.85 | 0.13 | Assumed roof elevations | | | |
| 102 | 101 | 5 | 199.3 | 198.5 | 78.0 | 0.85 | 0.25 | Assumed flat roof, S=1% | | | |
| 101 | 101 | 8 | | | | 0.85 | 0.84 | | | | |
| 101 | 100 | 3 | 198.5 | 101.5 | 105.8 | | | | | | |
| 100 | 100 | 8 | | | | 0.37 | 0.25 | | | | |
| | | | | | | Total = | 1.47 | | | | |
| | | | | | | | | | | | |
| | | Area Weighted Runoff Coefficient = | | | | | 0.77 | | | | |

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1355

                              Analysis prepared by:

                             Fuscoe Engineering, Inc.
                                6390 Greenwich Dr.
                                    Suite #170
                               San Diego, CA 92122

 ************************* DESCRIPTION OF STUDY *************************
* 901 MISSION AVE POST-DEVELOPMENT REPORT                                *
* PROPOSED SERIES 100                                                    *
* OCEANSIDE, CALIFORNIA                                                  *
 **************************************************************************

  FILE NAME: PR100S1.DAT
  TIME/DATE OF STUDY: 15:02 08/06/2024
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.600
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.10
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====== =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
```

```
  FLOW PROCESS FROM NODE    103.00 TO NODE    102.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    62.00
  UPSTREAM ELEVATION(FEET) =    200.00
  DOWNSTREAM ELEVATION(FEET) =    199.30
  ELEVATION DIFFERENCE(FEET) =      0.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.383
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    61.29
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.850
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.76
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.76

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    101.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    199.30  DOWNSTREAM(FEET) =    198.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    78.00   CHANNEL SLOPE =  0.0103
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.850
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.63
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   0.80
  Tc(MIN.) =    4.18
  SUBAREA AREA(ACRES) =     0.25       SUBAREA RUNOFF(CFS) =    1.46
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       2.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   1.83
  LONGEST FLOWPATH FROM NODE    103.00 TO NODE    101.00 =     140.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =  81
```

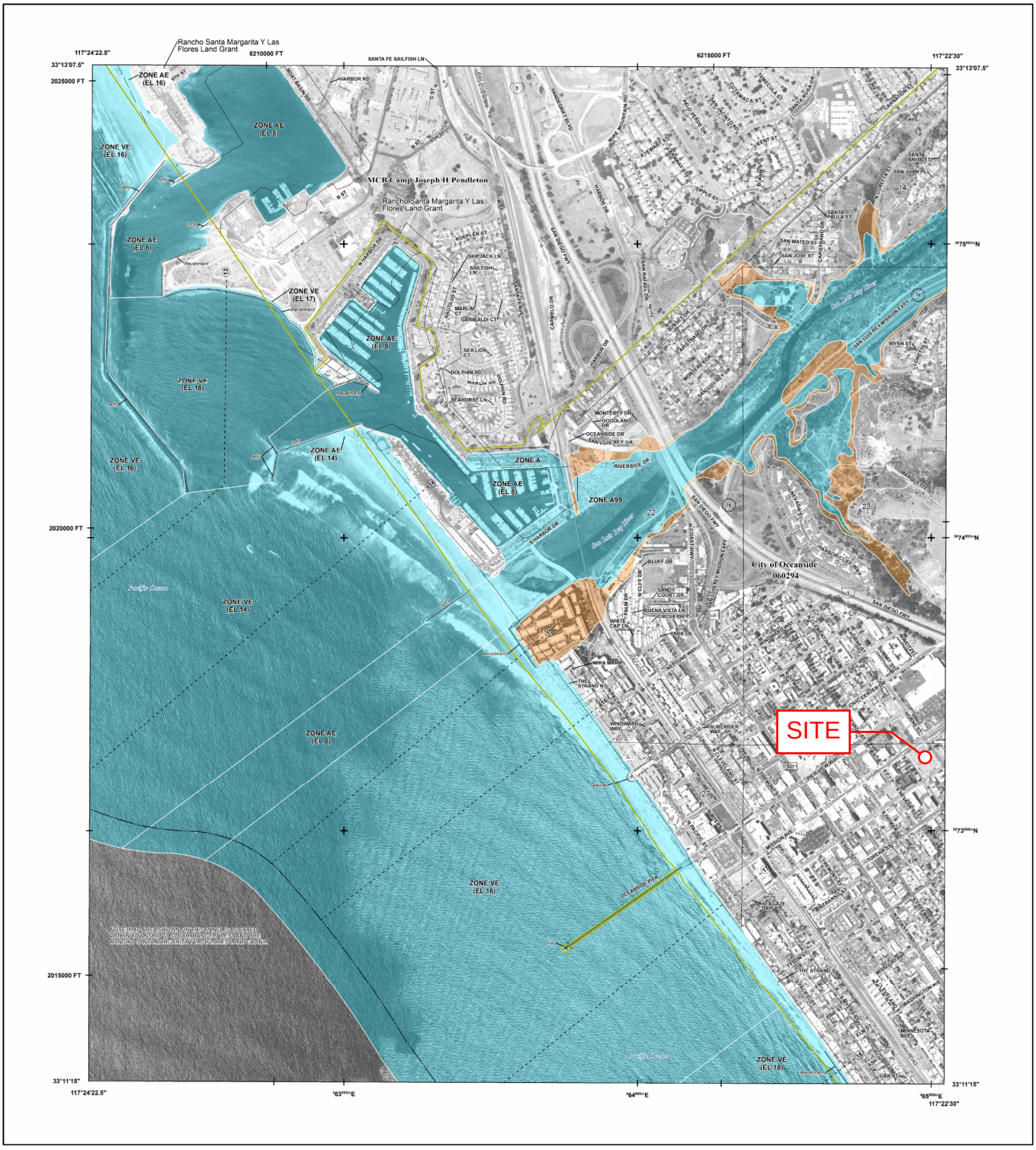
```
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.850
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
  SUBAREA AREA(ACRES) =    0.84   SUBAREA RUNOFF(CFS) =    4.89
  TOTAL AREA(ACRES) =        1.2   TOTAL RUNOFF(CFS) =       7.10
  TC(MIN.) =    4.18

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   198.50  DOWNSTREAM(FEET) =   101.50
  FLOW LENGTH(FEET) =   105.80   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.66
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.10
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    4.30
  LONGEST FLOWPATH FROM NODE    103.00 TO NODE    100.00 =     245.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.850
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7684
  SUBAREA AREA(ACRES) =    0.25   SUBAREA RUNOFF(CFS) =    0.63
  TOTAL AREA(ACRES) =        1.5   TOTAL RUNOFF(CFS) =       7.74
  TC(MIN.) =    4.30
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.5  TC(MIN.) =      4.30
  PEAK FLOW RATE(CFS)   =       7.74
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# APPENDIX 6

# FEMA FLOOD MAP




## FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

| | |
|---|---|
| SPECIAL FLOOD HAZARD AREAS | Without Base Flood Elevation (BFE) *Zone A, V, A99* |
| | With BFE or Depth *Zone AE, AO, AH, VE, AR* |
| | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X* |
| | Future Conditions 1% Annual Chance Flood Hazard *Zone X* |
| | Area with Reduced Flood Risk due to Levee See Notes. *Zone X* |
| | Area with Flood Risk due to Levee *Zone D* |
| OTHER AREAS | NO SCREEN Area of Minimal Flood Hazard *Zone X* |
| | Area of Undetermined Flood Hazard *Zone D* |
| GENERAL STRUCTURES | Channel, Culvert, or Storm Sewer |
| | Levee, Dike, or Floodwall |
| | 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | 8 Coastal Transect |
| | Coastal Transect Baseline |
| OTHER FEATURES | Profile Baseline |
| | Hydrographic Feature |
| | 513 Base Flood Elevation Line (BFE) |
| | Limit of Study |
| | Jurisdiction Boundary |

## NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was derived from digital orthophotography collected by the U.S. Department of Agriculture Farm Service Agency. Department of Agriculture imagery was flown in 2016 and was produced with a 1-meter ground sample distance.

Coastal Base Flood Elevations shown on the map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Coastal flood elevations are also provided in the Coastal Transect Parameters table in the FIS Report for this jurisdiction. Elevations shown in the Coastal Transect Parameters table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on the FIRM.

## SCALE

N

Map Projection:
Universal Transverse Mercator Zone 11N; North American Datum 1983;
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

## PANEL LOCATOR




*PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

SAN DIEGO COUNTY, CALIFORNIA and Incorporated Areas

PANEL 734 OF 2375

FEMA

Panel Contains:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| OCEANSIDE, CITY OF | 060294 | 0734 | J |
| SAN DIEGO COUNTY | 060284 | 0734 | J |

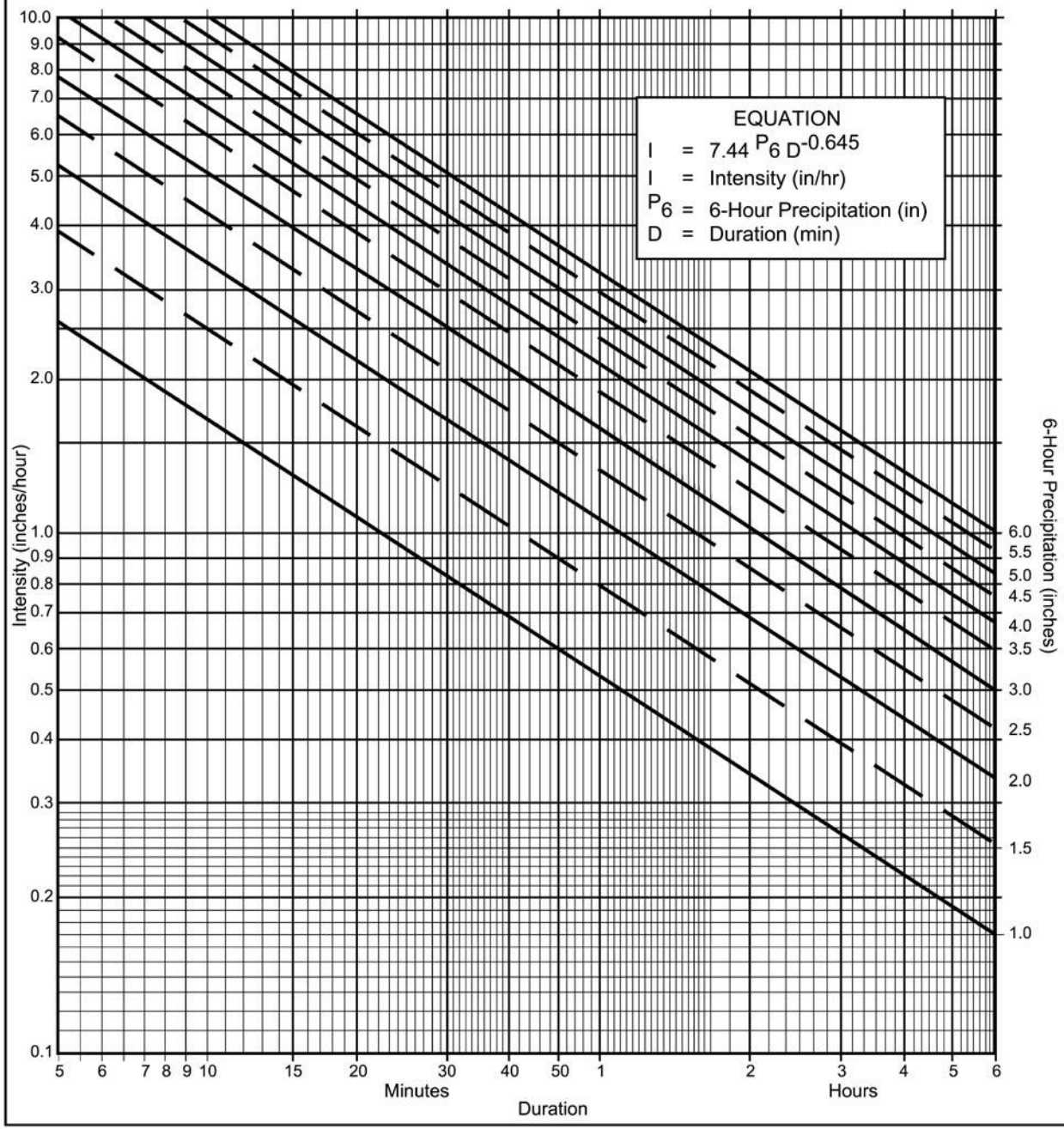
VERSION NUMBER
2.3.3.3

MAP NUMBER
06073C0734J

MAP REVISED
DECEMBER 20, 2019

# APPENDIX 7

# SAN DIEGO COUNTY
# 100-YEAR ISOPOLUVIAL MAPS




**Directions for Application:**

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

**Application Form:**

(a) Selected frequency 100 year

(b) $P_6$ = 2.6 in., $P_{24}$ = 4.5, $\frac{P_6}{P_{24}}$ = 58 %(2)

(c) Adjusted $P_6$(2) = NA in.

(d) $t_x$ = _____ min.

(e) I = _____ in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

| P6 | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Duration | I | I | I | I | I | I | I | I | I | I | I |
| 5 | 2.63 | 3.95 | 5.27 | 6.59 | 7.90 | 9.22 | 10.54 | 11.86 | 13.17 | 14.49 | 15.81 |
| 7 | 2.12 | 3.18 | 4.24 | 5.30 | 6.36 | 7.42 | 8.48 | 9.54 | 10.60 | 11.66 | 12.72 |
| 10 | 1.68 | 2.53 | 3.37 | 4.21 | 5.05 | 5.90 | 6.74 | 7.58 | 8.42 | 9.27 | 10.11 |
| 15 | 1.30 | 1.95 | 2.59 | 3.24 | 3.89 | 4.54 | 5.19 | 5.84 | 6.49 | 7.13 | 7.78 |
| 20 | 1.08 | 1.62 | 2.15 | 2.69 | 3.23 | 3.77 | 4.31 | 4.85 | 5.39 | 5.93 | 6.46 |
| 25 | 0.93 | 1.40 | 1.87 | 2.33 | 2.80 | 3.27 | 3.73 | 4.20 | 4.67 | 5.13 | 5.60 |
| 30 | 0.83 | 1.24 | 1.66 | 2.07 | 2.49 | 2.90 | 3.32 | 3.73 | 4.15 | 4.56 | 4.98 |
| 40 | 0.69 | 1.03 | 1.38 | 1.72 | 2.07 | 2.41 | 2.76 | 3.10 | 3.45 | 3.79 | 4.13 |
| 50 | 0.60 | 0.90 | 1.19 | 1.49 | 1.79 | 2.09 | 2.39 | 2.69 | 2.98 | 3.28 | 3.58 |
| 60 | 0.53 | 0.80 | 1.06 | 1.33 | 1.59 | 1.86 | 2.12 | 2.39 | 2.65 | 2.92 | 3.18 |
| 90 | 0.41 | 0.61 | 0.82 | 1.02 | 1.23 | 1.43 | 1.63 | 1.84 | 2.04 | 2.25 | 2.45 |
| 120 | 0.34 | 0.51 | 0.68 | 0.85 | 1.02 | 1.19 | 1.36 | 1.53 | 1.70 | 1.87 | 2.04 |
| 150 | 0.29 | 0.44 | 0.59 | 0.73 | 0.88 | 1.03 | 1.18 | 1.32 | 1.47 | 1.62 | 1.76 |
| 180 | 0.26 | 0.39 | 0.52 | 0.65 | 0.78 | 0.91 | 1.04 | 1.18 | 1.31 | 1.44 | 1.57 |
| 240 | 0.22 | 0.33 | 0.43 | 0.54 | 0.65 | 0.76 | 0.87 | 0.98 | 1.08 | 1.19 | 1.30 |
| 300 | 0.19 | 0.28 | 0.38 | 0.47 | 0.56 | 0.66 | 0.75 | 0.85 | 0.94 | 1.03 | 1.13 |
| 360 | 0.17 | 0.25 | 0.33 | 0.42 | 0.50 | 0.58 | 0.67 | 0.75 | 0.84 | 0.92 | 1.00 |

**Intensity-Duration Design Chart - Template**

**FIGURE 3-1**

33.11'49" N
117.22'35" W

2.6"

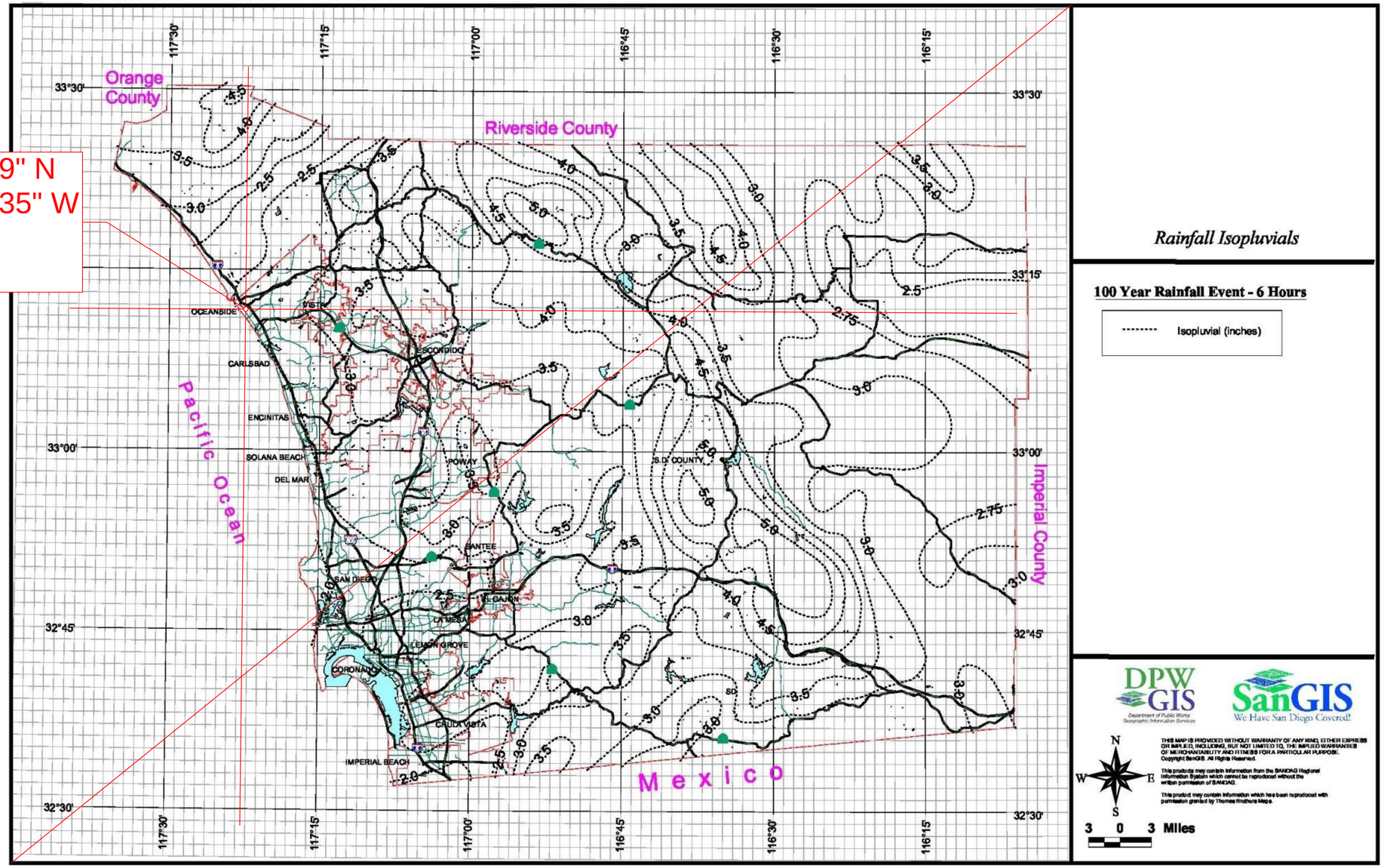



**Figure B-2. 100-Year 6-Hour Isopluvials.**

# County of San Diego Hydrology Manual

*Rainfall Isopluvials*

**100 Year Rainfall Event - 24 Hours**

Isopluvial (inches)

33.11'49" N
117.22'35" W

4.5"

Orange County

Riverside County

Imperial County

Mexico

Pacific Ocean

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
CHULA VISTA
IMPERIAL BEACH
SD

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works
Geographic Information Services

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We Have San Diego Covered!

N
W E
S

3 0 3 Miles

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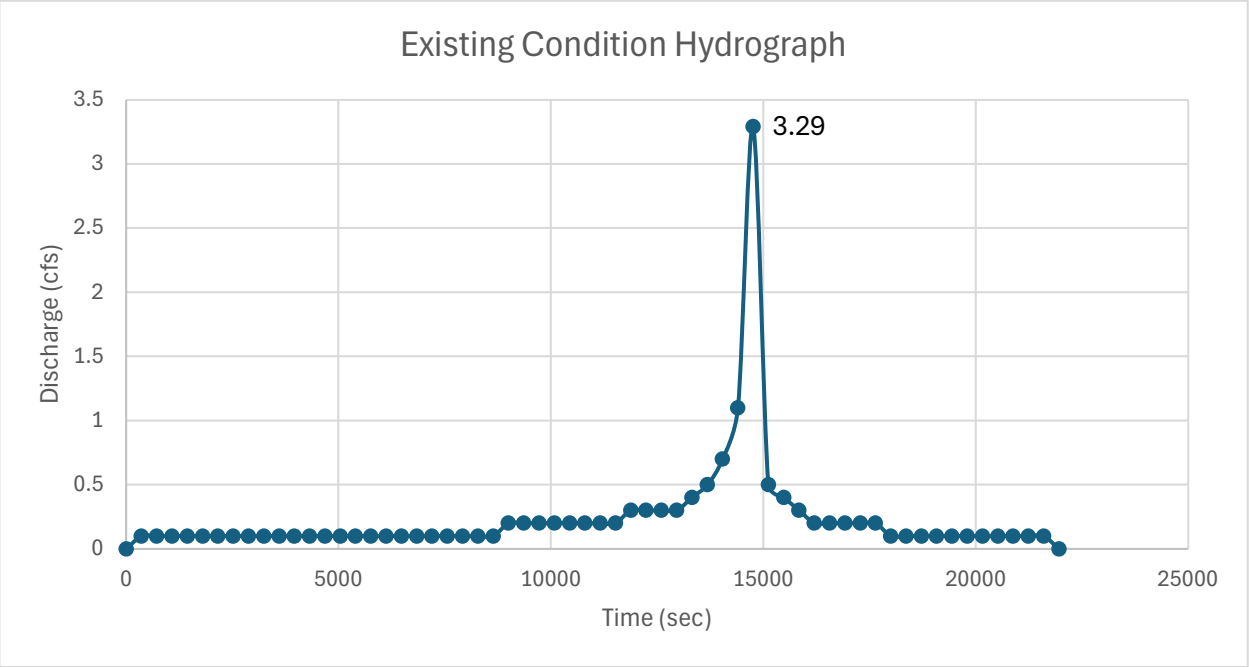
# APPENDIX 8

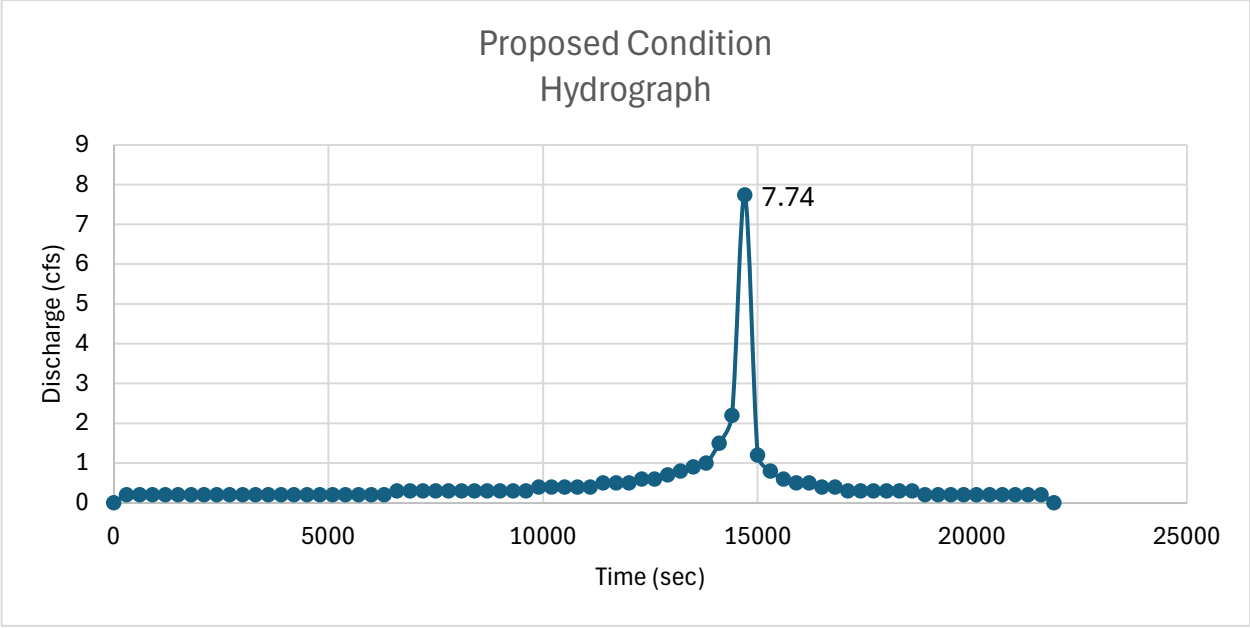
# HYDROGRAPHS, STORAGE CURVES & INFLOW HYDROGRAPH INPUTS

# Summary of Hydrograph Calculations

**901 Mission Ave, Oceanside, California**

| Series Name | Tc (min) | Runoff Coefficient (C) | 6-hr Rainfall (in) | Area (ac) | Peak Discharge (cfs) | Total Volume (cf) |
|---|---|---|---|---|---|---|
| Existing | 6 | 0.38 | 2.6 | 1.47 | 3.29 | 5,216 |
| Proposed | 5 | 0.77 | 2.6 | 1.47 | 7.74 | 10,572 |
| | | | | | **Difference in Volume =** | **5,356** |



RATIONAL METHOD HYDROGRAPHS PROGRAM
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**EXISTING SERIES 100**
RUN DATE 8/6/2024
TIME OF CONCENTRATION 6 MIN.
6 HOUR RAINFALL 2.6 INCHES
BASIN AREA 1.47 ACRES
RUNOFF COEFFICIENT 0.38
PEAK DISCHARGE 3.29 CFS

| | Time (min) | Time (sec) | Discharge (cfs) | Total Volume (cf) |
|---|---|---|---|---|
| TIME (MIN) = 0 DISCHARGE (CFS) = 0 | 0 | 0 | 0 | 18 |
| TIME (MIN) = 6 DISCHARGE (CFS) = 0.1 | 6 | 360 | 0.1 | 36 |
| TIME (MIN) = 12 DISCHARGE (CFS) = 0.1 | 12 | 720 | 0.1 | 36 |
| TIME (MIN) = 18 DISCHARGE (CFS) = 0.1 | 18 | 1080 | 0.1 | 36 |
| TIME (MIN) = 24 DISCHARGE (CFS) = 0.1 | 24 | 1440 | 0.1 | 36 |
| TIME (MIN) = 30 DISCHARGE (CFS) = 0.1 | 30 | 1800 | 0.1 | 36 |
| TIME (MIN) = 36 DISCHARGE (CFS) = 0.1 | 36 | 2160 | 0.1 | 36 |
| TIME (MIN) = 42 DISCHARGE (CFS) = 0.1 | 42 | 2520 | 0.1 | 36 |
| TIME (MIN) = 48 DISCHARGE (CFS) = 0.1 | 48 | 2880 | 0.1 | 36 |
| TIME (MIN) = 54 DISCHARGE (CFS) = 0.1 | 54 | 3240 | 0.1 | 36 |
| TIME (MIN) = 60 DISCHARGE (CFS) = 0.1 | 60 | 3600 | 0.1 | 36 |
| TIME (MIN) = 66 DISCHARGE (CFS) = 0.1 | 66 | 3960 | 0.1 | 36 |
| TIME (MIN) = 72 DISCHARGE (CFS) = 0.1 | 72 | 4320 | 0.1 | 36 |
| TIME (MIN) = 78 DISCHARGE (CFS) = 0.1 | 78 | 4680 | 0.1 | 36 |
| TIME (MIN) = 84 DISCHARGE (CFS) = 0.1 | 84 | 5040 | 0.1 | 36 |
| TIME (MIN) = 90 DISCHARGE (CFS) = 0.1 | 90 | 5400 | 0.1 | 36 |
| TIME (MIN) = 96 DISCHARGE (CFS) = 0.1 | 96 | 5760 | 0.1 | 36 |
| TIME (MIN) = 102 DISCHARGE (CFS) = 0.1 | 102 | 6120 | 0.1 | 36 |
| TIME (MIN) = 108 DISCHARGE (CFS) = 0.1 | 108 | 6480 | 0.1 | 36 |
| TIME (MIN) = 114 DISCHARGE (CFS) = 0.1 | 114 | 6840 | 0.1 | 36 |
| TIME (MIN) = 120 DISCHARGE (CFS) = 0.1 | 120 | 7200 | 0.1 | 36 |
| TIME (MIN) = 126 DISCHARGE (CFS) = 0.1 | 126 | 7560 | 0.1 | 36 |
| TIME (MIN) = 132 DISCHARGE (CFS) = 0.1 | 132 | 7920 | 0.1 | 36 |
| TIME (MIN) = 138 DISCHARGE (CFS) = 0.1 | 138 | 8280 | 0.1 | 36 |
| TIME (MIN) = 144 DISCHARGE (CFS) = 0.1 | 144 | 8640 | 0.1 | 54 |
| TIME (MIN) = 150 DISCHARGE (CFS) = 0.2 | 150 | 9000 | 0.2 | 72 |
| TIME (MIN) = 156 DISCHARGE (CFS) = 0.2 | 156 | 9360 | 0.2 | 72 |
| TIME (MIN) = 162 DISCHARGE (CFS) = 0.2 | 162 | 9720 | 0.2 | 72 |
| TIME (MIN) = 168 DISCHARGE (CFS) = 0.2 | 168 | 10080 | 0.2 | 72 |
| TIME (MIN) = 174 DISCHARGE (CFS) = 0.2 | 174 | 10440 | 0.2 | 72 |
| TIME (MIN) = 180 DISCHARGE (CFS) = 0.2 | 180 | 10800 | 0.2 | 72 |
| TIME (MIN) = 186 DISCHARGE (CFS) = 0.2 | 186 | 11160 | 0.2 | 72 |
| TIME (MIN) = 192 DISCHARGE (CFS) = 0.2 | 192 | 11520 | 0.2 | 90 |
| TIME (MIN) = 198 DISCHARGE (CFS) = 0.3 | 198 | 11880 | 0.3 | 108 |
| TIME (MIN) = 204 DISCHARGE (CFS) = 0.3 | 204 | 12240 | 0.3 | 108 |
| TIME (MIN) = 210 DISCHARGE (CFS) = 0.3 | 210 | 12600 | 0.3 | 108 |
| TIME (MIN) = 216 DISCHARGE (CFS) = 0.3 | 216 | 12960 | 0.3 | 126 |
| TIME (MIN) = 222 DISCHARGE (CFS) = 0.4 | 222 | 13320 | 0.4 | 162 |
| TIME (MIN) = 228 DISCHARGE (CFS) = 0.5 | 228 | 13680 | 0.5 | 216 |
| TIME (MIN) = 234 DISCHARGE (CFS) = 0.7 | 234 | 14040 | 0.7 | 324 |
| TIME (MIN) = 240 DISCHARGE (CFS) = 1.1 | 240 | 14400 | 1.1 | 790.2 |
| TIME (MIN) = 246 DISCHARGE (CFS) = 3.29 | 246 | 14760 | 3.29 | 682.2 |
| TIME (MIN) = 252 DISCHARGE (CFS) = 0.5 | 252 | 15120 | 0.5 | 162 |
| TIME (MIN) = 258 DISCHARGE (CFS) = 0.4 | 258 | 15480 | 0.4 | 126 |
| TIME (MIN) = 264 DISCHARGE (CFS) = 0.3 | 264 | 15840 | 0.3 | 90 |
| TIME (MIN) = 270 DISCHARGE (CFS) = 0.2 | 270 | 16200 | 0.2 | 72 |
| TIME (MIN) = 276 DISCHARGE (CFS) = 0.2 | 276 | 16560 | 0.2 | 72 |
| TIME (MIN) = 282 DISCHARGE (CFS) = 0.2 | 282 | 16920 | 0.2 | 72 |
| TIME (MIN) = 288 DISCHARGE (CFS) = 0.2 | 288 | 17280 | 0.2 | 72 |
| TIME (MIN) = 294 DISCHARGE (CFS) = 0.2 | 294 | 17640 | 0.2 | 54 |
| TIME (MIN) = 300 DISCHARGE (CFS) = 0.1 | 300 | 18000 | 0.1 | 36 |
| TIME (MIN) = 306 DISCHARGE (CFS) = 0.1 | 306 | 18360 | 0.1 | 36 |
| TIME (MIN) = 312 DISCHARGE (CFS) = 0.1 | 312 | 18720 | 0.1 | 36 |
| TIME (MIN) = 318 DISCHARGE (CFS) = 0.1 | 318 | 19080 | 0.1 | 36 |
| TIME (MIN) = 324 DISCHARGE (CFS) = 0.1 | 324 | 19440 | 0.1 | 36 |
| TIME (MIN) = 330 DISCHARGE (CFS) = 0.1 | 330 | 19800 | 0.1 | 36 |
| TIME (MIN) = 336 DISCHARGE (CFS) = 0.1 | 336 | 20160 | 0.1 | 36 |
| TIME (MIN) = 342 DISCHARGE (CFS) = 0.1 | 342 | 20520 | 0.1 | 36 |
| TIME (MIN) = 348 DISCHARGE (CFS) = 0.1 | 348 | 20880 | 0.1 | 36 |
| TIME (MIN) = 354 DISCHARGE (CFS) = 0.1 | 354 | 21240 | 0.1 | 36 |
| TIME (MIN) = 360 DISCHARGE (CFS) = 0.1 | 360 | 21600 | 0.1 | 18 |
| TIME (MIN) = 366 DISCHARGE (CFS) = 0 | 366 | 21960 | 0 | 0 |
| | | | Volume (cf) = | 5,216 |

