City of Oakley
Planning Division

Oakley Shops at Laurel Fields Project

Initial Study/Mitigated Negative Declaration

June 2024

Prepared by

RANEY PLANNING & MANAGEMENT, INC. | 25 years
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INITIAL STUDY

A. PROJECT SUMMARY

1. Project Title: Oakley Shops at Laurel Fields Tentative Parcel Map, Conditional Use Permit, Variance, and Design Review (TPM 01-24, CUP 01-24, VA 01-24, DR 02-24)

2. Lead Agency Name and Address: City of Oakley
Planning Division
3231 Main Street
Oakley, CA 94561

3. Contact Person and Phone Number: Ken Strelo
Community Development Director
(925) 625-7000

4. Project Location: 998 Laurel Road
Oakley, CA 94561
Assessor's Parcel Number (APN): 035-220-028

5. Project Applicant Name and Address: Regency Centers
1777 Botelo Drive, Suite 200
Walnut Creek, CA 94596

6. Existing General Plan Designation: Commercial (CO)

7. Existing Zoning Designation: RB (Retail Business) District

8. Required Approvals from Other Public Agencies: None

9. Surrounding Land Uses and Setting:

The approximately 8.77-acre project site, identified by APN 035-220-028, is located at 998 Laurel Road in the City of Oakley, California. The project site is primarily undeveloped with 12 non-native trees along the frontage of Laurel Road. The project site includes a gravel roadway, which connects Laurel Road to a centrally located on-site gravel pad. The gravel pad has historically been used as an overflow parking lot for the adjacent Laurel Baseball Fields. Surrounding existing land uses include single-family residences, undeveloped land, the Contra Costa Canal, and the Delta de Anza Regional Trail to the north; a single-family residence and Laurel Baseball Fields to the east; a vineyard to the south, across Laurel Road; and single-family residences, and a 7-Eleven convenience store with Chevron gas station to the west, across O'Hara Avenue. The City of Oakley General Plan designates the project site as Commercial (CO) and the site is zoned RB (Retail Business) District.

10. Project Description Summary:

Development of the Oakley Shops at Laurel Fields Project (proposed project) would include the removal of four of the 12 on-site trees and the construction of a shopping center with 81,728 square feet (sf) of commercial retail space. The project site would be subdivided into two parcels: the 7.72-acre Parcel 1 and 1.05-acre Parcel 2. The Parcel 1 area would be developed with a 55,500-sf Safeway grocery store with a 1,200-sf, fully enclosed outdoor storage area, loading docks, and a drive-thru pharmacy; four separate retail pads totaling 18,145 sf of space for shops and restaurants; and a 5,000-sf pad for shops. Two of the retail pads are anticipated to be developed with drive-thru restaurants. The Parcel 2 area would be developed with a 3,083-sf convenience store and gas station with 16 vehicle fueling stations and adjacent fuel truck parking. The proposed project would also include construction of new sidewalks along the frontage of O'Hara Avenue. The frontage of Laurel Road is already improved with sidewalks. The proposed project would include off-site improvements to the existing bioretention area located within the Laurel Baseball Fields, as well as off-site utility improvements within O'Hara Avenue and Laurel Road. In addition, the proposed project would include the installation of diagonal hatched white striping and "KEEP CLEAR" markings in the portion of O'Hara Avenue, which abuts the central project driveway. The project would require approval of a Tentative Parcel Map (TPM 01-24); Conditional Use Permit (CUP 01-24) for the operation of two drive-thru restaurants and one drive-thru pharmacy on Parcel 1 and the operation of a gas station on Parcel 2; Variance (VA 01-24) for an additional five feet in allowable height on the grocery store entry tower; as well as a Design Review (DR 02-24).

11. Status of Native American Consultation Pursuant to Public Resources Code Section 21080.3.1:

In compliance with Assembly Bill (AB) 52 (Public Resources Code [PRC] Section 21080.3.1), a project notification letter was distributed to the chairpersons of the following tribes on March 25, 2024: Amah Mutsun Tribal Band of Mission San Juan Bautista, Chicken Ranch Rancheria of Me-Wuk Indians, Guidiville Indian Rancheria, Indian Canyon Mutsun Band of Costanoan Ohlone People, Muwekma Ohlone Indian Tribe of the SF Bay Area, Nashville Enterprise Miwok-Maidu-Nishinam Tribe, North Valley Yokuts Tribe, The Ohlone Indian Tribe, Tule River Indian Tribe, Wilton Rancheria, and The Confederated Villages of Lisjan. The City of Oakley received an email from Corrina Gould, Tribal Chair of Confederated Villages of Lisjan Nation with a request to review the California Historic Resources Information System (CHRIS) and Sacred Lands File (SLF) search results, as well as any available archaeological reports. The City of Oakley also received an email and letter from Irenne Zwielein of The Amah Mutsun Tribal Band of San Juan Bautista which offered their Cultural Resources Monitoring, Consulting and/or Sensitivity Training services. Requests to consult were not received during the 30-day response period.

B. SOURCES

All technical reports and modeling results prepared for the project analysis are available at: https://www.ci.oakley.ca.us/ceqa-documents/. The following documents are referenced information sources used for the purposes of this Initial Study/Mitigated Negative Declaration (IS/MND):

1. Association of Bay Area Governments. *Hazard Viewer.* Available at: https://abag.ca.gov/our-work/resilience/data-research/hazard-viewer/. Accessed April 2024.
2. Bay Area Air Quality Management District. *2022 California Environmental Quality Act Guidelines*. April 2023.
3. Bay Area Air Quality Management District. *Air Quality Summary Reports*. Available at: http://www.baaqmd.gov/about-air-quality/air-quality-summaries. Accessed April 2024.
4. Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines.* May 2017.
5. CalEPA. *Cortese List Data Resources*. Available at: https://calepa.ca.gov/sitecleanup/corteselist/. Accessed April 2024.
6. California Air Resources Board. *2022 Scoping Plan for Achieving Carbon Neutrality.* November 16, 2022.
7. California Air Resources Board. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005.
8. California Building Standards Commission. *2022 California Green Building Standards Code*. 2023.
9. California Department of Conservation. *California Earthquake Hazards Zone Application.* Available at: https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed April 2024.
10. California Department of Conservation. *California Important Farmland Finder.* Available at: https://maps.conservation.ca.gov/dlrp/ciff/. Accessed March 2024.
11. California Department of Forestry and Fire Protection. *Contra Costa County, Very High Fire Hazard Severity Zones in LRA*. January 7, 2009.
12. California Department of Resources Recycling and Recovery (CalRecycle). *Facility/Site Summary: Potrero Hill Landfill (48-AA-0075)*. Available at: https://www2.calrecycle.ca.gov/SolidWaste/Site/Summary/3591. Accessed May 2024.
13. California Department of Transportation. *California State Scenic Highway System Map.* Available at: https://www.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed April 2024.
14. California Geologic Survey. *Seismic Hazard Zone Report for the Brentwood 7.5-Minute Quadrangle, Contra Costa County, California.* 2018.
15. City of Oakley. *City of Oakley 2020 General Plan Draft Environmental Impact Report*. September 2002.
16. City of Oakley. *City of Oakley General Plan, Focused General Plan Update*. Adopted January 11, 2022.
17. City of Oakley. *City of Oakley Impact Fees Fiscal Year 23-24.* July 2023.
18. City of Oakley. *Mobility White Paper, City of Oakley Focused General Plan Update.* December 2021.
19. City of Oakley. *Oakley Commercial & Industrial Design Guidelines.* February 2005.
20. City of Oakley. *Oakley Municipal Code* [Title 6, Chapter 11]. Updated February 23, 2021.
21. City of Oakley. *Strategic Energy Plan*. Fall 2015.
22. Contra Costa Conservation and Development. *2016 Agricultural Preserves Map.* Available at: https://www.contracosta.ca.gov/DocumentCenter/View/882/Map-of-Properties-Under-Contract. Accessed March 2024.
23. Contra Costa County Fire Protection District. *2021 Annual Report*. Available at: https://www.cccfpd.org/2022-annual-report/. Accessed April 2024.
24. Contra Costa County. *Contra Costa County Transportation Analysis Guidelines.* June 23, 2020.
25. Department of Toxic Substances Control. *Hazardous Waste and Substances Site List (Cortese).* Available at: https://www.envirostor.dtsc.ca.gov/public/. Accessed April 2024.

26. Diablo Water District. *2020 Urban Water Management Plan.* May 2022.
27. East Contra Costa County Habitat Conservation Plan Association. *Final East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan.* October 2006.
28. Federal Emergency Management Agency. *Flood Insurance Rate Map 06013C0355G.* Effective March 21, 2017.
29. Fehr & Peers. *Final Oakley Shops at Laurel Fields Transportation Impact Assessment.* May 2024.
30. H.T. Harvey & Associates. *East Contra Costa County Habitat Conservation Plan – Assessment of Plan Effects on CEQA Species.* February 17, 2015.
31. Intertek PSI. *Geotechnical Engineering Report Proposed Oakley Shops at Laurel Fields.* October 30, 2023.
32. Intertek PSI. *Geotechnical Engineering Report Addendum #1; Supplemental Recommendations Proposed Oakley Shops at Laurel Fields.* April 16, 2024.
33. Ironhouse Sanitary District. *Sewer System Management Plan*. April 2017.
34. Moore Biological Consultants. *Application Form and Planning Survey Report.* January 2024.
35. Native American Heritage Commission. *Re: Oakley Shops at Laurel Fields Project, Contra Costa County.* March 27, 2024.
36. Northwest Information Center. Re: *Record search results for the proposed Oakley Shops at Laurel Fields Project.* March 29, 2024.
37. SAGE Consulting Engineers, Inc. *Stormwater Control Plan for Oakley Shops at Laurel Fields.* January 31, 2024.
38. Saxelby Acoustics. *Environmental Noise Assessment Oakley Shops at Laurel Fields.* May 14, 2024.
39. State Water Resources Control Board. *GeoTracker.* Available at: https://geotracker.waterboards.ca.gov/map/?myaddress=California&from=header&cqid=8858350455. Accessed April 2024.
40. U.S. Environmental Protection Agency. *Contaminated Land.* Available at: https://www.epa.gov/report-environment/contaminated-land. Accessed April 2024.
41. U.S. Fish and Wildlife Service. *National Wetlands Inventory.* Available at: https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/. Accessed April 2024.

C. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Less Than Significant with Mitigation Incorporated" or as indicated by the checklist on the following pages.

☐ **Aesthetics**	☐ **Agriculture and Forest Resources**	☐ **Air Quality**
☐ **Biological Resources**	☒ **Cultural Resources**	☐ **Energy**
☒ **Geology and Soils**	☒ **Greenhouse Gas Emissions**	☒ **Hazards and Hazardous Materials**
☐ **Hydrology and Water Quality**	☐ **Land Use and Planning**	☐ **Mineral Resources**
☒ **Noise**	☐ **Population and Housing**	☐ **Public Services**
☐ **Recreation**	☒ **Transportation**	☒ **Tribal Cultural Resources**
☐ **Utilities and Service Systems**	☐ **Wildfire**	☒ **Mandatory Findings of Significance**

D. DETERMINATION

On the basis of this initial study:

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

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

☐ I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature	Date
Ken Strelo, Community Development Director	City of Oakley
Printed Name	For

E. BACKGROUND AND INTRODUCTION

This IS/MND provides an environmental analysis pursuant to the California Environmental Quality Act (CEQA) for the proposed project. The applicant has submitted this application to the City of Oakley, which is the Lead Agency for the purposes of CEQA review. The IS/MND contains an analysis of the environmental effects of construction and operation of the proposed project.

In December 2002, the City of Oakley adopted the Oakley General Plan and the Oakley General Plan Environmental Impact Report (EIR). The General Plan EIR was a program-level EIR, prepared pursuant to Section 15168 of the CEQA Guidelines (Title 14, California Code of Regulations [CCR], Sections 15000 et seq.). The General Plan EIR analyzed full implementation of the Oakley General Plan and identified measures to mitigate the significant adverse project and cumulative impacts associated with the General Plan.

In January 2022, the City of Oakley adopted the Focused General Plan Update and the Focused General Plan Update Initial Study/Negative Declaration (IS/ND). The Focused General Plan Update IS/ND analyzed implementation of the Focused General Plan Update. The Focused General Plan Update amended the City's existing General Plan to bring it into compliance with State requirements related to environmental justice, mobility, and climate change and adaptation. The Focused General Plan Update also updated the setting information, and provided minor revisions to the goals, policies, and programs in the following elements: Land Use, Growth Management, Open Space and Conservation, Parks and Recreation, Noise, and Economic Development. All updates were applied to be consistent with current conditions, to remove policies and programs that have already been implemented or are no longer applicable, to update policies and programs to reflect current City practices, and to clarify the City's approach to achieving the vision and goals of the General Plan.

The City of Oakley General Plan, Focused General Plan Update, General Plan EIR, and Focused General Plan Update IS/ND are incorporated by reference to the extent that the analysis included in the aforementioned documents is applicable to the proposed project. The aforementioned documents are available online at:

- https://www.ci.oakley.ca.us/departments/planning-zoning/reference-documents/
- https://www.ci.oakley.ca.us/general-plan-update/

The impact discussions for each section of this IS/MND have been largely based on information in the Oakley General Plan, Focused General Plan Update, Oakley General Plan EIR, and Focused General Plan Update IS/ND, as well as technical studies prepared for the proposed project.

The mitigation measures prescribed for environmental effects described in this IS/MND would be implemented in conjunction with the project, as required by CEQA, and the mitigation measures would be incorporated into the project. In addition, a project Mitigation Monitoring and Reporting Program (MMRP) would be adopted in conjunction with approval of the project.

F. PROJECT DESCRIPTION

The following section provides a comprehensive description of the proposed project in accordance with CEQA Guidelines, including the project location and setting, and project components.

Project Location and Setting

The approximately 8.77-acre project site, further identified by APN 035-220-028, is located at 998 Laurel Road in the City of Oakley, California (see Figure 1 and Figure 2). The project site is primarily undeveloped and includes a gravel roadway, which connects Laurel Road to a centrally located on-site gravel pad. The gravel pad has historically been used as an overflow parking lot for the adjacent Laurel Baseball Fields. Surrounding existing land uses include single-family residences, undeveloped land, the Contra Costa Canal, and the Delta de Anza Regional Trail to the north; a single-family residence and Laurel Baseball Fields to the east; a vineyard to the south, across Laurel Road; and single-family residences, and a 7-Eleven convenience store with a Chevron gas station to the west, across O'Hara Avenue. The project site is located approximately 1.86 miles east of State Route (SR) 4 and approximately 2.43 miles southeast of SR 160. The City of Oakley General Plan designates the project site as CO and the site is zoned RB District.

Project Components

The proposed project would include the subdivision of the project site into two parcels (Parcel 1 and Parcel 2) and development of a new shopping center with approximately seven buildings, totaling 81,728 sf of commercial retail space and a total of 360 parking stalls (see Figure 3). The approximately 7.72-acre Parcel 1 would be developed with a 55,500-sf Safeway grocery store with a 1,200-sf, fully enclosed outdoor storage area, loading docks, and a drive-thru pharmacy; four separate retail pads totaling 18,145 sf of space for shops and restaurants; and a 5,000-sf pad for shops. Two of the retail pads on Parcel 1 are anticipated to be developed with drive-thru restaurants. The approximately 1.05-acre Parcel 2 would be developed with a 3,083-sf convenience store and gas station with 16 vehicle fueling stations and adjacent fuel truck parking. The proposed project would also include construction of new sidewalks along the frontage of O'Hara Avenue. The frontage of Laurel Road is already improved with sidewalks.

Table 1 provides a summary of the type and size of each building proposed as part of the project.

Table 1
Land Use Summary

Building Type	Size (sf)
Parcel 1	
Safeway	55,500
Shops	5,000
Pad 1	7,000
Pad 2	4,680
Pad 3	4,000
Pad 4	2,465
Parcel 1 Total:	78,645
Parcel 2	
Convenience Store	3,083
Parcel 2 Total:	**3,083**
Parcel 1 and Parcel 2 Total:	**81,728**

Figure 1
Regional Project Location

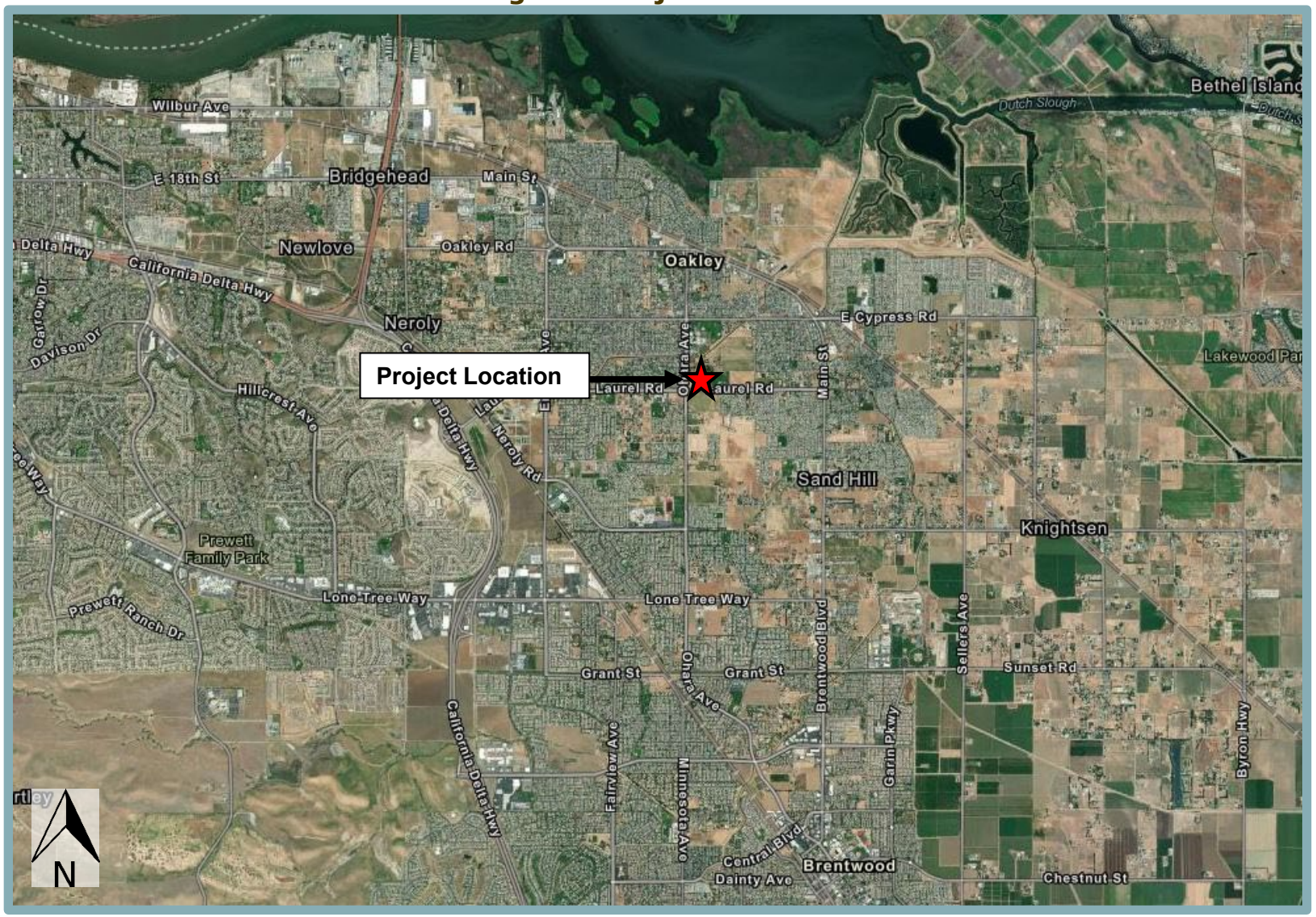
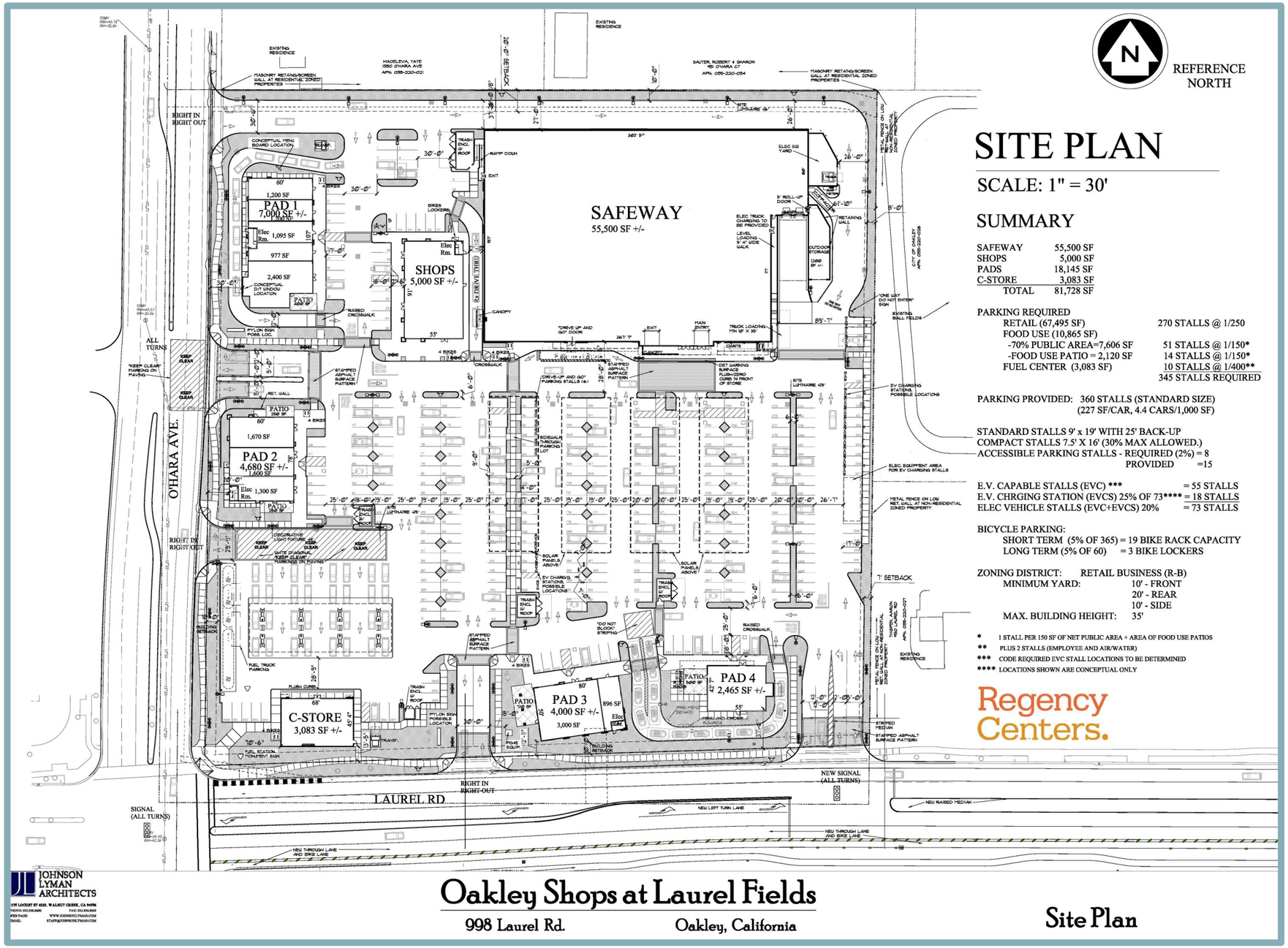


Figure 2
Project Site Boundaries



Figure 3
Site Plan



In addition, the proposed project would include improvements to the existing detention basin located at the Laurel Baseball Fields, east of the project site, as well as off-site utility improvements within O'Hara Avenue and Laurel Road. The proposed project would also include the installation of diagonal hatched white striping and "KEEP CLEAR" markings in the portion of O'Hara Avenue, which abuts the central project driveway.

The proposed project would require approval of a Tentative Parcel Map (TPM 01-24); Conditional Use Permit (CUP 01-24) for the operation of two drive-thru restaurants and one drive-thru pharmacy on Parcel 1 and the operation of a gas station on Parcel 2; Variance (VA 01-24) for an additional five feet in allowable height on the grocery store entry tower; as well as a Design Review (DR 02-24). The following sections describe the foregoing project components.

Tentative Parcel Map

The Tentative Parcel Map would subdivide the project site into two commercial parcels: Parcel 1 and Parcel 2 (see Figure 4). The approximately 1.05-acre Parcel 2 would be located in the southwestern corner of the project site and the approximately 7.72-acre Parcel 1 would consist of the remaining site area.

Below is additional detail regarding the site access and parking lot circulation, landscaping, utility infrastructure, and off-site improvements.

Site Access and Parking Lot Circulation

Primary vehicular access to the site would be provided by three new driveways off of O'Hara Avenue and two new driveways off of Laurel Road. The central driveway off of Laurel Road and the northwestern and southwestern driveways off of O'Hara Avenue would be right-in/right-out only. The remaining driveways off of Laurel Road and O'Hara Avenue would allow vehicles to both enter and exit the project site. Trucks would access the Safeway loading docks from the northernmost driveway off of O'Hara Avenue. The trucks would then travel along a one-way internal roadway located behind the Safeway, along the northern and eastern boundaries of the site.

Emergency vehicle access would be provided by the three new driveways off of O'Hara Avenue and two new driveways off of Laurel Road, which would connect to the proposed parking lot and internal circulation system.

Overall, the proposed parking lot would include 360 parking spaces, including parking spaces for standard and compact vehicles, Americans with Disabilities Act (ADA) parking spaces, parking designated for electric vehicles (EVs), charging stations for EVs, and short-term and long-term bicycle parking. Site improvements would be in compliance ADA parking and path of travel requirements.

It should be noted that roadway improvements to Laurel Road would be completed as part of a separate City of Oakley Capital Improvement Plan (CIP) project, including construction of two new through lanes and a bike lane, new raised median, and a new left turn lane for access to the project's southeastern driveway. As part of the CIP project, the City of Oakley would install a new traffic signal at the intersection of Laurel Road and the project site's southeastern driveway.

Landscaping

The proposed project would include the removal of four existing on-site trees along the Laurel Road frontage; however, a total of 122 drought tolerant trees would be planted throughout the project site, and along the frontages of O'Hara Avenue and Laurel Road (Figure 5).

Figure 4
Tentative Parcel Map

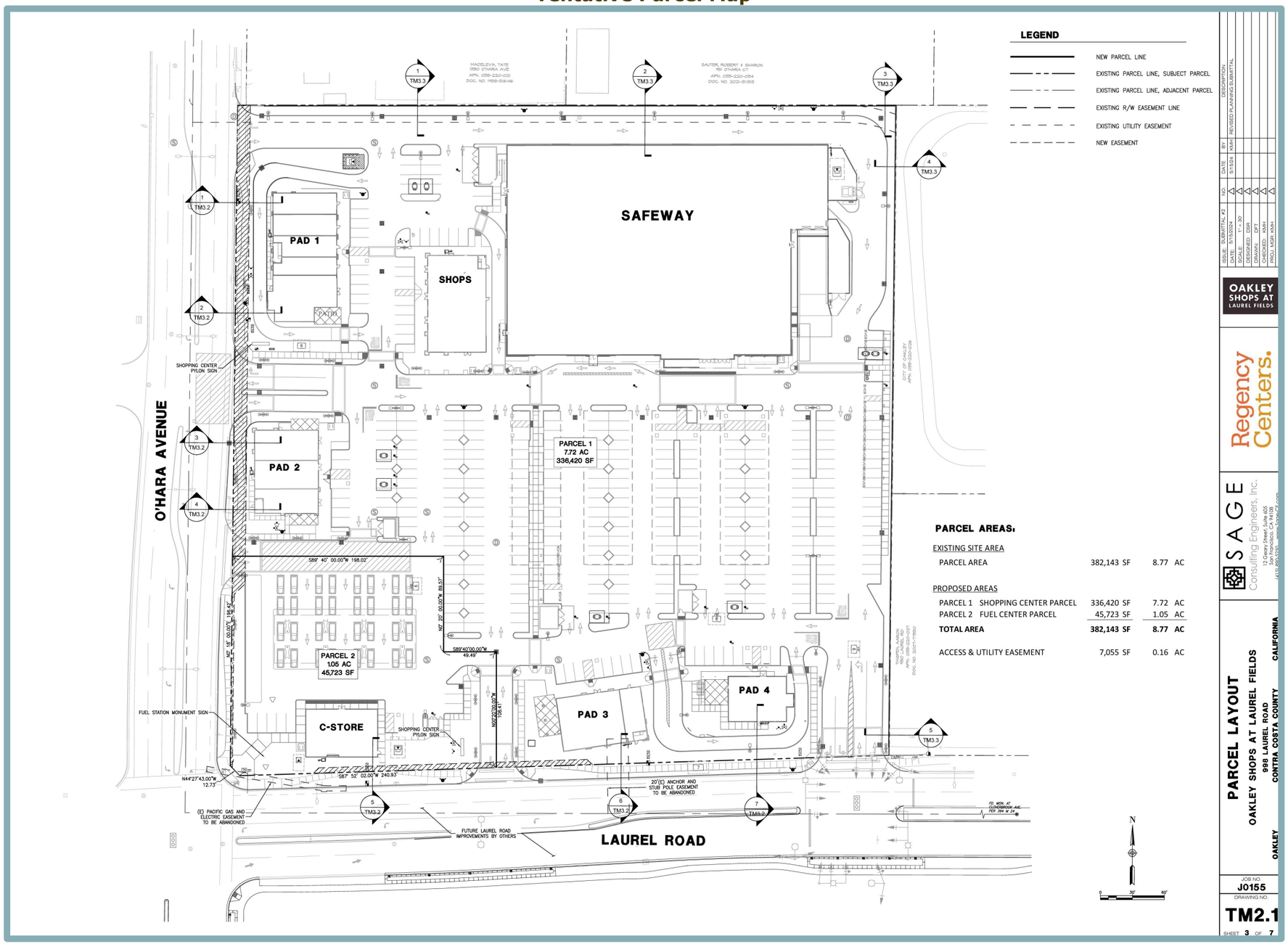
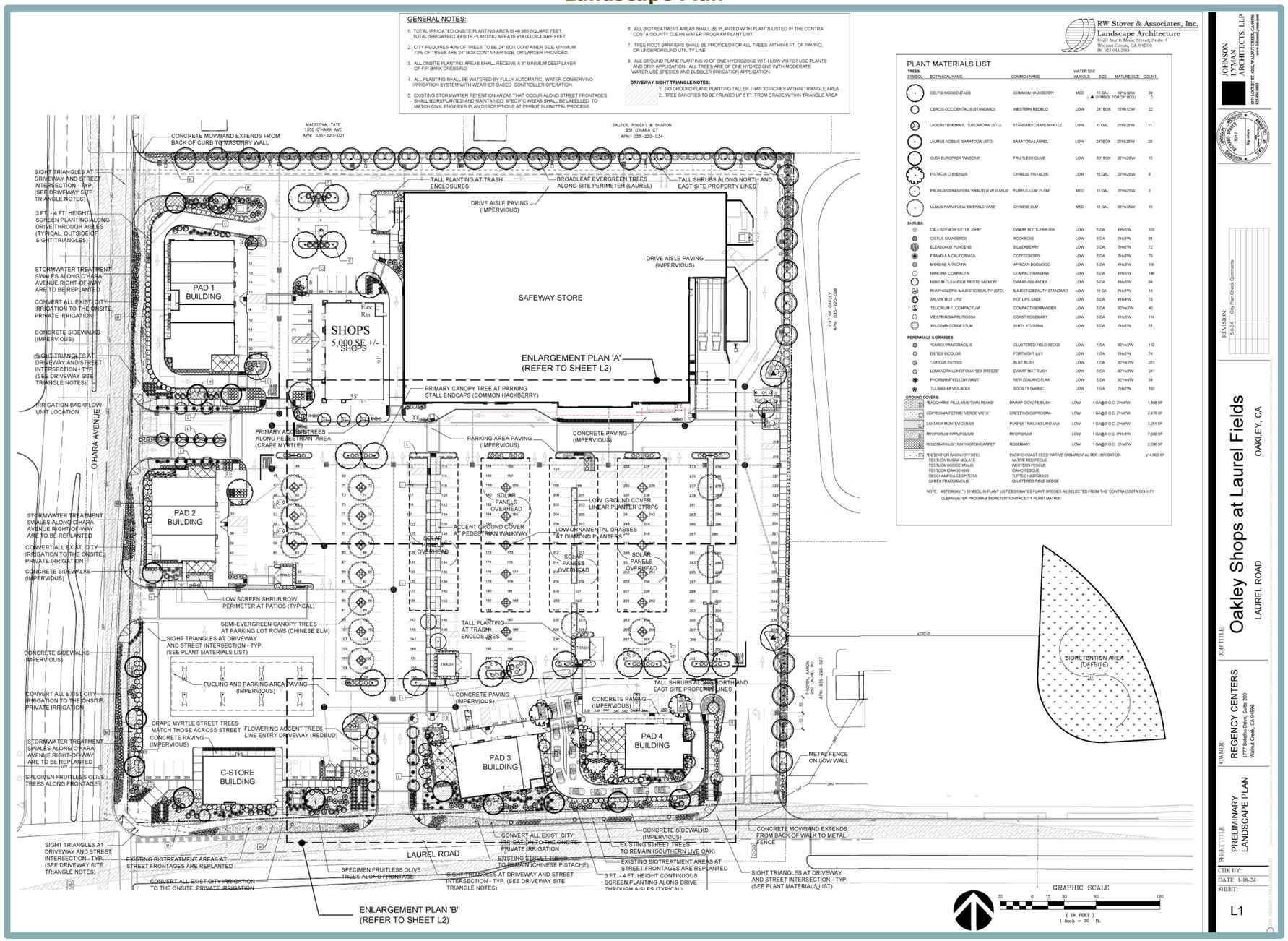


Figure 5
Landscape Plan



In addition, a variety of drought tolerant shrubs, groundcover, and grasses would be planted throughout the project site. All landscaping would comply with the State's Model Water Efficient Landscape Ordinance (MWELO). As required by the City's Commercial and Industrial Design Guidelines, an eight-foot-tall masonry wall, or similar wall, would be constructed along the northern boundary of the project site between the proposed shopping center and the existing adjacent residential properties. The proposed project would also include construction of new sidewalks along the frontage of O'Hara Avenue. The frontage of Laurel Road is already improved with sidewalks.

Utilities

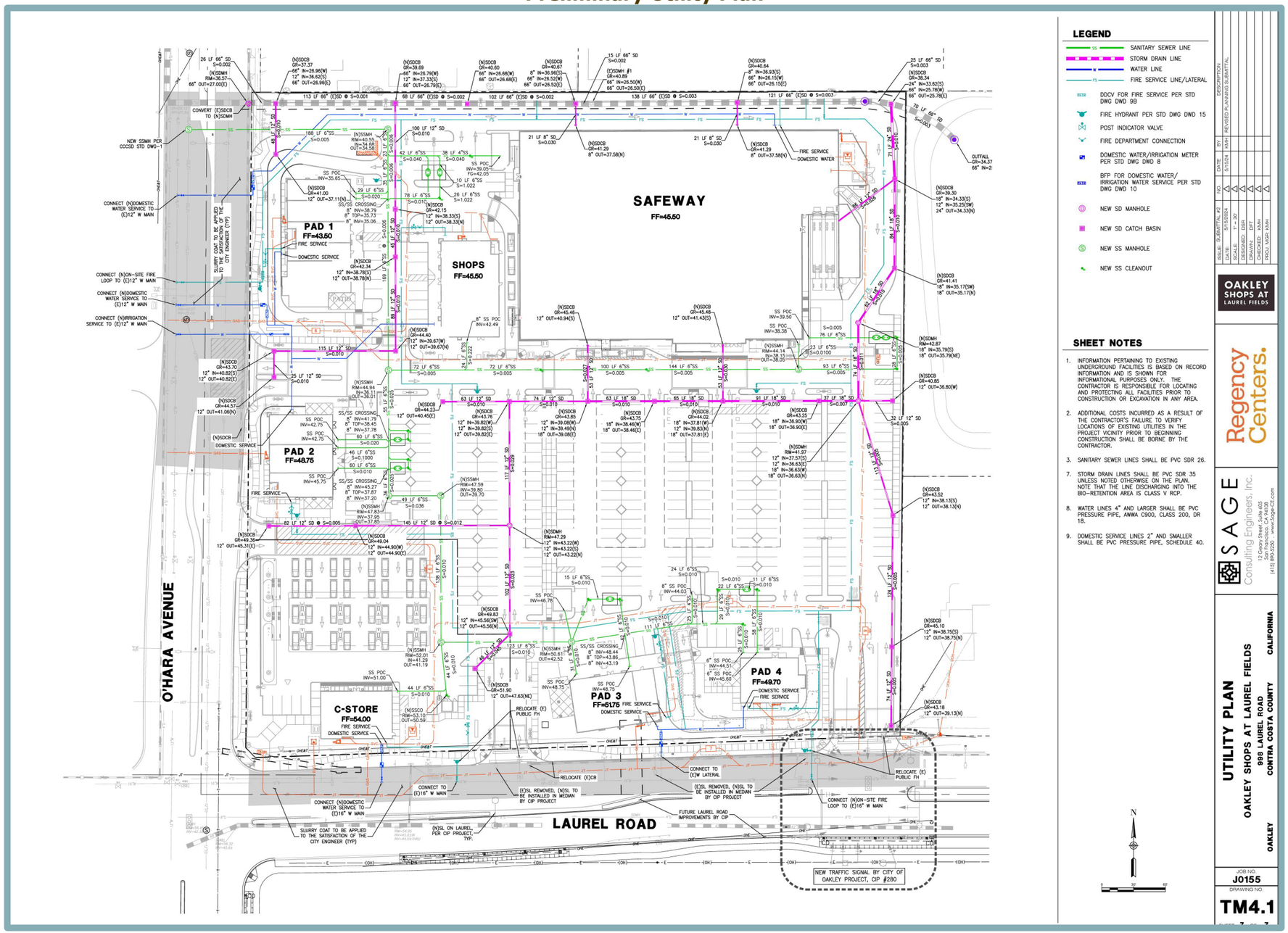
A preliminary utility plan has been prepared for the proposed project and is included as Figure 6. Water service for the proposed project would be provided by the Diablo Water District (DWD). The proposed project would include the installation of five new backflow preventors, five domestic water/irrigation meters, and domestic water lines throughout the project site. The proposed project would also include the installation of new fire service water lines, six fire hydrants, seven post indicator valves, two double detector check valves, and seven new fire department connections. Two of the existing fire hydrants located along the frontage of Laurel Road would be relocated from their existing locations to locations closer to the proposed driveways off of Laurel Road. The two relocated fire hydrants would serve the project site. The new domestic water system and the water piping loop for fire protection services would connect to existing water mains and existing 16-inch water lines within Laurel Road, as well as existing water mains and existing 12-inch water lines within O'Hara Avenue.

Sanitary sewer service for the proposed project would be provided by the Ironhouse Sanitary District (ISD). The proposed project would include the installation of new sanitary sewer lines, manholes, and cleanouts throughout the project site. The new sewer network would connect to a new sewer manhole to be located within O'Hara Avenue before being directed to the existing 12-inch sanitary sewer lines within O'Hara Avenue. In addition, the proposed project would include installation of a new off-site sanitary sewer manhole within O'Hara Avenue.

A Preliminary Stormwater Control Plan has been prepared for the proposed project (see Figure 7). In order to manage and treat stormwater, the project site would be divided into six drainage management areas (DMAs): DMA-1R, DMA-1P, DMA-1L, the existing impervious sidewalk along Laurel Road (EIS-L), the self-retaining landscape located between the sidewalk and curb along Laurel Road (SR-L), and the self-treating landscape located between the new sidewalk and curb along O'Hara Avenue (ST-O). Stormwater from the impervious areas on the project site including roofs in DMA-1R and paved areas in DMA-1P, would be collected by catch basins and directed through new storm drain lines and manholes towards the existing 66-inch storm drain line located within the storm drain easement along the northern boundary of the project site. The existing storm drain outfalls to the existing 14,000-sf Laurel Basin bioretention area (Integrated Management Practices [IMP]-1) located at the Laurel Baseball Fields. IMP-1 would be resized to ensure the bioretention area has the capacity to treat runoff from the proposed 81,728-sf shopping center and parking lot. The IMP-1 bioretention basin area would be designed and constructed according to the criteria in the Contra Costa County Clean Water Program *Stormwater C.3 Guidebook*.

Any runoff overflow associated with DMA-1L would be directed toward the IMP-1. Stormwater from the impervious sidewalk along Laurel Road (EIS-L) would drain to the self-retaining landscape area located between the sidewalk and the curb on Laurel Road. Stormwater from the landscaped areas along the frontage of O'Hara (ST-O) would be self-treating and stormwater from the landscape areas along the frontage of Laurel Road (SR-L) would be self-retaining.

Figure 6
Preliminary Utility Plan



LEGEND

- SANITARY SEWER LINE
- STORM DRAIN LINE
- WATER LINE
- FIRE SERVICE LINE/LATERAL
- DDCV FOR FIRE SERVICE PER STD DWG DWD 9B
- FIRE HYDRANT PER STD DWG DWD 15
- POST INDICATOR VALVE
- FIRE DEPARTMENT CONNECTION
- DOMESTIC WATER/IRRIGATION METER PER STD DWG DWD 8
- BFP FOR DOMESTIC WATER/ IRRIGATION WATER SERVICE PER STD DWG DWD 10
- NEW SD MANHOLE
- NEW SD CATCH BASIN
- NEW SS MANHOLE
- NEW SS CLEANOUT

SHEET NOTES

1. INFORMATION PERTAINING TO EXISTING UNDERGROUND FACILITIES IS BASED ON RECORD INFORMATION AND IS SHOWN FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL FACILITIES PRIOR TO CONSTRUCTION OR EXCAVATION IN ANY AREA.
2. ADDITIONAL COSTS INCURRED AS A RESULT OF THE CONTRACTOR'S FAILURE TO VERIFY LOCATIONS OF EXISTING UTILITIES IN THE PROJECT VICINITY PRIOR TO BEGINNING CONSTRUCTION SHALL BE BORNE BY THE CONTRACTOR.
3. SANITARY SEWER LINES SHALL BE PVC SDR 26.
7. STORM DRAIN LINES SHALL BE PVC SDR 35 UNLESS NOTED OTHERWISE ON THE PLAN. NOTE THAT THE LINE DISCHARGING INTO THE BIO-RETENTION AREA IS CLASS V RCP.
8. WATER LINES 4" AND LARGER SHALL BE PVC PRESSURE PIPE, AWWA C900, CLASS 200, DR 18.
9. DOMESTIC SERVICE LINES 2" AND SMALLER SHALL BE PVC PRESSURE PIPE, SCHEDULE 40.

NO	DATE	BY	DESCRIPTION
2	5/15/24	KMH	REVISED PLANNING SUBMITTAL

ISSUE: SUBMITTAL #2
DATE: 5/15/2024
SCALE: 1" = 30'
DESIGNED: TH
DRAWN: DFT
CHECKED: KMH
PROJ. MGR: KMH

OAKLEY SHOPS AT LAUREL FIELDS

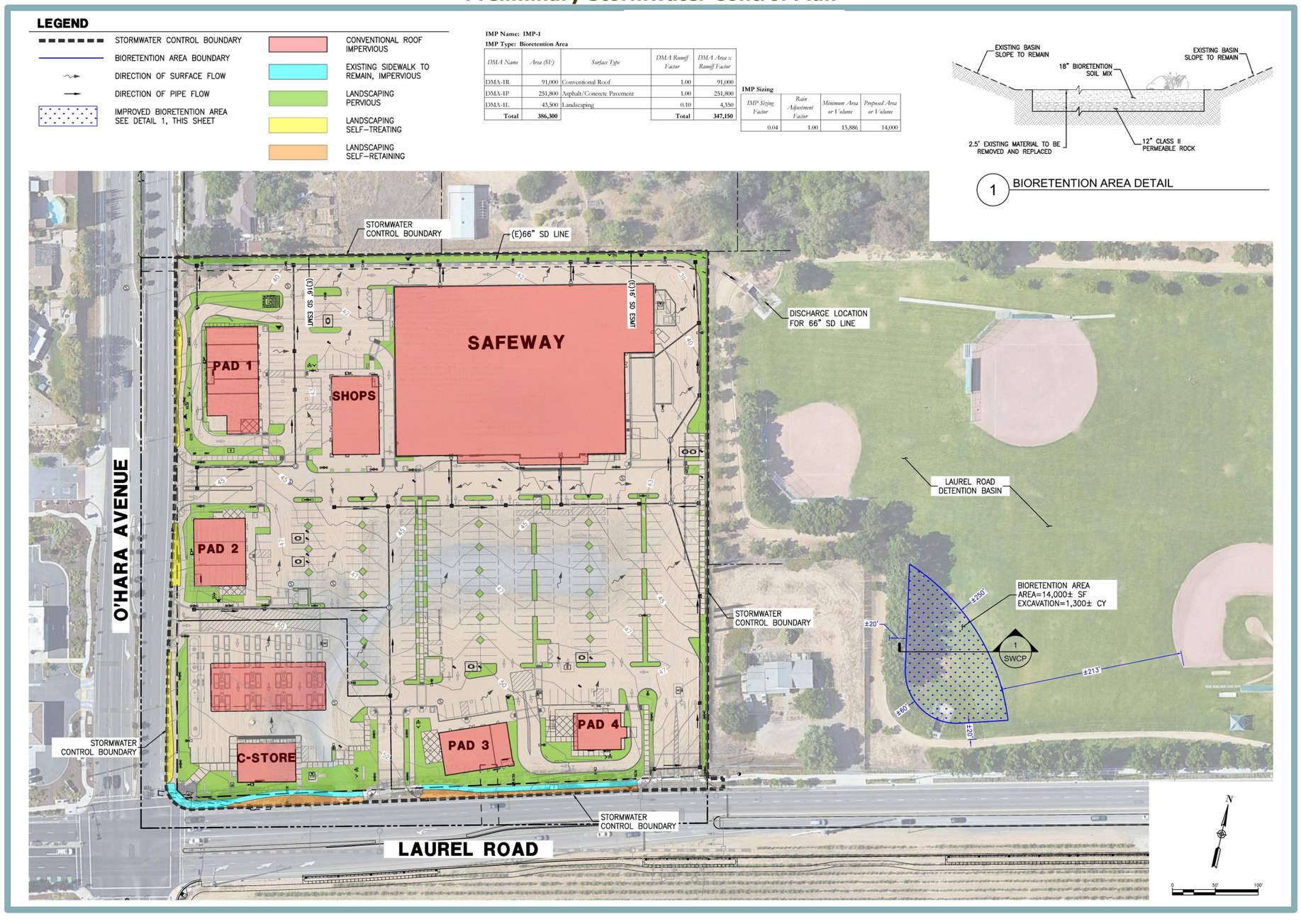
Regency Centers.

SAGE ENGINEERING
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UTILITY PLAN
OAKLEY SHOPS AT LAUREL FIELDS
998 LAUREL ROAD
CONTRA COSTA COUNTY CALIFORNIA
OAKLEY

JOB NO.
J0155
DRAWING NO.
TM4.1

Figure 7
Preliminary Stormwater Control Plan



Off-Site Improvements

To facilitate utility access to the project site, the proposed project would include off-site improvements to install a new sanitary sewer manhole, sanitary sewer lines, water lines, and fire service water lines within O'Hara Avenue (Figure 6). The proposed project would also include the installation of new fire service water lines, water lines, and a backflow preventors within Laurel Road, and two existing fire hydrants, which are currently located along the frontage of Laurel Road, would be relocated and would serve the project site.

Off-site improvements would also include the replacement of an existing catch basin and storm drain manhole within O'Hara Avenue. The proposed project would also include the installation of diagonal hatched white striping and "KEEP CLEAR" markings in the portion of O'Hara Avenue, which abuts the central project driveway. In addition, the proposed project would include off-site improvements to the existing bioretention area located within the Laurel Baseball Fields.

Conditional Use Permit

Pursuant to Section 9.1.504(c) of the City's Municipal Code, drive-thru restaurants and services, and gas service stations are permitted uses in the RB District, subject to approval of a Conditional Use Permit. Therefore, the proposed project would require approval of a Conditional Use Permit for the operation of two drive-thru restaurants and one drive-thru pharmacy on Parcel 1 and operation of a gas service station on Parcel 2.

Variance

Pursuant to Section 9.1.504(g) of the City's Municipal Code, the maximum allowable building height within the RB District is 35 feet. The entry tower of the proposed Safeway grocery would be 40 feet; therefore, the proposed project would require approval of a Variance to exceed the maximum allowable height in the RB District by five feet, for a maximum building height of 40 feet.

Design Review

Pursuant to Section 9.1.1604 of the City's Municipal Code, the proposed project would be subject to Design Review by the City to ensure that development of the proposed project would be in compliance with the City's Commercial and Industrial Design Guidelines. Specifically, the site plan would be analyzed based on elements of design, development location, arrangement of all structures, and design in harmony with surrounding facilities. The purpose of the regulations is to allow design review of all developments, signs, buildings, structures, and other facilities in order to further enhance the City's appearance, and the livability and usefulness of properties.

Discretionary Actions

The proposed project would require the following approvals from the City of Oakley:

- Adoption of the IS/MND, including the MMRP;
- Approval of a Tentative Parcel Map;
- Approval of a Conditional Use Permit;
- Approval of a Variance; and
- Approval of Design Review.

G. ENVIRONMENTAL CHECKLIST

The following checklist contains the environmental checklist form presented in Appendix G of the CEQA Guidelines. The checklist form is used to describe the impacts of the proposed project. A discussion follows each environmental issue identified in the checklist. For this checklist, the following designations are used:

Potentially Significant Impact: An impact that could be significant, and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared.

Less Than Significant with Mitigation Incorporated: An impact that requires mitigation to reduce the impact to a less-than-significant level.

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

No Impact: The project would not have any impact.

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

Discussion

a. Examples of typical scenic vistas include mountain ranges, ridgelines, or bodies of water as viewed from a highway, public space, or other area designated for the express purpose of viewing and sightseeing. In general, a project's impact to a scenic resource would occur if development of the project would substantially change or remove a scenic resource. A scenic resource includes any such areas designated by a federal, State, or local agency. The City's predominantly flat landscape is rich in scenic resources. Oakley's scenic resources include the waterways of the Delta, Dutch Slough, Marsh Creek, and Contra Costa Canal, habitat areas, and open space land. Other scenic resources include the view of Mount Diablo west of the City.[1] Views of the Delta, Dutch Slough, and Marsh Creek are not available from the project site.

While the project site is located approximately 600 feet south of the Contra Costa Canal, views of the Contra Costa Canal are not available from the site. In addition, Mount Diablo can be viewed on the horizon from motorists travelling southbound along O'Hara Avenue and westbound on Laurel Road. However, as the Mount Diablo summit is more than 14 miles from the project site generally to the southwest, and the site is located on the northeast corner of the intersection of Laurel Road and O'Hara Avenue, public views of Mount Diablo would not be obstructed by development of the proposed project and implementation of the proposed project would not have a substantial adverse effect on a scenic vista.

As noted previously, the proposed project would be consistent with the General Plan land use designation and zoning designation for the project site. The existing RB District zoning at the project site allows for a maximum commercial building height of 35 feet. While the proposed project would require approval of a Variance in order to add an additional five feet in allowable height to the Safeway entry tower, development of the proposed project would not impact views of Mount Diablo from the nearby public roadways.

[1] City of Oakley. *City of Oakley General Plan, Focused General Plan Update* [pg. 6-24]. Adopted January 11, 2022.

As such, the proposed project is generally consistent with what has been anticipated for the site and potential impacts to scenic vistas and visual character associated with future development of the project site were already evaluated and considered in the General Plan EIR, which concluded that the General Plan's goals, policies, and programs would reduce any potential impacts on the aesthetic qualities to a less-than-significant level.[2] Therefore, the proposed project would not have a substantial adverse effect on a scenic vista and a ***less-than-significant*** impact would occur.

b. According to the California Scenic Highway Mapping System, portions of SR 160, 580, and 680 are listed as Officially Designated as State Scenic Highways, while portion of SR 4, 160, and 580 are listed as Eligible designations.[3] The project site is located approximately 3.43 miles southeast of the portion of SR 160, which is an Officially Designated State Scenic Highway. The site is also approximately 32.97 miles northeast of SR 580 and 20.37 miles northeast of SR 680. Views of the project site from the aforementioned highways are not available due to the substantial distance and intervening urban development. Development of the proposed project would, therefore, not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway. Thus, a ***less-than-significant*** impact would occur.

c. The project site is located within a developed area of the City. Therefore, the applicable CEQA consideration is whether the project would conflict with applicable zoning and other regulations related to scenic quality.

The project site has been previously anticipated for development of commercial uses by the City's General Plan, and impacts related to degradation of visual character and quality were analyzed in the General Plan EIR. As noted previously, the proposed project would be consistent with the General Plan land use designation and zoning designation for the project site. While the proposed project would require approval of a Variance to exceed the maximum allowable height (35 feet) within the RB District by five feet on the Safeway entry tower, the majority of the proposed Safeway building would have a maximum height of 35 feet and only architectural elements related to the entry tower would reach the proposed height of 40 feet. In addition, the City's Commercial and Industrial Design Guidelines encourage the use of tower elements as architectural landmarks, such as the proposed Safeway entry tower.[4] The Commercial and Industrial Design Guidelines allow for decorative towers and other special design features to exceed the established building height limit, provided that the features do not exceed 15 percent of the building footprint and do not contain habitable space. Furthermore, as discussed above, the proposed Variance would not cause the proposed building to block views of any scenic resources within the City. The increase in maximum allowed height would also not substantially change the aesthetic value of the allowed commercial uses that were generally analyzed in the General Plan. Therefore, the height increase facilitated by the Variance is not anticipated to deteriorate the scenic quality of the site.

Pursuant to Section 9.1.1604 of the City's Municipal Code, implementation of the proposed project would also require Design Review, which is a City regulation related to scenic quality. Design Review would ensure that the development of the proposed project

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2 City of Oakley. *City of Oakley 2020 General Plan Draft Environmental Impact Report* [pg. 3-24]. September 2002.

3 California Department of Transportation. *California State Scenic Highway System Map*. Available at: https://www.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed April 2024.

4 City of Oakley. *Oakley Commercial & Industrial Design Guidelines*. February 2005.

would be in compliance with the City's Commercial and Industrial Design Guidelines, which establishes the City's standards for site planning (e.g., building siting setbacks, orientation, buffers, parking), architecture (e.g., facades, entries, materials and colors), landscaping and site elements (e.g., entry and plaza enhancements, parking lot landscaping, lighting), and renovation and remodels. For example, because the proposed project would consist of a large, multi-tenant commercial site, building pads would be located at the front of the site, along the entry drive, or at the corners of the site, consistent with the Commercial and Industrial Design Guidelines. Furthermore, the proposed project would include landscaping consisting of a combination of trees, shrubs, and groundcover, consistent with the Commercial and Industrial Design Guidelines. Design Review would also ensure that the aesthetic and architectural design of the development would be compatible with surrounding development. The proposed project would include landscaping features at the project site frontage and within the project site that would be similar to existing features in the development west of the site.

Based on the above, the proposed project would not conflict with applicable zoning and other regulations governing scenic qualities, and a ***less-than-significant*** impact would occur.

d. As previously discussed, the project site is currently undeveloped. Therefore, development of the project site with commercial buildings and parking areas would introduce new sources of light and glare associated with interior lights spilling from the windows of the proposed commercial buildings, exterior lighting on the proposed structures, outdoor lighting in the parking areas, and light reflected off windows. In addition, the proposed project would generate vehicle trips which, in turn, would create sources of light from vehicle headlights.

The project site is bordered by single-family residences, undeveloped land, the Contra Costa Canal, and the Delta de Anza Regional Trail to the north; a single-family residence and Laurel Baseball Fields to the east; a vineyard to the south, across Laurel Road; and single-family residences, and a 7-Eleven convenience store with a Chevron gas station to the west, across O'Hara Avenue. Thus, the project vicinity contains numerous existing sources of light and glare.

As discussed under question 'c', the project would be required to undergo a Design Review to ensure that development of the project would be in compliance with the Commercial and Industrial Design Guidelines, which, among other things, establishes the City's standards for site lighting and pedestrian scale lighting. The proposed project would be required to comply with the City's Commercial and Industrial Design Guidelines, which requires site lighting at commercial uses to incorporate cut-offs to prevent spill-over laterally onto adjacent properties and upwards into the night sky.

In addition, because the proposed project would be consistent with the General Plan land use designation for the site, the impacts of new sources of light or glare associated with future commercial development at the project site were already evaluated and considered in the General Plan EIR analysis. Therefore, any creation of new sources of light and glare by the proposed project would be considered a ***less-than-significant*** impact.

II. AGRICULTURE AND FOREST RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	✖
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	✖
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	✖
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	✖
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	✖

Discussion

a,e. Pursuant to the California Department of Conservation (DOC) Farmland Mapping and Monitoring Program, the project site is designated as "Other Land" (see Figure 8).[5] According to the DOC, land not included in any other mapping category or vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land. The site does not contain Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Furthermore, the site is not zoned or designated in the General Plan for agricultural uses; rather, the site is designated in the General Plan as CO and is zoned RB District. As such, development of the proposed project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use or result in the loss of forest land to non-forest use and ***no impact*** would occur as a result of the proposed project.

b. The project site is currently zoned RB District; thus, the site is not zoned for agricultural use. Additionally, the site is not under an active Williamson Act contract.[6] Therefore, the proposed project would not conflict with existing zoning for agricultural use or conflict with a Williamson Act contract, and ***no impact*** would occur.

[5] California Department of Conservation. *California Important Farmland Finder.* Available at: https://maps.conservation.ca.gov/dlrp/ciff/. Accessed March 2024.

[6] Contra Costa Conservation and Development. *2016 Agricultural Preserves Map.* Available at: https://www.contracosta.ca.gov/DocumentCenter/View/882/Map-of-Properties-Under-Contract. Accessed March 2024.

Figure 8
Project Site DOC Farmland Mapping and Monitoring Program Classifications



c,d. The project site is not zoned forest land (as defined in PRC Section 12220[g]), timberland (as defined by PRC Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g]). Therefore, the proposed project would have ***no impact*** with regard to conversion of forest land or any potential conflict with forest land, timberland, or Timberland Production zoning.

III. AIR QUALITY. *Would the project:*	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	✖	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	✖	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	✖	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	✖	☐

Discussion

a,b. The City of Oakley is located in the San Francisco Bay Area Air Basin (SFBAAB), which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The SFBAAB area is currently designated as a nonattainment area for State and federal ozone, State and federal fine particulate matter 2.5 microns in diameter ($PM_{2.5}$), and State respirable particulate matter 10 microns in diameter (PM_{10}) ambient air quality standards (AAQS). The SFBAAB is designated attainment or unclassified for all other AAQS. It should be noted that on January 9, 2013, the U.S. Environmental Protection Agency (USEPA) issued a final rule to determine that the Bay Area has attained the 24-hour $PM_{2.5}$ federal AAQS. Nonetheless, the Bay Area must continue to be designated as nonattainment for the federal $PM_{2.5}$ AAQS until such time as the BAAQMD submits a redesignation request and a maintenance plan to the USEPA, and the USEPA approves the proposed redesignation. The USEPA has not yet approved a request for redesignation of the SFBAAB; therefore, the SFBAAB remains in nonattainment for 24-hour $PM_{2.5}$.