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**PROPOSED SERIES 100**
RUN DATE 8/6/2024
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 2.6 INCHES
BASIN AREA 1.47 ACRES
RUNOFF COEFFICIENT 0.77
PEAK DISCHARGE 7.74 CFS

| | Time (min) | Time (sec) | Discharge (cfs) | Total Volume (cf) |
|---|---|---|---|---|
| TIME (MIN) = 0 DISCHARGE (CFS) = 0 | 0 | 0 | 0 | 30 |
| TIME (MIN) = 5 DISCHARGE (CFS) = 0.2 | 5 | 300 | 0.2 | 60 |
| TIME (MIN) = 10 DISCHARGE (CFS) = 0.2 | 10 | 600 | 0.2 | 60 |
| TIME (MIN) = 15 DISCHARGE (CFS) = 0.2 | 15 | 900 | 0.2 | 60 |
| TIME (MIN) = 20 DISCHARGE (CFS) = 0.2 | 20 | 1200 | 0.2 | 60 |
| TIME (MIN) = 25 DISCHARGE (CFS) = 0.2 | 25 | 1500 | 0.2 | 60 |
| TIME (MIN) = 30 DISCHARGE (CFS) = 0.2 | 30 | 1800 | 0.2 | 60 |
| TIME (MIN) = 35 DISCHARGE (CFS) = 0.2 | 35 | 2100 | 0.2 | 60 |
| TIME (MIN) = 40 DISCHARGE (CFS) = 0.2 | 40 | 2400 | 0.2 | 60 |
| TIME (MIN) = 45 DISCHARGE (CFS) = 0.2 | 45 | 2700 | 0.2 | 60 |
| TIME (MIN) = 50 DISCHARGE (CFS) = 0.2 | 50 | 3000 | 0.2 | 60 |
| TIME (MIN) = 55 DISCHARGE (CFS) = 0.2 | 55 | 3300 | 0.2 | 60 |
| TIME (MIN) = 60 DISCHARGE (CFS) = 0.2 | 60 | 3600 | 0.2 | 60 |
| TIME (MIN) = 65 DISCHARGE (CFS) = 0.2 | 65 | 3900 | 0.2 | 60 |
| TIME (MIN) = 70 DISCHARGE (CFS) = 0.2 | 70 | 4200 | 0.2 | 60 |
| TIME (MIN) = 75 DISCHARGE (CFS) = 0.2 | 75 | 4500 | 0.2 | 60 |
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| TIME (MIN) = 85 DISCHARGE (CFS) = 0.2 | 85 | 5100 | 0.2 | 60 |
| TIME (MIN) = 90 DISCHARGE (CFS) = 0.2 | 90 | 5400 | 0.2 | 60 |
| TIME (MIN) = 95 DISCHARGE (CFS) = 0.2 | 95 | 5700 | 0.2 | 60 |
| TIME (MIN) = 100 DISCHARGE (CFS) = 0.2 | 100 | 6000 | 0.2 | 60 |
| TIME (MIN) = 105 DISCHARGE (CFS) = 0.2 | 105 | 6300 | 0.2 | 75 |
| TIME (MIN) = 110 DISCHARGE (CFS) = 0.3 | 110 | 6600 | 0.3 | 90 |
| TIME (MIN) = 115 DISCHARGE (CFS) = 0.3 | 115 | 6900 | 0.3 | 90 |
| TIME (MIN) = 120 DISCHARGE (CFS) = 0.3 | 120 | 7200 | 0.3 | 90 |
| TIME (MIN) = 125 DISCHARGE (CFS) = 0.3 | 125 | 7500 | 0.3 | 90 |
| TIME (MIN) = 130 DISCHARGE (CFS) = 0.3 | 130 | 7800 | 0.3 | 90 |
| TIME (MIN) = 135 DISCHARGE (CFS) = 0.3 | 135 | 8100 | 0.3 | 90 |
| TIME (MIN) = 140 DISCHARGE (CFS) = 0.3 | 140 | 8400 | 0.3 | 90 |
| TIME (MIN) = 145 DISCHARGE (CFS) = 0.3 | 145 | 8700 | 0.3 | 90 |
| TIME (MIN) = 150 DISCHARGE (CFS) = 0.3 | 150 | 9000 | 0.3 | 90 |
| TIME (MIN) = 155 DISCHARGE (CFS) = 0.3 | 155 | 9300 | 0.3 | 90 |
| TIME (MIN) = 160 DISCHARGE (CFS) = 0.3 | 160 | 9600 | 0.3 | 105 |
| TIME (MIN) = 165 DISCHARGE (CFS) = 0.4 | 165 | 9900 | 0.4 | 120 |
| TIME (MIN) = 170 DISCHARGE (CFS) = 0.4 | 170 | 10200 | 0.4 | 120 |
| TIME (MIN) = 175 DISCHARGE (CFS) = 0.4 | 175 | 10500 | 0.4 | 120 |
| TIME (MIN) = 180 DISCHARGE (CFS) = 0.4 | 180 | 10800 | 0.4 | 120 |
| TIME (MIN) = 185 DISCHARGE (CFS) = 0.4 | 185 | 11100 | 0.4 | 135 |
| TIME (MIN) = 190 DISCHARGE (CFS) = 0.5 | 190 | 11400 | 0.5 | 150 |
| TIME (MIN) = 195 DISCHARGE (CFS) = 0.5 | 195 | 11700 | 0.5 | 150 |
| TIME (MIN) = 200 DISCHARGE (CFS) = 0.5 | 200 | 12000 | 0.5 | 165 |
| TIME (MIN) = 205 DISCHARGE (CFS) = 0.6 | 205 | 12300 | 0.6 | 180 |
| TIME (MIN) = 210 DISCHARGE (CFS) = 0.6 | 210 | 12600 | 0.6 | 195 |
| TIME (MIN) = 215 DISCHARGE (CFS) = 0.7 | 215 | 12900 | 0.7 | 225 |
| TIME (MIN) = 220 DISCHARGE (CFS) = 0.8 | 220 | 13200 | 0.8 | 255 |
| TIME (MIN) = 225 DISCHARGE (CFS) = 0.9 | 225 | 13500 | 0.9 | 285 |
| TIME (MIN) = 230 DISCHARGE (CFS) = 1 | 230 | 13800 | 1 | 375 |
| TIME (MIN) = 235 DISCHARGE (CFS) = 1.5 | 235 | 14100 | 1.5 | 555 |
| TIME (MIN) = 240 DISCHARGE (CFS) = 2.2 | 240 | 14400 | 2.2 | 1491 |
| TIME (MIN) = 245 DISCHARGE (CFS) = 7.74 | 245 | 14700 | 7.74 | 1341 |
| TIME (MIN) = 250 DISCHARGE (CFS) = 1.2 | 250 | 15000 | 1.2 | 300 |
| TIME (MIN) = 255 DISCHARGE (CFS) = 0.8 | 255 | 15300 | 0.8 | 210 |
| TIME (MIN) = 260 DISCHARGE (CFS) = 0.6 | 260 | 15600 | 0.6 | 165 |
| TIME (MIN) = 265 DISCHARGE (CFS) = 0.5 | 265 | 15900 | 0.5 | 150 |
| TIME (MIN) = 270 DISCHARGE (CFS) = 0.5 | 270 | 16200 | 0.5 | 135 |
| TIME (MIN) = 275 DISCHARGE (CFS) = 0.4 | 275 | 16500 | 0.4 | 120 |
| TIME (MIN) = 280 DISCHARGE (CFS) = 0.4 | 280 | 16800 | 0.4 | 105 |
| TIME (MIN) = 285 DISCHARGE (CFS) = 0.3 | 285 | 17100 | 0.3 | 90 |
| TIME (MIN) = 290 DISCHARGE (CFS) = 0.3 | 290 | 17400 | 0.3 | 90 |
| TIME (MIN) = 295 DISCHARGE (CFS) = 0.3 | 295 | 17700 | 0.3 | 90 |
| TIME (MIN) = 300 DISCHARGE (CFS) = 0.3 | 300 | 18000 | 0.3 | 90 |
| TIME (MIN) = 305 DISCHARGE (CFS) = 0.3 | 305 | 18300 | 0.3 | 90 |
| TIME (MIN) = 310 DISCHARGE (CFS) = 0.3 | 310 | 18600 | 0.3 | 75 |
| TIME (MIN) = 315 DISCHARGE (CFS) = 0.2 | 315 | 18900 | 0.2 | 60 |
| TIME (MIN) = 320 DISCHARGE (CFS) = 0.2 | 320 | 19200 | 0.2 | 60 |
| TIME (MIN) = 325 DISCHARGE (CFS) = 0.2 | 325 | 19500 | 0.2 | 60 |
| TIME (MIN) = 330 DISCHARGE (CFS) = 0.2 | 330 | 19800 | 0.2 | 60 |
| TIME (MIN) = 335 DISCHARGE (CFS) = 0.2 | 335 | 20100 | 0.2 | 60 |
| TIME (MIN) = 340 DISCHARGE (CFS) = 0.2 | 340 | 20400 | 0.2 | 60 |
| TIME (MIN) = 345 DISCHARGE (CFS) = 0.2 | 345 | 20700 | 0.2 | 60 |
| TIME (MIN) = 350 DISCHARGE (CFS) = 0.2 | 350 | 21000 | 0.2 | 60 |
| TIME (MIN) = 355 DISCHARGE (CFS) = 0.2 | 355 | 21300 | 0.2 | 60 |
| TIME (MIN) = 360 DISCHARGE (CFS) = 0.2 | 360 | 21600 | 0.2 | 30 |
| TIME (MIN) = 365 DISCHARGE (CFS) = 0 | 365 | 21900 | 0 | |
| | | | Volume (cf) = | 10,572 |

**ATTACHMENT 6**
**Geotechnical and Groundwater Investigation Report**

This is the cover sheet for Attachment 6.

# GEOTECHNICAL INVESTIGATION

## 901 MISSION AVENUE MIXED-USE
## OCEANSIDE, CALIFORNIA

**PREPARED FOR**

**JPI**
**SAN DIEGO. CALIFORNIA**

**MAY 15, 2024**
**PROJECT NO. G3303-42-01**

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. G3303-42-01
May 15, 2024

JPI
11988 El Camino Real, Suite 200
San Diego, California 92130

Attention: Mr. Conner Kloeppel

Subject: GEOTECHNICAL INVESTIGATION
901 MISSION AVENUE MIXED-USE
OCEANSIDE, CALIFORNIA

Dear Mr. Kloeppel:

In accordance with your request, we herein submit this geotechnical investigation for the subject site. Geocon Incorporated previously performed an investigation on the property (Geocon, 2004) to evaluate geologic conditions and potential geologic hazards at the site. The field data and laboratory test results from that study were used to provide conclusions and recommendations pertinent to geotechnical aspects of currently proposed project. The site is suitable for development provided the recommendations in this report are followed.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

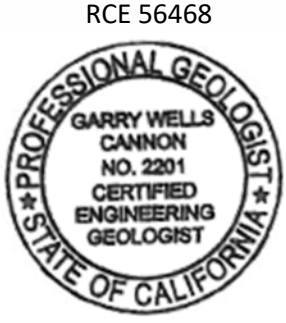
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Senior Staff Geologist

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RCE 56468

Rodney C. Mikesell
GE 2533

JPS:GWC:RCM:am

(e-mail) Addressee









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LIMITATIONS AND UNIFORMITY OF CONDITIONS

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APPENDIX B
   LABORATORY TESTING

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   RECOMMENDED GRADING SPECIFICATIONS

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# GEOTECHNICAL INVVESTIGATION

## 1. PURPOSE AND SCOPE

This report provides recommendations for development of a proposed mixed-use project planned for the property located at 901 Mission Avenue between Horne Street and Clementine Street in Oceanside, California (see Site Location Map). Geocon Incorporated previously performed a geotechnical investigation on the property (Geocon, 2004) and the field data and laboratory test results from that study are deemed adequate and applicable to the currently proposed project.




**Site Location Map**

The scope of this study included reviewing Geocon (2004) and other readily available geologic reports and maps; engineering analysis using data from Geocon (2004); and preparing this report. We herein provide recommendations for remedial grading; foundation design; concrete slab-on-grade; and concrete flatwork.

We conducted our previous field investigation (Geocon, 2004) on December 30, 2003. The approximate locations of the exploratory borings are shown on the Geologic Map, Figure 1.

Appendix A presents the exploratory boring logs and details of the field investigation. Details of the laboratory testing and a summary of test results are provided in Appendix B and on the boring logs in Appendix A.

The recommendations presented herein are based on our analysis of data and our observations obtained during previous investigations and our experience with similar soil and geologic conditions.

# 2. SITE AND PROJECT DESCRIPTION

The site is bounded by Horne Street to the east, Clementine Street to the west, Mission Avenue to the north, and Seagaze Drive to the south. Site elevation ranges between about 100 feet above Mean Sea Level (MSL) on the western side to about 117 feet MSL to the eastern side.

The property is currently vacant. A paved driveway bisects the north and south halves of the property. Previously, buildings and parking lots occupied the property. In 1982 or 1983, buildings on the northern half of the property were demolished. During our previous investigation (Geocon, 2004), two single-story houses and apartment buildings occupied the southwestern corner of the block. In 2006 or 2007 the remaining structures on the property were demolished.

Based on discussions with you and drawings we have reviewed, we understand that a 6-story apartment building over two podium levels and two levels of subterranean parking are planned.

# 3. SOIL AND GEOLOGIC CONDITIONS

The site is underlain by undocumented fill overlying Old Paralic Deposits (shown as terrace deposits on the boring logs). Descriptions of the soils encountered during our investigation are presented below and on the boring logs in Appendix A. A Geologic Map and Geologic Cross Sections showing these units are presented as Figures 1 and 2, respectively.

## 3.1 Undocumented Fill (Qudf)

Undocumented fill soils were encountered in all borings to depths ranging between about 2 to 9 feet below existing grade. The fill generally consisted of silty sand with scattered gravel. The fill is unsuitable to support the planned improvements and will require complete removal. These soils may be reused as fill provided debris is removed.

### 3.2 Old Paralic Deposits (Qop)

Old Paralic Deposits were encountered beneath the undocumented fill and extended through the full depth explored. The terrace deposit consisted of dense to very dense, silty sand, clayey sand, and sand with silt. Cobbles were encountered at a depth of approximately 20 feet below the ground surface. The Old Paralic Deposits are suitable to support the planned improvements.

## 4. GROUNDWATER

We did not encounter groundwater during our previous investigation; however, it is not uncommon for groundwater or seepage conditions to develop where none previously existed. Groundwater and seepage conditions are dependent on seasonal precipitation, irrigation, land use, among other factors, and vary as a result. Proper surface drainage will be important to future performance of the project. We do not anticipate ground water will affect the constructability of the project.

## 5. GEOLOGIC HAZARDS

### 5.1. Ground Rupture

The USGS (2016) and Kennedy & Tan (2008) show that there are no mapped Quaternary faults crossing or trending toward the site. The site is not located within a currently established Alquist-Priolo Earthquake Fault Zone (CEG, 2021a). The closest active fault is the Newport-Inglewood-Rose Canyon fault zone located approximately 4.5 miles to the west. The risk associated with ground rupture hazard is low.

There are no active faults, potentially active faults, inactive faults, presumed inactive faults, or activity unknown faults at the site or trending toward the site. The risk associated with ground rupture hazard is low

### 5.2. Seismicity

Considerations important in seismic design include frequency and duration of motion and soil conditions underlying the site. The seismic design of structures should be evaluated in accordance with the 2022 California Building Code currently adopted by the local agency. The risk associated with strong seismic ground motion hazard is high; however, the risk is no greater than that for the site vicinity.

### 5.3. Liquefaction

Considering the lack of shallow permanent groundwater and the density and age of the underlying geologic units, the risk associated with seismically induced soil liquefaction hazard is low.

### 5.4. Landslides

No evidence of landsliding was observed during our investigation. Kennedy & Tan (2007) show that there are no landslides mapped at the site or in an area that could impact the site. The risk associated with ground movement hazard due to landsliding is low.

### 5.5. Tsunamis and Seiches

The site is not located within a California Tsunami Hazard Area (CGS, 2021b). There are no lakes or reservoirs located near the site. The risk associated with inundation hazard due to tsunami or seiche is low.

### 5.6. Flooding

The site is designated as Zone X (FEMA, 2019). The risk associated with flooding hazard is low.

# 6. CONCLUSIONS AND RECOMMENDATIONS

## 6.1 General

6.1.1 It is our opinion that the site is suitable for the planned improvements, provided the recommendations presented herein are implemented during the design and construction of the project.

6.1.2 The site is underlain by undocumented fill and Old Paralic Deposits. The undocumented fill is not suitable to support settlement-sensitive improvements and will require remedial grading. The Old Paralic Deposits are suitable to support the compacted fill and settlement-sensitive improvements.

6.1.3 We did not encounter groundwater during our investigation. Groundwater will not be a constraint to project development; however, seepage could be encountered during the grading operations, especially during the rainy seasons.

6.1.4 No significant geologic hazards were observed or are known to exist on the site that would adversely impact the site.

6.1.5 The proposed structure can be supported on conventional shallow foundations bearing entirely on undisturbed old paralic deposits (i.e. terrace deposits).

## 6.2 Excavation and Soil Characteristics

6.2.1 Excavation of the on-site soils should be possible with moderate effort using conventional heavy-duty equipment.

6.2.2 The soil encountered in the field investigation possess a “very low” to “low” expansion potential (expansion index [EI] ≤ 50) as defined by 2022 California Building Code (CBC) Section 1803.5.3. the following table presents soil classifications based on expansion index. We expect a majority of the on-site soil possess a “very low” to “low” expansion potential (EI ≤ 50).

**EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX**

| Expansion Index (EI) | ASTM D 4829 Expansion Classification | 2022 CBC Expansion Classification |
|---|---|---|
| 0 – 20 | Very Low | Non-Expansive |
| 21 – 50 | Low | Expansive |
| 51 – 90 | Medium | |
| 91 – 130 | High | |
| Greater Than 130 | Very High | |

6.2.3 We performed laboratory tests during our previous investigation on samples of the site soils to evaluate the percentage of water-soluble sulfate content. Appendix B presents results of the laboratory tests. The test results indicate the on-site soils at the locations tested possess a "S0" sulfate exposure to concrete structures as defined by 2022 CBC Section 1904 and ACI 318-08 Sections 4.2 and 4.3. The following table presents a summary of concrete requirements set forth by 2022 CBC Section 1904 and ACI 318. We recommend ACI guidelines be followed when determining the type of concrete used for the project. The presence of water-soluble sulfates is not a visually discernible characteristic; therefore, other soil samples from the site could yield different concentrations. Over time landscaping activities (i.e., addition of fertilizers and other soil nutrients) could affect the concentration.

**REQUIREMENTS FOR CONCRETE EXPOSED TO SULFATE-CONTAINING SOLUTIONS**

| Exposure Class | | Water-Soluble Sulfate ($SO_4$) Percent by Weight | Cement Type (ASTM C 150) | Maximum Water to Cement Ratio by Weight[1] | Minimum Compressive Strength (psi) |
|---|---|---|---|---|---|
| S0 | | $SO_4$<0.10 | No Type Restriction | n/a | 2,500 |
| S1 | | 0.10≤$SO_4$<0.20 | II | 0.50 | 4,000 |
| S2 | | 0.20≤$SO_4$≤2.00 | V | 0.45 | 4,500 |
| S3 | Option 1 | $SO_4$>2.00 | V+Pozzolan or Slag | 0.45 | 4,500 |
| | Option 2 | | V | 0.40 | 5,000 |

[1] Maximum water to cement ratio limits do not apply to lightweight concrete

6.2.4 Geocon Incorporated does not practice in the field of corrosion engineering; therefore, further evaluation by a corrosion engineer may be needed if improvements susceptible to corrosion are planned.

## 6.3 Subdrains

6.3.1 Subdrains will not be required for this project.

## 6.4 Grading Recommendations

6.4.1 Grading should be performed in accordance with the recommendations provided in this report, the *Recommended Grading Specifications* contained in Appendix C and the local Grading Ordinances. Where the recommendations of this report conflict with Appendix C, the recommendations of this section take precedence.

6.4.2 Earthwork should be observed, and compacted fill tested by Geocon Incorporated.

6.4.3 A preconstruction conference should be held at the site with the City representative, owner, grading and underground contractors, civil engineer, and geotechnical engineer in attendance. Special soil handling and the grading plans can be discussed at that time.

6.4.4 Site preparation should begin with the removal of deleterious material, debris, and vegetation. Material generated during stripping and demolition should be exported from the site and should not be mixed with the fill soil. Existing building foundations and underground improvements within the proposed building areas should be removed.

6.4.5 Abandoned foundations and buried utilities should be removed and the resulting depressions or trenches backfilled with properly compacted soil as part of the remedial grading.

6.4.6 Undocumented fill should be completely removed to expose the underlying Old Paralic Deposits. The removals should extend to the property lines, where practicable. We expect excavations to reach basement level will remove most, if not all of the undocumented fill. Where undocumented fill extends below the basement level, the fill should be removed and recompacted. A representative of Geocon should be on-site during removals to observe the terrace deposits.

6.4.7 Prior to placing fill, the ground surface should be scarified to a depth of at least 12 inches, moisture conditioned, and compacted. Fill soils should then be placed and compacted in layers to the design finish-grade elevation. The fill layers should be no thicker than will allow for adequate bonding and compaction. Fill (including scarified ground surfaces) should be

compacted to at least 90 percent of maximum dry density (as determined by ASTM D 1557) at or slightly above optimum moisture content.

6.4.8 The following table provides a summary of the grading recommendations.

**SUMMARY OF GRADING RECOMMENDATIONS**

| Area | Removal Requirements |
|---|---|
| Site | Complete removal of undocumented fill. |
| Lateral Grading Limits | To property limits, where practicable. |
| Compaction Requirements | At least 90 percent relative compaction near or slightly above optimum moisture content. |
| Exposed Removal Bottoms | Scarify Upper 12 Inches |
| Expansion Potential | "Very Low" to "Low" (Expansion Index of 50 or less) |

6.4.9 Imported soil should have the characteristics presented on the following table. We should be notified of the imported soil source and should be provided with samples in order to perform testing of imported soil prior to its arrival at the site to evaluate its suitability as fill material.

**SUMMARY OF IMPORT FILL RECOMMENDATIONS**

| Soil Characteristic | Values |
|---|---|
| Expansion Potential | "Very Low" to "Low" (Expansion Index of 50 or less) |
| Particle Size | Maximum Dimension Less Than 3 Inches |
| | Generally Free of Debris |

## 6.5 Excavation Slopes and Shoring

6.5.1 The recommendations included herein are provided for stable excavations. Geocon Incorporated is not responsible for site safety and the stability of the proposed excavations. It is the contractor's responsibility to ensure that all excavations, temporary slopes, and trenches are properly constructed and maintained in accordance with applicable OSHA guidelines in order to maintain the safety and stability of the excavations and adjacent improvements. The walls of the excavations should not be allowed to become saturated or to dry out. Surcharge loads should not be permitted to a distance equal to the height of the

excavation from the top of the excavation unless the shoring system is designed to accommodate the surcharge loading. The top of sloped excavations should be a minimum of 15 feet from the edge of existing improvements. Vertical excavations should be shored in accordance with applicable OSHA codes and regulations.

6.5.2 The design of temporary shoring is governed by soil and groundwater conditions, and by the depth and width of the excavated area. Continuous support of the excavation face can be provided by a system of soldier piles and wood lagging or other applicable techniques. Excavations exceeding 15 feet may require soil nails, tieback anchors or internal bracing to provide additional wall restraint.

6.5.3 The condition of existing buildings, streets, sidewalks, and other structures/improvements around the perimeter of the planned excavation should be documented prior to the start of shoring and excavation work. Special attention should be given to documenting cracks or other indications of differential settlement within the adjacent structures, pavements, and other improvements. Underground utilities that are sensitive to settlement should be videotaped prior to construction to check the integrity of pipes. Monitoring points should be established on the shoring wall and adjacent building. The points should be monitored weekly during the excavation work and on a monthly thereafter until the podium floor is finished. Inclinometers should be installed and monitored behind any shoring sections that will be advanced deeper than 30 feet below the existing ground surface.

6.5.4 In general, ground conditions are suited for soldier-pile-and-tieback-anchor walls. However, gravel, cobble, and oversized material could be encountered that might be difficult to drill. Additionally, if cohesionless sands are encountered, some raveling could occur along the unsupported portions of excavations.

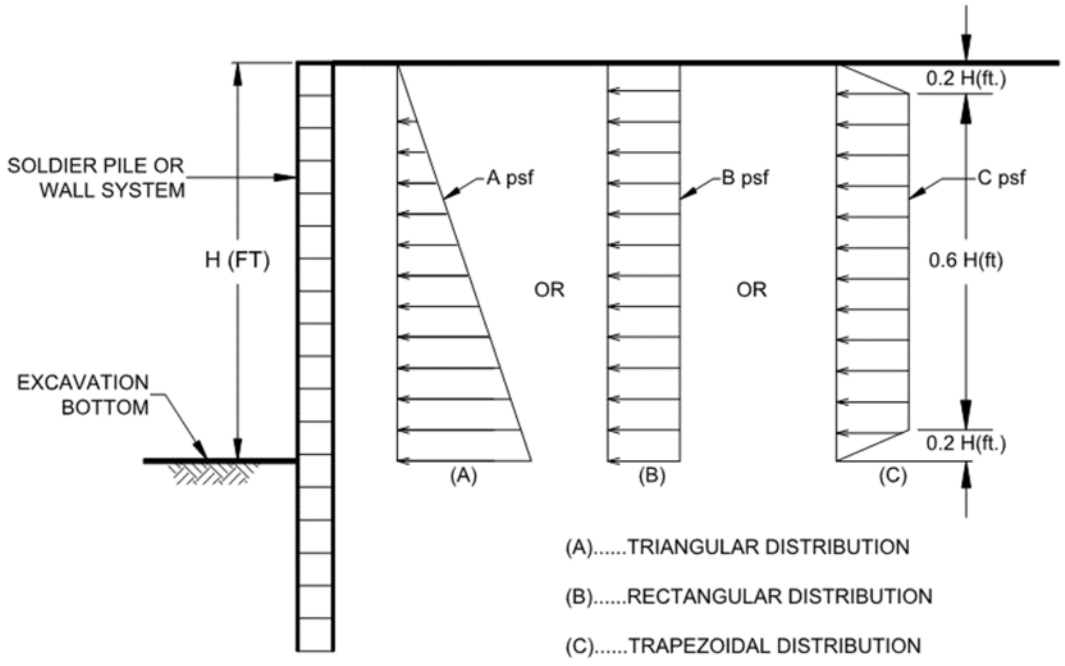
6.5.5 Temporary shoring should be designed in conformance with FHWA-IF-99-015 using a lateral pressure envelope acting on the back of the shoring as presented in the following table assuming a level backfill. The distributions are shown on the Active Pressures for Temporary Shoring. Cantilevered shoring should use the triangular distribution and multi-braced systems (such as tieback anchors and rakers) should use the trapezoidal or rectangular distributions. The project shoring engineer should determine the applicable soil pressure distribution for the design of the temporary shoring system. Additional lateral earth pressure due to the surcharging effects from construction equipment, sloping backfill, stockpiles,

adjacent structures, and traffic loads should be considered during design of the shoring system.

**SUMMARY OF TEMPORARY SHORING WALL RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Triangular Distribution, A | 25H psf |
| Rectangular Distribution, B | 16H psf |
| Trapezoidal Distribution, C | 20H psf |
| Passive Pressure, P | 350D + 500 psf |
| Effective Zone Angle, E | 30 degrees |
| Maximum Design Lateral Movement | 1 Inch |
| Maximum Design Vertical Movement | ½ Inch |
| Maximum Design Retained Height, H | 15 Feet |

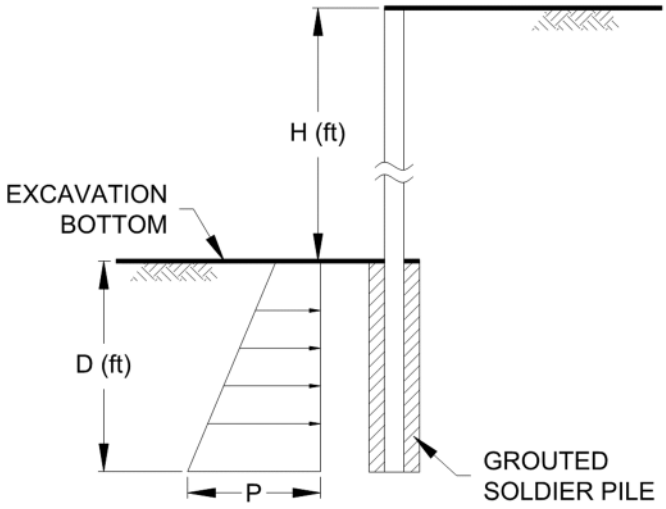
H equals the height of the retaining portion of the wall in feet
D equals the embedment depth of the retaining wall in feet




**Active Pressures on Temporary Shoring**

6.5.6 The passive resistance can be assumed to act over a width of three pile diameters. Typically, soldier piles are embedded a minimum of 0.5 times the maximum height of the excavation

(this depth is to include footing excavations) if tieback anchors are not employed. The project structural engineer should determine the actual embedment depth.




**Passive Pressures on Temporary Shoring**

6.5.7 We should observe the drilled shafts for the soldier piles prior to the placement of the pile to check that the exposed soil conditions are similar to those expected and that excavation extends to an appropriate bearing strata and design depth.

6.5.8 It is essential that the shoring system be designed to of the amount of lateral wall displacement. Earth pressures acting on a lagging wall can cause movement of the shoring toward the excavation and result in ground subsidence outside of the excavation.