In compliance with regulations, due to the nonattainment designations of the area, the BAAQMD periodically prepares and updates air quality plans that provide emission reduction strategies to achieve attainment of the AAQS, including control strategies to reduce air pollutant emissions through regulations, incentive programs, public education, and partnerships with other agencies. The current air quality plans are prepared in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

The most recent federal ozone plan is the 2001 Ozone Attainment Plan, which was adopted on October 24, 2001, and approved by the California Air Resources Board (CARB) on November 1, 2001. The plan was submitted to the USEPA on November 30, 2001 for review and approval. The most recent State ozone plan is the 2017 Clean Air Plan, adopted on April 19, 2017. The 2017 Clean Air Plan was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, PM, toxic air contaminants (TACs), and greenhouse gases (GHGs). Although a plan for achieving the State PM_{10} standard is not required, the BAAQMD has prioritized measures to reduce PM in developing the control strategy for the 2017 Clean Air Plan. The control strategy serves as the backbone of the BAAQMD's current PM control program.

The aforementioned air quality plans contain mobile source controls, stationary source controls, and transportation control measures to be implemented in the region to attain the State and federal AAQS within the SFBAAB. Adopted BAAQMD rules and regulations, as

well as the thresholds of significance, have been developed with the intent to ensure continued attainment of AAQS, or to work towards attainment of AAQS for which the area is currently designated nonattainment, consistent with applicable air quality plans. For development projects, BAAQMD establishes significance thresholds for emissions of the ozone precursors reactive organic gases (ROG) and oxides of nitrogen (NO_X), as well as for PM_{10}, and $PM_{2.5}$, expressed in pounds per day (lbs/day) and tons per year (tons/yr). The thresholds are listed in Table 2. Thus, by exceeding the BAAQMD's mass emission thresholds for construction and/or operational emissions of ROG, NO_X, or PM_{10}, a project would be considered to conflict with or obstruct implementation of the BAAQMD's air quality planning efforts.

Table 2
BAAQMD Thresholds of Significance

Pollutant	Construction	Operational	
	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	54	10
NO_x	54	54	10
PM_{10} (exhaust)	82	82	15
$PM_{2.5}$ (exhaust)	54	54	10

Source: BAAQMD, Air Quality Guidelines, April 2023.

Particulate matter can be split into two categories: fugitive and exhaust. The BAAQMD thresholds of significance for exhaust are presented in Table 2. It should be noted that BAAQMD does not maintain quantitative thresholds for fugitive emissions of PM_{10} or $PM_{2.5}$, rather, BAAQMD requires all projects within the district's jurisdiction to implement Basic Construction Mitigation Measures (BCMMs) related to dust suppression.

The proposed project's construction and operational emissions were quantified using the California Emissions Estimator Model (CalEEMod) software version 2022.1.1.14 – a Statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions, including GHG emissions, from land use projects. The model applies inherent default values for various land uses, including construction data, vehicle mix, trip length, average speed, compliance with the 2022 California Building Standards Code (CBSC), etc. Where project-specific information is available, such information should be applied in the model. Accordingly, the proposed project's modeling assumes the following project and/or site-specific information:

- Construction would begin in August 2024 and occur over approximately one year;
- Grading would involve the import of 6,291 cubic yards of soil;
- Grading would involve the export of 1,300 cubic yards of soil associated with the excavation of the off-site bioretention basin;
- Operational trip generation rates were updated to 5,518 daily vehicle trips, consistent with the project-specific Transportation Impact Assessment (TIA) prepared by Fehr & Peers;
- The project would comply with the MWELO and the 2019 CALGreen Code; and
- The project would comply with all applicable provisions of the 2022 California CBSC.

The proposed project's estimated emissions associated with construction and operations are presented and discussed in further detail below. A discussion of the proposed project's contribution to cumulative air quality conditions is provided below as well. All CalEEMod modeling results are included as Appendix A to this IS/MND.

Construction Emissions

During construction of the proposed project, various types of equipment and vehicles would temporarily operate on the project site. Construction exhaust emissions would be generated from construction equipment, vegetation clearing and earth movement activities, construction worker commutes, and construction material hauling for the entire construction period. The aforementioned activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants. Project construction activities also represent sources of fugitive dust, which includes PM emissions. As construction of the proposed project would generate air pollutant emissions intermittently within the site and vicinity, until all construction has been completed, construction is a potential concern because the project is in a non-attainment area for ozone, PM_{10}, and $PM_{2.5}$.

According to the CalEEMod modeling results, buildout of the proposed project would result in maximum unmitigated construction criteria air pollutant emissions as shown in Table 2. As shown in the table, the proposed project's construction emissions would be below the applicable thresholds of significance for ROG, NO_X, PM_{10}, and $PM_{2.5}$.

Table 3
Maximum Unmitigated Construction Emissions (lbs/day)

Pollutant	Construction Emissions	Threshold of Significance	Exceeds Threshold?
ROG	3.48	54	**NO**
NO_X	7.35	54	**NO**
PM_{10}*	0.31	82	**NO**
$PM_{2.5}$*	0.28	54	**NO**

Notes:
* Denotes emissions from exhaust only. BAAQMD does not have adopted PM thresholds for fugitive emissions.

Sources: CalEEMod, May 2024 (see Appendix A).

All projects within the jurisdiction of the BAAQMD are required to implement all of the BAAQMD's BCMMs, which would be required by the City as conditions of approval:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

6. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
7. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
8. Unpaved roads providing access to sites located 100 feet or further from a paved road shall be treated with a six- to 12-inch layer of compacted layer of wood chips, mulch, or gravel.
9. Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations.

The proposed project's required implementation of the BAAQMD's BCMMs listed above for the project's construction activities would help to further minimize construction-related emissions.

Overall, because the proposed project would be below the applicable thresholds of significance for construction emissions, project construction would not result in a significant air quality impact.

Operational Emissions

Operational emissions of ROG, NO_X, and PM would be generated by the proposed project from both mobile and stationary sources. Day-to-day activities, such as the future vehicle trips to and from the project site, would make up the majority of the mobile emissions. Emissions would also occur from area sources, such as operations from the proposed gas station and landscape maintenance equipment exhaust.

According to the CalEEMod results, buildout of the proposed project would result in maximum unmitigated operational criteria air pollutant emissions as shown in Table 4.

Table 4
Maximum Unmitigated Operational Emissions

Pollutant	Proposed Project Emissions		Threshold of Significance		Exceeds Threshold?
	lbs/day	tons/yr	lbs/day	tons/yr	
ROG	21.5	3.92	54	10	**NO**
NO_X	14.2	2.59	54	10	**NO**
PM_{10}*	0.26	0.05	82	15	**NO**
$PM_{2.5}$*	0.24	0.04	54	10	**NO**

Note:
* Denotes emissions from exhaust only. BAAQMD does not have adopted PM thresholds for fugitive emissions.

Source: CalEEMod, May 2024 (see Appendix A).

As shown in the table, operations of the proposed project would be below the applicable thresholds of significance. Thus, operations of the project would not be considered to conflict with air quality plans during project operations.

Cumulative Emissions

Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By nature, air pollution is largely a cumulative impact. A single project is not sufficient in size to, by itself, result in nonattainment of AAQS. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. The thresholds of significance presented in Table 2 represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions. If a project exceeds the significance thresholds presented in Table 2, the proposed project's emissions would be cumulatively considerable, resulting in significant adverse cumulative air quality impacts to the region's existing air quality conditions.

Because the proposed project would result in both construction-related and operational emissions below the applicable thresholds of significance, construction and operations of the project would not be expected to result in a cumulatively considerable contribution to the region's existing air quality conditions.

Conclusion

As stated previously, the applicable regional air quality plans include the 2001 Ozone Attainment Plan and the 2017 Clean Air Plan. According to BAAQMD, if a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project may be considered consistent with the air quality plans.

As discussed above, the proposed project would result in construction and operational emissions below the applicable thresholds of significance. Therefore, the proposed project would not conflict with or obstruct implementation of the applicable air quality plans, violate any air quality standards or contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase in any criteria air pollutant, and impacts would be considered ***less than significant***.

c. Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Heightened sensitivity may be caused by health problems, proximity to the emissions source, and/or duration of exposure to air pollutants. Children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution.

Accordingly, land uses that are typically considered to be sensitive receptors include residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics. Existing sensitive receptors near the project site include the single-family residences to the north and west of the project site boundary. The existing single-family residence located east of the project site is a legal non-conforming residential use and is not considered to be a sensitive receptor. The nearest residence is located 20 feet north of the site boundary. The closest receptor to where the off-site infrastructure improvements would occur along O'Hara Avenue is located approximately 65 feet to the west of the off-site improvement area. The closest receptor

to where the off-site improvements would occur along Laurel Road is located 150 feet northeast of the off-site improvement area.

The major pollutant concentrations of concern are localized carbon monoxide (CO) emissions and TACs, as well as regional effects of emissions of criteria pollutants, which are addressed in further detail below.

Localized CO Emissions

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. High levels of localized CO concentrations are only expected where background levels are high, and traffic volumes and congestion levels are high. Emissions of CO are of potential concern, as the pollutant is a toxic gas that results from the incomplete combustion of carbon-containing fuels such as gasoline or wood. CO emissions are particularly related to traffic levels.

In order to provide a conservative indication of whether a project would result in localized CO emissions that would exceed the applicable threshold of significance, the BAAQMD has established screening criteria for localized CO emissions. According to BAAQMD, a proposed project would result in a less-than-significant impact related to localized CO emission concentrations if all of the following conditions are true for the project:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans;
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

While BAAQMD has established the foregoing screening criteria for potential impacts, it should be noted that the SFBAAB has been in attainment of California AAQS (CAAQS) and National AAQS (NAAQS) for CO for more than 20 years.[7] Due to the continued attainment of CAAQS and NAAQS, and advances in vehicle emissions technologies, the likelihood that any single project would create a CO hotspot is minimal. With regard to the proposed project, according to the TIA prepared by Fehr & Peers, the proposed project is expected to generate approximately 5,518 daily vehicle trips, 270 of which would be during the AM peak hour, 499 during the midday peak hour, and 497 during the PM peak hour.[8] The addition of 1,266 total peak hour trips per day generated by the proposed project is not anticipated to increase traffic volumes at any nearby intersections to more than 44,000 vehicles per hour. Furthermore, areas where vertical and/or horizontal mixing is limited due to tunnels, underpass, or similar features do not exist in the project area. Therefore, based on the BAAQMD's screening criteria for localized CO emissions, the proposed project would not be expected to result in substantial levels of localized CO at surrounding

[7] Bay Area Air Quality Management District. *Air Quality Summary Reports*. Available at: http://www.baaqmd.gov/about-air-quality/air-quality-summaries. Accessed April 2024.

[8] Fehr & Peers. *Final Oakley Shops at Laurel Fields Transportation Impact Assessment.* May 2024.

intersections or generate localized concentrations of CO that would exceed standards or cause health hazards.

TAC Emissions

Another category of environmental concern is TACs. The CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (Handbook) provides recommended setback distances for sensitive land uses from major sources of TACs, including, but not limited to, freeways and high traffic roads, distribution centers, gas dispensing facilities (GDFs), and rail yards. The CARB has identified diesel particulate matter (DPM) from diesel-fueled engines as a TAC; thus, high volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. Gasoline includes multiple TACs, which are released through various processes during the operation of GDFs. Such TACs include benzene, ethyl benzene, toluene, and xylene, among others. Health risks associated with TACs are a function of both the concentration of emissions and the duration of exposure, where the higher the concentration and/or the longer the period of time that a sensitive receptor is exposed to pollutant concentrations would correlate to a higher health risk.

Implementation of the proposed project would also result in TAC emissions related to construction of the proposed project and operation of the proposed gas station. Each source of TACs is discussed in further depth in the sections below.

Construction Emissions

Short-term, construction-related activities would result in the generation of TACs, specifically DPM, from on-road haul trucks and off-road equipment exhaust emissions. Construction is temporary and occurs over a relatively short duration in comparison to the operational lifetime of the proposed project. Health risks are typically associated with exposure to high concentrations of TACs over extended periods of time (e.g., 30 years or greater), whereas the construction period associated with the proposed project is estimated to be approximately one year.

All construction equipment and operation thereof would be regulated per the In-Use Off-Road Diesel Vehicle Regulation, which is intended to help reduce emissions associated with off-road diesel vehicles and equipment, including DPM. Project construction would also be required to comply with all applicable BAAQMD rules and regulations, particularly associated with permitting of air pollutant sources. In addition, only portions of the site would be disturbed at a time throughout the construction period, with operation of construction equipment occurring intermittently throughout the course of a day rather than continuously at any one location on the project site. Operation of construction equipment within portions of the development area would allow for the dispersal of emissions, and would ensure that construction-activity is not continuously occurring in the portions of the project site closest to existing receptors. Because construction equipment on-site would not operate for long periods of time and would be used at varying locations within the site, associated emissions of DPM would not occur at the same location (or be evenly spread throughout the entire project site) for long periods of time. Due to the temporary nature of construction and the relatively short duration of potential exposure to associated emissions, the potential for any one sensitive receptor in the area to be exposed to concentrations of pollutants for a substantially extended period of time would be low. For the aforementioned reasons, project construction would not be expected to expose sensitive receptors to substantial pollutant concentrations.

Due to the temporary nature of construction and the relatively short duration of potential exposure to associated emissions, the potential for any one sensitive receptor in the area to be exposed to concentrations of pollutants for a substantially extended period of time would be low.

GDF Operations

GDFs are considered sources of various types of TACs, including benzene. As a result, in order to reduce adverse health effects, the CARB recommends that GDFs with a total throughput of 3.6 million gallons per year or greater be sited at least 300 feet away from existing sensitive land uses, or that a detailed health risk assessment be performed if such land uses are within 300 feet from each other.[9] The proposed project would include construction of a GDF with a throughput of 4.68 million gallons per year, which would be located in the southwest corner of the project site. The property lines of the nearest sensitive receptors (single-family residences) are located 310 feet northwest and 450 feet east of the proposed gas station. Furthermore, the existing sensitive receptors would be separated from the project site by the proposed commercial uses on the eastern portion of the project site on Parcel 2. Thus, the proposed project would be sited outside of the CARB's recommended setback distance from existing sensitive receptors and, based on agency guidance, health risks would be less than significant.

Criteria Pollutant Emissions

Criteria pollutant emissions have the ability to cause negative health effects. As discussed under section 'a' above, the AAQS presented are health-based standards designed to ensure safe levels of criteria pollutants that avoid specific adverse health effects. Because the SFBAAB is designated as nonattainment for State and federal eight-hour ozone and State PM_{10} standards, the BAAQMD, along with other air districts in the SFBAAB region, has adopted federal and state attainment plans to demonstrate progress towards attainment of the AAQS. Full implementation of the attainment plans would ensure that the AAQS are attained and sensitive receptors within the SFBAAB are not exposed to excess concentrations of criteria pollutants. The BAAQMD's thresholds of significance were established with consideration given to the health-based air quality standards established by the AAQS, and are designed to aid the district in implementing the applicable attainment plans to achieve attainment of the AAQS. Thus, if a project's criteria pollutant emissions exceed the BAAQMD's emission thresholds of significance, a project would be considered to conflict with or obstruct implementation of the BAAQMD's air quality planning efforts, thereby delaying attainment of the AAQS. Because the AAQSs are representative of safe levels that avoid specific adverse health effects, a project's hinderance of attainment of the AAQS could be considered to contribute towards regional health effects associated with the existing nonattainment status of ozone and PM standards.

The proposed project would not result in short-term construction-related or long-term operational emissions of criteria pollutants that would exceed BAAQMD standards. Consequently, implementation of the proposed project would not conflict with the BAAQMD's adopted attainment plans nor would the proposed project inhibit attainment of regional AAQS. Therefore, implementation of the proposed project would not contribute towards regional health effects associated with the existing nonattainment status of ozone and PM_{10} standards.

[9] California Air Resources Board. *Air Quality and Land Use Handbook: A Community Health Perspective* [pg. 32]. April 2005.

Conclusion

Based on the above, the proposed project would not expose any sensitive receptors to substantial concentrations of localized CO, TACs, or criteria pollutants associated with construction or operation. Therefore, the proposed project would result in a ***less-than-significant*** impact related to the exposure of sensitive receptors to substantial pollutant concentrations.

d. Emissions such as those leading to odors have the potential to adversely affect sensitive receptors within the project area. Pollutants of principal concern include emissions leading to odors, emission of dust, or emissions considered to constitute air pollutants. Air pollutants have been discussed in sections 'a' through 'c' above. Therefore, the following discussion focuses on emissions of odors and dust.

Pursuant to the BAAQMD CEQA Guidelines, odors are generally regarded as an annoyance rather than a health hazard.[10] Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The presence of an odor impact is dependent on several variables including: the nature of the odor source; the frequency of odor generation; the intensity of odor; the distance of odor source to sensitive receptors; wind direction; and sensitivity of the receptor.

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, quantification of significant odor impacts is relatively difficult. Typical odor-generating land uses include, but are not limited to, wastewater treatment plants, landfills, and composting facilities. The proposed project would not introduce any such land uses.

Construction activities often include diesel-fueled equipment and heavy-duty diesel trucks, which can create odors associated with diesel fumes, which could be found to be objectionable. However, as discussed above, construction activities would be temporary, and hours of operation for construction equipment would be restricted to the hours of 7:30 AM to 7:00 PM Monday through Friday and 9:00 AM to 7:00 PM on weekends and holidays per Section 4.2.208 of the City of Oakley Municipal Code. Entitlement approvals further limit construction to non-holiday weekdays unless a written request to extend the construction hours/days is received and approved by the City. Project construction would also be required to comply with all applicable BAAQMD rules and regulations, particularly associated with permitting of air pollutant sources. The aforementioned regulations would help to minimize air pollutant emissions, as well as any associated odors. Accordingly, substantial objectionable odors would not be expected to occur during construction activities or affect a substantial number of people.

In addition, the proposed restaurants and Safeway grocery store would produce food waste, the decomposition of which could create objectionable odors if not properly contained and handled. However, the proposed project would provide adequate waste receptacles throughout the facilities and would utilize outdoor trash dumpsters that would be picked up on a regular basis. In addition, commercial uses such as fast-food restaurants that utilize deep fryers may create odorous emissions from cooking food, particularly oily foods. Operations of such sources could result in exposure of on-site

[10] Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines* [pg. 7-1]. May 2017.

receptors (i.e., customers for a short period of time and employees for an extended period of time) to objectionable odors. The potential exists for odors to be carried off-site as well. However, fast-food restaurants typically have an exhaust hood that captures emissions from the cooking surface, as well as scrubbers for washing the cooking vapors and trapping some of the larger particles. Accordingly, the project would not be expected to create objectionable odors affecting a substantial number of people.

BAAQMD regulates objectionable odors through Regulation 7, Odorous Substances, which does not become applicable until the Air Pollution Control Officer (APCO) receives odor complaints from ten or more complainants within a 90-day period. Once effective, Regulation 7 places general limitation on odorous substances and specific emission limitations on certain odorous compounds, which remain effective until such time that citizen complaints have not been received by the APCO for one year. The limits of Regulation 7 become applicable again when the APCO receives odor complaints from five or more complainants within a 90-day period. Thus, although not anticipated, if odor complaints are made after the proposed project is developed, the BAAQMD would ensure that such odors are addressed, and any potential odor effects are minimized or eliminated.

The proposed project includes a GDF, the operations of which could generate odorous emissions. However, as the property lines of the nearest sensitive receptors (single-family residences) are located over 300 feet from the proposed gas station, which includes 16 vehicle fueling stations, and would be separated from the project site by the proposed commercial uses on Parcel 2, odors generated as part of project operation would not be discernible. In addition, gas pumps are required to include vapor-recovery systems, which limit the release of gasoline vapors during vehicle refueling and underground tank refilling. Given the distance and existing uses separating the project site from the single-family residences to the north, west, and east, and the required vapor-recovery systems that would be installed on the proposed gas pumps, odors are anticipated to dissipate prior to reaching any nearby receptors, and the GDF would not result in emissions of odors that would adversely affect the nearest receptors during project operation.

With respect to dust, as noted previously, all projects under the jurisdiction of BAAQMD are required to implement the BAAQMD's BCMMs. Such measures would act to reduce construction-related dust by ensuring that haul trucks with loose material are covered, reducing vehicle dirt track-out, and limiting vehicle speeds within project site, among other methods, which would ensure that construction of the proposed project does not result in substantial emissions of dust. Although the project would require soil hauling, California Vehicle Code Section 23114(e) requires all haul trucks to be covered, which would minimize emissions of fugitive dust during transport. Following project construction, vehicles operating within the project site would be limited to paved areas of the site, and non-paved areas would be landscaped. Thus, project operations would not include sources of dust that could adversely affect a substantial number of people.

For the aforementioned reasons, construction and operation of the proposed project would not result in emissions (such as those leading to odors) adversely affecting a substantial number of people, and a ***less-than-significant*** impact would occur.

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

Discussion

a,f. The following discussion is based primarily on a Planning Survey Report (PSR), prepared by Moore Biological Consultants (Moore) for the proposed project (see Appendix B).[11] The PSR evaluated the 8.77-acre project site, as well as the 0.32-acre water quality basin improvement area located within the Laurel Baseball Fields and the 0.63 acres of off-site improvements along Laurel Road and O'Hara Avenue.

Currently, the approximately 8.77-acre project site is primarily undeveloped and includes a gravel roadway, which connects Laurel Road to a centrally located on-site gravel pad. The gravel pad has historically been used as an overflow parking lot for the adjacent Laurel Baseball Fields. According to Moore, the graveled driveway and associated pad on the site have been present for decades and the project site has been used for a staging for nearby development and most recently, a parking area for the Laurel Baseball Fields.

Special-status species include those plant and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal and State Endangered Species Acts. Both acts afford protection to listed and proposed species. In addition, California Department of Fish and Wildlife (CDFW) Species of Special Concern, which are species that face extirpation in California if current

[11] Moore Biological Consultants. *Application Form and Planning Survey Report.* January 2024.

population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern, sensitive species included in USFWS Recovery Plans, and CDFW special-status invertebrates are all considered special-status species. Although CDFW Species of Special Concern generally do not have special legal status, they are given special consideration under CEQA. In addition to regulations for special-status species, most birds in the U.S., including non-status species, are protected by the Migratory Bird Treaty Act (MBTA) of 1918. Under the MBTA, destroying active nests, eggs, and young is illegal. Species that meet the definition of rare, threatened, or endangered under Section 15380 of the CEQA guidelines are also considered special-status species. In addition, plant species on California Native Plant Society (CNPS) categories 1A, 1B, 2B, 3, and 4 are considered special-status plant species and are protected under CEQA.

The project site is located within the boundaries of the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (ECCCHCP/NCCP), which is intended to provide an effective framework to protect natural resources in the cities of Brentwood, Clayton, Oakley and Pittsburg, and portions of east Contra Costa County (unincorporated), including special-status species. Raney Planning and Management, Inc. conducted a search of the California Natural Diversity Database (CNDDB) within the nine U.S. Geological Survey (USGS) quadrangles that define the project region, including the project site. The CNDDB search was conducted in order to identify special-status plant and wildlife species that may occur at or near the project site. The intent of the database review was to identify documented occurrences of special-status species in the vicinity of the project area, to determine their locations relative to the project site, and to evaluate whether the site meets the habitat requirements of such species. Furthermore, the CNDDB search was conducted to identify any special-status species that are not covered by the ECCCHCP/NCCP and were not evaluated in the PSR prepared by Moore.

Based on the results of the CNDDB search, 49 special-status plant species and 46 special-status wildlife species have the potential to occur within the vicinity of the project site (see Appendix C). Of the 95 special-status species that could occur within the vicinity of the project site, 20 species (nine special-status plant species and 11 special-status wildlife species) are covered or considered to be no-take under the ECCCHCP/NCCP, five special-status plant species are considered to be no-take under the ECCCHCP/NCCP, and 70 species (35 special-status plant species and 35 special-status wildlife species) are not covered under the ECCCHCP/NCCP. Because the project site does not support coastal scrub, wetlands, riparian forest, streams/creek, and other forms of aquatic habitat, the majority of the special-status species were eliminated from further consideration due to lack of suitable on-site habitat.

In February 2015, the East Contra Costa County Habitat Conservancy prepared an ECCCHCP/NCCP Assessment of Plan Effects on CEQA Species.[12] The purpose of the assessment was to provide a programmatic, cumulative CEQA effects analysis for CEQA species not covered by the HCP/NCCP. The 2015 ECCCHCP/NCCP Assessment of Plan Effects on CEQA Species concluded that mitigation measures required in the ECCCHCP/NCCP also provide mitigation for non-covered species; therefore, projects consistent with the ECCCHCP/NCCP would have a less-than-significant impact on other potential special-status species.

[12] H.T. Harvey & Associates. *East Contra Costa County Habitat Conservation Plan – Assessment of Plan Effects on CEQA Species.* February 17, 2015.

According to the 2015 ECCCHCP/NCCP Assessment of Plan Effects on CEQA Species, for all but two of the potential special-status species addressed (Lime Ridge navarretia [*Navarretia gowenii*] and the Lime Ridge eriastrum [*Eriastrum ertterae]*), impacts would be less than significant under CEQA. Because of uncertainty regarding the distribution of the Lime Ridge navarretia and the Lime Ridge eriastrum, the 2015 ECCCHCP/NCCP Assessment of Plan Effects on CEQA Species concluded that a potentially significant impact could occur related to the two aforementioned species. Based on the CNDDB search conducted by Raney Planning and Management, Inc., known occurrences of Lime Ridge navarretia or Lime Ridge eriastrum did not occur within the nine USGS quadrangles that define the project region, including the project site. Therefore, implementation of the proposed project would not impact the species. Based on the conclusions of the 2015 ECCCHCP/NCCP Assessment of Plan Effects on CEQA Species and the absence of the Lime Ridge navarretia and Lime Ridge eriastrum in the vicinity of the project site, the proposed project would have a less-than-significant impact on any potential special-status plant species and potential special-status wildlife species not covered by the ECCCHCP/NCCP that could occur within the vicinity of the project site because the proposed project would be required to comply with the ECCCHCP/NCCP.

In compliance with the ECCCHCP/NCCP, the PSR prepared for the proposed project by Moore included all species covered under the ECCCHCP/NCCP. According to the PSR, 7.37 acres of the project site and off-site improvements areas are categorized by Grassland (Ruderal) land cover type and 2.03 acres are categorized by Developed Land (Urban) land cover type. In addition, the 0.32-acre water quality basin area is categorized by Developed Land (Turf) land cover type. Based on the on-site land cover type, Moore determined that covered plant species do not have the potential to occur on-site. As a result, special-status plants are not discussed further. However, based on the on-site land cover types, Moore conducted planning-level surveys on the project site for western burrowing owl, Swainson's hawk, and golden eagle.

Special-Status Wildlife

As part of the PSR, Moore conducted a field survey on December 12, 2023, of species habitat within the entire study area, including visible portions of the adjacent properties. According to the PSR, the on-site ruderal grassland and on-site trees could provide potential habitat for western burrowing owl (*Athene cunnicularia*), Swainson's hawk (*Buteo swainsoni*), and golden eagle (*Aquila chrysaetos*). In addition, other avian species protected by the MBTA could use the existing grassland as foraging and potential nesting habitat.

Western Burrowing Owl

The primary habitat requirement for western burrowing owls is small mammal burrows that the species uses for nesting. Typically, the species uses abandoned ground squirrel burrows, but western burrowing owls have been known to dig burrows in softer soils. In urban areas, western burrowing owls may use pipes, culverts, and piles of material as artificial burrows. Western burrowing owls breed semi-colonially from March through August.

The CNDDB search returned three occurrences of burrowing owl within a one-mile radius of the project site. The nearest record of burrowing owl in the CNDDB search area is located at the intersection of O'Hara Avenue and Laurel Road, approximately 150 feet southwest of the project site. According to the PSR, the project site contains ruderal

grassland and is within the range of western burrowing owl. Western burrowing owls are known to occur within disked fields, if small mammal burrows are present. As part of the PSR, the site was inspected for western burrowing owls and ground squirrel burrows with evidence of burrowing owl occupancy (i.e., white wash, pellets, feathers). Ground squirrel burrows and burrowing owls were not observed during the field survey. In addition, the grasslands located at the project site are routinely disked, which provides low-quality nesting habitat for burrowing owl. Nonetheless, because suitable habitat for western burrowing owl exists on the project site, pre-construction surveys for western burrowing owls would be required by the ECCCHCP/NCCP to confirm presence or absence of the species. If western burrowing owls are present on or near the project site, development of the proposed project could result in an adverse impact to the species.

Swainson's Hawk

Swainson's hawk is a summer resident and migrant in California's Central Valley and scattered portions of the southern California interior. Areas typically used by Swainson's hawk for nesting include the edge of narrow bands of riparian vegetation, isolated patches of oak woodland, lone trees, planted and natural trees associated with roads, farmyards and sometimes adjacent residential areas. Swainson's hawk typically forage in open habitats, including grasslands, open woodlands, and agricultural areas.

The CNDDB search did not return any occurrences of Swainson's hawk within 1,000 feet of the project site. The nearest record of Swainson's hawk in the CNDDB search area is approximately one-mile southeast of the project site. According to the PSR, the ruderal grasslands located on-site are along the western edge of the range for Swainson's hawks. Seven of the on-site trees are large enough to be potentially suitable for nesting raptors, including Swainson's hawks. In addition, several trees in proximity of the project site, specifically, the trees located at the residences north of the project site, are potentially suitable for nesting. Moore surveyed the trees at and near the site with binoculars to search for raptor stick nests; however, raptor stick nests were not observed. In addition, Swainson's hawks were observed during the field survey; however, the field survey was conducted during the winter when Swainson's hawks are not nesting in the area. Therefore, Swainson's hawks may forage in the project vicinity and could potentially nest in trees in or near the site.

Because suitable habitat for Swainson's hawk exists on the project site, pre-construction surveys for Swainson's hawk would be required by the ECCCHCP/NCCP to confirm presence or absence of the species. If Swainson's hawks are present on or near the project site, development of the proposed project could result in an adverse impact to the species.

Golden Eagle

Golden eagles are fairly adaptable in habitat but often reside in areas with few shared ecological characteristics, such as mountains and cliffs. In addition, golden eagles tend to avoid developed areas. The project site contains ruderal grassland that is located within the range of the golden eagle.

As part of the PSR, trees on the site and visible from the site were inspected for raptor stick nests. The project site is noted to have 12 trees on-site, which are potentially suitable for nesting golden eagles; however, all of the trees on-site are unlikely to be used by nesting raptors of any species due to their small sizes. Furthermore, golden eagles would

be unlikely to nest at or near the project site due to the development surrounding the project site. As such, raptor stick nests were not observed in the on-site trees or in trees visible from the site. In addition, golden eagles were not observed at the project site as the species nests more often on cliffs in remote natural areas than in trees near urban areas.

The CNDDB search did not include any occurrences of golden eagles within 0.5 miles of the project site. Nonetheless, pre-construction surveys for golden eagle are required by the ECCCHCP/NCCP to confirm presence or absence of the species. If golden eagle is present on or near the project site, the proposed project could result in an adverse impact to the species.

Nesting Raptors and Migratory Birds

The trees on-site may be used by other migratory birds protected by the MBTA for nesting. As part of the proposed project, four of the 12 on-site trees would be removed. Construction activities that adversely affect the nesting success of raptors and migratory birds (i.e., lead to the abandonment of active nests) or result in mortality of individual birds constitute a violation of State and federal laws, and in the event that such species occur on or near the project site during the breeding season, project construction activities could result in an adverse effect to species protected under the MBTA.

ECCCHCP/NCCP Requirements

Procedures for pre-construction surveys, best management practices, and construction monitoring, as well as Applicable Avoidance and Minimization Measures for species covered by the ECCCHCP/NCCP are outlined in Section 6.3.3 Surveys for Construction Monitoring and Section 6.4.3 Species-Level Measures of the ECCCHCP/NCCP.[13] The project would be required to comply with all ECCCHCP/NCCP requirements, including conducting pre-construction surveys prior to ground disturbance activities to establish whether nests of Swainson's hawks and golden eagles are occupied. If nests are occupied, the project would be required to comply with the minimization requirements and construction monitoring in the ECCCHCP/NCCP. In compliance with the ECCCHCP/NCCP, the project would also be required to follow Applicable Avoidance and Minimization Measures if nests are located within 1,000 feet of the project site.

All birds covered by the ECCCHCP/NCCP (tricolored blackbird, western burrowing owl, golden eagle, and Swainson's hawk) are also considered migratory birds and are subject to the prohibitions of the MBTA. Therefore, actions conducted under the ECCCHCP/NCCP comply with the provisions of the MBTA. Conservation Measure 1.12, Implement Best Management Practices for Rural Road Maintenance, and Conservation, Measure 1.14, Design Requirements for Covered Roads Outside of the UDA, of the ECCCHCP/NCCP incorporates avoidance guidelines for compliance with the MBTA. Because the project would comply with all ECCCHCP/NCCP requirements, the project would also comply with the provisions of the MBTA.

Additionally, the proposed project would be subject to pay all applicable fees according to the Fee Zone Map of the ECCCHCP/NCCP prior to construction and in compliance with Section 9.2.712 of the Oakley Municipal Code. The developer would be required to pay the appropriate fees based on the applicable fee calculator at the time of development.

[13] East Contra Costa County Habitat Conservation Plan Association. *Final East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan.* October 2006.

Conclusion

Based on the above, western burrowing owl, Swainson's hawk, golden eagle, and other nesting migratory birds and raptors, have the potential to occur on-site. However, the project would comply with ECCCHCP/NCCP requirements, and pre-construction surveys would be required. The project would be required to comply with the ECCCHCP/NCCP's Applicable Avoidance and Minimization Measures for western burrowing owl, Swainson's hawk, golden eagle, and nesting and migratory birds. The proposed project would comply with all applicable ECCCHCP/NCCP requirements. Thus, the proposed project would not have an adverse effect, either directly or through habitat modifications, on species identified as special-status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS, nor conflict with provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or State habitat conservation plan. As such, a ***less-than-significant*** impact would result.

b,c. The project site is currently undeveloped with graveled areas. The project site does not contain riparian habitat or other sensitive natural communities, including wetlands, or potentially jurisdictional waters of the State.[14] As part of the PSR, Moore conducted an assessment of potentially jurisdictional waters of the U.S. or wetlands at the site during the field survey and determined that potentially jurisdictional waters of the U.S. or wetlands of any type are not located on the site. Therefore, the proposed project would not have a substantial adverse effect on riparian habitat, sensitive natural communities, or federally protected wetlands, and a ***less-than-significant*** impact would occur.

d. The project site is located in an urbanized area and is primarily undeveloped and incudes a gravel roadway and centrally-located gravel pad. The project site is surrounded by residences to the north; commercial uses and single-family residences to the west, across O'Hara Avenue; a single-family residence and Laurel Baseball Fields to the east; and a vineyard to the south. Furthermore, according to the PSR, the ruderal grasslands at the project site have been periodically mowed and/or disked for decades. In addition, the graveled driveway and associated pad on the site have been present for decades as the project site has been used for a staging area for nearby development and most recently, a parking area for the Laurel Baseball Fields. Therefore, the project site has been subject to regular disturbance. The developed nature of the surrounding area precludes the use of the project site as a migratory corridor and, therefore, the project site and surrounding area are not anticipated to support any substantial wildlife movement corridors or wildlife nursery sites. As such, the project would not interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites, and a ***less-than-significant*** impact would occur.

e. As previously noted, 12 non-native trees currently exist on the project site along the frontage of Laurel Road. Four Chinese pistache trees and four southern live oak trees would be preserved, and a total of three olive trees and one Chinese pistache tree would be removed as part of the project.

Section 9.1.1112 of the Municipal Code defines protected trees and heritage trees, and establishes requirements governing the removal of such. Section 9.1.1112 defines a

[14] U.S. Fish and Wildlife Service. *National Wetlands Inventory.* Available at: https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/. Accessed April 2024.

protected tree as any tree adjacent to or part of a riparian habitat, foothill woodland, or oak savanna that measures 20 inches in circumference or larger and an indigenous tree that measures 40 inches in circumference or larger or as a California native oak that measures at least 50 inches in circumference (15.6 inches diameter). Section 9.1.1112 also requires that any protected trees that are to be removed shall be replaced. The four on-site trees proposed for removal do not meet the City's definition of protected or heritage trees. Because the trees located on the project site would not be considered a protected tree or heritage tree, the removal of the on-site trees and vegetation would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, and a ***less-than-significant*** impact would occur.

V. CULTURAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	✖	☐	☐
b. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?	☐	✖	☐	☐
c. Disturb any human remains, including those interred outside of dedicated cemeteries.	☐	✖	☐	☐

Discussion

a,b,c. Historical resources are features that are associated with the lives of historically important persons and/or historically significant events, that embody the distinctive characteristics of a type, period, region or method of construction, or that have yielded, or may be likely to yield, information important to the pre-history or history of the local area, California, or the nation. Examples of typical historical resources include, but are not limited to, buildings, farmsteads, rail lines, bridges, and trash scatters containing objects such as colored glass and ceramics. According to the City's Focused General Plan Update, while the City of Oakley does not contain any officially designated historic structures, numerous buildings located primarily in the downtown area are eligible for such designation or listing.[15] However, the project site and off-site improvement areas are located outside of the City of Oakley's downtown area.

On March 29, 2024, the Northwest Information Center (NWIC) performed a records search of the California Historic Resources Information System (CHRIS) for cultural resource site records and survey reports within the proposed project area. The CHRIS search concluded that the project site does not contain any recorded archaeological resources, historic buildings or structures included in any lists of historic resources, nor does the project site contain Native American resources.[16] The CHRIS search also concluded that there is a low to medium potential for unrecorded Native American resources and a high potential for unrecorded historic-period archaeological resources to be located within the project area. In addition, on March 27, 2024, the Native American Heritage Commission (NAHC) conducted a records search of the Sacred Lands File (SLF) which indicated that archaeological and other cultural resources are not known to be present in the project vicinity. [17]

As previously discussed, the project site is primarily undeveloped and is regularly disked. The project site also includes a gravel roadway and gravel pad, which have historically been used as an overflow parking lot for the adjacent Laurel Baseball Fields. While historic resources have not been recorded at the project site, the potential exists for resources to occur. Thus, ground-disturbing activity related to project construction could encounter such resources. Therefore, the proposed project could cause a substantial adverse change in the significance of a historic or archaeological resource pursuant to CEQA Guidelines Section 15064.5 and/or disturb human remains, including those interred

[15] City of Oakley. *City of Oakley General Plan, Focused General Plan Update* [pg. 6-20]. Adopted January 11, 2022.
[16] Northwest Information Center. Re: *Record search results for the proposed Oakley Shops at Laurel Fields Project.* March 29, 2024.
[17] Native American Heritage Commission. *Re: Oakley Shops at Laurel Fields Project, Contra Costa County.* March 27, 2024.

outside of formal cemeteries during construction. Thus, impacts could be considered ***potentially significant***.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

V-1. *If buried archaeological, paleontological, and/or cultural resources are encountered during site grading or other site work, all such work shall be halted immediately within 100 feet of the discovery and the developer shall immediately notify the City of Oakley Planning Division of the discovery. In such case, the developer shall be required, at their own expense, to retain the services of a qualified archaeologist for the purpose of recording, protecting, or curating the discovery, as appropriate. The archaeologist shall be required to submit to the City of Oakley Planning Division for review and approval a report of the findings and method of curation or protection of the resources. Further grading or site work within the area of discovery would not be allowed until the preceding work has occurred.*

The foregoing requirements shall be noted on the project improvement plans and disclosed to any subcontractors by the general contractor or job superintendent during pre-construction meetings, subject to review and approval by the City of Oakley Planning Division.

V-2. *Pursuant to State Health and Safety Code §7050.5 (c) State Public Resources Code §5097.98, if human bone or bone of unknown origin is found during construction, all work shall stop within 100 feet of the find and the Contra Costa County Coroner shall be contacted immediately. If the remains are determined to be Native American, the Coroner shall notify the Native American Heritage Commission, who shall notify the person believed to be the most likely descendant. The most likely descendant shall work with the contractor to develop a program for re-internment of the human remains and any associated artifacts. Additional work is not to take place within 100 feet of the find until the identified appropriate actions have been implemented.*

The foregoing requirements shall be noted on the project improvement plans and disclosed to any subcontractors by the general contractor or job superintendent during pre-construction meetings, subject to review and approval of compliance by the City of Oakley Planning Division.

VI. ENERGY. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	✖	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	✖	☐

Discussion

a,b. The main forms of available energy supply are electricity, natural gas, and oil. A description of the 2022 California Green Building Standards Code, the Building Energy Efficiency Standards, and the City's Strategic Energy Plan (SEP), with which the proposed project would be required to comply, as well as discussions regarding the proposed project's potential effects related to energy demand during construction and operations, are provided below.

California Green Building Standards Code

The 2022 California Green Building Standards Code, otherwise known as the CALGreen Code (CCR Title 24, Part 11), is a portion of the CBSC, which became effective with the rest of the CBSC on January 1, 2023. [18] The purpose of the CALGreen Code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California. Requirements of the CALGreen Code include, but are not limited to, the following measures:

- Compliance with relevant regulations related to future installation of EV charging infrastructure in residential and non-residential structures;
- Indoor water use consumption is reduced through the establishment of maximum fixture water use rates;
- Outdoor landscaping must comply with the California Department of Water Resources' MWELO, or a local ordinance, whichever is more stringent, to reduce outdoor water use;
- Diversion of 65 percent of construction and demolition waste from landfills;
- Incentives for installation of electric heat pumps, which use less energy than traditional heating, ventilation, and air conditioning (HVAC) systems and water heaters;
- Required solar PV system and battery storage standards for certain buildings; and
- Mandatory use of low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.

Building Energy Efficiency Standards

The 2022 Building Energy Efficiency Standards is a portion of the CBSC, which expands upon energy-efficiency measures from the 2019 Building Energy Efficiency Standards,

[18] California Building Standards Commission. *2022 California Green Building Standards Code*. 2023.

went into effect starting January 1, 2023. The 2022 standards provide for additional efficiency improvements beyond the 2019 standards. The proposed project would be subject to all relevant provisions of the most recent update of the CBSC, including the Building Energy Efficiency Standards. Adherence to the most recent CALGreen Code and Building Energy Efficiency Standards would ensure that the proposed structure would consume energy efficiently.

Strategic Energy Plan

In the fall of 2015, the City of Oakley adopted a SEP to help meet State mandates for required energy use and GHG emission reductions.[19] The SEP included six energy planning goals and priorities, including, but not limited to, improving energy performance to exceed Title 24 requirements for new construction and major renovations of the City facilities; exploring opportunities for energy efficiency, demand reduction, and/or clean self-generation measures; and exploring existing economic and fiscal criteria commonly used for the evaluation and implementation of energy use reduction and energy generation strategies.

Construction Energy Use

Construction of the proposed project would involve on-site energy demand and consumption related to use of oil in the form of gasoline and diesel fuel for construction worker vehicle trips, hauling and materials delivery truck trips, and operation of off-road construction equipment. In addition, diesel-fueled portable generators may be necessary to provide additional electricity demands for temporary on-site lighting, welding, and for supplying energy to areas of the site where energy supply cannot be met via a hookup to the existing electricity grid. Even during the most intense period of construction, due to the different types of construction activities (e.g., site preparation, grading, building construction), only portions of the project site and off-site improvement areas would be disturbed at a time, with operation of construction equipment occurring at different locations on the project site, rather than a single location. Project construction would not involve the use of natural gas appliances or equipment.

All construction equipment and operation thereof would be regulated by the CARB's In-Use Off-Road Diesel Vehicle Regulation. The In-Use Off-Road Diesel Vehicle Regulation is intended to reduce emissions from in-use, off-road, heavy-duty diesel vehicles in California by imposing limits on idling, requiring all vehicles to be reported to CARB, restricting the addition of older vehicles into fleets, and requiring fleets to reduce emissions by retiring, replacing, or repowering older engines, or installing exhaust retrofits. In addition, as a means of reducing emissions, construction vehicles are required to become cleaner through the use of renewable energy resources. The In-Use Off-Road Diesel Vehicle Regulation would therefore help to improve fuel efficiency for equipment used in construction of the proposed project. Technological innovations and more stringent standards are being researched, such as multi-function equipment, hybrid equipment, or other design changes, which could help to further reduce demand on oil and limit emissions associated with construction.

Based on the above, the temporary increase in energy use occurring during construction of the proposed project would not result in a significant increase in peak or base demands or require additional capacity from local or regional energy supplies. In addition, construction activities would be required to comply with all applicable regulations related

[19] City of Oakley. *Strategic Energy Plan*. Fall 2015.

to energy conservation and fuel efficiency, which would help to reduce the temporary increase in demand.

Operational Energy Use

Following implementation of the proposed project, PG&E would provide electricity to the project site. Energy use associated with operation of the proposed project would be typical of commercial uses, requiring electricity for interior and exterior building lighting, HVAC, electronic equipment, machinery, refrigeration, appliances, security systems, and more. Maintenance activities during operations, such as landscape maintenance, would involve the use of electric or gas-powered equipment. In addition to on-site energy use, the proposed project would result in transportation energy use associated with vehicle trips generated by the proposed residential development. It should be noted that, as required by Mitigation Measure VIII-1 in this IS/MND, natural gas infrastructure would be allowed if the applicant implements alternative methods that reduce the project's greenhouse gas emissions in an equally effective or superior manner as would exist without natural gas emission infrastructure.

The proposed project would be subject to all relevant provisions of the most recent update of the CBSC, including the Building Energy Efficiency Standards. Adherence to the most recent CALGreen Code and the Building Energy Efficiency Standards would ensure that the proposed structures would consume energy efficiently through the incorporation of such features as efficient water heating systems, high performance attics and walls, and high efficacy lighting. Required compliance with the CBSC would ensure that the building energy use associated with the proposed project would not be wasteful, inefficient, or unnecessary. In addition, electricity supplied to the project site by PG&E would comply with the State's Renewable Portfolio Standard (RPS), which requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020 and to 60 percent by 2030. Thus, a portion of the energy consumed during operation of the proposed project would originate from renewable sources.

The CARB prepared the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan),[20] which builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. Appendix D of the 2022 Scoping Plan provides suggestions for prioritizing various types of mitigation, such as on-site GHG-reducing design features and mitigation measures. Appendix D includes the methods to reduce Vehicle Miles Traveled (VMT), support building decarbonization, and provide access to shared mobility services or transit, as well as EV charging. Appendix D provides further suggestions for prioritizing other mitigation types, including non-local off-site mitigation, and voluntary offsets issued by a recognized and reputable voluntary carbon registry. The regulation described above, with which the proposed project must comply, would be consistent with the intention of the 2022 Scoping Plan and the recommended actions included in Appendix D of the 2022 Scoping Plan.

Additionally, the proposed project would be consistent with the goals of the SEP, as the proposed project would comply with the latest CBSC standards regarding energy conservation, renewable energy resources, and green building standards.

[20] California Air Resources Board. *2022 Scoping Plan for Achieving Carbon Neutrality.* November 16, 2022.

With regard to transportation energy use, the proposed project would comply with all applicable regulations associated with vehicle efficiency and fuel economy. In addition, as discussed in Section XVII, Transportation, of this IS/MND, the project site is not anticipated to substantially increase VMT. Furthermore, the Tri-Delta Transit provides transit services in the City of Oakley, with three lines connecting Brentwood and the Pittsburg/Bay Point Bay Area Rapid Transit (BART) station. The site's access to public transit and proximity to bicycle and pedestrian facilities, such as existing sidewalks along O'Hara Avenue and Laurel Road, would reduce VMT and, consequently, fuel consumption associated with customers and employees traveling to the project site.

Conclusion

Based on the above, construction and operations of the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources or conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Thus, a ***less-than-significant*** impact would occur.

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

Discussion

ai-ii. The project site does not contain any active or potentially active faults, nor is the site located within a State-designated Alquist-Priolo Fault Zone.[21] However, according to the City's General Plan EIR, the City of Oakley is subject to seismic risk because the City is within the San Francisco Bay Area, an area of high seismicity.[22] In addition, according to the Geotechnical Investigation prepared for the proposed project by Intertek PSI (see Appendix D),[23] project area is considered to be seismically active and seismic hazards within the project site can be attributed to potential groundshaking as a result of earthquake events.

[21] California Geologic Survey. *Seismic Hazard Zone Report for the Brentwood 7.5-Minute Quadrangle, Contra Costa County, California.* 2018.
[22] City of Oakley. *City of Oakley 2020 General Plan Draft Environmental Impact Report* [pg. 3-161]. September 2002.
[23] Intertek PSI. *Geotechnical Engineering Report Proposed Oakley Shops at Laurel Fields*. October 30, 2023.

Proper engineering of the proposed buildings in compliance with the CBSC would ensure that the proposed project would not be subject to substantial risks related to seismic ground shaking. Projects designed in accordance with the CBSC should be able to: 1) resist minor earthquakes without damage, 2) resist moderate earthquakes without structural damage but with some nonstructural damage, and 3) resist major earthquakes without collapse but with some structural as well as nonstructural damage. Conformance with the CBSC design standards would be enforced through building plan review and require approval by the City.

Based on the above, the proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault or strong seismic ground shaking. Thus, a ***less-than-significant*** impact would occur.

aiii, c. The proposed project's potential effects related to liquefaction, subsidence/settlement, and lateral spreading are discussed in detail below. Please refer to question 'aiv' for a discussion of potential effects related to landslides. As discussed therein, the project site is not located on a geologic unit or soil that is unstable and could potentially result in on- or off-site landslides, and impacts related to landslides would not occur.

Liquefaction and Subsidence/Settlement

Liquefaction is the temporary transformation of loose, saturated granular sediments from a solid state to a liquefied state as a result of seismic ground shaking. In the process, the soil undergoes transient loss of strength, which commonly causes ground displacement or ground failure to occur. Because saturated soils are a necessary condition for liquefaction, soil layers in areas where the groundwater table is near the surface have higher liquefaction potential than those in which the water table is located at greater depths. Additionally, loose unsaturated sandy soils have the potential to settle during strong seismic shaking. Liquefaction can often result in subsidence, which refers to the gradual settling or sudden sinking of land surface, or settlement, which refers to the vertical movement of soil when a load is applied to the surface.

The project site and off-site improvement areas are not located within a State of California Seismic Hazard Zone for liquefaction.[24] According to the MTC/ABAG Hazard Viewer Map, project site is located within a "Moderate" Earthquake Liquefaction Susceptibility zone.[25] An evaluation of liquefaction induced settlement and dry sand settlement of the soil above the water table were conducted by Intertek PSI and consisted of cone penetration test (CPT) data using mapped historical high groundwater levels of 14 feet below ground surface (bgs), and an expected earthquake magnitude of 6.6. To evaluate soil conditions at the project site, Intertek PSI advanced 18 geotechnical borings at three CPTs throughout the project site. Intertek PSI generally encountered medium dense to dense poorly graded to silty sand in the borings to the maximum depth explored of 26.5 feet bgs. Clayey sand to sandy lean clay of low plasticity was encountered near the bottom of Borings 8 through 10 at a depth of about 26 feet. The CPTs also encountered sands to silty sands from 24 to 30 feet bgs and interbedded clays to silty clays were encountered from approximately 26 to 46 feet. Very dense silty sands were encountered below the clays from 46 to 50 feet. In one of the CPTs, clay to silty clay was encountered at depths

[24] California Department of Conservation. *California Earthquake Hazards Zone Application.* Available at: https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed April 2024.

[25] Association of Bay Area Governments. *Hazard Viewer.* Available at: https://abag.ca.gov/our-work/resilience/data-research/hazard-viewer/. Accessed April 2024.

of approximately 55 to 70 feet and very dense silty sands were encountered at the maximum depth explored of approximately 89 feet.

Based on the analysis, an estimated 0.5 to 0.75 inches of liquefaction-induced total settlements may occur within the liquefiable sand layers encountered in the subsurface exploration at the project site. The depth of liquefaction settlement is expected to occur in the poorly graded sand to silty sand layers at depths of approximately 20 to 23 feet, and between 31 to 33 feet in the southwest corner of the site. However, the Geotechnical Engineering Report determined that the potential for liquefaction-induced ground surface manifestations (i.e., sand boils and ground fissures) to occur across the site is low.

Oakley Municipal Code Section 6.9.328 requires that as part of obtaining a Grading Permit, an application must be accompanied, among other documents, with three copies of a geotechnical or engineering geology report to excavate and grade the project site. The project's Improvement Plans would be required to be signed by a State-certified civil engineer who prepared the geotechnical report and reviewed to ensure that the plans conform to all recommendations contained in the report. Furthermore, Oakley Municipal Code Section 6.9.702 provides that, upon completion of rough grading work, but before the issuance of building permits, the City Engineer may require that a soil engineering report be prepared certifying the adequacy of the site for the intended use, as affected by soil engineering reports. While the proposed project would be required to comply with the requirements set forth in Oakley Municipal Code Sections 6.9.328 and 6.9.702, due to the potential for liquefaction to occur on-site, foundation subsidence or settlement may occur, and, without the implementation of mitigation, an impact could occur.

Lateral Spreading

Lateral spreading involves horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water; typically, lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. Given that the project site does not contain, and is not adjacent to, any free faces including excavations, channels, or open bodies of water, lateral spreading would not present a likely hazard at the site.

Conclusion

Based on the above, the proposed project would not be subject to substantial risks related to lateral spreading. However, the potential exists for liquefaction and associated subsidence/settlement to occur at the project site. Without implementation of mitigation, the proposed project could cause substantial adverse effects related to such. Thus, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

VII-1. *Prior to approval of any grading permits, the project Civil Engineer shall show on the project plans that the project design adheres to all engineering recommendations provided in the site-specific Geotechnical Engineering Report prepared for the proposed project by Intertek PSI. Proof of compliance with all recommendations specified in the Geotechnical*

Engineering Report shall be subject to review and approval by the City Engineer.

The project plans shall include, but not be limited to, engineering recommendations related to site preparation and grading, excavations, underground storage tank excavation, utility trench backfill, foundations, floor slabs, retaining walls, pavement areas, and project review and construction monitoring.

aiv, d. The proposed project's potential effects related to landslides and expansive soils are discussed in detail below.

Landslides

Seismically-induced landslides are triggered by earthquake ground shaking. The risk of landslide hazard is greatest in areas with steep, unstable slopes. The project site is relatively flat and is not located near any slopes. Therefore, the proposed project would not be subject to landslide risks and would not expose people or structures to potential risk of loss, injury, or death involving landslides.

Expansive Soils

Expansive soils can undergo significant volume changes with variations in moisture content. Specifically, such soils shrink and harden when dried and expand and soften when wetted. If structures are underlain by expansive soils, foundation systems must be capable of withstanding the potential damaging movements of the soil.

According to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey, the project site is comprised entirely of Delhi sand with two to nine percent slopes, which has a shrink-swell numerical rating of 0.12. The numerical ratings indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00). Per the Geotechnical Investigation prepared for the proposed project, the near-surface soils encountered in the subsurface exploration consisted of poorly graded sand with low fines content. Such soils are considered to have a very low expansion potential. Therefore, the project site is not located on expansive soil, as defined in Table 18-1B of the Uniform Building Code, and substantial direct or indirect risks to life or property due to expansive soils would likely not occur.

Conclusion

Based on the above, the proposed project would not be located on expansive soil and would not subject to substantial risks related to landslides or expansive soils. Therefore, a ***less-than-significant*** impact would occur.

b. During construction activities, topsoil would be exposed following site grading and prior to constructing building foundations. As a result, the potential for topsoil erosion would exist. Following development of the site, all exposed soils would be covered with impervious surfaces or landscaping and, thus, the potential for erosion to occur would not exist long-term.

As discussed further under questions 'ci' and 'ciii' in Section X, Hydrology and Water Quality, of this IS/MND, pursuant to the City of Oakley Municipal Code Sections 6.9.308

and 6.11.212, preparation of an Erosion Control Plan and Stormwater Pollution Prevention Plan (SWPPP) prior to construction activities and implementation of Best Management Practices (BMPs) during construction is required. The erosion control measures required by both the SWPPP and the Erosion Control Plan would ensure that the proposed project would not result in substantial erosion or the loss of topsoil. Therefore, the proposed project would not result in substantial soil erosion or the loss of topsoil, and a ***less-than-significant*** impact would occur.

e. The proposed project would connect to existing ISD sewer services. Thus, the construction or operation of septic tanks or other alternative wastewater disposal systems would not be included as part of the project. Therefore, ***no impact*** regarding the capability of soil to adequately support the use of septic tanks or alternative wastewater disposal systems would occur.

f. The City's General Plan does not note the existence of any unique geologic features within the City. Consequently, implementation of the proposed project is not anticipated to result in direct or indirect destruction of unique geologic features.

The City's General Plan indicates that few paleontological resources are known to occur within the City Planning Area.[26] In addition, portions of the surrounding area are developed and paleontological resources have not been encountered in the vicinity. Thus, existing paleontological resources are not expected to occur on the site. Nonetheless, the potential exists for previously unknown paleontological resources could exist within the project site. Ground-disturbing activity such as grading, trenching, or excavating associated with implementation of the proposed project would have the potential to disturb or destroy such resources if present. Therefore, the proposed project could result in the direct or indirect destruction of a unique paleontological resource, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

VII-2. Implement Mitigation Measures V-1 and V-2.

[26] City of Oakley. *City of Oakley General Plan, Focused General Plan Update* [pg. 6-19]. Adopted January 11, 2022.

VIII. GREENHOUSE GAS EMISSIONS. *Would the project:*	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	✖	☐	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?	☐	✖	☐	☐

Discussion

a,b. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. An individual project's GHG emissions are at a micro-scale level relative to global emissions and effects to global climate change; however, an individual project could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. As such, impacts related to emissions of GHG are inherently considered cumulative impacts.

Implementation of the proposed project would cumulatively contribute to increases of GHG emissions. Estimated GHG emissions attributable to future development would be primarily associated with increases of carbon dioxide (CO_2) and, to a lesser extent, other GHG pollutants, such as methane (CH_4) and nitrous oxide (N_2O) associated with area sources, mobile sources or vehicles, utilities (electricity), water usage, wastewater generation, and the generation of solid waste. The primary source of GHG emissions for the project would be mobile source emissions. The common unit of measurement for GHG is expressed in terms of annual metric tons of CO_2 equivalents ($MTCO_2e$/yr).

The proposed project is located within the jurisdictional boundaries of BAAQMD. The most recent BAAQMD Air Quality Guidelines were released in April 2023.[27] The updated GHG thresholds address more recent climate change legislation, including Senate Bill (SB) 32 (signed into law on September 8, 2016), and provide qualitative thresholds related to Buildings and Transportation.

Construction GHG emissions are a one-time release and are, therefore, not typically expected to generate a significant contribution to global climate change. Neither the City nor BAAQMD has an adopted threshold of significance for construction-related GHG emissions and does not require quantification. Nonetheless, the proposed project's construction GHG emissions, as well as operational emissions, have been estimated using CalEEMod under the same assumptions discussed in Section III, Air Quality, of this IS (see Appendix A). The emissions estimates prepared for the proposed project determined that unmitigated construction of the project would result in total GHG emissions of 399 $MTCO_2e$ over the entire construction period.

[27] Bay Area Air Quality Management District. *2022 California Environmental Quality Act Guidelines*. April 2023.

Potential impacts related to operational GHG emissions resulting from implementation of the proposed project are considered in comparison with BAAQMD's adopted thresholds of significance below.

BAAQMD Thresholds of Significance

The BAAQMD's adopted thresholds of significance for GHG emissions are qualitative, and address recent climate change legislation, including SB 32. According to the new thresholds of significance, a project must either include specific project design elements (e.g., exclude use of natural gas, achieve a specific reduction in project-generated VMT below the regional average) or be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).[28]

The City of Oakley does not have a GHG reduction strategy under CEQA Guidelines Section 15183.5(b). Therefore, the following analysis focuses on the new BAAQMD GHG thresholds related to specific project design elements.

According to the BAAQMD's thresholds of significance, in order to find a less-than-significant GHG impact, projects must include, at a minimum, the following project design elements:

1. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development);
2. The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines;
3. The project will achieve a reduction in project-generated VMT below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted SB 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's "Technical Advisory on Evaluating Transportation Impacts in CEQA"; and
4. The project will achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

In order to be consistent with the first criterion, the proposed project would be required to include all electric appliances and plumbing. The 2022 Building Energy Efficiency Standards requires that new development be built electric-ready (i.e., structures will be required to have electric supply panels and circuitry to support all-electric appliances and heating). Implementation of Mitigation Measure VIII-1 would allow natural gas infrastructure if the applicant implements alternative methods that reduce the project's GHG emissions in an equally effective or superior manner as would exist without natural gas emission infrastructure. Thus, the proposed project would comply with the first criterion.

Regarding the second criterion, as discussed in Section VI, Energy, of this IS/MND, the proposed project would comply with all applicable federal, State, and local regulations regarding energy use during both project construction and project operations. Therefore, as discussed therein, the proposed project would not result in any wasteful, inefficient, or unnecessary energy usage.

[28] Bay Area Air Quality Management District. *2022 California Environmental Quality Act Guidelines*. April 2023.

With respect to the third criterion, as discussed in Section XVII, Transportation, of this IS/MND, the proposed project may be presumed to be a local-serving facility and would therefore have a less-than-significant impact on VMT. Therefore, the project would be consistent with the current version of the California Climate Change Scoping Plan.

With respect to the fourth criterion, the proposed project would be subject to the non-residential standards set forth in Section 5.106.5.3 of the CALGreen Code. Pursuant to Section 5.106.5.3, the proposed project would include 73 EV parking and charging spaces. Compliance with the aforementioned CalGreen Code requirement would be sufficient to comply with the Tier 2 CALGreen standards, as required by BAAQMD. It should be noted that other options may be available to developers to meet the fourth criterion of BAAQMD's GHG thresholds of significance. For example, the use of higher-level EV chargers may result in a lower criteria for the total number of EV spaces required to meet CALGreen standards.

As previously noted, the CARB prepared the 2022 Scoping Plan, which builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. Appendix D of the 2022 Scoping Plan provides suggestions for prioritizing various types of mitigation, such as on-site GHG-reducing design features and mitigation measures. Similar to the 2022 Scoping Plan, BAAQMD identified the necessary design elements required of new land use projects and plans being built today in order to achieve California's long-term climate goal of carbon neutrality by 2045. If these design elements are incorporated into the design and construction of a project, then the project would contribute its portion of what is necessary to achieve California's long-term climate goals— its "fair share"—and a lead agency reviewing the project under CEQA can conclude that the project would not make a cumulatively considerable contribution to global climate change.

Based on the above, BAAQMD's thresholds of significance are consistent with the 2022 Scoping Plan. Therefore, if a development project is consistent with BAAQMD's thresholds of significance, it can be assumed that the project would also be consistent with the 2022 Scoping Plan. Given that the proposed project would not be consistent with BAAQMD's required thresholds of significance without implementation of mitigation, the proposed project would conflict with the 2022 Scoping Plan.

Conclusion

Based on the above, without the implementation of mitigation, the project may not comply with the BAAQMD's required thresholds of significance. Therefore, the proposed project could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. Thus, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

VIII-1. *Consistent with the BAAQMD's thresholds of significance, prior to issuance of building permits for the proposed project, the project applicant shall demonstrate via project design and/or notation included on project design that natural gas infrastructure shall be prohibited. Natural gas infrastructure*

may be allowed if the applicant implements alternative methods that reduce the project's greenhouse gas emissions in an equally effective or superior manner as would exist without natural gas emission infrastructure.

Conformance with the foregoing requirement shall be confirmed through review and approval of building permit plans by the City of Oakley Planning Division.

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

Discussion

a. Projects that involve the routine transport, use, or disposal of hazardous materials are typically industrial in nature. As such, the proposed project's commercial uses are not anticipated to involve the routine transport, use, disposal, or generation of substantial amounts of hazardous materials. On-site maintenance may involve the use of common cleaning products, fertilizers, and herbicides, any of which could contain potentially hazardous chemicals; however, such products would be expected to be used in accordance with label instructions. Due to the regulations governing use of such products and the amount anticipated to be used on the site, routine use of such products would not represent a substantial risk to public health or the environment.

In addition, the proposed project's gas station component would involve the routine transport and use of gasoline and diesel fuels as part of the refilling of the gas station's underground storage tanks (USTs) and fuel dispensers, as well as the storage and selling of automotive fluids through the location's convenience store. Transport of any fuels to the project site would be required to adhere to the Hazardous Materials Regulations stipulated in the Code of Federal Regulations, Title 49, Parts 100-185, which regulate the transportation of hazardous material and hazardous waste.

The proposed project would be required to obtain a Conditional Use Permit for operation of the gas station on Parcel 2, and adhere to all requirements set forth by the City in the permit related to operational use. Fuel would be stored on-site in USTs, which would dispense fuels through 16 pumps.

It should be noted that the underground storage of hazardous materials is subject to the provisions of the California Health and Safety Code and Title 23 of the CCR. Pursuant to Title 23 of the CCR, new USTs are subject to various safety requirements. Such measures include that all new USTs used for the storage of hazardous substances, including associated piping, must have primary and secondary containment systems. The primary containment system must be product-tight, and the secondary containment system must be designed and constructed such that the system can be periodically tested. The design and construction of all primary containment system, including any integral secondary containment, must be approved by an independent testing organization, in accordance with industry codes and/or engineering standards. In addition, all new USTs are required by CCR Title 23 to include equipment capable of detecting a leak at the earliest possible opportunity. The new USTs installed as part of the proposed project would be subject to all applicable regulations set forth by Title 23 of the CCR, including the aforementioned requirements pertaining to primary and secondary containment systems, as well as leak-detection equipment.

The Contra Costa Health Services Hazardous Materials Programs (CCHSHMP) is the designated local agency assigned to implement the program to protect the public health from exposure to hazardous materials stored in the USTs, including the protection of groundwater from contamination. In order to meet the requirements of the CCHSHMP, the project would be subject to annual inspections and the issuance of operating permits, which are also issued for UST system installation, removals, upgrades, and repairs. CCHSHMP personnel would witness specified phases of the work being conducted on the UST system to ensure that the work is conforming to plans approved by the CCHSHMP.

Based on the above, the proposed project would be required to comply with all applicable provisions of the California Health and Safety Code and Title 23 of the CCR, as well as the CCHSHMP. Compliance with such would ensure that the project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and a ***less-than-significant*** impact would occur.

b. The following discussion provides an analysis of potential hazards related to the proposed construction activities and the project's potential to exacerbate any existing on-site hazardous conditions.

Construction Activities

Construction activities associated with the proposed project would involve the use of heavy equipment, which would contain fuels and oils, and the use of other products such as concrete, paints, and adhesives. Small quantities of potentially toxic substances (e.g., petroleum and other chemicals used to operate and maintain construction equipment) would be used at the project site and transported to and from the site during construction. Similarly, operation of the proposed project would include the use of equipment which could use small quantities of potentially toxic substances. However, the project contractor would be required to comply with all California Health and Safety Codes and local City ordinances regulating the handling, storage, and transportation of hazardous and toxic materials. Thus, construction of the proposed project would not create a significant hazard

to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment.

Existing On-Site Conditions

As discussed previously, the project site primarily consists of undeveloped land that appears to be regularly disked. A gravel roadway and gravel pad are also located on-site and have historically been used as an overflow parking lot for the adjacent Laurel Baseball Fields. A review of Google Earth aerial photographs of the project site shows that the project site was used for agricultural purposes around 1939. Although not documented at the project site, past agricultural activities within the project site may have included the use of pesticides, fertilizers, arsenic, or other chemicals. Agricultural uses could result in concentrations of residual chemicals being present in the near surface soil if use or storage of pesticides, fertilizers, or other chemicals has occurred. However, upon development of the project, the site would primarily be covered by pavement and other impervious surfaces, thereby limiting future upset of on-site soils. Nonetheless, issues related to contaminated soils could pose a risk to construction workers during ground disturbing activities. Furthermore, contaminated soils can leach toxic chemicals into nearby ground or surface waters, where these materials can be taken up by plants and animals, contaminate a human drinking water supply, or volatilize and contaminate the indoor air in overlying buildings.[29] Therefore, analysis of on-site soils would be required in order to ensure that any existing soil contaminant concentrations are below the direct exposure Environmental Screening Levels (ESLs) for residential developments, which measures potential hazards to human health. Depending on the types of soil contaminants present, the primary source for ESLs is the California Department of Toxic Substances Control's (DTSC's) residential screening levels, which are recommended in the DTSC's Office of Human and Ecological Risk guidance document *Human Health Risk Assessment Note 3*. For parameters and compounds where DTSC residential screening levels are not established, any detected compounds may instead be compared to Regional Screening Levels (RSLs) established by the USEPA Region 9.

Conclusion

Based on the above, historical agricultural activities on-site may have included pesticide and/or arsenic use, thereby contaminating soils within the subject property. Therefore, the proposed project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

IX-1. *Prior to initiation of construction activities on the proposed project site, the project applicant shall complete an analysis of on-site soils to determine whether substantial concentrations of organochloride pesticides, arsenic, or other soil contaminants are present above the applicable direct exposure Environmental Screening Levels (ESLs) set by the Regional Water Quality Control Board, the residential screening levels set by the Department of*

[29] U.S. Environmental Protection Agency. *Contaminated Land.* Available at: https://www.epa.gov/report-environment/contaminated-land. Accessed April 2024.

Toxic Substances Control's Human Health Risk Assessment Note 3, and/or the U.S. Environmental Protection Agency's Regional Screening Levels for Region 9. If contaminants are not detected above applicable ESLs/RSLs, then further mitigation is not required. If contaminants are detected above the applicable ESLs/RSLs, then the soils shall be remediated by off-hauling to a licensed landfill facility. Such remediation activities shall be performed by a licensed hazardous waste contractor (Class A) and contractor personnel that have completed 40-hour OSHA hazardous training. Impacted soils shall be managed in accordance with the recommendations of applicable federal, State, and local standards, to the satisfaction of the City of Oakley and the Contra Costa County Environmental Health Division. The results of soil sampling and analysis, as well as verification of proper remediation and disposal, shall be submitted to the City of Oakley Planning Division for review and approval.

c. The nearest school relative to the project site is Laurel Elementary School, which is located approximately 820 feet (0.15-mile) southwest of the site. As such, the project site is within one-quarter mile of existing schools. However, as discussed under questions 'a' and 'b' above, development of the proposed project would not result in any significant hazards related to the use, transport, disposal, or upset of hazardous materials. Additionally, the project contractor would be required to comply with all California Health and Safety Codes and local County and City ordinances regulating the handling, storage, and transportation of hazardous and toxic materials. Therefore, the proposed project would result in a ***less-than-significant*** impact related to hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

d. The California Environmental Protection Agency (Cal EPA) has compiled a list of data resources that provide information regarding the facilities or sites identified as meeting the "Cortese List" requirements, pursuant to Government Code 65962.5. The components of the Cortese List include the DTSC Hazardous Waste and Substances Site List,[30] the list of leaking underground storage tank (UST) sites from the State Water Resources Control Board (SWRCB's) GeoTracker database,[31] the list of solid waste disposal sites identified by the SWRCB, and the list of active Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO) from the SWRCB.[32]

The project site is not included on the DTSC Hazardous Waste and Substances Site List, SWRCB's list of solid waste disposal sites, list of leaking UST sites, SWRCB's GeoTracker database, or list of active CDO and CAO. Therefore, the proposed project would not create a significant hazard to the public or the environment related to being located on a site which is included on a list of hazardous materials compiled pursuant to Government Code Section 65962.5, and a ***less-than-significant*** impact would occur.

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30 Department of Toxic Substances Control. *Hazardous Waste and Substances Site List (Cortese).* Available at: https://www.envirostor.dtsc.ca.gov/public/. Accessed April 2024.

31 State Water Resources Control Board. *GeoTracker.* Available at: https://geotracker.waterboards.ca.gov/map/?myaddress=California&from=header&cqid=8858350455. Accessed April 2024.

32 CalEPA. *Cortese List Data Resources*. Available at: https://calepa.ca.gov/sitecleanup/corteselist/. Accessed April 2024.

e. The nearest airport to the project site is the Byron Airport, located approximately 11.12 miles southeast of the project site. Therefore, the project site is not located within two miles of any public airports and does not fall within an airport land use plan area. Accordingly, ***no impact*** would occur related to a safety hazard or excessive noise for people residing or working in the project area.

f. During construction of the proposed project, all construction equipment would be staged on-site so as to prevent obstruction of local and regional travel routes in the City that could be used as evacuation routes during emergency events.

Emergency vehicle access would be provided by three new driveways off of O'Hara Avenue and two new driveways off of Laurel Road. The driveways would connect to the proposed parking lot and internal circulation system. According to the Traffic Impact Assessment prepared by Fehr & Peers for the proposed project, the width of the five new driveways is sufficient to accommodate emergency vehicles. The new internal circulation system would ensure that the proposed commercial uses would not interfere with potential evacuation or response routes used by emergency response teams during operations.

The project would also include construction of new sidewalks along the frontage of O'Hara Avenue, as well as off-site improvements to install a new sanitary sewer manhole, sanitary sewer lines, water lines, and fire service water lines within O'Hara Avenue; install new fire service water lines, water lines, and backflow preventors within Laurel Road; and relocate two existing fire hydrants, which are currently located along the frontage of Laurel Road. The project would also include off-site improvements to the existing bioretention area located within the Laurel Baseball Fields. The implementation of the off-site improvements would directly influence the transportation network near the site during construction, and could result in roadway or lane closures that adversely affect residents in the project area.

Based on the above, the project would not substantially alter the existing circulation system in the surrounding area. However, without proper planning of construction activities, construction traffic could interfere with existing roadway operations during the construction phase, which could impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, project traffic related to construction activities could result in a ***significant*** impact.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

IX-2. *Prior to issuance of demolition or grading permits, the project applicant shall prepare and submit a Construction Traffic Control Plan to the City for review and approval. The Construction Traffic Control Plan shall include, but not be limited to, the following items, to the satisfaction of the City Engineer:*

- *Truck drivers shall be notified of and required to use the most direct route between the site and SR 4, as determined by the City Engineering Department;*
- *All site ingress and egress shall occur only at the main driveways to the project site and construction activities may require installation*

of temporary (or ultimate) traffic signals as determined by the City Engineer;

- *Specifically-designated travel routes for large vehicles shall be monitored and controlled by flaggers for large construction vehicle ingress and egress;*
- *Warning signs indicating frequent truck entry and exit shall be posted on O'Hara Avenue and Laurel Road;*
- *Any debris and mud on nearby streets caused by trucks shall be monitored daily and may require instituting a street cleaning program;*
- *Construction employee parking shall be provided on the project site to eliminate conflicts with nearby areas. Construction of the project shall be staggered so that employee parking demand is met primarily by using on-site parking; and*
- *If importation and exportation of material becomes a traffic nuisance, the City Engineer shall limit the hours the activities can take place.*

g. According to the California Department of Forestry and Fire Protection (CAL FIRE) Fire and Resource Assessment Program, the project site is not located within a Very High or High Fire Hazard Severity Zone (FHSZ).[33] Furthermore, the existing roadways in the project vicinity would act as fire breaks and would reduce the risk for the uncontrolled spread of wildland fires. Therefore, the proposed project would not expose people or structures to the risk of loss, injury or death involving wildland fires, and a ***less-than-significant*** impact would occur.

[33] California Department of Forestry and Fire Protection. *Contra Costa County, Very High Fire Hazard Severity Zones in LRA*. January 7, 2009.

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

Discussion

a, ci-ciii. The following discussion provides a summary of the proposed project's potential to violate water quality standards/waste discharge requirements, alter the drainage pattern of the site resulting in erosion or siltation, increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or otherwise degrade water quality during construction and operation.

Construction

During the early stages of construction activities, topsoil would be exposed due to grading and excavation of the site. After grading and prior to overlaying the ground with impervious surfaces and structures, the potential exists for wind and water to discharge sediment and/or urban pollutants into stormwater runoff, which could adversely affect water quality.

The SWRCB regulates stormwater discharges associated with construction activities where clearing, grading, or excavation results in land disturbance of one or more acres. The City's National Pollutant Discharge Elimination System (NPDES) permit requires applicants to show proof of coverage under the State's General Construction Permit prior

to receipt of any construction permits. The State's General Construction Permit requires a SWPPP to be prepared for the site. A SWPPP describes BMPs to control or minimize pollutants from entering stormwater and must address both grading/erosion impacts and non-point source pollution impacts of the development project. Because the proposed project would disturb greater than one acre of land, the proposed project would be subject to the requirements of the State's General Construction Permit and, with implementation of the required SWPPP and BMPs included therein, construction of the proposed project would not result in a violation of water quality standards and/or degradation of water quality.

Furthermore, per Municipal Code Sections 6.9.306, 6.9.308, and 6.9.404, the proposed project would be required to submit an Erosion Control Plan with submittal of the grading permit application to ensure water quality is not degraded. The plan would include erosion control measures that would be implemented during grading and would be approved by the City Engineer. Given the required submittal and approval of a SWPPP and Erosion Control Plan, the proposed project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality during construction.

Operations

Following project buildout, the surface of the site would be covered with either impervious surfaces or landscaped areas, and topsoil would no longer be exposed. As such, the potential for erosion and associated impacts to water quality would be reduced. However, the addition of impervious surfaces on the site would result in the generation of urban runoff during project operations, which could contain pollutants if the runoff comes into contact with vehicle fluids on parking surfaces and/or landscape fertilizers and herbicides. All municipalities within Contra Costa County (and the County itself) are required to develop more restrictive surface water control standards for new development projects as part of the renewal of the Countywide NPDES permit.

The City of Oakley has adopted the County C.3 Stormwater Standards, which require new development and redevelopment projects that create or alter 10,000 sf or more of impervious area to contain and treat all stormwater runoff from the project site. The proposed project would include 342,800 sf of new impervious area; therefore, the proposed project would be subject to the County C.3 Stormwater Standards.[34] The proposed project would also be subject to the requirements of the SWRCB and the Regional Water Quality Control Board (RWQCB), as well as the County C.3 Standards, which are included in the City's NPDES General Permit. In addition, the proposed project would adhere to Title 6, Chapter 11, of the Municipal Code, which establishes standards for stormwater management and discharge.[35] Prior to issuance of a building permit, the applicant would submit a Stormwater Control Plan (SWCP) that meets the criteria in the most recent version of the Contra Costa Clean Water Program Stormwater C.3 Guidebook. Compliance with such requirements would ensure that impacts to water quality standards or waste discharge requirements would not occur during operation of the proposed project.

A Preliminary Stormwater Control Plan has been prepared for the proposed project (see Figure 7 and Appendix F). In order to manage and treat stormwater, the project site would be divided into six DMAs: DMA-1R, DMA-1P, DMA-1L, EIS-L, SR-L, ST-O. Stormwater

[34] SAGE Consulting Engineers, Inc. *Stormwater Control Plan for Oakley Shops at Laurel Fields.* January 31, 2024.
[35] City of Oakley. *Oakley Municipal Code* [Title 6, Chapter 11]. Updated February 23, 2021.

from the impervious areas on the project site including roofs in DMA-1R and paved areas in DMA-1P, would be collected by catch basins and directed through new storm drain lines and manholes towards the existing 66-inch storm drain line located within the storm drain easement along the northern boundary of the project site. The existing storm drain outfalls to the existing 14,000-sf Laurel Basin bioretention area (IMP-1) located at the Laurel Baseball Fields. IMP-1 would be resized to ensure the bioretention area has the capacity to treat runoff from the proposed 81,728-sf shopping center and parking lot. The IMP-1 bioretention basin area would be designed and constructed according to the criteria in the Contra Costa County Clean Water Program *Stormwater C.3 Guidebook*.

Any runoff overflow associated with DMA-1L would be directed toward the IMP-1. Stormwater from the impervious sidewalk along Laurel Road (EIS-L) would drain to the self-retaining landscape area located between the sidewalk and the curb on Laurel Road. Stormwater from the landscaped areas along the frontage of O'Hara (ST-O) would be self-treating and stormwater from the landscape areas along the frontage of Laurel Road (SR-L) would be self-retaining.

Based on the above, the proposed project is not anticipated to have a negative impact on the properties adjacent to the project site and would not adversely affect surface water quality.

Conclusion

Based on the above, given compliance with the City's Municipal Code and existing County regulations, impacts related to water quality would not occur during project construction or operations. Thus, the proposed project would not violate water quality standards/waste discharge requirement, alter the drainage pattern of the site resulting in erosion or siltation, increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or otherwise degrade water quality during construction, and a ***less-than-significant*** impact would occur.

b,e. Potable water service for the proposed project would be provided by the DWD. According to the DWD's 2020 Urban Water Management Plan (UWMP), the primary water supply for distribution is treated surface water.[36] As a result, any increase in water demand associated with the proposed project would be primarily met through surface water supply, rather than groundwater.

The DWD operates a groundwater supply system that currently consists of groundwater extracted from two wells in Oakley, which is then conveyed in a dedicated well supply pipeline to a blending facility. According to the DWD 2020 UWMP, the wells are connected to the East Contra Costa Subbasin underlying the City. The East Contra Costa Subbasin has been designated as a medium-priority basin by the Department of Water Resources, and is not in overdraft conditions.[37]

The project site represents a relatively small area compared to the overall surface area of the East Contra Costa Subbasin. In addition, runoff from the proposed impervious surfaces would be directed to the bioretention area located within Laurel Baseball Fields where runoff water would percolate and recharge the East Contra Costa Subbasin.

[36] Diablo Water District. *2020 Urban Water Management Plan.* May 2022.
[37] *Ibid*.

Therefore, any new impervious surfaces associated with the proposed project would not interfere substantially with groundwater recharge within the East Contra Costa Subbasin.

Based on the above, the proposed project would result in a ***less-than-significant*** impact with respect to substantially decreasing groundwater supplies, interfering substantially with groundwater recharge, or conflicting with or obstructing implementation of a water quality control plan or sustainable groundwater management plan.

civ. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the project site, the project site is located within the 500-year floodplain (Zone X), which is not designated as a Special Flood Hazard Area.[38] Additionally, pursuant to Municipal Code Section 6.12.138(e), the project would be required to provide adequate drainage to reduce flood hazards. Thus, the project would not impede or redirect flood flows, resulting in a ***less-than-significant*** impact.

d. Tsunamis are defined as sea waves created by undersea fault movement, whereas a seiche is a long-wavelength, large-scale wave action set up in a closed body of water such as a lake or reservoir. The project site is located 46.1 miles from the California coastline and approximately 1.6 miles south of the San Francisco Bay tributaries. Given the distance to the San Francisco Bay tributaries, it is not anticipated that the project site would be affected by flooding risks associated with tsunamis. Furthermore, seiches do not pose a risk to the proposed project because the project site is not located adjacent to a large, closed body of water. As such, the proposed project would not result in a risk related to the release of pollutants due to project inundation flooding, tsunami, or seiche, and ***no impact*** would occur.

[38] Federal Emergency Management Agency. *Flood Insurance Rate Map 06013C0355G.* Effective March 21, 2017.

XI. LAND USE AND PLANNING. *Would the project:*		Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a.	Physically divide an established community?	☐	☐	✖	☐
b.	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	✖	☐

Discussion

a. A project risks dividing an established community if the project would introduce infrastructure or alter a land use so as to change the land use conditions in the surrounding community or isolate an existing land use. The 8.77-acre project site is currently undeveloped. Surrounding existing land uses include single-family residences, undeveloped land, the Contra Costa Canal, and the Delta de Anza Regional Trail to the north; a single-family residence and Laurel Baseball Fields to the east; a vineyard to the south, across Laurel Road; and single-family residences, and a 7-Eleven convenience store with a Chevron gas station to the west, across O'Hara Avenue.

Development of the project site with a grocery store, restaurants, retail uses, and a gas station would provide goods and services to a portion of the City of Oakley, which is predominantly residential. The proposed commercial development would be compatible with the existing commercial development west of the site, across O'Hara Avenue. The proposed sidewalk improvements along O'Hara Avenue would also increase pedestrian connectivity in the project area. Therefore, the proposed project would be a continuation of the surrounding development and would not isolate an existing land use. Furthermore, the City of Oakley General Plan designates the project site as CO and the site is zoned RB District. Thus, development of the site with commercial uses was evaluated as part of the City's General Plan EIR and the Focused General Plan Update IS/ND. As such, the proposed project would not physically divide an established community and a ***less-than-significant*** impact would occur.

b. The proposed project is consistent with the General Plan land use designation of CO; therefore, commercial development has been anticipated at the project site. As demonstrated throughout this IS/MND, the proposed project would not conflict with City policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect. For example, in compliance with the ECCCHCP/NCCCP, the proposed project would be subject to pay all applicable fees according to the Fee Zone Map of the ECCCHCP/NCCP prior to construction and completion of pre-construction surveys for Swainson's hawk, western burrowing owl, golden eagle, and migratory birds. The developer would be required to pay the appropriate fees based on the applicable fee calculator at the time of development. Thus, the proposed project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect, and thus, a ***less-than-significant*** impact would occur.

XII. MINERAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	✖
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	✖

Discussion

a,b. The City of Oakley General Plan EIR states that the only viable mineral resource currently mined in the City of Oakley is sand.[39] In addition, the General Plan does not identify any known mineral resource areas within the Planning Area, including the project site. Furthermore, because the site is located near residential development, the site would not be suitable for mining operations. Thus, the proposed project would not result in the loss of availability of a known mineral resource or a locally important mineral recovery site, and the proposed project would result in ***no impact*** related to mineral resources.

[39] City of Oakley. *City of Oakley 2020 General Plan Draft Environmental Impact Report* [pg. 278]. September 2002.

XIII. NOISE. *Would the project result in:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	✖	☐	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	✖	☐	☐
c. For a project located within the vicinity 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?	☐	☐	☐	✖

Discussion

a. The following discussion presents information regarding noise standards and criteria applicable to various land uses, as well as sensitive noise receptors in proximity to the project site and the potential for the proposed project to result in impacts during project construction and operation. The following terms are referenced in the sections below:

- Decibel (dB): A unit of sound energy intensity. An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels. All references to decibels in this report will be A-weighted unless noted otherwise.
- Day-Night Average Level (L_{dn}): The average sound level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 PM to 7:00 AM) hours.
- Equivalent Sound Level (L_{eq}): The average sound level over a given time-period.
- Maximum Sound Level (L_{max}): The maximum sound level over a given time-period.
- Median Sound Level (L_{50}): The sound level exceeded 50 percent of the time over a given time-period.

Sensitive Noise Receptors and Existing Noise Environment

Some land uses are considered more sensitive to noise than others, and, thus, are referred to as sensitive noise receptors. Land uses often associated with sensitive noise receptors generally include residences, schools, libraries, hospitals and passive recreational areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise. The nearest sensitive uses include the single-family residences to the north, west, and east of the project site boundary, with the closest located approximately 20 feet from the northern site boundaries.

The existing noise environment in the project area is primarily defined by traffic on O'Hara Avenue directly west of the project and Laurel Road directly south of the project site. To quantify the existing ambient noise environment in the project vicinity, Saxelby Acoustics conducted continuous (24-hour) noise level measurements at three locations on the project site. The noise measurement locations are shown on Figure 9. A summary of the noise level measurement survey result is provided in Table 5.

Figure 9
Noise Measurement Sites



Table 5
Summary of Existing Background Noise Measurement Data

Site	Date	L_{dn}	Daytime			Nighttime		
			L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{max}
LT-1 (175 feet east of Laurel Road)	5/7/2024	61	55	53	72	54	51	68
LT-2 (525 feet east of O'Hara Avenue)	5/7/2024	54	48	47	65	47	45	59
LT-3 (180 feet north of O'Hara Avenue)	5/7/2024	54	50	48	67	47	44	61

Notes:
- All values shown in dBA
- Daytime hours: 7:00 AM to 10:00 PM
- Nighttime Hours: 10:00 PM to 7:00 AM

Source: Saxelby Acoustics. 2024.

Standards of Significance

The City of Oakley General Plan Noise Element establishes a noise level standard of 60 dB as normally acceptable at residential land uses. Based upon General Plan Figure 9-1, an ambient noise level of 60 dBA L_{dn} is considered normally acceptable for single-family residential uses. In addition to the policies listed above, Policy 9.1.6 in the City's General Plan is summarized in Table 6.

Table 6
Significance of Changes in Noise Exposure

Ambient Noise Level Without Project, L_{dn}	Increase Required for Significant Impact
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

Source: City of Oakley General Plan Noise Element, 2002.

Per the City's General Plan Table 9-7, with regard to non-transportation noise, exterior noise levels at residences should not exceed 55 dBA during daytime hours (7:00 AM to 10:00 PM) and 45 dBA during nighttime hours (10:00 PM to 7:00 AM).

The following analysis relies on the aforementioned thresholds of significance to determine if noise impacts associated with construction and operation of the proposed project would occur.

Construction Noise

During construction of the proposed project, heavy-duty equipment would be used for demolition, grading, excavation, paving, and building construction, which would result in temporary noise level increases. Standard construction equipment, such as backhoes,

dozers, and dump trucks would be used on-site. Project haul truck traffic on local roadways would also result in a temporary noise level increase during construction activities.

Noise levels would vary depending on the type of equipment used, how the equipment is operated, and how well the equipment is maintained. In addition, noise exposure at any single point outside the project site would vary depending on the proximity of construction activities to that point. Construction activities would be temporary in nature and are anticipated to occur during normal daytime hours. Section 4.2.208 of the Municipal Code restricts noise-producing construction activities to weekday hours between 7:30 AM and 7:00 PM Monday through Friday, and from 9:00 AM to 7:00 PM on weekends and holidays.

Table 7 shows the predicted construction noise levels for development of the proposed project.

Table 7
Construction Equipment Noise

Type of Equipment	Maximum Level, dB at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: Federal Highway Administration, Roadway Construction Noise Model User's Guide, January 2006.

Based on the table, activities involved in typical construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet. The closest noise-sensitive receptor to the proposed project site would be located in the vicinity of LT-1 in Figure 9, approximately 280 north of the acoustic center of construction activity, where multiple pieces of heavy construction equipment would potentially operate at the project site.

According to the Environmental Noise Assessment prepared for the proposed project by Saxelby Acoustics (see Appendix G),[40] the maximum construction noise levels at the nearest sensitive receptor would be up to 75 dBA. Existing maximum noise levels in the vicinity of the sensitive receptors ranged from 60-76 dBA during acceptable hours of construction. Therefore, construction activity would not result in an increase of noise levels above existing ambient maximum noise levels at the nearest sensitive receptor.

Although construction activities are temporary in nature and would likely occur during normal daytime working hours, construction-related noise could result in sleep interference at existing noise-sensitive land uses in the vicinity of the construction if construction activities were to occur outside the normal daytime hours. Furthermore, while the proposed project would be required to comply with all General Plan policies related to noise, a potentially significant impact could occur related to the generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of

[40] Saxelby Acoustics. *Environmental Noise Assessment Oakley Shops at Laurel Fields.* May 14, 2024.

standards established in the local general plan or noise ordinance during construction. Therefore, impacts resulting from noise levels temporarily exceeding the threshold of significance due to construction would be considered potentially significant.

Operational Noise

Operations associated with the proposed development would generate noise primarily associated with vehicle traffic along the local roadways as well as stationary sources at the project site. Such noise sources are discussed in the sections below.

Traffic Noise

Operations associated with the proposed project would generate noise associated with vehicle traffic on local roadways. To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels were predicted at sensitive receptors for Existing, Existing Plus Project, Cumulative, and Cumulative Plus Project conditions. Noise levels due to traffic were calculated using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) and project-generated traffic was calculated using the project trip generation volumes provided for the proposed project by Fehr & Peers.[41] The modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the project vicinity under existing and cumulative conditions are presented in Table 8 and Table 9, respectively.

Table 8
Predicted Traffic Noise Levels and Project-Related Traffic Noise Level Increases

Roadway	Segment	Predicted Exterior Noise Level at Closest Sensitive Receptors (dBA L_{dn})		
		Existing No Project	Existing + Project	Change
O'Hara Avenue	North of Laurel Road	60.0	60.7	0.7
O'Hara Avenue	South of Laurel Road	57.2	57.6	0.4
Laurel Road	East of Rose Avenue	60.0	60.4	0.4
Laurel Road	West of Rose Avenue	60.2	60.6	0.4
Laurel Road	West of Mercedes Lane	60.8	61.2	0.4

Source: Saxelby Acoustics, 2024.

Table 9
Cumulative Traffic Noise Levels and Project-Related Traffic Noise Level Increases

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Cumulative No Project	Cumulative + Project	Change
O'Hara Avenue	North of Laurel Road	60.9	61.5	0.6
O'Hara Avenue	South of Laurel Road	58.2	58.5	0.3
Laurel Road	East of Rose Avenue	61.0	61.3	0.3
Laurel Road	West of Rose Avenue	61.1	61.5	0.4
Laurel Road	West of Mercedes Lane	61.8	62.1	0.3

Source: Saxelby Acoustics, 2024.

[41] Fehr & Peers. *Final Oakley Shops at Laurel Fields Transportation Impact Assessment.* May 2024.

Based upon the Table 6, criteria, where existing traffic noise levels are greater than 65 dB L_{dn}, at the outdoor activity areas of noise-sensitive uses, a +1.5 dB L_{dn} increase in roadway noise levels would be considered significant. As shown in Table 5, the existing noise level in the project vicinity is 61 dB L_{dn} or less.

As shown in Table 8 and Table 9, under both existing and cumulative conditions, the proposed project would result in a maximum traffic noise level increase of 0.7 dBA. Because the applicable minimum significance threshold is an increase of 1.5 dBA in roadway noise levels, project related traffic would not result in a substantial permanent increase in noise levels, and the impact would be less than significant.

On-Site Noise Sources

The primary new noise sources associated with implementation of the project would consist of loading dock activity, emergency backup generators, rooftop HVAC equipment, on-site vehicle circulation, and drive-thru speakers associated with the shopping center and parking lot.

The following is a list of additional assumptions for each operational component of the proposed project used for the noise modeling based on data from similar operations:

- **Loading Dock and Truck Circulation**: Saxelby Acoustics utilized average sound level data collected at similar grocery store loading docks to determine typical noise levels associated with the proposed loading docks. Activities during the peak hour of loading dock activities would include truck arrival/departures, truck idling, truck backing, air brake release, operation of truck-mounted refrigeration units, and operation of truck lifts. The loading dock noise measurements indicate that the operation of the proposed loading docks during both the daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00AM) would produce an average noise level of 57 dBA L_{eq} at a distance of 100 feet from the center of the loading dock area.
- **Emergency Backup Generators**: Saxelby Acoustics modeled the generator noise levels based on data available for a similar backup unit because the specific model of backup generator was unknown at the time of the study. Backup generators are typically equipped with weather-proof enclosures, some of which are sound-reducing. Saxelby Acoustics referenced sound data for a 150 kW Kohler backup generator, which was reported to produce noise levels of up to 69 dBA L_{eq} at a distance of 23 feet with a high-performance sound enclosure. Such noise levels are typical of generators of this capacity. Due to close proximity to nearby residences, Saxelby Acoustics assumed the generator would be equipped with a high-performance sound enclosure.
- **Rooftop HVACs**: Based on the proposed roof plans for the project buildings, Saxelby Acoustics assumed that each retail space would, on average, utilize one seven-to-twelve-ton packaged HVAC unit, each fast-food restaurant and the gas station convenience store would utilize two seven-to-twelve-ton packaged units, and the grocery store would utilize up to twelve seven-to-twelve-ton packaged units. Each packaged unit is estimated to have a sound level rating of approximately 88 dBA based on manufacturer's data for similar units. All equipment is assumed to operate continuously during the daytime, and 25 percent of the time at night. Saxelby Acoustics assumed that the HVAC units would be installed on the rooftop of the proposed commercial buildings surrounded by four-foot parapets.

- **Parking Lot Circulation**: The commercial component of the project is projected to generate 1,054 on-site trips in the afternoon peak hour.[42] Saxelby Acoustics assumed that one percent of peak afternoon hour would be heavy trucks. Parking lot movements are predicted to generate a sound exposure level (SEL) of 71 dBA SEL at 50 feet for cars and 85 dBA SEL at 50 feet for trucks. Nighttime traffic outside of the AM or PM peak hour is estimated to be approximately 25 percent of daytime trips during nighttime hours (10:00 PM to 7:00 AM).
- **Drive-Thru Speaker Boxes**: The proposed drive-thru restaurants would likely use speaker boxes to collect customer orders. Saxelby Acoustics assumed that speaker boxes would produce an average noise level of 68 dBA L_{eq} at a distance of three feet. Saxelby Acoustics assumed that each drive-thru restaurant would utilize up to two speakers.

Using the assumptions established above and in accordance with applicable standards, Saxelby calculated the maximum noise levels at the nearest sensitive receptors resulting from operation of the proposed project. The noise level contours for the daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM) are shown in Figure 10 and Figure 11, respectively. As required by the City's Commercial and Industrial Design Guidelines, t the proposed project would include construction of an eight-foot-tall masonry wall between the proposed shopping center and the existing adjacent single-family residences located north of the project site.

As shown on Figure 10, the project is predicted to expose nearby residences to noise levels up to 52 dBA, L_{eq} during daytime (7:00 AM to 10:00 PM) hours. The predicted project noise levels would meet the City of Oakley noise level standards for non-transportation noise sources of 55 dBA L_{eq} during daytime hours, and a less-than-significant impact would occur. However, as shown on Figure 11, operation of the project is predicted to expose nearby residences to noise levels up to 49 dBA L_{eq} during nighttime (10:00 PM to 7:00 AM) hours at receptors to the northeast and southeast. Such noise levels would exceed the 45 dBA L_{eq} standard during nighttime hours.

In order to reduce nighttime noise levels at the existing residences to the northeast of the project site, Saxelby recommends the installation of a sound wall along the northeastern boundary of the site. Figure 12 and Figure 13, respectively, show the required location of the sound barrier and the daytime and nighttime noise levels resulting from buildout of the proposed project with the sound barrier incorporated. As shown in Figure 13, following incorporation of a sound barrier into the project design, noise levels associated with nighttime operation the proposed project would be reduced below the applicable thresholds.

It should also be noted that the analysis conducted by Saxelby Acoustics assumed that the proposed emergency backup generators would produce no greater than 69 dBA at a distance of 23 feet. Generators which do not utilize sound-attenuating enclosures can produce noise levels higher than this level. If an unshrouded generator were selected for this project, noise levels could exceed the City of Oakley noise level standards.

[42] Fehr & Peers. *Final Oakley Shops at Laurel Fields Transportation Impact Assessment.* May 2024.

Figure 10
Project Noise Contours (Daytime) (dBA L_{eq})

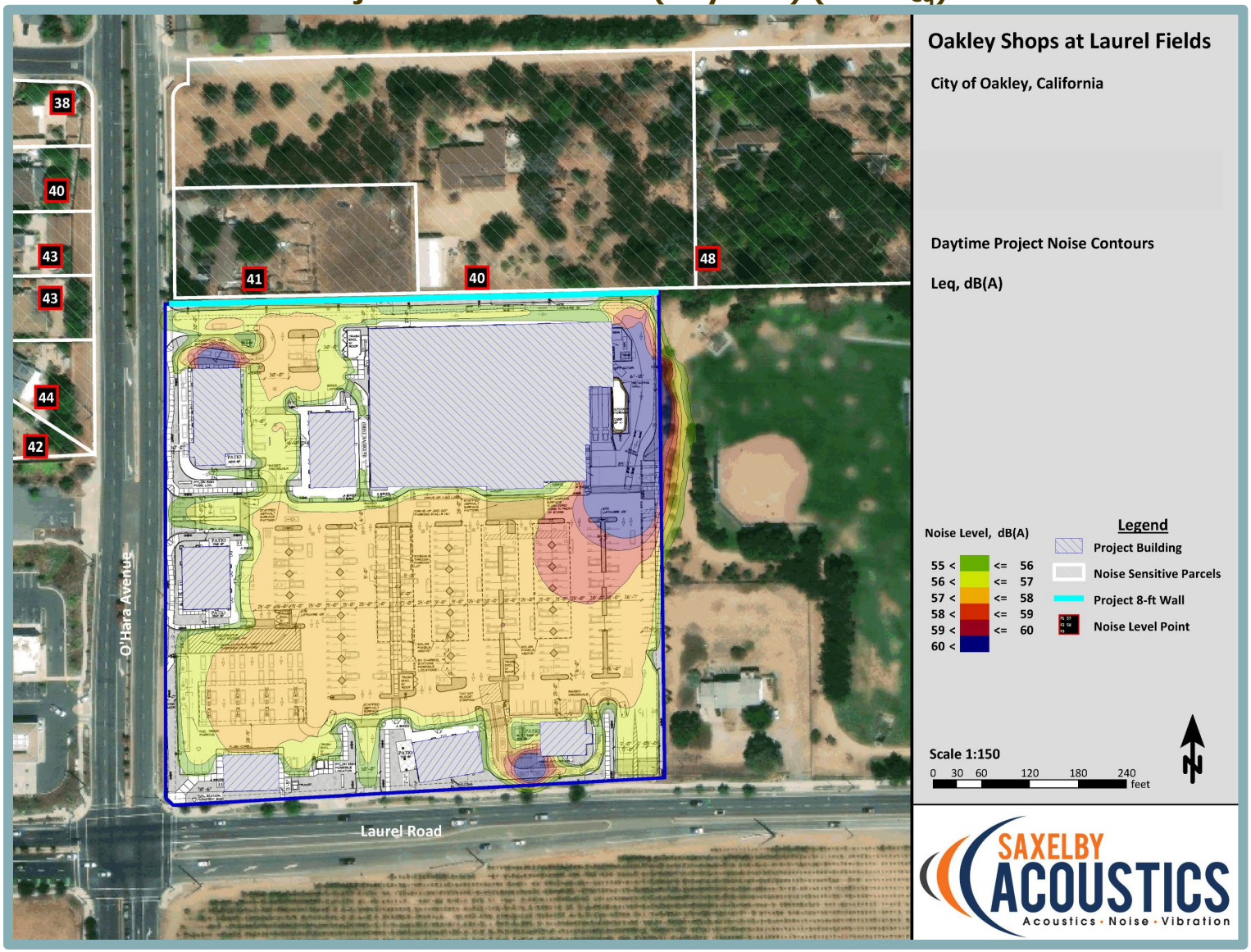


Figure 11
Project Noise Contours (Nighttime) (dBA L_{eq})

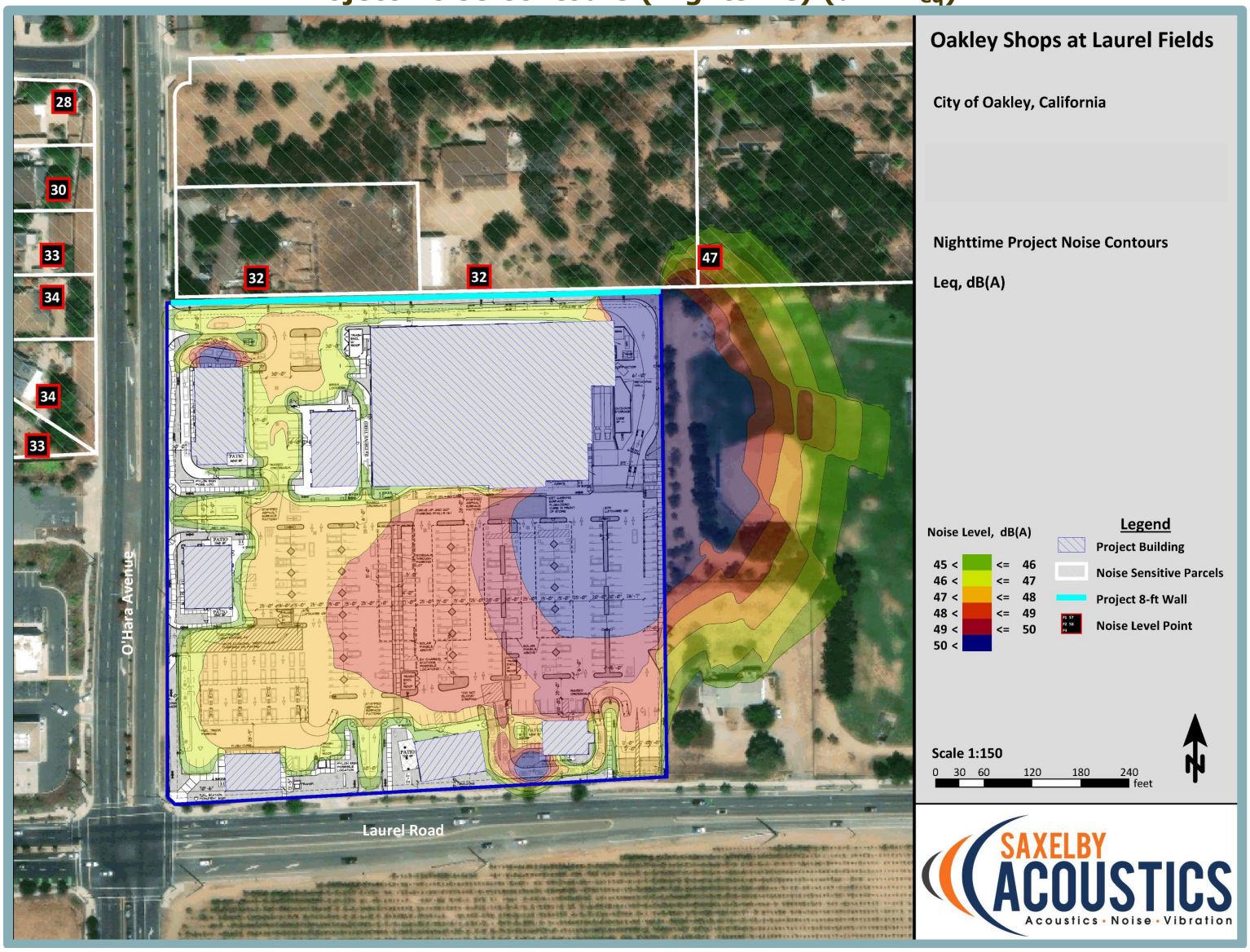


Figure 12
Project Noise Contours with Recommended Sound Walls (Daytime) (dBA L_{eq})

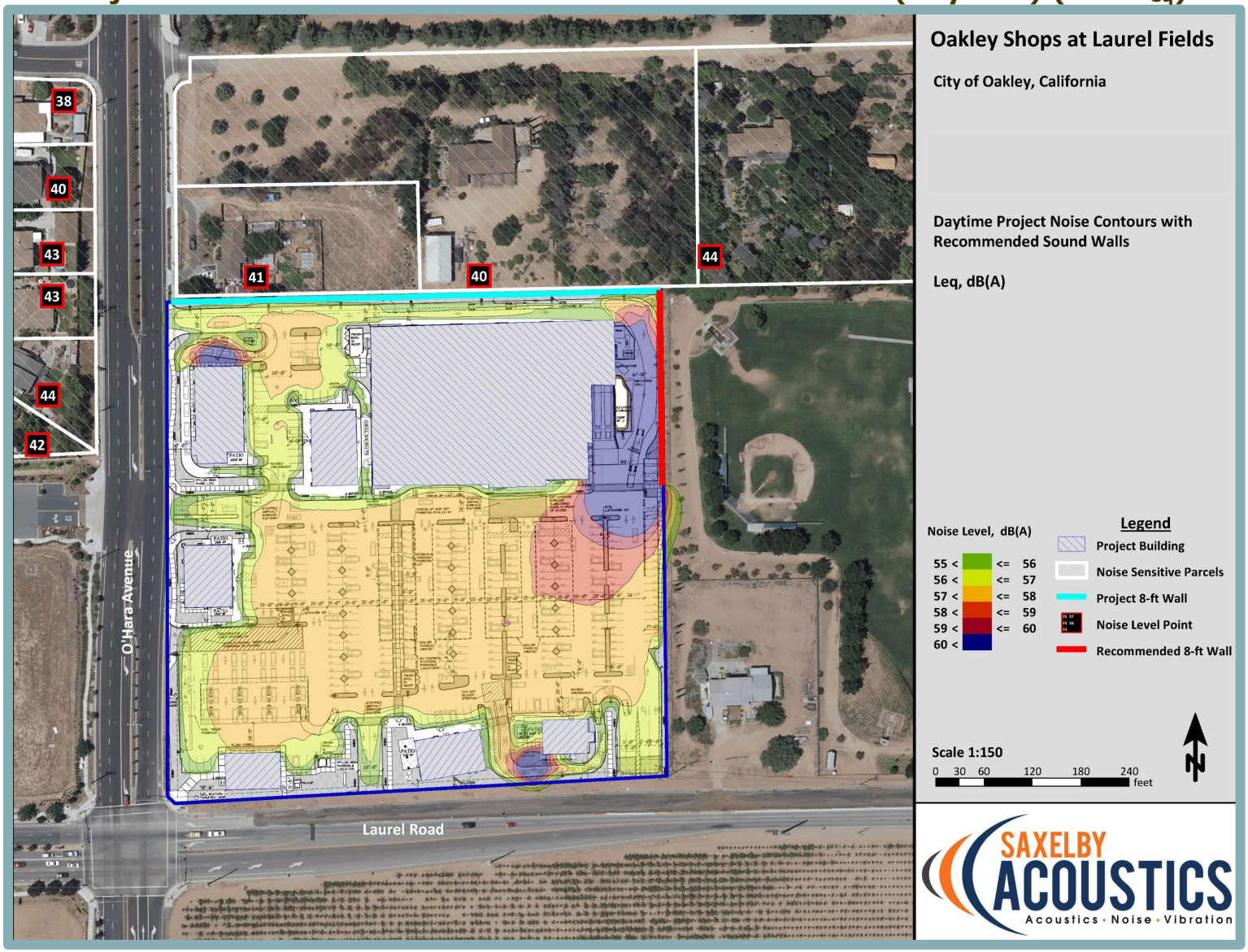
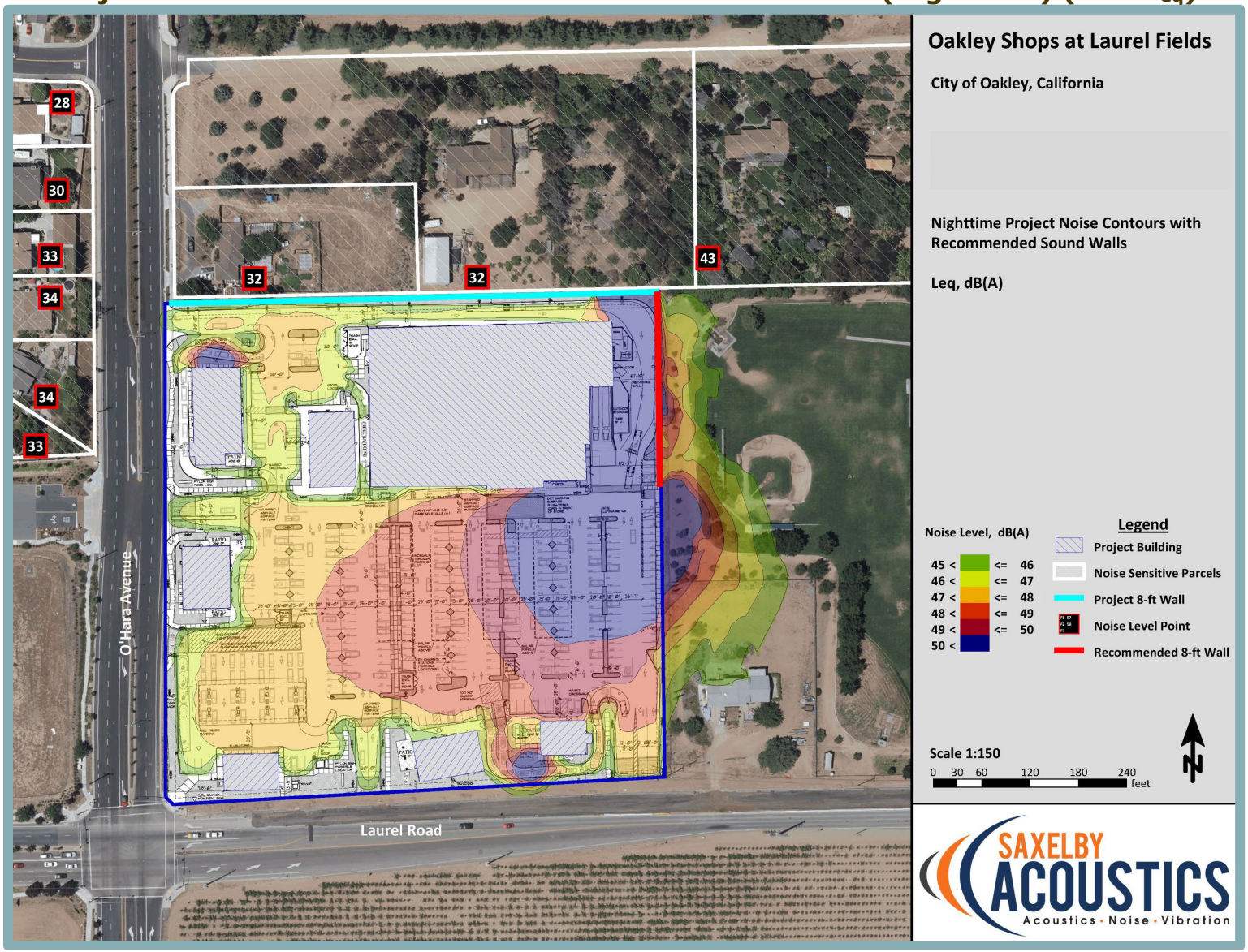


Figure 13
Project Noise Contours with Recommended Sound Walls (Nighttime) (dBA L_{eq})



Conclusion

Based on the above, operation of the proposed project during the daytime would not result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the City's General Plan and the Municipal Code. However, operation of the proposed project during the nighttime would result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the City's General Plan and the Municipal Code.

Should the project not comply with the noise regulations discussed above during construction activities, or should the proposed project not include the construction of a sound barrier along the eastern boundary of the project site, the proposed project could 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, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

XIII-1. *Prior to approval of grading permits, the following criteria shall be established and noted on graded plans, subject to review and approval by the City of Oakley Planning Division*

- *Construction activities shall be limited to between the daytime hours of 7:30 AM to 7:00 PM Monday through Friday, and 9:00 AM to 7:00 PM on Saturdays, Sundays, and holidays.*
- *All construction equipment powered by internal combustion engines shall be properly muffled and maintained.*
- *Quiet construction equipment, particularly air compressors, shall be selected whenever possible.*
- *All stationary noise-generating construction equipment such as generators or air compressors shall be located as far as is practical from existing residences. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.*
- *Unnecessary idling of internal combustion engines shall be prohibited.*
- *The construction contractor shall, to the maximum extent practical, locate on-site equipment staging areas to maximize the distance between construction-related noise sources and noise-sensitive.*

XIII-2. *Throughout the duration of construction, the proposed backup generators shall utilize sound-attenuating enclosures to reduce noise levels to less than 69 dBA at a distance of 23 feet. Proof of compliance with this measure shall be submitted to the City of Oakley Public Works and Engineering Department for review and approval.*

XIII-3. Prior to Improvement Plan approval, the Improvement Plans for the proposed project shall indicate that development of the proposed project includes construction of an eight-foot-tall barrier along the northeastern boundary of the project site, as shown in Figure 12 and Figure 13 of the IS/MND prepared for the proposed project. The barrier height shall be relative to the commercial building pads or the nearby residences, whichever is greater. The noise barrier wall shall be constructed of masonry units and the total height of the barrier may be achieved through use of masonry wall and/or earthen berm. Inclusion of the foregoing requirements on the Improvement Plans for the proposed project shall be subject to review and approval by the City of Oakley Planning Division.

b. Similar to noise, vibration involves a source, a transmission path, and a receiver. However, noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration depends on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration is measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of peak particle velocities (PPV) in inches per second (in/sec). Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of PPV. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 10, which was developed by the California Department of Transportation (Caltrans), shows the vibration levels that would normally be required to result in damage to structures. As shown in the table, the threshold for architectural damage to structures is 0.20 in/sec PPV and continuous vibrations of 0.10 in/sec PPV, or greater, would likely cause annoyance to sensitive receptors.

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and paving occur. Table 11 shows the typical vibration levels produced by construction equipment at various distances. As shown in Table 11, the most substantial source of groundborne vibrations associated with project construction would be the use of vibratory compactors. Use of vibratory compactors/rollers could be required during construction of the proposed project.

Based on Table 11, construction vibration levels anticipated for the project would be less than the 0.2 in/sec threshold at distances of 26 feet or more. Sensitive receptors that could be impacted by construction-related vibrations, including those affected by the off-site improvements, are located approximately 20 feet, or further, from where construction would occur. Thus, construction vibrations could exceed acceptable levels.

The use of vibratory compactors/rollers during construction of the proposed project would occur within 20 feet from the adjacent single-family residences. Therefore, the proposed project could exceed acceptable vibration levels.

Table 10
Effects of Vibration on People and Buildings

PPV		Human Reaction	Effect on Buildings
mm/sec	in/sec		
0.15 to 0.30	0.006 to 0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10 to 15	0.4 to 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Caltrans. Transportation Related Earthborne Vibrations. TAV-02-01-R9601. February 20, 2002.

Table 11
Vibration Levels for Various Construction Equipment

Type of Equipment	PPV at 25 feet (in/sec)	PPV at 50 feet (in/sec)
Large Bulldozer	0.089	0.031
Loaded Trucks	0.076	0.027
Small Bulldozer	0.003	0.001
Auger/drill Rigs	0.089	0.031
Jackhammer	0.035	0.012
Vibratory Hammer	0.070	0.025
Vibratory Compactor/roller	0.210 (less than 0.20 at 26 feet)	0.074

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006.

Because construction activities could expose people to or generate excessive groundbourne vibrations or groundborne noise levels, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

XIII-4. *Throughout the duration of construction, any compaction required within 26 feet from the adjacent residential structures to the north, east, and west shall be accomplished by using static drum rollers, which use weight*

instead of vibrations to achieve soil compaction. As an alternative to this requirement, preconstruction crack documentation and construction vibration monitoring could be conducted to ensure that construction vibrations do not cause damage to any adjacent structures.

While the nearest sensitive receptor is located approximately 20 feet from the property line of the project site, the use of bulldozers, loaded trucks, auger/drill rigs, and vibratory hammers shall occur at distances of 15 feet or greater from adjacent residential structures. Proof of compliance with this measure shall be submitted to the City of Oakley Public Works and Engineering Department for review and approval.

c. The nearest airport to the site is Byron Airport, located approximately 11.12 miles southeast of the site. The site is not covered by an existing airport land use plan. Given that the project site is not located within two miles of a public or private airport, the proposed project would not expose people residing or working in the project area to excessive noise levels associated with airports. Thus, ***no impact*** would occur.

XIV. POPULATION AND HOUSING. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure)?	☐	☐	✖	☐
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	✖	☐

Discussion

a. The proposed project would include the development of a vacant parcel with a shopping center. Given that the proposed project would not include any residential development, the proposed project would not directly induce population growth. While the proposed project could create new jobs in the area, which could potentially result in an increase in the housing demand, such an increase would be minimal because the jobs are anticipated to be filled by the local population. As such, the proposed project would create employment, but would not lead to influx of new residents to the project area.