6.5.9 Survey points should be established at the top of the pile on at least 20 percent of the soldier piles. An additional point located at an intermediate point between the top of the pile and the base of the excavation should be monitored on at least 20 percent of the piles if tieback anchors will be used. These points should be monitored on a weekly basis during excavation work and on a monthly basis thereafter until the permanent support system is constructed.

6.5.10 The project civil engineer should provide the approximate location, depth, and pipe type of the underground utilities to the shoring engineer to help select the shoring type and shoring design. The shoring system should be designed to limit horizontal soldier pile movement to a maximum of 1 inch. The amount of horizontal deflection can be assumed to be essentially

zero along the Active Zone and Effective Zone boundary. The magnitude of movement for intermediate depths and distances from the shoring wall can be linearly interpolated.

6.5.11 Lagging should keep pace with excavation. The excavation should not be advanced deeper than 5 feet below the bottom of lagging at any time or as determined by the shoring design engineer. Unlagged portions should only be allowed to stand for short periods of time in order to decrease the risk of soil instability and should never be left unsupported overnight. Proper backfilling should be conducted when necessary between the back of lagging and excavation sidewalls to reduce sloughing in this zone and all voids should be filled by the end of each day. It may be necessary to backfill with slurry to help prevent future lateral movement behind the supported excavation. Further, the excavation should not be advanced further than four feet below a row of tiebacks prior to those tiebacks being proof tested and locked off unless otherwise specific by the shoring engineer. Surface sloughing can occur during the excavation process.

## 6.6 Seismic Design Criteria – 2022 California Building Code

6.6.1 The following table summarizes site-specific design criteria obtained from the 2022 California Building Code (CBC; Based on the 2021 International Building Code [IBC] and ASCE 7-16), Chapter 16 Structural Design, Section 1613 Earthquake Loads. We used SEAOC (2020) to calculate the seismic design parameters. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613.2.2 of the 2022 CBC and Table 20.3-1 of ASCE 7-16. We assigned the site class based on exploratory borings performed on the property and the results of a ReMi line performed for the adjacent property to the west (CTE 2023). The values presented herein are for the risk-targeted maximum considered earthquake ($MCE_R$).

**2022 CBC SEISMIC DESIGN PARAMETERS**

| Parameter | Value | 2022 CBC Reference |
|---|---|---|
| Site Class | C | Section 1613.2.2 |
| $MCE_R$ Ground Motion Spectral Response Acceleration – Class B (short), $S_S$ | 1.052g | Figure 1613.2.1(1) |
| $MCE_R$ Ground Motion Spectral Response Acceleration – Class B (1 sec), $S_1$ | 0.384g | Figure 1613.2.1(2) |
| Site Coefficient, $F_A$ | 1.2 | Table 1613.2.3(1) |
| Site Coefficient, $F_V$ | 1.5 | Table 1613.2.3(2) |
| Site Class Modified $MCE_R$ Spectral Response Acceleration (short), $S_{MS}$ | 1.262g | Section 1613.2.3 (Eqn 16-36) |
| Site Class Modified $MCE_R$ Spectral Response Acceleration – (1 sec), $S_{M1}$ | 0.576 | Section 1613.2.3 (Eqn 16-37) |
| 5% Damped Design Spectral Response Acceleration (short), $S_{DS}$ | 0.841g | Section 1613.2.4 (Eqn 16-38) |
| 5% Damped Design Spectral Response Acceleration (1 sec), $S_{D1}$ | 0.384g | Section 1613.2.4 (Eqn 16-39) |

*See following paragraph.

6.6.2 The following table presents the mapped maximum considered geometric mean ($MCE_G$) seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-16.

**ASCE 7-16 PEAK GROUND ACCELERATION**

| Parameter | Value | ASCE 7-16 Reference |
|---|---|---|
| Site Class | C | Section 1613.2.2 (2022 CBC) |
| Mapped $MCE_G$ Peak Ground Acceleration, PGA | 0.462g | Figure 22-7 |
| Site Coefficient, $F_{PGA}$ | 1.2 | Table 11.8-1 |
| Site Class Modified $MCE_G$ Peak Ground Acceleration, $PGA_M$ | 0.554g | Section 11.8.3 (Eqn 11.8-1) |

6.6.3 Conformance to the seismic design criteria presented in the above tables does not constitute a guarantee or assurance that significant structural damage or ground failure will not occur in the event of a large earthquake. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

6.6.4 The project structural engineer or architect should determine the appropriate Risk Category and Seismic Design Category for the planned structures. The values presented herein assume a Risk Category of II and resulting in a Seismic Design Category D. The following table presents a summary of the risk categories in accordance with ASCE 7-16.

**ASCE 7-16 RISK CATEGORIES**

| Risk Category | Building Use | Examples |
|---|---|---|
| I | Low risk to Human Life at Failure | Barn, Storage Shelter |
| II | Nominal Risk to Human Life at Failure (Buildings Not Designated as I, III or IV) | Residential, Commercial and Industrial Buildings |
| III | Substantial Risk Human Life at Failure | Theaters, Lecture Halls, Dining Halls, Schools, Prisons, Small Healthcare Facilities, Infrastructure Plants, Storage for Explosives/Toxins |
| IV | Essential Facilities | Hazardous Material Facilities, Hospitals, Fire and Rescue, Emergency Shelters, Police Stations, Power Stations, Aviation Control Facilities, National Defense, Water Storage |

## 6.7 Shallow Foundations

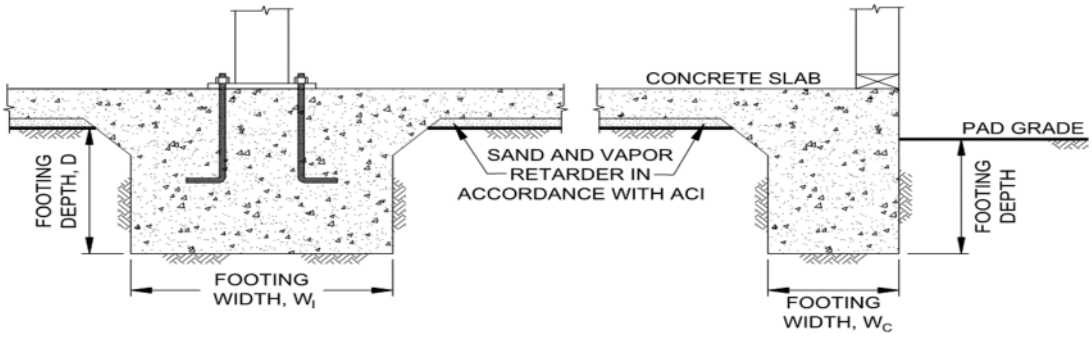
6.7.1 The proposed structure can be supported on shallow foundations bearing on undisturbed Old Paralic Deposits. Where fill is encountered below building footings, the footings should be deepened to extend through the fill to bear on the underlying Old Paralic Deposits. As an alternative to deepening footings, fill beneath the footing can be removed and the resulting excavation filled with a minimum 2-sack cement-slurry back to footing bottom.

6.7.2 Foundations should consist of continuous strip footings and isolated spread footings. The following table provides a summary of the foundation design recommendations. The allowable bearing pressure below for the basement walls assumes footings are at least 10 feet below finish grade.

**SUMMARY OF FOUNDATION RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Minimum Continuous Foundation Width, $W_C$ | 12 inches |
| Minimum Isolated Foundation Width, $W_I$ | 24 inches |
| Minimum Foundation Depth, D | 18 Inches Below Lowest Adjacent Grade |
| Minimum Concrete Reinforcement | (4) No. 5 Bars, 2 at the Top and 2 at the Bottom |
| Allowable Bearing Capacity for the Building (Footings Bering on Old Paralic Deposits) | 6,000 psf |
| Allowable Bearing Pressure (Ancillary Structures bearing on Compacted Fill) | 2,500 psf |
| Bearing Capacity Increase for Ancillary Structures | 500 psf per Foot of Depth |
| | 300 psf per Foot of Width |
| Maximum Allowable Bearing Pressure (Ancillary Structures) | 4,000 psf |
| Estimated Total Settlement | 1 Inch |
| Estimated Differential Settlement | ½ Inch in 40 Feet |
| Footing Size Used for Settlement | 8-Foot Square |
| Design Expansion Index | 50 or less |

6.7.3 The foundations should be embedded in accordance with the recommendations herein and the Wall/Column Footing Dimension Detail. The embedment depths should be measured from the lowest adjacent pad grade for both interior and exterior footings. Footings should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope (unless designed with a post-tensioned foundation system as discussed herein).




**Wall/Column Footing Dimension Detail**

6.7.4 The bearing capacity values presented herein are for dead plus live loads and may be increased by one-third when considering transient loads due to wind or seismic forces.

6.7.5 We should observe the foundation excavations prior to the placement of reinforcing steel and concrete to check that the exposed soil conditions are similar to those expected and that they have been extended to the appropriate bearing strata. Foundation modifications may be required if unexpected soil conditions are encountered.

6.7.6 We should be consulted to provide additional design parameters as required by the structural engineer.

## 6.8 Interior Concrete Slabs on Grade

6.8.1 Interior concrete slabs on grade for the structure should be constructed in accordance with the following table.

**MINIMUM INTERIOR CONCRETE SLAB-ON-GRADE RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Minimum Concrete Slab Thickness | 5 inches |
| Minimum Concrete Reinforcement | No. 3 Bars 18 Inches on Center, Both Directions |
| Typical Slab Underlayment | 3 to 4 Inches of Sand/Gravel |
| Design Expansion Index | 50 or less |

6.8.2 A vapor retarder should underlie slabs that receive moisture-sensitive floor coverings or could be used to store moisture-sensitive materials. The vapor retarder design should be consistent with the guidelines presented in the American Concrete Institute's (ACI) *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (ACI 302.2R-06). The vapor retarder should be installed in a manner that prevents puncture in accordance with manufacturer's requirements and ASTM recommendations. The project architect or developer should specify the vapor retarder used based on the type of floor covering that will be installed and if the structure will possess a humidity-controlled environment.

6.8.3 The project foundation engineer, architect, or developer should determine the bedding sand thickness. It is common to have 3 to 4 inches of sand in the southern California region. We should be contacted to provide recommendations if the bedding sand is thicker than 6 inches.

6.8.4 The foundation-design engineer should provide appropriate concrete-mix-design criteria and curing measures to assure proper curing of the slab including reducing potential rapid moisture loss which could result in shrinkage cracking and slab curl.

6.8.5 The foundation-design engineer should present the concrete-mix design and proper concrete-curing methods on the foundation plans. It is critical that the foundation contractor understands and follows the recommendations presented on the foundation plans.

6.8.6 Concrete slabs should be provided with adequate crack-control joints, construction joints and expansion joints to reduce concrete-shrinkage cracking. The American Concrete Institute (ACI) criteria should be used when establishing crack-control spacing. Crack-control joints should be spaced at intervals no greater than 12 feet. Additional concrete reinforcement, concrete admixtures or closer crack control joint spacing should be considered where exposed-concrete finished floors are planned.

6.8.7 Subgrade presaturation prior to placing concrete is not deemed necessary; however, the subgrade soil should be moisturized to maintain a moist condition as would be expected in any such concrete placement.

6.8.8 The concrete-slab-on-grade recommendations are based on soil support characteristics only. The project structural engineer should evaluate the structural requirements of the concrete slabs for supporting expected loads.

6.8.9 The recommendations of this report are intended to reduce potential cracking of slabs due to expansive soil, differential settlement of existing soil or soil with varying thicknesses. Even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade placed on such conditions may still exhibit cracking due to soil movement and/or shrinkage. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.

## 6.9 Exterior Concrete Flatwork

6.9.1 Exterior concrete flatwork not subject to vehicular traffic should be constructed in accordance with the recommendations presented in the following table. The recommended reinforcing steel could help reduce potential cracking.

**MINIMUM CONCRETE FLATWORK RECOMMENDATIONS**

| Expansion Index, EI | Minimum Concrete Reinforcement* Options | Minimum Thickness |
|---|---|---|
| EI $\leq$ 50 | 6x6-W2.9/W2.9 (6x6-6/6) welded wire mesh | 4 Inches |
| | No. 3 Bars 24 inches on center, Both Directions | |

*In excess of 8 feet square.

6.9.2 If subgrade soils have an expansion index greater than 20, the City of Oceanside requires a minimum of 6 inches of Class 2 base beneath curbs, gutters, and sidewalks. Although the expansion index performed during our previous geotechnical was less than 20, additional expansion index tests should be performed on subgrade soils to evaluate if base is required beneath curbs, gutters, and sidewalks.

6.9.3 The subgrade soil should be properly moisturized and compacted prior to the placement of reinforcing steel and concrete. The subgrade soil should be compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content in accordance with ASTM D 1557.

6.9.4 Even with the incorporation of the recommendations presented in this report, the exterior concrete flatwork can experience differential movement. Flatwork should be structurally connected to the curbs, where practical, to reduce potential offset between the curb and the flatwork.

6.9.5 Concrete flatwork should be provided with crack-control joints. The project structural engineer should determine the spacing of the crack-control joints based on the slab thickness and the intended use. American Concrete Institute (ACI) criteria should be used when establishing crack control spacing.

6.9.6 Subgrade soil for exterior slabs that are not subjected to vehicle loads should be compacted in accordance with criteria presented in the grading section prior section of this report.

Subgrade soil should be properly compacted, and the moisture content of subgrade soil should be verified prior to placing concrete.

6.9.7 Where exterior flatwork abuts the structure at entrance or exit points, the exterior slab should be dowelled into the foundation stem wall. This recommendation is intended to reduce potential differential elevations that could result from differential settlement or minor heave of the flatwork. The project structural engineer should provide dowelling details.

6.9.8 The recommendations presented herein are intended to reduce potential cracking of exterior slabs resulting from differential movement; however, even with the incorporation of the recommendations presented herein, slabs-on-grade could still crack. The occurrence of concrete shrinkage cracks is independent of the soil supporting characteristics. Their occurrence may be controlled by limiting the slump of the concrete; the use of crack control joints; and proper concrete placement and curing. Crack control joints should be spaced at intervals no greater than 12 feet. The Portland Concrete Association (PCA) and American Concrete Institute (ACI) provide recommendations for proper concrete mix, construction, and curing practices, and should be incorporated into project construction.

## 6.10 Retaining Walls

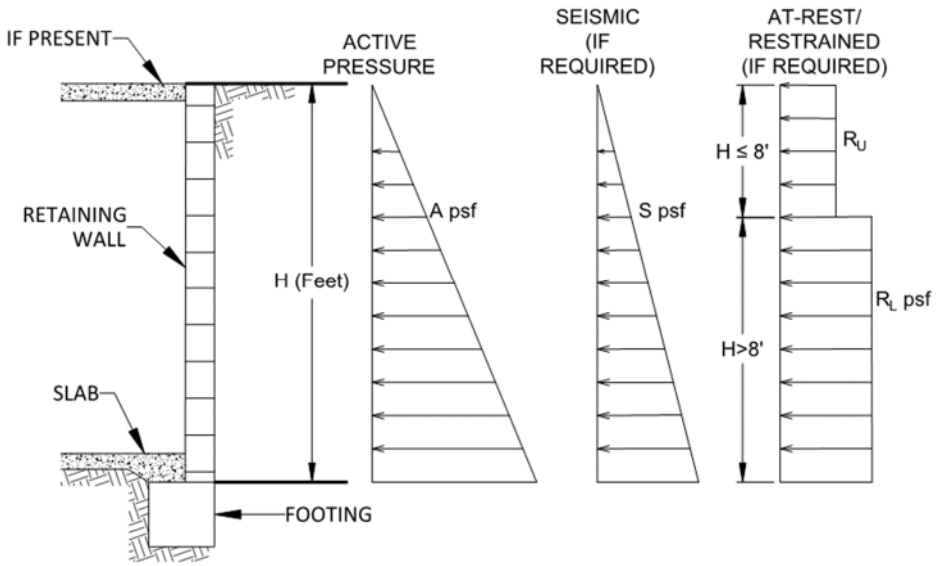
6.10.1 Walls that are allowed to rotate more than 0.001H (where H equals the height of the retaining portion of the wall) at the top of the wall should be designed using the values presented in the following table. Soil with an expansion index (EI) greater than 50 should not be used as backfill material behind retaining walls.

**RETAINING WALL DESIGN RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Active Soil Pressure, A (Level Backfill) | 35H psf |
| Active Soil Pressure, A (2:1 max Sloping Backfill) | 50H psf |
| Seismic Pressure, S | 15H psf |
| At-Rest/Restrained Walls Additional Uniform Pressure (0 to 8 Feet High) | 7H psf |
| At-Rest/Restrained Walls Additional Uniform Pressure (8+ Feet High) | 13H psf |
| Expected Expansion Index for the Subject Property | EI $\leq$ 50 |

H equals the height of the retaining portion of the wall in feet.

6.10.2 The project retaining walls should be designed as shown in the Retaining Wall Loading Diagram.




**Retaining Wall Loading Diagram**

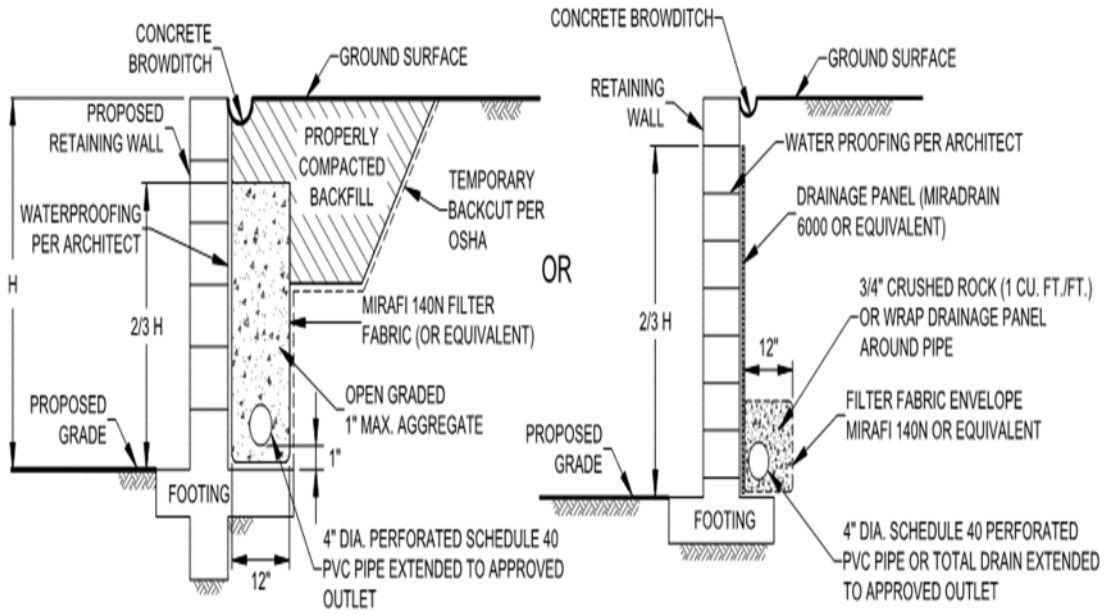
6.10.3 Where walls are restrained from movement at the top (at-rest condition), an additional uniform pressure should be applied to the wall.

6.10.4 The structural engineer should determine the Seismic Design Category for the project in accordance with Section 1613.3.5 of the 2022 CBC or Section 11.6 of ASCE 7-10. For structures assigned to Seismic Design Category of D, E, or F, retaining walls that support more than 6 feet of backfill should be designed with seismic lateral pressure in accordance with Section 1803.5.12 of the 2022 CBC. The seismic load is dependent on the retained height where H is the height of the wall, in feet, and the calculated loads result in pounds per square foot (psf) exerted at the base of the wall and zero at the top of the wall.

6.10.5 Retaining walls should be designed to ensure stability against overturning sliding, and excessive foundation pressure. Where a keyway is extended below the wall base with the intent to engage passive pressure and enhance sliding stability, it is not necessary to consider active pressure on the keyway.

6.10.6 Drainage openings through the base of the wall (weep holes) should not be used where the seepage could be a nuisance or otherwise adversely affect the property adjacent to the base of the wall.

6.10.7 The recommendations herein assume a properly compacted, granular (EI of 50 or less), free-draining backfill soil and that no hydrostatic forces or imposed surcharge load. The retaining wall should be properly drained as shown in the Typical Retaining Wall Drainage Detail. If conditions different than those described are expected, or if specific drainage details are desired, Geocon should be contacted for additional recommendations.




**Typical Retaining Wall Drainage Detail**

6.10.8 In general, wall foundations should be designed in accordance with the following table. The proximity of the foundation to the top of a slope steeper than 3:1 could impact the allowable soil bearing pressure. Therefore, retaining wall foundations should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope.

**SUMMARY OF RETAINING WALL FOUNDATION RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Minimum Retaining Wall Foundation Width | 12 inches |
| Minimum Retaining Wall Foundation Depth | 12 Inches |
| Minimum Concrete Reinforcement | Per Structural Engineer |
| Allowable Bearing Capacity | 2,500 psf |
| Bearing Capacity Increase | 500 psf per Foot of Depth |
| | 300 psf per Foot of Width |
| Maximum Allowable Bearing Capacity | 4,000 psf |
| Estimated Total Settlement | 1 Inch |
| Estimated Differential Settlement | ½ Inch in 40 Feet |

6.10.9 The recommendations presented herein are applicable for the design of rigid concrete or masonry retaining walls. Should other types of walls (such as mechanically stabilized earth [MSE] walls) be planned, Geocon should be consulted for additional recommendations.

6.10.10 Soil contemplated for use as retaining wall backfill, including imported soils, should be identified in the field prior to backfill. At that time, Geocon should be provided samples for laboratory testing to evaluate its suitability. Modified lateral earth pressures may be necessary if the backfill soil does not meet the required expansion index or shear strength.

6.10.11 City or regional standard wall designs, if used, are based on a specific active lateral earth pressure and/or soil friction angle. In this regard, on-site soil to be used as backfill may or may not meet the values for standard wall designs. Geocon should be consulted to assess the suitability of the on-site soil for use as wall backfill if standard wall designs are used.

## 6.11 Lateral Loading

6.11.1 The following table provides design parameters to resist lateral loads and for the design of footings or shear keys. The allowable passive pressure assumes a horizontal surface extending at least 5 feet, or three times the surface generating the passive pressure, whichever is greater. The upper 12 inches of soil in areas not covered by floor slabs or pavement should not be included in the determination of passive resistance.

**SUMMARY OF LATERAL LOAD DESIGN RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Passive Pressure Fluid Density | 350 pcf |
| Coefficient of Friction (Concrete and Soil) | 0.35 |
| Coefficient of Friction (Along Vapor Barrier) | 0.2 to 0.25* |

*Per manufacturer's recommendations.

6.11.2 The passive and frictional resistant loads can be combined for design purposes. The lateral passive pressures may be increased by one-third when considering transient loads due to wind or seismic forces.

## 6.12 Preliminary Pavement Recommendations

6.12.1 We calculated the flexible pavement sections in general conformance with the *Caltrans Method of Flexible Pavement Design* (Highway Design Manual, Section 608.4) using an estimated Traffic Index (TI) of 5.0, 5.5, 6.0, and 7.0 for parking stalls, driveways, medium truck traffic areas, and heavy truck traffic areas, respectively. The project civil engineer and owner should review the pavement designations to determine appropriate locations for pavement thickness. The final pavement sections for the parking lot should be based on the R-Value of the subgrade soil encountered at final subgrade elevation. We have assumed an R-Value of 30 and 78 for the subgrade soil and base materials, respectively, for the purposes of this preliminary analysis. The following table presents the preliminary flexible pavement sections.

**PRELIMINARY FLEXIBLE PAVEMENT SECTION**

| Location | Assumed Traffic Index | Asphalt Concrete (inches) | Class 2 Aggregate Base (inches) |
|---|---|---|---|
| Parking Stalls for Automobiles and Light-Duty Vehicles | 5.0 | 3 | 5.5 |
| Driveways for Automobiles and Light-Duty Vehicles | 5.5 | 3 | 7 |
| Medium Truck Traffic Areas | 6.0 | 3.5 | 7.5 |
| Driveways for Heavy Truck Traffic | 7.0 | 4 | 9.5 |

6.12.2 Prior to placing base materials, the upper 12 inches of the subgrade soil should be scarified, moisture conditioned as necessary, and recompacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content as determined by ASTM D 1557. Similarly, the base material should be compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Asphalt concrete should be compacted to a density of at least 95 percent of the laboratory Hveem density in accordance with ASTM D 2726.

6.12.3 Base materials should conform to Section 26-1.02B of the *Standard Specifications for The State of California Department of Transportation (Caltrans)* with a ¾-inch maximum size aggregate. Asphalt concrete should conform to Section 203-6 of the *Standard Specifications for Public Works Construction (Greenbook)*.

6.12.4 A rigid Portland cement concrete (PCC) pavement section should be placed in roadway aprons and cross gutters. We calculated the rigid pavement section in general conformance with the procedure recommended by the American Concrete Institute report ACI 330-21 *Commercial Concrete Parking Lots and Site Paving Design and Construction – Guide.* The following table provides the traffic categories and design parameters used for the calculations for 20-year design life.

**TRAFFIC CATEGORIES**

| Traffic Category | Description | Reliability (%) | Slabs Cracked at End of Design Life (%) |
|---|---|---|---|
| A | Car Parking Areas and Access Lanes | 60 | 15 |
| E | Heavy Truck Traffic | 75 | 15 |

6.12.5 We used the parameters presented in the following table to calculate the pavement design sections. We should be contacted to provide updated design sections, if necessary.

**RIGID PAVEMENT DESIGN PARAMETERS**

| Design Parameter | Design Value |
|---|---|
| Modulus of Subgrade Reaction, k | 150 pci |
| Modulus of Rupture for Concrete, $M_R$ | 500 psi |
| Concrete Compressive Strength | 3,000 psi |
| Concrete Modulus of Elasticity, E | 3,150,000 psi |

6.12.6 Based on the criteria presented herein, the PCC pavement sections should have a minimum thickness as presented on the following table.

**RIGID PAVEMENT DESIGN THICKNESS**

| Traffic Category | Trucks Per Day | Portland Cement Concrete, T (Inches) |
|---|---|---|
| A = Car Parking Areas and Access Lanes | 1 | 5 |
| Heavy Truck Traffic | <10 | 6.5 |

6.12.7 The PCC vehicular pavement should be placed over subgrade soil that is compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content.

6.12.8 The recommendations of the referenced ACI guidelines should be followed for joint and joint spacings.

6.12.9 Reinforcing steel will not be necessary within the concrete for geotechnical purposes.

6.12.10 To control the location and spread of concrete shrinkage cracks, crack-control joints (weakened plane joints) should be included in the design of the concrete pavement. The location, spacing and depth of the crack-control joints should be in accordance with ACI guidelines.

6.12.11 Concrete curb/gutter should be placed on soil subgrade compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Subgrade for cross-gutters should be compacted to a dry density of at

least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Where flatwork is located directly adjacent to the curb/gutter, the concrete flatwork should be structurally connected to the curbs to help reduce the potential for offsets between the curbs and the flatwork.

6.12.12 Subgrade for cross-gutters should be compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content.

6.12.13 Base materials should not be placed below the curb/gutter, or cross-gutters to mitigate water infiltration from the adjacent parkways into the pavement sections. However, the City of Oceanside may require it where subgrade soils have an expansion index greater than 20.

6.12.14 Where flatwork is located adjacent to the curb/gutter, the concrete flatwork should be structurally connected to the curbs to reduce potential offsets between the curbs and the flatwork.

6.12.15 The performance of pavement is highly dependent on providing positive surface drainage away from the edge of the pavement. Ponding of water on or adjacent to the pavement will likely result in pavement distress and subgrade failure. Drainage from landscaped areas should be directed to controlled drainage structures. Landscape areas adjacent to the edge of asphalt pavements are not recommended due to the potential for surface or irrigation water to infiltrate the underlying permeable aggregate base and cause distress. Where such a condition cannot be avoided, consideration should be given to incorporating measures that will significantly reduce the potential for subsurface water migration into the aggregate base. If planter islands are planned, the perimeter curb should extend at least 6 inches below the level of the base materials.

## 6.13 Site Drainage and Moisture Protection

6.13.1 Adequate site drainage is critical to reduce the risk for differential soil movement, erosion, and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to footings. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2022 CBC 1804.4. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices. Roof and pavement drainage should be directed into conduits that carry runoff away from the proposed structure.

6.13.2 In the case of basement walls or building walls retaining landscaping areas, a water-proofing system should be used on the wall and joints, and a Miradrain drainage panel (or similar) should be placed over the waterproofing. The project architect or civil engineer should provide detailed specifications on the plans for all waterproofing and drainage.

6.13.3 Underground utilities should be leak free. Utility and irrigation lines should be checked at appropriate intervals for leaks. Detected leaks should be promptly repaired. Detrimental soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.

6.13.4 Landscaping planters adjacent to paved areas are not recommended due to the risk for surface or irrigation water to infiltrate the pavement subgrade and base course. Area drains to collect excess irrigation water and transmit it to drainage structures, or impervious above-grade planter boxes should be used. A cutoff wall along the edge of the pavement that extends at least 6 inches below the bottom of the base material should be considered where landscaping is planned next to pavement.

## 6.14 Grading and Foundation Plan Review

6.14.1 Geocon Incorporated should review the grading and building foundation plans for the project prior to final design submittal to evaluate if additional analyses and/or recommendations are required.