As discussed in Section XIX, Utilities and Services Systems, of this IS/MND, adequate utility infrastructure and services exist to meet the additional demand that would be created by the project. Similarly, as discussed in Section XV, Public Services, of this IS/MND, public service providers, such as local police and fire departments, would be capable of accommodating the demands of the proposed project. Therefore, the proposed project would not induce substantial unplanned population growth either directly or indirectly, and a ***less-than-significant*** impact would occur.

b. The proposed project would not require the demolition of any existing residences or any other structures within the project site. As such, the proposed project would not displace a substantial number of existing housing or people and would not necessitate the construction of replacement housing elsewhere. Therefore, a ***less-than-significant*** impact would occur.

XV. PUBLIC SERVICES. *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Fire protection?	☐	☐	✖	☐
b. Police protection?	☐	☐	✖	☐
c. Schools?	☐	☐	✖	☐
d. Parks?	☐	☐	✖	☐
e. Other Public Facilities?	☐	☐	✖	☐

Discussion

a. Fire protection services within the project area are provided by the Contra Costa County Fire Protection District (CCCFPD). The CCCFPD provides fire suppression and prevention, emergency medical, rescue, ambulance transport, and public education services to more than one million people across the 304-square-mile service area.[43] Services are provided from 26 fire stations and the nearest station, Station 93, is located at 530 O'Hara Avenue, approximately 0.57-mile north of the project site. The proposed project would be conditioned to establish a funding mechanism to cover the ongoing financial impact the project would have on fire protection services provided in the City. The proposed project would be subject to the fire facilities impact fees established by the City of Oakley Municipal Code Section 9.2.502. Payment of the required impact fee would help account for any increased demands on fire services that may result from the proposed project, as well as ensure that the project conforms with the City of Oakley's General Plan Policy 4.4.2, which requires new developments to pay a fair share of costs for new fire protection facilities and services. Additionally, the proposed project would not include any alterations to the circulation system of the surrounding area which could conflict with the City of Oakley's General Plan Policy 4.4.4, or otherwise impact response times.

   As the proposed project is consistent with the General Plan, the increased demand for fire services due to commercial development was anticipated and included in the CCCFPD's planning efforts. In addition, the project would be required to pay development fees in accordance with the City of Oakley Municipal Code. As the proposed project is not expected to cause significant degradation to response times or service ratios for the CCCFPD, which would induce the need for physically altered or expanded governmental facilities for fire protection services, the project would result in a ***less-than-significant*** impact.

b. Police protection is provided to the City of Oakley by the Oakley Police Department. The Oakley Police Department currently employs 33 sworn full-time-equivalent law enforcement positions.[44] As previously discussed, the proposed project would result in the development of a shopping center with 81,728 sf of commercial retail space. Given the size of the proposed project, an increase in demand for police services could occur with

[43] Contra Costa County Fire Protection District. *2021 Annual Report*. Available at: https://www.cccfpd.org/2022-annual-report/. Accessed April 2024.

[44] City of Oakley. *City of Oakley General Plan, Focused General Plan Update*. Adopted January 11, 2022.

implementation of the project. Nevertheless, the increase in police service demand from development of the project site has been included in City of Oakley's demand predictions based on anticipated General Plan buildout. In addition, the project would be conditioned to establish a funding mechanism to cover the ongoing financial impact the project would have on police services provided in the City to mitigate the financial impact to the City's police services budget. In addition, the proposed project is consistent with the site's General Plan land use and zoning designations. As such, buildout of the site with commercial uses, including associated demand on police facilities, has been anticipated by the City and analyzed in the General Plan EIR.

Based on the above, the proposed project would create a demand that was anticipated for the site and would not induce the need for physically altered or expanded governmental facilities for police protection services, the construction of which could cause significant environmental impacts. Therefore, the proposed project would result in a ***less-than-significant*** impact.

b. The Oakley Union Elementary School District, Antioch Unified School District, and the Liberty Union High School District provide public educational services to the City of Oakley. The project site is within the Oakley Union Elementary School District and Liberty Union High School District. Because the project would include commercial uses only, the proposed project would not directly generate new residents in the town. Thus, development of the proposed project would not significantly increase demand for school facilities and services. The City of Oakley General Plan includes goals and policies set forth to ensure adequate primary and secondary schools are developed in response to population growth. The City expects the General Plan to assist in the goal of providing an efficient and complete educational system for the citizens of Oakley. For example, Policy 4.6.6, set forth in the General Plan, ensures that school facility impacts fees, which are set by the respective school district, are collected and requires that the City shall work with developers and school districts to establish mitigation measures to ensure the availability of adequate school facilities. Collection of school facility impact fees, which is a requirement of all new development, mitigates impacts to school services.

Based on the above, the proposed project would result in a ***less-than-significant*** impact related to the need for new or physically altered school facilities, the construction of which could cause significant environmental impacts.

d,e. The proposed project would not include any designated parkland and is not anticipated to generate new demand for parks. Notwithstanding, it is noted that the project site is located approximately 80 feet west of the Laurel Baseball Fields, and several parks are located within one-mile of the project site, including Duarte Ranch Park and Shady Oak Park to the southeast; the Koda Dog Agility Park and Nunn-Wilson Family Park to the west; and Laurel Park, Nutmeg Park, and Novarina Park to the southwest. The Oakley 2020 General Plan EIR also analyzed impacts of buildout of the General Plan on other public facilities, such as libraries. The Oakley Branch Library is located in Freedom High School at 1050 Neroly Road and is open Tuesday through Saturday. Other libraries in close proximity to the City of Oakley include the Antioch Library and the Brentwood Branch Library. Because the proposed project includes commercial uses only, the proposed project would not directly generate new residents in the City and increase demand for parks and /or other public facilities; however, the project would still be subject to payment of City of Oakley Park Impact Fees.

Based on the above, the proposed project would result in a ***less-than-significant*** impact related to the need for new or physically altered parks and other public facilities, the construction of which could cause significant environmental impacts.

XVI. RECREATION. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	✖
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	✖

Discussion

a,b. The proposed project would not result in any population growth that could increase the use of existing recreational facilities, nor would the proposed project include or require construction or expansion of new or existing recreational facilities. In addition, the proposed project would not involve the extension of major infrastructure associated with water, sanitary sewer, storm drainage, or energy services. Therefore, the project would not generate population growth and additional demand for recreational facilities, either directly or indirectly.

Oakley Municipal Code Section 9.2.204 mandates developments that include subdivision of land to either dedicate parkland or pay fees in lieu of the dedication for the neighborhood and community parks and recreation programs. Because the proposed project would not include subdivision of the site, the project is not subject to the City Code requirements for parkland dedication or fee payment. However, the proposed project would be required to pay any impact fees associated with the development of the site and issuance of building permits from the City of Oakley. Based on the City's list of impact fees, impact fees related to commercial development include, but are not limited to, park acquisition, park improvement, and public facilities.[45]

Currently, the City of Oakley includes an ample amount of community and recreation facilities. For example, the proposed project would be located approximately 80 feet west of the Laurel Baseball Fields, and within one mile of several parks. Additionally, the City of Oakley includes recreation facilities run by the East Bay Regional Park District (EBRPD), such as the Antioch/Oakley Regional Shoreline Park, Big Break Regional Shoreline, Black Diamond Mines Regional Preserve, and the Round Valley Regional Preserve. The Oakley Recreation Center is located approximately 750 feet north of the project site, the Delta de Anza Regional Trail is located approximately 1,200 feet north of the project site, and Laurel Park and Nutmeg Park are located approximately 1,617 feet southwest of the project site. Due to the nature of the proposed project and the ample amount of existing recreational facilities in the town, the proposed project would not substantially increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

[45] City of Oakley. *City of Oakley Impact Fees Fiscal Year 23-24.* July 2023.

Based on the above, the proposed project would not result in population growth that could increase the use of existing recreational facilities, nor would the proposed project include or require construction or expansion of new or existing recreational facilities which might have an adverse physical effect on the environment. Thus, ***no impact*** would occur.

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

Discussion

a. The law has changed with respect to how transportation-related impacts may be addressed under CEQA. Traditionally, lead agencies used level of service (LOS) to assess the significance of such impacts, with greater levels of congestion considered to be more significant than lesser levels. Mitigation measures typically took the form of capacity-increasing improvements, which often had their own environmental impacts (e.g., to biological resources). Depending on circumstances, and an agency's tolerance for congestion (e.g., as reflected in its general plan), LOS D, E, or F often represented significant environmental effects. In 2013, however, the State Legislature passed legislation with the intention of ultimately doing away with LOS in most instances as a basis for environmental analysis under CEQA. Enacted as part of SB 743 (2013), PRC Section 21099, subdivision (b)(1), directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the Secretary of the Natural Resources Agency for certification and adoption proposed CEQA Guidelines addressing "criteria for determining the significance of transportation impacts of projects within transit priority areas. Those criteria shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. In developing the criteria, [OPR] shall recommend potential metrics to measure transportation impacts that may include, but are not limited to, vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated. The office may also establish criteria for models used to analyze transportation impacts to ensure the models are accurate, reliable, and consistent with the intent of this section."

Subdivision (b)(2) of Section 21099 further provides that "[u]pon certification of the guidelines by the Secretary of the Natural Resources Agency pursuant to this section, automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion *shall not be considered a significant impact on the environment* pursuant to [CEQA], except in locations specifically identified in the guidelines, if any." (Italics added.)

Pursuant to SB 743, the Natural Resources Agency promulgated CEQA Guidelines Section 15064.3 in late 2018. It became effective in early 2019. Subdivision (a) of that section provides that "[g]enerally, vehicle miles traveled is the most appropriate measure of transportation impacts. For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel.

Except as provided in subdivision (b)(2) below (regarding roadway capacity), a project's effect on automobile delay shall not constitute a significant environmental impact."[46]

Please refer to question 'b' for a discussion of VMT.

Project Trip Generation

The TIA for the proposed project was prepared by Fehr & Peers to identify the proposed project's potential trip generation and any transportation related impacts associated with such (see Appendix H).[47] Project vehicle trip generation rates were obtained from the Institute of Transportation Engineer's Trip Generation Manual (11th Edition). Based on the Institute of Transportation Engineer's rates, the proposed project is estimated to generate 5,518 new daily vehicle trips, including 270 AM peak hour, 499 midday peak hour, and 497 PM peak hour trips.

Pedestrian, Bicycle, and Transit Facilities

The proposed project's potential impacts related to pedestrian, bicycle, and transit facilities are discussed below. The following discussion is based primarily on the TIA prepared for the project by Fehr & Peers (Appendix H).[48]

Pedestrian Facilities

Pedestrian facilities are comprised of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access destinations such as institutions, businesses, public transportation, and recreation facilities. Crosswalks and pedestrian push-button actuated signals are provided at signalized intersections in the area. In general, all roadways within the study area provide sidewalks except for the following:

- East side of O'Hara Avenue along the project frontage;
- East side of O'Hara Avenue from Laurel Road to approximately 340 feet south of Grapevine Lane; and
- South side of Laurel Road from O'Hara Avenue to approximately 520 feet west of Cloverbrook Avenue.

In addition, the City of Oakley has a CIP project planned for construction in summer 2024, which would include the construction of sidewalk and frontage improvements at the southeast corner of the Laurel Road and O'Hara Avenue intersection.

The proposed project would include construction of a sidewalk along the project frontage on the east side of O'Hara Avenue. The new sidewalk would connect to the existing sidewalk along Laurel Road, as well as the sidewalk located on the east side of O'Hara Avenue, north of the project site. All new sidewalks would be required to comply with the ADA and would connect to the existing pedestrian network in the project vicinity. The project would add internal sidewalks and pedestrian pathways throughout the project site,

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46 Subdivision (b)(2) of Section 15064.3 ("transportation projects") provides that "[t]ransportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.

47 Fehr & Peers. *Final Oakley Shops at Laurel Fields Transportation Impact Assessment.* May 2024.

48 *Ibid*.

which would connect pedestrians to the commercial businesses and the existing sidewalk on Laurel Road and the new sidewalk on O'Hara Avenue along the project frontage.

Considering the above, the proposed construction of new sidewalks would enhance the existing pedestrian infrastructure and would be required to comply with applicable City and ADA standards.

The proposed project would also be required to comply with Section 9.1.1.1236(c) of the City of Oakley's Ordinance No. 3-23, which states the following:

> 7) The entire drive through shall be screened from adjacent street and residential views to a height of at least three feet. Screening devices shall be a combination of berming, hedge and landscape materials and solid walls as approved by the Community Development Director.
>
> 12) Site plans shall be designed so access to the building from adjacent parcels and public rights of way is accomplished without direct interference with a drive through or queuing lane. In the event such a design is not achievable, the crossing shall be located a reasonable distance away from any building corners and enhanced with a raised crossing, signage and an automatic or pedestrian operated warning light to vehicles.
>
> 13) Site plans shall be designed so that all pedestrian walkways adjacent to a drive-through lane shall contain a pedestrian barrier to prevent pedestrians from cutting though the drive- through lane. The barrier shall direct the pedestrian to safe areas to exit the walkway.

Without compliance with Ordinance No. 3-23, the proposed project could result in the creation of a conflict with any adopted programs, plans, ordinances, or policies addressing pedestrian facilities and a significant impact could occur related to pedestrian facilities.

Bicycle Facilities

Approximately 29 miles of bicycle facilities are installed throughout the City of Oakley, including 15 miles of Class II on-street bicycle lanes and 12.4 miles of Class I multi-use paths.[49] In addition, 23 miles of additional bicycle facilities are either planned or proposed, such as new Class II bicycle lanes on Main Street and Laurel Road in the vicinity of the project site.[50]

The proposed project would provide short-term bicycle racks for 19 bicycles and long-term bicycle lockers for three bicycles. Bicycle access to the project site would be provided by the Class II bicycle lanes along O'Hara Avenue, Laurel Road, and Rose Avenue. In addition, the Delta de Anza Regional Trail Class I bicycle path is located approximately 630 feet north of the project site and can be accessed from O'Hara Avenue. The Delta de Anza Regional trail is a paved, multi-use hiking, bicycling and equestrian trail that currently spans over 15 miles. The Delta de Anza Regional trail connects the cities of Concord, Bay Point, Pittsburg, Antioch, and Oakley and provides access to Contra Loma Regional Park (and Black Diamond Mines Regional Preserve) through Antioch Community Park.

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[49] City of Oakley. *Mobility White Paper, City of Oakley Focused General Plan Update.* December 2021.
[50] *Ibid.*

Implementation of the proposed project would not preclude the future development of the planned bicycle lanes. As such, development of the project would not preclude construction of any planned bicycle trails, the proposed project would not result in the creation of a conflict with any adopted programs, plans, ordinances, or policies addressing bicycle facilities, and a less-than-significant impact would occur related to bicycle facilities.

Transit Facilities

Eastern Contra Costa Transit Authority (Tri Delta Transit) provides transit service in eastern Contra Costa County, serving the communities of Brentwood, Antioch, Oakley, Concord, Discovery Bay, Bay Point, and Pittsburg. In addition to the regular transit service to the project area, Tri Delta Transit provides dial-a-ride door-to-door service within Eastern Contra Costa County for people with disabilities and senior citizens.

Currently, 15 routes operate on weekdays, with five routes operating on weekends. One route, Route 383, serves the project area. Route 383 runs between the intersection of Adams Lane and O'Hara Avenue, and the intersection of Wilbur Avenue and Cavallo Road. The route operates along Laurel Road and O'Hara Avenue, and the nearest stop to the project site is located 0.4 miles east at the intersection of Laurel Road and Rose Avenue. Route 383 operates on weekdays only with one-hour headways from 5:00 AM to 7:00 PM. The services run between the Antioch BART Station and Blue Goose Park in Brentwood.

The project site is located within 0.5-mile of an existing bus stop, and does not propose any features which could conflict with existing or planned transit facilities. In addition, the TIA determined that the proposed project would not result in increases in ridership on local or regional transit facilities that would exceed the capacity of existing bus services. Therefore, the TIA concluded that transit access to the project site is adequate and would not result in any significant impacts to the nearby transit network.

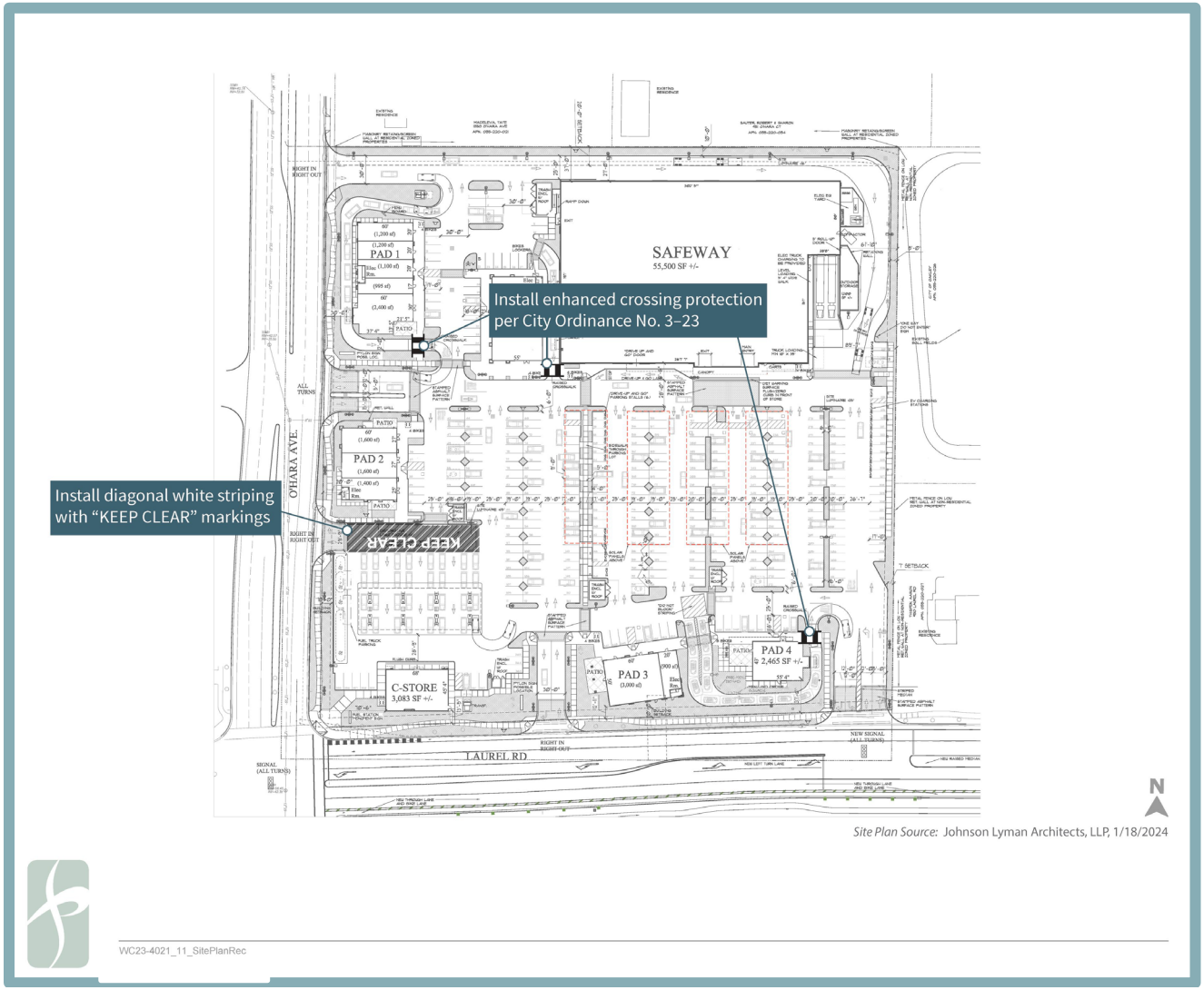
Conclusion

Based on the above, the proposed project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit and bicycle. However, without the proper installation of screening devices and/or fencing and enhancements to the proposed crosswalks at the two drive-thru restaurants and the drive-thru pharmacy, the proposed project would conflict with a program, plan, ordinance, or policy addressing the pedestrian facilities and could result in a ***potentially significant*** impact.

Mitigation Measure(s)

With respect to pedestrian facilities, in order to comply with Ordinance No. 3-23, Fehr & Peers recommends the addition of screening devices and/or fencing between the drive-thru restaurant lanes on Pad 1 and Pad 4, and the adjacent sidewalks along O'Hara Avenue and Laurel Road. In addition, Fehr & Peers recommends that the crosswalks crossing the drive-thru lanes downstream of the pick-up windows at the two proposed drive-thru restaurants and the drive-thru pharmacy should be enhanced with a raised crossing, signage, and an automatic or pedestrian operated warning light for vehicles. The aforementioned site improvements are presented in Figure 14. Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

Figure 14
TIA Site Plan Recommendations



Note: Figure 14 reflects a previous site plan. Please see Figure 3 of this IS/MND for the current site plan. The current site plan includes Fehr & Peers' recommended "KEEP CLEAR" markings" north of the proposed gas station. The current site plan also includes Fehr & Peers' recommended raised crosswalks at the three crosswwalks indicated on Figure 14.

XVII-1. Prior to Improvement Plan approval, the Improvement Plans for the proposed project shall indicate that development of the proposed project includes installation of a combination of screening devices and/or fencing between the drive-thru lanes serving Pads 1 and 4 and the adjacent sidewalks along O'Hara Avenue and Laurel Road. The screening devices and/or fencing may be achieved through use of a combination of berms, hedges, landscape materials, and solid walls. Inclusion of the foregoing requirements on the Improvement Plans for the proposed project shall be subject to review and approval by the City of Oakley Planning Division.

XVII-2. Prior to Improvement Plan approval, the Improvement Plans for the proposed project shall indicate that development of the proposed project includes enhancements to the three crosswalks which cross the drive-thru lanes downstream of the pick-up windows at the two drive-thru restaurants on Pads 1 and 4 and the drive-thru pharmacy. The crosswalks shall be enhanced with a signage, and an automatic or pedestrian operated warning light for vehicles at the locations shown in Figure 14 of the IS/MND prepared for the proposed project. Inclusion of the foregoing requirements on the Improvement Plans for the proposed project shall be subject to review and approval by the City of Oakley Planning Division.

b. Section 15064.3 of the CEQA Guidelines provides specific considerations for evaluating a project's transportation impacts. Pursuant to Section 15064.3, analysis of VMT attributable to a project is the most appropriate measure of transportation impacts. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Although the City of Oakley has not yet established any standards or thresholds regarding VMT, pursuant to Section 15064.3(b)(3), a lead agency may analyze a project's VMT qualitatively based on the availability of transit, proximity to destinations, etc. While changes to driving conditions that increase intersection delay are an important consideration for traffic operations and management, the method of analysis does not fully describe environmental effects associated with fuel consumption, emissions, and public health. Section 15064.3(3) changes the focus of transportation impact analysis in CEQA from measuring impact to drivers to measuring the impact of driving.

Per Contra Costa Transportation Authority (CCTA) guidance,[51] and consistent with OPR recommendations, local-serving retail may generally be presumed to have a less-than-significant VMT impact and can generally be screened from further VMT analysis. OPR based the presumption on substantial research demonstrating that adding local-serving retail uses typically improves destination accessibility to customers, often reducing trip distances because customers need to travel shorter distances than they previously did. The total demand for retail in a region also tends to hold steady; adding new local-serving retail typically shifts trips away from another use rather than adding entirely new shopping trips to the region. According to the TIA, the proposed project can be categorized as a collection of local serving retail land uses and new long distance or regionally significant vehicle trips to and from the project site are not expected. It is anticipated that current vehicle trips on the roadway network traveling to other grocery stores, convenience stores, or restaurants are expected to travel to the project site rather than existing alternative retail locations further away.

[51] Contra Costa County. *Contra Costa County Transportation Analysis Guidelines.* June 23, 2020.

As previously discussed, neither the CCTA nor City of Oakley have specific thresholds relative to VMT for local serving retail land uses. However, OPR's "Technical Advisory on Evaluating Transportation Impacts in CEQA" identifies the following recommended numeric VMT thresholds for retail projects:

- Retail projects (and other non-residential/non-office projects) that result in a net increase in total VMT may indicate a significant transportation impact.

To conduct the VMT assessment, Fehr & Peers used the CCTA travel demand model to estimate the project's effect on average daily vehicle miles of travel. Fehr & Peers estimated the baseline total VMT, both with and without the project's proposed land uses, and calculated VMT with and without the proposed project. Based on the TIA, the baseline weekday daily VMT without the proposed project would be 244,652 miles and the weekday daily VMT with the proposed project would be 243,970 miles. As such, development of the proposed project would result in a decrease in total VMT by 682 miles.

Based on the above, the proposed project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b), and a ***less-than-significant*** impact would occur.

c,d. A discussion of potential hazards related to vehicle circulation, emergency vehicle access, and vehicle queuing is provided below.

Site Access and Circulation

Primary access to the project site would be provided by three new driveways off of O'Hara Avenue and two new driveways off of Laurel Road (see Figure 3). The central driveway off of Laurel Road and the northwestern and southwestern driveways off of O'Hara Avenue would provide right-in/right-out access to and from the site on the northern side of Laurel Road and the eastern side of O'Hara Avenue, respectively. The southeastern driveway off of Laurel Road would allow vehicles to exit the site using either a left- or right-turn lane. The remaining driveways off of Laurel Road and O'Hara Avenue would allow vehicles to both enter and exit the project site. Trucks would access the Safeway loading docks from the northernmost driveway off of O'Hara Avenue. The trucks would then travel on a one-way internal roadway located behind the Safeway, along the northern and eastern boundaries of the site. The proposed circulation improvements would be subject to compliance with all applicable roadway design standards. The proposed project would not alter the existing transportation network nor increase hazards due to a geometrical design feature.

It should be noted that roadway improvements to Laurel Road would be completed as part of a separate City of Oakley CIP project, including construction of two new through lanes and a bike lane, new raised median, and a new left turn lane for access to the project's southeastern driveway. As part of the CIP project, the City of Oakley would install a new traffic signal at the intersection of Laurel Road and the project site's southeastern driveway.

Construction traffic associated with the proposed project would include heavy-duty vehicles which would share the area roadways with normal vehicle traffic, as well as transport of construction materials, and daily construction employee trips to and from the site. However, such heavy-duty truck traffic would only occur throughout the duration of construction activities and would cease upon buildout of the proposed subdivision. During project construction, public roads in the vicinity would remain open and available for use by emergency vehicles and other traffic. In addition to the construction of structures and

the new internal roadway network, the project would also include off-site improvements to install utility extensions within O'Hara Avenue and Laurel Road. However, during construction of the off-site utility improvements, vehicle travel along O'Hara Avenue and Laurel Road may be affected by truck traffic and/or road closures. As a result, the implementation of the utility improvements would directly influence the transportation network near the site during construction, and could result in roadway or lane closures that adversely affect residents in the project area.

The posted speed limit on O'Hara Avenue along the project frontage is 35 miles per hour and the posted speed limit on Laurel Road is 40 miles per hour. As part of the TIA, Fehr & Peers observed speeds on both roadways, which generally ranged from 35 to 45 miles per hour. Table 201.1 of the Caltrans Highway Design Manual states that the stopping sight distance standard for a design speed of 45 miles per hour is 360 feet. Based on Fehr & Peers' observation of the existing sight distance at the proposed driveways on O'Hara Avenue and Laurel Road, sight distances are greater than 360 feet. Thus, Fehr & Peers concluded that the sight distance at the proposed driveway locations is adequate. In addition, the proposed project would include the installation of diagonal hatched white striping and "KEEP CLEAR" markings in the portion of O'Hara Avenue, which abuts the central project driveway. The site improvements are presented in Figure 3. However, because the project's design is not yet finalized, Fehr & Peers recommends that the City Engineer analyze the final site plan for the project site to ensure that the project does not include features, which could comprise the driveway sight distance at the proposed driveways. Fehr & Peers also recommends that objects (e.g., landscaping, monument signs, etc.) greater than three feet in height should not be allowed within the sight distance triangles at the driveway intersections.

Emergency Vehicle Access

Emergency vehicle access would be provided by the three new driveways off of O'Hara Avenue and two new driveways off of Laurel Road, which would connect to the proposed parking lot and internal circulation system. According to the TIA prepared for the proposed project, the width of the proposed driveways is sufficient to accommodate emergency vehicles. In addition, all interior drive aisles and parking stalls would comply with City design standards, and, thus, on-site circulation would be expected to function acceptably for emergency response vehicles. As such, the proposed on-site vehicle circulation would allow for emergency vehicle access and would not impede current response times to the project site.

Vehicle Queueing

An on-site queuing assessment was conducted for the two proposed drive-thru restaurants, gas station, and drive-thru pharmacy to ensure the site's functionality and compliance with the previously mentioned City of Oakley's Ordinance No. 3-23. With respect to vehicle queuing, Section 9.1.1.1236(c) of the City's Ordinance No. 3-23 requires the following:

> 4) An application for a proposed drive-through restaurant shall include a traffic analysis that specifically analyzes onsite and nearby pedestrian/bicycle safety and drive-through lane queuing for the purposes of providing recommendations to avoid conflicts between various modes of transportation. The traffic analysis shall also analyze drive-through vehicle queueing and make recommendations to the site planning design that results in avoiding or

minimizing negative impacts to the surrounding area on- and off-site, including but not limited to:

i. Blocking access to parking spaces;
ii. Creating conflicts to internal circulation; or
iii. Spill back into adjacent main drive aisles or rights of way causing interference to vehicular, bicycle or pedestrian flow or reduction in road capacity.

6) No portion of the drive-through lane or its required queueing as determined in the traffic analysis shall obstruct any drive aisles or off-street parking. The drive-through shall not take ingress or egress from a local residential road.

Based on the trip generation calculated by Fehr & Peers for the proposed project and typical fast-food drive thru processing rates, Fehr & Peers estimated the average and 95th percentile queues for the proposed 2,400-sf drive-thru restaurant on Pad 1 and the proposed 2,200-sf drive-thru restaurant on Pad 4. At both locations, the average AM and PM peak hour queues were estimated to be approximately four vehicles in length with 95th percentile queues of approximately eight vehicles. Both drive-thru restaurants would have sufficient planned storage to accommodate the anticipated queue lengths. The proposed gas station would have 16 gas pumps and provide room for 16 vehicles to queue. According to the TIA, the proposed amount of fueling space and queueing is adequate to serve the forecast rates of vehicles arriving and departing the proposed gas station.

Given the unique nature of the gas station's configuration and the potential for a Safeway gas station to operate in a different manner than a typical gas station, Fehr & Peers observed and collected additional data at an operating Safeway gas station located at 19555 Mountain House Parkway in San Joaquin County, California. The configuration of the proposed Safeway gas station at the project site would be identical to the existing Safeway gas station operating in San Joaquin County, which includes 16 gas pumps with space for 16 vehicles to queue. The queuing area abuts an internal drive aisle, which is accessed by a right turn in/right turn out driveway on a four-lane arterial roadway. Safeway management provided Fehr & Peers with hourly transaction data for the existing gas station from May 21, 2023 to June 15, 2023. The hourly transaction data at the existing Safeway gas station is summarized in Table 15 of the TIA. Based on the transaction data, the gas station is consistently used throughout the day with peak activity occurring between 2:00 PM and 7:00 PM. On September 26, 2023, Fehr & Peers observed queue lengths at the existing Safeway gas station at 19555 Mountain House Parkway from 8:00 AM to 8:00 PM. Based on Fehr & Peers' observations, the proposed gas station vehicle queue would have a total capacity of 16 vehicles, with a maximum of four vehicles at each queue, and would not spill into the abutting drive aisle.

Fehr & Peers also observed a similar, but not identical, Safeway gas station located at 7497 Dublin Boulevard in the City of Dublin, California. The existing Safeway gas station in Dublin is smaller than the proposed gas station and provides eight pumps with eight spaces for vehicle queueing adjacent to an internal roadway, which is accessed by a right turn in/right turn out driveway. Based on Fehr & Peers' weekday peak hour observations of queues at the Dublin location, the vehicle queue did not spill onto the adjacent internal roads or onto Dublin Boulevard.

Based on the anticipated trip generation rates, gas station processing times, and the queuing observations at similar Safeway gas stations, Fehr & Peers concluded that

excessive queuing would not be anticipated at the proposed Safeway gas station. To ensure that the internal driving aisle is not blocked, and queues do not extend onto O'Hara Avenue, the proposed project would include the installation of diagonal hatched white striping and "KEEP CLEAR" markings in the portion of the internal drive aisle, which abut the gas station queuing area. The site improvements are presented in Figure 3.

In addition, the proposed project would include a drive-thru pharmacy window on the southwestern corner of the Safeway grocery store. The pharmacy drive-thru would provide space for four vehicles to queue in addition to the vehicle waiting at the window. Fehr & Peers observed an operating Safeway drive-thru pharmacy, similar to the proposed pharmacy, which is located at 19555 Mountain House Parkway in San Joaquin County, California. The pharmacy window is open from 9:00 AM to 1:00 PM and from 1:45 PM to 8:00 PM on weekdays; the pharmacy closes at 5:00 PM on weekends. On January 10, 2024, Fehr & Peers observed queue lengths at the pharmacy drive-thru at 19555 Mountain House Parkway. Fehr & Peers estimated the average queue to be no more than one vehicle in length with 95th percentile queues of approximately no more than two vehicles. According to the TIA, the planned storage at the Safeway pharmacy drive-thru window would be sufficient to accommodate the anticipated queue lengths.

Furthermore, as previously noted, roadway improvements to Laurel Road would be completed as part of a separate City of Oakley CIP project, including construction of two new through lanes and a bike lane, new raised median, and a new left turn lane for access to the project's southeastern driveway. As part of the City's CIP project, the City of Oakley would also install a new traffic signal at the intersection of Laurel Road and the project site's southeastern driveway, which would be the main entrance for the Safeway grocery store. The roadway improvements and installation of a new traffic signal would accommodate queuing vehicles entering the shopping center.

Conclusion

Based on the above, without proper planning of construction activities, construction traffic could interfere with existing roadway operations during the construction phase, which could result in a risk to public safety. Furthermore, without implementation of on-site improvements, operation of the proposed project could result in increased on-site transportation-related hazards. Therefore, development of the proposed project could substantially increase hazards due to a geometric design feature or incompatible uses, or result in inadequate emergency access, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

XVII-3. *Implement Mitigation Measure IX-2.*

XVII-4. *Prior to final design approval, the final site plan for the project shall be analyzed by the City Engineer to ensure that adequate sight distance is maintained at all driveways. Objects (e.g., landscaping, monument signs, etc.) greater than three feet in height shall not be allowed within the sight distance triangles at driveway intersections. The City Engineer shall review available speed survey information from the City and adjust required sight distance if necessary. All site plans shall be reviewed and approved by the*

City of Oakley Public Works and Engineering Department, and the City of Oakley Planning Division prior to final design approval.

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

Discussion

a,b. As discussed in Section V, Cultural Resources, of this IS/MND, based on the results of the CHRIS record search, there is a low to moderate potential exists for buried archaeological site indicators to occur in the project site area. In addition, the NAHC conducted a records search of the SLF on March 27, 2024. According to the NAHC SLF, the search results were negative and, thus, the project site does not contain known tribal cultural resources.

In compliance with AB 52 (PRC Section 21080.3.1), a project notification letter was distributed to the chairpersons of the following tribes on March 25, 2024: Amah Mutsun Tribal Band of Mission San Juan Bautista, Chicken Ranch Rancheria of Me-Wuk Indians, Guidiville Indian Rancheria, Indian Canyon Mutsun Band of Costanoan Ohlone People, Muwekma Ohlone Indian Tribe of the SF Bay Area, Nashville Enterprise Miwok-Maidu-Nishinam Tribe, North Valley Yokuts Tribe, The Ohlone Indian Tribe, Tule River Indian Tribe, Wilton Rancheria, and The Confederated Villages of Lisjan.

The City of Oakley received an email from Corrina Gould, Tribal Chair of The Confederated Villages of Lisjan Nation with a request to review the CHRIS and SLF search results, as well as any available archaeological reports. The City of Oakley also received an email and letter from Irenne Zwielein of The Amah Mutsun Tribal Band of San Juan Bautista which offered their Cultural Resources Monitoring, Consulting and/or Sensitivity Training services. Requests to consult were not received during the 30-day response period.

Based on the history of disturbance at the project site as a result of past agricultural uses, as well as the lack of identified tribal cultural resources at the site and within the off-site improvements areas, tribal cultural resources are not expected to occur within the project site. Nevertheless, the possibility exists that development of the proposed project could result in a substantial adverse change in the significance of a tribal cultural resource if

previously unknown tribal cultural resources are uncovered during grading or other ground-disturbing activities. Thus, a ***potentially significant*** impact related to tribal cultural resources could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

XVIII-1. Implement Mitigation Measures V-1 and V-2.

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

Discussion

a-c. Water, sanitary sewer, stormwater drainage, electricity, and telecommunications services would be provided to the project site by way of new connections to existing infrastructure in the immediate project area. Brief discussions of each utility that would serve the proposed project are included below.

Water Supply

Water service for the proposed project would be provided by the DWD. Pursuant to the DWD's 2020 UWMP, DWD's primary water supply for the distribution system is treated surface water from the United States Bureau of Reclamation's Central Valley Project (CVP) purchased from the Contra Costa Water District (CCWD). CVP water is conveyed through the Contra Costa Canal and Los Vaqueros system and treated at the Randall-Bold Water Treatment Plant in Oakley, which is jointly owned by DWD and CCWD.[52]

The proposed project would include the installation of five new backflow preventors, five domestic water/irrigation meters, and domestic water lines throughout the project site. The proposed project would also include the installation of new fire service water lines, six fire hydrants, seven post indicator valves, two double detector check valves, and seven new fire department connections. Two of the existing fire hydrants located along the frontage of Laurel Road would be relocated from their existing locations to locations closer to the proposed driveways off of Laurel Road. The two relocated fire hydrants would serve the project site. The new domestic water system and the water piping loop for fire protection

[52] Diablo Water District. *2020 Urban Water Management Plan.* May 2022.

services would connect to existing water mains and existing 16-inch water lines within Laurel Road, as well as existing water mains and existing 12-inch water lines within O'Hara Avenue.

According to the DWD 2020 UWMP, the DWD's projected water supply exceeds the water demand for normal, single-dry, and multiple-dry years until at least 2040.[53] For example, during the fifth year of drought in 2025, the anticipated supply exceeds the anticipated demand by 1,207 acre-feet per year. Furthermore, the project site has been anticipated for commercial development by the City of Oakley's General Plan EIR and the Focused General Plan Update IS/ND. The DWD's demand estimates consider increases in demand due to buildout of the City's General Plan;[54] consequently, the DWD has anticipated some level of increased water demand due to development of the project site compared to existing conditions. In addition, DWD's demand estimates would have anticipated commercial development at the project site which would generally have a higher water demand than the proposed residences. Thus, given the DWD's anticipated water surplus even with consideration of building of the project, adequate long-term water supply exists to accommodate the proposed project.

Wastewater Conveyance and Treatment

Sanitary sewer services would be provided to the project site by ISD. The wastewater system is composed of collection, treatment, and effluent recycling facilities. ISD operates and maintains the sewer system, which collects wastewater flows from individual developments within the City and conveys them to ISD's Water Recycling Facility. Wastewater is ultimately treated and stored either at the facility in a large 76 million gallon holding pond, or the treated water is conveyed to an outfall pipe in the San Joaquin River. The Water Recycling Facility has an average daily flow of 2.3 million gallons per day (MGD). The facility has a treatment capacity of approximately 4.3 MGD.[55]

The proposed would include the installation of new sanitary sewer lines, manholes, and cleanouts throughout the project site. The new on-site sewer network would connect to a new sewer manhole to be located within O'Hara Avenue before being directed to the existing 12-inch sanitary sewer lines within O'Hara Avenue. In addition, the proposed project would include installation of a new off-site sanitary sewer manhole within O'Hara Avenue.

Because the site has been anticipated for commercial development in the City's General Plan, and, thus, anticipated by the ISD, the increase in effluent associated with the proposed project has been anticipated by the ISD. Therefore, given the available capacity within the wastewater facility and the generation of wastewater, the proposed project would not result in inadequate capacity to serve the project's projected demand in addition to the existing commitments.

Stormwater Drainage

As discussed above in Section X, Hydrology and Water Quality, of this IS/MND, in order to manage and treat stormwater, the project site would be divided into six DMAs. Stormwater water runoff from the impervious surfaces within three of the DMAs would be directed through new storm drain lines and manholes towards the existing 66-inch storm

53 Diablo Water District. *2020 Urban Water Management Plan* [pg. 5-5 to 5-6]. May 2022.
54 *Ibid* [pg. 2-2].
55 Ironhouse Sanitary District. *Sewer System Management Plan* [pg. I-3]. April 2017.

drain line located within the storm drain easement along the northern boundary of the project site. The existing storm drain outfalls to the existing 14,000-sf Laurel Basin bioretention area (IMP-1) located at the Laurel Baseball Fields. IMP-1 would be resized to ensure the bioretention area has the capacity to treat runoff from the proposed 81,728-sf shopping center and parking lot. The IMP-1 bioretention basin area would be designed and constructed according to the criteria in the Contra Costa County Clean Water Program *Stormwater C.3 Guidebook*.

Stormwater from the impervious sidewalk along Laurel Road (EIS-L) would drain to the self-retaining landscape area located between the sidewalk and the curb on Laurel Road. Stormwater from the landscaped areas along the frontage of O'Hara (ST-O) would be self-treating, and stormwater from the landscape areas along the frontage of Laurel Road (SR-L) would be self-retaining.

The proposed on-site drainage systems would be required to comply with the City's SWPPP and Erosion and Control Plan, as well as the County C.3 standards. Therefore, the proposed project would not affect stormwater flows into ISD's existing system.

Electricity and Telecommunications

Electricity and telecommunications utilities would be provided by way of connections to existing infrastructure located within the immediate project vicinity. PG&E would provide electricity services to the project site, while AT&T would provide telecommunication services. The proposed project would not require major upgrades to, or extension of, existing infrastructure. Thus, impacts related to electricity, natural gas, and telecommunications infrastructure would be less than significant.

Conclusion

Based on the above, the proposed project would not require or result in the relocation or construction of new or expanded water, wastewater treatment, stormwater, electric power, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. Sufficient water supplies would be available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years. Furthermore, adequate wastewater capacity would also be available to serve the project's projected demand in addition to ISD's existing commitments. Thus, a ***less-than-significant*** impact would occur.

d,e. Solid waste, recyclable materials, and compostable material from the City of Oakley is hauled to Potrero Hills Landfill, located in Solano County. The landfill has a maximum permitted throughput of 4,330 tons per day. According to the California Department of Resources Recycling and Recovery (CalRecycle), the Potrero Hills Landfill has a remaining capacity of 13,872,000 cubic yards out of a total permitted capacity of 83,100,000 cubic yards.[56] Due to the substantial amount of available capacity remaining at Potrero Hills Landfill, sufficient capacity would be available to accommodate the project's solid waste disposal needs. Additionally, because the site has been anticipated for commercial development by the City General Plan, impacts related to solid waste resulting from development of the site have already been evaluated in the City's General Plan EIR and the Focused General Plan Update IS/ND.

[56] California Department of Resources Recycling and Recovery (CalRecycle). *Facility/Site Summary: Potrero Hill Landfill (48-AA-0075)*. Available at: https://www2.calrecycle.ca.gov/SolidWaste/Site/Summary/3591. Accessed May 2024.

Furthermore, as required by CALGreen Code Section 4.408, the proposed project would be required to submit a Waste Management Plan to the City detailing on-site sorting of construction debris. Implementation of the Waste Management Plan would ensure that the proposed project meets established diversion requirements for reused or recycled construction waste.

Based on the above, the proposed project would comply with applicable federal, State, and local statutes and regulations related to solid waste. Therefore, the proposed project would have a ***less-than-significant*** impact related to solid waste.

XX. WILDFIRE. *If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	✖	☐
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	✖	☐
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	✖	☐
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	✖	☐

Discussion

a-d. According to the CALFIRE Fire and Resource Assessment Program, the project site is not located within a Very High or High FHSZ.[57] In addition, the project site is located near existing development and roadways that may act as a fire break. The presence of urban development and paved areas would preclude the uncontrolled spread of wildlife. As such, the proposed project would not result in substantial risks or hazards related to wildfires, and a ***less-than-significant*** impact would occur.

[57] California Department of Forestry and Fire Protection. *Contra Costa County, Very High Fire Hazard Severity Zones in LRA*. January 7, 2009.

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

Discussion

a. As discussed in Section IV, Biological Resources, of this IS/MND, while a limited potential exists for western burrowing owl, Swainson's hawk, golden eagle, and other birds protected by the MBTA to occur on-site, the proposed project would comply with the ECCCHCP/NCCP requirements including avoidance and minimization measures. In addition, Mitigation Measures V-1 and V-2 would ensure that, in the event that the on-site structures are considered historic, or if previously unknown prehistoric resources are discovered within the project site, such resources would be protected in compliance with the requirements of CEQA and other State standards.

Considering the above, the proposed project would not degrade the quality of the environment, substantially reduce or impact the habitat of fish or wildlife species, cause fish or wildlife populations to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. Therefore, with implementation of the mitigation measures identified herein, a ***less-than-significant*** impact would occur.

b. The proposed project, in conjunction with other development within the City of Oakley, could incrementally contribute to cumulative impacts in the area. However, as demonstrated in this IS/MND, all potential environmental impacts that could occur as a result of project implementation would be reduced to a less-than-significant level through compliance with the mitigation measures included in this IS/MND, as well as applicable General Plan policies, Municipal Code standards, and other applicable local and State regulations.

All cumulative impacts related to air quality, noise, and transportation are either less than significant or less than significant after mitigation. Given the scope of the project, any incremental effects would not be considerable relative to the effects of all past, current, and probable future projects. In addition, the proposed project is consistent with what has been anticipated for the site and potential impacts resulting from development of the residential project have been analyzed in the City's General Plan EIR and the Focused General Plan Update IS/ND.

Therefore, when viewed in conjunction with other closely related past, present, or reasonably foreseeable future projects, with the implementation of mitigation, development of the proposed project would not result in a cumulatively considerable contribution to cumulative impacts, and the project's incremental contribution to cumulative impacts would be ***less than significant***.

c. As described in this IS/MND, the proposed project would comply with all applicable General Plan policies, Municipal Code standards, other applicable local and State regulations, and mitigation measures included herein. In addition, as discussed in Section VII, Geology and Soils, Section IX, Hazards and Hazardous Materials, Section XIII, Noise, and Section XVII Transportation, of this IS/MND, the proposed project would not cause substantial effects to human beings, including effects related to exposure to hazardous materials and noise, after the implementation of the required mitigation measures. Therefore, with implementation of the required mitigation measures, the proposed project would result in a ***less-than-significant*** impact.

Appendix A
Air Quality and Greenhouse Gas Emissions – CalEEMod Results

Oakley Shops at Laurel Fields v2 Custom Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Oakley Shops at Laurel Fields v2
Construction Start Date	8/1/2024
Operational Year	2025
Lead Agency	City of Oakley
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	20.6
Location	998 Laurel Rd, Oakley, CA 94561, USA
County	Contra Costa
City	Oakley
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1358
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.23

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

Supermarket	55.5	1000sqft	4.91	50,500	46,985	—	—	—
Fast Food Restaurant with Drive Thru	4.60	1000sqft	0.11	9,465	0.00	—	—	—
Strip Mall	18.5	1000sqft	0.43	18,545	0.00	—	—	—
Parking Lot	365	Space	3.28	146,000	0.00	—	—	—
Convenience Market with Gas Pumps	16.0	Pump	0.05	3,083	0.00	—	—	—
Other Asphalt Surfaces	2.54	Acre	2.54	0.00	0.00	—	—	Represents construction of off-site improvement areas
Other Non-Asphalt Surfaces	0.32	Acre	0.32	0.00	0.00	—	—	Represents improvements to bioretention basin area

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Energy	E-10-B	Establish Onsite Renewable Energy Systems: Solar Power
Water	W-7	Adopt a Water Conservation Strategy

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.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.41	6.82	36.0	33.7	0.07	1.60	19.8	21.4	1.47	10.1	11.6	—	7,931	7,931	0.37	0.25	6.37	8,017

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.38	6.79	35.9	31.6	0.07	1.47	9.67	11.1	1.35	3.77	5.12	—	7,916	7,916	0.37	0.25	0.17	7,999
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.09	3.48	7.35	10.4	0.02	0.31	1.88	2.19	0.28	0.76	1.05	—	2,375	2,375	0.10	0.10	1.39	2,410
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.20	0.63	1.34	1.91	< 0.005	0.06	0.34	0.40	0.05	0.14	0.19	—	393	393	0.02	0.02	0.23	399

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.41	3.71	36.0	33.7	0.07	1.60	19.8	21.4	1.47	10.1	11.6	—	7,931	7,931	0.37	0.25	3.25	8,017
2025	1.99	6.82	12.9	19.3	0.03	0.47	1.14	1.61	0.44	0.28	0.71	—	4,472	4,472	0.17	0.20	6.37	4,542
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.38	3.61	35.9	31.6	0.07	1.47	9.67	11.1	1.35	3.77	5.12	—	7,916	7,916	0.37	0.25	0.08	7,999
2025	1.97	6.79	13.1	18.6	0.03	0.47	1.14	1.61	0.44	0.28	0.71	—	4,393	4,393	0.18	0.20	0.17	4,458
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.91	0.77	7.35	6.94	0.01	0.31	1.88	2.19	0.28	0.76	1.05	—	1,575	1,575	0.07	0.04	0.27	1,590
2025	1.09	3.48	7.35	10.4	0.02	0.28	0.57	0.85	0.26	0.14	0.39	—	2,375	2,375	0.10	0.10	1.39	2,410
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.17	0.14	1.34	1.27	< 0.005	0.06	0.34	0.40	0.05	0.14	0.19	—	261	261	0.01	0.01	0.04	263

2025	0.20	0.63	1.34	1.91	< 0.005	0.05	0.10	0.15	0.05	0.03	0.07	—	393	393	0.02	0.02	0.23	399

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.41	3.71	36.0	33.7	0.07	1.60	19.8	21.4	1.47	10.1	11.6	—	7,931	7,931	0.37	0.25	3.25	8,017
2025	1.99	6.82	12.9	19.3	0.03	0.47	1.14	1.61	0.44	0.28	0.71	—	4,472	4,472	0.17	0.20	6.37	4,542
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.38	3.61	35.9	31.6	0.07	1.47	9.67	11.1	1.35	3.77	5.12	—	7,916	7,916	0.37	0.25	0.08	7,999
2025	1.97	6.79	13.1	18.6	0.03	0.47	1.14	1.61	0.44	0.28	0.71	—	4,393	4,393	0.18	0.20	0.17	4,458
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.91	0.77	7.35	6.94	0.01	0.31	1.88	2.19	0.28	0.76	1.05	—	1,575	1,575	0.07	0.04	0.27	1,590
2025	1.09	3.48	7.35	10.4	0.02	0.28	0.57	0.85	0.26	0.14	0.39	—	2,375	2,375	0.10	0.10	1.39	2,410
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.17	0.14	1.34	1.27	< 0.005	0.06	0.34	0.40	0.05	0.14	0.19	—	261	261	0.01	0.01	0.04	263
2025	0.20	0.63	1.34	1.91	< 0.005	0.05	0.10	0.15	0.05	0.03	0.07	—	393	393	0.02	0.02	0.23	399

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

Unmit.	25.3	25.8	14.1	148	0.29	0.28	25.0	25.3	0.27	6.35	6.61	230	32,209	32,439	25.0	1.37	11,236	44,707
Mit.	25.3	25.8	14.1	148	0.29	0.28	25.0	25.3	0.27	6.35	6.61	230	31,528	31,758	24.9	1.36	11,236	44,020
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	2%	2%	< 0.5%	1%	—	2%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	22.2	22.7	16.5	136	0.27	0.27	25.0	25.3	0.25	6.35	6.60	230	30,206	30,436	25.3	1.52	11,127	42,647
Mit.	22.2	22.7	16.5	136	0.27	0.27	25.0	25.3	0.25	6.35	6.60	230	29,525	29,756	25.2	1.50	11,127	41,959
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	2%	2%	< 0.5%	1%	—	2%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	20.9	21.5	14.2	122	0.25	0.26	22.5	22.8	0.24	5.71	5.95	230	28,015	28,245	25.0	1.33	11,168	40,435
Mit.	20.9	21.5	14.2	122	0.25	0.26	22.5	22.8	0.24	5.71	5.95	230	27,334	27,564	24.9	1.32	11,168	39,748
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	2%	2%	< 0.5%	1%	—	2%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.81	3.92	2.59	22.2	0.05	0.05	4.11	4.16	0.04	1.04	1.09	38.1	4,638	4,676	4.14	0.22	1,849	6,695
Mit.	3.81	3.92	2.59	22.2	0.05	0.05	4.11	4.16	0.04	1.04	1.09	38.1	4,526	4,564	4.12	0.22	1,849	6,581
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	2%	2%	< 0.5%	1%	—	2%

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

Mobile	23.5	22.1	13.3	137	0.29	0.21	25.0	25.2	0.20	6.35	6.54	—	29,241	29,241	1.52	1.28	112	29,773
Area	1.76	3.64	0.08	9.90	< 0.005	0.02	—	0.02	0.01	—	0.01	—	40.7	40.7	< 0.005	< 0.005	—	40.9
Energy	0.08	0.04	0.76	0.64	< 0.005	0.06	—	0.06	0.06	—	0.06	—	2,889	2,889	0.40	0.04	—	2,911
Water	—	—	—	—	—	—	—	—	—	—	—	18.7	36.9	55.7	1.93	0.05	—	118
Waste	—	—	—	—	—	—	—	—	—	—	—	211	0.00	211	21.1	0.00	—	740
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,124	11,124
Off-Road	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Total	25.3	25.8	14.1	148	0.29	0.28	25.0	25.3	0.27	6.35	6.61	230	32,209	32,439	25.0	1.37	11,236	44,707
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	22.1	20.6	15.7	135	0.27	0.21	25.0	25.2	0.20	6.35	6.54	—	27,279	27,279	1.81	1.43	2.90	27,753
Area	—	2.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.08	0.04	0.76	0.64	< 0.005	0.06	—	0.06	0.06	—	0.06	—	2,889	2,889	0.40	0.04	—	2,911
Water	—	—	—	—	—	—	—	—	—	—	—	18.7	36.9	55.7	1.93	0.05	—	118
Waste	—	—	—	—	—	—	—	—	—	—	—	211	0.00	211	21.1	0.00	—	740
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,124	11,124
Off-Road	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Total	22.2	22.7	16.5	136	0.27	0.27	25.0	25.3	0.25	6.35	6.60	230	30,206	30,436	25.3	1.52	11,127	42,647
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	19.9	18.6	13.4	116	0.25	0.19	22.5	22.7	0.18	5.71	5.89	—	25,068	25,068	1.53	1.25	44.1	25,522
Area	0.87	2.82	0.04	4.88	< 0.005	0.01	—	0.01	0.01	—	0.01	—	20.1	20.1	< 0.005	< 0.005	—	20.1
Energy	0.08	0.04	0.76	0.64	< 0.005	0.06	—	0.06	0.06	—	0.06	—	2,889	2,889	0.40	0.04	—	2,911
Water	—	—	—	—	—	—	—	—	—	—	—	18.7	36.9	55.7	1.93	0.05	—	118

Waste	—	—	—	—	—	—	—	—	—	—	—	211	0.00	211	21.1	0.00	—	740
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,124	11,124
Off-Road	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.39	1.39	< 0.005	< 0.005	0.00	1.39
Total	20.9	21.5	14.2	122	0.25	0.26	22.5	22.8	0.24	5.71	5.95	230	28,015	28,245	25.0	1.33	11,168	40,435
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.63	3.40	2.44	21.2	0.04	0.03	4.11	4.14	0.03	1.04	1.07	—	4,150	4,150	0.25	0.21	7.29	4,225
Area	0.16	0.51	0.01	0.89	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.32	3.32	< 0.005	< 0.005	—	3.34
Energy	0.02	0.01	0.14	0.12	< 0.005	0.01	—	0.01	0.01	—	0.01	—	478	478	0.07	0.01	—	482
Water	—	—	—	—	—	—	—	—	—	—	—	3.10	6.12	9.22	0.32	0.01	—	19.5
Waste	—	—	—	—	—	—	—	—	—	—	—	35.0	0.00	35.0	3.50	0.00	—	122
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,842	1,842
Off-Road	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Stationary	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	0.23	0.23	< 0.005	< 0.005	0.00	0.23
Total	3.81	3.92	2.59	22.2	0.05	0.05	4.11	4.16	0.04	1.04	1.09	38.1	4,638	4,676	4.14	0.22	1,849	6,695

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	23.5	22.1	13.3	137	0.29	0.21	25.0	25.2	0.20	6.35	6.54	—	29,241	29,241	1.52	1.28	112	29,773
Area	1.76	3.64	0.08	9.90	< 0.005	0.02	—	0.02	0.01	—	0.01	—	40.7	40.7	< 0.005	< 0.005	—	40.9
Energy	0.08	0.04	0.76	0.64	< 0.005	0.06	—	0.06	0.06	—	0.06	—	2,209	2,209	0.29	0.03	—	2,224
Water	—	—	—	—	—	—	—	—	—	—	—	18.7	35.8	54.5	1.93	0.05	—	117
Waste	—	—	—	—	—	—	—	—	—	—	—	211	0.00	211	21.1	0.00	—	740

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,124	11,124
Off-Road	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Total	25.3	25.8	14.1	148	0.29	0.28	25.0	25.3	0.27	6.35	6.61	230	31,528	31,758	24.9	1.36	11,236	44,020
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	22.1	20.6	15.7	135	0.27	0.21	25.0	25.2	0.20	6.35	6.54	—	27,279	27,279	1.81	1.43	2.90	27,753
Area	—	2.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.08	0.04	0.76	0.64	< 0.005	0.06	—	0.06	0.06	—	0.06	—	2,209	2,209	0.29	0.03	—	2,224
Water	—	—	—	—	—	—	—	—	—	—	—	18.7	35.8	54.5	1.93	0.05	—	117
Waste	—	—	—	—	—	—	—	—	—	—	—	211	0.00	211	21.1	0.00	—	740
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,124	11,124
Off-Road	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Total	22.2	22.7	16.5	136	0.27	0.27	25.0	25.3	0.25	6.35	6.60	230	29,525	29,756	25.2	1.50	11,127	41,959
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	19.9	18.6	13.4	116	0.25	0.19	22.5	22.7	0.18	5.71	5.89	—	25,068	25,068	1.53	1.25	44.1	25,522
Area	0.87	2.82	0.04	4.88	< 0.005	0.01	—	0.01	0.01	—	0.01	—	20.1	20.1	< 0.005	< 0.005	—	20.1
Energy	0.08	0.04	0.76	0.64	< 0.005	0.06	—	0.06	0.06	—	0.06	—	2,209	2,209	0.29	0.03	—	2,224
Water	—	—	—	—	—	—	—	—	—	—	—	18.7	35.8	54.5	1.93	0.05	—	117
Waste	—	—	—	—	—	—	—	—	—	—	—	211	0.00	211	21.1	0.00	—	740
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,124	11,124
Off-Road	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.39	1.39	< 0.005	< 0.005	0.00	1.39
Total	20.9	21.5	14.2	122	0.25	0.26	22.5	22.8	0.24	5.71	5.95	230	27,334	27,564	24.9	1.32	11,168	39,748

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.63	3.40	2.44	21.2	0.04	0.03	4.11	4.14	0.03	1.04	1.07	—	4,150	4,150	0.25	0.21	7.29	4,225
Area	0.16	0.51	0.01	0.89	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.32	3.32	< 0.005	< 0.005	—	3.34
Energy	0.02	0.01	0.14	0.12	< 0.005	0.01	—	0.01	0.01	—	0.01	—	366	366	0.05	< 0.005	—	368
Water	—	—	—	—	—	—	—	—	—	—	—	3.10	5.92	9.03	0.32	0.01	—	19.3
Waste	—	—	—	—	—	—	—	—	—	—	—	35.0	0.00	35.0	3.50	0.00	—	122
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,842	1,842
Off-Road	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Stationary	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	0.23	0.23	< 0.005	< 0.005	0.00	0.23
Total	3.81	3.92	2.59	22.2	0.05	0.05	4.11	4.16	0.04	1.04	1.09	38.1	4,526	4,564	4.12	0.22	1,849	6,581

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

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

Location	TOG	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	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
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	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.49	0.45	< 0.005	0.02	—	0.02	0.02	—	0.02	—	72.5	72.5	< 0.005	< 0.005	—	72.8
Dust From Material Movement	—	—	—	—	—	—	0.27	0.27	—	0.14	0.14	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.09	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	12.0	12.0	< 0.005	< 0.005	—	12.1
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.05	0.79	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	157	157	< 0.005	0.01	0.66	160
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	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.99	1.99	< 0.005	< 0.005	< 0.005	2.02
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	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.33	0.33	< 0.005	< 0.005	< 0.005	0.33
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	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	0.00

3.2. Site Preparation (2024) - Mitigated

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

Location	TOG	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	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.49	0.45	< 0.005	0.02	—	0.02	0.02	—	0.02	—	72.5	72.5	< 0.005	< 0.005	—	72.8

Dust From Material Movement	—	—	—	—	—	—	0.27	0.27	—	0.14	0.14	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.09	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	12.0	12.0	< 0.005	< 0.005	—	12.1
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.05	0.79	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	157	157	< 0.005	0.01	0.66	160
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	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.99	1.99	< 0.005	< 0.005	< 0.005	2.02
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	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.33	0.33	< 0.005	< 0.005	< 0.005	0.33
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	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	0.00

3.3. Grading (2024) - Unmitigated

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

Location	TOG	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	4.19	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	9.21	9.21	—	3.66	3.66	—	—	—	—	—	—	—
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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.19	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	9.21	9.21	—	3.66	3.66	—	—	—	—	—	—	—
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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.69	0.58	5.64	4.96	0.01	0.24	—	0.24	0.22	—	0.22	—	1,085	1,085	0.04	0.01	—	1,088

Dust From Material Movement	—	—	—	—	—	—	1.51	1.51	—	0.60	0.60	—	—	—	—	—	—	—
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	1.03	0.91	< 0.005	0.04	—	0.04	0.04	—	0.04	—	180	180	0.01	< 0.005	—	180
Dust From Material Movement	—	—	—	—	—	—	0.28	0.28	—	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.05	0.90	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	180	180	< 0.005	0.01	0.76	183
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	0.00
Hauling	0.12	0.02	1.49	0.70	0.01	0.02	0.29	0.31	0.01	0.08	0.09	—	1,153	1,153	0.09	0.19	2.49	1,213
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.07	0.76	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	164	164	< 0.005	0.01	0.02	167
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	0.00
Hauling	0.12	0.02	1.57	0.71	0.01	0.02	0.29	0.31	0.01	0.08	0.09	—	1,153	1,153	0.09	0.19	0.06	1,211
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.12	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	27.3	27.3	< 0.005	< 0.005	0.05	27.7
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	0.00
Hauling	0.02	< 0.005	0.25	0.12	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	190	190	0.02	0.03	0.18	199

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.52	4.52	< 0.005	< 0.005	0.01	4.59
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	0.00
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.4	31.4	< 0.005	0.01	0.03	33.0

3.4. Grading (2024) - Mitigated

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

Location	TOG	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	4.19	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	9.21	9.21	—	3.66	3.66	—	—	—	—	—	—	—
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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.19	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	9.21	9.21	—	3.66	3.66	—	—	—	—	—	—	—
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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.69	0.58	5.64	4.96	0.01	0.24	—	0.24	0.22	—	0.22	—	1,085	1,085	0.04	0.01	—	1,088
Dust From Material Movement	—	—	—	—	—	—	1.51	1.51	—	0.60	0.60	—	—	—	—	—	—	—
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	1.03	0.91	< 0.005	0.04	—	0.04	0.04	—	0.04	—	180	180	0.01	< 0.005	—	180
Dust From Material Movement	—	—	—	—	—	—	0.28	0.28	—	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.05	0.90	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	180	180	< 0.005	0.01	0.76	183
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	0.00
Hauling	0.12	0.02	1.49	0.70	0.01	0.02	0.29	0.31	0.01	0.08	0.09	—	1,153	1,153	0.09	0.19	2.49	1,213
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.07	0.76	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	164	164	< 0.005	0.01	0.02	167
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	0.00
Hauling	0.12	0.02	1.57	0.71	0.01	0.02	0.29	0.31	0.01	0.08	0.09	—	1,153	1,153	0.09	0.19	0.06	1,211
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.12	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	27.3	27.3	< 0.005	< 0.005	0.05	27.7

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	0.00
Hauling	0.02	< 0.005	0.25	0.12	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	190	190	0.02	0.03	0.18	199
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.52	4.52	< 0.005	< 0.005	0.01	4.59
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	0.00
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.4	31.4	< 0.005	0.01	0.03	33.0

3.5. Building Construction (2025) - Unmitigated

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

Location	TOG	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	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.66	0.56	5.15	6.43	0.01	0.21	—	0.21	0.20	—	0.20	—	1,182	1,182	0.05	0.01	—	1,186
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	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.94	1.17	< 0.005	0.04	—	0.04	0.04	—	0.04	—	196	196	0.01	< 0.005	—	196
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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.33	0.32	0.22	3.71	0.00	0.00	0.73	0.73	0.00	0.17	0.17	—	779	779	0.01	0.03	3.09	791
Vendor	0.10	0.04	1.33	0.64	0.01	0.01	0.26	0.28	0.01	0.07	0.09	—	1,006	1,006	0.06	0.14	2.67	1,053
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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.31	0.30	0.28	3.14	0.00	0.00	0.73	0.73	0.00	0.17	0.17	—	713	713	0.02	0.03	0.08	722
Vendor	0.09	0.04	1.41	0.66	0.01	0.01	0.26	0.28	0.01	0.07	0.09	—	1,007	1,007	0.06	0.14	0.07	1,051
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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.15	0.12	1.51	0.00	0.00	0.36	0.36	0.00	0.08	0.08	—	355	355	0.01	0.02	0.66	361
Vendor	0.05	0.02	0.68	0.32	< 0.005	0.01	0.13	0.13	0.01	0.04	0.04	—	496	496	0.03	0.07	0.57	519
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.28	0.00	0.00	0.06	0.06	0.00	0.02	0.02	—	58.8	58.8	< 0.005	< 0.005	0.11	59.7
Vendor	0.01	< 0.005	0.12	0.06	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	82.2	82.2	< 0.005	0.01	0.09	85.9
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	0.00

3.6. Building Construction (2025) - Mitigated

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

Location	TOG	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	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.66	0.56	5.15	6.43	0.01	0.21	—	0.21	0.20	—	0.20	—	1,182	1,182	0.05	0.01	—	1,186
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.94	1.17	< 0.005	0.04	—	0.04	0.04	—	0.04	—	196	196	0.01	< 0.005	—	196
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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.33	0.32	0.22	3.71	0.00	0.00	0.73	0.73	0.00	0.17	0.17	—	779	779	0.01	0.03	3.09	791
Vendor	0.10	0.04	1.33	0.64	0.01	0.01	0.26	0.28	0.01	0.07	0.09	—	1,006	1,006	0.06	0.14	2.67	1,053

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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.31	0.30	0.28	3.14	0.00	0.00	0.73	0.73	0.00	0.17	0.17	—	713	713	0.02	0.03	0.08	722
Vendor	0.09	0.04	1.41	0.66	0.01	0.01	0.26	0.28	0.01	0.07	0.09	—	1,007	1,007	0.06	0.14	0.07	1,051
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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.15	0.12	1.51	0.00	0.00	0.36	0.36	0.00	0.08	0.08	—	355	355	0.01	0.02	0.66	361
Vendor	0.05	0.02	0.68	0.32	< 0.005	0.01	0.13	0.13	0.01	0.04	0.04	—	496	496	0.03	0.07	0.57	519
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.28	0.00	0.00	0.06	0.06	0.00	0.02	0.02	—	58.8	58.8	< 0.005	< 0.005	0.11	59.7
Vendor	0.01	< 0.005	0.12	0.06	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	82.2	82.2	< 0.005	0.01	0.09	85.9
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	0.00

3.7. Paving (2024) - Unmitigated

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

Location	TOG	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	1.01	0.85	7.81	10.0	0.01	0.39	—	0.39	0.36	—	0.36	—	1,512	1,512	0.06	0.01	—	1,517
Paving	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.95	1.22	< 0.005	0.05	—	0.05	0.04	—	0.04	—	183	183	0.01	< 0.005	—	184
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.17	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	30.4	30.4	< 0.005	< 0.005	—	30.5
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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.05	0.57	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	< 0.005	0.01	0.01	125
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	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	15.1	15.1	< 0.005	< 0.005	0.03	15.4
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	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.50	2.50	< 0.005	< 0.005	< 0.005	2.54

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	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	0.00

3.8. Paving (2024) - Mitigated

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

Location	TOG	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	1.01	0.85	7.81	10.0	0.01	0.39	—	0.39	0.36	—	0.36	—	1,512	1,512	0.06	0.01	—	1,517
Paving	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.95	1.22	< 0.005	0.05	—	0.05	0.04	—	0.04	—	183	183	0.01	< 0.005	—	184
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.17	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	30.4	30.4	< 0.005	< 0.005	—	30.5
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	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.05	0.57	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	< 0.005	0.01	0.01	125
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	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	15.1	15.1	< 0.005	< 0.005	0.03	15.4
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	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.50	2.50	< 0.005	< 0.005	< 0.005	2.54
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	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	0.00

3.9. Paving (2025) - Unmitigated

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

Location	TOG	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	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.93	1.25	< 0.005	0.04	—	0.04	0.04	—	0.04	—	189	189	0.01	< 0.005	—	190
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.17	0.23	< 0.005	0.01	—	0.01	0.01	—	0.01	—	31.3	31.3	< 0.005	< 0.005	—	31.4
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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.05	0.53	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	121	121	< 0.005	0.01	0.01	123
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	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.3	15.3	< 0.005	< 0.005	0.03	15.5
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	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.54	2.54	< 0.005	< 0.005	< 0.005	2.57
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	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	0.00

3.10. Paving (2025) - Mitigated

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

Location	TOG	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	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.93	1.25	< 0.005	0.04	—	0.04	0.04	—	0.04	—	189	189	0.01	< 0.005	—	190
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.17	0.23	< 0.005	0.01	—	0.01	0.01	—	0.01	—	31.3	31.3	< 0.005	< 0.005	—	31.4

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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.05	0.53	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	121	121	< 0.005	0.01	0.01	123
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	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.3	15.3	< 0.005	< 0.005	0.03	15.5
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	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.54	2.54	< 0.005	< 0.005	< 0.005	2.57
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	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	0.00

3.11. Architectural Coating (2025) - Unmitigated

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

Location	TOG	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	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	5.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	5.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.06	0.44	0.56	< 0.005	0.01	—	0.01	0.01	—	0.01	—	65.8	65.8	< 0.005	< 0.005	—	66.1
Architectural Coatings	—	2.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.08	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.9	10.9	< 0.005	< 0.005	—	10.9
Architectural Coatings	—	0.46	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.04	0.74	0.00	0.00	0.15	0.15	0.00	0.03	0.03	—	156	156	< 0.005	0.01	0.62	158
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	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.06	0.63	0.00	0.00	0.15	0.15	0.00	0.03	0.03	—	143	143	< 0.005	0.01	0.02	144
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	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.30	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	71.0	71.0	< 0.005	< 0.005	0.13	72.1
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	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.8	11.8	< 0.005	< 0.005	0.02	11.9
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	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	0.00

3.12. Architectural Coating (2025) - Mitigated

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

Location	TOG	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	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	5.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	5.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.06	0.44	0.56	< 0.005	0.01	—	0.01	0.01	—	0.01	—	65.8	65.8	< 0.005	< 0.005	—	66.1
Architectural Coatings	—	2.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.08	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.9	10.9	< 0.005	< 0.005	—	10.9
Architectural Coatings	—	0.46	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.04	0.74	0.00	0.00	0.15	0.15	0.00	0.03	0.03	—	156	156	< 0.005	0.01	0.62	158
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	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.06	0.63	0.00	0.00	0.15	0.15	0.00	0.03	0.03	—	143	143	< 0.005	0.01	0.02	144
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	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.30	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	71.0	71.0	< 0.005	< 0.005	0.13	72.1
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	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.8	11.8	< 0.005	< 0.005	0.02	11.9
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	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	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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	9.38	8.84	5.31	54.7	0.11	0.08	10.00	10.1	0.08	2.54	2.61	—	11,678	11,678	0.61	0.51	44.7	11,891
Fast Food Restaurant with Drive Thru	6.13	5.78	3.47	35.8	0.08	0.05	6.54	6.59	0.05	1.66	1.71	—	7,637	7,637	0.40	0.34	29.2	7,776
Strip Mall	1.83	1.73	1.04	10.7	0.02	0.02	1.95	1.97	0.02	0.50	0.51	—	2,281	2,281	0.12	0.10	8.73	2,323
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Convenience Market with Gas Pumps	6.14	5.79	3.47	35.8	0.08	0.05	6.54	6.60	0.05	1.66	1.71	—	7,645	7,645	0.40	0.34	29.3	7,784
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	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	23.5	22.1	13.3	137	0.29	0.21	25.0	25.2	0.20	6.35	6.54	—	29,241	29,241	1.52	1.28	112	29,773
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	8.82	8.23	6.27	53.9	0.11	0.08	10.00	10.1	0.08	2.54	2.61	—	10,895	10,895	0.72	0.57	1.16	11,084
Fast Food Restaurant with Drive Thru	5.77	5.38	4.10	35.2	0.07	0.05	6.54	6.59	0.05	1.66	1.71	—	7,124	7,124	0.47	0.37	0.76	7,248
Strip Mall	1.72	1.61	1.22	10.5	0.02	0.02	1.95	1.97	0.02	0.50	0.51	—	2,128	2,128	0.14	0.11	0.23	2,165

Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Convenience Market with Gas Pumps	5.77	5.39	4.10	35.3	0.07	0.05	6.54	6.60	0.05	1.66	1.71	—	7,132	7,132	0.47	0.37	0.76	7,256
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	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	22.1	20.6	15.7	135	0.27	0.21	25.0	25.2	0.20	6.35	6.54	—	27,279	27,279	1.81	1.43	2.90	27,753
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	1.59	1.49	1.07	9.28	0.02	0.02	1.80	1.81	0.01	0.46	0.47	—	1,818	1,818	0.11	0.09	3.19	1,851
Fast Food Restaurant with Drive Thru	0.80	0.75	0.54	4.65	0.01	0.01	0.90	0.91	0.01	0.23	0.24	—	911	911	0.06	0.05	1.60	928
Strip Mall	0.31	0.29	0.21	1.81	< 0.005	< 0.005	0.35	0.35	< 0.005	0.09	0.09	—	355	355	0.02	0.02	0.62	361
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Convenience Market with Gas Pumps	0.93	0.87	0.63	5.44	0.01	0.01	1.06	1.06	0.01	0.27	0.28	—	1,066	1,066	0.07	0.05	1.87	1,085
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	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	3.63	3.40	2.44	21.2	0.04	0.03	4.11	4.14	0.03	1.04	1.07	—	4,150	4,150	0.25	0.21	7.29	4,225

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	9.38	8.84	5.31	54.7	0.11	0.08	10.00	10.1	0.08	2.54	2.61	—	11,678	11,678	0.61	0.51	44.7	11,891
Fast Food Restaurant with Drive Thru	6.13	5.78	3.47	35.8	0.08	0.05	6.54	6.59	0.05	1.66	1.71	—	7,637	7,637	0.40	0.34	29.2	7,776
Strip Mall	1.83	1.73	1.04	10.7	0.02	0.02	1.95	1.97	0.02	0.50	0.51	—	2,281	2,281	0.12	0.10	8.73	2,323
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Convenience Market with Gas Pumps	6.14	5.79	3.47	35.8	0.08	0.05	6.54	6.60	0.05	1.66	1.71	—	7,645	7,645	0.40	0.34	29.3	7,784
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	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	23.5	22.1	13.3	137	0.29	0.21	25.0	25.2	0.20	6.35	6.54	—	29,241	29,241	1.52	1.28	112	29,773
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Superma	8.82	8.23	6.27	53.9	0.11	0.08	10.00	10.1	0.08	2.54	2.61	—	10,895	10,895	0.72	0.57	1.16	11,084
Fast Food Restaurant with Drive Thru	5.77	5.38	4.10	35.2	0.07	0.05	6.54	6.59	0.05	1.66	1.71	—	7,124	7,124	0.47	0.37	0.76	7,248
Strip Mall	1.72	1.61	1.22	10.5	0.02	0.02	1.95	1.97	0.02	0.50	0.51	—	2,128	2,128	0.14	0.11	0.23	2,165
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Convenience Market with Gas Pumps	5.77	5.39	4.10	35.3	0.07	0.05	6.54	6.60	0.05	1.66	1.71	—	7,132	7,132	0.47	0.37	0.76	7,256
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	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	22.1	20.6	15.7	135	0.27	0.21	25.0	25.2	0.20	6.35	6.54	—	27,279	27,279	1.81	1.43	2.90	27,753
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	1.59	1.49	1.07	9.28	0.02	0.02	1.80	1.81	0.01	0.46	0.47	—	1,818	1,818	0.11	0.09	3.19	1,851
Fast Food Restaurant with Drive Thru	0.80	0.75	0.54	4.65	0.01	0.01	0.90	0.91	0.01	0.23	0.24	—	911	911	0.06	0.05	1.60	928
Strip Mall	0.31	0.29	0.21	1.81	< 0.005	< 0.005	0.35	0.35	< 0.005	0.09	0.09	—	355	355	0.02	0.02	0.62	361
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Convenience Market with Gas Pumps	0.93	0.87	0.63	5.44	0.01	0.01	1.06	1.06	0.01	0.27	0.28	—	1,066	1,066	0.07	0.05	1.87	1,085
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	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	3.63	3.40	2.44	21.2	0.04	0.03	4.11	4.14	0.03	1.04	1.07	—	4,150	4,150	0.25	0.21	7.29	4,225

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	1,453	1,453	0.24	0.03	—	1,468
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	240	240	0.04	< 0.005	—	242
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	88.6	88.6	0.01	< 0.005	—	89.4
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	70.1	70.1	0.01	< 0.005	—	70.7

Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	88.7	88.7	0.01	< 0.005	—	89.6
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
undefined	—	—	—	—	—	—	—	—	—	—	—	—	39.9	39.9	0.01	< 0.005	—	40.3
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,980	1,980	0.32	0.04	—	2,000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	1,453	1,453	0.24	0.03	—	1,468
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	240	240	0.04	< 0.005	—	242
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	88.6	88.6	0.01	< 0.005	—	89.4
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	70.1	70.1	0.01	< 0.005	—	70.7
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	88.7	88.7	0.01	< 0.005	—	89.6
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
undefined	—	—	—	—	—	—	—	—	—	—	—	—	39.9	39.9	0.01	< 0.005	—	40.3
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,980	1,980	0.32	0.04	—	2,000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	241	241	0.04	< 0.005	—	243
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	39.7	39.7	0.01	< 0.005	—	40.1
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	14.7	14.7	< 0.005	< 0.005	—	14.8
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	11.6	11.6	< 0.005	< 0.005	—	11.7
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	14.7	14.7	< 0.005	< 0.005	—	14.8
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
undefined	—	—	—	—	—	—	—	—	—	—	—	—	6.61	6.61	< 0.005	< 0.005	—	6.67
Total	—	—	—	—	—	—	—	—	—	—	—	—	328	328	0.05	0.01	—	331

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	774	774	0.13	0.02	—	781
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	240	240	0.04	< 0.005	—	242
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	88.6	88.6	0.01	< 0.005	—	89.4
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	70.1	70.1	0.01	< 0.005	—	70.7
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	88.7	88.7	0.01	< 0.005	—	89.6
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
undefined	—	—	—	—	—	—	—	—	—	—	—	—	39.9	39.9	0.01	< 0.005	—	40.3
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,301	1,301	0.21	0.03	—	1,314
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	774	774	0.13	0.02	—	781

Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	240	240	0.04	< 0.005	—	242
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	88.6	88.6	0.01	< 0.005	—	89.4
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	70.1	70.1	0.01	< 0.005	—	70.7
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	88.7	88.7	0.01	< 0.005	—	89.6
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
undefined	—	—	—	—	—	—	—	—	—	—	—	—	39.9	39.9	0.01	< 0.005	—	40.3
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,301	1,301	0.21	0.03	—	1,314
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	128	128	0.02	< 0.005	—	129
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	39.7	39.7	0.01	< 0.005	—	40.1
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	14.7	14.7	< 0.005	< 0.005	—	14.8
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	11.6	11.6	< 0.005	< 0.005	—	11.7

Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	14.7	14.7	< 0.005	< 0.005	—	14.8
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
undefined	—	—	—	—	—	—	—	—	—	—	—	—	6.61	6.61	< 0.005	< 0.005	—	6.67
Total	—	—	—	—	—	—	—	—	—	—	—	—	215	215	0.03	< 0.005	—	217

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	0.04	0.02	0.37	0.31	< 0.005	0.03	—	0.03	0.03	—	0.03	—	438	438	0.04	< 0.005	—	440
Fast Food Restaurant with Drive Thru	0.04	0.02	0.34	0.29	< 0.005	0.03	—	0.03	0.03	—	0.03	—	409	409	0.04	< 0.005	—	410
Strip Mall	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	33.9	33.9	< 0.005	< 0.005	—	34.0
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

Convenience Market with Gas Pumps	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	26.8	26.8	< 0.005	< 0.005	—	26.8
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	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	0.08	0.04	0.76	0.64	< 0.005	0.06	—	0.06	0.06	—	0.06	—	908	908	0.08	< 0.005	—	911
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	0.04	0.02	0.37	0.31	< 0.005	0.03	—	0.03	0.03	—	0.03	—	438	438	0.04	< 0.005	—	440
Fast Food Restaurant with Drive Thru	0.04	0.02	0.34	0.29	< 0.005	0.03	—	0.03	0.03	—	0.03	—	409	409	0.04	< 0.005	—	410
Strip Mall	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	33.9	33.9	< 0.005	< 0.005	—	34.0
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	26.8	26.8	< 0.005	< 0.005	—	26.8
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	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	0.08	0.04	0.76	0.64	< 0.005	0.06	—	0.06	0.06	—	0.06	—	908	908	0.08	< 0.005	—	911
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	0.01	< 0.005	0.07	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	72.6	72.6	0.01	< 0.005	—	72.8
Fast Food Restaurant with Drive Thru	0.01	< 0.005	0.06	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	67.8	67.8	0.01	< 0.005	—	67.9
Strip Mall	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.61	5.61	< 0.005	< 0.005	—	5.62
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.43	4.43	< 0.005	< 0.005	—	4.44
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.01	0.14	0.12	< 0.005	0.01	—	0.01	0.01	—	0.01	—	150	150	0.01	< 0.005	—	151

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	0.04	0.02	0.37	0.31	< 0.005	0.03	—	0.03	0.03	—	0.03	—	438	438	0.04	< 0.005	—	440

Fast Food Restaurant with Drive Thru	0.04	0.02	0.34	0.29	< 0.005	0.03	—	0.03	0.03	—	0.03	—	409	409	0.04	< 0.005	—	410
Strip Mall	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	33.9	33.9	< 0.005	< 0.005	—	34.0
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	26.8	26.8	< 0.005	< 0.005	—	26.8
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	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	0.08	0.04	0.76	0.64	< 0.005	0.06	—	0.06	0.06	—	0.06	—	908	908	0.08	< 0.005	—	911
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	0.04	0.02	0.37	0.31	< 0.005	0.03	—	0.03	0.03	—	0.03	—	438	438	0.04	< 0.005	—	440
Fast Food Restaurant with Drive Thru	0.04	0.02	0.34	0.29	< 0.005	0.03	—	0.03	0.03	—	0.03	—	409	409	0.04	< 0.005	—	410
Strip Mall	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	33.9	33.9	< 0.005	< 0.005	—	34.0
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

Convenience Market with Gas Pumps	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	26.8	26.8	< 0.005	< 0.005	—	26.8
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	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	0.08	0.04	0.76	0.64	< 0.005	0.06	—	0.06	0.06	—	0.06	—	908	908	0.08	< 0.005	—	911
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	0.01	< 0.005	0.07	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	72.6	72.6	0.01	< 0.005	—	72.8
Fast Food Restaurant with Drive Thru	0.01	< 0.005	0.06	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	67.8	67.8	0.01	< 0.005	—	67.9
Strip Mall	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.61	5.61	< 0.005	< 0.005	—	5.62
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.43	4.43	< 0.005	< 0.005	—	4.44
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.01	0.14	0.12	< 0.005	0.01	—	0.01	0.01	—	0.01	—	150	150	0.01	< 0.005	—	151

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	TOG	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	—	1.77	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	1.76	1.62	0.08	9.90	< 0.005	0.02	—	0.02	0.01	—	0.01	—	40.7	40.7	< 0.005	< 0.005	—	40.9
Total	1.76	3.64	0.08	9.90	< 0.005	0.02	—	0.02	0.01	—	0.01	—	40.7	40.7	< 0.005	< 0.005	—	40.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	1.77	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	2.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	—	0.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.16	0.15	0.01	0.89	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.32	3.32	< 0.005	< 0.005	—	3.34
Total	0.16	0.51	0.01	0.89	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.32	3.32	< 0.005	< 0.005	—	3.34

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	TOG	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	—	1.77	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	1.76	1.62	0.08	9.90	< 0.005	0.02	—	0.02	0.01	—	0.01	—	40.7	40.7	< 0.005	< 0.005	—	40.9
Total	1.76	3.64	0.08	9.90	< 0.005	0.02	—	0.02	0.01	—	0.01	—	40.7	40.7	< 0.005	< 0.005	—	40.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	1.77	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	2.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.16	0.15	0.01	0.89	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.32	3.32	< 0.005	< 0.005	—	3.34
Total	0.16	0.51	0.01	0.89	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.32	3.32	< 0.005	< 0.005	—	3.34

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	13.1	26.3	39.4	1.35	0.03	—	82.8
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	2.68	5.05	7.73	0.28	0.01	—	16.6
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	2.63	4.97	7.60	0.27	0.01	—	16.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Convenie Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	0.32	0.61	0.93	0.03	< 0.005	—	1.99
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	18.7	36.9	55.7	1.93	0.05	—	118
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	13.1	26.3	39.4	1.35	0.03	—	82.8
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	2.68	5.05	7.73	0.28	0.01	—	16.6
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	2.63	4.97	7.60	0.27	0.01	—	16.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	0.32	0.61	0.93	0.03	< 0.005	—	1.99
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	18.7	36.9	55.7	1.93	0.05	—	118

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	2.17	4.36	6.53	0.22	0.01	—	13.7
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	0.44	0.84	1.28	0.05	< 0.005	—	2.74
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	0.44	0.82	1.26	0.04	< 0.005	—	2.70
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	0.05	0.10	0.15	0.01	< 0.005	—	0.33
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	3.10	6.12	9.22	0.32	0.01	—	19.5

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	13.1	25.1	38.3	1.35	0.03	—	81.6

Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	2.68	5.05	7.73	0.28	0.01	—	16.6
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	2.63	4.97	7.60	0.27	0.01	—	16.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	0.32	0.61	0.93	0.03	< 0.005	—	1.99
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	18.7	35.8	54.5	1.93	0.05	—	117
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	13.1	25.1	38.3	1.35	0.03	—	81.6
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	2.68	5.05	7.73	0.28	0.01	—	16.6
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	2.63	4.97	7.60	0.27	0.01	—	16.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	0.32	0.61	0.93	0.03	< 0.005	—	1.99
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	18.7	35.8	54.5	1.93	0.05	—	117
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	2.17	4.16	6.33	0.22	0.01	—	13.5
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	0.44	0.84	1.28	0.05	< 0.005	—	2.74
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	0.44	0.82	1.26	0.04	< 0.005	—	2.70
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	0.05	0.10	0.15	0.01	< 0.005	—	0.33
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	3.10	5.92	9.03	0.32	0.01	—	19.3

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	169	0.00	169	16.9	0.00	—	590
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	28.6	0.00	28.6	2.85	0.00	—	99.9
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	10.5	0.00	10.5	1.05	0.00	—	36.7
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	3.65	0.00	3.65	0.37	0.00	—	12.8
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	211	0.00	211	21.1	0.00	—	740
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Superma	—	—	—	—	—	—	—	—	—	—	—	169	0.00	169	16.9	0.00	—	590
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	28.6	0.00	28.6	2.85	0.00	—	99.9
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	10.5	0.00	10.5	1.05	0.00	—	36.7
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	3.65	0.00	3.65	0.37	0.00	—	12.8
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	211	0.00	211	21.1	0.00	—	740
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	27.9	0.00	27.9	2.79	0.00	—	97.7
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	4.73	0.00	4.73	0.47	0.00	—	16.5
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	1.74	0.00	1.74	0.17	0.00	—	6.08
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	0.60	0.00	0.60	0.06	0.00	—	2.12
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	35.0	0.00	35.0	3.50	0.00	—	122

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	169	0.00	169	16.9	0.00	—	590
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	28.6	0.00	28.6	2.85	0.00	—	99.9
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	10.5	0.00	10.5	1.05	0.00	—	36.7
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	3.65	0.00	3.65	0.37	0.00	—	12.8

Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	211	0.00	211	21.1	0.00	—	740
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	169	0.00	169	16.9	0.00	—	590
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	28.6	0.00	28.6	2.85	0.00	—	99.9
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	10.5	0.00	10.5	1.05	0.00	—	36.7
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	3.65	0.00	3.65	0.37	0.00	—	12.8
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	211	0.00	211	21.1	0.00	—	740
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	27.9	0.00	27.9	2.79	0.00	—	97.7

Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	4.73	0.00	4.73	0.47	0.00	—	16.5
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	1.74	0.00	1.74	0.17	0.00	—	6.08
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	0.60	0.00	0.60	0.06	0.00	—	2.12
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	35.0	0.00	35.0	3.50	0.00	—	122

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10,470	10,470

Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14.8	14.8
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.12	0.12
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	639	639
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,124	11,124
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10,470	10,470
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14.8	14.8
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.12	0.12
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	639	639
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,124	11,124
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,733	1,733

Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.45	2.45
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	106	106
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,842	1,842

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10,470	10,470
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14.8	14.8
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.12	0.12
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	639	639
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,124	11,124

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10,470	10,470
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14.8	14.8
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.12	0.12
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	639	639
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,124	11,124
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Supermarket	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,733	1,733
Fast Food Restaurant with Drive Thru	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.45	2.45
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02
Convenience Market with Gas Pumps	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	106	106
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,842	1,842

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	0.00	0.00	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	0.00	0.00	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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	0.00	0.00	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	0.00	0.00	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.7.2. Mitigated

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

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	0.00	0.00	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	0.00	0.00	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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	0.00	0.00	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	0.00	0.00	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forklifts	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

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

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Emergency Generator	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	0.23	0.23	< 0.005	< 0.005	0.00	0.23
Total	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	0.23	0.23	< 0.005	< 0.005	0.00	0.23

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.69	1.69	< 0.005	< 0.005	0.00	1.69
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	0.23	0.23	< 0.005	< 0.005	0.00	0.23
Total	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	0.23	0.23	< 0.005	< 0.005	0.00	0.23

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	TOG	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	TOG	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	TOG	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	TOG	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	TOG	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	TOG	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	TOG	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	TOG	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
Site Preparation	Site Preparation	8/1/2024	8/7/2024	5.00	5.00	—
Grading	Grading	8/8/2024	10/30/2024	5.00	60.0	—
Building Construction	Building Construction	3/6/2025	11/12/2025	5.00	180	—
Paving	Paving	10/31/2024	3/5/2025	5.00	90.0	—
Architectural Coating	Architectural Coating	3/20/2025	11/26/2025	5.00	180	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	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	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
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

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	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	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
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
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	15.8	20.0	HHDT

Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	88.4	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	37.3	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	17.7	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	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
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT

Grading	Hauling	15.8	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	88.4	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	37.3	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	17.7	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	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	0.00	0.00	122,390	40,797	16,061

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	7.50	0.00	—
Grading	6,291	1,300	60.0	0.00	—
Paving	0.00	0.00	0.00	0.00	6.14

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Supermarket	0.00	0%
Fast Food Restaurant with Drive Thru	0.00	0%
Strip Mall	0.00	0%
Parking Lot	3.28	100%
Convenience Market with Gas Pumps	0.00	0%
Other Asphalt Surfaces	2.54	100%
Other Non-Asphalt Surfaces	0.32	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	204	0.03	< 0.005
2025	0.00	204	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
Supermarket	2,413	2,410	2,410	880,304	14,156	14,140	14,140	5,165,364
Fast Food Restaurant with Drive Thru	1,062	1,578	1,578	441,323	6,230	9,257	9,257	2,589,551
Strip Mall	471	471	471	171,940	2,765	2,762	2,762	1,008,895
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Convenience Market with Gas Pumps	1,579	1,003	1,003	516,331	9,267	5,884	5,884	3,029,678
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	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
Supermarket	2,413	2,410	2,410	880,304	14,156	14,140	14,140	5,165,364
Fast Food Restaurant with Drive Thru	1,062	1,578	1,578	441,323	6,230	9,257	9,257	2,589,551
Strip Mall	471	471	471	171,940	2,765	2,762	2,762	1,008,895
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Convenience Market with Gas Pumps	1,579	1,003	1,003	516,331	9,267	5,884	5,884	3,029,678
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Other Non-Asphalt Surfaces	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)
0	0.00	122,390	40,797	16,061

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)
Supermarket	2,600,186	204	0.0330	0.0040	1,367,586
Fast Food Restaurant with Drive Thru	429,510	204	0.0330	0.0040	1,277,027
Strip Mall	158,467	204	0.0330	0.0040	105,680
Parking Lot	125,351	204	0.0330	0.0040	0.00
Convenience Market with Gas Pumps	158,740	204	0.0330	0.0040	83,490
Other Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00
Other Non-Asphalt Surfaces	0.00	204	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)
Supermarket	1,384,186	204	0.0330	0.0040	1,367,586
Fast Food Restaurant with Drive Thru	429,510	204	0.0330	0.0040	1,277,027
Strip Mall	158,467	204	0.0330	0.0040	105,680
Parking Lot	125,351	204	0.0330	0.0040	0.00
Convenience Market with Gas Pumps	158,740	204	0.0330	0.0040	83,490
Other Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00
Other Non-Asphalt Surfaces	0.00	204	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)
Supermarket	6,841,386	560,773
Fast Food Restaurant with Drive Thru	1,396,255	0.00
Strip Mall	1,373,675	0.00
Parking Lot	0.00	0.00
Convenience Market with Gas Pumps	167,315	0.00
Other Asphalt Surfaces	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Supermarket	6,841,386	140,193
Fast Food Restaurant with Drive Thru	1,396,255	0.00
Strip Mall	1,373,675	0.00
Parking Lot	0.00	0.00
Convenience Market with Gas Pumps	167,315	0.00
Other Asphalt Surfaces	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Supermarket	313	—
Fast Food Restaurant with Drive Thru	53.0	—

Strip Mall	19.5	—
Parking Lot	0.00	—
Convenience Market with Gas Pumps	6.78	—
Other Asphalt Surfaces	0.00	—
Other Non-Asphalt Surfaces	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Supermarket	313	—
Fast Food Restaurant with Drive Thru	53.0	—
Strip Mall	19.5	—
Parking Lot	0.00	—
Convenience Market with Gas Pumps	6.78	—
Other Asphalt Surfaces	0.00	—
Other Non-Asphalt Surfaces	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
Supermarket	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Supermarket	Supermarket refrigeration and condensing units	R-404A	3,922	26.5	16.5	16.5	18.0
Fast Food Restaurant with Drive Thru	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
Fast Food Restaurant with Drive Thru	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0

Fast Food Restaurant with Drive Thru	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
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
Convenience Market with Gas Pumps	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Convenience Market with Gas Pumps	Supermarket refrigeration and condensing units	R-404A	3,922	26.5	16.5	16.5	18.0
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
Supermarket	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Supermarket	Supermarket refrigeration and condensing units	R-404A	3,922	26.5	16.5	16.5	18.0
Fast Food Restaurant with Drive Thru	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
Fast Food Restaurant with Drive Thru	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0
Fast Food Restaurant with Drive Thru	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
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

Convenience Market with Gas Pumps	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Convenience Market with Gas Pumps	Supermarket refrigeration and condensing units	R-404A	3,922	26.5	16.5	16.5	18.0
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
Forklifts	Electric	Average	2.00	8.00	82.0	0.20

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Forklifts	Electric	Average	2.00	8.00	82.0	0.20

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
Emergency Generator	Diesel	1.00	0.01	3.00	201	0.73

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)

Appendix B
Planning Survey Report

City of Oakley
Planning Division
MAR 7, 2024
RECEIVED

Application Form and Planning Survey Report

To Comply With and Receive Permit Coverage Under The East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan

Please complete this application to apply for take authorization under the state and federal East Contra Costa County HCP/NCCP incidental take permits. The East Contra Costa County Habitat Conservancy ("Conservancy") or local jurisdiction (City of Brentwood, City of Clayton, City of Oakley, City of Pittsburg, and Contra Costa County) may request more information in order to deem the application complete.

I. PROJECT OVERVIEW

PROJECT INFORMATION	
PROJECT NAME: Oakley Safeway Retail Center	
PROJECT TYPE: ☐ Residential ☒ Commercial ☐ Transportation ☐ Utility ☐ Other (Industrial)	
PROJECT DESCRIPTION (BRIEF): The project is a commercial center with Safeway being the anchor store. A detailed project description is included in Attachment A.	
PROJECT ADDRESS/LOCATION: 998 Laurel Avenue, Oakley, Contra Costa County, California. The site is at the northeast corner of Laurel Avenue and O'Hara Avenue. This PSR also addresses improvements to a 0.32+/-acre off-site Water Quality Basin improvements area.	
PARCEL/PROJECT SIZE (ACRES): Commercial Project Site: 9.4+/- acres (8.77+/- acre Site and 0.63+/- acres of Off-site Improvements to Laurel Avenue and O'Hara Avenue). **Off-site Water Quality Basin:** 0.32+/- acre.	
PROJECT APN(S): Commercial Project Site: 035-220-028; **Off-site Water Quality Basin:** 035-220-026.	
APPLICATION SUBMITTAL DATE: January 2024	**FINAL PSR DATE:** (City/County/Conservancy use)
LEAD PLANNER: Ken Strelo	
JURISDICTION: ☐ City of Brentwood ☐ City of Clayton ☒ City of Oakley ☐ City of Pittsburg ☐ Contra Costa County ☐ Participating Special Entity* *Participating Special Entities are organizations not subject to the authority of a local jurisdiction. Such organizations may include school districts, irrigation districts, transportation agencies, local park districts, geological hazard abatement districts, or other utilities or special districts that own land or provide public services.	
DEVELOPMENT FEE ZONE: ☒ Zone I ☐ Zone II ☐ Zone III ☐ Zone IV See figure 9-1 of the HCP/NCCP at www.cocohcp.org for a generalized development fee zone map. Detailed development fee zone maps by jurisdiction are available from the jurisdiction.	

PROJECT APPLICANT INFORMATION	
APPLICANT'S NAME: Regency Centers	
AUTHORIZED AGENT'S NAME AND TITLE: Michelle Rooney, Manager Investments	
PHONE NO.: (925) 279-1801	**APPLICANT'S E-MAIL:** MichelleRooney@regencycenters.com
MAILING ADDRESS: 1777 Botelho Drive, Suite 200, Walnut Creek, CA 94596	

BIOLOGIST INFORMATION[1]	
BIOLOGICAL/ENVIRONMENTAL FIRM: Moore Biological Consultants	
CONTACT NAME AND TITLE: Diane S. Moore, M.S.	
PHONE NO.: (209) 745-1159	**CONTACT'S E-MAIL:** moorebio@softcom.net
MAILING ADDRESS: Moore Biological Consultants, 10330 Twin Cities Rd., Ste. 30, Galt, California 95632	

[1] A USFWS/CDFW-approved biologist (project-specific) is required to conduct the surveys. Please submit biologist(s) approval request to the Conservancy.

II. PROJECT DETAILS

Please complete and/or provide the following attachments:

1) **Project Description**
   Attach as **Attachment A: Project Description**. Provide a detailed written description that concisely and completely describes the project and location. Include the following information:
   - All activities proposed for the site or project, including roads utilized, construction staging areas, and the installation of underground facilities, to ensure the entire project is covered by the HCP/NCCP permit
   - Proposed construction dates, including details on construction phases, if applicable
   - Reference a City/County application number for the project, if applicable
   - General Best Management Practices, if applicable
   - If the project will have temporary impacts, please provide a restoration plan describing how the site will be restored to pre-project conditions, including revegetation seed mixes or plantings and timing

2) **Project Vicinity Map**
   Provide a project vicinity map. Attach as **Figure 1** in **Attachment B: Figures**.

3) **Project Site Plans**
   Provide any project site plans for the project. Attach as **Figure 2** in **Attachment B: Figures**.

4) **CEQA Document**
   Indicate the status of CEQA documents prepared for the project. Provide additional comments below table if necessary.

Type of Document	Status	Date Completed
☐ Initial Study	Not yet initiated	
☐ Notice of Preparation		
☐ Draft EIR		
☐ Final EIR		
☐ Notice of Categorical Exemption		
☐ Notice of Statutory Exemption		
☐ Other (describe)		

III. EXISTING CONDITIONS AND IMPACTS

Please complete and/or provide the following attachments:

1) **Field-Verified Land Cover Map**[2]
   Attach a field-verified land cover map in **Attachment B: Figures** and label as **Figure 3**. The map should contain all land cover types present on-site overlaid on aerial/satellite imagery. Map colors for the land cover types should conform to the HCP/NCCP (see *Figure 3-3: Landcover in the Inventory Area* for land cover type legend).

2) **Photographs of the Project Site**
   Attach representative photos of the project site in **Attachment B: Figures** and label as **Figure 4**. Please provide captions for each photo.

[2] For PSEs and city or county public works projects, please also identify permanent and temporary impact areas by overlaying crosshatching (permanent impacts) and hatching (temporary impacts) on the land cover map.

3) Land Cover Types and Impacts and Supplemental Tables

- For all terrestrial land cover types please provide calculations to the nearest **hundredth of an acre (0.01)**.
  For aquatic land cover types please provide calculations to the nearest **thousandth of an acre (0.001)**.
- **Permanent Impacts** are broadly defined in the ECCC HCP/NCCP to include all areas removed from an undeveloped or habitat-providing state and includes land in the same parcel or project that is not developed, graded, physically altered, or directly affected in any way but is isolated from natural areas by the covered activity. Unless such undeveloped land is dedicated to the Preserve System or is a deed-restricted creek setback, the development mitigation fee will apply (if proposed, would require Conservancy approval).
- **Temporary Impacts** are broadly defined in the ECCC HCP/NCCP as any impact on vegetation or habitat that does not result in permanent habitat removal (i.e., vegetation can eventually recover).
- If **wetland (riparian woodland/scrub, wetland, or aquatic)** land cover types are present on the parcel but will not be impacted please discuss in the following section 4) Jurisdictional Wetlands and Waters. Wetland impact fees will only be charged if wetland features are impacted. However, development fees will apply to the entire parcel.
- **Stream** land cover type is considered a linear feature where impacts are calculated based on length impacted. The acreage within a stream, below Top of Bank (TOB), must be assigned to the adjacent land cover type(s). Insert area of impact to stream below TOB in parentheses after the Land Cover acreage number (e.g., Riparian Woodland/Scrub: 10 (0.036) – where 10 is the total impacted acreage including 0.036 acre, which is the acreage within stream TOB). Complete following supplemental **Stream Feature Detail** table to provide information for linear feet.
- **Total Impacts** acreage should be the total parcel acreage (development project) or project footprint acreage (rural infrastructure or utility project).

Table 1A: Land Cover Types and Impacts (Commercial Center)

Land Cover Type	Permanent Impacts	Temporary Impacts	*Proposed for HCP/NCCP Dedication on the Parcel (Requires Conservancy Approval)* *Stream Setback*	*Preserve System Dedication*
Grassland				
Annual Grassland				
Alkali Grassland				
Ruderal	7.37			
Shrubland				
Chaparral and Scrub				
Woodland				
Oak Savannah				
Oak Woodland				
Riparian				
Riparian Woodland/Scrub				
Wetland				
Permanent Wetland				
Seasonal Wetland				
Alkali Wetland				
Aquatic				
Aquatic (Reservoir/Open Water)				
Slough/Channel				
Pond				
Stream (in linear feet)	-	-	-	-
Irrigated Agriculture				
Pasture				
Cropland				
Orchard				
Vineyard				
Other				
Nonnative woodland				
Wind turbines				
Developed (not counted toward Fees)				
Urban	2.03			
Aqueduct				
Turf				
Landfill				
TOTAL IMPACTS	9.4			

Identify any uncommon vegetation and uncommon landscape features[3]:

Supplemental to Table 1A: Uncommon Vegetation and Landscape Features (Commercial Center)

	Permanent Impacts	Temporary Impacts
Uncommon Grassland Alliances		
Purple Needlegrass Grassland		
Blue Wildrye Grassland		
Creeping Ryegrass Grassland		
Wildflower Fields		
Squirreltail Grassland		
One-sided Bluegrass Grassland		
Serpentine Bunchgrass Grassland		
Saltgrass Grassland		
Alkali Sacaton Bunchgrass Grassland		
☐ Other		
Uncommon Landscape Features		
Rock Outcrops		
Caves		
Springs and seeps		
Scalds		
Sand Deposits		
☐ Mines[4]		
☐ Buildings (bat roosts)[3]		
☒ Potential nest sites (trees or cliffs)[3]	7	

Please provide details of impacts to stream features:

Stream Name: None

Watershed: N/A

Supplemental to Table 1A: Stream Feature Detail[5] (Commercial Center)

Stream Width	Stream Type[6]	Permanent Impacts (linear feet)[7]	Temporary Impacts (linear feet)[7]
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		

[3] These acreages are for Conservancy tracking purposes. Impacts to these uncommon vegetation and landscape features should be accounted for within the land cover types in Table 1 (e.g., x acres of purple needlegrass in this supplemental table should be accounted for within annual grassland in Table 1).

[4] Insert amount/number, not acreage. Provide additional information on these features in Attachment A: Project Description.

[5] Use more than 1 row as necessary to describe impacts to streams on site.

[6] See glossary (Appendix A) for definition of stream type and order.

[7] Stream length is measured along stream centerline, based on length of impact to any part of the stream channel, TOB to TOB.

Table 1B: Land Cover Types and Impacts (Water Quality Basin)

Land Cover Type	Permanent Impacts	Temporary Impacts	*Stream Setback*	*Preserve System Dedication*
Grassland				
Annual Grassland				
Alkali Grassland				
Ruderal				
Shrubland				
Chaparral and Scrub				
Woodland				
Oak Savannah				
Oak Woodland				
Riparian				
Riparian Woodland/Scrub				
Wetland				
Permanent Wetland				
Seasonal Wetland				
Alkali Wetland				
Aquatic				
Aquatic (Reservoir/Open Water)				
Slough/Channel				
Pond				
Stream (in linear feet)	-	-	-	-
Irrigated Agriculture				
Pasture				
Cropland				
Orchard				
Vineyard				
Other				
Nonnative woodland				
Wind turbines				
Developed (not counted toward Fees)				
Urban				
Aqueduct				
Turf	0.32			
Landfill				
TOTAL IMPACTS	0.32			

Identify any uncommon vegetation and uncommon landscape features[8]:

Supplemental to Table 1B: Uncommon Vegetation and Landscape Features (Water Quality Basin)

	Permanent Impacts	Temporary Impacts
Uncommon Grassland Alliances		
Purple Needlegrass Grassland		
Blue Wildrye Grassland		
Creeping Ryegrass Grassland		
Wildflower Fields		
Squirreltail Grassland		
One-sided Bluegrass Grassland		
Serpentine Bunchgrass Grassland		
Saltgrass Grassland		
Alkali Sacaton Bunchgrass Grassland		
☐ Other		

[8] These acreages are for Conservancy tracking purposes. Impacts to these uncommon vegetation and landscape features should be accounted for within the land cover types in Table 1 (e.g., x acres of purple needlegrass in this supplemental table should be accounted for within annual grassland in Table 1).

Uncommon Landscape Features		
Rock Outcrops		
Caves		
Springs and seeps		
Scalds		
Sand Deposits		
☐ Mines[9]		
☐ Buildings (bat roosts)[3]		
☐ Potential nest sites (trees or cliffs)[3]		

Please provide details of impacts to stream features:

Stream Name: None

Watershed: N/A

Supplemental to Table 1B: Stream Feature Detail[10] (Water Quality Basin)

Stream Width	Stream Type[11]	Permanent Impacts (linear feet)[12]	Temporary Impacts (linear feet)[7]
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		

4) Summary of Land Cover Types

Please provide a written summary of descriptions for land cover types found on site including characteristic vegetation.

General Setting: The 9.4+/- acre Commercial Center site is in Oakley, in Contra Costa County, California. The site is within Section 25, in Township 2 North, Range 2 East of the USGS 7.5-minute Brentwood topographic quadrangle (Figure 1). The site slopes down from southwest to northeast and ranges in elevations from approximately 35 to 55 feet above mean sea level.

The Commercial Center site is a sandy field vegetated in sparse amounts of grasses and weeds (Figure 3 and Figures 4A). There is a graveled entrance in to the site from Laurel Avenue that leads to a large graveled pad in the approximate central part of the site (Figure 4B). Surrounding land uses in this portion of Oakley are a mixture of residential, agricultural, and commercial. O'Hara Avenue borders the site to the west and there is a gas station and residential subdivision west of O'Hara Avenue. Laurel Avenue borders the south edge of the site and there is a vineyard further to the south, across Laurel Avenue.

There are two relatively large residential parcels to the north of the site and Laurel Park is situated to the east of the site.

[9] Insert amount/number, not acreage. Provide additional information on these features in Attachment A: Project Description.

[10] Use more than 1 row as necessary to describe impacts to streams on site.

[11] See glossary (Appendix A) for definition of stream type and order.

[12] Stream length is measured along stream centerline, based on length of impact to any part of the stream channel, TOB to TOB.

The project will involve water quality improvements to a 0.32+/- acre area in Laurel Park (Figure 2E). Laurel Park is an existing dual-function detention basin and baseball/softball park immediately east of the site. The basin floor is several feet in elevation below the site.

The East Contra Costa County Habitat Conservation Plan (ECCCHCP) bases development fees on landcover types present on the site in November of 2007 when the City of Oakley adopted the HCP. In some parts of Oakley, current landcover types differ from those present in 2007.

Field-Verified Land Cover Types: Biologists Diane S. Moore, M.S. and Colleen A. Laskowski, M.S. conducted a survey on December 12, 2023. We confirmed minimal landscape changes in the site between 2007 and present time. Laurel Park was developed more than 2 decades ago.

Ruderal Grassland: There is a total of 7.37+/- acres of ruderal grassland in the site. The site has been routinely disked for decades and the ruderal grassland is highly disturbed (see Figure 4A). Soils in the site are very sandy, and supporting sparse amounts of grasses and weeds. Representative grassland species in the site include stinkwort (*Dittrichia graveolens*), telegraphweed (*Heterotheca grandiflora*), filaree (*Erodium botrys*), oats (*Avena fatua*), and prickly lettuce (*Lactuca serriola*).

Urban/Developed: The 2.03+/- acres of Urban/Developed areas in the site includes a graveled driveway from Laurel Avenue leading to a graveled pad in the approximate central part of the site and developed areas along O'Hara Avenue and Laurel Road (see Figures 4B-4E). The graveled driveway and associated pad in the site have been present for decades as this area has been used for a staging area for nearby development and most recently, a parking area for the community fields in Laurel Park.

The 0.32+/- acres of Laurel Park that will be subject to water quality improvements is also developed and part of the baseball/softball park. The grass on the basin floor is well maintained and routinely mowed.

Trees: Trees in the site are limited to 7 trees within the landscape strip along the south edge of the site (Figure 4D). There are a few smaller trees along the north edge of the site, best described as shrubs. There are no trees within the 0.32+/- acres of Laurel Park that will be subject to water quality improvements.

5) Jurisdictional Wetlands and Waters

If wetlands and waters are present on the project site, project proponents must conduct a delineation of jurisdictional wetlands and waters. Jurisdictional wetlands and waters are defined on pages 1-18 and 1-19 of the ECCC HCP/NCCP as the following land cover types: permanent wetland, seasonal wetland, alkali wetland, aquatic, pond, slough/channel, and stream. It should be noted that these features differ for federal and state jurisdictions. If you have identified any of these land cover types in Table 1, complete the section below.

a) Attach the wetland delineation report as **Attachment E: Wetland Delineation.** If a wetland delineation has not been completed, please explain below in section 4c.

b) Please check the following permits the project may require. Please submit copies of these permits to the Conservancy prior to the start of construction:

☐ CWA Section 404 Permit[13] ☐ CWA Section 401 Water Quality Certification

☐ Waste Discharge Requirements ☐ Lake and Streambed Alteration Agreement

[13] The USACE Sacramento District issued a Regional General Permit 1 (RGP) related to ECCC HCP/NCCP covered activities. The RGP is designed to streamline wetland permitting in the entire ECCC HCP/NCCP Plan Area by coordinating the avoidance, minimization, and mitigation measures in the Plan with the Corps' wetland permitting requirement. Applicants seeking authorization under this RGP shall notify the Corps in accordance with RGP general condition number 18 (Notification).

c) Provide any additional information on impacts to jurisdictional wetland and waters below, including status of the permit(s):

An assessment of potentially jurisdictional Waters of the U.S. or wetlands in the site was undertaken during the December 12, 2023 survey. There are no potentially jurisdictional Waters of the U.S. or wetlands of any type in the site. The site consists of a grassland field and graveled areas. Soils in the site are extremely sandy and appear well-draining.

There are no potentially jurisdictional Waters of the U.S. or wetlands in the Laurel Basin. The basin was excavated in uplands for stormwater detention purposes and is vegetated in maintained turf.

6) Species-Specific Planning Survey Requirements

Based on the land cover types found on-site and identified in Table 1, check the applicable boxes in Table 2a.

Table 2a. Species –Specific Planning Survey Requirements

Land Cover Type in Project Area	Required Survey Species	Habitat Element in Project Area	Planning Survey Requirement[14]	Info in HCP
☒ Grasslands, oak savannah, agriculture, or ruderal	☐ San Joaquin kit fox	Assumed if within modeled range of species	If within modeled range of species, identify and map potential breeding or denning habitat within the project site and a 250-ft radius around the project footprint.	pp. 6-37 to 6-38
	☒ Western burrowing owl	Assumed	Identify and map potential breeding habitat within the project site and a 500-ft radius around the project footprint. Please note the HCP requires buffers for occupied burrows. Surveys may need to encompass an area larger than the project footprint.	pp. 6-39 to 6-41
☐ Aquatic (ponds, wetlands, streams, sloughs, channels, and marshes)	☐ Giant garter snake	Aquatic habitat accessible from the San Joaquin River	Identify and map potential habitat.	pp. 6-43 to 6-45
	☐ California tiger salamander	Ponds and wetlands Vernal pools Reservoirs Small lakes	Identify and map potential breeding habitat. Document habitat quality and features. Provide the Conservancy with photo-documentation and report.	pp. 6-45
	☐ California red-legged frog	Slow-moving streams, ponds and wetlands	Identify and map potential breeding habitat. Document habitat quality and features. Provide the Conservancy with photo-documentation and report.	p. 6-46
	☐ Covered shrimp	Seasonal wetlands Vernal pools Sandstone rock outcrops Sandstone depressions	Identify and map potential habitat. Please note the HCP requires a 50 foot non-disturbance buffer from seasonal wetlands that may be occupied by covered shrimp. Surveys may need to encompass an area larger than the project footprint.	pp. 6-46 to 6-48
☒ Any	☐ Townsend's big-eared bat	Rock formations with caves Mines Abandoned buildings outside urban area	Map and document potential breeding or roosting habitat.	pp. 6-36 to 6-37
	☒ Swainson's hawk	Potential nest sites within 1,000 feet of project	Inspect large trees for presence of nest sites. Document and map.	pp. 6-41 to 6-43
	☒ Golden Eagle	Potential nest sites with ½ mile of project	Inspect large trees for presence of nest sites. Document and map.	pp. 6-38 to 6-39
Surveys for all covered species must be conducted by a qualified biologist (USFWS/CDFW project-specific approved). Please submit biologist approval request to the East Contra Costa County Habitat Conservancy. Surveys for all covered species must be conducted according to the respective USFWS or CDFW survey protocols, as identified in Chapter 6.4.3 in the HCP/NCCP.				

[14] The planning survey requirements in this table are not comprehensive. Please refer to Chapter 6.4.3 in the ECCC HCP/NCCP for more detail.

7) Planning Survey Species Habitat Maps

Provide Planning Survey Species Habitat Maps as required in Table 2a, attach as **Figure 5** in **Attachment B: Figures**.

8) Results of Species-Specific Surveys

Provide a written summary describing the results of the planning surveys. Please discuss the location, quantity, and quality of suitable habitat for specified covered wildlife species on the project site.

Western Burrowing Owl: The project site contains ruderal grassland and is within the range of western burrowing owl (*Athene cunicularia*). The site was inspected for burrowing owls and ground squirrel burrows with evidence of burrowing owl occupancy (i.e., white wash, pellets, feathers). The grasslands in the site are disked, providing low-quality nesting habitat for burrowing owl. No ground squirrel burrows were observed in the site during the field survey and no burrowing owls were seen.

The Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB, 2024) contains a record of burrowing owl near the intersection of O'Hara Avenue and Laurel Avenue; this record is from 2006. There are two other records of this species within the larger geographical area depicted in Figure 5b.

Swainson's Hawk: The site is ruderal grassland and is along the western edge of the range of Swainson's hawks (*Buteo swainsoni*). There are 7 marginally large enough trees in the site that are potentially suitable for nesting raptors, including Swainson's hawks (Figure 5a). There are also several trees that are potentially suitable for nesting in parcels in close proximity to the site, most notably in the residential parcels to the north of site. Trees in and near the site were scanned with binoculars to search for raptor stick nests and none were observed. No Swainson's hawks were observed during the field survey, which was conducted in the winter when Swainson's hawks are not in the area. This species may forage in the project vicinity and could potentially nest in trees in or near the site during some years.

CDFW's CNDDB (2024) does not contain any records of Swainson's hawk within 1,000 feet of the site or within the larger geographical area depicted in Figure 5b.

Golden Eagle: The site contains a large area of ruderal grassland and is within the range of golden eagles (*Aquila chrysaetos*). There are 7 trees in the site, all of which are too small to support this large eagle. It is considered unlikely that golden eagles would nest in or near the site due to the site's proximity to development. Trees in the site and visible from the site were inspected for large raptor stick nests capable of supporting eagles and none were observed. No golden eagles were observed during the field survey and this species nests more often on cliffs in remote natural areas than in trees near urban areas.

CDFW's CNDDB (2024) contains no occurrences of golden eagle within 0.5 miles of the site or within the larger geographical area depicted in Figure 5b.