# LIMITATIONS AND UNIFORMITY OF CONDITIONS

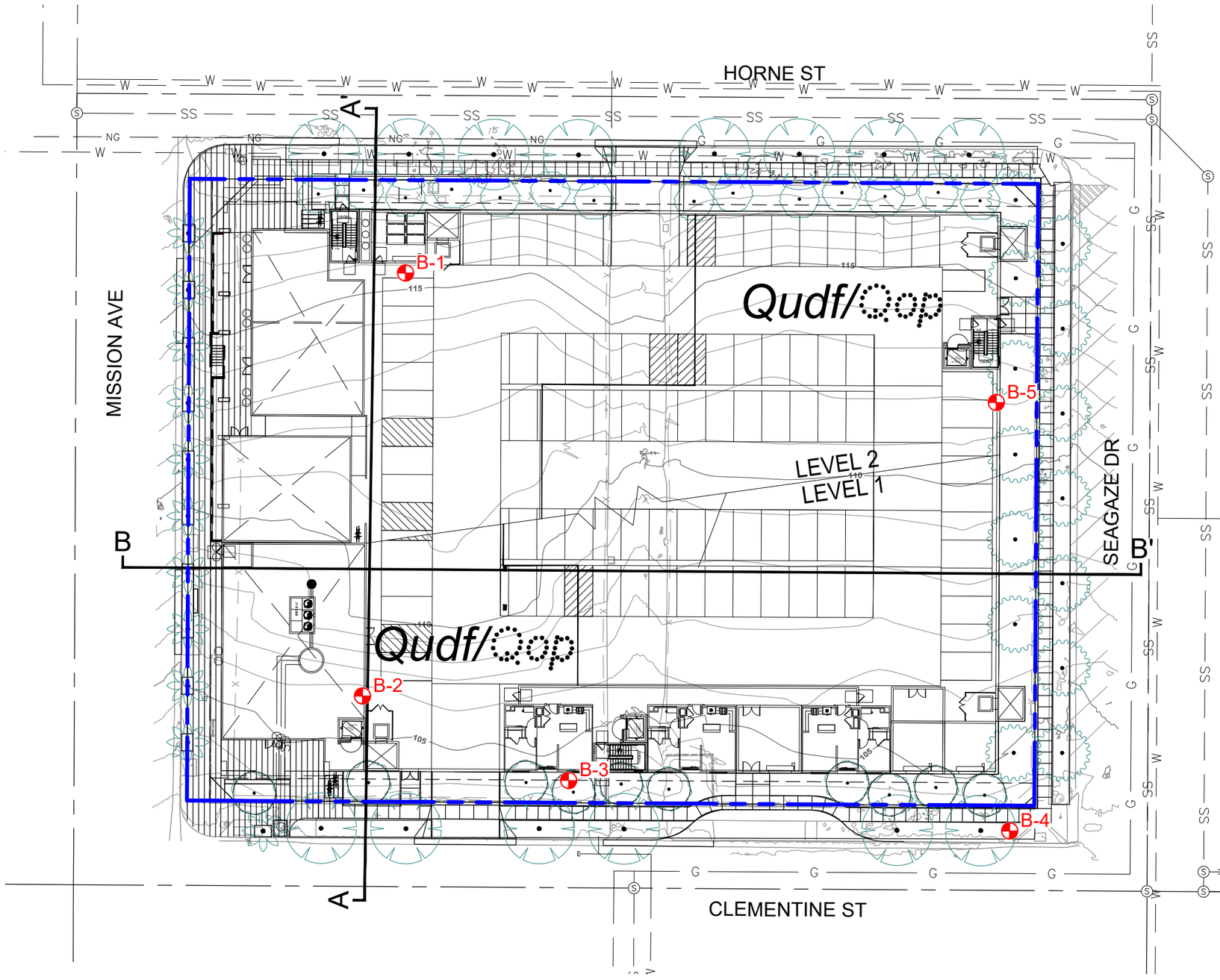
1. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

2. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

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 the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

4. The findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

# 901 MISSION AVENUE
# SAN DIEGO, CALIFORNIA




0' 20' 40' 60' 80'

SCALE 1"=40'(on 11x17)

## GEOCON LEGEND

Qudf .....UNDOCUMENTED FILL

Qop .....OLD PARALIC DEPOSITS (Dotted Where Buried)

B-5 .....APPROX. LOCATION OF BORING

A A' .....APPROX. LOCATION OF GEOLOGIC CROSS SECTION


GEOCON INCORPORATED

GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974

PHONE 858 558-6900 - FAX 858 558-6159


PROJECT NO. G3303 - 42 - 01

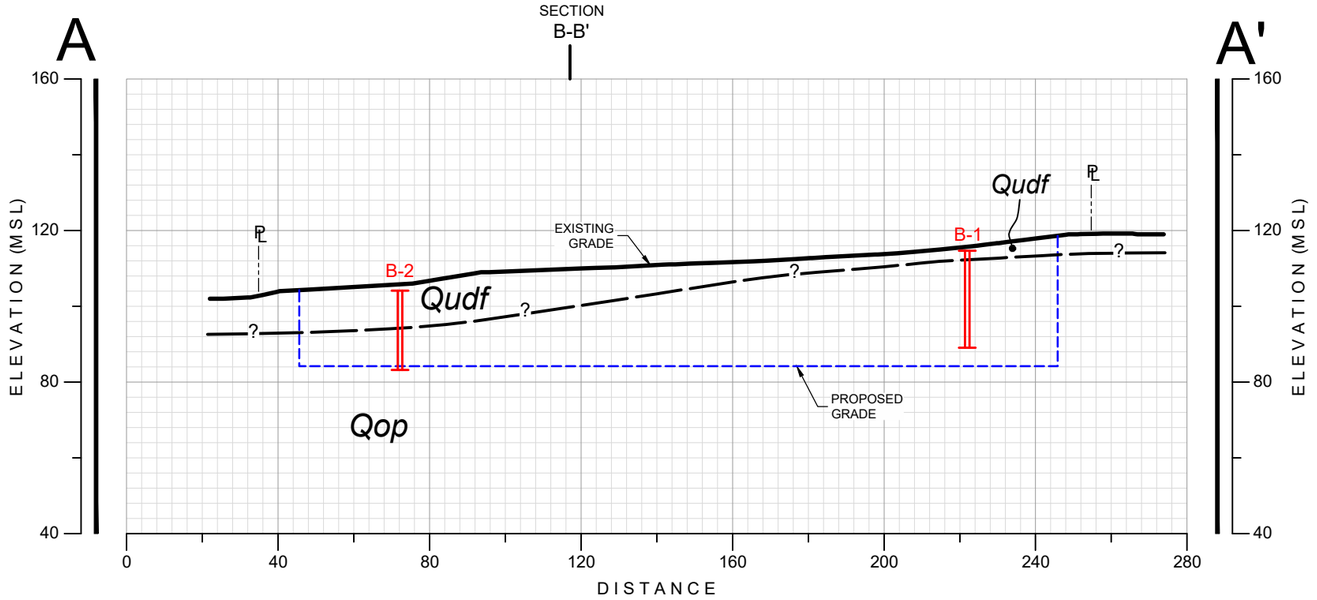
FIGURE 1

DATE 05 - 15 - 2024

# GEOLOGIC MAP

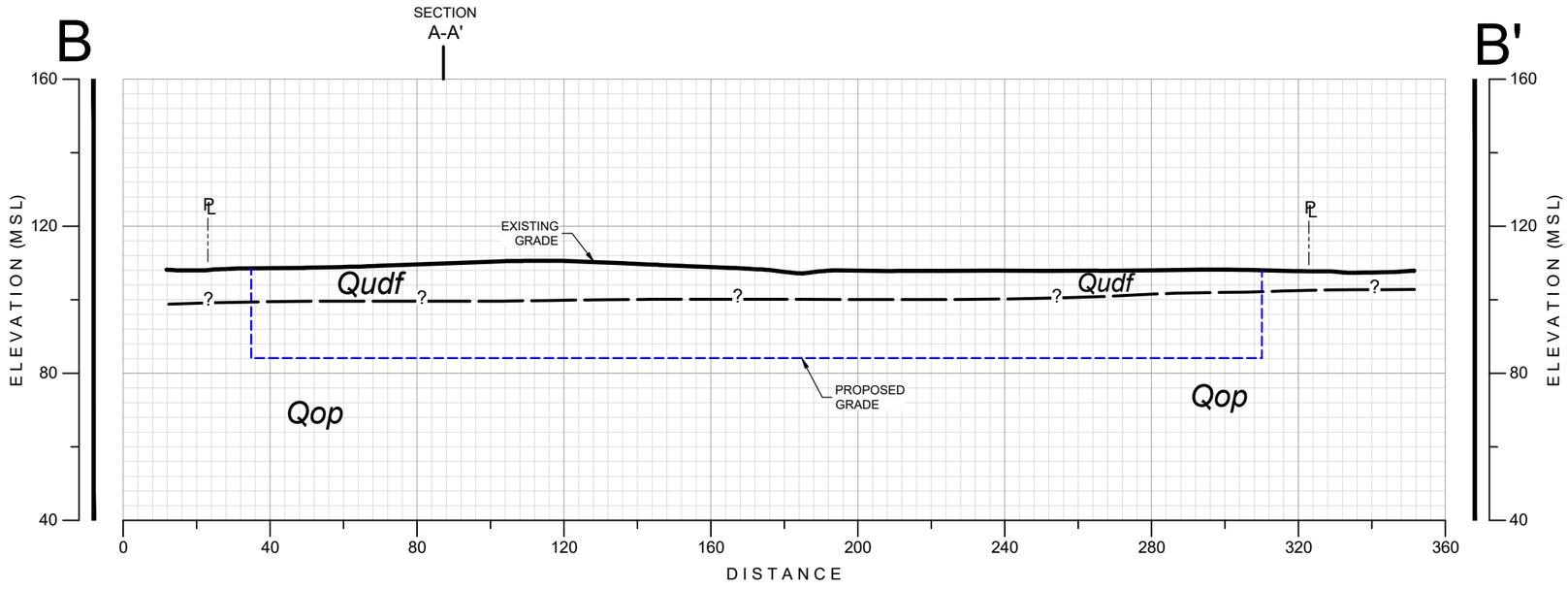

Plotted:05/15/2024 7:52AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G3303-42-01 (901 Mission Avenue)\SHEETS\G3303-42-01 Geo Map.dwg

901 MISSION AVENUE
SAN DIEGO, CALIFORNIA




## GEOLOGIC CROSS-SECTION A-A'

SCALE: 1" = 40' (Vert. = Horiz.)




## GEOLOGIC CROSS-SECTION B-B'

SCALE: 1" = 40' (Vert. = Horiz.)

### GEOCON LEGEND

*Qudf* .....UNDOCUMENTED FILL

*Qop* .....OLD PARALIC DEPOSITS

B-2 .....APPROX. LOCATION OF BORING

?2 .....APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOCON INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

PROJECT NO. G3303 - 42 - 01
FIGURE 2
DATE 05 - 15 - 2024

GEOLOGIC CROSS SECTION

Plotted:05/15/2024 7:44AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G3303-42-01 (901 Mission Avenue)\SHEETS\G3303-42-01 XSections.dwg

# APPENDIX A

# APPENDIX A
# FIELD INVESTIGATION

Our previous field investigation was performed on December 30, 2003, and consisted of a site reconnaissance and drilling five exploratory small-diameter borings at the approximate locations shown on Figure 1. The small-diameter borings were drilled to depths varying from 10½ to 25 feet using a CME drill rig equipped with hollow-stem auger. Relatively undisturbed samples were obtained by driving a California Sampler 12 inches with blows from a 140-pound hammer falling 30 inches. This split-tube sampler was equipped with 1-inch-high by $2^{3}/_{8}$-inch-diameter brass sampler rings to facilitate sample removal and testing. Disturbed bulk samples were obtained from the boring's cuttings.

The soil conditions encountered in the borings were visually examined, classified and logged in general accordance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D 2488). The logs of the exploratory borings are presented on Figures A-1 through A-5. The logs depict the various soil types encountered and indicate the depths at which samples were obtained.

PROJECT NO. 07213-22-01

## BORING B 1

ELEV. (MSL.) 114' DATE COMPLETED 12-30-2003

EQUIPMENT CME 75

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B1-1 | | | SM | **UNDOCUMENTED FILL**<br>Loose, damp, moderate yellowish brown to moderate brown Silty SAND. Scattered gravel | | | |
| 2 | B1-2 | | | | | 88 | | |
| 4 | | | | | **TERRACE DEPOSIT**<br>Dense, damp to moist, moderate brown Silty SAND, Slightly porous. Very dense below 5 feet, non-porous | | | |
| 6 | B1-3 | | | | | 63 | | 2.0 |
| 8 | | | | | | | | |
| 10 | B1-4 | | | SM | | 68/6 | 96.5 | 5.9 |
| 12 | | | | | | | | |
| 14 | | | | | | | | |
| 16 | B1-5 | | | | -Mottled moderate brown and light brown | 50/4 | | |
| 18 | | | | | -Becomes pale yellow brown below 15 feet | | | |
| 20 | | | | | -Abundant cobbles below 20 feet<br>-2 hours to advance 5 feet | | | |
| 22 | | | | | | | | |
| 24 | | | | | | | | |
| | | | | | BORING TERMINATED AT 25 FEET (REFUSAL)<br>Backfilled with approximately 7 cubic feet of bentonite chips | | | |

07213-22-01.GPJ

**Figure A-1, Log of Boring B 1, Page 1 of 1**

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07213-22-01

## BORING B 2

ELEV. (MSL.) 103' DATE COMPLETED 12-30-2003

EQUIPMENT CME 75

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B2-1 | | | | **UNDOCUMENTED FILL**<br>Loose to medium dense, moist, moderate brown Silty SAND; scattered gravel | | | |
| 2 | B2-2 | | | | | 92 | 3.9 | 112.1 |
| 4 | | | | | | | | |
| 6 | B2-3 | | | SM | | 52 | | |
| 8 | | | | | | | | |
| 10 | B2-4 | | | | **TERRACE DEPOSITS**<br>Very dense, moist, moderate brown, Silty SAND, scattered cobbles | 90 | 126.7 | 10.4 |
| 12 | | | | | | | | |
| 14 | | | | SM | | | | |
| 16 | B2-5 | | | | -Very dense, moist, moderate brown, poorly graded SAND with silt | 88 | 109.1 | 7.3 |
| 18 | | | | | | | | |
| | B2-6 | | | | -With silt and gravel; (top of cobble layer?) | 50/4 | | |
| | | | | | BORING TERMINATED AT 19½ FEET<br>Backfilled with soil cuttings mixed with 1x94 lb sack of cement | | | |

07213-22-01.GPJ

**Figure A-2,**
**Log of Boring B 2, Page 1 of 1**

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◣ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07213-22-01

## BORING B 3

ELEV. (MSL.) 101' DATE COMPLETED 12-30-2003

EQUIPMENT CME 75

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B3-1 | | | SM | **UNDOCUMENTED FILL**<br>Loose, moist, moderate brown, Silty SAND | | | |
| 2 | B3-2 | | | SM | **TERRACE DEPOSITS**<br>Dense, moist, moderate brown Silty SAND | 58 | 116.2 | 6.7 |
| 4 | | | | | | | | |
| 6 | B3-3 | | | SM | | 55 | 120.9 | 9.5 |
| 8 | | | | | | | | |
| 10 | B3-4 | | | | -Very dense, moist, moderate brown, poorly graded SAND with Silt | 50/6 | | |
| | | | | | BORING TERMINATED AT 10½ FEET<br>Backfilled with soil cuttings mixed with 1x94 lb sack of cement | | | |

**Figure A-3,**
**Log of Boring B 3, Page 1 of 1**

07213-22-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07213-22-01

## BORING B 4

ELEV. (MSL.) 100' DATE COMPLETED 12-30-2003

EQUIPMENT CME 75

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B4-1 | | | | **UNDOCUMENTED FILL** | | | |
| 2 | B4-2 | | | SM | Medium dense to loose, moist to wet, moderate brown Silty SAND | 28 | 120.4 | 10.7 |
| 4 | | | | | | | | |
| 6 | B4-3 | | | SM | **TERRACE DEPOSITS** -Medium dense, moist, moderate brown, Silty SAND | 24 | | |
| 8 | | | | | | | | |
| 10 | B4-4 | | | SP-SM | Dense, moist, moderate brown poorly graded SAND with Silt | 38 | 107.8 | 7.4 |
| | | | | | BORING TERMINATED AT 11 FEET<br>Backfilled with soil cuttings mixed with ½x94 lb sack of cement | | | |

**Figure A-4,**
**Log of Boring B 4, Page 1 of 1**

07213-22-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◣ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07213-22-01

## BORING B 5

ELEV. (MSL.) 109' DATE COMPLETED 12-30-2003

EQUIPMENT CME 75

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B5-1 | | | SM | **UNDOCUMENTED FILL**<br>Loose, moist, dark yellowish brown and light brown Silty SAND; scattered gravel | | | |
| 2 | B5-2 | | | | | 50/6 | | |
| 4 | | | | SM | **TERRACE DEPOSITS**<br>Very dense, moist, moderate brown Silty SAND | | | |
| 6 | B5-3 | | | | | 50/4 | 109.6 | 6.8 |
| 8 | | | | | | | | |
| 10 | B5-4 | | | SP-SM | Very dense, moist, grayish orange and dark yellowish orange SAND with Silt | 98 | 106.5 | 3.6 |
| 12 | | | | | | | | |
| 14 | | | | SC | Very dense, moist, moderate to light brown Clayey SAND | | | |
| 16 | B5-5 | | | | | 50/6 | 109.8 | 7.4 |
| 18 | | | | | | | | |
| 20 | B5-6 | | | | | 78 | | |
| | | | | | BORING TERMINATED AT 20 FEET<br>Backfilled with soil cuttings mixed with 1x94 lb sack of cement | | | |

07213-22-01.GPJ

**Figure A-5,**
**Log of Boring B 5, Page 1 of 1**

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

# APPENDIX B

# APPENDIX B
# LABORATORY TESTING

Presented below are the results of laboratory testing performed as part of Geocon's 2004 geotechnical investigation. Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. Samples were subjected to drained direct shear testing, expansion index testing, R-value testing, and laboratory maximum dry density and optimum moisture content tests. One sample was tested for its corrosivity characteristics. Results of all laboratory tests are presented on the following tables. In situ moisture and dry density tests are presented on the boring logs (Appendix A).

## SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS
## ASTM D 3080

| Sample No. | Dry Density (pcf) | Moisture Content (%) | Unit Cohesion (psf) | Angle of Shear Resistance (degrees) |
|---|---|---|---|---|
| B1-1 and B5-1 combined* | 119.0 | 9.4 | 344 | 38 |
| B1-5 | 113.3 | 6.6 | 197 | 40 |

* Sample remolded to 90 percent relative compaction at approximately optimum moisture content.

## SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS
## ASTM D 4829

| Sample No. | Moisture Content | | Dry Density (pcf) | Expansion Index |
|---|---|---|---|---|
| | Before Test (%) | After Test (%) | | |
| B1-1 and B5-1 combined | 7.8 | 12.9 | 118.7 | 0 |

## SUMMARY OF LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT TEST RESULTS
## ASTM D 1557

| Sample No. | Description | Maximum Dry Density (pcf) | Optimum Moisture Content (% dry wt.) |
|---|---|---|---|
| B1-1 and B5-1 combined | Brown Silty SAND | 134.2 | 7.8 |

## SUMMARY OF LABORATORY RESISTANCE VALUE TEST RESULTS
## ASTM D 2844

| Sample No. | Description | R-Value |
|---|---|---|
| B1-1 and B5-1 combined | Brown Silty SAND | 64 |

## SUMMARY OF LABORATORY PH AND RESISTIVITY TEST RESULTS
## CALIFORNIA TEST METHOD NO. 643

| Sample No. | pH | MINIMUM RESISTIVITY (OHM-CENTIMETERS) |
|---|---|---|
| B1-1 and B5-1 combined | 6.8 | 175.8 |

## SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS
## CALIFORNIA TEST METHOD NO. 417

| Sample No. | WATER-SOLUBLE SULFATE (%) |
|---|---|
| B1-1 and B5-1 combined | 0.015 |

# APPENDIX C

# APPENDIX C

# RECOMMENDED GRADING SPECIFICATIONS

## FOR

## 901 MISSION AVENUE MIXED-USE
## OCEANSIDE, CALIFORNIA

## PROJECT NO. G3303-42-01

# RECOMMENDED GRADING SPECIFICATIONS

## 1. GENERAL

1.1 These Recommended Grading Specifications shall be used in conjunction with the Geotechnical Report for the project prepared by Geocon. The recommendations contained in the text of the Geotechnical Report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict.

1.2 Prior to the commencement of grading, a geotechnical consultant (Consultant) shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications. It shall be the responsibility of the Contractor to assist the Consultant and keep them apprised of work schedules and changes so that personnel may be scheduled accordingly.

1.3 It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans. If, in the opinion of the Consultant, unsatisfactory conditions such as questionable soil materials, poor moisture condition, inadequate compaction, and/or adverse weather result in a quality of work not in conformance with these specifications, the Consultant will be empowered to reject the work and recommend to the Owner that grading be stopped until the unacceptable conditions are corrected.

## 2. DEFINITIONS

2.1 **Owner** shall refer to the owner of the property or the entity on whose behalf the grading work is being performed and who has contracted with the Contractor to have grading performed.

2.2 **Contractor** shall refer to the Contractor performing the site grading work.

2.3 **Civil Engineer** or **Engineer of Work** shall refer to the California licensed Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topography.

2.4 **Consultant** shall refer to the soil engineering and engineering geology consulting firm retained to provide geotechnical services for the project.

2.5 **Soil Engineer** shall refer to a California licensed Civil Engineer retained by the Owner, who is experienced in the practice of geotechnical engineering. The Soil Engineer shall be responsible for having qualified representatives on-site to observe and test the Contractor's work for conformance with these specifications.

2.6 **Engineering Geologist** shall refer to a California licensed Engineering Geologist retained by the Owner to provide geologic observations and recommendations during the site grading.

2.7 **Geotechnical Report** shall refer to a soil report (including all addenda) which may include a geologic reconnaissance or geologic investigation that was prepared specifically for the development of the project for which these Recommended Grading Specifications are intended to apply.

## 3. MATERIALS

3.1 Materials for compacted fill shall consist of any soil excavated from the cut areas or imported to the site that, in the opinion of the Consultant, is suitable for use in construction of fills. In general, fill materials can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.

3.1.1 **Soil fills** are defined as fills containing no rocks or hard lumps greater than 12 inches in maximum dimension and containing at least 40 percent by weight of material smaller than ¾ inch in size.

3.1.2 **Soil-rock fills** are defined as fills containing no rocks or hard lumps larger than 4 feet in maximum dimension and containing a sufficient matrix of soil fill to allow for proper compaction of soil fill around the rock fragments or hard lumps as specified in Paragraph 6.2. **Oversize rock** is defined as material greater than 12 inches.

3.1.3 **Rock fills** are defined as fills containing no rocks or hard lumps larger than 3 feet in maximum dimension and containing little or no fines. Fines are defined as material smaller than ¾ inch in maximum dimension. The quantity of fines shall be less than approximately 20 percent of the rock fill quantity.

3.2 Material of a perishable, spongy, or otherwise unsuitable nature as determined by the Consultant shall not be used in fills.

3.3 Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Articles 9 and 10; 40CFR; and any other applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.

3.4 The outer 15 feet of *soil-rock* fill slopes, measured horizontally, should be composed of properly compacted *soil* fill materials approved by the Consultant. *Rock* fill may extend to the slope face, provided that the slope is not steeper than 2:1 (horizontal:vertical) and a soil layer no thicker than 12 inches is track-walked onto the face for landscaping purposes. This procedure may be utilized provided it is acceptable to the governing agency, Owner and Consultant.

3.5 Samples of soil materials to be used for fill should be tested in the laboratory by the Consultant to determine the maximum density, optimum moisture content, and, where appropriate, shear strength, expansion, and gradation characteristics of the soil.

3.6 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated condition.

## 4. CLEARING AND PREPARING AREAS TO BE FILLED

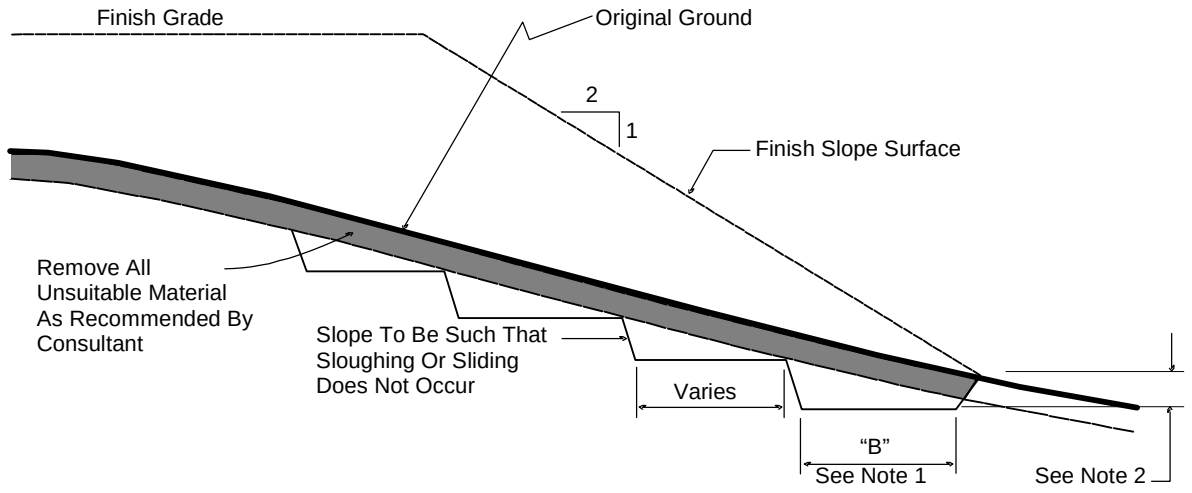
4.1 Areas to be excavated and filled shall be cleared and grubbed. Clearing shall consist of complete removal above the ground surface of trees, stumps, brush, vegetation, man-made structures, and similar debris. Grubbing shall consist of removal of stumps, roots, buried logs and other unsuitable material and shall be performed in areas to be graded. Roots and other projections exceeding 1½ inches in diameter shall be removed to a depth of 3 feet below the surface of the ground. Borrow areas shall be grubbed to the extent necessary to provide suitable fill materials.

4.2 Asphalt pavement material removed during clearing operations should be properly disposed at an approved off-site facility or in an acceptable area of the project evaluated by Geocon and the property owner. Concrete fragments that are free of reinforcing steel may be placed in fills, provided they are placed in accordance with Section 6.2 or 6.3 of this document.

4.3 After clearing and grubbing of organic matter and other unsuitable material, loose or porous soils shall be removed to the depth recommended in the Geotechnical Report. The depth of removal and compaction should be observed and approved by a representative of the Consultant. The exposed surface shall then be plowed or scarified to a minimum depth of 6 inches and until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.

4.4 Where the slope ratio of the original ground is steeper than 5:1 (horizontal:vertical), or where recommended by the Consultant, the original ground should be benched in accordance with the following illustration.

TYPICAL BENCHING DETAIL




No Scale

DETAIL NOTES:

(1) Key width "B" should be a minimum of 10 feet, or sufficiently wide to permit complete coverage with the compaction equipment used. The base of the key should be graded horizontal, or inclined slightly into the natural slope.

(2) The outside of the key should be below the topsoil or unsuitable surficial material and at least 2 feet into dense formational material. Where hard rock is exposed in the bottom of the key, the depth and configuration of the key may be modified as approved by the Consultant.

4.5 After areas to receive fill have been cleared and scarified, the surface should be moisture conditioned to achieve the proper moisture content, and compacted as recommended in Section 6 of these specifications.

## 5. COMPACTION EQUIPMENT

5.1 Compaction of *soil* or *soil-rock* fill shall be accomplished by sheepsfoot or segmented-steel wheeled rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment. Equipment shall be of such a design that it will be capable of compacting the *soil* or *soil-rock* fill to the specified relative compaction at the specified moisture content.

5.2 Compaction of *rock* fills shall be performed in accordance with Section 6.3.

## 6. PLACING, SPREADING AND COMPACTION OF FILL MATERIAL

6.1 *Soil* fill, as defined in Paragraph 3.1.1, shall be placed by the Contractor in accordance with the following recommendations:

6.1.1 *Soil* fill shall be placed by the Contractor in layers that, when compacted, should generally not exceed 8 inches. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to obtain uniformity of material and moisture in each layer. The entire fill shall be constructed as a unit in nearly level lifts. Rock materials greater than 12 inches in maximum dimension shall be placed in accordance with Section 6.2 or 6.3 of these specifications.

6.1.2 In general, the *soil* fill shall be compacted at a moisture content at or above the optimum moisture content as determined by ASTM D 1557.

6.1.3 When the moisture content of *soil* fill is below that specified by the Consultant, water shall be added by the Contractor until the moisture content is in the range specified.

6.1.4 When the moisture content of the *soil* fill is above the range specified by the Consultant or too wet to achieve proper compaction, the *soil* fill shall be aerated by the Contractor by blading/mixing, or other satisfactory methods until the moisture content is within the range specified.

6.1.5 After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to a relative compaction of at least 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry density of the compacted fill to the maximum laboratory dry density as determined in accordance with ASTM D 1557. Compaction shall be continuous over the entire area, and compaction equipment shall make sufficient passes so that the specified minimum relative compaction has been achieved throughout the entire fill.

6.1.6 Where practical, soils having an Expansion Index greater than 50 should be placed at least 3 feet below finish pad grade and should be compacted at a moisture content generally 2 to 4 percent greater than the optimum moisture content for the material.

6.1.7 Properly compacted *soil* fill shall extend to the design surface of fill slopes. To achieve proper compaction, it is recommended that fill slopes be over-built by at least 3 feet and then cut to the design grade. This procedure is considered preferable to track-walking of slopes, as described in the following paragraph.

6.1.8 As an alternative to over-building of slopes, slope faces may be back-rolled with a heavy-duty loaded sheepsfoot or vibratory roller at maximum 4-foot fill height intervals. Upon completion, slopes should then be track-walked with a D-8 dozer or similar equipment, such that a dozer track covers all slope surfaces at least twice.

6.2 *Soil-rock* fill, as defined in Paragraph 3.1.2, shall be placed by the Contractor in accordance with the following recommendations:

6.2.1 Rocks larger than 12 inches but less than 4 feet in maximum dimension may be incorporated into the compacted *soil* fill, but shall be limited to the area measured 15 feet minimum horizontally from the slope face and 5 feet below finish grade or 3 feet below the deepest utility, whichever is deeper.

6.2.2 Rocks or rock fragments up to 4 feet in maximum dimension may either be individually placed or placed in windrows. Under certain conditions, rocks or rock fragments up to 10 feet in maximum dimension may be placed using similar methods. The acceptability of placing rock materials greater than 4 feet in

maximum dimension shall be evaluated during grading as specific cases arise and shall be approved by the Consultant prior to placement.

6.2.3 For individual placement, sufficient space shall be provided between rocks to allow for passage of compaction equipment.

6.2.4 For windrow placement, the rocks should be placed in trenches excavated in properly compacted *soil* fill. Trenches should be approximately 5 feet wide and 4 feet deep in maximum dimension. The voids around and beneath rocks should be filled with approved granular soil having a Sand Equivalent of 30 or greater and should be compacted by flooding. Windrows may also be placed utilizing an "open-face" method in lieu of the trench procedure, however, this method should first be approved by the Consultant.

6.2.5 Windrows should generally be parallel to each other and may be placed either parallel to or perpendicular to the face of the slope depending on the site geometry. The minimum horizontal spacing for windrows shall be 12 feet center-to-center with a 5-foot stagger or offset from lower courses to next overlying course. The minimum vertical spacing between windrow courses shall be 2 feet from the top of a lower windrow to the bottom of the next higher windrow.

6.2.6 Rock placement, fill placement and flooding of approved granular soil in the windrows should be continuously observed by the Consultant.

6.3 *Rock* fills, as defined in Section 3.1.3, shall be placed by the Contractor in accordance with the following recommendations:

6.3.1 The base of the *rock* fill shall be placed on a sloping surface (minimum slope of 2 percent). The surface shall slope toward suitable subdrainage outlet facilities. The *rock* fills shall be provided with subdrains during construction so that a hydrostatic pressure buildup does not develop. The subdrains shall be permanently connected to controlled drainage facilities to control post-construction infiltration of water.

6.3.2 *Rock* fills shall be placed in lifts not exceeding 3 feet. Placement shall be by rock trucks traversing previously placed lifts and dumping at the edge of the currently placed lift. Spreading of the *rock* fill shall be by dozer to facilitate *seating* of the

rock. The *rock* fill shall be watered heavily during placement. Watering shall consist of water trucks traversing in front of the current rock lift face and spraying water continuously during rock placement. Compaction equipment with compactive energy comparable to or greater than that of a 20-ton steel vibratory roller or other compaction equipment providing suitable energy to achieve the required compaction or deflection as recommended in Paragraph 6.3.3 shall be utilized. The number of passes to be made should be determined as described in Paragraph 6.3.3. Once a *rock* fill lift has been covered with *soil* fill, no additional *rock* fill lifts will be permitted over the *soil* fill.

6.3.3 Plate bearing tests, in accordance with ASTM D 1196, may be performed in both the compacted *soil* fill and in the *rock* fill to aid in determining the required minimum number of passes of the compaction equipment. If performed, a minimum of three plate bearing tests should be performed in the properly compacted *soil* fill (minimum relative compaction of 90 percent). Plate bearing tests shall then be performed on areas of *rock* fill having two passes, four passes and six passes of the compaction equipment, respectively. The number of passes required for the *rock* fill shall be determined by comparing the results of the plate bearing tests for the *soil* fill and the *rock* fill and by evaluating the deflection variation with number of passes. The required number of passes of the compaction equipment will be performed as necessary until the plate bearing deflections are equal to or less than that determined for the properly compacted *soil* fill. In no case will the required number of passes be less than two.

6.3.4 A representative of the Consultant should be present during *rock* fill operations to observe that the minimum number of “passes” have been obtained, that water is being properly applied and that specified procedures are being followed. The actual number of plate bearing tests will be determined by the Consultant during grading.

6.3.5 Test pits shall be excavated by the Contractor so that the Consultant can state that, in their opinion, sufficient water is present and that voids between large rocks are properly filled with smaller rock material. In-place density testing will not be required in the *rock* fills.