9) Covered and No-Take Plants

Please check the applicable boxes in Table 2b based on the land cover types found in the project area. If suitable land cover types are present on site, surveys must be conducted using approved CDFW/USFWS methods during the appropriate season for identification of covered and no-take species (see page 6-9 of the ECCC HCP/NCCP). Reference populations of covered and no-take plants should be visited, where possible, prior to conducting surveys to confirm that the plant species is visible and detectable at the time surveys are conducted. In order to complete all the necessary covered and no-take plant surveys, spring, summer, and fall surveys may be required.

Table 2b. Covered and No-Take Plant Species

Plant Species	Covered (C) or No-Take (N)	Associated Land Cover Type	Typical Habitat or Physical Conditions, if Known	Typical Blooming Period	Suitable Land Cover Type Present
Adobe navarretia (*Navarretia nigelliformis* ssp. *radians*) [a]	C	Annual Grassland	Generally found on clay barrens in Annual Grassland [b]	Apr–Jun	☐ Yes ☒ No
Alkali milkvetch (*Astragalus tener* ssp. *tener*)	N	Alkali grassland Alkali wetland Annual grassland Seasonal wetland	Generally found in vernally moist habitat in soils with a slight to strongly elevated pH	Mar–Jun	☐ Yes ☒ No
Big tarplant (*Blepharizonia plumosa*)	C	Annual grassland	Elevation below 1500 feet [d] most often on Altamont Series or Complex soils	Jul–Oct	☐ Yes ☒ No
Brewer's dwarf flax (*Hesperolinon breweri*)	C	Annual grassland Chaparral and scrub Oak savanna Oak woodland	Generally, restricted to grassland areas within a 500+ buffer from oak woodland and/or chaparral/scrub [d]	May–Jul	☐ Yes ☒ No
Brittlescale (*Atriplex depressa*)	C	Alkali grassland Alkali wetland	Restricted to soils of the Pescadero or Solano soil series; generally found in southeastern region of plan area [d]	May–Oct	☐ Yes ☒ No
Caper-fruited tropidocarpum (*Tropidocarpum capparideum)*	N	Alkali grassland		Mar–Apr	☐ Yes ☒ No
Contra Costa goldfields (*Lasthenia conjugens*)	N	Alkali grassland Alkali wetland Annual grassland Seasonal wetland	Generally found in vernal pools	Mar–Jun	☐ Yes ☒ No
Diablo Helianthella (*Helianthella castanea*)	C	Chaparral and scrub Oak savanna Oak woodland	Elevations generally above 650 feet [d]	Mar–Jun	☐ Yes ☒ No
Diamond-petaled poppy (*Eschscholzia rhombipetala*)	N	Annual grassland		Mar–Apr	☐ Yes ☒ No
Large-flowered fiddleneck (*Amsinckia grandiflora*)	N	Annual grassland	Generally on clay soil	Apr–May	☐ Yes ☒ No
Mount Diablo buckwheat (*Eriogonum truncatum*)	N	Annual grassland Chaparral and scrub	Ecotone of grassland and chaparral/scrub	Apr–Sep	☐ Yes ☒ No
Mount Diablo fairy-lantern (*Calochortus pulchellus*)	C	Annual grassland Chaparral and scrub Oak savanna Oak woodland	Elevations generally between 650 and 2,600[d]	Apr–Jun	☐ Yes ☒ No
Mount Diablo Manzanita (*Arctostaphylos auriculata*)	C	Chaparral and scrub	Elevations generally between 700 and 1,860 feet; restricted to the eastern and northern flanks of Mt. Diablo [d] and the vicinity of Black Diamond Mines	Jan–Mar	☐ Yes ☒ No
Recurved larkspur (*Delphinium recurvatum*)	C	Alkali grassland Alkali wetland		Mar–Jun	☐ Yes ☒ No
Round-leaved filaree (*California macrophylla*) [c]	C	Annual grassland		Mar–May	☐ Yes ☒ No
San Joaquin spearscale (*Extriplex joaquiniana*) [e]	C	Alkali grassland Alkali wetland		Apr–Oct	☐ Yes ☒ No
Showy madia (*Madia radiata*)	C	Annual grassland Oak savanna Oak woodland	Primarily occupies open grassland or grassland on edge of oak woodland	Mar–May	☐ Yes ☒ No

[a] The species *Navarretia nigelliformis* subsp. *nigelliformis* is no longer considered to occur within Contra Costa County based on specimen annotations at the UC and Jepson Herbaria at the University of California Berkeley as well as the opinions of experts in the genus. This taxon is now recognized as *Navarretia nigelliformis* subsp. *radians.* Any subspecies of *Navarretia nigelliformis* encountered as a part of botanical surveys in support of a PSR should be considered as covered under this HCP/NCCP.

[b] Habitat for the *Navarretia nigelliformis* subspecies that occurs within the inventory are is inaccurately described in the HCP/NCCP as vernal pools. The entity within the Inventory generally occupies clay barrens within Annual Grassland habitat, which is an upland habitat type.

[c] From California Native Plant Society. 2007. *Inventory of Rare and Endangered Plants* (online edition, v7-07d). Sacramento, CA. Species may be identifiable outside of the typical blooming period; a professional botanist shall determine if a covered or no take plant occurs on the project site. Reference population of covered and no-take plants should be visited, where possible, prior to conducting surveys to confirm that the plant is visible and detectable at the time surveys are conducted.

[d] See Species Profiles in Appendix D of the Final HCP/NCCP. Reference populations of covered and no-take plants should be visited, where possible, prior to conducting surveys to confirm that the plant species is visible and detectable at the time surveys are conducted.

[e] In the recent update to the Jepson eflora (JFP 2013) *Atriplex joaquinana* has been circumscribed and segregated into a new genus called *Extriplex* based on the work of Elizabeth Zacharias and Bruce Baldwin (2010). The etymology of the genus *Extriplex* means, "beyond or outside Atriplex".

10) Results of Covered and No-Take Plant Species

Provide a written summary describing the results of the planning surveys conducted as required in Table 2b. Describe the methods used to survey the site for all covered and no-take plants, including the dates and times of all surveys conducted (see Tables 3-8 and 6-5 of the ECCC HCP/NCCP for covered and no-take plants), including reference populations visited prior to conducting surveys.

If any covered or no-take plant species were found, include the following information in the results summary:

- Description and number of occurrences and their rough population size.
- Description of the "health" of each occurrence, as defined on pages 5-49 and 5-50 of the HCP/NCCP.
- A map of all the occurrences.
- Justification of surveying time window, if outside of the plant's blooming period.
- The CNDDB form(s) submitted to CDFW (if this is a new occurrence).
- A description of the anticipated impacts that the covered activity will have on the occurrence and how the project will avoid impacts to all covered and no-take plant species. If impacts to covered plant species cannot be avoided and plants will be removed by covered activity, the Conservancy must be notified and has the option to salvage the covered plants. All projects must demonstrate avoidance of all six no-take plants (see table 6-5 of the HCP/NCCP).

Survey Methods

A survey to assess potentially suitable habitat for special-status plants was undertaken during the December 12, 2023 survey. The site was systematically searched by walking throughout the site, focusing on grassland areas that could potentially support special-status plants.

Survey Results and Discussion

The site contains areas of ruderal grassland that has been periodically mowed and/or disked for decades. Due to an absence of potentially suitable habitat for special-status plants, focused surveys during the blooming period of each species in Table 2b were not warranted.

IV. SPECIES-SPECIFIC AVOIDANCE AND MINIMIZATION REQUIREMENTS

Please complete and/or provide the following attachments:

1) Species-Specific Avoidance and Minimization for Selected Covered Wildlife

Complete the following table and check the applicable box for covered species determined by the planning surveys.

Table 3. Summary of Applicable Preconstruction Surveys, Avoidance and Minimization, and Construction Monitoring Requirements[15]

Species	Preconstruction Survey Requirements	Avoidance and Minimization Requirements	Construction Monitoring Required	Info in HCP
☐ San Joaquin kit fox	• On project footprint and 250-ft radius, map all dens (>5 in. diameter) and determine status • Provide written survey results to USFWS within 5 working days after surveying	• Monitor dens • Destroy unoccupied dens • Discourage use of occupied (non-natal) dens	• Establish exclusion zones (>50 ft for potential dens, and >100 ft for known dens) • Notify USFWS of occupied natal dens	pp. 6-37 to 6-38
☒ Western burrowing owl	• On project footprint and 500-ft radius, identify and map all owls and burrows, and determine status • Document use of habitat (e.g. breeding, foraging)	• Avoid occupied nests during breeding season (Feb-Sep) • Avoid occupied burrows during nonbreeding season (Sep – Feb) • Install one-way doors in occupied burrow (if avoidance not possible) • Monitor burrows with doors installed	• Establish buffer zones (250 ft around nests) • Establish buffer zones (160 ft around burrows)	pp. 6-39 to 6-41

[15] The requirements in this table are not comprehensive; they are detailed in the next section on the following page.

☐ Giant garter snake	• Delineate aquatic habitat up to 200 ft from water's edge on each side • Document any occurrences	• Limit construction to Oct-May • Dewater habitat April 15 – Sep 30 prior to construction • Minimize clearing for construction	• Delineate 200 ft buffer around potential habitat near construction • Provide field report on monitoring efforts • Stop construction activities if snake is encountered; allow snake to passively relocate • Remove temporary fill or debris from construction site • Mandatory training for construction personnel	pp. 6-43 to 6-45
☐ California tiger salamander	• Provide written notification to USFWS and CDFW regarding timing of construction and likelihood of occurrence on site	• Allow agency staff to translocate species, if requested	• None	p. 6-45
☐ California red-legged frog	• Provide written notification to USFWS and CDFW regarding timing of construction and likelihood of occurrence on site	• Allow agency staff to translocate species, if requested	• None	p. 6-46
☐ Covered shrimp	• Establish presence/absence • Document and evaluate use of all habitat features (e.g. vernal pools, rock outcrops)	• Establish buffer near construction activities • Prohibit incompatible activities	• Establish buffer around outer edge of all hydric vegetation associated with habitat (50 ft or immediate watershed, whichever is larger) • Mandatory training for construction personnel	pp. 6-46 to 6-48
☐ Townsend's big-eared bat	• Establish presence/absence • Determine if potential sites were recently occupied (guano)	• Seal hibernacula before Nov • Seal nursery sites before April • Delay construction near occupied sites until hibernation or nursery seasons are over	• None	pp. 6-36 to 6-37
☒ Swainson's hawk	• Determine whether potential nests are occupied	• No construction within 1,000 ft of occupied nests within breeding season (March 15 - Sep 15) • If necessary, remove active nest tree after nesting season to prevent occupancy in second year.	• Establish 1,000 ft buffer around active nest and monitor compliance (no activity within established buffer)	pp. 6-41 to 6-43
☒ Golden Eagle	• Establish presence/absence of nesting eagles	• No construction within ½ mile near active nests (most activity late Jan – Aug)	• Establish ½ mile buffer around active nest and monitor compliance with buffer	pp. 6-38 to 6-39

2) Required Preconstruction Surveys, Avoidance and Minimization, and Construction Monitoring

All preconstruction surveys shall be conducted in accordance with the requirements set forth in Section 6.4.3, Species-Level Measures, and Table 6-1 of the ECCC HCP/NCCP. Detailed descriptions of preconstruction surveys, avoidance and minimization, and construction monitoring applicable to each of the wildlife species in Table 3 are located below. Please remove the species-specific measures that do not apply to your project (highlight entire section and delete).

WESTERN BURROWING OWL

Preconstruction Surveys

Prior to any ground disturbance related to covered activities, a USFWS/CDFW- approved biologist will conduct a preconstruction survey in areas identified in the planning surveys as having potential burrowing owl habitat. The surveys will establish the presence or absence of western burrowing owl and/or habitat features and evaluate use by owls in accordance with CDFW survey guidelines (California Department of Fish and Game 1995).

On the parcel where the activity is proposed, the biologist will survey the proposed disturbance footprint and a 500-foot radius from the perimeter of the proposed footprint to identify burrows and owls. Adjacent parcels under different land ownership will not be surveyed. Surveys should take place near sunrise or sunset in accordance with CDFW guidelines. All burrows or burrowing owls will be identified and mapped. Surveys will take place no more than 30 days prior to construction. During the breeding season (February 1– August 31), surveys will document whether burrowing owls are nesting in or directly adjacent to disturbance areas. During the nonbreeding season (September 1–January 31), surveys will document whether burrowing owls are using habitat in or directly adjacent to any

disturbance area. Survey results will be valid only for the season (breeding or nonbreeding) during which the survey is conducted.

Avoidance and Minimization and Construction Monitoring

This measure incorporates avoidance and minimization guidelines from CDFW's *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 1995).

If burrowing owls are found during the breeding season (February 1 – August 31), the project proponent will avoid all nest sites that could be disturbed by project construction during the remainder of the breeding season or while the nest is occupied by adults or young. Avoidance will include establishment of a non-disturbance buffer zone (described below). Construction may occur during the breeding season if a qualified biologist monitors the nest and determines that the birds have not begun egg-laying and incubation or that the juveniles from the occupied burrows have fledged. During the nonbreeding season (September 1 – January 31), the project proponent should avoid the owls and the burrows they are using, if possible. Avoidance will include the establishment of a buffer zone (described below).

During the breeding season, buffer zones of at least 250 feet in which no construction activities can occur will be established around each occupied burrow (nest site). Buffer zones of 160 feet will be established around each burrow being used during the nonbreeding season. The buffers will be delineated by highly visible, temporary construction fencing.

If occupied burrows for burrowing owls are not avoided, passive relocation will be implemented. Owls should be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors in burrow entrances. These doors should be in place for 48 hours prior to excavation. The project area should be monitored daily for 1 week to confirm that the owl has abandoned the burrow. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation (California Department of Fish and Game 1995). Plastic tubing or a similar structure should be inserted in the tunnels during excavation to maintain an escape route for any owls inside the burrow.

SWAINSON'S HAWK

Preconstruction Survey

Prior to any ground disturbance related to covered activities that occurs during the nesting season (March 15–September 15), a qualified biologist will conduct a preconstruction survey no more than 1 month prior to construction to establish whether Swainson's hawk nests within 1,000 feet of the project site are occupied. If potentially occupied nests within 1,000 feet are off the project site, then their occupancy will be determined by observation from public roads or by observations of Swainson's hawk activity (e.g., foraging) near the project site. If nests are occupied, minimization measures and construction monitoring are required (see below).

Avoidance and Minimization and Construction Monitoring

During the nesting season (March 15–September 15), covered activities within 1,000 feet of occupied nests or nests under construction will be prohibited to prevent nest abandonment. If site-specific conditions or the nature of the covered activity (e.g., steep topography, dense vegetation, limited activities) indicate that a smaller buffer could be used, the Implementing Entity will coordinate with CDFW/USFWS to determine the appropriate buffer size.

If young fledge prior to September 15, covered activities can proceed normally. If the active nest site is shielded from view and noise from the project site by other development, topography, or other features, the project applicant can apply to the Implementing Entity for a waiver of this avoidance measure. Any waiver must also be approved by USFWS and CDFW. While the nest is occupied, activities outside the buffer can take place.

All active nest trees will be preserved on site, if feasible. Nest trees, including non-native trees, lost to covered activities will be mitigated by the project proponent according to the requirements below.

Mitigation for Loss of Nest Trees

The loss of non-riparian Swainson's hawk nest trees will be mitigated by the project proponent by:

- If feasible on-site, planting 15 saplings for every tree lost with the objective of having at least 5 mature trees established for every tree lost according to the requirements listed below.

  AND either

  1) Pay the Implementing Entity an additional fee to purchase, plant, maintain, and monitor 15 saplings on the HCP/NCCP Preserve System for every tree lost according to the requirements listed below, OR

  2) The project proponent will plant, maintain, and monitor 15 saplings for every tree lost at a site to be approved by the Implementing Entity (e.g., within an HCP/NCCP Preserve or existing open space linked to HCP/NCCP preserves), according to the requirements listed below.

The following requirements will be met for all planting options:

- Tree survival shall be monitored at least annually for 5 years, then every other year until year 12. All trees lost during the first 5 years will be replaced. Success will be reached at the end of 12 years if at least 5 trees per tree lost survive without supplemental irrigation or protection from herbivory. Trees must also survive for at least three years without irrigation.
- Irrigation and fencing to protect from deer and other herbivores may be needed for the first several years to ensure maximum tree survival.
- Native trees suitable for this site should be planted. When site conditions permit, a variety of native trees will be planted for each tree lost to provide trees with different growth rates, maturation, and life span, and to provide a variety of tree canopy structures for Swainson's hawk. This variety will help to ensure that nest trees will be available in the short term (5-10 years for cottonwoods and willows) and in the long term (e.g., Valley oak, sycamore). This will also minimize the temporal loss of nest trees.
- Riparian woodland restoration conducted as a result of covered activities (i.e., loss of riparian woodland) can be used to offset the nest tree planting requirement above, if the nest trees are riparian species.
- Whenever feasible and when site conditions permit, trees should be planted in clumps together or with existing trees to provide larger areas of suitable nesting habitat and to create a natural buffer between nest trees and adjacent development (if plantings occur on the development site).
- Whenever feasible, plantings on the site should occur closest to suitable foraging habitat outside the UDA.
- Trees planted in the HCP/NCCP preserves or other approved offsite location will occur within the known range of Swainson's hawk in the inventory area and as close as possible to high-quality foraging habitat.

GOLDEN EAGLE

Preconstruction Survey

Prior to implementation of covered activities, a qualified biologist will conduct a preconstruction survey to establish whether nests of golden eagles are occupied (see Section 6.3.1, *Planning Surveys*). If nests are occupied, minimization requirements and construction monitoring will be required.

Avoidance and Minimization

Covered activities will be prohibited within 0.5 mile of active nests. Nests can be built and active at almost any time of the year, although mating and egg incubation occurs late January through August, with peak activity in March through July. If site-specific conditions or the nature of the covered activity (e.g., steep topography, dense vegetation, limited activities) indicate that a smaller buffer could be appropriate or that a larger buffer should be implemented, the Implementing Entity will coordinate with CDFW/USFWS to determine the appropriate buffer size.

Construction Monitoring

Construction monitoring will focus on ensuring that no covered activities occur within the buffer zone established around an active nest. Although no known golden eagle nest sites occur within or near the ULL, covered activities inside and outside of the Preserve System have the potential to disturb golden eagle nest sites. Construction monitoring will ensure that direct effects to golden eagles are minimized.

3) Construction Monitoring Plan

Before implementing a covered activity, the applicant will develop and submit a construction monitoring plan to the planning department of the local land use jurisdiction and the East Contra Costa County Habitat Conservancy for review and approval. Elements of a brief construction monitoring plan will include the following:

- Results of planning and preconstruction surveys.[16]
- Description of avoidance and minimization measures to be implemented, including a description of project-specific refinements to the measures or additional measures not included in the HCP/NCCP.
- Description of monitoring activities, including monitoring frequency and duration, and specific activities to be monitored.
- Description of the onsite authority of the construction monitor to modify implementation of the activity.

☒ Check box to acknowledge this requirement.

V. SPECIFIC CONDITIONS ON COVERED ACTIVITIES

1) Check off the HCP conservation measures that apply to the project.

APPLIES TO ALL PROJECTS

☒ **Conservation Measure 1.11. Avoid Direct Impacts on Extremely Rare Plants, Fully Protected Wildlife Species, or Migratory Birds.** This conservation measure applies to all projects. All projects will avoid all impacts on extremely rare plants and fully protected species listed in Table 6-5 of the ECCC HCP/NCCP. See HCP pp. 6-23 to 6-25, and Table 6-5.

APPLIES TO PROJECTS THAT IMPACT COVERED PLANT SPECIES

☐ **Conservation Measure 3.10. Plant Salvage when Impacts are Unavoidable.** This condition applies to projects that cannot avoid impacts on covered plants and help protect covered plants by prescribing salvage whenever avoidance of impacts is not feasible. Project proponents wishing to remove populations of covered plants must notify the Conservancy of their construction schedule to allow the Conservancy the option of salvaging the populations. See HCP pp. 6-48 to 6-50.

APPLIES TO PROJECTS THAT INCLUDE ARE ADJACENT TO STREAMS, PONDS, OR WETLANDS

☐ **Conservation Measure 2.12. Wetland, Pond, and Stream Avoidance and Minimization.** All projects will implement measures described in the HCP to avoid and minimize impacts on wetlands, ponds, streams, and riparian woodland/scrub. See HCP pp. 6-33 to 6-35.

APPLIES TO NEW DEVELOPMENT PROJECTS

☒ **Conservation Measure 1.10. Maintain Hydrologic Conditions and Minimize Erosion.** All new development must avoid or minimize direct and indirect impacts on local hydrological conditions and erosion by incorporating the applicable Provision C.3 Amendments of the Contra Costa County Clean Water Program's (CCCCWP's) amended NPDES Permit (order no. R2-2003-0022; permit no. CAS002912). The overall goal of this measure is to ensure that new development covered under the HCP has no or minimal adverse effects on downstream fisheries to avoid take of fish listed under ESA or CESA. See HCP pp. 6-21 to 6-22.

APPLIES TO NEW DEVELOPMENT PROJECTS THAT INCLUDE OR ARE ADJACENT TO STREAMS, PONDS, OR WETLANDS

☐ **Conservation Measure 1.7. Establish Stream Setbacks.** A stream setback will be applied to all development projects covered by the HCP according to the stream types listed in Table 6-2 of the HCP. See HCP pp. 6-15 to 6-18 and Table 6-2.

APPLIES TO NEW DEVELOPMENT PROJECTS ADJACENT TO EXISTING PUBLIC OPEN SPACE, HCP PRESERVES, OR LIKELY HCP ACQUISITION SITES

☐ **Conservation Measure 1.6. Minimize Development Footprint Adjacent to Open Space.** Project applicants are encouraged to minimize their development footprint and set aside portions of their land to contribute to the HCP Preserve System. Land set aside that contributes to the HCP biological goals and objectives may be credited against development fees. See HCP pages 6-14 to 6-15.

☐ **Conservation Measure 1.8. Establish Fuel Management Buffer to Protect Preserves and Property.** Buffer zones will provide a buffer between development and wildlands that allows adequate fuel management to minimize the risk of wildlife damage to property or to the preserve. The minimum buffer zone for new development is 100 feet. See HCP pages 6-18 to 6-19.

[16] If the preconstruction surveys do not trigger construction monitoring, results of preconstruction surveys should still be submitted to the local jurisdiction and the East Contra Costa County Habitat Conservancy.

☐ **Conservation Measure 1.9. Incorporate Urban-Wildlife Interface Design Elements.** These projects will incorporate design elements at the urban-wildlife interface to minimize the indirect impacts of development on the adjacent preserve. See HCP pp. 6-20 to 6-21.

APPLIES TO ROAD MAINTENANCE PROJECTS OUTSIDE THE UDA

☐ **Conservation Measure 1.12. Implement Best Management Practices for Rural Road Maintenance.** Road maintenance activities have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways, spreading invasive weeds, and disturbing breeding wildlife. In order to avoid and minimize these impacts, BMPs described in the HCP will be used where appropriate and feasible. See HCP pp. 6-25 to 6-26.

APPLIES TO NEW ROADS OR ROAD IMPROVEMENTS OUTSIDE THE UDA

☐ **Conservation Measure 1.14. Design Requirements for Covered Roads Outside the Urban Development Area (UDA).** New roads or road improvements outside the UDA have impacts on many covered species far beyond the direct impacts of their project footprints. To minimize the impacts of new, expanded, and improved roads in agricultural and natural areas of the inventory area, road and bridge construction projects will adopt siting, design, and construction requirements described in the HCP and listed in Table 6-6. See HCP pp. 6-27 to 6-33 and Table 6-6.

APPLIES TO FLOOD CONTROL MAINTENANCE ACTIVITIES

☐ **Conservation Measure 1.13. Implement Best Management Practices for Flood Control Facility Maintenance.** Flood control maintenance activities have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways and disturbing breeding wildlife. In order to avoid and minimize these impacts, BMPs described in the HCP will be used where appropriate and feasible. See HCP pp. 6-26 to 6-27.

2) For all checked conservation measures, describe how the project will comply with each measure. Attach as Attachment C: Project Compliance to HCP Conditions.

VI. MITIGATION MEASURES

1) Mitigation Fee Calculator(s)
Complete and attach the fee calculator (use permanent and/or temporary impact fee calculator as appropriate), and attach as **Attachment D: Fee Calculator(s)**.

2) Briefly describe the amount of fees to be paid and when applicant plans to submit payment.

The 9.4+/- acre site falls within Fee Zone 1.

Development will impact 7.37+/- acres of the ruderal grassland. There is no fee on the remaining 2.03 acres of Urban/Developed land in the site.

Development will also impact 0.32+/- acres of turf in the Laurel Basin. The basin is "Urban/Developed" land that is exempt from ECCCHCP fees.

Using the current (2023) fee schedule, fees would be paid on 7.37+/ acres at a cost of $19,611.52 per acre, for a total cost of $144,536.90.

Construction is expected to commence in late-2024. Fees will be paid pursuant to the fee schedule that is in place at the time construction commences.

ATTACHMENT A: PROJECT DESCRIPTION

9.4+/- Acre “Oakley Safeway Retail Center” Project

Project Description
January 2024

The 9.4+/- acre project site is located at the northeast corner of Laurel Avenue and O’Hara Avenue, in Oakley, Contra Costa County, California. The site is within Section 25, in Township 2 North, Range 2 East of the USGS 7.5-minute Brentwood topographic quadrangle (Figure 1). The site slopes down from southwest to northeast and ranges in elevations from approximately 35 to 55 feet above mean sea level.

The site is a sandy field vegetated in sparse amounts of grasses and weeds, with a graveled pad in the approximate central part of the site. O’Hara Avenue borders the site to the west and there is a gas station and residential subdivision west of O’Hara Avenue. Laurel Avenue borders the south edge of the site and there is a vineyard further to the south, across Laurel Avenue. There are two relatively large residential parcels north of the site and Laurel Park is situated to the east of the site.

The project is a commercial center with associated parking and landscaping (Figures 2A – 2D). The center will include a 5,500 square foot Safeway, a gas station and convenience store, and five other buildings and/or pads. Access from the site will be from O’Hara Avenue and Laurel Avenue. The proposed project will connect to existing City infrastructure to provide sewer, water, and gas to the site (Figure 2D). Stormwater will be collected and conveyed via an existing public 66” storm drain pipeline in an easement along the north edge of the site to a regional storm drain basin in Laurel Park, east of the site (Figure 2E).

In-lieu of constructing stormwater treatment facilities on-site, 14,000+/- square feet (0.32+/- acre) of Laurel Basin will be improved (Figure 2E). The improvements will involve constructing a bioretention area sized to treat the volume of stormwater discharged from the new development. Approximately 1,300 cubic yards of existing material will be excavated and replaced with 18” of bioretention soil mix over 12” of Caltrans Class II permeable material.

Standard construction best management practices (BMPs) will be employed during construction to minimize the potential for erosion and off-site transport of fines. BMPs will include use of water trucks, appropriate compaction of soil, and installation of straw wattles, silt fences or other technologies along the perimeter of the site during construction, and stabilization of bare soils as appropriate with seeding, straw, and/or hydromulch.

Construction is expected to begin in Fall 2024.

ATTACHMENT B: FIGURES

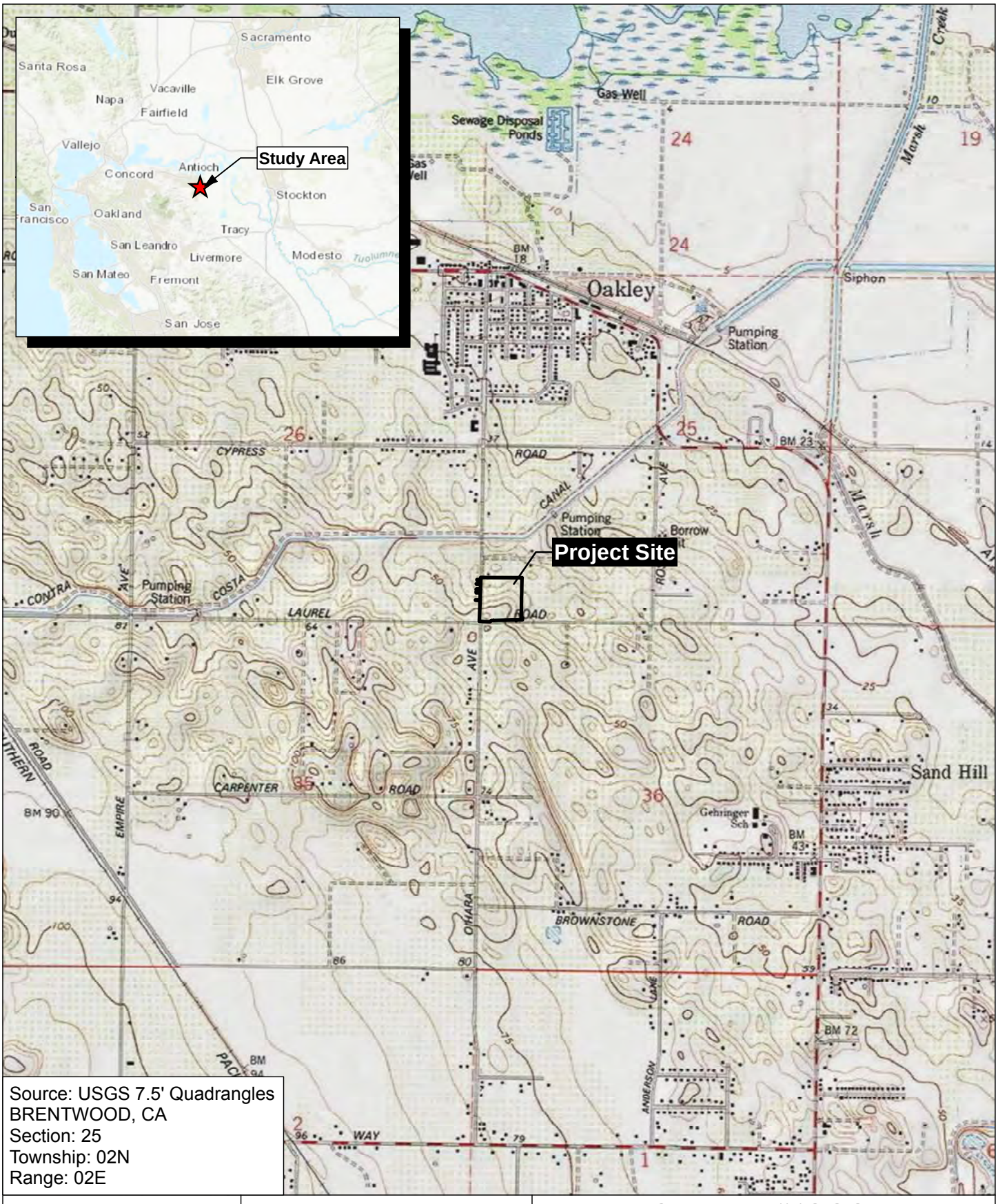


Figure 1

Moore Biological Consultants

Map Date: 12/15/2023

Site Map/USGS

Oakley Safeway Retail Center

City of Oakley, Contra Costa County, CA

C:\EFC_INC\Projects\Moore Biological\Oakley Safeway Retail Center\MXD\oakley_safeway_retail_center.mxd Figure_1.mxd

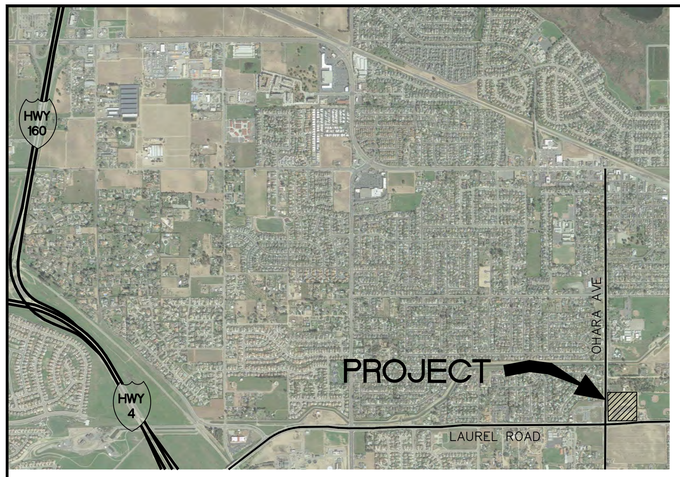
REGENCY CENTERS

OAKLEY SHOPS AT LAUREL FIELDS

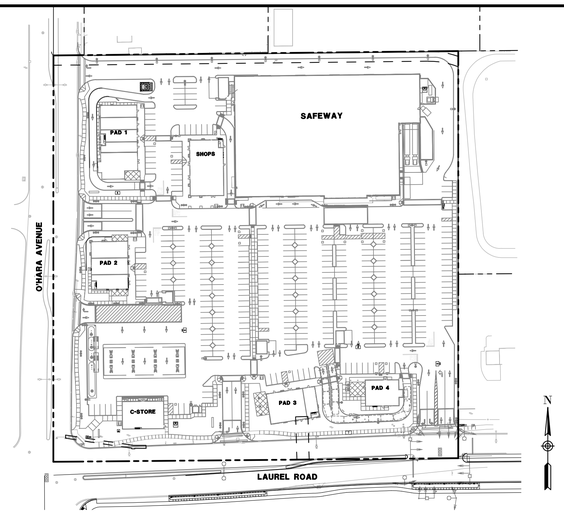
TENTATIVE MAP

998 LAUREL ROAD
OAKLEY, CALIFORNIA

SUBMITTAL #1



VICINITY MAP
NTS



SITE MAP
1" = 100'

LEGEND

EXISTING	NEW	
□	■	CATCH BASIN/DRAINAGE INLET
WM ■	WM ■	WATER METER
GM ■	GM ■	GAS METER
○	●	SANITARY SEWER CLEANOUT
		FIRE HYDRANT
○ SM	● SM	SANITARY SEWER/STORM DRAIN MANHOLE
WV	WV	WATER VALVE
GV	GV	GAS VALVE
6"W	6"W	WATER LINE
6"FS	6"FS	FIRE SERVICE LINE
2"G	2"G	GAS LINE
XXLF X"SS S = X	XXLF X"SS S = X	SANITARY SEWER LINE
XXLF X"SD S = X	XXLF X"SD S = X	STORM DRAIN LINE
ELEC	ELEC	ELECTRICAL LINE
TEL	TEL	TELEPHONE LINE
JT	JT	JOINT TRENCH
51	51	CONTOUR
x XX.XX	x XX.XX	ELEVATION
x	x	BARBED WIRE FENCE
o	o	CHAIN-LINKED FENCE
□	□	WOOD FENCE
		WALL
		CURB
		CURB AND GUTTER
		CONTROLLER CABINET
		GUY POLE
		HANDICAP SPACE
		POWER POLE
		IRON PIPE
		RAILROAD SPIKE
		STANDARD CITY MONUMENT
		STREET SIGN
		STREET LIGHT
12"	12"	TREE WITH SIZE
		TRANSFORMER
3.0%	3.0%	SLOPE
		DIRECTION OF DRAINAGE
		TREE TO BE REMOVED, SEE LANDSCAPE PLANS
GB	GB	GRADE BREAK
R	R	RIDGE LINE
x	x	SWALE
		SAWCUT LINE

ABBREVIATIONS

AB	AGGREGATE BASE	L	LENGTH
AC	ASPHALT CONCRETE	LF	LINEAR FOOT
AD	AREA DRAIN	LG	LIP OF GUTTER
		LP	LIGHT POLE
BC	BEGIN CURVE	LT	LEFT
BCR	BEGIN CURB RETURN		
BFP	BACKFLOW PREVENTER	MAX	MAXIMUM
BLDG	BUILDING	MH	MANHOLE
BM	BENCH MARK	MIN	MINIMUM
BVC	BEGIN VERTICAL CURVE	MW	MONITORING WELL
BWK	BACK OF WALK		
		(N)	NEW
C&G	CURB & GUTTER	NTS	NOT TO SCALE
CB	CATCH BASIN		
CL	CENTERLINE	OC	ON CENTER
CO	CLEANOUT	OHE	OVERHEAD ELECTRIC
CONC	CONCRETE	OHT	OVERHEAD TELEPHONE
D	DELTA	PAE	PUBLIC ACCESS EASEMENT
DDCV	DOUBLE DETECTOR CHECK VALVE	PB	PULL BOX
DET	DETAIL	PCC	PORTLAND CEMENT CONCRETE
ø	NOMINAL DIAMETER	PG&E	PACIFIC GAS & ELECTRIC
DIA	DIAMETER	PIV	POST INDICATOR VALVE
DIP	DUCTILE IRON PIPE	PP	POWER POLE
DWY	DRIVEWAY	PRC	POINT OF REVERSE CURVE
		PUE	PUBLIC UTILITY EASEMENT
(E)	EXISTING	PVC	POLYVINYL CHLORIDE PIPE
E	ELECTRICAL LINE		
EB	ELECTRIC BOX	R	RADIUS
EC	END CURVE	R/W	RIGHT-OF-WAY
ECR	END CURB REURN	RCP	REINFORCED CONCRETE PIPE
EG	EXISTING GRADE	REINF	REINFORCED
ELEC	ELECTRICAL	RT	RIGHT
EP	EDGE OF PAVEMENT		
ESMT	EASEMENT	SD	STORM DRAIN
ETW	EDGE OF TRAVEL WAY	SDMH	STORM DRAIN MANHOLE
EVC	END VERTICAL CURVE	SF	SQUARE FOOT
EX	EXISTING	SS	SANITARY SEWER
		SSCO	SANITARY SEWER CLEANOUT
FDC	FIRE DEPARTMENT CONNECTION	SSF	SOUTH SAN FRANCISCO
FF	FINISHED FLOOR	SSMH	SANITARY SEWER MANHOLE
FG	FINISHED GRADE	STA	STATION
FH	FIRE HYDRANT	SWK	SIDEWALK
FL	FLOWLINE		
FS	FINISHED SURFACE	T	TELEPHONE LINE
FT	FEET	TC	TOP OF CURB
		TEL	TELEPHONE
G	GAS	TEMP	TEMPORARY
GB	GRADE BREAK	TP	TELEPHONE POLE
GM	GAS METER	TS	TRAFFIC SIGNAL
GR	GRATE	TSB	TRAFFIC SIGNAL BOX
HCR	HANDICAP RAMP	TYP	TYPICAL
HDPE	HIGH DENSITY POLYETHYLENE		
		VCP	VITRIFIED CLAY PIPE
INV	INVERT	VG	VALLEY GUTTER
IRR	IRRIGATION		
		W	WATER
JB	JUNCTION BOX	WL	WATERLINE
JP	JOINT POLE	WM	WATER METER
JT	JOINT TRENCH	WV	WATER VALVE

SUBDIVIDER'S STATEMENT

OWNER:	SAFEWAY INC.
DEVELOPER:	REGENCY CENTERS
ENGINEER:	SAGE CONSULTING ENGINEERS INC. 12 GEARY STREET, SUITE 605 SAN FRANCISCO, CA 94108
AREA:	8.77 ACRES
ASSESSOR'S PARCEL NO:	035-220-028
EXISTING/PROPOSED ZONING:	RETAIL BUSINESS / RETAIL BUSINESS
EXISTING USE:	VACANT
PROPOSED USE:	NEIGHBORHOOD RETAIL
UTILITY PROVIDER:	
WATER SUPPLY:	DIABLO WATER DISTRICT
FIRE PROTECTION:	CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT
SANITARY:	IRONHOUSE SANITAR
STORM DRAIN:	CITY OF OAKLEY
GAS:	PACIFIC GAS & ELECTRIC
ELECTRIC:	PACIFIC GAS & ELECTRIC
TELEPHONE:	AT&T
CABLE TELEVISION:	COMCAST

CIVIL SHEET INDEX

SHEET	TITLE
TM0.1	TITLE SHEET
TM1.1	TOPOGRAPHIC SURVEY
TM2.1	PARCEL LAYOUT
TM3.1	GRADING PLAN
TM3.2	SITE SECTIONS
TM3.3	SITE SECTIONS
TM4.1	UTILITY PLAN

PROJECT CONTACTS

DEVELOPER
REGENCY CENTERS
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WALNUT CREEK, CA 94596
ATTN: CRAIG RAMEY

CIVIL ENGINEER
SAGE CONSULTING ENGINEERS INC.
12 GEARY STREET, SUITE 407
SAN FRANCISCO, CA 94108
ATTN: KIRSTEN HANSON
(415) 890-5250 X02

RETAIL ARCHITECT
JOHNSON LYMAN ARCHITECTS
1375 LOCUST ST., #202
WALNUT CREEK, CA 94596
ATTN: ROBERT LYMAN
(925) 930-9690

JOINT TRENCH
TARRAR UTILITY CONSULTANTS
813 FIRST STREET
BRENTWOOD, CA 94513
ATTN: KARA PEDERSON
(925) 240-2595

OFFSITE CIVIL ENGINEER
BKF
2100 FRANKLIN ST, SUITE 4C
OAKLAND, CA 94612
ATTN: KEVIN WONG
(510) 899-7308

GEOTECHNICAL ENGINEER
PROFESSIONAL SERVICE INDUSTRIES, INC.
16170 VINEYARD BLVD, SUITE 170
MORGAN HILL, CA 96037
ATTN: RAMSEY ZEIDAN
(408) 669-5500

CITY OF OAKLEY
PUBLIC WORKS AND ENGINEERING DEPARTMENT
3231 MAIN STREET
OAKLEY, CA 94561
ATTN: BILLILEE SAENGCHALERN
(925) 625-7000

FIRE DEPARTMENT
4005 PORT CHICAGO HIGHWAY
STE 250
CONCORD, CA 94520
(925) 941-3300

SEWER
IRONHOUSE SANITARY DISTRICT
450 WALNUT MEADOWS DRIVE
OAKLEY, CA 94561
ATTN: LOUIS SOLANA
(925) 809-3005

GAS AND ELECTRIC
PG&E

WATER
DIABLO WATER DISTRICT
87 CAROL LANE
OAKLEY, CA 94561
ATTN: CHRISTINE BELLICI
(925) 625-0588

GENERAL NOTES

1. TENTATIVE MAPS: THIS TENTATIVE MAP IS BEING FILED IN ACCORDANCE WITH CHAPTER 3, ARTICLE 3, SECTION 66453 AND CHAPTER 4.5 OF THE SUBDIVISION MAP ACT.
2. BASIS OF BEARING: THE CENTERLINE OF O'HARA AVENUE, AS SHOWN ON THE PARCEL MAP 209-71, RECORDED IN BOOK BOOK 32 OF PARCEL MAPS, PAGE 50, TAKEN AS NORTH 00°18'00" EAST, WAS USED AS BASIS OF BEARINGS FOR THIS SURVEY.
3. BASIS OF ELEVATION DATUM: GPS SURVEY FOR LAUREL ROAD AND O'HARA AVENUE WIDENING, DATED MARCH 11, 2003, DAVID ENICE L.S. 4071, NAVD88 DATUM.
4. ONSITE BENCHMARK: TOP OF CURB, NORTH RETURN OF NORTHEASTERLY CORNER OF INTERSECTION OF LAUREL ROAD WITH O'HARA AVENUE, AS SHOWN ON PLANS FOR O'HARA AVENUE ROADWAY IMPROVEMENTS, CIP PROJECT #96.

   ELEVATION = 55.48 FEET, CITY DATUM.

ENGINEER'S STATEMENT

THIS TENTATIVE MAP HAS BEEN PREPARED BY ME OR UNDER MY DIRECTION IN ACCORDANCE WITH STANDARD ENGINEERING PRACTICE.

KIRSTEN HANSON, PE, QSP/D
PRINCIPAL
SAGE CONSULTING ENGINEERS

DATE

ISSUE	SUBMITTAL #1	NO.	DATE	BY	DESCRIPTION
DATE	1/31/2024	1			
SCALE	AS NOTED	2			
DESIGNED	DSR	3			
DRAWN	DPT	4			
CHECKED	KMH	5			
PROJ. MGR.	KMH	6			

OAKLEY SHOPS AT LAUREL FIELDS

Regency Centers.

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San Francisco, CA 94108
(415) 890-5250 - www.Sage-CE.com

TITLE SHEET
OAKLEY SHOPS AT LAUREL FIELDS
998 LAUREL ROAD
CONTRA COSTA COUNTY CALIFORNIA
OAKLEY

JOB NO.
J0155
DRAWING NO.
TM0.1
SHEET 1 OF 7

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Figure 2A: Tentative Map - Title Sheet

LEGEND

- NEW PARCEL LINE
- EXISTING PARCEL LINE, SUBJECT PARCEL
- EXISTING PARCEL LINE, ADJACENT PARCEL
- EXISTING R/W EASEMENT LINE
- EXISTING UTILITY EASEMENT
- NEW EASEMENT

SAFEWAY

SHOPS

PAD 1

PAD 2

PAD 3

PAD 4

C-STORE

PARCEL 1
7.72 AC
336,420 SF

PARCEL 2
1.05 AC
45,723 SF

MADELEVA, TATE
1350 O'HARA AVE
APN: 035-220-021

SAUTER, ROBERT & SHARON
451 O'HARA CT
APN: 035-220-034

CITY OF OAKLEY
APN: 035-220-026

THIPPEN, AARON
150 LAUREL RD
APN: 035-220-027

16' CITY OF OAKLEY FLOOD CONTROL EASEMENT INSTR. NO. 2008-156821 O.R.

(E) 42' R/W DEDICATION INSTR. NO. 2012-79938 O.R.

12'

SHOPPING CENTER PYLON SIGN

PUBLIC ACCESS EASEMENT ±5,770 SF

O'HARA AVENUE

S89° 40' 00.00"W 198.02'

N0° 18' 00.00"E 196.42'

N0° 20' 00.00"W 89.57'

S89°40'00.00"W 49.49'

N0°20'00.00"W 108.41'

2'

FUEL STATION MONUMENT SIGN

N44°27'43.00"W 12.73'

S87° 52' 02.00"W 240.93'

OFFER OF R/W DEDICATION INSTR. NO. 2012-79938 O.R.

(E) PACIFIC GAS AND ELECTRIC EASEMENT TO BE ABANDONED

PUBLIC ACCESS EASEMENT ±1,285 SF

20'(E) ANCHOR AND STUB POLE EASEMENT TO BE ABANDONED

FUTURE LAUREL ROAD IMPROVEMENTS BY OTHERS

LAUREL ROAD

OFFER OF R/W DEDICATION INSTR. NO. 2012-79938 O.R.

PARCEL AREAS:

EXISTING SITE AREA			
GROSS PARCEL AREA	437,644 SF	10.05	AC
(E) R/W DEDICATION	55,501 SF	1.27	AC
NET PARCEL AREA	**382,143 SF**	**8.77**	**AC**
PROPOSED AREAS			
PARCEL 1 SHOPPING CENTER	336,420 SF	7.72	AC
PARCEL 2 FUEL & C-STORE	45,723 SF	1.05	AC
TOTAL AREA	**382,143 SF**	**8.77**	**AC**
ACCESS & UTILITY EASEMENT	7,055 SF	0.16	AC

N

0 30' 60'

NO.	DATE	BY	DESCRIPTION
1			

ISSUE: SUBMITTAL #1
DATE: 1/31/2024
SCALE: 1" = 30'
DESIGNED: DSR
DRAWN: DFT
CHECKED: KMH
PROJ. MGR: KMH

OAKLEY SHOPS AT LAUREL FIELDS

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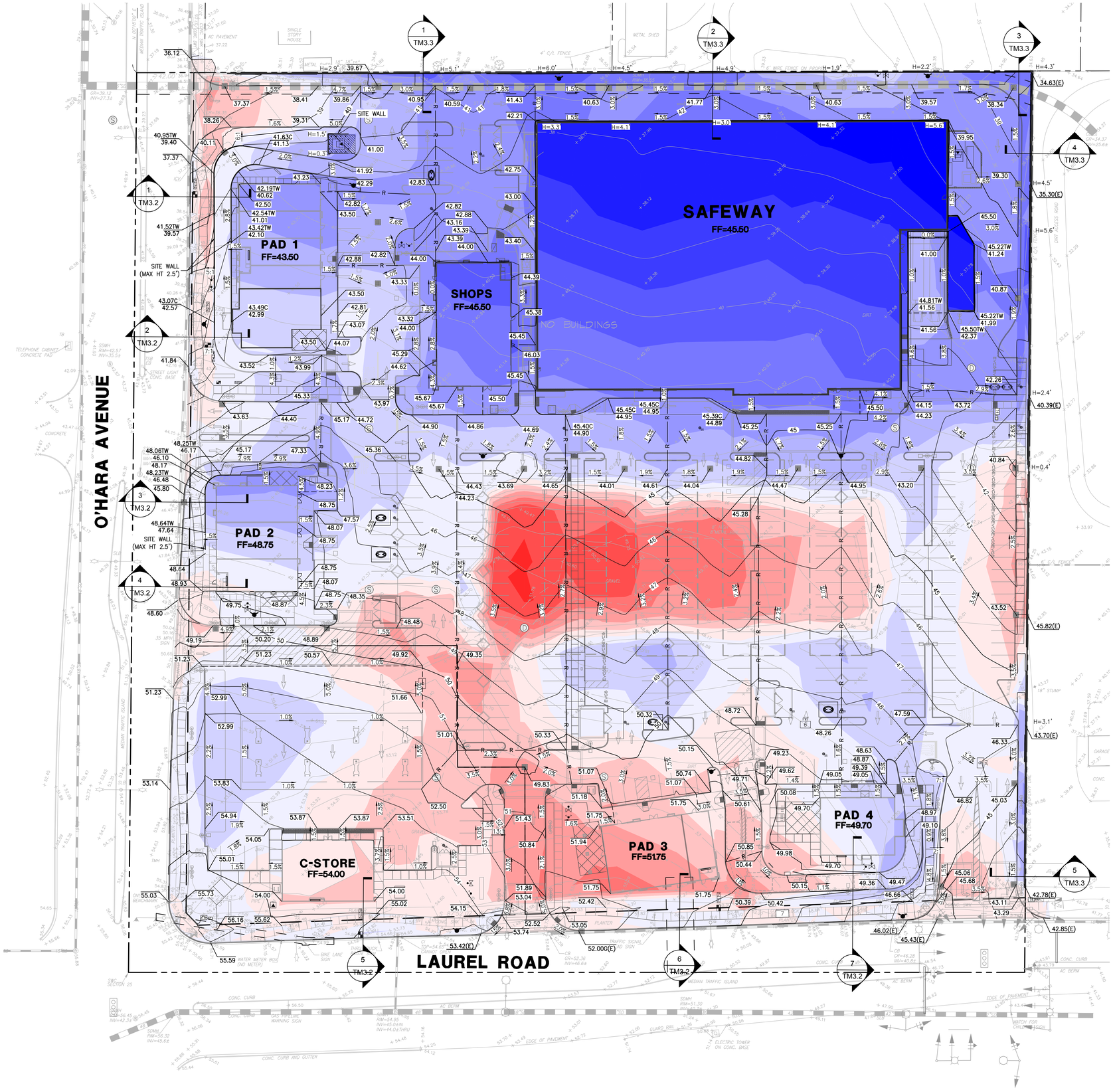
PARCEL LAYOUT

OAKLEY SHOPS AT LAUREL FIELDS
998 LAUREL ROAD
CONTRA COSTA COUNTY CALIFORNIA
OAKLEY

JOB NO. J0155
DRAWING NO. TM2.1
SHEET 3 OF 7

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Figure 2B: Parcel Layout



LEGEND

- GB — GRADE BREAK
- R — RIDGE LINE
- 51 — PROPOSED CONTOUR
- 51 — EXISTING CONTOUR
- 3.0% — SLOPE
- 2 / C6.2 — DETAIL NUMBER / SHEET NUMBER
- XX.XX — FINISHED GRADE ELEVATION
- XX.XXC — TOP OF CURB ELEVATION
- XX.XXG — GUTTER FLOW LINE ELEVATION
- XX.XXTW / XX.XXBW — TOP OF WALL ELEVATION / BOTTOM OF WALL ELEVATION
- XX.XXCO — CURB OPENING FLOW LINE ELEVATION
- PATH OF OVERLAND RELEASE

SHEET NOTES

1. CURB RAMPS SHALL HAVE MAXIMUM SLOPES OF 8.33% IN THE DIRECTION OF TRAVEL, AND MAXIMUM CROSS-SLOPES OF 2.0%. THE CONTRACTOR SHALL VERIFY THAT ALL NEW AND EXISTING CURB RAMPS MEET STATE AND FEDERAL REQUIREMENTS FOR ACCESSIBILITY.
2. ADA ACCESSIBLE ROUTES SHALL HAVE MAXIMUM SLOPES OF 5.0% IN THE DIRECTION OF TRAVEL, AND MAXIMUM CROSS-SLOPES OF 2.0%. WHERE NECESSARY TO CHANGE ELEVATION AT A SLOPE EXCEEDING 5.0%, PEDESTRIAN RAMPS SHALL BE PROVIDED IN COMPLIANCE WITH THE APPROPRIATE PROVISIONS OF STATE AND FEDERAL BUILDING CODES.
3. THE CONTRACTOR MAY GRIND EXISTING AC PAVEMENT AND REUSE AS BASE FOR NEW PAVEMENT, IF AUTHORIZED BY SOILS ENGINEER PRIOR TO CONSTRUCTION.
4. THE CONTRACTOR SHALL SAWCUT AND REMOVE EXISTING AC PAVEMENT, CURB AND GUTTER 12" (MIN.) FROM FACE OF NEW OR EXISTING CURB AND REPLACE WITH FULL DEPTH AC.
5. CONTRACTOR SHALL MATCH NEW CURBS, SIDEWALKS, AND PAVEMENT TO EXISTING AT LIMIT OF WORK.

CUT FILL LEGEND

Number	COLOR	MIN. CUT/FILL	MAX. CUT/FILL	VOL (CY)
1		-8.00	-6.00	0.00
2		-6.00	-5.00	0.94
3		-5.00	-4.00	109.72
4		-4.00	-3.00	358.24
5		-3.00	-2.00	791.66
6		-2.00	-1.00	1741.01
7		-1.00	0.00	3469.72
8		0.00	1.00	8716.03
9		1.00	2.00	6407.89
10		2.00	3.00	4926.09
11		3.00	4.00	3566.58
12		4.00	5.00	2308.10
13		5.00	6.00	1593.40
14		6.00	7.00	1061.51
15		7.00	8.00	444.22
16		8.00	9.00	40.76

Total Cut	(22,709) cy
Total Fill	29,000 cy
Total Import	6,291 cy

NOTES:

- EXISTING GRADE IS BASED ON TOPOGRAPHIC SURVEY PREPARED BY ZIEBATECH, RECEIVED ON 12/16/2016.

N

0 30' 60'

NO.	DESCRIPTION	DATE	BY
	ISSUE: SUBMITTAL #1		
	DATE: 1/31/2024		
	SCALE: 1" = 30'		
	DESIGNED: DSR		
	DRAWN: DFT		
	CHECKED: KMH		
	PROJ. MGR: KMH		

OAKLEY SHOPS AT LAUREL FIELDS

Regency Centers.

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San Francisco, CA 94108
(415) 890-3250 · www.Sage-CE.com

GRADING PLAN

OAKLEY SHOPS AT LAUREL FIELDS
998 LAUREL ROAD
CONTRA COSTA COUNTY CALIFORNIA
OAKLEY

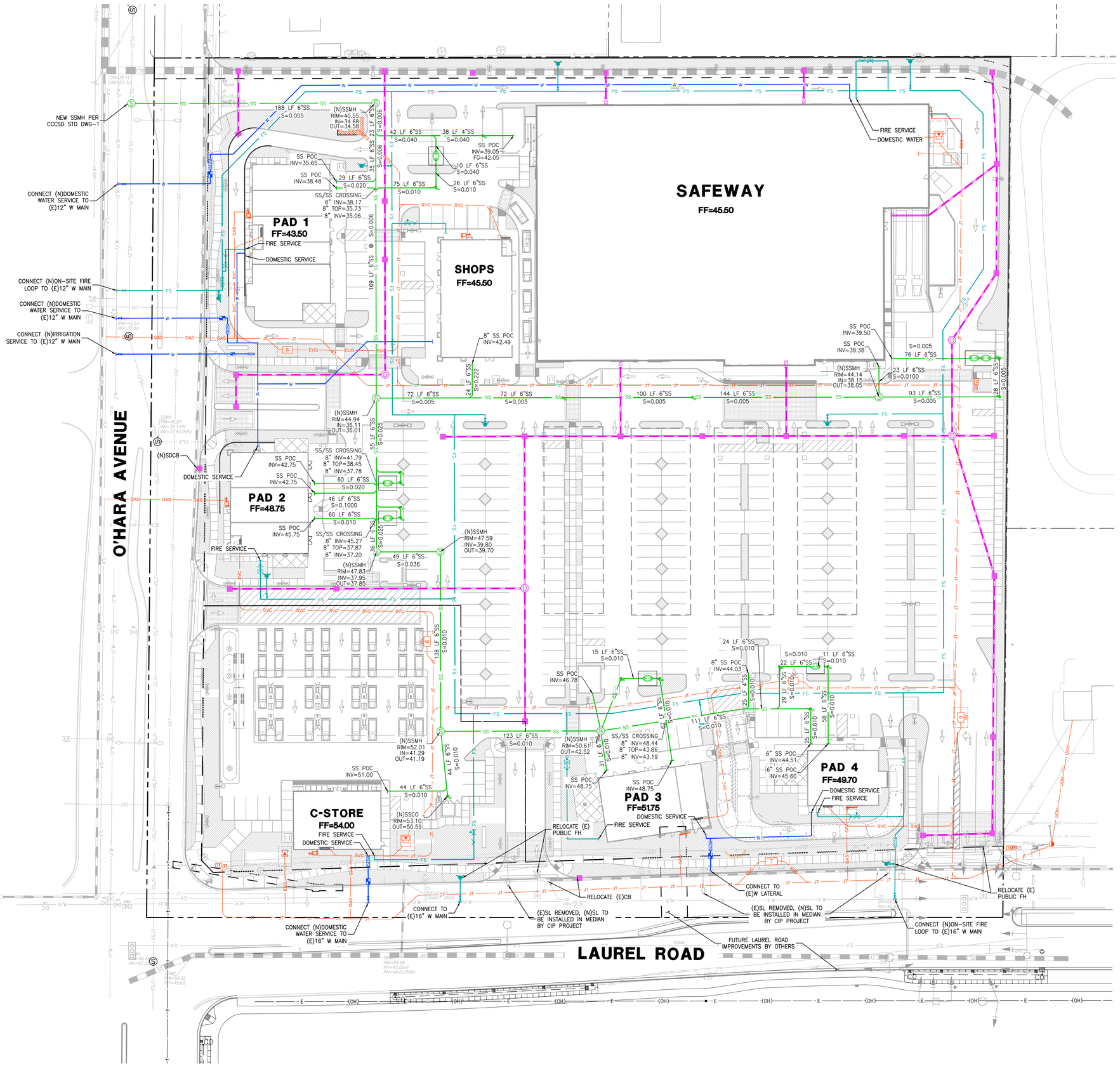
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DRAWING NO. TM3.1

SHEET 4 OF 7

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Figure 2C: Grading Plan



LEGEND

- SS — SANITARY SEWER LINE
- STORM DRAIN LINE
- W — WATER LINE
- FS — FIRE SERVICE LINE/LATERAL
- DDCV FOR FIRE SERVICE PER STD DWG DWD 9B
- FIRE HYDRANT PER STD DWG DWD 15
- POST INDICATOR VALVE
- FIRE DEPARTMENT CONNECTION
- DOMESTIC WATER/IRRIGATION METER PER STD DWG DWD 8
- BFP FOR DOMESTIC WATER/ IRRIGATION WATER SERVICE PER STD DWG DWD 10
- NEW SD MANHOLE
- NEW SD CATCH BASIN
- NEW SS MANHOLE
- NEW SS CLEANOUT

SHEET NOTES

1. INFORMATION PERTAINING TO EXISTING UNDERGROUND FACILITIES IS BASED ON RECORD INFORMATION AND IS SHOWN FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL FACILITIES PRIOR TO CONSTRUCTION OR EXCAVATION IN ANY AREA.
2. ADDITIONAL COSTS INCURRED AS A RESULT OF THE CONTRACTOR'S FAILURE TO VERIFY LOCATIONS OF EXISTING UTILITIES IN THE PROJECT VICINITY PRIOR TO BEGINNING CONSTRUCTION SHALL BE BORNE BY THE CONTRACTOR.
3. SANITARY SEWER LINES SHALL BE PVC SDR 26.
7. STORM DRAIN LINES SHALL BE PVC SDR 35 UNLESS NOTED OTHERWISE ON THE PLAN. NOTE THAT THE LINE DISCHARGING INTO THE BIO-RETENTION AREA IS CLASS V RCP.
8. WATER LINES 4" AND LARGER SHALL BE PVC PRESSURE PIPE, AWWA C900, CLASS 200, DR 18.
9. DOMESTIC SERVICE LINES 2" AND SMALLER SHALL BE PVC PRESSURE PIPE, SCHEDULE 40.