6.3.6 To reduce the potential for “piping” of fines into the *rock* fill from overlying *soil* fill material, a 2-foot layer of graded filter material shall be placed above the uppermost lift of *rock* fill. The need to place graded filter material below the *rock*

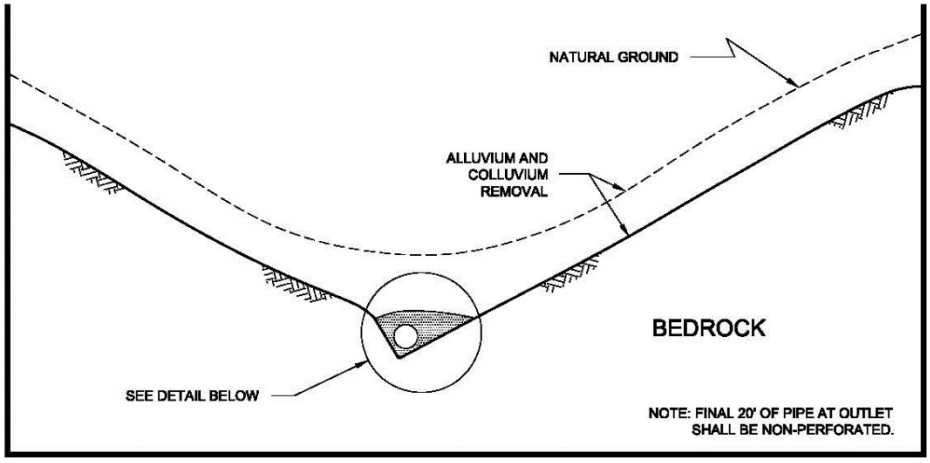
should be determined by the Consultant prior to commencing grading. The gradation of the graded filter material will be determined at the time the *rock* fill is being excavated. Materials typical of the *rock* fill should be submitted to the Consultant in a timely manner, to allow design of the graded filter prior to the commencement of *rock* fill placement.

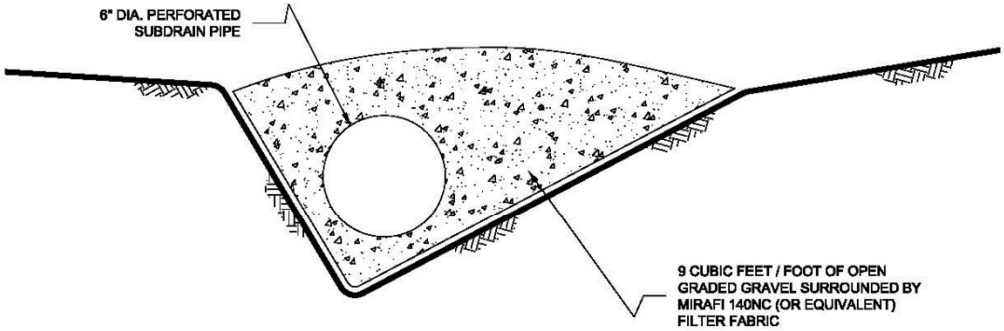
6.3.7 *Rock* fill placement should be continuously observed during placement by the Consultant.

## 7. SUBDRAINS

7.1 The geologic units on the site may have permeability characteristics and/or fracture systems that could be susceptible under certain conditions to seepage. The use of canyon subdrains may be necessary to mitigate the potential for adverse impacts associated with seepage conditions. Canyon subdrains with lengths in excess of 500 feet or extensions of existing offsite subdrains should use 8-inch-diameter pipes. Canyon subdrains less than 500 feet in length should use 6-inch-diameter pipes.

TYPICAL CANYON DRAIN DETAIL




NOTES:

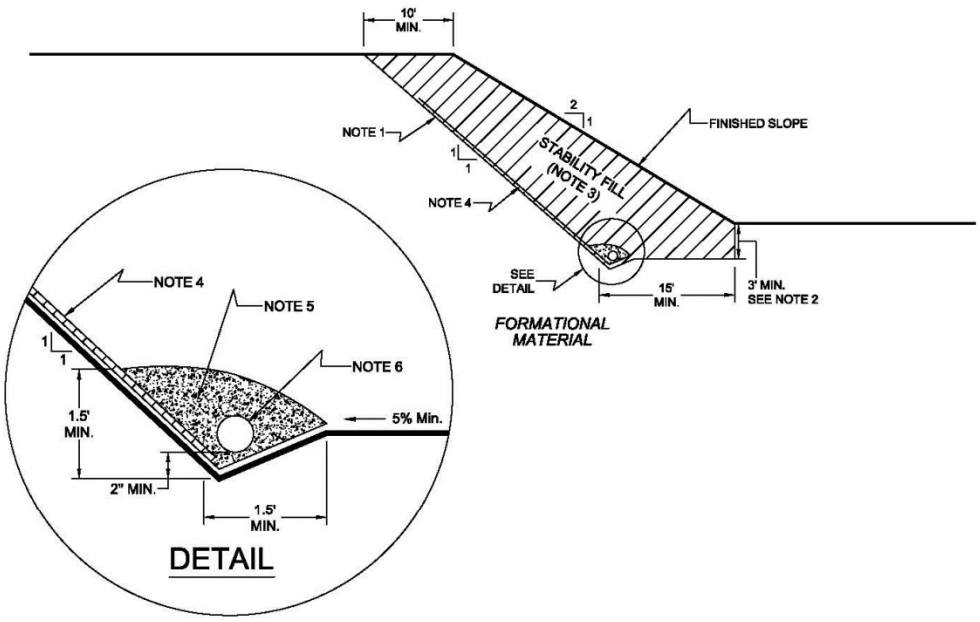
1.....6-INCH DIAMETER, SCHEDULE 80 PVC PERFORATED PIPE FOR FILLS
IN EXCESS OF 100-FEET IN DEPTH OR A PIPE LENGTH OF LONGER THAN 500 FEET.

2.....6-INCH DIAMETER, SCHEDULE 40 PVC PERFORATED PIPE FOR FILLS
LESS THAN 100-FEET IN DEPTH OR A PIPE LENGTH SHORTER THAN 500 FEET.

NO SCALE

7.2 Slope drains within stability fill keyways should use 4-inch-diameter (or lager) pipes.

TYPICAL STABILITY FILL DETAIL




**NOTES:**

1.....EXCAVATE BACKCUT AT 1:1 INCLINATION (UNLESS OTHERWISE NOTED).

2.....BASE OF STABILITY FILL TO BE 3 FEET INTO FORMATIONAL MATERIAL, SLOPING A MINIMUM 5% INTO SLOPE.

3.....STABILITY FILL TO BE COMPOSED OF PROPERLY COMPACTED GRANULAR SOIL.

4.....CHIMNEY DRAINS TO BE APPROVED PREFABRICATED CHIMNEY DRAIN PANELS (MIRADRAIN G200N OR EQUIVALENT) SPACED APPROXIMATELY 20 FEET CENTER TO CENTER AND 4 FEET WIDE. CLOSER SPACING MAY BE REQUIRED IF SEEPAGE IS ENCOUNTERED.

5.....FILTER MATERIAL TO BE 3/4-INCH, OPEN-GRADED CRUSHED ROCK ENCLOSED IN APPROVED FILTER FABRIC (MIRAFI 140NC).

6.....COLLECTOR PIPE TO BE 4-INCH MINIMUM DIAMETER, PERFORATED, THICK-WALLED PVC SCHEDULE 40 OR EQUIVALENT, AND SLOPED TO DRAIN AT 1 PERCENT MINIMUM TO APPROVED OUTLET.

NO SCALE

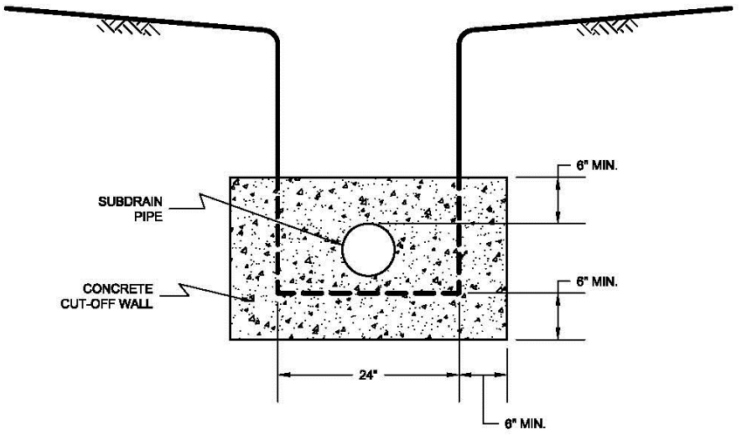
7.3 The actual subdrain locations will be evaluated in the field during the remedial grading operations. Additional drains may be necessary depending on the conditions observed and the requirements of the local regulatory agencies. Appropriate subdrain outlets should be evaluated prior to finalizing 40-scale grading plans.

7.4 *Rock* fill or *soil-rock* fill areas may require subdrains along their down-slope perimeters to mitigate the potential for buildup of water from construction or landscape irrigation. The subdrains should be at least 6-inch-diameter pipes encapsulated in gravel and filter fabric. *Rock* fill drains should be constructed using the same requirements as canyon subdrains.

7.5 Prior to outletting, the final 20-foot segment of a subdrain that will not be extended during future development should consist of non-perforated drainpipe. At the non-perforated/ perforated interface, a seepage cutoff wall should be constructed on the downslope side of the pipe.

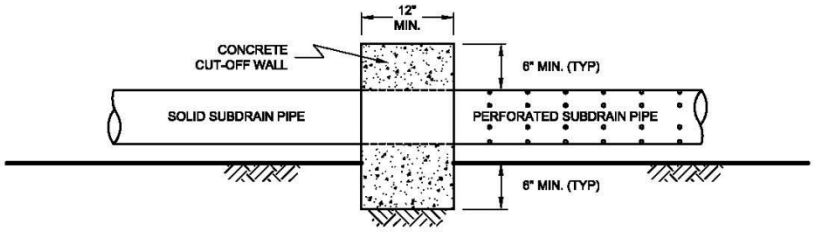
TYPICAL CUT OFF WALL DETAIL

FRONT VIEW




NO SCALE

SIDE VIEW

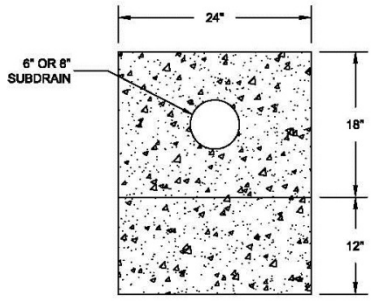



NO SCALE

7.6 Subdrains that discharge into a natural drainage course or open space area should be provided with a permanent headwall structure.

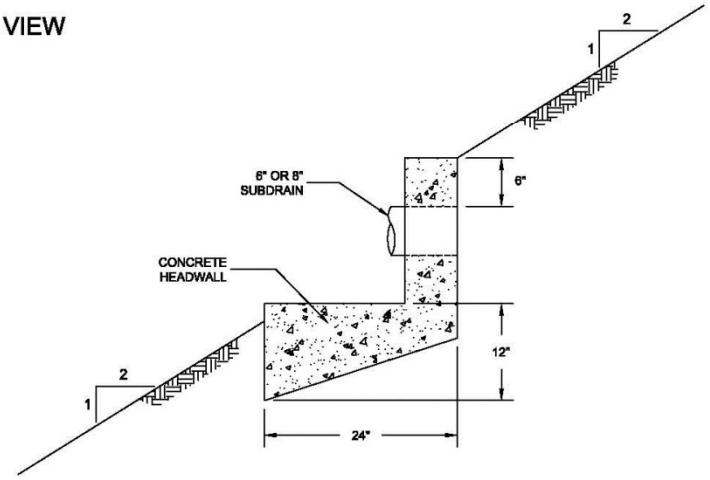
TYPICAL HEADWALL DETAIL

FRONT VIEW




NO SCALE

SIDE VIEW




NOTE: HEADWALL SHOULD OUTLET AT TOE OF FILL SLOPE
OR INTO CONTROLLED SURFACE DRAINAGE

NO SCALE

7.7 The final grading plans should show the location of the proposed subdrains. After completion of remedial excavations and subdrain installation, the project civil engineer should survey the drain locations and prepare an “as-built” map showing the drain locations. The final outlet and connection locations should be determined during grading operations. Subdrains that will be extended on adjacent projects after grading can be placed on formational material and a vertical riser should be placed at the end of the subdrain. The grading contractor should consider videoing the subdrains shortly after

burial to check proper installation and functionality. The contractor is responsible for the performance of the drains.

## 8. OBSERVATION AND TESTING

8.1 The Consultant shall be the Owner's representative to observe and perform tests during clearing, grubbing, filling, and compaction operations. In general, no more than 2 feet in vertical elevation of *soil* or *soil-rock* fill should be placed without at least one field density test being performed within that interval. In addition, a minimum of one field density test should be performed for every 2,000 cubic yards of *soil* or *soil-rock* fill placed and compacted.

8.2 The Consultant should perform a sufficient distribution of field density tests of the compacted *soil* or *soil-rock* fill to provide a basis for expressing an opinion whether the fill material is compacted as specified. Density tests shall be performed in the compacted materials below any disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof is below that specified, the particular layer or areas represented by the test shall be reworked until the specified density has been achieved.

8.3 During placement of *rock* fill, the Consultant should observe that the minimum number of passes have been obtained per the criteria discussed in Section 6.3.3. The Consultant should request the excavation of observation pits and may perform plate bearing tests on the placed *rock* fills. The observation pits will be excavated to provide a basis for expressing an opinion as to whether the *rock* fill is properly seated and sufficient moisture has been applied to the material. When observations indicate that a layer of *rock* fill or any portion thereof is below that specified, the affected layer or area shall be reworked until the *rock* fill has been adequately seated and sufficient moisture applied.

8.4 A settlement monitoring program designed by the Consultant may be conducted in areas of *rock* fill placement. The specific design of the monitoring program shall be as recommended in the Conclusions and Recommendations section of the project Geotechnical Report or in the final report of testing and observation services performed during grading.

8.5 We should observe the placement of subdrains, to check that the drainage devices have been placed and constructed in substantial conformance with project specifications.

8.6 Testing procedures shall conform to the following Standards as appropriate:

**8.6.1 Soil and Soil-Rock Fills:**

8.6.1.1 Field Density Test, ASTM D 1556, *Density of Soil In-Place By the Sand-Cone Method.*

8.6.1.2 Field Density Test, Nuclear Method, ASTM D 6938, *Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).*

8.6.1.3 Laboratory Compaction Test, ASTM D 1557, *Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Pound Hammer and 18-Inch Drop*.

8.6.1.4. Expansion Index Test, ASTM D 4829, *Expansion Index Test*.

## 9. PROTECTION OF WORK

9.1 During construction, the Contractor shall properly grade all excavated surfaces to provide positive drainage and prevent ponding of water. Drainage of surface water shall be controlled to avoid damage to adjoining properties or to finished work on the site. The Contractor shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control features have been installed. Areas subjected to erosion or sedimentation shall be properly prepared in accordance with the Specifications prior to placing additional fill or structures.

9.2 After completion of grading as observed and tested by the Consultant, no further excavation or filling shall be conducted except in conjunction with the services of the Consultant.

## 10. CERTIFICATIONS AND FINAL REPORTS

10.1 Upon completion of the work, Contractor shall furnish Owner a certification by the Civil Engineer stating that the lots and/or building pads are graded to within 0.1 foot vertically of elevations shown on the grading plan and that all tops and toes of slopes are within 0.5 foot horizontally of the positions shown on the grading plans. After installation of a section of subdrain, the project Civil Engineer should survey its location and prepare an *as-built* plan of the subdrain location. The project Civil Engineer should verify the proper outlet for the subdrains and the Contractor should ensure that the drain system is free of obstructions.

10.2 The Owner is responsible for furnishing a final as-graded soil and geologic report satisfactory to the appropriate governing or accepting agencies. The as-graded report should be prepared and signed by a California licensed Civil Engineer experienced in

geotechnical engineering and by a California Certified Engineering Geologist, indicating that the geotechnical aspects of the grading were performed in substantial conformance with the Specifications or approved changes to the Specifications.

# LIST OF REFERENCES

CGS (2021a), *EQ Zapp: California Earthquake Hazards Zone Application*, online map that queries California Geological Survey mapped earthquake hazard zones, https://www.conservation.ca.gov/cgs/geohazards/eq-zapp, accessed April 2, 2024;

CGS (2021b), *Tsunami Inundation Maps and Data,* web application for accessing tsunami inundation hazard, https://www.conservation.ca.gov/cgs/tsunami/maps, accessed April 2, 2024;

CTE (2023), *Geotechnical Investigation, Proposed 801 – 815 Mission Avenue Mult-Family Residence, 801 – 815 Mission Avenue, Oceanside, California,* CTE Job No. 4830.2200116, dated August 15, 2023;

FEMA (2019), *Flood Map Service Center*, FEMA website, https://msc.fema.gov/portal/home, flood map number 06073C1613H, effective December 20, 2019, accessed May 4, 2024;

Geocon Incorporated (2004), *Geotechnical Investigation, Mission Avenue Mixed-use Project, Mission Avenue at Horne Street, Oceanside, California*, Project No. 07213-22-01, dated January 9, 2004;

Kennedy, M. P., and Tan, S. S., (2007), *Geologic Map of the Oceanside 30' x 60' Quadrangle, California*, USGS Regional Geologic Map Series, 1:100,000 Scale, Map No. 3;

SEAOCC (2020), *Seismic Design Maps*, website interface that queries the U.S. Geological Survey (USGS) web servers and retrieves the seismic design variables using ASCE 7-16, ASCE 7-10, ASCE 41-13, ASCE 41-17, IBC 2015, IBC 2012, NEHRP-2015, and NEHRP 2009 seismic design map data, http://seismicmaps.org, accessed April 2, 2024;

USGS (2019), *Quaternary Fault and Fold Database of the United States*: U.S. Geological Survey website, https://www.usgs.gov/natural-hazards/earthquake-hazards/faults, accessed April 2, 2024;

**ATTACHMENT 7**
**Storm Water Quality Assessment Form**

This is the cover sheet for Attachment 7.

*City of Oceanside – Engineering Division – Clean Water Program*

# STORM WATER QUALITY ASSESSMENT FOR PLANNING, ENGINEERING, AND BUILDING PERMIT APPLICATIONS

All applications for Planning, Engineering, or Building Division permits are required to complete this assessment form and include it as part of the initial permit application submittal. Staff will review the permit application content to determine the applicability of State and City storm water requirements. Please note a storm water assessment cannot be provided without a complete permit application package.

| Section 1 – Project Information | |
|---|---|
| Applicant Name: JPI Company | Phone Number: (314) 302-2469 |
| Project Name: 901 Mission Ave | Project Site Address: 901 Mission Ave, Oceanside, CA 92054 |
| Permit Applications Number(s): | Assessor Parcel Number(s): 147-196-10 |
| Project Description: Redevelopment, podium type building, multi-story residential with retail | Project Disturbed Area (square feet): 65,950 |
| Existing Impervious Area (square feet): 4,400 | Created or Replaced Impervious Area (square feet): 51,100 |

| Section 2 – Identify Applicable Priority Development Project Categories (Check All Boxes that Apply) | |
|---|---|
| ☐ | **New Development Project** – A project that creates 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. |
| ☒ | **Redevelopment Project** – A project that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. |
| ☒ | **Restaurants** – Category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812); where new or redevelopment projects create and/or replace 5,000 square feet or more impervious surface (collectively over the entire project site). |
| ☐ | **Hillside Development** – Category includes development on any natural slope that is twenty-five percent or greater; where new or redevelopment projects create and/or replace 5,000 square feet or more impervious surface (collectively over the entire project site). |
| ☐ | **Parking Lots** – Category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce; where new or redevelopment projects create and/or replace 5,000 square feet or more impervious surface (collectively over the entire project site). |
| ☐ | **Streets, Roads, Highways, Freeways, and Driveways** – Category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles; where new or redevelopment projects that create and/or replace 5,000 square feet or more impervious surface (collectively over the entire project site). |
| ☐ | **Water Quality Environmentally Sensitive Area** – New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharge directly to a Water Quality Environmentally Sensitive Area (WQESA). "Discharge directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the WQESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). |
| ☐ | **Automotive Repair Shop** – Category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539, where new or redevelopment projects create and/or replace 5,000 square feet or more impervious surface (collectively over the entire project site). |
| ☐ | **Retail Gasoline Outlet (RGOs)** – Category includes RGOs that meet the following criteria (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day; where new or redevelopment projects create and/or replace 5,000 square feet or more impervious surface (collectively over the entire project site). |
| ☒ | **Development Projects greater than one acre** – New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. |

# STORM WATER QUALITY ASSESSMENT FOR PLANNING, ENGINEERING, AND BUILDING PERMIT APPLICATIONS

| Section 3 – Identify Projects Not Subject to Permanent Stormwater Requirements (Check All Boxes that Apply) | |
|---|---|
| ☐ | The project consists of work entirely within an existing structure. |
| ☐ | The project consists of construction of overhead or underground utilities (no new impervious surfaces). |
| ☐ | The project consists of routine maintenance. |
| ☐ | The project consists of less than 50 yards of grading and presents no opportunities to improve water quality. |
| **Section 4 – Project Category Determination** | |
| ☒ | **Priority Development Project**: If any item in Section 2 is applicable, the project is a Priority Development Project. **Please prepare a PDP SWQMP for the project.** |
| ☐ | **Standard Development Project**: If none of the items in Section 2 or 3 are applicable, the project is a Standard Development Project. **Please prepare an SDP SWQMP.** |
| ☐ | **Project Not Subject to Permanent Stormwater Requirements:** If any item in Section 3 is applicable, the project is not subject to Permanent Stormwater Requirements. **Please submit the project plans with this form.**<br>**Note:** Projects in this category are subject to typical pollution prevention measures outlined by the pollution prevention checklist on the following page. |

| Section 5 – Applicant Certification | |
|---|---|
| Name of Responsible Party:<br>Bryan Smith | Title:<br>Senior Project Manager |
| Email Address (optional)<br>bsmith@fuscoe.com | Phone Number:<br>(858) 554-1500 |
| I understand and acknowledge the City of Oceanside has adopted minimum requirements, as mandated by the San Diego Regional Water Quality Control Board – Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 (NPDES NO. CAS0109266) for mitigating impacts associated with urban runoff, including storm water from construction and land development activities. I certify this assessment has been accurately completed to the best of my knowledge and is consistent with the proposed project. I acknowledge that non-compliance with the City Best Management Practice (BMP) Design Manual, Grading Ordinance, and Erosion Control Ordinance may result in enforcement action by the City, the California State Water Resources Control Board, and/or the San Diego Regional Water Quality Control Board. Enforcement action may include stop work orders, notice of violation, fines, or other actions. | |
| Applicant Signature:  | Date:<br>5/17/2024 |

## Stormwater Pollution Prevention Measures for Projects Not Subject to Permanent Stormwater Requirements

| Project Activity | Yes | No | Required Pollution Prevention |
|---|---|---|---|
| **Trash & Waste Generation**<br><br>*****REQUIRED FOR ALL PROJECTS***** | ☒ | ☐ | • Train/inform all employees of pollution prevention requirements<br>• Collect and contain all construction trash, waste, and debris<br>• Promptly contain and clean any spill on site<br>• Routinely inspect site, remove loose trash and prevent spills<br>• Properly dispose of any hazardous materials<br>• Do not wash down surfaces unless water is collected or directed to landscape<br>• Permanent trash collection areas require full structure/enclosure |
| **Digging of Dirt –** excavation, trenching, or grading | ☐ | ☐ | • Do not allow dirt to migrate into street, sidewalk, or storm drain<br>• Preserve existing vegetation where feasible<br>• Perimeter site controls such as silt fence or straw wattles<br>• Cover exposed dirt using mulch, tarps, or erosion control devices<br>• Install and secure tarps over dirt piles<br>• Routinely sweep site to remove dirt |
| **Landscaping and Irrigation Systems** | ☐ | ☐ | • Do not store landscape materials in street<br>• Do not allow dirt to migrate into street, sidewalk, or storm drain<br>• Test irrigation system and prevent runoff/overspray<br>• Install and secure tarps over piles of mulch or soil<br>• Routinely sweep site to remove mulch or soil<br>• Do not wash down surfaces unless water is collected or directed to landscape |
| **Concrete, Paint, Mortar, or Stucco Work** | ☐ | ☐ | • Contain wet mixing areas within confined area<br>• Do not allow material to travel into site soil, street, or storm drain<br>• Properly dispose of waste material |
| **Temporary Storage of Materials Outside** | ☐ | ☐ | • Elevate material off ground where possible, such as on pallets<br>• Install and secure tarps over materials |
| **Demolition of Structures** | ☐ | ☐ | • Follow Required Pollution Prevention for “Digging of Dirt” |
| **New Structure –** house addition, shed, etc. | ☐ | ☐ | • Follow Required Pollution Prevention for “Digging of Dirt”<br>• Direct downspouts to landscape, where feasible<br>• Consider rainwater harvesting<br>• Preserve existing vegetation and drainage patterns, where feasible |
| **Patio, Driveway, or Sidewalk** | ☐ | ☐ | • Consider use of pervious pavers or pervious concrete (refer to Section 3 of page 4 for routine maintenance information)<br>• Direct runoff to landscape areas, where feasible |
| **Re-Roofing** | ☐ | ☐ | • Contain removed roof debris in waste containers<br>• Follow Required Pollution Prevention for “Temporary Storage of Materials Outside” |
| **Washing of Material, Equipment, or Surface** | ☐ | ☐ | • Do not wash down surfaces unless water is collected or directed to landscape |
| **Draining of Water Heater, Pool, or Spa** | ☐ | ☐ | • Direct drain water to landscape areas where possible<br>• Contact Stormwater Division if considering draining to sanitary system cleanout or storm drain system (760-643-2804) |
| **Storm Drain at Industrial or Commercial Property** | ☐ | ☐ | • Install “No Dumping” or similar signage at each storm drain inlet |

## Completion Guidance

Please note – the Applicant is required to complete and submit this form as part of the project application. For definitions and additional information, please refer to the City of Oceanside BMP Design Manual. For assistance, please contact Development Services Staff at (760) 435-4373.

## Section 1 – Project Information

1. Applicant Name – provide name of Individual completing form, i.e. Owner or Owner Representative
2. Phone Number – provide phone number of Individual completing form, i.e. Owner or Owner Representative
3. Project Name – provide project name (consistent with project application)
4. Project Site Address – provide a physical address for the proposed project, or nearest cross street
5. Permit Application Number(s) – provide all applicable permit application numbers
6. Assessor Parcel Number(s) – provide Assessor Parcel Number(s); refer to title documents or contact City Staff for assistance
7. Project Description – provide a brief project description (e.g. single-family dwelling, retail business, repair shop, etc)
8. Project Disturbed Area – provide the disturbed area for the entire project, including onsite and offsite work
9. Existing Impervious Area – provide the total existing impervious area within the property and project boundary
10. Created or Replaced Impervious Area – provide the total area of all newly created or replaced impervious surfaces within the project area

## Section 2 – Identify Applicable Priority Development Project Categories

1. Review each category and check the appropriate boxes that apply to your project.
2. General identification of Automotive Repair Shop SIC (Standard Industrial Classifications) as follows:
   5013 – Motor vehicle supplies and new parts, 5014 – Tires and tubes, 5541 – Gasoline service stations, 7532 – Top and body repair, and paint shops, 7533 – Auto exhaust system repair shops, 7534 – Tire retreading and repair shops, 7536 – Automotive glass replacement shops, 7537 – Automotive transmission repair shops, 7538 – General automotive repair shops, 7539 – Automotive repair shops-not elsewhere classified
3. Contact Staff for assistance in determining applicability of the Water Quality Environmentally Sensitive Area (WQESA) category

## Section 3 – Identify Projects Not Subject to Permanent Stormwater Requirements

1. Please refer to Page 1-6 of the City of Oceanside BMP Design Manual for a complete list of routine maintenance activities.
2. Activities that expose native subgrade in the process of replacing impervious surfaces, are not considered routine maintenance.

## Section 4 – Project Category Determination

1. PDP SWQMP – Priority Development Project Stormwater Quality Management Plan
2. SDP SWQMP – Standard Development Project Stormwater Quality Management Plan
3. Contact Staff for assistance in determining the Project Category

## Section 5 – Applicant Certification

1. Name of Responsible Party – provide name of Owner
2. Title of Responsible Party – provide responsible party's title, if applicable
3. Phone Number – provide phone number of Owner
4. Email Address (Optional) – provide email address
5. Applicant Signature – provide signature of Individual completing form, i.e. Owner or Owner Representative
6. Date – provide date current date

**[Insert other supporting documentation here]**

# GEOTECHNICAL INVESTIGATION

## 901 MISSION AVENUE MIXED-USE
## OCEANSIDE, CALIFORNIA

**PREPARED FOR**

**JPI**
**SAN DIEGO. CALIFORNIA**

**MAY 15, 2024**
**PROJECT NO. G3303-42-01**

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. G3303-42-01
May 15, 2024

JPI
11988 El Camino Real, Suite 200
San Diego, California 92130

Attention: Mr. Conner Kloeppel

Subject: GEOTECHNICAL INVESTIGATION
901 MISSION AVENUE MIXED-USE
OCEANSIDE, CALIFORNIA

Dear Mr. Kloeppel:

In accordance with your request, we herein submit this geotechnical investigation for the subject site. Geocon Incorporated previously performed an investigation on the property (Geocon, 2004) to evaluate geologic conditions and potential geologic hazards at the site. The field data and laboratory test results from that study were used to provide conclusions and recommendations pertinent to geotechnical aspects of currently proposed project. The site is suitable for development provided the recommendations in this report are followed.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

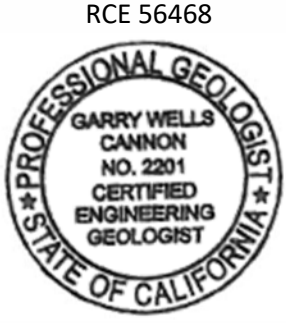
Jake P. Shelton
Senior Staff Geologist

Garry W. Cannon
CEG 2201
RCE 56468

Rodney C. Mikesell
GE 2533

JPS:GWC:RCM:am

(e-mail) Addressee









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# GEOTECHNICAL INVVESTIGATION

## 1. PURPOSE AND SCOPE

This report provides recommendations for development of a proposed mixed-use project planned for the property located at 901 Mission Avenue between Horne Street and Clementine Street in Oceanside, California (see Site Location Map). Geocon Incorporated previously performed a geotechnical investigation on the property (Geocon, 2004) and the field data and laboratory test results from that study are deemed adequate and applicable to the currently proposed project.




**Site Location Map**

The scope of this study included reviewing Geocon (2004) and other readily available geologic reports and maps; engineering analysis using data from Geocon (2004); and preparing this report. We herein provide recommendations for remedial grading; foundation design; concrete slab-on-grade; and concrete flatwork.

We conducted our previous field investigation (Geocon, 2004) on December 30, 2003. The approximate locations of the exploratory borings are shown on the Geologic Map, Figure 1.

Appendix A presents the exploratory boring logs and details of the field investigation. Details of the laboratory testing and a summary of test results are provided in Appendix B and on the boring logs in Appendix A.

The recommendations presented herein are based on our analysis of data and our observations obtained during previous investigations and our experience with similar soil and geologic conditions.

# 2. SITE AND PROJECT DESCRIPTION

The site is bounded by Horne Street to the east, Clementine Street to the west, Mission Avenue to the north, and Seagaze Drive to the south. Site elevation ranges between about 100 feet above Mean Sea Level (MSL) on the western side to about 117 feet MSL to the eastern side.

The property is currently vacant. A paved driveway bisects the north and south halves of the property. Previously, buildings and parking lots occupied the property. In 1982 or 1983, buildings on the northern half of the property were demolished. During our previous investigation (Geocon, 2004), two single-story houses and apartment buildings occupied the southwestern corner of the block. In 2006 or 2007 the remaining structures on the property were demolished.

Based on discussions with you and drawings we have reviewed, we understand that a 6-story apartment building over two podium levels and two levels of subterranean parking are planned.

# 3. SOIL AND GEOLOGIC CONDITIONS

The site is underlain by undocumented fill overlying Old Paralic Deposits (shown as terrace deposits on the boring logs). Descriptions of the soils encountered during our investigation are presented below and on the boring logs in Appendix A. A Geologic Map and Geologic Cross Sections showing these units are presented as Figures 1 and 2, respectively.

## 3.1 Undocumented Fill (Qudf)

Undocumented fill soils were encountered in all borings to depths ranging between about 2 to 9 feet below existing grade. The fill generally consisted of silty sand with scattered gravel. The fill is unsuitable to support the planned improvements and will require complete removal. These soils may be reused as fill provided debris is removed.

### 3.2 Old Paralic Deposits (Qop)

Old Paralic Deposits were encountered beneath the undocumented fill and extended through the full depth explored. The terrace deposit consisted of dense to very dense, silty sand, clayey sand, and sand with silt. Cobbles were encountered at a depth of approximately 20 feet below the ground surface. The Old Paralic Deposits are suitable to support the planned improvements.

## 4. GROUNDWATER

We did not encounter groundwater during our previous investigation; however, it is not uncommon for groundwater or seepage conditions to develop where none previously existed. Groundwater and seepage conditions are dependent on seasonal precipitation, irrigation, land use, among other factors, and vary as a result. Proper surface drainage will be important to future performance of the project. We do not anticipate ground water will affect the constructability of the project.

## 5. GEOLOGIC HAZARDS

### 5.1. Ground Rupture

The USGS (2016) and Kennedy & Tan (2008) show that there are no mapped Quaternary faults crossing or trending toward the site. The site is not located within a currently established Alquist-Priolo Earthquake Fault Zone (CEG, 2021a). The closest active fault is the Newport-Inglewood-Rose Canyon fault zone located approximately 4.5 miles to the west. The risk associated with ground rupture hazard is low.

There are no active faults, potentially active faults, inactive faults, presumed inactive faults, or activity unknown faults at the site or trending toward the site. The risk associated with ground rupture hazard is low

### 5.2. Seismicity

Considerations important in seismic design include frequency and duration of motion and soil conditions underlying the site. The seismic design of structures should be evaluated in accordance with the 2022 California Building Code currently adopted by the local agency. The risk associated with strong seismic ground motion hazard is high; however, the risk is no greater than that for the site vicinity.

### 5.3. Liquefaction

Considering the lack of shallow permanent groundwater and the density and age of the underlying geologic units, the risk associated with seismically induced soil liquefaction hazard is low.

### 5.4. Landslides

No evidence of landsliding was observed during our investigation. Kennedy & Tan (2007) show that there are no landslides mapped at the site or in an area that could impact the site. The risk associated with ground movement hazard due to landsliding is low.

### 5.5. Tsunamis and Seiches

The site is not located within a California Tsunami Hazard Area (CGS, 2021b). There are no lakes or reservoirs located near the site. The risk associated with inundation hazard due to tsunami or seiche is low.

### 5.6. Flooding

The site is designated as Zone X (FEMA, 2019). The risk associated with flooding hazard is low.

# 6. CONCLUSIONS AND RECOMMENDATIONS

## 6.1 General

6.1.1 It is our opinion that the site is suitable for the planned improvements, provided the recommendations presented herein are implemented during the design and construction of the project.

6.1.2 The site is underlain by undocumented fill and Old Paralic Deposits. The undocumented fill is not suitable to support settlement-sensitive improvements and will require remedial grading. The Old Paralic Deposits are suitable to support the compacted fill and settlement-sensitive improvements.

6.1.3 We did not encounter groundwater during our investigation. Groundwater will not be a constraint to project development; however, seepage could be encountered during the grading operations, especially during the rainy seasons.

6.1.4 No significant geologic hazards were observed or are known to exist on the site that would adversely impact the site.

6.1.5 The proposed structure can be supported on conventional shallow foundations bearing entirely on undisturbed old paralic deposits (i.e. terrace deposits).

## 6.2 Excavation and Soil Characteristics

6.2.1 Excavation of the on-site soils should be possible with moderate effort using conventional heavy-duty equipment.

6.2.2 The soil encountered in the field investigation possess a “very low” to “low” expansion potential (expansion index [EI] ≤ 50) as defined by 2022 California Building Code (CBC) Section 1803.5.3. the following table presents soil classifications based on expansion index. We expect a majority of the on-site soil possess a “very low” to “low” expansion potential (EI ≤ 50).

**EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX**

| Expansion Index (EI) | ASTM D 4829 Expansion Classification | 2022 CBC Expansion Classification |
|---|---|---|
| 0 – 20 | Very Low | Non-Expansive |
| 21 – 50 | Low | Expansive |
| 51 – 90 | Medium | |
| 91 – 130 | High | |
| Greater Than 130 | Very High | |

6.2.3 We performed laboratory tests during our previous investigation on samples of the site soils to evaluate the percentage of water-soluble sulfate content. Appendix B presents results of the laboratory tests. The test results indicate the on-site soils at the locations tested possess a "S0" sulfate exposure to concrete structures as defined by 2022 CBC Section 1904 and ACI 318-08 Sections 4.2 and 4.3. The following table presents a summary of concrete requirements set forth by 2022 CBC Section 1904 and ACI 318. We recommend ACI guidelines be followed when determining the type of concrete used for the project. The presence of water-soluble sulfates is not a visually discernible characteristic; therefore, other soil samples from the site could yield different concentrations. Over time landscaping activities (i.e., addition of fertilizers and other soil nutrients) could affect the concentration.

**REQUIREMENTS FOR CONCRETE EXPOSED TO SULFATE-CONTAINING SOLUTIONS**

| Exposure Class | | Water-Soluble Sulfate ($SO_4$) Percent by Weight | Cement Type (ASTM C 150) | Maximum Water to Cement Ratio by Weight[1] | Minimum Compressive Strength (psi) |
|---|---|---|---|---|---|
| S0 | | $SO_4$<0.10 | No Type Restriction | n/a | 2,500 |
| S1 | | 0.10≤$SO_4$<0.20 | II | 0.50 | 4,000 |
| S2 | | 0.20≤$SO_4$≤2.00 | V | 0.45 | 4,500 |
| S3 | Option 1 | $SO_4$>2.00 | V+Pozzolan or Slag | 0.45 | 4,500 |
| | Option 2 | | V | 0.40 | 5,000 |

[1] Maximum water to cement ratio limits do not apply to lightweight concrete

6.2.4 Geocon Incorporated does not practice in the field of corrosion engineering; therefore, further evaluation by a corrosion engineer may be needed if improvements susceptible to corrosion are planned.

## 6.3 Subdrains

6.3.1 Subdrains will not be required for this project.

## 6.4 Grading Recommendations

6.4.1 Grading should be performed in accordance with the recommendations provided in this report, the *Recommended Grading Specifications* contained in Appendix C and the local Grading Ordinances. Where the recommendations of this report conflict with Appendix C, the recommendations of this section take precedence.

6.4.2 Earthwork should be observed, and compacted fill tested by Geocon Incorporated.

6.4.3 A preconstruction conference should be held at the site with the City representative, owner, grading and underground contractors, civil engineer, and geotechnical engineer in attendance. Special soil handling and the grading plans can be discussed at that time.

6.4.4 Site preparation should begin with the removal of deleterious material, debris, and vegetation. Material generated during stripping and demolition should be exported from the site and should not be mixed with the fill soil. Existing building foundations and underground improvements within the proposed building areas should be removed.

6.4.5 Abandoned foundations and buried utilities should be removed and the resulting depressions or trenches backfilled with properly compacted soil as part of the remedial grading.

6.4.6 Undocumented fill should be completely removed to expose the underlying Old Paralic Deposits. The removals should extend to the property lines, where practicable. We expect excavations to reach basement level will remove most, if not all of the undocumented fill. Where undocumented fill extends below the basement level, the fill should be removed and recompacted. A representative of Geocon should be on-site during removals to observe the terrace deposits.

6.4.7 Prior to placing fill, the ground surface should be scarified to a depth of at least 12 inches, moisture conditioned, and compacted. Fill soils should then be placed and compacted in layers to the design finish-grade elevation. The fill layers should be no thicker than will allow for adequate bonding and compaction. Fill (including scarified ground surfaces) should be

compacted to at least 90 percent of maximum dry density (as determined by ASTM D 1557) at or slightly above optimum moisture content.

6.4.8 The following table provides a summary of the grading recommendations.

**SUMMARY OF GRADING RECOMMENDATIONS**

| Area | Removal Requirements |
|---|---|
| Site | Complete removal of undocumented fill. |
| Lateral Grading Limits | To property limits, where practicable. |
| Compaction Requirements | At least 90 percent relative compaction near or slightly above optimum moisture content. |
| Exposed Removal Bottoms | Scarify Upper 12 Inches |
| Expansion Potential | "Very Low" to "Low" (Expansion Index of 50 or less) |

6.4.9 Imported soil should have the characteristics presented on the following table. We should be notified of the imported soil source and should be provided with samples in order to perform testing of imported soil prior to its arrival at the site to evaluate its suitability as fill material.

**SUMMARY OF IMPORT FILL RECOMMENDATIONS**

| Soil Characteristic | Values |
|---|---|
| Expansion Potential | "Very Low" to "Low" (Expansion Index of 50 or less) |
| Particle Size | Maximum Dimension Less Than 3 Inches |
| | Generally Free of Debris |

## 6.5 Excavation Slopes and Shoring

6.5.1 The recommendations included herein are provided for stable excavations. Geocon Incorporated is not responsible for site safety and the stability of the proposed excavations. It is the contractor's responsibility to ensure that all excavations, temporary slopes, and trenches are properly constructed and maintained in accordance with applicable OSHA guidelines in order to maintain the safety and stability of the excavations and adjacent improvements. The walls of the excavations should not be allowed to become saturated or to dry out. Surcharge loads should not be permitted to a distance equal to the height of the

excavation from the top of the excavation unless the shoring system is designed to accommodate the surcharge loading. The top of sloped excavations should be a minimum of 15 feet from the edge of existing improvements. Vertical excavations should be shored in accordance with applicable OSHA codes and regulations.

6.5.2 The design of temporary shoring is governed by soil and groundwater conditions, and by the depth and width of the excavated area. Continuous support of the excavation face can be provided by a system of soldier piles and wood lagging or other applicable techniques. Excavations exceeding 15 feet may require soil nails, tieback anchors or internal bracing to provide additional wall restraint.

6.5.3 The condition of existing buildings, streets, sidewalks, and other structures/improvements around the perimeter of the planned excavation should be documented prior to the start of shoring and excavation work. Special attention should be given to documenting cracks or other indications of differential settlement within the adjacent structures, pavements, and other improvements. Underground utilities that are sensitive to settlement should be videotaped prior to construction to check the integrity of pipes. Monitoring points should be established on the shoring wall and adjacent building. The points should be monitored weekly during the excavation work and on a monthly thereafter until the podium floor is finished. Inclinometers should be installed and monitored behind any shoring sections that will be advanced deeper than 30 feet below the existing ground surface.

6.5.4 In general, ground conditions are suited for soldier-pile-and-tieback-anchor walls. However, gravel, cobble, and oversized material could be encountered that might be difficult to drill. Additionally, if cohesionless sands are encountered, some raveling could occur along the unsupported portions of excavations.

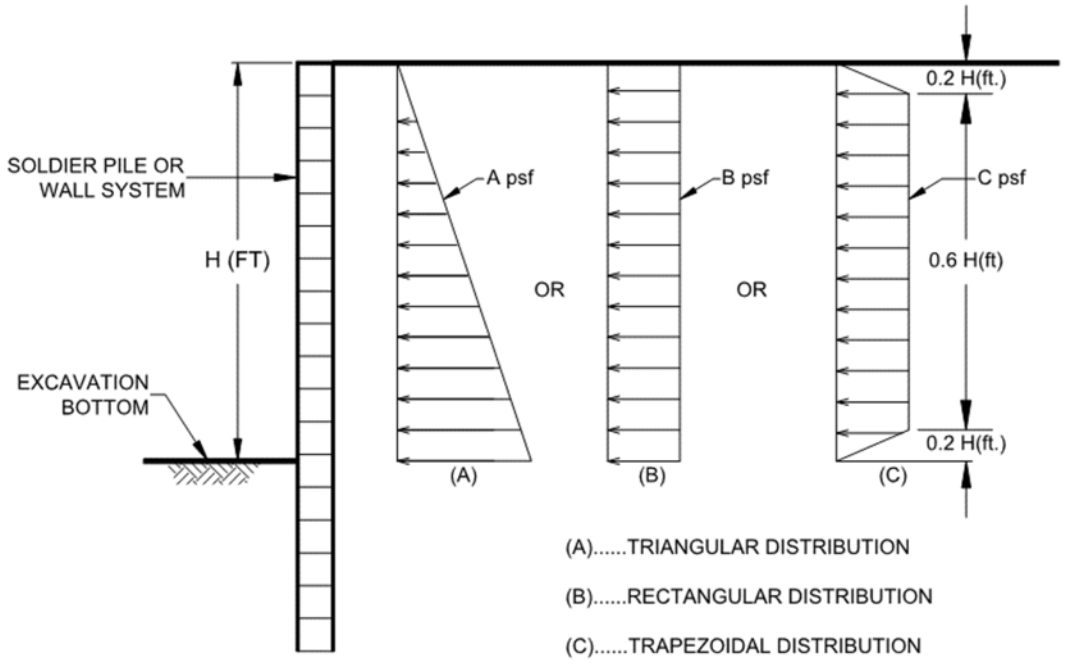
6.5.5 Temporary shoring should be designed in conformance with FHWA-IF-99-015 using a lateral pressure envelope acting on the back of the shoring as presented in the following table assuming a level backfill. The distributions are shown on the Active Pressures for Temporary Shoring. Cantilevered shoring should use the triangular distribution and multi-braced systems (such as tieback anchors and rakers) should use the trapezoidal or rectangular distributions. The project shoring engineer should determine the applicable soil pressure distribution for the design of the temporary shoring system. Additional lateral earth pressure due to the surcharging effects from construction equipment, sloping backfill, stockpiles,

adjacent structures, and traffic loads should be considered during design of the shoring system.

**SUMMARY OF TEMPORARY SHORING WALL RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Triangular Distribution, A | 25H psf |
| Rectangular Distribution, B | 16H psf |
| Trapezoidal Distribution, C | 20H psf |
| Passive Pressure, P | 350D + 500 psf |
| Effective Zone Angle, E | 30 degrees |
| Maximum Design Lateral Movement | 1 Inch |
| Maximum Design Vertical Movement | ½ Inch |
| Maximum Design Retained Height, H | 15 Feet |

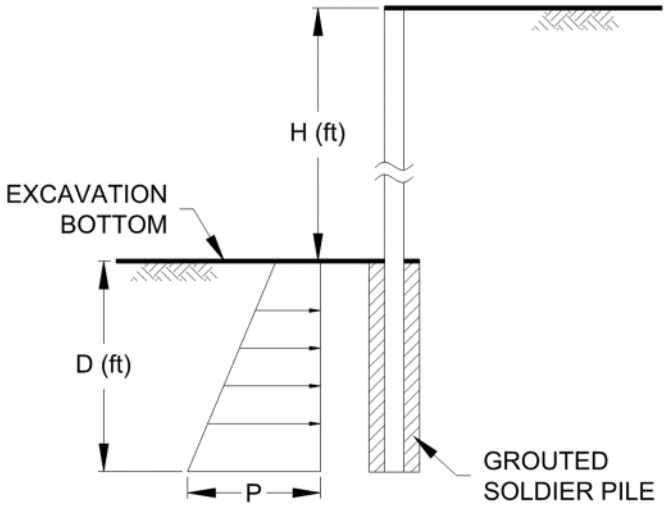
H equals the height of the retaining portion of the wall in feet
D equals the embedment depth of the retaining wall in feet




**Active Pressures on Temporary Shoring**

6.5.6 The passive resistance can be assumed to act over a width of three pile diameters. Typically, soldier piles are embedded a minimum of 0.5 times the maximum height of the excavation

(this depth is to include footing excavations) if tieback anchors are not employed. The project structural engineer should determine the actual embedment depth.




**Passive Pressures on Temporary Shoring**

6.5.7 We should observe the drilled shafts for the soldier piles prior to the placement of the pile to check that the exposed soil conditions are similar to those expected and that excavation extends to an appropriate bearing strata and design depth.

6.5.8 It is essential that the shoring system be designed to of the amount of lateral wall displacement. Earth pressures acting on a lagging wall can cause movement of the shoring toward the excavation and result in ground subsidence outside of the excavation.

6.5.9 Survey points should be established at the top of the pile on at least 20 percent of the soldier piles. An additional point located at an intermediate point between the top of the pile and the base of the excavation should be monitored on at least 20 percent of the piles if tieback anchors will be used. These points should be monitored on a weekly basis during excavation work and on a monthly basis thereafter until the permanent support system is constructed.

6.5.10 The project civil engineer should provide the approximate location, depth, and pipe type of the underground utilities to the shoring engineer to help select the shoring type and shoring design. The shoring system should be designed to limit horizontal soldier pile movement to a maximum of 1 inch. The amount of horizontal deflection can be assumed to be essentially

zero along the Active Zone and Effective Zone boundary. The magnitude of movement for intermediate depths and distances from the shoring wall can be linearly interpolated.

6.5.11 Lagging should keep pace with excavation. The excavation should not be advanced deeper than 5 feet below the bottom of lagging at any time or as determined by the shoring design engineer. Unlagged portions should only be allowed to stand for short periods of time in order to decrease the risk of soil instability and should never be left unsupported overnight. Proper backfilling should be conducted when necessary between the back of lagging and excavation sidewalls to reduce sloughing in this zone and all voids should be filled by the end of each day. It may be necessary to backfill with slurry to help prevent future lateral movement behind the supported excavation. Further, the excavation should not be advanced further than four feet below a row of tiebacks prior to those tiebacks being proof tested and locked off unless otherwise specific by the shoring engineer. Surface sloughing can occur during the excavation process.

## 6.6 Seismic Design Criteria – 2022 California Building Code

6.6.1 The following table summarizes site-specific design criteria obtained from the 2022 California Building Code (CBC; Based on the 2021 International Building Code [IBC] and ASCE 7-16), Chapter 16 Structural Design, Section 1613 Earthquake Loads. We used SEAOC (2020) to calculate the seismic design parameters. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613.2.2 of the 2022 CBC and Table 20.3-1 of ASCE 7-16. We assigned the site class based on exploratory borings performed on the property and the results of a ReMi line performed for the adjacent property to the west (CTE 2023). The values presented herein are for the risk-targeted maximum considered earthquake ($MCE_R$).

**2022 CBC SEISMIC DESIGN PARAMETERS**

| Parameter | Value | 2022 CBC Reference |
|---|---|---|
| Site Class | C | Section 1613.2.2 |
| $MCE_R$ Ground Motion Spectral Response Acceleration – Class B (short), $S_S$ | 1.052g | Figure 1613.2.1(1) |
| $MCE_R$ Ground Motion Spectral Response Acceleration – Class B (1 sec), $S_1$ | 0.384g | Figure 1613.2.1(2) |
| Site Coefficient, $F_A$ | 1.2 | Table 1613.2.3(1) |
| Site Coefficient, $F_V$ | 1.5 | Table 1613.2.3(2) |
| Site Class Modified $MCE_R$ Spectral Response Acceleration (short), $S_{MS}$ | 1.262g | Section 1613.2.3 (Eqn 16-36) |
| Site Class Modified $MCE_R$ Spectral Response Acceleration – (1 sec), $S_{M1}$ | 0.576 | Section 1613.2.3 (Eqn 16-37) |
| 5% Damped Design Spectral Response Acceleration (short), $S_{DS}$ | 0.841g | Section 1613.2.4 (Eqn 16-38) |
| 5% Damped Design Spectral Response Acceleration (1 sec), $S_{D1}$ | 0.384g | Section 1613.2.4 (Eqn 16-39) |

*See following paragraph.

6.6.2 The following table presents the mapped maximum considered geometric mean ($MCE_G$) seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-16.

**ASCE 7-16 PEAK GROUND ACCELERATION**

| Parameter | Value | ASCE 7-16 Reference |
|---|---|---|
| Site Class | C | Section 1613.2.2 (2022 CBC) |
| Mapped $MCE_G$ Peak Ground Acceleration, PGA | 0.462g | Figure 22-7 |
| Site Coefficient, $F_{PGA}$ | 1.2 | Table 11.8-1 |
| Site Class Modified $MCE_G$ Peak Ground Acceleration, $PGA_M$ | 0.554g | Section 11.8.3 (Eqn 11.8-1) |

6.6.3 Conformance to the seismic design criteria presented in the above tables does not constitute a guarantee or assurance that significant structural damage or ground failure will not occur in the event of a large earthquake. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

6.6.4 The project structural engineer or architect should determine the appropriate Risk Category and Seismic Design Category for the planned structures. The values presented herein assume a Risk Category of II and resulting in a Seismic Design Category D. The following table presents a summary of the risk categories in accordance with ASCE 7-16.

**ASCE 7-16 RISK CATEGORIES**

| Risk Category | Building Use | Examples |
|---|---|---|
| I | Low risk to Human Life at Failure | Barn, Storage Shelter |
| II | Nominal Risk to Human Life at Failure (Buildings Not Designated as I, III or IV) | Residential, Commercial and Industrial Buildings |
| III | Substantial Risk Human Life at Failure | Theaters, Lecture Halls, Dining Halls, Schools, Prisons, Small Healthcare Facilities, Infrastructure Plants, Storage for Explosives/Toxins |
| IV | Essential Facilities | Hazardous Material Facilities, Hospitals, Fire and Rescue, Emergency Shelters, Police Stations, Power Stations, Aviation Control Facilities, National Defense, Water Storage |

## 6.7 Shallow Foundations

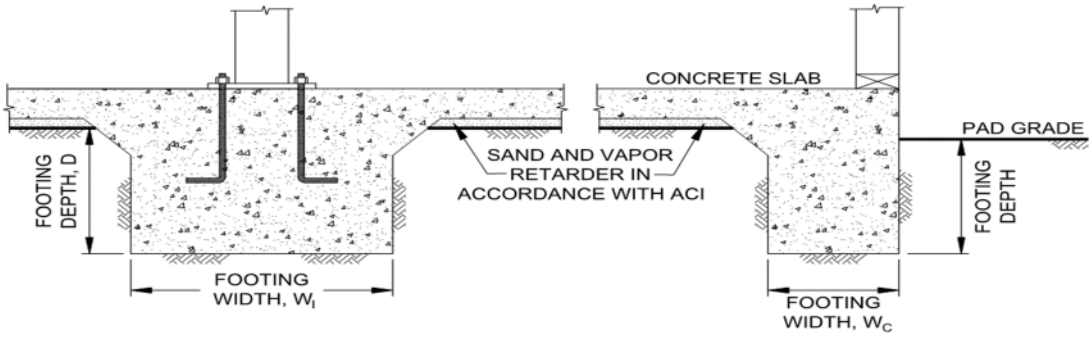
6.7.1 The proposed structure can be supported on shallow foundations bearing on undisturbed Old Paralic Deposits. Where fill is encountered below building footings, the footings should be deepened to extend through the fill to bear on the underlying Old Paralic Deposits. As an alternative to deepening footings, fill beneath the footing can be removed and the resulting excavation filled with a minimum 2-sack cement-slurry back to footing bottom.

6.7.2 Foundations should consist of continuous strip footings and isolated spread footings. The following table provides a summary of the foundation design recommendations. The allowable bearing pressure below for the basement walls assumes footings are at least 10 feet below finish grade.

**SUMMARY OF FOUNDATION RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Minimum Continuous Foundation Width, $W_C$ | 12 inches |
| Minimum Isolated Foundation Width, $W_I$ | 24 inches |
| Minimum Foundation Depth, D | 18 Inches Below Lowest Adjacent Grade |
| Minimum Concrete Reinforcement | (4) No. 5 Bars, 2 at the Top and 2 at the Bottom |
| Allowable Bearing Capacity for the Building (Footings Bering on Old Paralic Deposits) | 6,000 psf |
| Allowable Bearing Pressure (Ancillary Structures bearing on Compacted Fill) | 2,500 psf |
| Bearing Capacity Increase for Ancillary Structures | 500 psf per Foot of Depth |
| | 300 psf per Foot of Width |
| Maximum Allowable Bearing Pressure (Ancillary Structures) | 4,000 psf |
| Estimated Total Settlement | 1 Inch |
| Estimated Differential Settlement | ½ Inch in 40 Feet |
| Footing Size Used for Settlement | 8-Foot Square |
| Design Expansion Index | 50 or less |

6.7.3 The foundations should be embedded in accordance with the recommendations herein and the Wall/Column Footing Dimension Detail. The embedment depths should be measured from the lowest adjacent pad grade for both interior and exterior footings. Footings should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope (unless designed with a post-tensioned foundation system as discussed herein).




**Wall/Column Footing Dimension Detail**

6.7.4 The bearing capacity values presented herein are for dead plus live loads and may be increased by one-third when considering transient loads due to wind or seismic forces.

6.7.5 We should observe the foundation excavations prior to the placement of reinforcing steel and concrete to check that the exposed soil conditions are similar to those expected and that they have been extended to the appropriate bearing strata. Foundation modifications may be required if unexpected soil conditions are encountered.

6.7.6 We should be consulted to provide additional design parameters as required by the structural engineer.

## 6.8 Interior Concrete Slabs on Grade

6.8.1 Interior concrete slabs on grade for the structure should be constructed in accordance with the following table.

**MINIMUM INTERIOR CONCRETE SLAB-ON-GRADE RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Minimum Concrete Slab Thickness | 5 inches |
| Minimum Concrete Reinforcement | No. 3 Bars 18 Inches on Center, Both Directions |
| Typical Slab Underlayment | 3 to 4 Inches of Sand/Gravel |
| Design Expansion Index | 50 or less |

6.8.2 A vapor retarder should underlie slabs that receive moisture-sensitive floor coverings or could be used to store moisture-sensitive materials. The vapor retarder design should be consistent with the guidelines presented in the American Concrete Institute's (ACI) *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (ACI 302.2R-06). The vapor retarder should be installed in a manner that prevents puncture in accordance with manufacturer's requirements and ASTM recommendations. The project architect or developer should specify the vapor retarder used based on the type of floor covering that will be installed and if the structure will possess a humidity-controlled environment.

6.8.3 The project foundation engineer, architect, or developer should determine the bedding sand thickness. It is common to have 3 to 4 inches of sand in the southern California region. We should be contacted to provide recommendations if the bedding sand is thicker than 6 inches.

6.8.4 The foundation-design engineer should provide appropriate concrete-mix-design criteria and curing measures to assure proper curing of the slab including reducing potential rapid moisture loss which could result in shrinkage cracking and slab curl.

6.8.5 The foundation-design engineer should present the concrete-mix design and proper concrete-curing methods on the foundation plans. It is critical that the foundation contractor understands and follows the recommendations presented on the foundation plans.

6.8.6 Concrete slabs should be provided with adequate crack-control joints, construction joints and expansion joints to reduce concrete-shrinkage cracking. The American Concrete Institute (ACI) criteria should be used when establishing crack-control spacing. Crack-control joints should be spaced at intervals no greater than 12 feet. Additional concrete reinforcement, concrete admixtures or closer crack control joint spacing should be considered where exposed-concrete finished floors are planned.

6.8.7 Subgrade presaturation prior to placing concrete is not deemed necessary; however, the subgrade soil should be moisturized to maintain a moist condition as would be expected in any such concrete placement.

6.8.8 The concrete-slab-on-grade recommendations are based on soil support characteristics only. The project structural engineer should evaluate the structural requirements of the concrete slabs for supporting expected loads.

6.8.9 The recommendations of this report are intended to reduce potential cracking of slabs due to expansive soil, differential settlement of existing soil or soil with varying thicknesses. Even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade placed on such conditions may still exhibit cracking due to soil movement and/or shrinkage. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.

## 6.9 Exterior Concrete Flatwork

6.9.1 Exterior concrete flatwork not subject to vehicular traffic should be constructed in accordance with the recommendations presented in the following table. The recommended reinforcing steel could help reduce potential cracking.

**MINIMUM CONCRETE FLATWORK RECOMMENDATIONS**

| Expansion Index, EI | Minimum Concrete Reinforcement* Options | Minimum Thickness |
|---|---|---|
| EI $\leq$ 50 | 6x6-W2.9/W2.9 (6x6-6/6) welded wire mesh | 4 Inches |
| | No. 3 Bars 24 inches on center, Both Directions | |

*In excess of 8 feet square.

6.9.2 If subgrade soils have an expansion index greater than 20, the City of Oceanside requires a minimum of 6 inches of Class 2 base beneath curbs, gutters, and sidewalks. Although the expansion index performed during our previous geotechnical was less than 20, additional expansion index tests should be performed on subgrade soils to evaluate if base is required beneath curbs, gutters, and sidewalks.

6.9.3 The subgrade soil should be properly moisturized and compacted prior to the placement of reinforcing steel and concrete. The subgrade soil should be compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content in accordance with ASTM D 1557.

6.9.4 Even with the incorporation of the recommendations presented in this report, the exterior concrete flatwork can experience differential movement. Flatwork should be structurally connected to the curbs, where practical, to reduce potential offset between the curb and the flatwork.

6.9.5 Concrete flatwork should be provided with crack-control joints. The project structural engineer should determine the spacing of the crack-control joints based on the slab thickness and the intended use. American Concrete Institute (ACI) criteria should be used when establishing crack control spacing.

6.9.6 Subgrade soil for exterior slabs that are not subjected to vehicle loads should be compacted in accordance with criteria presented in the grading section prior section of this report.

Subgrade soil should be properly compacted, and the moisture content of subgrade soil should be verified prior to placing concrete.

6.9.7 Where exterior flatwork abuts the structure at entrance or exit points, the exterior slab should be dowelled into the foundation stem wall. This recommendation is intended to reduce potential differential elevations that could result from differential settlement or minor heave of the flatwork. The project structural engineer should provide dowelling details.

6.9.8 The recommendations presented herein are intended to reduce potential cracking of exterior slabs resulting from differential movement; however, even with the incorporation of the recommendations presented herein, slabs-on-grade could still crack. The occurrence of concrete shrinkage cracks is independent of the soil supporting characteristics. Their occurrence may be controlled by limiting the slump of the concrete; the use of crack control joints; and proper concrete placement and curing. Crack control joints should be spaced at intervals no greater than 12 feet. The Portland Concrete Association (PCA) and American Concrete Institute (ACI) provide recommendations for proper concrete mix, construction, and curing practices, and should be incorporated into project construction.

## 6.10 Retaining Walls

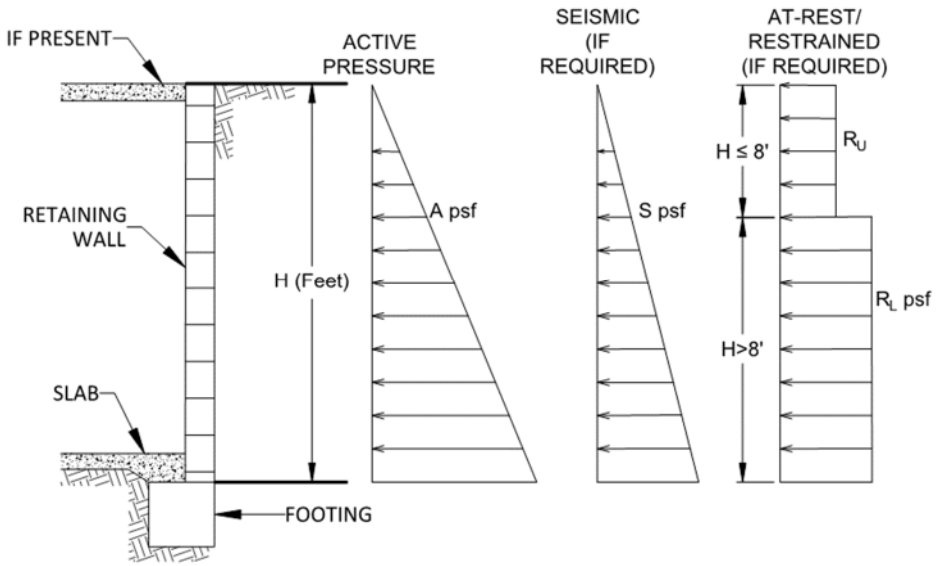
6.10.1 Walls that are allowed to rotate more than 0.001H (where H equals the height of the retaining portion of the wall) at the top of the wall should be designed using the values presented in the following table. Soil with an expansion index (EI) greater than 50 should not be used as backfill material behind retaining walls.