NO.	DESCRIPTION	BY	DATE

ISSUE: SUBMITTAL #1
DATE: 1/31/2024
SCALE: 1" = 30'
DESIGNED: DSR
DRAWN: DPT
CHECKED: KMH
PROJ. MGR: KMH

OAKLEY SHOPS AT LAUREL FIELDS

Regency Centers.

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UTILITY PLAN

OAKLEY SHOPS AT LAUREL FIELDS
998 LAUREL ROAD
CONTRA COSTA COUNTY CALIFORNIA

OAKLEY

N

0 30' 60'

JOB NO. J0155

DRAWING NO. TM4.1

SHEET 7 OF 7

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Figure 2D: Utility Plan

LEGEND

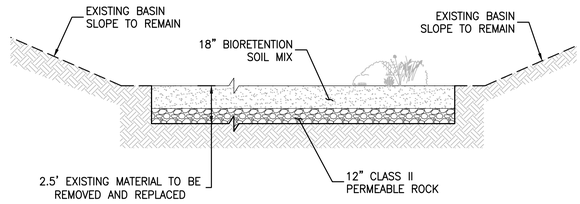
- STORMWATER CONTROL BOUNDARY
- BIORETENTION AREA BOUNDARY
- DIRECTION OF SURFACE FLOW
- DIRECTION OF PIPE FLOW
- IMPROVED BIORETENTION AREA SEE DETAIL 1, THIS SHEET
- CONVENTIONAL ROOF IMPERVIOUS
- EXISTING SIDEWALK TO REMAIN, IMPERVIOUS
- LANDSCAPING PERVIOUS
- LANDSCAPING SELF–TREATING
- LANDSCAPING SELF–RETAINING

IMP Name: IMP-1
IMP Type: Bioretention Area

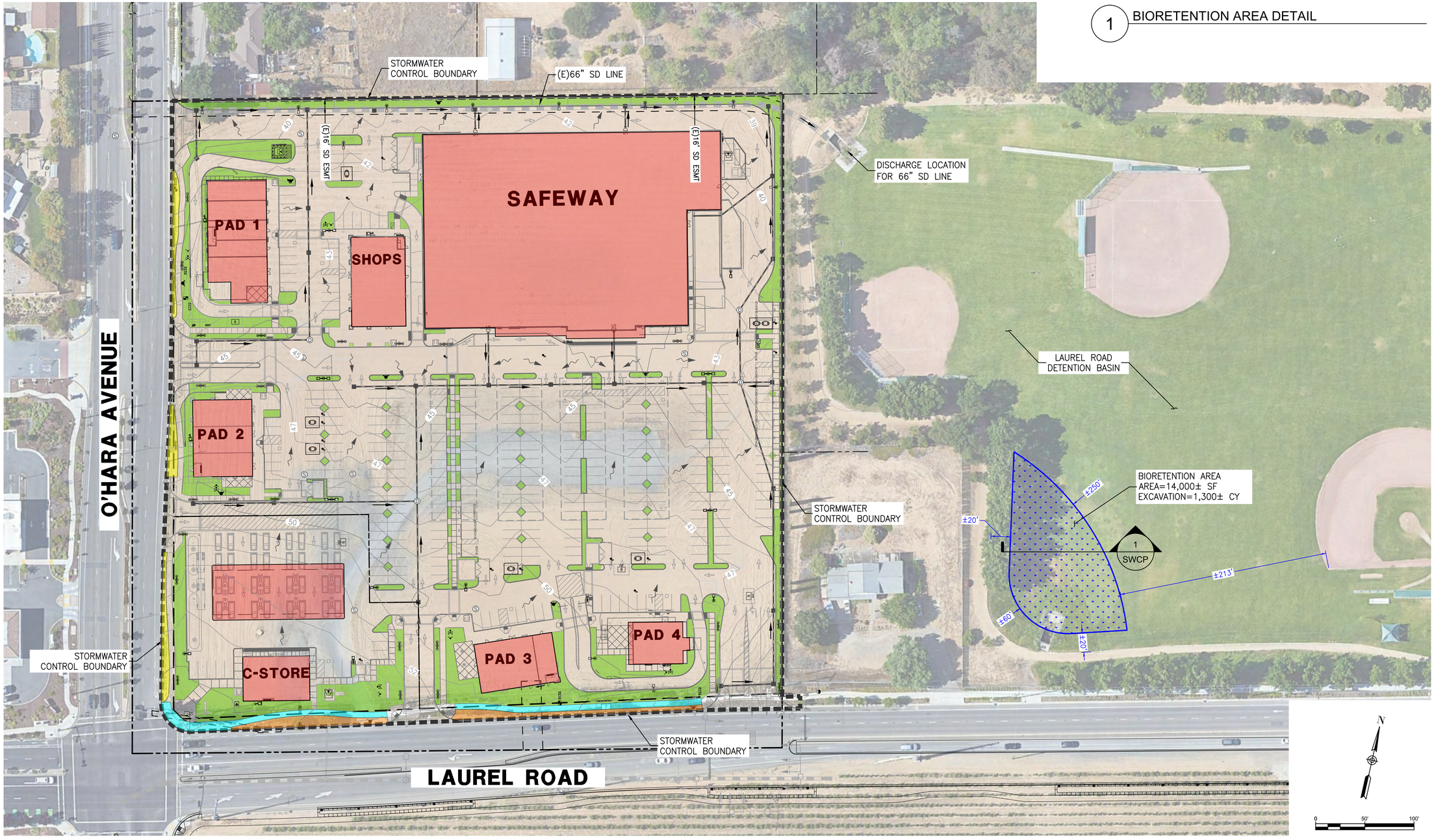
DMA Name	*Area (SF)*	*Surface Type*	*DMA Runoff Factor*	*DMA Area x Runoff Factor*
DMA-1R	91,000	Conventional Roof	1.00	91,000
DMA-1P	251,800	Asphalt/Concrete Pavement	1.00	251,800
DMA-1L	43,500	Landscaping	0.10	4,350
Total	**386,300**		**Total**	**347,150**

IMP Sizing

IMP Sizing Factor	*Rain Adjustment Factor*	*Minimum Area or Volume*	*Proposed Area or Volume*
0.04	1.00	13,886	14,000



1 BIORETENTION AREA DETAIL



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ISSUE: SUBMITTAL #1
DATE: 1/31/2024
SCALE: 1"= 100'
DESIGNED: KH
DRAWN: PA
CHECKED: KH
PROJ. MGR: KH
JOB NO.: J0155

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STORMWATER CONTROL EXHIBIT

OAKLEY SHOPS AT LAUREL FIELDS

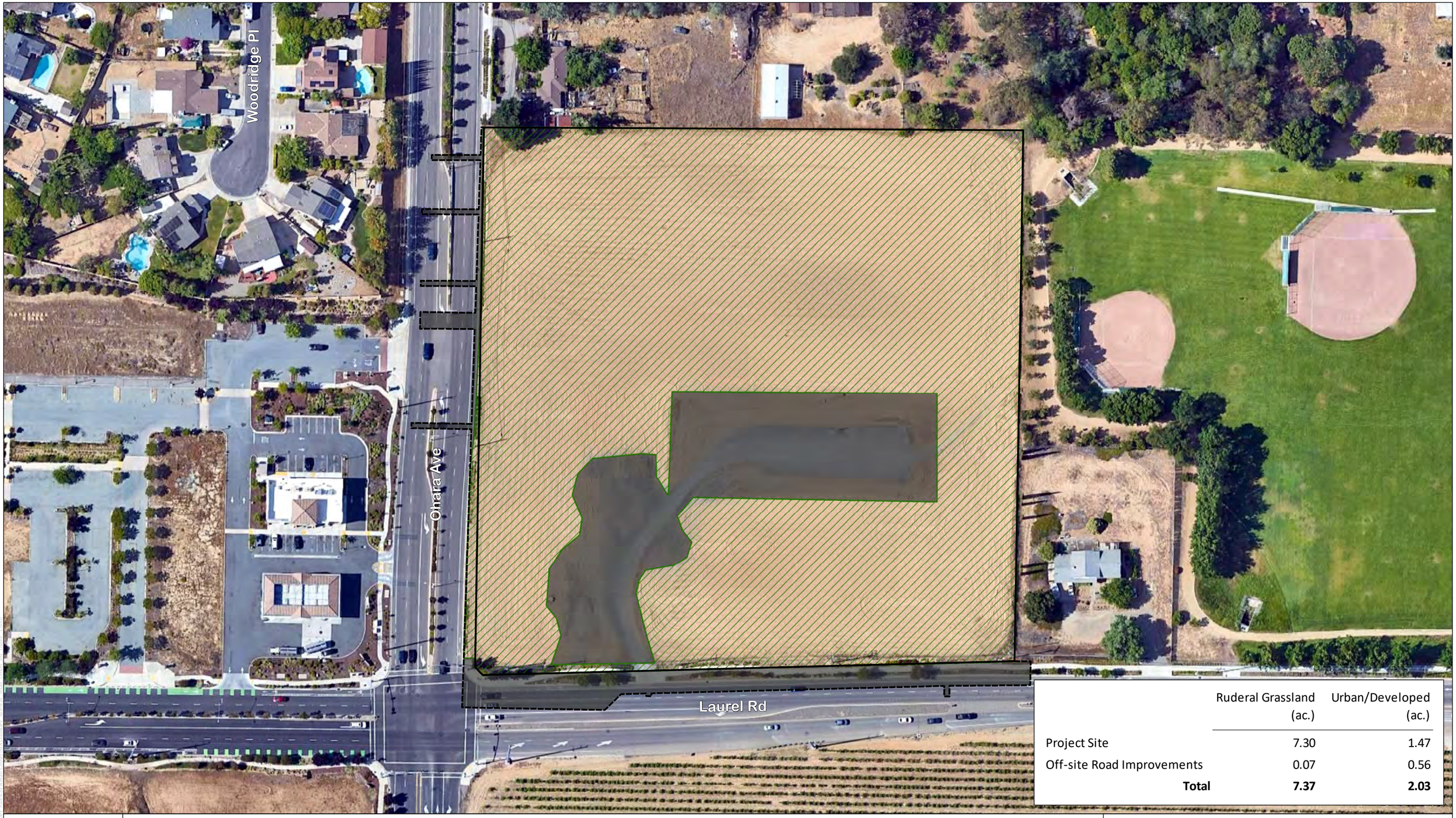
998 LAUREL ROAD
OAKLEY, CALIFORNIA

CONTRACT NO.
J0155

DRAWING NO.
SWCP

SHEET 1 OF 1

Figure 2E: Stormwater Control Exhibit



	Ruderal Grassland (ac.)	Urban/Developed (ac.)
Project Site	7.30	1.47
Off-site Road Improvements	0.07	0.56
Total	**7.37**	**2.03**

Figure 3

Project Site (8.77 acres)

Off-site Road Improvements (0.63 acre)

Ruderal Grassland

Urban/Developed

N W E S

0 50 100

Moore Biological Consultants

Map Date: 12/15/2023
Aerial Source: Google Earth (04/2022)

Field Verified Landcover Map

Oakley Safeway Retail Center

City of Oakley, Contra Costa County, CA

C:\EC_ENC\Projects\Moore Biological\Oakley Safeway Retail Center\MXD\oakley_safeway_retail_center_psr_figure_3.mxd



Body of the site, looking northwest from the central-east part of the site; 12/12/23.



Ruderal grassland in the south part of the site, looking west from the southeast part of the site; 12/12/23. Soils in the site are extremely sandy and support sparce amounts of ruderal grasslan vegetation.

FIGURE 4A

MOORE BIOLOGICAL **REPRESENTATIVE PHOTOGRAPHS**



Graveled pad in the central part of the site, looking west from the southeast part of the site; 12/12/23. This part of the site has been used for parking for the sports center to the east of the site.



Existing entrance in to the site, looking north from Laurel Avenue; 12/12/23. This gravel driveway leads to the parking area in the body of the site.

FIGURE 4B

MOORE BIOLOGICAL **REPRESENTATIVE PHOTOGRAPHS**



North edge of the site, looking west from the northeast corner of the site; 12/12/23.



West edge of the site, looking north; 12/12/23. There are a few bioswale areas along the west edge of the site that appear to treat road run-off.

FIGURE 4C

MOORE BIOLOGICAL **REPRESENTATIVE PHOTOGRAPHS**



South edge of the site, looking west from the southeast corner of the site; 12/12/23.



East edge of the site, looking north from the southeast corner of the site; 12/12/23.

FIGURE 4D

MOORE BIOLOGICAL **REPRESENTATIVE PHOTOGRAPHS**



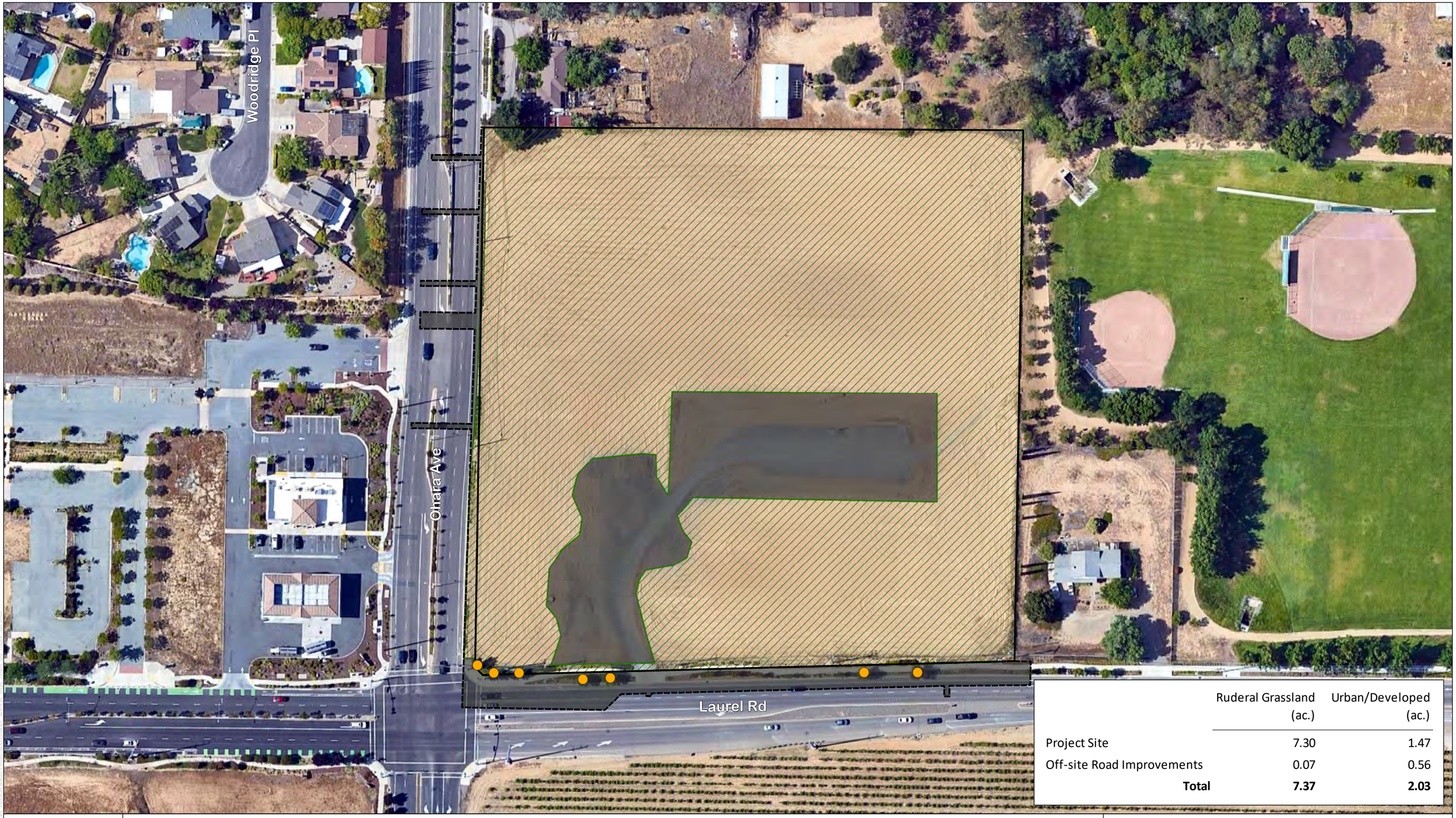
Northwest corner of the site, looking north along O'Hara Avenue; 12/12/23. The project will involve sidewalk improvements along O'Hara Avenue at this location.



Large off-site pine tree in close proximity to the site, looking east; 12/12/23. This tree overhangs the fence line.

FIGURE 4E

MOORE BIOLOGICAL **REPRESENTATIVE PHOTOGRAPHS**



	Ruderal Grassland (ac.)	Urban/Developed (ac.)
Project Site	7.30	1.47
Off-site Road Improvements	0.07	0.56
Total	**7.37**	**2.03**

Figure 5a

Project Site (8.77 acres)

Off-site Road Improvements (0.63 acre)

Ruderal Grassland; assumed habitat for burrowing owl

Urban/Developed

Trees; potential nest site for Swainson's hawk, golden eagle and white-tailed kite

N W E S

0 50 100

Moore Biological Consultants

Map Date: 12/15/2023
Aerial Source: Google Earth (04/2022)

Field Verified Landcover Map

Oakley Safeway Retail Center

City of Oakley, Contra Costa County, CA

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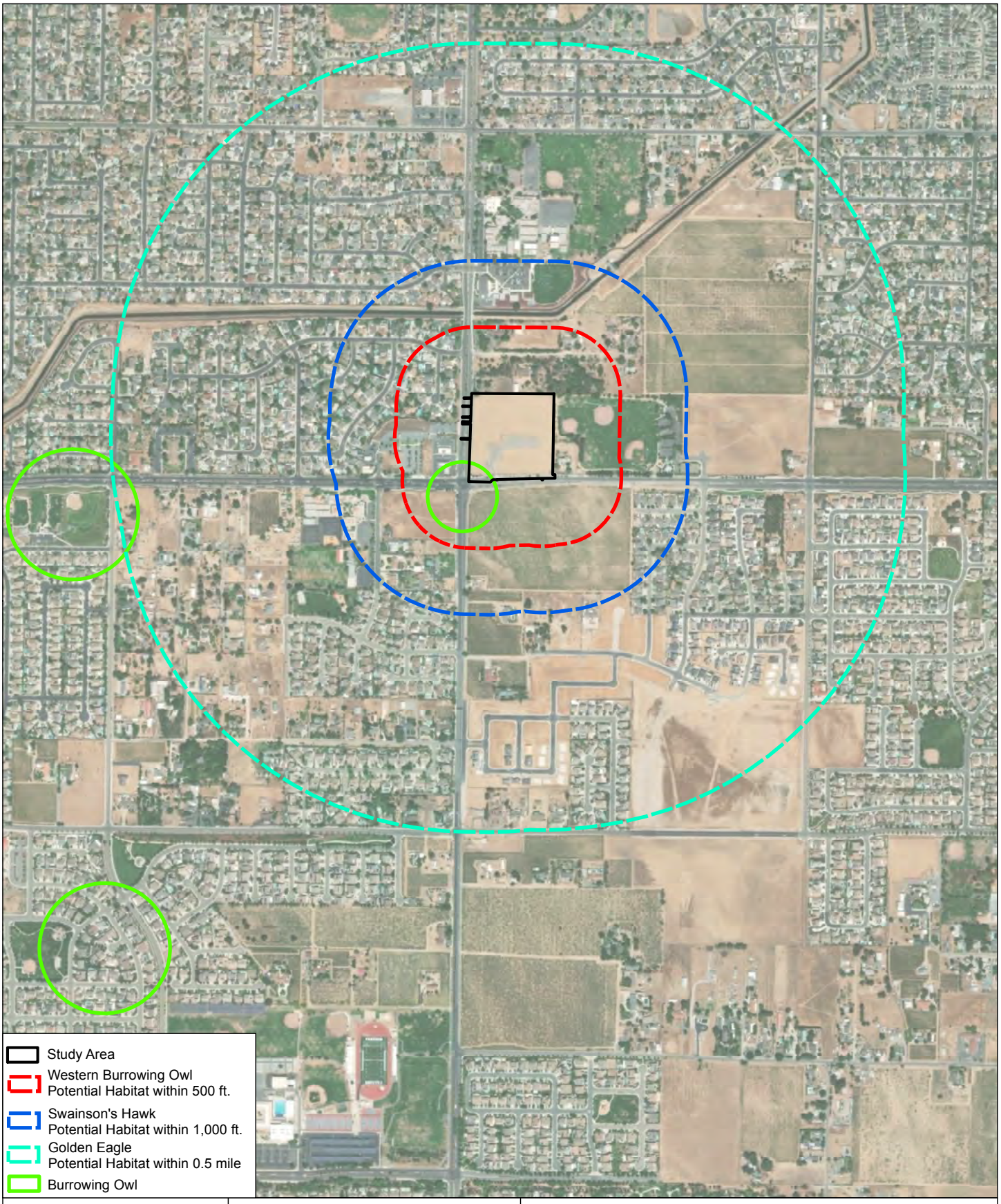


Figure 5b

0 500 1,000

N W E S

Moore Biological Consultants

Map Date: 12/15/2023
Aerial Photo: Maxar (07/2022)

Planning Survey Species Habitat Map

Oakley Safeway Retail Center

City of Oakley, Contra Costa County, CA

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ATTACHMENT C: PROJECT COMPLIANCE TO HCP CONDITIONS

9.4+/- Acre “Oakley Safeway Retail Center” Project

Project Compliance to HCP Conditions
January 2024

HCP/NCCP Conservation Measure 1.11. Avoid Direct Impacts on Extremely Rare Plants, Fully Protected Wildlife Species, or Covered Migratory Birds:

The potential for special-status plants to occur within the site is considered extremely remote, as described in Section III (10).

Species-specific pre-construction surveys, and if needed, monitoring and avoidance requirements for burrowing owl, Swainson’s hawk, and golden eagle will be conducted as described in Section IV (2). There is no suitable habitat in the site for ringtail (*Bassariscus astutus*), a “fully protected species,” per California Fish and Game Code Section 4700. Similarly, there is no suitable nesting habitat in the site for peregrine falcon (*Falco peregrinus*), a “fully protected species,” per California Fish and Game Code Section 3511.

White-tailed kite (*Elanus caeruleus*), another “fully protected species,” per California Fish and Game Code Section 3511 could potentially nest in trees in and near the site. Prior to any ground disturbance related to covered activities that occur during the nesting season (March 15-August 31), a qualified biologist will conduct a preconstruction survey no more than 1 month prior to construction to establish whether white-tailed kite is nesting in trees in or visible from the site or off-site water quality improvements area. In the event active nests are found, the applicant shall notify the Implementing Entity (i.e., City of Oakley) and consult with California Department of Fish and Wildlife (CDFW) for further guidance.

Tree, shrubs, and grasslands in or near the site could be used by other species of nesting birds protected by the Migratory Bird Treaty Act. If possible, vegetation removal will occur outside of the general bird nesting season (February 1 through August 31). Alternately, a qualified biologist will conduct a preconstruction survey no more than 2 weeks prior to vegetation removal. In the event active nests are found, the applicant shall notify the Implementing Entity and consult with CDFW for further guidance.

HCP/NCCP Conservation Measure 1.10. Maintain Hydrologic Conditions and Minimize Erosion:

The project has been designed to maintain hydrologic conditions and minimize erosion. Standard construction best management practices (BMPs) will be employed during construction to minimize the potential for erosion and off-site transport of fines. BMPs will include use of water trucks, appropriate compaction of soil, and installation of straw wattles, silt fences or other technologies along the perimeter of the site during construction, and stabilization of bare soils as appropriate with seeding, straw, and/or hydromulch.

ATTACHMENT D: FEE CALCULATOR

ECCC HCP/NCCP 2023 Fee Calculator Worksheet
Permanent Impacts

PROJECT APPLICANT: Regency Centers
PROJECT NAME: Oakley Safeway Retail Center
APN(s): 035-220-028
JURISDICTION: City of Oakley
DATE: Janaury 2024

DEVELOPMENT FEE		**PERMANENT IMPACTS (ACRES)**		**2023 FEE/ACRE** *subject to change* [1, 5]		
See appropriate ordinance or HCP/NCCP Figure 9-1 to determine Fee Zone	Fee Zone 1	7.37	x	$19,611.52	=	$144,536.90
	Fee Zone 2		x	$39,223.04	=	$0.00
	Fee Zone 3		x	$9,805.76	=	$0.00
	Fee Zone 4[2]		x	$29,417.28	=	$0.00
				Development Fee Total	=	**$144,536.90**

WETLAND MITIGATION FEE		**PERMANENT IMPACTS (ACRES)**		**2023 FEE/ACRE** *subject to change* [1, 5]		
Impacts to riparian/scrub, wetlands, ponds, aquatic, and slough/channel are charged both a wetland mitigation fee and a development fee. Include these impact acres to development fee above.[3]	Riparian woodland / scrub		x	$110,667.08	=	$0.00
	Perennial Wetland		x	$167,718.29	=	$0.00
	Seasonal Wetland		x	$392,489.03	=	$0.00
	Alkali Wetland		x	$396,778.59	=	$0.00
	Ponds		x	$215,976.51	=	$0.00
	Aquatic (open water)		x	$107,988.87	=	$0.00
	Slough / Channel		x	$154,206.78	=	$0.00
	STREAMS	**PERMANENT IMPACTS (LINEAR FEET)**		**2023 FEE/LINEAR FT** *subject to change* [1, 5]		
	Streams 25 feet wide or less		x	$569.07	=	$0.00
	Streams greater than 25 feet wide		x	$854.23	=	$0.00
				Wetland Mitigation Fee Total	=	**$0.00**

STREAM SETBACK ENCROACHMENT		**ENCROACHMENT IMPACTS (ACRES)**		**2023 FEE/ACRE** *subject to change* [1, 5]		
	Encroachment in Stream Setback		x	$55,333.54	=	$0.00
				Stream Setback Encroachment Total	=	**$0.00**

FINAL FEE CALCULATION			
	Development Fee Total		$144,536.90
	Wetland Mitigation Fee Total	+	$0.00
	Encroachment in Stream Setback Fee Total	+	$0.00
	Mitigation Fee Subtotal	=	**$144,536.90**
	Contribution to Recovery[4]	+	
	TOTAL AMOUNT TO BE PAID	=	**$144,536.90**

[1] Development fees are adjusted annually (no later than March 15 of each year) according to a formula that includes both a Home Price Index (HPI) and a Consumer Price Index (CPI). The Wetland Mitigation Fees are adjusted according to a CPI.

[2] Fee Zone 4 is not shown on Figure 9-1 of the HCP/NCCP but refers to the fee applicable to those few covered acitivities located in northeastern Antioch (p. 9-21).

[3] Per Chapter 9.3.1 of the HCP/NCCP, for every acre of impact on wetlands, streams, ponds, and riparian woodland/scrub, applicants will pay the appropriate development fee (according to fee zone) towards land acquisition and the conservation program as a whole, as well as a wetland mitigation fee to cover the costs of successful restoration or creation.

[4] Participating Special Entities (PSEs) are required to pay fees over and above permanent and temporary impact mitigation fees to cover indirect costs of extending permit coverage, including a portion of the costs of the initial preparation of the Plan, and a portion of the costs of conservation actions designed to contribute to species recovery. This amount will be determined in accordance with the Contribution to Recovery Implementation Policy adopted by the Conservancy Governing Board on December 8, 2014.

[5] The Conservancy conducted the periodic fee audit required by the HCP/NCCP in 2023. Action by the County and participating cities is pending, which could result in adjustments to some or all fees in 2023.

Appendix C
CNDDB Search Results

SciName	ComName	TaxonGrou	ElmCode	TotalOccs	FedList	CalList	GRank	SRank	RPlantRank	OthrStatus	Habitats	GenHab	MicroHab	ReturnOccs
Agelaius tri	tricolored b	Birds	ABPBXB00	960	None	Threatened	G1G2	S2		BLM_S-Sen	Freshwater	Highly colo	Requires o	11
Ambystom	California t	Amphibians	AAAAA011	1326	Threatened	Threatened	G2G3T3	S3		CDFW_WL-	Cismontan	Lives in vac	Need unde	214
Ammodran	grasshoppe	Birds	ABPBXA00	27	None	None	G5	S3		CDFW_SSC	Valley & foo	Dense gras	Favors nati	1
Anniella pu	Northern C	Reptiles	ARACC010	386	None	None	G3	S2S3		CDFW_SSC	Chaparral |	Sandy or lo	Soil moistu	7
Antrozous p	pallid bat	Mammals	AMACC100	420	None	None	G4	S3		BLM_S-Sen	Chaparral |	Deserts, gr	Roosts mus	1
Aquila chry	golden eagl	Birds	ABNKC220	332	None	None	G5	S3		BLM_S-Sen	Broadleave	Rolling foot	Cliff-walle	15
Archoplites	Sacrament	Fish	AFCQB070	5	None	None	G1	S1		AFS_TH-Thr	Aquatic | S	Historically	Prefers war	1
Arizona ele	California g	Reptiles	ARADB010	260	None	None	G5T2	S2		CDFW_SSC	-Species of	Patchily dis	Generalist	1
Athene cun	burrowing c	Birds	ABNSB100	2057	None	None	G4	S2		BLM_S-Sen	Coastal pra	Open, dry a	Subterrane	131
Buteo regal	ferruginous	Birds	ABNKC191	107	None	None	G4	S3S4		CDFW_WL-	Great Basin	Open grass	Eats mostly	2
Charadrius	western sn	Birds	ABNNB030	140	Threatened	None	G3T3	S3		CDFW_SSC	Great Basin	Sandy beac	Needs sand	1
Circus hud	northern ha	Birds	ABNKC110	82	None	None	G5	S3		CDFW_SSC	Coastal scr	Coastal sal	Nests on gr	7
Elanus leuc	white-taile	Birds	ABNKC060	190	None	None	G5	S3S4		BLM_S-Sen	Cismontan	Rolling foot	Open grass	8
Emys marm	western po	Reptiles	ARAAD020	1559	Proposed T	None	G3G4	S3		BLM_S-Sen	Aquatic | A	A thoroughl	Needs bask	61
Eremophila	California h	Birds	ABPAT0201	94	None	None	G5T4Q	S4		CDFW_WL-	Marine inte	Coastal reg	Short-grass	5
Falco mexi	prairie falc	Birds	ABNKD060	451	None	None	G5	S4		CDFW_WL-	Great Basin	Inhabits dry	Breeding si	5
Geothlypis	saltmarsh c	Birds	ABPBX120	114	None	None	G5T3	S3		CDFW_SSC	Marsh & sw	Resident of	Requires th	4
Lanius ludc	loggerhead	Birds	ABPBR010	110	None	None	G4	S4		CDFW_SSC	Broadleave	Broken woo	Prefers ope	2
Lasiurus fra	western red	Mammals	AMACC050	128	None	None	G4	S3		CDFW_SSC	Cismontan	Roosts prin	Prefers hab	2
Laterallus j	California b	Birds	ABNME030	304	None	Threatened	G3T1	S2		BLM_S-Sen	Brackish m	Inhabits fre	Needs wate	22
Masticophi	San Joaquir	Reptiles	ARADB210	96	None	None	G5T2T3	S3		CDFW_SSC	Chenopod	Open, dry h	Needs man	1
Melospiza r	Suisun son	Birds	ABPBXA30	36	None	None	G5T3	S2		CDFW_SSC	Marsh & sw	Resident of	Inhabits ca	6
Melospiza r	song sparro	Birds	ABPBXA30	92	None	None	G5T3?Q	S3?		CDFW_SSC	Artificial flo	Central low	Freshwater	31
Nannopter	double-cre	Birds	ABNFD010	39	None	None	G5	S4		CDFW_WL-	Riparian for	Colonial ne	Nests along	1
Neotoma fu	San Francis	Mammals	AMAFF080	42	None	None	G5T2T3	S2S3		CDFW_SSC	Chaparral |	Forest habi	Constructs	1
Phrynosom	coast horne	Reptiles	ARACF121	841	None	None	G4	S4		BLM_S-Sen	Chaparral |	Frequents a	Open areas	1
Rana drayt	California r	Amphibians	AAABH010	1764	Threatened	None	G2G3	S2S3		CDFW_SSC	Aquatic | A	Lowlands a	Requires 1	184
Reithrodon	salt-marsh	Mammals	AMAFF020	151	Endangere	Endangere	G1G2	S3		CDFW_FP-I	Marsh & sw	Only in the	Pickleweed	7
Sternula an	California l	Birds	ABNNM081	76	Endangere	Endangere	G4T2T3Q	S2		CDFW_FP-I	Alkali playa	Nests alon	Colonial br	2
Taxidea tax	American b	Mammals	AMAJF0401	647	None	None	G5	S3		CDFW_SSC	Alkali mars	Most abun	Needs suffi	11

SciName	ComName	TaxonGrou	ElmCode	TotalOccs	FedList	CalList	GRank	SRank	RPlantRank	OthrStatus	Habitats	GenHab	MicroHab	ReturnOccs
Amsinckia	large-flowe	Dicots	PDBOR010	9	Endangere	Endangere	G1	S1	1B.1	SB_UCBG-l	Cismontan	Cismontan	Annual gras	4
Arctostaph	Mt. Diablo r	Dicots	PDERI0404	17	None	None	G2	S2	1B.3	SB_UCSC-l	Chaparral	Chaparral,	In canyons	10
Arctostaph	Contra Cos	Dicots	PDERI0427	10	None	None	G5T2	S2	1B.2	SB_UCSC-l	Chaparral	Chaparral.	Rocky slop	2
Astragalus	alkali milk-	Dicots	PDFAB0F8	65	None	None	G2T1	S1	1B.2	SB_UCSC-l	Alkali playa	Alkali playa	Low ground	4
Atriplex cor	heartscale	Dicots	PDCHE040	66	None	None	G3T2	S2	1B.2	BLM_S-Sen	Chenopod	Chenopod	Alkaline fla	2
Atriplex dep	brittlescale	Dicots	PDCHE042	60	None	None	G2	S2	1B.2		Alkali playa	Chenopod	Usually in a	11
Atriplex mir	lesser salts	Dicots	PDCHE042	52	None	None	G2	S2	1B.1	SB_CalBG/	Alkali playa	Chenopod	In alkali sin	1
Blepharizor	big tarplant	Dicots	PDAST1C0	53	None	None	G1G2	S1S2	1B.1	SB_CalBG/	Valley & foo	Valley and	Dry hills an	24
Brasenia sc	watershield	Dicots	PDCAB010	43	None	None	G5	S3	2B.3	IUCN_LC-L	Marsh & sw	Freshwater	Aquatic kn	1
Calochortu	Mt. Diablo f	Monocots	PMLIL0D16	52	None	None	G2	S2	1B.2	SB_CalBG/	Chaparral	Chaparral,	On wooded	16
Carex com	bristly sedg	Monocots	PMCYP032	31	None	None	G5	S2	2B.1	IUCN_LC-L	Coastal pra	Marshes an	Lake margi	1
Centromad	Congdon's	Dicots	PDAST4R0F	96	None	None	G3T2	S2	1B.1	BLM_S-Sen	Valley & foo	Valley and	Alkaline soi	10
Chloropyro	soft salty bi	Dicots	PDSCR0J0I	27	Endangere	Rare	G2T1	S1	1B.2	SB_CalBG/	Marsh & sw	Coastal sal	In coastal s	1
Cicuta mac	Bolander's	Dicots	PDAPI0M0	17	None	None	G5T4T5	S2?	2B.1	SB_CalBG/	Marsh & sw	Marshes an	In fresh or b	3
Cryptantha	Hoover's cr	Dicots	PDBOR0A1	4	None	None	GH	SH	1A		Interior dun	Valley and	In coarse sa	1
Delphinium	recurved la	Dicots	PDRAN0B1	119	None	None	G2?	S2?	1B.2	BLM_S-Sen	Chenopod	Chenopod	On alkaline	4
Downingia	dwarf dowr	Dicots	PDCAM060	132	None	None	GU	S2	2B.2		Valley & foo	Valley and	Vernal lake	2
Eriogonum	Antioch Du	Dicots	PDPGN084	1	None	None	G5T1	S1	1B.1		Interior dun	Interior dur	Grows on th	1
Eriogonum	Mt. Diablo b	Dicots	PDPGN085	7	None	None	G1	S1	1B.1	SB_UCBG-l	Chaparral	Chaparral,	Dry, expose	3
Eryngium je	Jepson's co	Dicots	PDAPI0Z13	19	None	None	G2	S2	1B.2	SB_CalBG/	Valley & foo	Vernal pool	Clay. 3-305	1
Eryngium ra	Delta butto	Dicots	PDAPI0Z0S	26	None	Endangere	G1	S1	1B.1		Riparian sc	Riparian sc	Seasonally	1
Eryngium s	spiny-sepal	Dicots	PDAPI0Z0Y	108	None	None	G2	S2	1B.2	BLM_S-Sen	Valley & foo	Vernal pool	Some sites	1
Erysimum c	Contra Cos	Dicots	PDBRA160	4	Endangere	Endangere	G5T1	S1	1B.1	SB_CalBG/	Interior dun	Inland dune	Stabilized d	4
Eschscholz	diamond-p	Dicots	PDPAP0A0	12	None	None	G1	S1	1B.1	SB_CalBG/	Valley & foo	Valley and	Alkaline, cl	3
Extriplex jo	San Joaquir	Dicots	PDCHE041	127	None	None	G2	S2	1B.2	BLM_S-Sen	Alkali playa	Chenopod	In seasonal	47
Fritillaria lil	fragrant frit	Monocots	PMLIL0V0C	82	None	None	G2	S2	1B.2	SB_CalBG/	Cismontan	Coastal scr	Often on se	1
Helianthell	Diablo helia	Dicots	PDAST4M0	107	None	None	G2	S2	1B.2	SB_CalBG/	Broadleave	Broadleafe	Usually in c	19
Hesperolin	Brewer's we	Dicots	PDLIN0103	29	None	None	G2	S2	1B.2		Chaparral	Chaparral,	Often in roc	12
Hibiscus la	woolly rose	Dicots	PDMAL0H0	173	None	None	G5T3	S3	1B.2	SB_CalBG/	Freshwater	Marshes an	Moist, fresh	60
Lasthenia c	Contra Cos	Dicots	PDAST5L04	36	Endangere	None	G1	S1	1B.1	SB_UCBG-l	Alkali playa	Valley and	Vernal pool	1
Lathyrus je	Delta tule p	Dicots	PDFAB250I	133	None	None	G5T2	S2	1B.2	SB_BerrySE	Freshwater	Marshes an	In freshwat	38
Lilaeopsis r	Mason's lila	Dicots	PDAPI1903	197	None	Rare	G2	S2	1B.1		Freshwater	Marshes an	Tidal zones	119
Limosella a	Delta mudv	Dicots	PDSCR100	59	None	None	G4G5	S2	2B.1		Brackish m	Riparian sc	Usually on	45
Madia radia	showy gold	Dicots	PDAST650E	100	None	None	G3	S3	1B.1	BLM_S-Sen	Cismontan	Valley and	Mostly on a	2
Malacothar	Hall's bush	Dicots	PDMAL0Q0	44	None	None	G2	S2	1B.2	BLM_S-Sen	Chaparral	Chaparral,	Some popu	1
Monolopia	woodland v	Dicots	PDAST6G0	94	None	None	G3	S3	1B.2	SB_CalBG/	Broadleave	Chaparral,	Grassy site	1
Navarretia r	shining nav	Dicots	PDPLM0C0	102	None	None	G4T2	S2	1B.2	BLM_S-Sen	Cismontan	Cismontan	Apparently	4
Oenothera	Antioch Du	Dicots	PDONA0C0	10	Endangere	Endangere	G5T1	S1	1B.1	SB_CalBG/	Interior dun	Interior dur	Remnant ri	9
Plagiobothr	bearded po	Dicots	PDBOR0V0	15	None	None	G2	S2	1B.1		Valley & foo	Vernal pool	Wet sites. 1	1
Potamoget	eel-grass p	Monocots	PMPOT031	20	None	None	G5	S3	2B.2		Marsh & sw	Marshes an	Ponds, lake	1
Puccinellia	California a	Monocots	PMPOA531	80	None	None	G2	S2	1B.2	BLM_S-Sen	Chenopod	Meadows a	Alkaline, ve	6
Scutellaria	marsh skul	Dicots	PDLAM1U0	38	None	None	G5	S2	2B.2		Lower mon	Marshes an	Swamps an	3
Scutellaria	side-flower	Dicots	PDLAM1U0	13	None	None	G5	S1S2	2B.2	IUCN_LC-L	Marsh & sw	Meadows a	Wet meado	1
Senecio ap	chaparral ra	Dicots	PDAST8H0	98	None	None	G3	S2	2B.2	SB_CalBG/	Chaparral	Chaparral,	Drying alka	2
Sidalcea ke	Keck's chec	Dicots	PDMAL110	50	Endangere	None	G2	S2	1B.1	SB_CalBG/	Cismontan	Cismontan	Grassy slop	1
Spergularia	long-styled	Dicots	PDCAR0W0	22	None	None	G5T2	S2	1B.2		Marsh & sw	Marshes an	Alkaline. 0-	9
Symphyotri	Suisun Mar	Dicots	PDASTE847	175	None	None	G2	S2	1B.2	SB_CalBG/	Brackish m	Marshes an	Most often	73
Tropidocarp	caper-fruite	Dicots	PDBRA2R0	20	None	None	G1	S1	1B.1	SB_CalBG/	Valley & foo	Valley and	Alkaline cla	8
Viburnum e	oval-leaved	Dicots	PDCPR070	39	None	None	G4G5	S3	2B.3		Chaparral	Chaparral,	215-1400 n	2

SciName	ComName	TaxonGrou	ElmCode	TotalOccs	FedList	CalList	GRank	SRank	RPlantRank	OthrStatus	Habitats	GenHab	MicroHab	ReturnOccs
Acipenser r	green sturg	Fish	AFCAA010	14	Threatened	None	G2T1	S1		AFS_VU-Vu	Aquatic | E	Spawning s	Spawning d	2
Agelaius tri	tricolored b	Birds	ABPBXB00	960	None	Threatened	G1G2	S2		BLM_S-Sen	Freshwater	Highly colo	Requires op	11
Ambystoma	California t	Amphibians	AAAAA011	1326	Threatened	Threatened	G2G3T3	S3		CDFW_WL-	Cismontan	Lives in vac	Need under	214
Amsinckia j	large-flowe	Dicots	PDBOR010	9	Endangere	Endangere	G1	S1	1B.1	SB_UCBG-U	Cismontan	Cismontan	Annual gras	4
Apodemia r	Lange's me	Insects	IILEPH701	1	Endangere	None	G5T1	S1			Interior dun	Inhabits sta	Primary hos	1
Branchinec	Conservanc	Crustacear	ICBRA0301	57	Endangere	None	G2	S2		IUCN_EN-E	Valley & foc	Endemic to	Inhabit asta	1
Branchinec	longhorn fa	Crustacear	ICBRA0302	23	Endangere	None	G2	S2		IUCN_EN-E	Valley & foc	Endemic to	Inhabit sma	5
Branchinec	vernal pool	Crustacear	ICBRA0303	804	Threatened	None	G3	S3		IUCN_VU-V	Valley & foc	Endemic to	Inhabit sma	22
Buteo swai	Swainson's	Birds	ABNKC190	2576	None	Threatened	G5	S4		BLM_S-Sen	Great Basin	Breeds in g	Requires ac	71
Charadrius	western sn	Birds	ABNNB030	140	Threatened	None	G3T3	S3		CDFW_SSC	Great Basin	Sandy beac	Needs sand	1
Chloropyro	soft salty bi	Dicots	PDSCR0J0	27	Endangere	Rare	G2T1	S1	1B.2	SB_CalBG/	Marsh & sw	Coastal sal	In coastal s	1
Emys marn	western po	Reptiles	ARAAD020	1559	Proposed T	None	G3G4	S3		BLM_S-Sen	Aquatic | A	A thoroughl	Needs bask	61
Eryngium ra	Delta butto	Dicots	PDAPI0Z0S	26	None	Endangere	G1	S1	1B.1		Riparian sc	Riparian sc	Seasonally	1
Erysimum c	Contra Cos	Dicots	PDBRA160	4	Endangere	Endangere	G5T1	S1	1B.1	SB_CalBG/	Interior dun	Inland dune	Stabilized d	4
Hypomesus	Delta smelt	Fish	AFCHB010	29	Threatened	Endangere	G1	S1		AFS_TH-Thr	Aquatic | E	Sacrament	Seldom fou	12
Lasthenia c	Contra Cos	Dicots	PDAST5L04	36	Endangere	None	G1	S1	1B.1	SB_UCBG-U	Alkali playa	Valley and f	Vernal pool	1
Laterallus j	California b	Birds	ABNME030	304	None	Threatened	G3T1	S2		BLM_S-Sen	Brackish m	Inhabits fre	Needs wate	22
Lepidurus p	vernal pool	Crustacear	ICBRA1001	336	Endangere	None	G3	S3		IUCN_EN-E	Valley & foc	Inhabits ver	Pools comr	2
Lilaeopsis r	Mason's lila	Dicots	PDAPI1903	197	None	Rare	G2	S2	1B.1		Freshwater	Marshes an	Tidal zones	119
Masticophi	Alameda w	Reptiles	ARADB210	167	Threatened	Threatened	G4T2	S2			Chaparral |	Typically fo	Mostly sout	18
Oenothera	Antioch Du	Dicots	PDONA0C0	10	Endangere	Endangere	G5T1	S1	1B.1	SB_CalBG/	Interior dun	Interior dur	Remnant riv	9
Oncorhync	steelhead -	Fish	AFCHA020	31	Threatened	None	G5T2Q	S2		AFS_TH-Thr	Aquatic | S	Populations	in the Sacr	2
Rana boylii	foothill yell	Amphibians	AAABH010	181	Threatened	Endangere	G3T2	S2		BLM_S-Sen	Aquatic | R	San Francis	Partly shad	1
Rana drayt	California r	Amphibians	AAABH010	1764	Threatened	None	G2G3	S2S3		CDFW_SSC	Aquatic | A	Lowlands a	Requires 1	184
Reithrodon	salt-marsh	Mammals	AMAFF020	151	Endangere	Endangere	G1G2	S3		CDFW_FP-I	Marsh & sw	Only in the	Pickleweed	7
Riparia ripa	bank swallo	Birds	ABPAU080	299	None	Threatened	G5	S3		BLM_S-Sen	Riparian sc	Colonial ne	Requires ve	1
Sidalcea ke	Keck's chec	Dicots	PDMAL110	50	Endangere	None	G2	S2	1B.1	SB_CalBG/	Cismontan	Cismontan	Grassy slop	1
Spirinchus	longfin sme	Fish	AFCHB030	46	Proposed E	Threatened	G5	S1		IUCN_LC-L	Aquatic | E	Euryhaline,	Prefer salin	9
Sternula an	California le	Birds	ABNNM081	76	Endangere	Endangere	G4T2T3Q	S2		CDFW_FP-I	Alkali playa	Nests alon	Colonial br	2
Thaleichthy	eulachon	Fish	AFCHB040	10	Threatened	None	G5	S1		IUCN_LC-L	Aquatic | K	Found in Kl	Spawn in lo	1
Thamnophi	giant garter	Reptiles	ARADB361	381	Threatened	Threatened	G2	S2		IUCN_VU-V	Marsh & sw	Prefers fres	This is the r	12
Vulpes mac	San Joaquir	Mammals	AMAJA030	1020	Endangere	Threatened	G4T2	S3			Chenopod s	Annual gras	Need loose	32

Appendix D
Geotechnical Engineering Report

GEOTECHNICAL ENGINEERING REPORT

Proposed Oakley Shops at Laurel Fields
998 Laurel Road
APN: 035-220-028
Oakley, California 94561
PSI Project No. 0587814

PREPARED FOR:

Regency Centers, LP
1777 Botelho Drive, Ste 200
Walnut Creek, California 94596

October 30, 2023

BY:

PROFESSIONAL SERVICE INDUSTRIES, INC.
16170 Vineyard Blvd., Suite 170
Morgan Hill, CA 95037
Phone: (408) 669–5500

City of Oakley
Planning Division

MAR 7, 2024

RECEIVED

Professional Service Industries, Inc.
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October 30, 2023

Regency Centers, LP
1777 Botelho Drive, Ste 200
Walnut Creek, California 94596

Attn: **Michelle Rooney**
Construction Department
Phone: 925.279.1800
michellerooney@regencycenters.com

Re: **Geotechnical Engineering Report**
PROPOSED OAKLEY SHOPS AT LAUREL FIELDS
998 LAUREL ROAD
APN: 035-220-028
OAKLEY, CALIFORNIA 94561
PSI Project No. 0587814

Professional Service Industries, Inc. (PSI), an Intertek Company, is pleased to submit this Geotechnical Engineering Report for the referenced project. This report includes the results from PSI's recent field exploration, field testing, and laboratory testing along with recommendations for use in preparation of the appropriate design and construction documents for this project.

PSI appreciates the opportunity to provide this Geotechnical Engineering Report and looks forward to continuing participation during the design and construction phases of this project. PSI also has great interest in providing materials testing and inspection services during the construction of this project and will be glad to meet with you to further discuss how we can be of assistance as the project advances.

If there are questions pertaining to this report, or if PSI may be of further service, please contact us at your convenience.

Respectfully submitted,

Professional Service Industries, Inc.

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1.0 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Professional Service Industries, Inc. (PSI), an Intertek Company, has completed field exploration, field testing, and geotechnical evaluation for the proposed development at the referenced site in Oakley, California. This work was performed in general accordance with the Professional Services Agreement between Regency Centers, LP and PSI, dated and signed on September 15, 2023, based on PSI's proposal 0587-404404, dated October 17, 2023.

1.2 SITE LOCATION

The site currently consists of a square-shaped, approximately 8.9-acre undeveloped parcel northeast of the intersection of Laurel Road and O'Hara Avenue in Oakley, California. A public park and baseball field are located to the east and residential properties located to the north. A gravel road provides access to the site from Laurel Road to the south and terminates at a relatively level gravel parking area near the central portion of the lot. Significant grading appears to have been performed to construct the gravel parking area.

1.3 PROJECT DESCRIPTION

Information provided to PSI by Regency Centers included the following:

- A request for revised proposal email, dated August 25, 2023.
- A previous geotechnical report, dated October 1, 2001, prepared by Korbmacher Engineering, Inc.
- Geotechnical Investigation Standards - Site Development, Issue-dated August 30, 2019, prepared by Albertsons Companies, Inc.
- Updated Site Plan, sheet A-1, dated August 21, 2023, prepared by Johnson Lyman Architects, LLP.
- Oakley Civil Progress Set including Cut Fill Exhibit, sheet CF-1, dated September 11, 2023, prepared by SAGE Consulting Engineers, Inc.
- ALTA/Topographic Survey, sheet 1 of 1, dated June 12, 2017, prepared by Ziebatech Land Surveying.

Based on the information provided, the proposed scope of work will consist of a new shopping center development which includes an approximately 55,000 square-foot (sf) Safeway supermarket and 6 various retail buildings ranging from about 2,200 sf to 7,000 sf in size. Two of the retail buildings are planned adjacent to the Safeway building at the north portion of the lot, one building at the west side, and three buildings along the south side of the site. A fuel center with a dispenser canopy and underground storage tanks is planned near the southwest corner of the lot. Pavement parking and drive aisles will occupy the central portion of the lot with flatwork surrounding the buildings.

Based on the Cut Fill Exhibit, sheet CF-1, dated September 11, 2023, prepared by SAGE Consulting Engineers, Inc., PSI understands that significant grading is planned to achieve the proposed finished floor elevations for the buildings. Based on the plans, up to 9 feet of fill is planned near the northeast corner of the site for construction of the proposed Safeway retail building (Finished Floor = EL 45.50). Fills ranging from about 1 to 6 feet are also anticipated for the development of the northern half of the property, the northern end of Pad 2 (FF = EL 45.75) near the west portion of the lot, and at the pavement areas near the central and southeast portions of the site. Cuts up to 8 feet are anticipated near the central portion of the site for construction of the parking lot, and up to about 4 feet at the south side of the site near Pad 3 (FF = EL 51.75).

Structural loading criteria were provided and are summarized in Table 1.1 below. Traffic Indexes (TI) of 6.3 for heavy duty traffic (50,000 ESALs) and 5.2 for light duty traffic (10,000 ESALs) were provided.

TABLE 1.1: SUMMARY OF STRUCTURAL LOADING CRITERIA

Design Element	Column Loading	Wall Loading	Slab Loading
Major Retail Buildings	120 kips	6 kips/ft	200 psf
Small Retail Buildings	90 kips	3.5 kips/ft	200 psf
Fuel Centers	60 kips	3 kips/ft	200 psf

The geotechnical recommendations presented in this report are based on the available project information, structure locations, and the subsurface materials encountered during the field investigation. Should any of the above information or design basis made by PSI be inconsistent with the planned construction, it is requested that you contact us immediately to allow us to make any necessary modifications to this report. PSI will not be held responsible for changes to the project if not provided the opportunity to review the information and provide modifications to our recommendations.

1.4 PREVIOUS SITE INVESTIGATION BY OTHERS

A previous geotechnical investigation was conducted at the subject site by Korbmacher Engineering, Inc., (dated October 1, 2001) and included 8 geotechnical borings extending to depths between 16.5 to 51.5 feet. Their subsurface exploration generally encountered loose to dense silty sand in the upper 21 to 28 feet. Layers of stiff to very stiff silty clay and loose clayey sands were encountered at deeper depths. Groundwater was encountered in their borings at depths ranging from 14 to 23 feet below existing grades.

2.0 SITE GEOLOGY

2.1 REGIONAL GEOLOGY

The subject site is located within a large region known as the Great Valley geomorphic province. The Great Valley consists of an alluvial plain, approximately 50 miles wide and 400 miles long, located between the Coast Range and Sierra Nevada Mountain ranges. The Great Valley is drained by the Sacramento and San Joaquin Rivers, which join and drain to the San Francisco Bay (CGS, 2002).

2.2 SITE GEOLOGY

Based on the Geologic map of the Antioch South and Brentwood quadrangles (Dibblee and Minch, 2006, DF-193), the geology underlying the site consists of Holocene age Sand dunes (Qd) related to the San Joaquin Delta.

Based on a USDA Soil Survey Report of the area, the site is generally underlain by Delhi sand (DaC). The soil units are described to have a low risk for corrosion to concrete and a moderate risk for corrosion to steel.

As discussed in the previous section, the previous geotechnical investigation conducted at the subject site by Korbmacher Engineering, Inc. (dated October 1, 2001) generally encountered loose to dense silty sand in the upper 21 to 28 feet. Layers of stiff to very stiff silty clay and loose clayey sands were encountered at deeper depths.

2.3 REGIONAL SEISMICITY

The project site is located in Northern California, which has undergone a complex multiphase structural history and remains an active tectonic region with documented historic earthquakes. Generally, the seismicity within California can be attributed to faulting due to regional tectonic movement. This includes the San Andreas and Hayward Faults and other sub-parallel strike-slip faults, as well as normal and thrust faulting within the State. The area of the subject site is considered seismically active. Seismic hazards within the site can be attributed to potential ground shaking resulting from earthquake events along nearby or more distant faulting.

3.0 SITE CONDITIONS AND GEOLOGIC HAZARDS

3.1 SITE DESCRIPTION

3.1.1 SURFACE CONDITIONS

At the time of our investigation, the site consisted of an undeveloped lot. A gravel road provided access to the central portion of the property from Laurel Road to the south. The gravel parking area near the central portion of the property appeared to be constructed with fill ranging from about 2 to 8 feet thick. The elevation difference between the toe of the slope and the surface of the gravel parking area ranged from about 3 to 8 feet with slopes ranging from about 3:1 to 7:1 (horizontal:vertical). The surface of the site generally consisted of loose sandy soil.

3.1.2 TOPOGRAPHY

Based on the U.S. Geological Survey (USGS) topographic map for the Brentwood Quadrangle (2015), Google Earth (WGS 84), and ALTA/Topographic Survey, dated June 12, 2017, prepared by Ziebatech Land Surveying (NAVD88), the site is located in area that slopes gently from the south to the northeast with elevations ranging from about 55 to 35 feet above Mean Sea Level over a horizontal distance of about 620 feet. The site is not located within the FEMA flood zone.

3.1.3 FAULTING

According to the Alquist-Priolo Special Studies Zones Act of 1972 (revised 1994) faults have been classified as active faults which show apparent movement during the last 11,000 years (i.e., Holocene time). Based on California Geologic Survey (CGS) information, the site is not located within an Alquist-Priolo fault zone area and no faults are known to traverse the site. Faults which may affect the site include the active Greenville Fault located about 10.3 miles southwest of the subject site, and the Concord/Green Valley Fault located about 16 miles to the west. A segment of the Great Valley Fault is located about 8 miles east of the site; although, the Great Valley Fault system is a blind thrust fault with no known surface expression and has been based on regional seismic activity and isolated subsurface information.

3.1.4 LURCHING AND SHALLOW GROUND RUPTURE

Evidence of active fault rupture was not observed within the explored areas of the site at the time of our subsurface exploration. PSI did not observe mapped faults crossing the site in readily available resources. As such, the potential for ground rupture from faulting at the site is considered to be low.

3.1.5 LIQUEFACTION

Soil liquefaction and seismically-induced settlement typically occur in saturated loose to medium dense cohesionless soils; and in clays and silts with low plasticity indexes and with moistures near their liquid limits, due to cyclic softening where the groundwater is relatively shallow (within 50 feet of the ground surface). During an earthquake, ground shaking causes a rapid increase in the porewater pressure within the soil mass under undrained conditions. The generation of excess porewater pressures causes a corresponding decrease in the soil's effective stress, which can result in a sudden loss of soil bearing strength and ground surface settlement within the liquefied (and softened) soil layers. Soil liquefaction potential is generally affected by soil types, mineral contents, ground acceleration, duration of shaking, and frequency content of the earthquake ground motion, among other factors. The site is not delineated as having a potential for liquefaction on the Earthquake Zones of Required Investigation map (Brentwood Quadrangle, CGS, 2018), although the region immediately to the northeast is delineated as a liquefaction hazard zone. Cone penetration tests (CPTs) were performed across the site to help evaluate the liquefaction potential.