**RETAINING WALL DESIGN RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Active Soil Pressure, A (Level Backfill) | 35H psf |
| Active Soil Pressure, A (2:1 max Sloping Backfill) | 50H psf |
| Seismic Pressure, S | 15H psf |
| At-Rest/Restrained Walls Additional Uniform Pressure (0 to 8 Feet High) | 7H psf |
| At-Rest/Restrained Walls Additional Uniform Pressure (8+ Feet High) | 13H psf |
| Expected Expansion Index for the Subject Property | EI $\leq$ 50 |

H equals the height of the retaining portion of the wall in feet.

6.10.2 The project retaining walls should be designed as shown in the Retaining Wall Loading Diagram.




**Retaining Wall Loading Diagram**

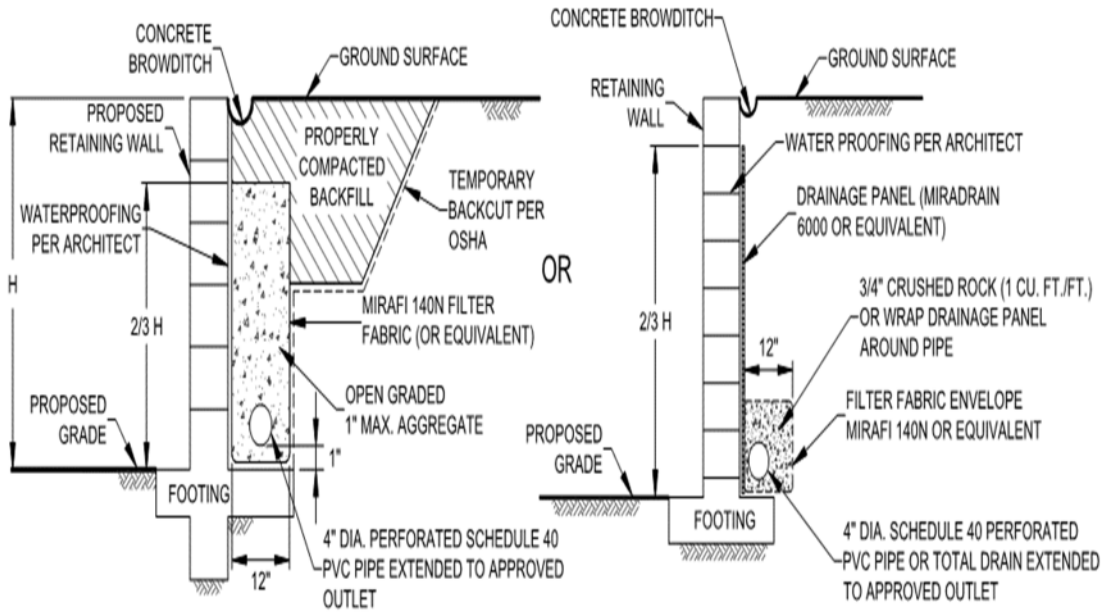
6.10.3 Where walls are restrained from movement at the top (at-rest condition), an additional uniform pressure should be applied to the wall.

6.10.4 The structural engineer should determine the Seismic Design Category for the project in accordance with Section 1613.3.5 of the 2022 CBC or Section 11.6 of ASCE 7-10. For structures assigned to Seismic Design Category of D, E, or F, retaining walls that support more than 6 feet of backfill should be designed with seismic lateral pressure in accordance with Section 1803.5.12 of the 2022 CBC. The seismic load is dependent on the retained height where H is the height of the wall, in feet, and the calculated loads result in pounds per square foot (psf) exerted at the base of the wall and zero at the top of the wall.

6.10.5 Retaining walls should be designed to ensure stability against overturning sliding, and excessive foundation pressure. Where a keyway is extended below the wall base with the intent to engage passive pressure and enhance sliding stability, it is not necessary to consider active pressure on the keyway.

6.10.6 Drainage openings through the base of the wall (weep holes) should not be used where the seepage could be a nuisance or otherwise adversely affect the property adjacent to the base of the wall.

6.10.7 The recommendations herein assume a properly compacted, granular (EI of 50 or less), free-draining backfill soil and that no hydrostatic forces or imposed surcharge load. The retaining wall should be properly drained as shown in the Typical Retaining Wall Drainage Detail. If conditions different than those described are expected, or if specific drainage details are desired, Geocon should be contacted for additional recommendations.




**Typical Retaining Wall Drainage Detail**

6.10.8 In general, wall foundations should be designed in accordance with the following table. The proximity of the foundation to the top of a slope steeper than 3:1 could impact the allowable soil bearing pressure. Therefore, retaining wall foundations should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope.

**SUMMARY OF RETAINING WALL FOUNDATION RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Minimum Retaining Wall Foundation Width | 12 inches |
| Minimum Retaining Wall Foundation Depth | 12 Inches |
| Minimum Concrete Reinforcement | Per Structural Engineer |
| Allowable Bearing Capacity | 2,500 psf |
| Bearing Capacity Increase | 500 psf per Foot of Depth |
| | 300 psf per Foot of Width |
| Maximum Allowable Bearing Capacity | 4,000 psf |
| Estimated Total Settlement | 1 Inch |
| Estimated Differential Settlement | ½ Inch in 40 Feet |

6.10.9 The recommendations presented herein are applicable for the design of rigid concrete or masonry retaining walls. Should other types of walls (such as mechanically stabilized earth [MSE] walls) be planned, Geocon should be consulted for additional recommendations.

6.10.10 Soil contemplated for use as retaining wall backfill, including imported soils, should be identified in the field prior to backfill. At that time, Geocon should be provided samples for laboratory testing to evaluate its suitability. Modified lateral earth pressures may be necessary if the backfill soil does not meet the required expansion index or shear strength.

6.10.11 City or regional standard wall designs, if used, are based on a specific active lateral earth pressure and/or soil friction angle. In this regard, on-site soil to be used as backfill may or may not meet the values for standard wall designs. Geocon should be consulted to assess the suitability of the on-site soil for use as wall backfill if standard wall designs are used.

## 6.11 Lateral Loading

6.11.1 The following table provides design parameters to resist lateral loads and for the design of footings or shear keys. The allowable passive pressure assumes a horizontal surface extending at least 5 feet, or three times the surface generating the passive pressure, whichever is greater. The upper 12 inches of soil in areas not covered by floor slabs or pavement should not be included in the determination of passive resistance.

**SUMMARY OF LATERAL LOAD DESIGN RECOMMENDATIONS**

| Parameter | Value |
|---|---|
| Passive Pressure Fluid Density | 350 pcf |
| Coefficient of Friction (Concrete and Soil) | 0.35 |
| Coefficient of Friction (Along Vapor Barrier) | 0.2 to 0.25* |

*Per manufacturer's recommendations.

6.11.2 The passive and frictional resistant loads can be combined for design purposes. The lateral passive pressures may be increased by one-third when considering transient loads due to wind or seismic forces.

## 6.12 Preliminary Pavement Recommendations

6.12.1 We calculated the flexible pavement sections in general conformance with the *Caltrans Method of Flexible Pavement Design* (Highway Design Manual, Section 608.4) using an estimated Traffic Index (TI) of 5.0, 5.5, 6.0, and 7.0 for parking stalls, driveways, medium truck traffic areas, and heavy truck traffic areas, respectively. The project civil engineer and owner should review the pavement designations to determine appropriate locations for pavement thickness. The final pavement sections for the parking lot should be based on the R-Value of the subgrade soil encountered at final subgrade elevation. We have assumed an R-Value of 30 and 78 for the subgrade soil and base materials, respectively, for the purposes of this preliminary analysis. The following table presents the preliminary flexible pavement sections.

**PRELIMINARY FLEXIBLE PAVEMENT SECTION**

| Location | Assumed Traffic Index | Asphalt Concrete (inches) | Class 2 Aggregate Base (inches) |
|---|---|---|---|
| Parking Stalls for Automobiles and Light-Duty Vehicles | 5.0 | 3 | 5.5 |
| Driveways for Automobiles and Light-Duty Vehicles | 5.5 | 3 | 7 |
| Medium Truck Traffic Areas | 6.0 | 3.5 | 7.5 |
| Driveways for Heavy Truck Traffic | 7.0 | 4 | 9.5 |

6.12.2 Prior to placing base materials, the upper 12 inches of the subgrade soil should be scarified, moisture conditioned as necessary, and recompacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content as determined by ASTM D 1557. Similarly, the base material should be compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Asphalt concrete should be compacted to a density of at least 95 percent of the laboratory Hveem density in accordance with ASTM D 2726.

6.12.3 Base materials should conform to Section 26-1.02B of the *Standard Specifications for The State of California Department of Transportation (Caltrans)* with a ¾-inch maximum size aggregate. Asphalt concrete should conform to Section 203-6 of the *Standard Specifications for Public Works Construction (Greenbook)*.

6.12.4 A rigid Portland cement concrete (PCC) pavement section should be placed in roadway aprons and cross gutters. We calculated the rigid pavement section in general conformance with the procedure recommended by the American Concrete Institute report ACI 330-21 *Commercial Concrete Parking Lots and Site Paving Design and Construction – Guide.* The following table provides the traffic categories and design parameters used for the calculations for 20-year design life.

**TRAFFIC CATEGORIES**

| Traffic Category | Description | Reliability (%) | Slabs Cracked at End of Design Life (%) |
|---|---|---|---|
| A | Car Parking Areas and Access Lanes | 60 | 15 |
| E | Heavy Truck Traffic | 75 | 15 |

6.12.5 We used the parameters presented in the following table to calculate the pavement design sections. We should be contacted to provide updated design sections, if necessary.

**RIGID PAVEMENT DESIGN PARAMETERS**

| Design Parameter | Design Value |
|---|---|
| Modulus of Subgrade Reaction, k | 150 pci |
| Modulus of Rupture for Concrete, $M_R$ | 500 psi |
| Concrete Compressive Strength | 3,000 psi |
| Concrete Modulus of Elasticity, E | 3,150,000 psi |

6.12.6 Based on the criteria presented herein, the PCC pavement sections should have a minimum thickness as presented on the following table.

**RIGID PAVEMENT DESIGN THICKNESS**

| Traffic Category | Trucks Per Day | Portland Cement Concrete, T (Inches) |
|---|---|---|
| A = Car Parking Areas and Access Lanes | 1 | 5 |
| Heavy Truck Traffic | <10 | 6.5 |

6.12.7 The PCC vehicular pavement should be placed over subgrade soil that is compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content.

6.12.8 The recommendations of the referenced ACI guidelines should be followed for joint and joint spacings.

6.12.9 Reinforcing steel will not be necessary within the concrete for geotechnical purposes.

6.12.10 To control the location and spread of concrete shrinkage cracks, crack-control joints (weakened plane joints) should be included in the design of the concrete pavement. The location, spacing and depth of the crack-control joints should be in accordance with ACI guidelines.

6.12.11 Concrete curb/gutter should be placed on soil subgrade compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Subgrade for cross-gutters should be compacted to a dry density of at

least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Where flatwork is located directly adjacent to the curb/gutter, the concrete flatwork should be structurally connected to the curbs to help reduce the potential for offsets between the curbs and the flatwork.

6.12.12 Subgrade for cross-gutters should be compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content.

6.12.13 Base materials should not be placed below the curb/gutter, or cross-gutters to mitigate water infiltration from the adjacent parkways into the pavement sections. However, the City of Oceanside may require it where subgrade soils have an expansion index greater than 20.

6.12.14 Where flatwork is located adjacent to the curb/gutter, the concrete flatwork should be structurally connected to the curbs to reduce potential offsets between the curbs and the flatwork.

6.12.15 The performance of pavement is highly dependent on providing positive surface drainage away from the edge of the pavement. Ponding of water on or adjacent to the pavement will likely result in pavement distress and subgrade failure. Drainage from landscaped areas should be directed to controlled drainage structures. Landscape areas adjacent to the edge of asphalt pavements are not recommended due to the potential for surface or irrigation water to infiltrate the underlying permeable aggregate base and cause distress. Where such a condition cannot be avoided, consideration should be given to incorporating measures that will significantly reduce the potential for subsurface water migration into the aggregate base. If planter islands are planned, the perimeter curb should extend at least 6 inches below the level of the base materials.

## 6.13 Site Drainage and Moisture Protection

6.13.1 Adequate site drainage is critical to reduce the risk for differential soil movement, erosion, and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to footings. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2022 CBC 1804.4. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices. Roof and pavement drainage should be directed into conduits that carry runoff away from the proposed structure.

6.13.2 In the case of basement walls or building walls retaining landscaping areas, a water-proofing system should be used on the wall and joints, and a Miradrain drainage panel (or similar) should be placed over the waterproofing. The project architect or civil engineer should provide detailed specifications on the plans for all waterproofing and drainage.

6.13.3 Underground utilities should be leak free. Utility and irrigation lines should be checked at appropriate intervals for leaks. Detected leaks should be promptly repaired. Detrimental soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.

6.13.4 Landscaping planters adjacent to paved areas are not recommended due to the risk for surface or irrigation water to infiltrate the pavement subgrade and base course. Area drains to collect excess irrigation water and transmit it to drainage structures, or impervious above-grade planter boxes should be used. A cutoff wall along the edge of the pavement that extends at least 6 inches below the bottom of the base material should be considered where landscaping is planned next to pavement.

## 6.14 Grading and Foundation Plan Review

6.14.1 Geocon Incorporated should review the grading and building foundation plans for the project prior to final design submittal to evaluate if additional analyses and/or recommendations are required.

# LIMITATIONS AND UNIFORMITY OF CONDITIONS

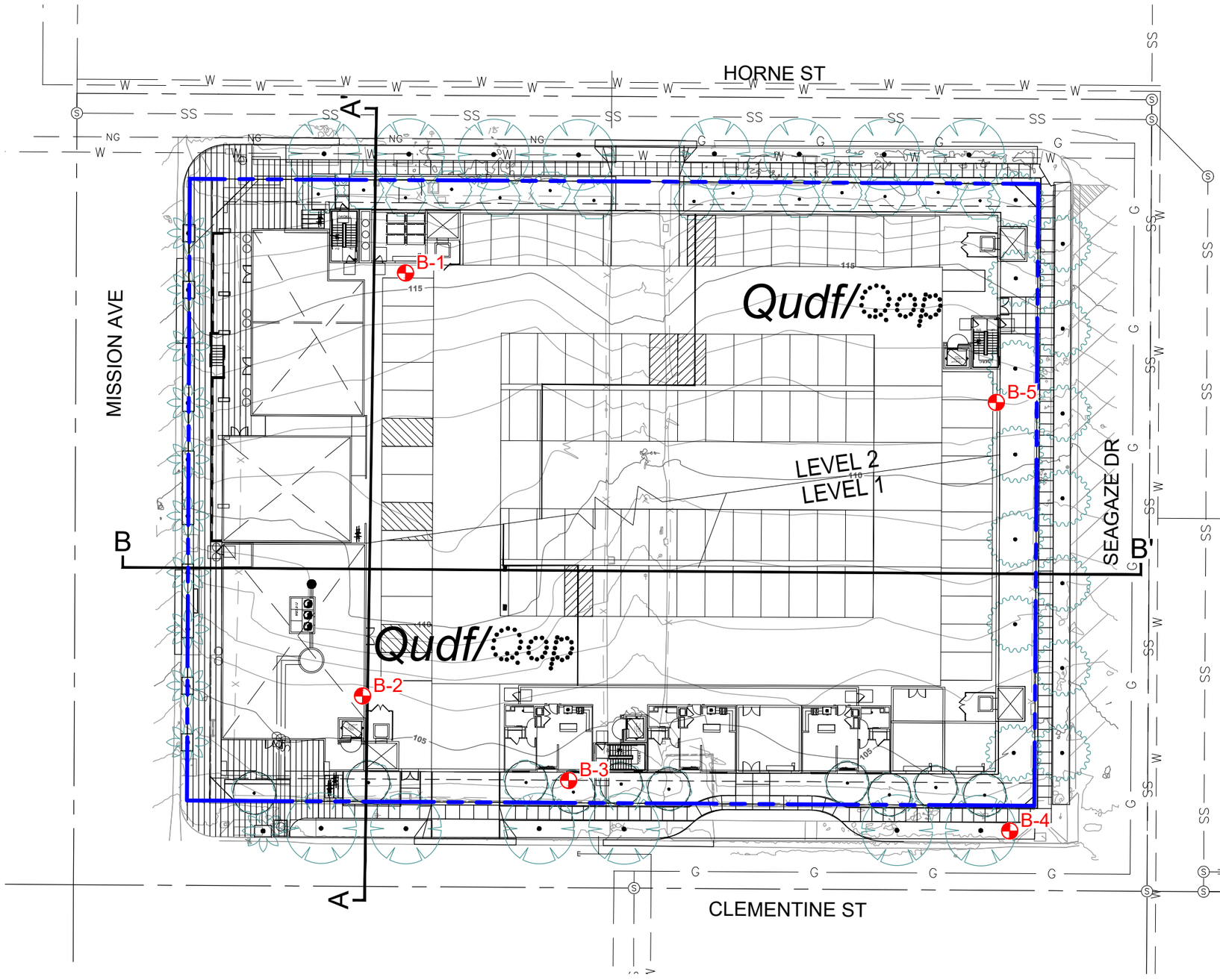
1. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

2. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

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 the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

4. The findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

# 901 MISSION AVENUE
# SAN DIEGO, CALIFORNIA




0' 20' 40' 60' 80'

SCALE 1"=40'(on 11x17)

## GEOCON LEGEND

Qudf .....UNDOCUMENTED FILL

Qop .....OLD PARALIC DEPOSITS (Dotted Where Buried)

B-5 .....APPROX. LOCATION OF BORING

A A' .....APPROX. LOCATION OF GEOLOGIC CROSS SECTION


GEOCON INCORPORATED

GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974

PHONE 858 558-6900 - FAX 858 558-6159


PROJECT NO. G3303 - 42 - 01

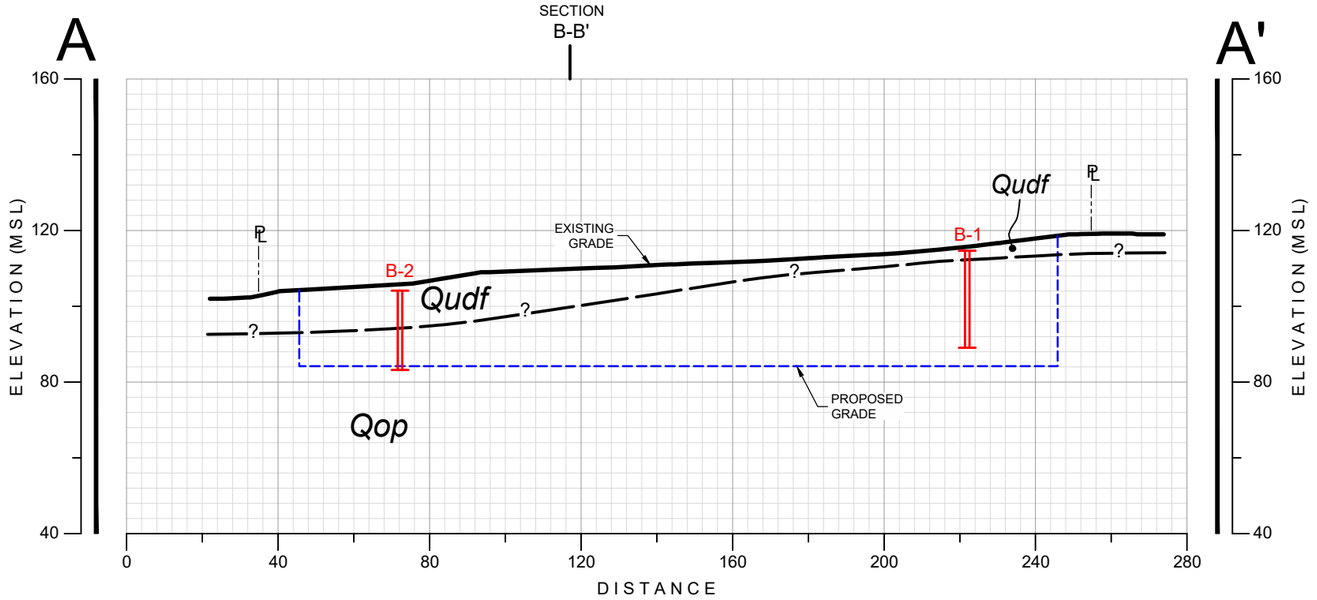
FIGURE 1

DATE 05 - 15 - 2024

# GEOLOGIC MAP

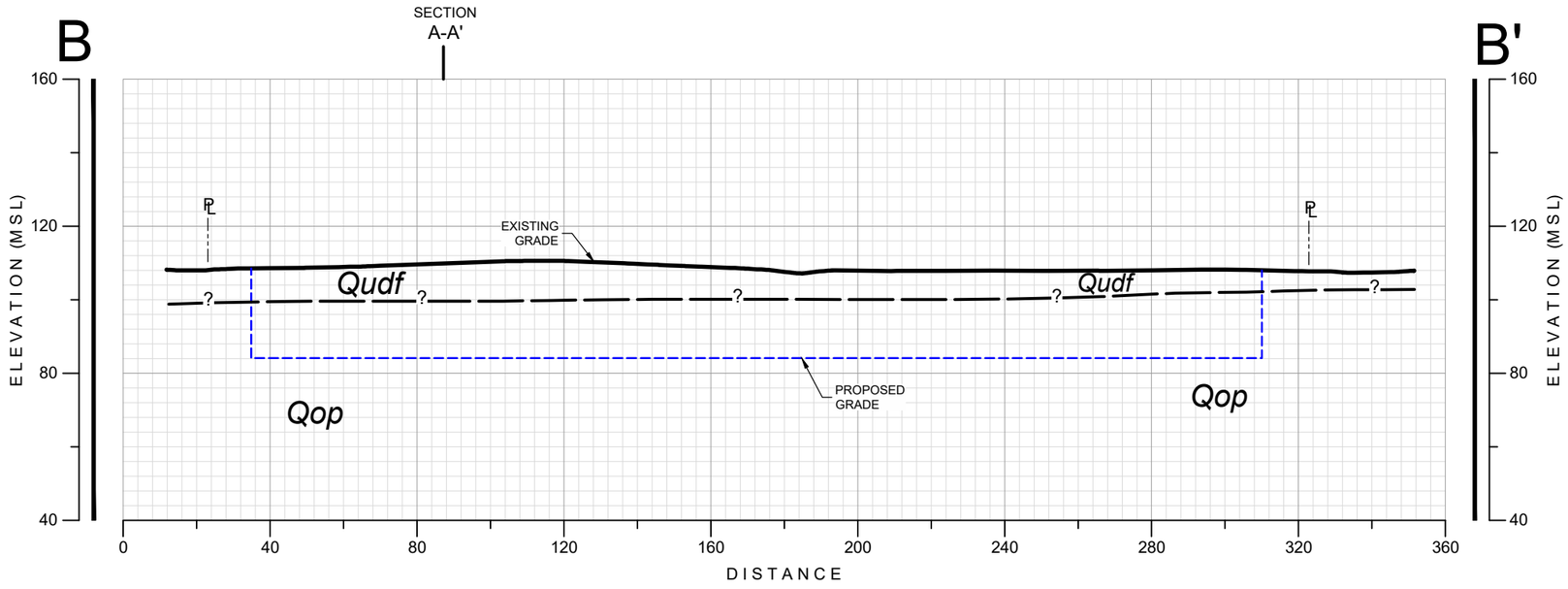

Plotted:05/15/2024 7:52AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G3303-42-01 (901 Mission Avenue)\SHEETS\G3303-42-01 Geo Map.dwg

901 MISSION AVENUE
SAN DIEGO, CALIFORNIA




## GEOLOGIC CROSS-SECTION A-A'

SCALE: 1" = 40' (Vert. = Horiz.)




## GEOLOGIC CROSS-SECTION B-B'

SCALE: 1" = 40' (Vert. = Horiz.)

### GEOCON LEGEND

*Qudf* .....UNDOCUMENTED FILL

*Qop* .....OLD PARALIC DEPOSITS

B-2 .....APPROX. LOCATION OF BORING

?2 .....APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOCON INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

PROJECT NO. G3303 - 42 - 01
FIGURE 2
DATE 05 - 15 - 2024

GEOLOGIC CROSS SECTION

Plotted:05/15/2024 7:44AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G3303-42-01 (901 Mission Avenue)\SHEETS\G3303-42-01 XSections.dwg

# APPENDIX A

# APPENDIX A
# FIELD INVESTIGATION

Our previous field investigation was performed on December 30, 2003, and consisted of a site reconnaissance and drilling five exploratory small-diameter borings at the approximate locations shown on Figure 1. The small-diameter borings were drilled to depths varying from 10½ to 25 feet using a CME drill rig equipped with hollow-stem auger. Relatively undisturbed samples were obtained by driving a California Sampler 12 inches with blows from a 140-pound hammer falling 30 inches. This split-tube sampler was equipped with 1-inch-high by $2^{3}/_{8}$-inch-diameter brass sampler rings to facilitate sample removal and testing. Disturbed bulk samples were obtained from the boring's cuttings.

The soil conditions encountered in the borings were visually examined, classified and logged in general accordance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D 2488). The logs of the exploratory borings are presented on Figures A-1 through A-5. The logs depict the various soil types encountered and indicate the depths at which samples were obtained.

PROJECT NO. 07213-22-01

## BORING B 1

ELEV. (MSL.) 114' DATE COMPLETED 12-30-2003

EQUIPMENT CME 75

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B1-1 | | | SM | **UNDOCUMENTED FILL**<br>Loose, damp, moderate yellowish brown to moderate brown Silty SAND. Scattered gravel | | | |
| 2 | B1-2 | | | | | 88 | | |
| 4 | | | | | **TERRACE DEPOSIT**<br>Dense, damp to moist, moderate brown Silty SAND, Slightly porous. Very dense below 5 feet, non-porous | | | |
| 6 | B1-3 | | | | | 63 | | 2.0 |
| 8 | | | | | | | | |
| 10 | B1-4 | | | SM | | 68/6 | 96.5 | 5.9 |
| 12 | | | | | | | | |
| 14 | | | | | | | | |
| 16 | B1-5 | | | | -Mottled moderate brown and light brown | 50/4 | | |
| 18 | | | | | -Becomes pale yellow brown below 15 feet | | | |
| 20 | | | | | -Abundant cobbles below 20 feet<br>-2 hours to advance 5 feet | | | |
| 22 | | | | | | | | |
| 24 | | | | | | | | |
| | | | | | BORING TERMINATED AT 25 FEET (REFUSAL)<br>Backfilled with approximately 7 cubic feet of bentonite chips | | | |

07213-22-01.GPJ

**Figure A-1, Log of Boring B 1, Page 1 of 1**

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07213-22-01

## BORING B 2

ELEV. (MSL.) 103' DATE COMPLETED 12-30-2003

EQUIPMENT CME 75

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B2-1 | | | | **UNDOCUMENTED FILL**<br>Loose to medium dense, moist, moderate brown Silty SAND; scattered gravel | | | |
| 2 | B2-2 | | | | | 92 | 3.9 | 112.1 |
| 4 | | | | | | | | |
| 6 | B2-3 | | | SM | | 52 | | |
| 8 | | | | | | | | |
| 10 | B2-4 | | | | **TERRACE DEPOSITS**<br>Very dense, moist, moderate brown, Silty SAND, scattered cobbles | 90 | 126.7 | 10.4 |
| 12 | | | | | | | | |
| 14 | | | | SM | | | | |
| 16 | B2-5 | | | | -Very dense, moist, moderate brown, poorly graded SAND with silt | 88 | 109.1 | 7.3 |
| 18 | | | | | | | | |
| | B2-6 | | | | -With silt and gravel; (top of cobble layer?) | 50/4 | | |
| | | | | | BORING TERMINATED AT 19½ FEET<br>Backfilled with soil cuttings mixed with 1x94 lb sack of cement | | | |

07213-22-01.GPJ

**Figure A-2,**
**Log of Boring B 2, Page 1 of 1**

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◣ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07213-22-01

## BORING B 3

ELEV. (MSL.) 101' DATE COMPLETED 12-30-2003

EQUIPMENT CME 75

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B3-1 | | | SM | **UNDOCUMENTED FILL**<br>Loose, moist, moderate brown, Silty SAND | | | |
| 2 | B3-2 | | | SM | **TERRACE DEPOSITS**<br>Dense, moist, moderate brown Silty SAND | 58 | 116.2 | 6.7 |
| 4 | | | | | | | | |
| 6 | B3-3 | | | SM | | 55 | 120.9 | 9.5 |
| 8 | | | | | | | | |
| 10 | B3-4 | | | | -Very dense, moist, moderate brown, poorly graded SAND with Silt | 50/6 | | |
| | | | | | BORING TERMINATED AT 10½ FEET<br>Backfilled with soil cuttings mixed with 1x94 lb sack of cement | | | |

**Figure A-3,**
**Log of Boring B 3, Page 1 of 1**

07213-22-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07213-22-01

## BORING B 4

ELEV. (MSL.) 100' DATE COMPLETED 12-30-2003

EQUIPMENT CME 75

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B4-1 | | | | **UNDOCUMENTED FILL** | | | |
| 2 | B4-2 | | | SM | Medium dense to loose, moist to wet, moderate brown Silty SAND | 28 | 120.4 | 10.7 |
| 4 | | | | | | | | |
| 6 | B4-3 | | | SM | **TERRACE DEPOSITS** -Medium dense, moist, moderate brown, Silty SAND | 24 | | |
| 8 | | | | | | | | |
| 10 | B4-4 | | | SP-SM | Dense, moist, moderate brown poorly graded SAND with Silt | 38 | 107.8 | 7.4 |
| | | | | | BORING TERMINATED AT 11 FEET<br>Backfilled with soil cuttings mixed with ½x94 lb sack of cement | | | |

**Figure A-4,**
**Log of Boring B 4, Page 1 of 1**

07213-22-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◣ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07213-22-01

## BORING B 5

ELEV. (MSL.) 109' DATE COMPLETED 12-30-2003

EQUIPMENT CME 75

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B5-1 | | | SM | **UNDOCUMENTED FILL**<br>Loose, moist, dark yellowish brown and light brown Silty SAND; scattered gravel | | | |
| 2 | B5-2 | | | | | 50/6 | | |
| 4 | | | | SM | **TERRACE DEPOSITS**<br>Very dense, moist, moderate brown Silty SAND | | | |
| 6 | B5-3 | | | | | 50/4 | 109.6 | 6.8 |
| 8 | | | | | | | | |
| 10 | B5-4 | | | SP-SM | Very dense, moist, grayish orange and dark yellowish orange SAND with Silt | 98 | 106.5 | 3.6 |
| 12 | | | | | | | | |
| 14 | | | | SC | Very dense, moist, moderate to light brown Clayey SAND | | | |
| 16 | B5-5 | | | | | 50/6 | 109.8 | 7.4 |
| 18 | | | | | | | | |
| 20 | B5-6 | | | | | 78 | | |
| | | | | | BORING TERMINATED AT 20 FEET<br>Backfilled with soil cuttings mixed with 1x94 lb sack of cement | | | |

07213-22-01.GPJ

**Figure A-5,**
**Log of Boring B 5, Page 1 of 1**

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

# APPENDIX B

# APPENDIX B
# LABORATORY TESTING

Presented below are the results of laboratory testing performed as part of Geocon's 2004 geotechnical investigation. Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. Samples were subjected to drained direct shear testing, expansion index testing, R-value testing, and laboratory maximum dry density and optimum moisture content tests. One sample was tested for its corrosivity characteristics. Results of all laboratory tests are presented on the following tables. In situ moisture and dry density tests are presented on the boring logs (Appendix A).

## SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS
## ASTM D 3080

| Sample No. | Dry Density (pcf) | Moisture Content (%) | Unit Cohesion (psf) | Angle of Shear Resistance (degrees) |
|---|---|---|---|---|
| B1-1 and B5-1 combined* | 119.0 | 9.4 | 344 | 38 |
| B1-5 | 113.3 | 6.6 | 197 | 40 |

* Sample remolded to 90 percent relative compaction at approximately optimum moisture content.

## SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS
## ASTM D 4829

| Sample No. | Moisture Content | | Dry Density (pcf) | Expansion Index |
|---|---|---|---|---|
| | Before Test (%) | After Test (%) | | |
| B1-1 and B5-1 combined | 7.8 | 12.9 | 118.7 | 0 |

## SUMMARY OF LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT TEST RESULTS
## ASTM D 1557

| Sample No. | Description | Maximum Dry Density (pcf) | Optimum Moisture Content (% dry wt.) |
|---|---|---|---|
| B1-1 and B5-1 combined | Brown Silty SAND | 134.2 | 7.8 |

## SUMMARY OF LABORATORY RESISTANCE VALUE TEST RESULTS
## ASTM D 2844

| Sample No. | Description | R-Value |
|---|---|---|
| B1-1 and B5-1 combined | Brown Silty SAND | 64 |

## SUMMARY OF LABORATORY PH AND RESISTIVITY TEST RESULTS
## CALIFORNIA TEST METHOD NO. 643

| Sample No. | pH | MINIMUM RESISTIVITY (OHM-CENTIMETERS) |
|---|---|---|
| B1-1 and B5-1 combined | 6.8 | 175.8 |

## SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS
## CALIFORNIA TEST METHOD NO. 417

| Sample No. | WATER-SOLUBLE SULFATE (%) |
|---|---|
| B1-1 and B5-1 combined | 0.015 |

# APPENDIX C

# APPENDIX C

# RECOMMENDED GRADING SPECIFICATIONS

## FOR

## 901 MISSION AVENUE MIXED-USE
## OCEANSIDE, CALIFORNIA

## PROJECT NO. G3303-42-01

# RECOMMENDED GRADING SPECIFICATIONS

## 1. GENERAL

1.1 These Recommended Grading Specifications shall be used in conjunction with the Geotechnical Report for the project prepared by Geocon. The recommendations contained in the text of the Geotechnical Report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict.

1.2 Prior to the commencement of grading, a geotechnical consultant (Consultant) shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications. It shall be the responsibility of the Contractor to assist the Consultant and keep them apprised of work schedules and changes so that personnel may be scheduled accordingly.

1.3 It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans. If, in the opinion of the Consultant, unsatisfactory conditions such as questionable soil materials, poor moisture condition, inadequate compaction, and/or adverse weather result in a quality of work not in conformance with these specifications, the Consultant will be empowered to reject the work and recommend to the Owner that grading be stopped until the unacceptable conditions are corrected.

## 2. DEFINITIONS

2.1 **Owner** shall refer to the owner of the property or the entity on whose behalf the grading work is being performed and who has contracted with the Contractor to have grading performed.

2.2 **Contractor** shall refer to the Contractor performing the site grading work.

2.3 **Civil Engineer** or **Engineer of Work** shall refer to the California licensed Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topography.

2.4 **Consultant** shall refer to the soil engineering and engineering geology consulting firm retained to provide geotechnical services for the project.

2.5 **Soil Engineer** shall refer to a California licensed Civil Engineer retained by the Owner, who is experienced in the practice of geotechnical engineering. The Soil Engineer shall be responsible for having qualified representatives on-site to observe and test the Contractor's work for conformance with these specifications.

2.6 **Engineering Geologist** shall refer to a California licensed Engineering Geologist retained by the Owner to provide geologic observations and recommendations during the site grading.

2.7 **Geotechnical Report** shall refer to a soil report (including all addenda) which may include a geologic reconnaissance or geologic investigation that was prepared specifically for the development of the project for which these Recommended Grading Specifications are intended to apply.

## 3. MATERIALS

3.1 Materials for compacted fill shall consist of any soil excavated from the cut areas or imported to the site that, in the opinion of the Consultant, is suitable for use in construction of fills. In general, fill materials can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.

3.1.1 **Soil fills** are defined as fills containing no rocks or hard lumps greater than 12 inches in maximum dimension and containing at least 40 percent by weight of material smaller than ¾ inch in size.

3.1.2 **Soil-rock fills** are defined as fills containing no rocks or hard lumps larger than 4 feet in maximum dimension and containing a sufficient matrix of soil fill to allow for proper compaction of soil fill around the rock fragments or hard lumps as specified in Paragraph 6.2. **Oversize rock** is defined as material greater than 12 inches.

3.1.3 **Rock fills** are defined as fills containing no rocks or hard lumps larger than 3 feet in maximum dimension and containing little or no fines. Fines are defined as material smaller than ¾ inch in maximum dimension. The quantity of fines shall be less than approximately 20 percent of the rock fill quantity.

3.2 Material of a perishable, spongy, or otherwise unsuitable nature as determined by the Consultant shall not be used in fills.

3.3 Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Articles 9 and 10; 40CFR; and any other applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.

3.4 The outer 15 feet of *soil-rock* fill slopes, measured horizontally, should be composed of properly compacted *soil* fill materials approved by the Consultant. *Rock* fill may extend to the slope face, provided that the slope is not steeper than 2:1 (horizontal:vertical) and a soil layer no thicker than 12 inches is track-walked onto the face for landscaping purposes. This procedure may be utilized provided it is acceptable to the governing agency, Owner and Consultant.

3.5 Samples of soil materials to be used for fill should be tested in the laboratory by the Consultant to determine the maximum density, optimum moisture content, and, where appropriate, shear strength, expansion, and gradation characteristics of the soil.

3.6 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated condition.

## 4. CLEARING AND PREPARING AREAS TO BE FILLED

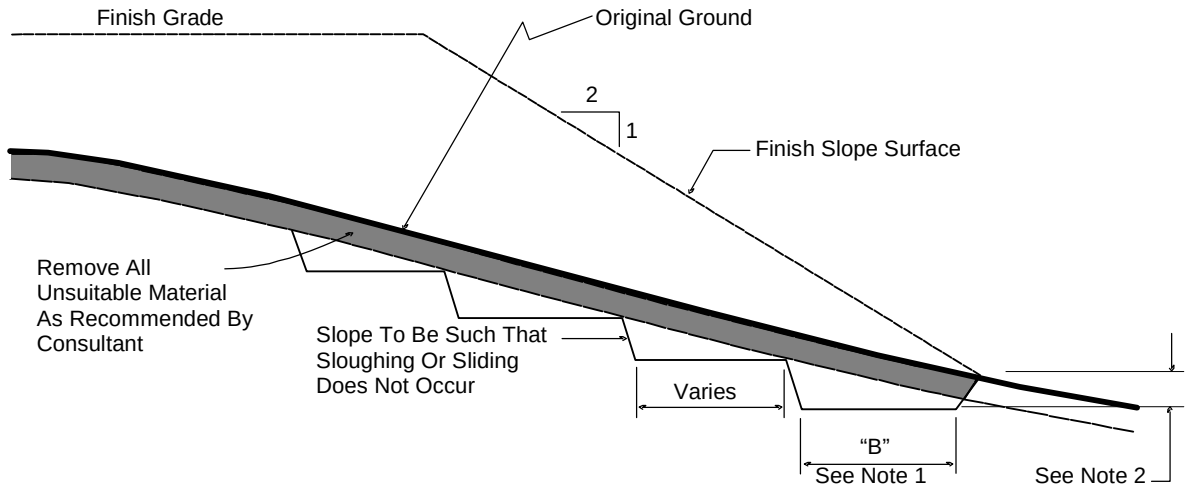
4.1 Areas to be excavated and filled shall be cleared and grubbed. Clearing shall consist of complete removal above the ground surface of trees, stumps, brush, vegetation, man-made structures, and similar debris. Grubbing shall consist of removal of stumps, roots, buried logs and other unsuitable material and shall be performed in areas to be graded. Roots and other projections exceeding 1½ inches in diameter shall be removed to a depth of 3 feet below the surface of the ground. Borrow areas shall be grubbed to the extent necessary to provide suitable fill materials.

4.2 Asphalt pavement material removed during clearing operations should be properly disposed at an approved off-site facility or in an acceptable area of the project evaluated by Geocon and the property owner. Concrete fragments that are free of reinforcing steel may be placed in fills, provided they are placed in accordance with Section 6.2 or 6.3 of this document.

4.3 After clearing and grubbing of organic matter and other unsuitable material, loose or porous soils shall be removed to the depth recommended in the Geotechnical Report. The depth of removal and compaction should be observed and approved by a representative of the Consultant. The exposed surface shall then be plowed or scarified to a minimum depth of 6 inches and until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.

4.4 Where the slope ratio of the original ground is steeper than 5:1 (horizontal:vertical), or where recommended by the Consultant, the original ground should be benched in accordance with the following illustration.

TYPICAL BENCHING DETAIL




No Scale

DETAIL NOTES:

(1) Key width "B" should be a minimum of 10 feet, or sufficiently wide to permit complete coverage with the compaction equipment used. The base of the key should be graded horizontal, or inclined slightly into the natural slope.

(2) The outside of the key should be below the topsoil or unsuitable surficial material and at least 2 feet into dense formational material. Where hard rock is exposed in the bottom of the key, the depth and configuration of the key may be modified as approved by the Consultant.

4.5 After areas to receive fill have been cleared and scarified, the surface should be moisture conditioned to achieve the proper moisture content, and compacted as recommended in Section 6 of these specifications.

## 5. COMPACTION EQUIPMENT

5.1 Compaction of *soil* or *soil-rock* fill shall be accomplished by sheepsfoot or segmented-steel wheeled rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment. Equipment shall be of such a design that it will be capable of compacting the *soil* or *soil-rock* fill to the specified relative compaction at the specified moisture content.

5.2 Compaction of *rock* fills shall be performed in accordance with Section 6.3.

## 6. PLACING, SPREADING AND COMPACTION OF FILL MATERIAL

6.1 *Soil* fill, as defined in Paragraph 3.1.1, shall be placed by the Contractor in accordance with the following recommendations:

6.1.1 *Soil* fill shall be placed by the Contractor in layers that, when compacted, should generally not exceed 8 inches. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to obtain uniformity of material and moisture in each layer. The entire fill shall be constructed as a unit in nearly level lifts. Rock materials greater than 12 inches in maximum dimension shall be placed in accordance with Section 6.2 or 6.3 of these specifications.

6.1.2 In general, the *soil* fill shall be compacted at a moisture content at or above the optimum moisture content as determined by ASTM D 1557.

6.1.3 When the moisture content of *soil* fill is below that specified by the Consultant, water shall be added by the Contractor until the moisture content is in the range specified.

6.1.4 When the moisture content of the *soil* fill is above the range specified by the Consultant or too wet to achieve proper compaction, the *soil* fill shall be aerated by the Contractor by blading/mixing, or other satisfactory methods until the moisture content is within the range specified.

6.1.5 After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to a relative compaction of at least 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry density of the compacted fill to the maximum laboratory dry density as determined in accordance with ASTM D 1557. Compaction shall be continuous over the entire area, and compaction equipment shall make sufficient passes so that the specified minimum relative compaction has been achieved throughout the entire fill.

6.1.6 Where practical, soils having an Expansion Index greater than 50 should be placed at least 3 feet below finish pad grade and should be compacted at a moisture content generally 2 to 4 percent greater than the optimum moisture content for the material.

6.1.7 Properly compacted *soil* fill shall extend to the design surface of fill slopes. To achieve proper compaction, it is recommended that fill slopes be over-built by at least 3 feet and then cut to the design grade. This procedure is considered preferable to track-walking of slopes, as described in the following paragraph.

6.1.8 As an alternative to over-building of slopes, slope faces may be back-rolled with a heavy-duty loaded sheepsfoot or vibratory roller at maximum 4-foot fill height intervals. Upon completion, slopes should then be track-walked with a D-8 dozer or similar equipment, such that a dozer track covers all slope surfaces at least twice.

6.2 *Soil-rock* fill, as defined in Paragraph 3.1.2, shall be placed by the Contractor in accordance with the following recommendations:

6.2.1 Rocks larger than 12 inches but less than 4 feet in maximum dimension may be incorporated into the compacted *soil* fill, but shall be limited to the area measured 15 feet minimum horizontally from the slope face and 5 feet below finish grade or 3 feet below the deepest utility, whichever is deeper.

6.2.2 Rocks or rock fragments up to 4 feet in maximum dimension may either be individually placed or placed in windrows. Under certain conditions, rocks or rock fragments up to 10 feet in maximum dimension may be placed using similar methods. The acceptability of placing rock materials greater than 4 feet in

maximum dimension shall be evaluated during grading as specific cases arise and shall be approved by the Consultant prior to placement.

6.2.3 For individual placement, sufficient space shall be provided between rocks to allow for passage of compaction equipment.

6.2.4 For windrow placement, the rocks should be placed in trenches excavated in properly compacted *soil* fill. Trenches should be approximately 5 feet wide and 4 feet deep in maximum dimension. The voids around and beneath rocks should be filled with approved granular soil having a Sand Equivalent of 30 or greater and should be compacted by flooding. Windrows may also be placed utilizing an "open-face" method in lieu of the trench procedure, however, this method should first be approved by the Consultant.

6.2.5 Windrows should generally be parallel to each other and may be placed either parallel to or perpendicular to the face of the slope depending on the site geometry. The minimum horizontal spacing for windrows shall be 12 feet center-to-center with a 5-foot stagger or offset from lower courses to next overlying course. The minimum vertical spacing between windrow courses shall be 2 feet from the top of a lower windrow to the bottom of the next higher windrow.

6.2.6 Rock placement, fill placement and flooding of approved granular soil in the windrows should be continuously observed by the Consultant.

6.3 *Rock* fills, as defined in Section 3.1.3, shall be placed by the Contractor in accordance with the following recommendations:

6.3.1 The base of the *rock* fill shall be placed on a sloping surface (minimum slope of 2 percent). The surface shall slope toward suitable subdrainage outlet facilities. The *rock* fills shall be provided with subdrains during construction so that a hydrostatic pressure buildup does not develop. The subdrains shall be permanently connected to controlled drainage facilities to control post-construction infiltration of water.

6.3.2 *Rock* fills shall be placed in lifts not exceeding 3 feet. Placement shall be by rock trucks traversing previously placed lifts and dumping at the edge of the currently placed lift. Spreading of the *rock* fill shall be by dozer to facilitate *seating* of the

rock. The *rock* fill shall be watered heavily during placement. Watering shall consist of water trucks traversing in front of the current rock lift face and spraying water continuously during rock placement. Compaction equipment with compactive energy comparable to or greater than that of a 20-ton steel vibratory roller or other compaction equipment providing suitable energy to achieve the required compaction or deflection as recommended in Paragraph 6.3.3 shall be utilized. The number of passes to be made should be determined as described in Paragraph 6.3.3. Once a *rock* fill lift has been covered with *soil* fill, no additional *rock* fill lifts will be permitted over the *soil* fill.

6.3.3 Plate bearing tests, in accordance with ASTM D 1196, may be performed in both the compacted *soil* fill and in the *rock* fill to aid in determining the required minimum number of passes of the compaction equipment. If performed, a minimum of three plate bearing tests should be performed in the properly compacted *soil* fill (minimum relative compaction of 90 percent). Plate bearing tests shall then be performed on areas of *rock* fill having two passes, four passes and six passes of the compaction equipment, respectively. The number of passes required for the *rock* fill shall be determined by comparing the results of the plate bearing tests for the *soil* fill and the *rock* fill and by evaluating the deflection variation with number of passes. The required number of passes of the compaction equipment will be performed as necessary until the plate bearing deflections are equal to or less than that determined for the properly compacted *soil* fill. In no case will the required number of passes be less than two.

6.3.4 A representative of the Consultant should be present during *rock* fill operations to observe that the minimum number of “passes” have been obtained, that water is being properly applied and that specified procedures are being followed. The actual number of plate bearing tests will be determined by the Consultant during grading.

6.3.5 Test pits shall be excavated by the Contractor so that the Consultant can state that, in their opinion, sufficient water is present and that voids between large rocks are properly filled with smaller rock material. In-place density testing will not be required in the *rock* fills.

6.3.6 To reduce the potential for “piping” of fines into the *rock* fill from overlying *soil* fill material, a 2-foot layer of graded filter material shall be placed above the uppermost lift of *rock* fill. The need to place graded filter material below the *rock*

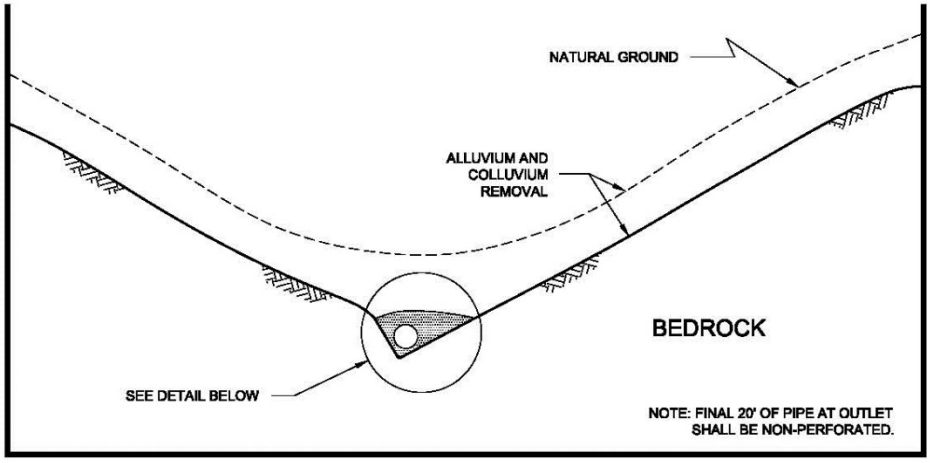
should be determined by the Consultant prior to commencing grading. The gradation of the graded filter material will be determined at the time the *rock* fill is being excavated. Materials typical of the *rock* fill should be submitted to the Consultant in a timely manner, to allow design of the graded filter prior to the commencement of *rock* fill placement.

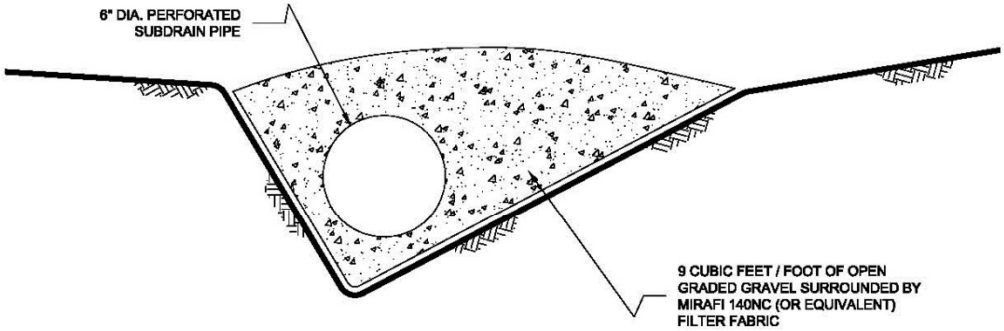
6.3.7 *Rock* fill placement should be continuously observed during placement by the Consultant.

## 7. SUBDRAINS

7.1 The geologic units on the site may have permeability characteristics and/or fracture systems that could be susceptible under certain conditions to seepage. The use of canyon subdrains may be necessary to mitigate the potential for adverse impacts associated with seepage conditions. Canyon subdrains with lengths in excess of 500 feet or extensions of existing offsite subdrains should use 8-inch-diameter pipes. Canyon subdrains less than 500 feet in length should use 6-inch-diameter pipes.

TYPICAL CANYON DRAIN DETAIL




NOTES:

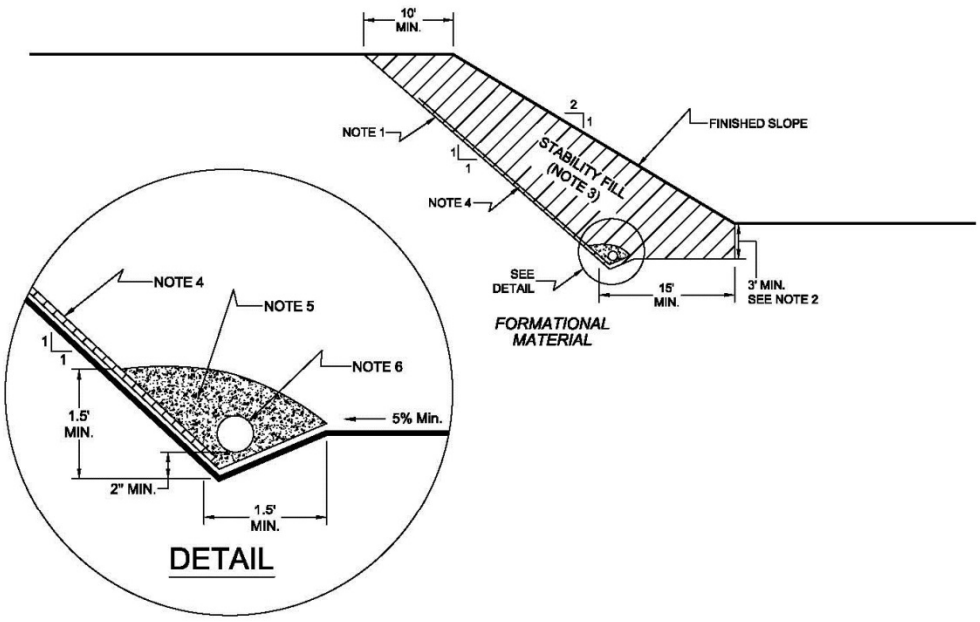
1.....6-INCH DIAMETER, SCHEDULE 80 PVC PERFORATED PIPE FOR FILLS
IN EXCESS OF 100-FEET IN DEPTH OR A PIPE LENGTH OF LONGER THAN 500 FEET.

2.....6-INCH DIAMETER, SCHEDULE 40 PVC PERFORATED PIPE FOR FILLS
LESS THAN 100-FEET IN DEPTH OR A PIPE LENGTH SHORTER THAN 500 FEET.

NO SCALE

7.2 Slope drains within stability fill keyways should use 4-inch-diameter (or lager) pipes.

TYPICAL STABILITY FILL DETAIL




**NOTES:**

1.....EXCAVATE BACKCUT AT 1:1 INCLINATION (UNLESS OTHERWISE NOTED).

2.....BASE OF STABILITY FILL TO BE 3 FEET INTO FORMATIONAL MATERIAL, SLOPING A MINIMUM 5% INTO SLOPE.

3.....STABILITY FILL TO BE COMPOSED OF PROPERLY COMPACTED GRANULAR SOIL.

4.....CHIMNEY DRAINS TO BE APPROVED PREFABRICATED CHIMNEY DRAIN PANELS (MIRADRAIN G200N OR EQUIVALENT) SPACED APPROXIMATELY 20 FEET CENTER TO CENTER AND 4 FEET WIDE. CLOSER SPACING MAY BE REQUIRED IF SEEPAGE IS ENCOUNTERED.

5.....FILTER MATERIAL TO BE 3/4-INCH, OPEN-GRADED CRUSHED ROCK ENCLOSED IN APPROVED FILTER FABRIC (MIRAFI 140NC).

6.....COLLECTOR PIPE TO BE 4-INCH MINIMUM DIAMETER, PERFORATED, THICK-WALLED PVC SCHEDULE 40 OR EQUIVALENT, AND SLOPED TO DRAIN AT 1 PERCENT MINIMUM TO APPROVED OUTLET.

NO SCALE

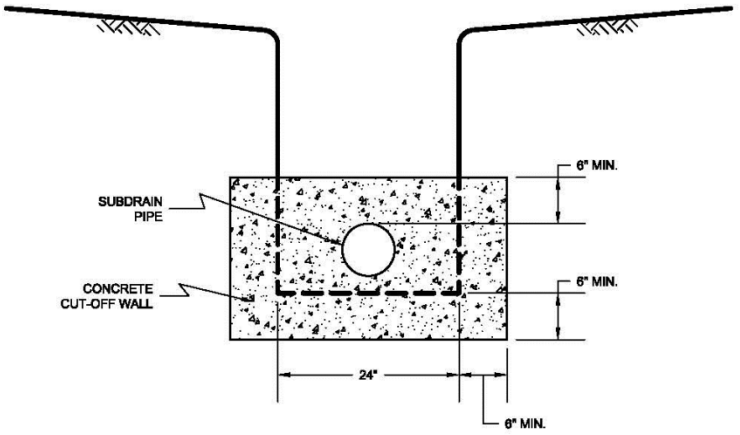
7.3 The actual subdrain locations will be evaluated in the field during the remedial grading operations. Additional drains may be necessary depending on the conditions observed and the requirements of the local regulatory agencies. Appropriate subdrain outlets should be evaluated prior to finalizing 40-scale grading plans.

7.4 *Rock* fill or *soil-rock* fill areas may require subdrains along their down-slope perimeters to mitigate the potential for buildup of water from construction or landscape irrigation. The subdrains should be at least 6-inch-diameter pipes encapsulated in gravel and filter fabric. *Rock* fill drains should be constructed using the same requirements as canyon subdrains.

7.5 Prior to outletting, the final 20-foot segment of a subdrain that will not be extended during future development should consist of non-perforated drainpipe. At the non-perforated/ perforated interface, a seepage cutoff wall should be constructed on the downslope side of the pipe.

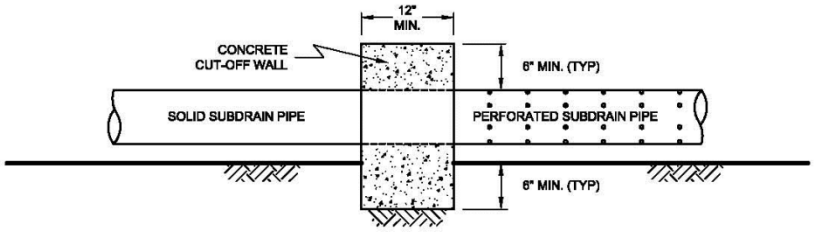
TYPICAL CUT OFF WALL DETAIL

FRONT VIEW




NO SCALE

SIDE VIEW

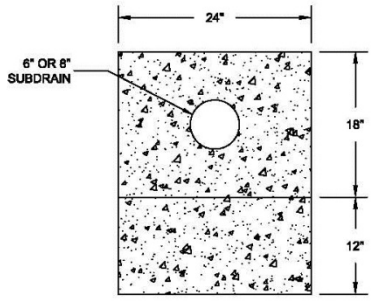



NO SCALE

7.6 Subdrains that discharge into a natural drainage course or open space area should be provided with a permanent headwall structure.

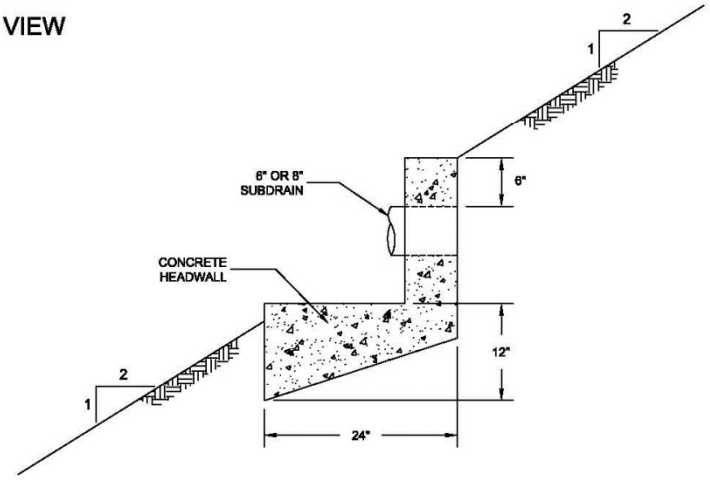
TYPICAL HEADWALL DETAIL

FRONT VIEW




NO SCALE

SIDE VIEW




NOTE: HEADWALL SHOULD OUTLET AT TOE OF FILL SLOPE
OR INTO CONTROLLED SURFACE DRAINAGE

NO SCALE

7.7 The final grading plans should show the location of the proposed subdrains. After completion of remedial excavations and subdrain installation, the project civil engineer should survey the drain locations and prepare an “as-built” map showing the drain locations. The final outlet and connection locations should be determined during grading operations. Subdrains that will be extended on adjacent projects after grading can be placed on formational material and a vertical riser should be placed at the end of the subdrain. The grading contractor should consider videoing the subdrains shortly after

burial to check proper installation and functionality. The contractor is responsible for the performance of the drains.

## 8. OBSERVATION AND TESTING

8.1 The Consultant shall be the Owner's representative to observe and perform tests during clearing, grubbing, filling, and compaction operations. In general, no more than 2 feet in vertical elevation of *soil* or *soil-rock* fill should be placed without at least one field density test being performed within that interval. In addition, a minimum of one field density test should be performed for every 2,000 cubic yards of *soil* or *soil-rock* fill placed and compacted.

8.2 The Consultant should perform a sufficient distribution of field density tests of the compacted *soil* or *soil-rock* fill to provide a basis for expressing an opinion whether the fill material is compacted as specified. Density tests shall be performed in the compacted materials below any disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof is below that specified, the particular layer or areas represented by the test shall be reworked until the specified density has been achieved.

8.3 During placement of *rock* fill, the Consultant should observe that the minimum number of passes have been obtained per the criteria discussed in Section 6.3.3. The Consultant should request the excavation of observation pits and may perform plate bearing tests on the placed *rock* fills. The observation pits will be excavated to provide a basis for expressing an opinion as to whether the *rock* fill is properly seated and sufficient moisture has been applied to the material. When observations indicate that a layer of *rock* fill or any portion thereof is below that specified, the affected layer or area shall be reworked until the *rock* fill has been adequately seated and sufficient moisture applied.

8.4 A settlement monitoring program designed by the Consultant may be conducted in areas of *rock* fill placement. The specific design of the monitoring program shall be as recommended in the Conclusions and Recommendations section of the project Geotechnical Report or in the final report of testing and observation services performed during grading.

8.5 We should observe the placement of subdrains, to check that the drainage devices have been placed and constructed in substantial conformance with project specifications.

8.6 Testing procedures shall conform to the following Standards as appropriate:

**8.6.1 Soil and Soil-Rock Fills:**

8.6.1.1 Field Density Test, ASTM D 1556, *Density of Soil In-Place By the Sand-Cone Method.*

8.6.1.2 Field Density Test, Nuclear Method, ASTM D 6938, *Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).*

8.6.1.3 Laboratory Compaction Test, ASTM D 1557, *Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Pound Hammer and 18-Inch Drop*.

8.6.1.4. Expansion Index Test, ASTM D 4829, *Expansion Index Test*.

## 9. PROTECTION OF WORK

9.1 During construction, the Contractor shall properly grade all excavated surfaces to provide positive drainage and prevent ponding of water. Drainage of surface water shall be controlled to avoid damage to adjoining properties or to finished work on the site. The Contractor shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control features have been installed. Areas subjected to erosion or sedimentation shall be properly prepared in accordance with the Specifications prior to placing additional fill or structures.

9.2 After completion of grading as observed and tested by the Consultant, no further excavation or filling shall be conducted except in conjunction with the services of the Consultant.

## 10. CERTIFICATIONS AND FINAL REPORTS

10.1 Upon completion of the work, Contractor shall furnish Owner a certification by the Civil Engineer stating that the lots and/or building pads are graded to within 0.1 foot vertically of elevations shown on the grading plan and that all tops and toes of slopes are within 0.5 foot horizontally of the positions shown on the grading plans. After installation of a section of subdrain, the project Civil Engineer should survey its location and prepare an *as-built* plan of the subdrain location. The project Civil Engineer should verify the proper outlet for the subdrains and the Contractor should ensure that the drain system is free of obstructions.

10.2 The Owner is responsible for furnishing a final as-graded soil and geologic report satisfactory to the appropriate governing or accepting agencies. The as-graded report should be prepared and signed by a California licensed Civil Engineer experienced in

geotechnical engineering and by a California Certified Engineering Geologist, indicating that the geotechnical aspects of the grading were performed in substantial conformance with the Specifications or approved changes to the Specifications.

# LIST OF REFERENCES

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