3.1.6 LIQUEFACTION AND LATERAL SPREADING

Lateral spreading is generally caused by liquefaction of soils on gentle slopes, resulting in predominately horizontal displacement and lateral extension of the soil mass accompanied by shear and tensile cracking of the ground surface. Lateral spreading can also occur on nearly flat-lying terrain where horizontal displacement takes place toward an unsupported slope face such as along a creek bank. Due to the gently sloping site topography and proposed grading plan, the potential for lateral spreading at this site is considered low.

3.1.7 GROUND FISSURING AND SAND BOILS

Ground fissuring and sand boils are surface manifestations associated with liquefaction and lateral spreading, ground oscillation, and flow failure. The likelihood of ground fissures developing is high when lateral spreading, ground oscillations, and flow failure occur. Sand boils occur when the high pore water pressures are relieved by drainage to the surface along weak spots that may have been created by fissuring. As the water flows to the surface, it can carry sediments, and if the pore water pressures are high enough create a gusher (sand boils) at the surface. Due to the depth of ground water and proposed grading plan, the potential for ground fissuring and sand boils at the surface of the site is low.

3.1.8 TSUNAMIS AND SEICHES

Based on the elevation of the site and distance to the ocean, the site is not located within a tsunami prone area. The site is not located within an inundation zone near a body of water; therefore, we do not consider seiches to be a design concern for the site.

3.1.9 LANDSLIDES AND SLOPE STABILITY

Seismically induced landsliding is not considered a hazard on or adjacent to the project site due to the absence of significant steep slopes in or around the project area. Therefore, landsliding is not considered a significant hazard for the project.

3.2 FIELD EXPLORATION AND LABORATORY TESTING PROGRAM

Prior to initiation of field drilling activities, the proposed construction area was marked with white paint and wooden stakes and USA North 811 was contacted a minimum of 48 hours prior to beginning work to locate any potential buried utilities. The USA North 811 inquiry identification number for the utility locate request was #2023092802647. Additionally, PSI subcontracted a private utility location service to verify that the proposed boring locations were clear of subsurface utilities. Drilling permits were obtained from Contra Costa County prior to subsurface exploration (Permit Nos. 0031041 and 0031042).

To evaluate soil conditions at the site, PSI advanced eighteen (18) geotechnical borings and three (3) CPTs across the site. The borings were drilled with a track-mounted CME-55 drill rig with 4-inch O.D. solid stem augers and CPT probes advanced using a 20-ton tracked CPT rig. Locations of the soil borings and CPTs, as well as the proposed improvements, are shown on Figure 2. The exploration design element, approximate depth, and total footage are provided in Table 3.1, on the following page.

TABLE 3.1: FIELD EXPLORATION SUMMARY

Design Element	Number of Explorations	Approximate Exploration Depth (feet)	Approximate Total Footage (feet)
Safeway Store	3	26½	79½
Small Retail Buildings	6	21½	129
Fuel Center (Retail/underground tank/canopy)	3	21½	64½
Pavements	6	11½	69
Liquefaction Analysis (Cone Penetration Tests)	3	50 to 89	189
Total	**21**	**-**	**531**

During field activities, the encountered subsurface conditions were observed, logged, and visually classified in the field (in general accordance with ASTM D2488/D2487). Field notes were maintained to summarize soil types and descriptions, water levels, changes in subsurface conditions, and augering conditions. The terminology used in the soil classifications and other modifiers are depicted in the General Notes and Soil Classification Chart. Information gathered from this boring is described below. At the completion of drilling, the boreholes were backfilled with cement grout per County guidelines.

Sampling procedures for the auger-drilled soil borings were performed in general accordance with applicable ASTM methods (ASTM D1586 and ASTM D3550) and CPT probes in accordance with ASTM D5778. Samples were identified in the field, placed in sealed containers, and transported to the laboratory for further classification and testing.

The boring and CPT locations were selected by PSI based on the conceptual site plan (A-1, dated August 21, 2023) provided. Elevations of the boring and CPT locations were estimated based on the ALTA/Topographic Survey provided. The references to elevations of various subsurface strata are based on depths below existing grade at the time of drilling. The approximate boring locations are depicted on Figure 2.

PSI supplemented the field exploration with a laboratory testing program to determine additional engineering characteristics of the subsurface soils encountered. The laboratory testing program was conducted in general accordance with applicable ASTM Test Methods, and is included in Appendix A. Portions of samples not altered or consumed by laboratory testing will be discarded 60 days from the date shown on this report.

3.3 SUBSURFACE CONDITIONS

The results of the field and laboratory testing have been used to generalize a subsurface profile at the project site. The following subsurface descriptions provide a highlighted generalization of the major subsurface stratification features and material characteristics.

During subsurface exploration, PSI generally encountered medium dense to dense poorly graded to silty sand in the borings to the maximum depth explored of 26.5 feet below ground surface (bgs). Clayey sand to sandy lean clay of low plasticity was encountered near the bottom of Borings 08 through 10 at a depth of about 26 feet.

Based on the CPT probes, sands to silty sands were encountered in the upper 24 to 30 feet bgs and generally consistent with what was encountered in the borings. Below the upper sand strata, interbedded clays to silty clays were encountered between depths of about 26 and 46 feet. Very dense silty sands were encountered near below the clays at depths of about 46 to 50 feet. In SCPT-02, clay to silty clay was encountered between depths of about 55 to 70 feet and was underlain by very dense silty sands to the maximum depth explored of about 89 feet, where the CPT was terminated due to tip refusal.

The boring and CPT logs, included in Appendix A, should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratifications, locations of the samples, and field and laboratory test data. The stratification shown on the boring logs represents the conditions only at the actual boring locations at the time of our exploration. The stratification that represents the approximate boundary between subsurface materials and the actual transition may be gradual. Variations will occur and should be expected across the site.

3.4 GROUNDWATER INFORMATION

During subsurface exploration, groundwater was measured at depths ranging from about 17½ to about 19½ feet bgs shortly after drilling of the borings were completed. Pore pressure dissipation testing within the CPT probes appear to indicate that groundwater is located at depths of approximately 20 to 22 feet bgs at the locations of the CPTs. A summary of measured groundwater depths is presented in Table 3.2 below.

TABLE 3.2: GROUNDWATER DEPTH SUMMARY

Exploration	Approximate Exploration Depth (feet)	Approximate Groundwater Depth (feet bgs)
CPT-01	50	22
SCPT-02	89	22
CPT-03	50	20
B06	21½	18
B08	26½	17½
B09	26½	18
B10	26½	19½
B12	21½	19½

Groundwater depths of about 14 to 23 bgs were reported during a previous investigation by others at the site in October 2001. The Seismic Hazard Zone Report for the Brentwood quadrangle (CGS, 2018, SHZR 124) indicates that the groundwater level in the vicinity of the site is historically located at a depth of about 25 feet below existing grades. Relevant nearby groundwater information was not available on GeoTracker (https://geotracker.waterboards.ca.gov/).

The groundwater levels presented in this report were measured at the time of PSI's field activities. It is possible, however, that transient, saturated ground conditions at shallower depths could develop at a later time during periods of heavy precipitation, landscape watering, leaking water utilities, or other unforeseen causes. Variations in groundwater levels should be expected seasonally, annually, and from location to location.

3.5 SEISMIC DESIGN PARAMETERS

We have employed the 2022 California Building Code (CBC), the locally adopted version of the International Building Code, 2021 edition. We assume that the project is governed by the International Building Code (IBC), 2021 edition. As part of this code, the design of structures must consider dynamic forces resulting from seismic events. These forces are dependent upon the magnitude of the earthquake event as well as the properties of the soils that underlie the site.

As part of the procedure to evaluate seismic forces, the code requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper 100 feet of the ground surface. Our exploration extended to a maximum depth of 89 feet bgs, but to define the Site Class for this project, we have interpreted the results of the soil test borings drilled within the project site and estimated appropriate soil properties below the base of the borings to a depth of 100 feet as permitted by the CBC. The estimated soil properties were based upon the soils encountered at the site, data available in published geologic reports, and our experience with subsurface conditions in the general site area. Shear wave velocities measurements taken from SCPT-02 generally were within the range of 600 to 1,200 ft/sec. When extrapolated down to a depth of 100 feet bgs.

Based on the subsurface conditions encountered at the site and measured shear wave velocities within the upper 100 feet, the site may be classified as Site Class "D" (stiff soil) as defined in Chapter 20.3-1 of the ASCE 7-16. The associated probabilistic ground acceleration values and site coefficients for the general site area were obtained from the USGS geohazards web page (https://seismicmaps.org/) using the ASCE 7-16 option and are presented in the table below.

TABLE 3.3: GROUND MOTION VALUES

Period (sec)	Mapped MCE Spectral Response Acceleration (g)		Site Coefficients		Adjusted MCE_R Spectral Response Acceleration (g)		Design Spectral Response Acceleration (g)	
0.2	S_s	1.338	F_a	1.0	S_{Ms}	1.338	S_{Ds}	0.892
1.0	S_1	0.468	F_v	1.8	S_{M1}	0.842	S_{D1}	0.562

2% Probability of Exceedance in 50 years for Latitude, Longitude: 37.9842°, -121.7128°
MCE_R = Maximum Considered Earthquake
* See 11.4.8 in ASCE 7-16

The Site Coefficients referring to ASCE 7-16 Section 11.4.8 require the structural engineer to apply appropriate calculations as needed. Design of structures should comply with the requirements of the governing justification's building codes and standard practices of the Structural Engineering Association of California.

In accordance with ASCE 7-16, Chapter 11, for a site with S_1>0.2, the Fa value is governed by Section 11.4.8. Section 11.4.8 requires a ground motion hazard analysis be performed for structures with seismic isolation elements or damping systems on all sites having S_1>0.2. Section 11.4.8 includes an exception where ground motion hazard analyses "is not required for structures other than seismically isolated structures and structures with dampening systems where the seismic response coefficient of the structure (Chapter 12) meets specific requirements". This report is based on no seismic isolation elements or dampening systems being installed and exceptions can be applied.

4.0 GEOTECHNICAL ENGINEERING ANALYSIS

4.1 LIQUEFACTION AND DRY SAND SETTLEMENT ANALYSIS

PSI performed a liquefaction triggering analysis for an earthquake magnitude of 6.6 and peak ground acceleration of 0.47g, the PGA_M for maximum considered earthquake based of a 10 percent probability of being exceeded in a 50-year period. For this liquefaction study, we have estimated the historic high groundwater table as being located at a depth of 14 feet bgs based on our subsurface exploration and previous investigations at the subject site.

The program CLiq v.3.5.2.17, developed by GeoLogismiki, and CPT data obtained was used to evaluate the potential for earthquake-induced liquefaction of the soils at the site. The program applied several published methodologies, including Roberston (2009) and Boulanger and Idriss (2014). The results of the liquefaction analysis are described below and included in Appendix B at the conclusion of this report.

4.1.1 LIQUEFACTION INDUCED SETTLEMENT

PSI estimated the potential for liquefaction-induced free-field settlement using the empirical methodologies developed by Boulanger and Idriss (2014) and NCEER and Robertson (2009). The empirical methods are based on case histories of areas that have undergone liquefaction. The results of our parametric studies indicate that liquefaction-induced total settlements on the order of ½- to ¾ inches could occur within the liquefiable sand layers encountered in the subsurface exploration. Differential settlement due to liquefaction of less than ½-inch is estimated across a horizontal distance of about 50 feet. Based on the analysis, a majority of the vertical settlements are projected to occur at the location of CPT-01, near the southwest corner of the site. The depth of liquefaction settlement is expected to occur in the poorly graded sand to silty sand layers at depths of approximately 20 to 23 feet, and between 31 to 33 feet in CPT-01. However, the potential for liquefaction-induced ground surface manifestations (i.e. sand boils and ground fissures) to occur across the site is considered low. Provided that these settlement estimates are tolerable, it is PSI's opinion that mitigation for liquefaction is not a design constraint for this project.

4.1.2 DRY SAND SETTLEMENT

Dynamic dry sand settlement occurs during moderate and large earthquakes when unsaturated soft or loose, natural or fill soils densify and settle, often unevenly across a site. Based on the proposed grading plan, PSI anticipates that the on-site loose to medium dense sands will be densified and improved as part of site grading and building pad and pavement subgrade preparation. Provided that site grading is performed as recommended in this report, PSI does not anticipate dry sand settlement to be a design concern for this project. The near-surface loose sands across the site should be removed and compacted as part of site grading, as discussed in the following sections. Where existing loose sand is not removed and compacted as recommended, the potential for differential settlement from dynamic dry sand densification should be accounted for.

4.2 EXPANSIVE SOILS

The near-surface soils encountered in the subsurface exploration consisted of poorly graded sand with low fines content. These soils are considered to have a very low expansion potential. Expansive soil movement is not considered to be a significant concern for the proposed development. Following site grading, testing of site soils should be performed by the project geotechnical consultant to confirm the basis of these recommendations if fine-grained soils are used onsite.

4.3 CORROSION POTENTIAL

Both metal and concrete elements in contact with soil are subject to corrosion or degradation due to the chemical activity of the soil. Therefore, buried metal and concrete elements should be designed to resist this chemical activity. Soil samples recovered from the borings were evaluated for the corrosivity characteristics of the subsoils. The composite soil samples were submitted to an analytical lab to determine the Sulfate, Chloride, and pH characteristics. The test results of the laboratory testing are presented in the following table.

TABLE 4.1: SUBSOIL CORROSIVITY CHARACTERISTICS

Sample	Depth (ft)	Minimum Resistivity (ohm-cm)	Water-Soluble Sulfate (SO_4) in Soil ppm (mg/kg) [%]	Water-Soluble Chloride Content in Soil ppm (mg/kg)	pH
B05	1 – 3		15 [0.0015]	<2	7.6
B09	1 – 3	7,508	17 [0.0017]	11	8.0
B16	1 – 3	15,750	11 [0.0011]	2	8.1

The concentration of water-soluble sulfates or dissolved sulfate in water is considered to be a good indicator of the potential for chemical attack on concrete. Based on ACI Manual of Concrete Practice (ACI 201.2R-10) or (ACI 318/318R-33, Table 19.3.1.1), the amount of water-soluble sulfate in soil can be used to evaluate the need for protection of concrete based on the following table.

TABLE 4.2: REQUIREMENTS FOR CONCRETE EXPOSED TO SULFATE

Water-soluble sulfate (SO_4) in Soil percent by mass (%)	Water-Soluble Sulfate (SO_4) in Water ppm (mg/kg)	Sulfate Exposure Class
$SO_4^- < 0.10$	$SO_4^- < 150$	S0 or Negligible Exposure
$0.10 \le SO_4^- < 0.20$	$150 \le SO_4^- < 1{,}500$	S1 or Moderate Exposure
$0.20 \le SO_4^- \le 2.0$	$1{,}500 \le SO_4^- \le 10{,}000$	S2 or Severe Exposure
$2.0 < SO_4^-$	$10{,}000 < SO_4^-$	S3 or Very Severe Exposure

Based on the test results of selected soil samples, the sulfate ion concentration and the potential for reactions within concrete exposed to sulfates is **negligible** with a Class **S0** Exposure. Evaluations of soluble sulfate content contained within the selected samples suggest no restriction on the type of concrete. The actual cement type to be used shall be determined by the project Structural Engineer.

The corrosion potential of the soils is also dependent on the chloride content present in the soil. The onset of corrosion of steel in concrete associated with the presence of chloride typically occurs when the values are above 463 mg/kg or ppm (1.5 pounds/yd3). The American Concrete Institute suggests maximum values of chlorides in conventionally reinforced concrete in moist environments be limited to 0.10% by weight of cement.

Soil pH can have a wide range of acidity, between 2.5 and 10. Concrete is alkaline in nature, meaning it has a pH of 7.0 or higher. pH levels below 5 can lead to extreme corrosion rates and premature pitting of metallic objects, a neutral pH of 7 is most desirable to minimize potential for damage. The intrinsic pH level of a soil can also be affected by precipitation. The pH values of the composite sample tested indicate the soils have a **low** corrosive potential.

Caltrans currently defines a corrosive environment as an area where the soil has either a chloride concentration of 500 ppm or greater, a minimum resistivity less than 2000 ohm-cm, a sulfate concentration of 1500 ppm or greater, or has a pH of 5.5 or less.

While the chloride and soil resistivity levels suggest that the site soils are non-corrosive according to Caltrans specifications, based on the minimum resistivity test results, the soils are characterized as being moderately corrosive to cast iron or ductile iron piping (Roberge, 2000). PSI does not practice in the field of corrosion engineering. We recommend that a qualified corrosion engineer be consulted to determine if special corrosion protection is warranted for this site. Testing for corrosivity of any fill soils should be conducted during site grading to verify our recommendations.

5.0 GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

5.1 GEOTECHNICAL DISCUSSION

The following geotechnical related recommendations have been developed on the basis of the subsurface conditions encountered and PSI's understanding of the proposed development. Should changes in the project criteria occur, a review must be made by PSI to determine if modifications to our recommendations will be required.

Based upon the data collected during this investigation and supplemental information available, it is PSI's opinion that the site is suitable for the proposed development provided the recommendations contained below are incorporated into the design and construction of the project. The primary geotechnical considerations for the proposed development included:

- The presence of very loose surface poorly graded sands blanketing the site.
- The proposed deep excavations planned for the underground storage tank(s) (UST) near the southwest corner of the site.

Based on the proposed grading plan, Cut Fill Exhibit, sheet CF-1, dated September 11, 2023, prepared by SAGE Consulting Engineers, Inc., mass grading is expected to be performed to achieve the proposed finished floor elevations of the proposed structures planned at the site. Prior to site grading, the existing surface grades should be scarified and compacted as recommended below prior to the start of site grading.

As discussed in the previous sections of this report, surface manifestations from liquefaction within the soils below ground water are considered to have a low potential based on the analysis performed; therefore, in PSI's opinion, mitigation of liquefaction settlement does not appear warranted for the project.

Based on the proposed excavation depth of the proposed location of the UST near the southwest corner of the site for the proposed fuel station and proximity to the property line and O'Hara Avenue, PSI anticipates that temporary shoring will be necessary due to the granular soil profile underlying the site. The poorly graded sands that were encountered in our subsurface exploration were judged to have very limited cohesion and are expected to have a high potential for caving when excavated vertically without support. The presence of groundwater and dewatering of deep excavations should also be anticipated.

The following geotechnical design recommendations have been developed based on the previously described project characteristics and subsurface conditions encountered. The proposed construction should be performed in accordance with these recommendations and the applicable building code, and local governmental standards which have jurisdiction over this project. If there are changes in the project criteria, PSI should be retained to determine if modifications in the recommendations will be required. The findings of such a review would be presented in a supplemental report. Once final design plans and specifications are available, a general review by PSI is recommended to confirm that the conditions anticipated in preparing this geotechnical report are consistent with the earthwork and foundation recommendations contained within the construction documents.

5.2 SITE PREPARATION

The proposed site improvement areas should be stripped and grubbed of any construction debris, trash, vegetation, organic laden materials, and other structures and utilities in conflict with the proposed construction. Following site clearing, the proposed development area should be improved as described in the sections below and extend at least 2 feet beyond the proposed building limits.

5.3 EARTHWORK

5.3.1 OVER-EXCAVATION AND GRADING

Based on the project plans, site grading is expected to consist of significant mass grading across the site to achieve the proposed floor elevations of the building pads and pavement areas. At least the upper 12 inches of the loose poorly graded sands blanketing the site should be removed/scarified to a depth of at least 12 inches, moisture conditioned and then compacted as described below prior to placing Engineered Fill above. Areas intended for building pads for structures should consist of at least 2 feet of properly compacted Engineered Fill. The limits of grading should extend at least 2 feet beyond the proposed building limits, where practical.

Following site preparation, the newly exposed subgrades in site improvement areas intended for building pads and pavements must be approved by the Geotechnical Engineer prior to fill placement. These exposed subgrades should be proof rolled with a loaded tandem axle dump truck or similar piece of rubber-tired equipment (15 tons or greater) in the presence of the Geotechnical Engineer's representative. The purpose of the proof rolling is to detect the existence of marginal or loose/soft near-surface materials or unsuitable soils that may require undercutting. Areas which deflect, rut or pump excessively during proof rolling, and which cannot densified and moisture conditioned in-place, should be undercut to suitable soils and backfilled, or as recommended by the geotechnical engineer. Proof rolling should not be performed on saturated, frozen or during wet weather conditions.

5.3.2 FILL MATERIALS

Engineered Fill may include onsite and import soil and should not contain rock fragments greater than 3 inches in diameter or have greater than 30 percent retained on the ¾-inch sieve, and should not contain more than 3 percent (by weight) of organic matter or other unsuitable material. On-site or Imported Engineered Fill soils should have an Expansion Index (EI) that does not exceed 50. Based on our subsurface investigation, existing onsite soils are generally suitable for use as Engineered Fill. The suitability of onsite materials for use as engineered fill should be confirmed by a PSI representative during grading. Fill materials meeting the above requirements should be approved by the Geotechnical Engineer several days prior to use at the site. Soils that are environmentally impacted should not be used as Engineered Fill onsite.

General Engineered Fill should be compacted to at least 90 percent of the maximum dry density as determined by the modified Proctor (ASTM D1557). The upper 12 inches of subgrade soils in pavement areas should be compacted to at least 95 percent. The moisture content of Engineered Fill should be maintained at approximately $\pm$2 percent of the material's optimum moisture content for coarse-grained soil. If the Engineered Fill is too dry, water should be uniformly applied across the affected fill area. If the Engineered Fill is too wet, it must be dried. Engineered Fill should be thoroughly mixed by disking or other appropriate methods to obtain relatively uniform moisture content throughout the lift immediately prior to compaction.

Engineered Fill should be placed in maximum lifts of 9 inches of loose material. Each lift of Engineered Fill should be tested by a PSI soils technician, working under the direction of our Project Geotechnical Engineer, prior to placement of subsequent lifts. If smaller compaction equipment such as jumping jacks or plate compactors are used thinner lifts will be required to achieve compaction.

Compaction of the Engineered Fill should be verified with a sufficient number of density tests, as determined by the Geotechnical Engineer, to determine if adequate compaction is being achieved by the contractor. The properly compacted Engineered Fill should extend horizontally outward beyond the proposed pavement construction area by a distance equal to the height of newly placed fill or 2 to 3 feet, whichever is greater, prior to significant sloping.

TABLE 5.1: COMPACTION CRITERIA AND TESTING FREQUENCY

Material Type (Location)	Per Modified Proctor Test (ASTM D1557)			
	Minimum Compaction (%)	Moisture Content Range (ref. to optimum moisture content)		Testing Frequency (min. 3 per lift)
		Minimum	Maximum	
Engineered Fill (General, non-pavement)	90	-2%	+2%	1 per 3,000 sf
Engineered Fill (Top 12-inches of Pavement Subgrade)	95	-2%	+2%	1 per 3,000 sf

5.3.3 EXCAVATIONS

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavation or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

We are providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or other parties' compliance with local, state, and federal safety or other regulations.

5.3.1 UNDERGROUND STORAGE TANK EXCAVATION AND UTILITY TRENCH BACKFILL

Excavations for the proposed UST excavations, along with utility trench excavations, should be performed in accordance with applicable Federal and State Occupational Safety and Health Administration regulations. Excavations for USTs and utility trenches in the soils at the site will need to be sloped or shored from the ground surface due to the potential for caving. Actual inclinations will ultimately depend on the soil and groundwater conditions encountered during earthwork. The contractor should be responsible for selecting the excavation technique, monitoring the excavations for safety, and providing shoring, as required, to protect personnel and adjacent improvements. On a preliminary basis, the soils encountered in our subsurface exploration should be classified as Type C. The contractor should be aware that excavation and shoring should conform to the requirements specified in in the applicable local, state, and federal safety regulations, such as OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations.

Utility trenches should be backfilled with Engineered Fill following the recommendations presented above. If rocks larger than 3-inches in maximum size are encountered, they should be removed from utility backfill material prior to placement in the utility trenches. Pipe zone backfill requirements should be in conformance with the requirements of the local agencies having jurisdiction, but should consist of clean granular sand material having a sand equivalent equal to or above 30. Jetting or flooding of utility backfill is not recommended. If smaller compaction equipment such as jumping jacks or plate compactors are used, thinner lifts will be required to achieve compaction. Utilities entering the building envelope should be backfilled below the foundation with cement slurry or concrete to prevent moisture intrusion beneath the building.

5.3.2 EXCAVATION DEWATERING AND SUBGRADE STABILIZATION

Groundwater is expected to be located at depths ranging from about 14 to 23 feet bgs based on this investigation and previous explorations at the site. The Seismic Hazard Zone Report for the Brentwood quadrangle (CGS, 2018, SHZR 124) indicates that the groundwater level in the vicinity of the site is historically located at a depth of about 25 feet below existing grades. The groundwater levels presented in this report were measured at the time of PSI's field activities. It is possible, however, that transient, saturated ground conditions at shallower depths could develop at a later time during periods of heavy precipitation, landscape watering, leaking water utilities, or other unforeseen causes. Variations in groundwater levels should be expected seasonally, annually, and from location to location. While groundwater is not expected to impact the construction of the proposed ground supported structures, it is expected to affect the excavations for the proposed underground storage tank(s).

We understand that excavations for the proposed USTs may be approximately 20 feet deep. Based on soil conditions and water levels observed, groundwater is expected to enter the proposed tank excavations. Dewatering is expected to be required to facilitate installation of the tanks. We recommend that dewatering be performed prior to excavation for the UST pit and that the water level be lowered to at least 2 feet below the base of the UST excavation(s). The water level should be maintained at this level until the UST are installed and excavation is completely backfilled. Temporary dewatering is the responsibility of the contractor.

Due to the depth to groundwater and the estimated UST excavation depth, yielding or "pumping" of the subgrade within the excavation pit is likely to occur. Should pumping conditions occur, it will be necessary to stabilize the base of the excavation. Such stabilization measures can include (but not limited to) the placement of uniform-sized, ¾-inch crushed rock within the areas exhibiting pumping conditions. The crushed rock should be properly tracked into the underlying soils such that it is adequately intruded into and interlocks with the soil matrix. We expect that a 6 to 12-inch thick gravel layer may be required. Following the placement and tracking of the gravel layer into the pumping subgrade soils, it is recommended that a woven stabilization fabric, such Mirafi 600X (or approved equivalent), be placed above the gravel layer. The gravel and stabilization fabric should extend at least 3 feet laterally beyond the limits of the pumping areas. After the pumping areas have been addressed and observed by the Geotechnical Engineer, Engineered Fill can then be placed in accordance with the recommendations in this report. Alternative stabilization measures are possible and will be considered upon request.

5.3.3 EXCAVATION SUPPORT

Temporary excavations such as those for UST or underground utility installation may be supported by several methods including tiebacks, soldier beams and wood lagging, soil nails, braced shoring or potentially other methods. The choice should be left to the contractor's judgment since economic considerations and/or the individual contractor's construction experience may determine which method is more economical and/or appropriate. Support of any adjacent existing structures and improvements without distress should also be the contractor's responsibility. We recommend that the structural engineer and geotechnical engineer be involved with the shoring system design. In addition, it should be the contractor's responsibility to undertake a preconstruction survey with benchmarks and photographs of the adjacent properties, pavements, and other structures.

5.4 FOUNDATIONS

In our opinion, the structural loads of the proposed structures may be supported by the foundation systems below constructed in accordance with the following design criteria. Additionally, PSI recommends that foundation type and bearing strata be consistent throughout a structure. As discussed above, to provide uniform support, building pads and foundations for new structures should be constructed on at least 2 feet of Engineered Fill with at least a 2-foot over-build beyond the limits of the structures. Once ***SITE PREPARATION*** and ***EARTHWORK*** has been performed, the following structural elements may be constructed.

5.4.1 SHALLOW FOUNDATIONS

Following site grading, as recommended, it is our opinion that conventional continuous and isolated spread footings are suitable for the support of the proposed structures. All footings should be supported by properly compacted engineering fill meeting the requirements in this report. Continuous footings should be founded at least 18 inches below lowest adjacent finished grade and have a minimum width of 18 inches. Isolated spread footings should be at least 24 inches wide and supported at a depth of 24 inches below the lowest adjacent grade. Footings with the above recommended minimum dimensions may be designed for an allowable bearing pressure of 2,500 psf. The allowable soil bearing pressure may be increased by one-third for loads of short duration, including wind and seismic forces. The weight of the foundations may be neglected in bearing capacity calculations. Appropriate foundation reinforcement and foundation dimensions should be provided in accordance with the Structural Engineer's design. In addition, it is recommended that the foundation systems be designed as a grid system to help permit spanning of local irregularities. Isolated footings should preferably be tied to the perimeter foundations via tie beams to provide increased rigidity of the foundation system.

The base frictional resistance and the passive soil resistance will counteract the horizontal loads on shallow foundations. Footings cast against compacted soil may be designed using a frictional coefficient between the concrete and soil of 0.30. An ultimate equivalent fluid pressure of 250 pounds per cubic foot (pcf) may be used to compute the passive resistance. Passive resistance within the upper 1 foot of soil should be neglected if the footings are placed using form boards. If the footings are cast against competent properly compacted fill soils and the soils above the footings are paved or consist of concrete floor slabs, the passive resistance within the upper 1 foot can be taken into account. The passive resistance of any un-compacted fill material or loose natural soils should be neglected. It is recommended that the overturning moments on the foundations be resisted by the weight of the foundation system. A minimum factor of safety of 2 should be used for sliding resistance.

We recommend the use of a smooth-edged excavator to make the footing excavations. The foundation excavations should be observed by a representative of PSI prior to steel or concrete placement to assess that the foundation materials can support the design loads and are consistent with the materials and recommendations discussed in this report.

Following excavation, footings should be inspected, and concrete should be placed as quickly as possible (same day) to avoid exposure of the excavations to wetting and drying. Surface run-off water should be drained away from excavations and not be allowed to pond within 10 feet of the open excavation during or after construction. If it is required that footing excavations be left open for more than one day, they should be protected to reduce moisture loss or gain.

PSI should be consulted during the design of the foundations to verify that the appropriate parameters are utilized. PSI should provide periodic observation during construction of the foundations to verify that the design parameters and the soil materials used during construction correspond.

5.4.2 SETTLEMENT

Based on the provided loads and the recommended site preparation, we estimate that post-construction total static settlement will be less than 1-inch. Differential settlement is estimated to be less than ¾-inch over a 50-foot span. These magnitudes of estimated settlements are assumed to be within tolerable limits but should be confirmed by the project architect and structural engineer.

5.4.3 DRILLED PIER FOUNDATIONS

If desired, Cast in Drilled Hole (CIDH) piers may be designed for canopy foundation elements, light poles, and other sign/monument structures. We recommend that these piers consist of an augered shaft drilled to a design depth and filled with reinforced concrete. Design parameters related to drilled pier foundations have been prepared based on the field explorations, testing of the selected samples in the laboratory, published references, and engineering judgment.

PSI recommends that the drilling contractor review the field exploration logs of this report before starting excavations for the drilled piers. Potential cave-ins and sloughing of sands below groundwater is possible, and casing should be made available at the project site prior to drilling. This can be further evaluated during drilling of the initial piers.

Piers should have a diameter of at least 18 inches and extend at least 8 feet deep bgs. Skin friction within the upper 2 feet of the piers should be neglected in design. The downward load capacity of the piers (extending to at least 8 feet bgs), may be designed based on an allowable skin friction value of 300 pounds per square foot. Provided the CIDH excavation is cleaned of loose soils, an allowable end bearing value of 3,000 pounds per square foot may be considered for design. These values may be increased by one-third for short duration wind and seismic loading. Uplift capacities should use 75 percent of the downward skin friction provided. Lateral loads on the piers may be resisted by passive earth pressure based upon an equivalent fluid pressure of 250 pounds per cubic foot up to 3,000 pounds per square foot, acting on 2 times the projected area of the pier. The passive resistance of the upper two feet of the piers should be neglected.

PSI recommends that the drilling contractor review the field exploration logs of this report before starting excavations for the drilled piers. Cave-ins and sloughing soils were not observed during our geotechnical exploration. However, potential cave-ins and sloughing are possible in localized sands, and casing should be made available at the project site prior to drilling.

PSI should be retained to observe and document complete drilled pier construction (start to finish) and to evaluate whether the subsurface and pier bearing conditions are as anticipated in this report. When the drilling processes are completed (inspected and approved by PSI) and bottoms cleaned for the drilled piers, the reinforcing steel and the concrete should be placed immediately after the final cleanout pass is conducted on the base. The tremie method of concrete placement should be adopted when placing concrete below groundwater (not anticipated) to prevent segregation of the concrete materials. If concrete is placed by the free-fall method into a dry excavation, it should be placed to avoid contact with the excavation sidewalls to prevent segregation. If temporary casing is used, it must be removed during concrete placement keeping a concrete head of at least 2 feet above the bottom of the casing as it is being withdrawn.

Concrete placed in the pier excavations should have a slump in the range of 6 to 8 inches to reduce the potential for the formation of voids as the temporary pier casing is extracted (if used) and around rebar. The concrete mix should be designed to attain the required 28-day design strength when placed at this slump. Pier designs should be reviewed by the Geotechnical Engineer prior to submittal.

We estimate that pier foundations will experience less than ½ inch of immediate, post-construction static settlement within the soils encountered, with less than ¼ inch of differential static settlement between piers with a lateral surface distance of 30 feet apart from each other.

Installation specifications should be based on recommendations suggested in the "Standards and Specifications for the Foundation Drilling Industry" published by the Association for Drilled Shaft Contractors (ADSC).

5.5 FLOOR SLABS

Soil subgrade below slab-on-grade areas should be prepared to remove all deleterious materials, as presented in the **EARTHWORK** section. All building floor slabs should be supported on at least 2 feet of compacted Engineered Fill compacted to a minimum 90 percent of the Modified Proctor (ASTM D1557) as described above.

Based on the near surface soil encountered, PSI estimates that a unit modulus of subgrade reaction (K_1) of 150 pounds per square inch per inch (psi/in) is suitable for concrete slab sections supported by compacted native soil having an expansion index less than 50. The coefficient of subgrade reaction (K_s) is the unit pressure required to produce a unit settlement in soils. A general equation to account for the to account for the effect of width of foundations in granular soils is given by:

$$k_s = k_1 \left(\frac{B + B_1}{2B} \right)^2$$

where, B = Width of foundation in feet.

B1 = 1 foot if k is for a 1-foot square plate.

K_1 = Unit modulus of subgrade reaction for a one-foot square footing.

In areas that will have moisture-sensitive materials placed directly on the floor, PSI recommends that the slabs-on-grade be underlain by a minimum 4 inches of sand or rounded aggregate base to provide a capillary break. A durable vapor-retarding membrane should be installed beneath the slab-on-grade to reduce the risks of damp floors. The vapor-retarding membrane should be installed in accordance with the manufacturer's recommendations.

5.5.1 FLATWORK

Flatwork should be underlain by a 4 to 6-inch layer of granular import material satisfying the requirements of select fill provided in the ***FILL MATERIALS*** section. The material should be compacted to a minimum 90% or greater than the maximum dry unit weight and contain a moisture content between ±2% optimum moisture content.

Proper drainage around grade-supported sidewalks and flatwork is also very important to reduce potential movements. Elevating the sidewalks where possible and providing rapid, positive drainage away from them will reduce moisture variations within the underlying soils and will therefore provide valuable benefit in reducing the full magnitude of potential movements from being realized.

5.6 RETAINING WALLS

Based on the recent soil data gathered from the site, PSI recommends the following design parameters for retaining walls up to six (6) feet in retained height.

5.6.1 GENERAL DESIGN CRITERIA

Cantilever earth retention structures, which are designed to yield at least 0.001H, where H is equal to the height of the earth retention structure to the base of its footing, may be designed using active conditions. Rigid earth retention structures (walls that are braced or tied to prevent movement such as dock walls or walls part of a building) should be designed using the at-rest condition.

In addition to the design lateral forces due to retained earth, surcharges due to existing improvements, such as adjacent buildings or traffic loading, should be considered in the design of the earth retention structures. Loads applied within a 1:1 (H:V) projection from the surcharge on the stem and footing of the earth retention structure should be considered in the design.

Retaining walls should be supported by conventional shallow continuous (strip) footings bearing on prepared areas as described above for shallow foundations. Construction joints should be installed above or below foundation steps. Final selection of the appropriate design parameters should be made by the designer of the earth retention structures.

5.6.2 LATERAL EARTH PRESSURES

An equivalent fluid pressure approach may be used to compute the horizontal pressure against the wall. Appropriate fluid unit weights are given below for specific slope gradients of the retained material. These do not include other superimposed loading conditions such as traffic, structures, or adverse geologic conditions. Where retaining walls will be subjected to surcharge loads, such as from adjacent structures or traffic loads, the walls should be designed for an additional uniform lateral pressure equal to one-half of the surcharge pressure or as determined by the structural engineer.

TABLE 5.2: LATERAL EARTH PRESSURES

Surface Slope of Retained Materials (H:V)	Active Equivalent Fluid Pressure (pcf) (Native Soil or Select Backfill)*	At- Rest Equivalent Fluid Pressure (pcf) (Native Soil or Select Backfill)*
Level	35	60
3:1	45	75

* The design pressures assume the backfill material has very low expansion potential. Backfill zone includes area between back of the wall to a plane (1:1 H:V) up from bottom of the wall foundation (on the backside of the wall) to the (sloped) ground surface.

5.6.3 RETAINING WALL BACKFILL AND DRAINAGE

Retaining walls should be provided with an adequate pipe and gravel back drain system to help prevent buildup of hydrostatic pressures where this potential exists. Backdrains should consist of a minimum 4-inch diameter perforated collector pipe (Schedule 40, SDR 35, or approved equivalent) embedded in a minimum of one (1) cubic foot per linear foot of ¾- to 1-inch clean crushed rock or an approved equivalent, wrapped in filter fabric (Mirafi 140N or an approved equivalent). The drain system should be connected to a suitable outlet or weep-holes. Below grade walls or walls designed to retain insitu soils (cut walls) may require a more robust drainage system.

Retaining wall backfill should be placed in lifts no greater than eight (8) inches in thickness and compacted to a minimum of 90 percent relative compaction in accordance with ASTM Test Method D 1557 as Engineered Fill. The wall drainage should include a minimum two (2) feet wide section of ¾- to 1-inch clean crushed rock (or an approved equivalent). The rock should be placed immediately adjacent to the back of the wall and extend up from a back drain to within approximately 24 inches of the finish grade. The rock should be separated from the earth with filter fabric as described above. The upper 24 inches should consist of compacted plastic (clayey) material.

Waterproofing the back of the retaining walls should be considered to mitigate water staining, infiltration, and moisture migration through the wall. If a waterproofing system is used, it should be designed by a qualified waterproofing consultant.

5.7 PAVEMENT DESIGN

In designing the proposed pavement areas, the following conditions were considered:

1. Subgrade support characteristics are typically represented by an R-Value for the design of flexible pavements in this region.
2. Vehicular traffic volumes, in terms of the number and frequency of vehicles and their range of axle loads should be considered.
3. Likely changes in vehicular use over the life of the pavement should also be considered. We have anticipated that the pavement areas will not experience additional traffic.
4. Pavement life cycle was considered to be 20 years using Caltrans and Portland Cement Association Design Methods.

All site preparations and grading should be performed as discussed above.

Since an evaluation of the characteristics of the actual soils present at pavement subgrade can only be provided at the completion of grading, the following pavement sections should be used for planning purposes only. Final pavement designs should be evaluated after R-value tests have been performed on the actual in-place subgrade materials exposed for use during construction.

It should be noted that additional earthwork and/or ground improvement efforts may be required during grading on the actual subgrade material encountered, in order to achieve the aforementioned design parameters and assumptions. These design thicknesses anticipate that a properly prepared subgrade has been achieved.

Based on the results of our field exploration and laboratory testing, we recommend the pavement designs presented in the table below. The pavement design criteria are based on the soil conditions present at the site, an R-value of 50 and the anticipated Traffic Index indicated below based on the estimated traffic for the site. Final pavement designs should be based on R-value testing of the as-graded subgrade and actual traffic volumes.

TABLE 5.3: PAVEMENT DESIGN PARAMETERS

Location	Traffic Index (TI)	Asphalt Thickness (inches)	+	Aggregate Base Thickness (inches)	Portland Cement Concrete Thickness (inches)	+	Aggregate Base Thickness (inches)
Standard Drive Aisles	5.0	3	+	4	5	+	4
	5.5	3	+	4			
Heavy Duty	6.5	4	+	6	6	+	4
	7.0	5	+	6			

We recommend rigid pavements (Portland Cement Concrete, PCC) be constructed at all areas requiring heavy braking and turning such as intersections, entrances, docking bays, trash truck loading areas, etc. PCC pavement sections should incorporate appropriate steel reinforcement and crack control joints if needed and as designed by the project structural engineer. We recommend that sections be as nearly squared as possible and no more than 15-feet on a side. Contraction joints may be constructed by saw cutting to a depth of 30 percent of the slab thickness. Expansion/cold/construction joints may be used in lieu of contraction joints. Such joints should be properly sealed.

The below presented estimated pavement sections are based on the field and laboratory test results for the project, local pavement design practice, design assumptions presented herein and previous experience with similar projects. The project Civil Engineer should verify that the Traffic Index and other design values are appropriate for the expected traffic and design life of the project. PSI should be notified in writing if the assumptions or design parameters are incorrect or require modification.

Pavements can be expected to crack due to environmental factors. Periodic maintenance to reduce damage to the pavement structure should be planned throughout the life of the pavement. During the paving life, maintenance to seal surface cracks within concrete or asphalt paving and to reseal joints within concrete pavement should be undertaken to achieve the desired paving life. Perimeter drainage should be controlled to prevent or retard influx of surface water from areas surrounding the paving. Water penetration leads to paving degradation. Water penetration into base or subgrade materials, sometimes due to irrigation or surface water infiltration leads to pre-mature paving degradation. Curbs should be used in conjunction with asphalt paving to reduce potential for infiltration of moisture into the base course. Curbs should extend the full depth of the base course and should extend into the underlying subgrade. The base layer should be tied into the area inlets to drain water that may collect in the base.

5.7.1 PAVEMENT MATERIALS

Pavement material requirements for the above pavement sections are presented below:

- **Compacted Subgrade:** Pavement subgrade preparation should be performed in accordance with the ***FILL MATERIALS*** section. Subgrade soils should be proof-rolled and scarified to a depth of 12 inches. The upper 12 inches of pavement subgrade should be compacted to 95 percent of the laboratory standard.
- **Aggregate Base Course:** Base materials should consist of Class II Aggregate Base. Aggregate base should be placed in maximum 6-inch compacted lifts. The base materials should be compacted to at

least 95 percent of the maximum dry density as determined by ASTM D1557. Aggregate base materials should be moisture conditioned to between ±2 percentage points of the optimum moisture content.

- **Portland Cement Concrete:** Concrete used for paving should have a minimum compressive strength of 4,000 psi at 28-days. Concrete should have a water/cement ration of 0.5 or lower. The air content at the point of placement should range from 2 to 4 percent. The concrete pavements should be reinforced and jointed per current ACI recommendations.

All materials should conform to and be placed in accordance with the latest revision of the Standard Specifications for Public Works Construction (Greenbook), the American Concrete Institute (ACI), the Portland Cement Association (PCA) and the requirements of the City Public Works.

5.8 DRAINAGE CONSIDERATIONS

Site grading should be carefully planned to promote positive drainage away from structures and to divert surface water away from or into stormwater systems. Water should not be allowed to collect near foundations either during or after construction.

Pavement surfaces and open space areas should be sloped such that surface water runoff is collected and routed to suitable discharge points. We also recommend that ground surfaces adjacent to buildings be sloped to facilitate positive drainage away from the buildings.

A positive slope gradient of 5 percent down and away from the building perimeter should be applied to the finished subgrade (inclusive of topsoil). This slope should extend no less than 10 feet away from the outside building perimeter, with drainage swales provided to remove runoff from around the structure. Any utility trench that enters the perimeter of structures should be excavated with a slight slope down and away from the perimeter of the structure.

5.8.1 MOISTURE SENSITIVE SOILS / WEATHER RELATED CONCERNS

The soils encountered at this site are expected to be sensitive to disturbances caused by construction traffic and changes in moisture content. During wet weather periods, increases in the moisture content of the soil may cause significant reduction in the soil strength and support capabilities. In addition, soils which become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundations construction activities during dry weather.

If grading occurs in a period of increased rainfall, unstable subgrade conditions may be present. These conditions may require stabilizing the subgrade with admixtures, such as cement kiln dust or a coarse aggregate. Isolated areas may be stabilized using a geogrid, such as Tensar BX-1200 or equal, with one foot compacted aggregate base over the geogrid. Additional recommendations can be provided, as required, during construction.

5.9 PLAN REVIEW AND CONSTRUCTION OBSERVATION

After final plans and specifications are complete, PSI should review the design and specifications so that the earthwork recommendations are properly interpreted and implemented. It is considered imperative that the Geotechnical Engineer and/or their representative be present during earthwork operations to observe the field conditions with respect to the design documents and specifications. PSI will not be responsible for changes in the project design or project information it was not provided, or interpretations and field quality control observations made by others. PSI would be pleased to provide these services for this project. Such reviews, responses to reviewers, conference calls, or additional scope of work beyond this report will require additional budget.

6.0 GEOTECHNICAL RISK AND REPORT LIMITATIONS

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding sections constitute PSI's professional estimate of those measures that are necessary for the proposed structure to perform according to the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.

Services performed by PSI for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in this area. No warranty, expressed or implied, is made.

The recommendations submitted are based on the subsurface information obtained by PSI, and information provided by the client, client's representative and client's design consultants. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation and/or other recommendations are required. If PSI is not retained to perform these functions, PSI cannot be responsible for the impact of those conditions on the performance of the project.

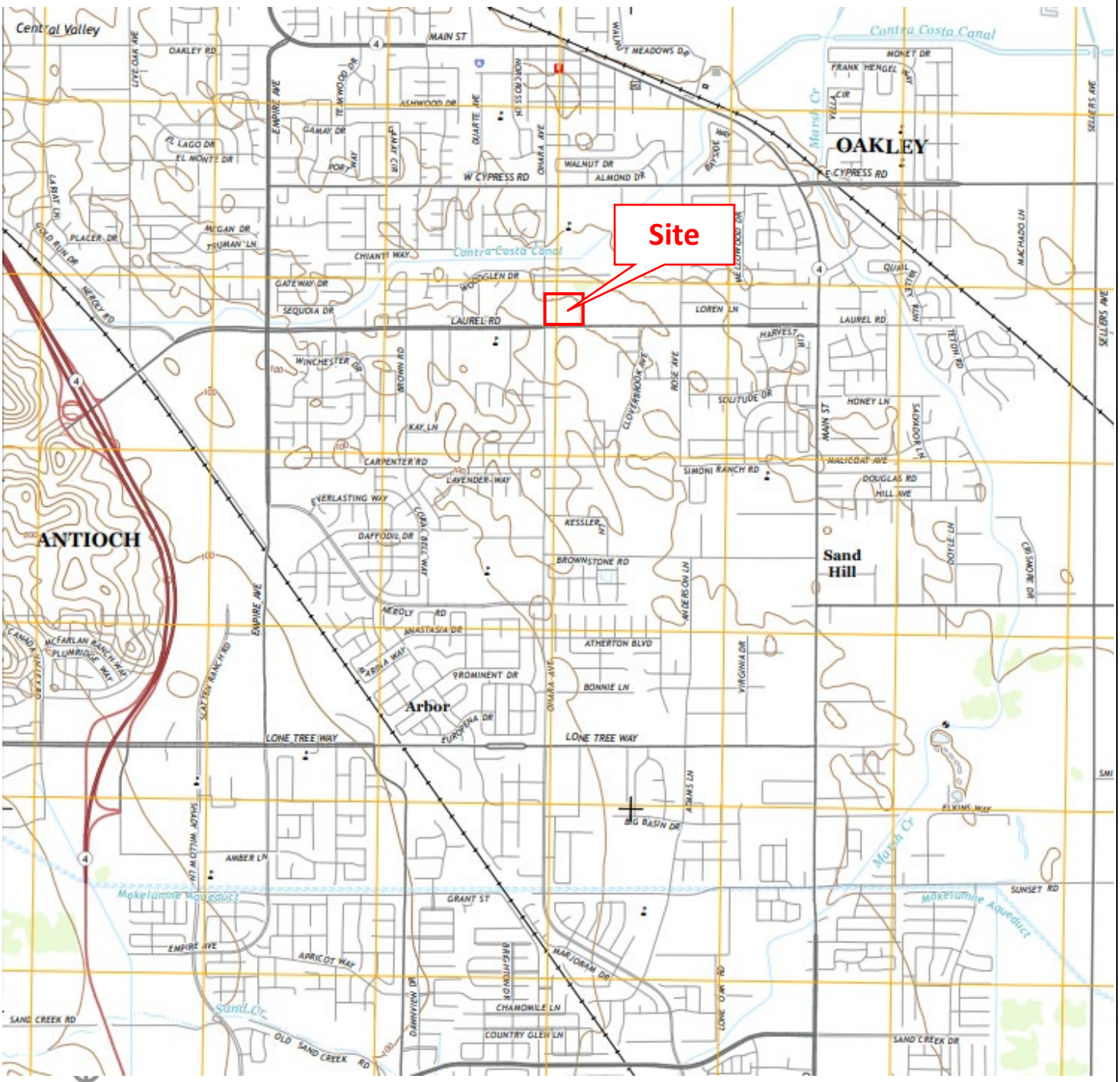
The Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations.

This report has been prepared for the exclusive use of Regency Centers, L.P., and their design consultants.

7.0 REFERENCES

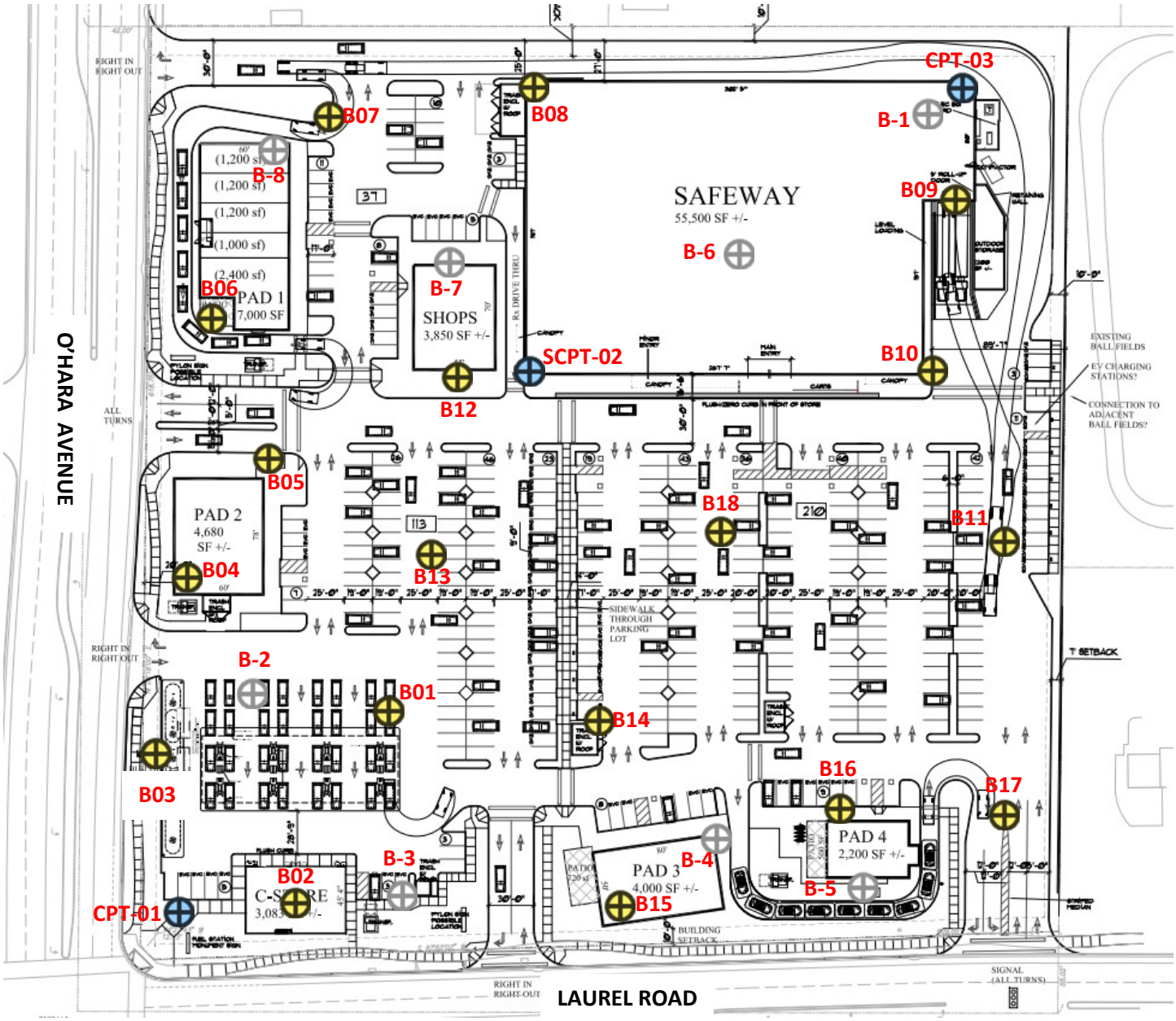
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FIGURES



Base is Brentwood 7.5-Minute Quadrangle (USGS, 2015). Figure is not to scale.

intertek psi	**DATE:** 10/30/2023	**REGENCY CENTERS, LP** **OAKLEY SHOPS AT LAUREL FIELDS** 998 Laurel Road Oakley, California 94561	**PROJECT NUMBER:** 0587814	N
INTERTEK - PSI, INC. 16170 VINEYARD BLVD., SUITE 170 MORGAN HILL, CALIFORNIA	**PREPARED BY**: RZ	**SITE VICINITY MAP**	**FIGURE 1**	



Reference – Johnson Lyman Architects, LLP, dated August 21, 2023.

LEGEND

B-8 Approximate Locations of Borings by Korbmacher Engineering, Inc. (2001).

B18 Approximate Locations of Borings by PSI

CPT-01 Approximate Locations of Cone Penetration Tests (CPT) by PSI

Approximate Scale: 1 in = 100 ft

0 50 100 200 feet

intertek psi	**DATE:** 10/30/2023	**REGENCY CENTERS, LP** **OAKLEY SHOPS AT LAUREL FIELDS** 998 Laurel Road Oakley, California 94561	**PROJECT NUMBER:** 0587814	N
INTERTEK - PSI, INC. 16170 VINEYARD BLVD., SUITE 170 MORGAN HILL, CALIFORNIA	**PREPARED BY**: RZ	**SITE PLAN**	**FIGURE 2**	

APPENDIX A

Field Exploration & Laboratory Testing Program

FIELD EXPLORATION PROGRAM

Our field exploration program consisted of performing eighteen (18) solid-stem auger borings to a maximum depth of 26½ feet for soil samples and testing and three (3) Cone Penetration Test (CPT) probes using a 20-ton track CPT rig. Prior to initiation of field drilling activities, PSI outlined the site and marked the proposed exploration locations with white paint and contacted Underground Service Alert (USA) a minimum of 48 hours prior to beginning work to locate any potential buried utilities. Additionally, PSI subcontracted a private utility location service to verify that the proposed exploration locations were clear of subsurface utilities. Drilling permits were obtained from Contra Costa County prior to subsurface exploration (Permit Nos. 0031041 and 0031042).

The subsurface exploration was conducted between October 9 through 12, 2023. The subsurface exploration locations are shown on Figure 2. Drilling was performed by H1 Drilling, Inc., out of Sacramento, California using a solid-stem auger method of drilling with a track-mounted CME-55 rig. The CPT probes were performed by ConeTec, Inc., out of Richmond, California. The soil types encountered at the specific boring locations are presented on the attached boring and CPT logs.

During the boring sampling procedure, Standard Penetration Tests (SPT) were performed in accordance with ASTM D1586 and relatively undisturbed samples were obtained in general accordance with ASTM D3550. The SPT for soil borings is performed by driving a split-spoon sampler, with an outside diameter (O.D.) of 2 inches, into the undisturbed formation located at the bottom of the advanced borehole with repeated blows of a 140-pound hammer falling a vertical distance of 30 inches. The number of blows required to drive the sampler the last 12 inches of an 18-inch penetration depth is a measure of the soil consistency (blow count). For ASTM D3550 (California Modified Sampler) the split barrel sampler possesses a 3-inch O.D. and is driven in the same manner as the SPT. The field blow counts obtained from the California Modified sampler should be adjusted to obtain a rough correlation to SPT blow counts (SPT-N value). SPT blow counts in gravel tend to over-estimate density. Samples were identified in the field, placed in sealed containers, and transported to the laboratory for further classification and testing. At the completion of drilling, the borings were backfilled with cement grout per County guidelines.

Cone Penetration Test

The CPT is an in-situ testing method used to determine the geotechnical engineering properties of soils and delineating soil lithology. The test method consists of advancing an instrumented cone tip, mechanical or electric, through several rods and at a constant rate of 2 cm/sec. The resistance needed to penetrate the ground is measured continuously. The total force acting on the cone is called the cone resistance (qc). Measurements with an electric cone, equipped with a friction sleeve, provide the local sleeve friction (fs) which can be related to the undrained shear strength of fine-grained soils and the friction resistance of cohesion less soils. The dimensionless ratio of the friction sleeve to point bearing capacity provides an indicator of the type of soil penetrated. Measurements of pore water pressure and rates of dissipation are also made with a piezometer fitted between the cone and the sleeve. CPT probe testing does not allow for visual classification of the subsurface soils, but instead classifies the soil based on a correlation between tip resistance and side friction obtained in real-time during the testing. Cone penetration test logs and data are provided in this Appendix.

Down hole shear wave velocity measurements were made while advancing SCPT-02. This test consists of generating a shear wave by striking a hammer equipped with a trigger on a source beam located on the ground surface under the outrigger of the cone rig. The seismic cone consists of a piezocone unit with a receiver above it. The seismic cone penetrometer is pushed into the ground and penetration is stopped at 3-foot intervals. During the pause in penetration, a shear wave is generated at the ground surface and the time required for the shear wave to reach the seismometer in the cone penetrometer is recorded. The shear wave velocity measurements are used with elastic theory to estimate the mass density of the soil layers. Shear wave velocity measurements are provided in Appendix A.

Pore Pressure Dissipation Tests (PPDT's) conducted at various intervals measured hydrostatic water pressures and determined the approximate depth of the ground water table. A PPDT is conducted when the cone is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (u) with time is measured behind the tip of the cone and recorded by a computer system.

Pore pressure dissipation data can be interpreted to provide estimates of:

- Equilibrium piezometric pressure
- Phreatic Surface
- In situ horizontal coefficient of consolidation (c_h)
- In situ horizontal coefficient of permeability (k_h)

In order to correctly interpret the equilibrium piezometric pressure and/or the phreatic surface, the pore pressure must be monitored until such time as there is no variation in pore pressure with time. This time is commonly referred to as t_{100}, the point at which 100% of the excess pore pressure has dissipated.

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SPT: Standard Penetration Test sampler - 1 3/8" I.D., 2" O.D.
CMS: California Modified Sampler - 2 1/2" I.D., 3" O.D.
ST: Shelby Tube - 3" O.D.
RC: Rock Core
BS: Bulk Sample

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u: Unconfined compressive strength, TSF
Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼,▽,⧩ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated

Description	Criteria
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

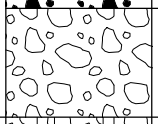
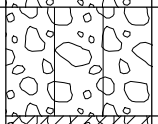
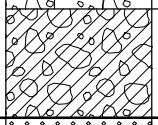
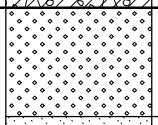
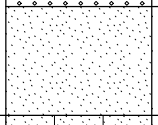
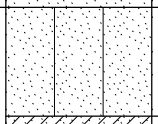
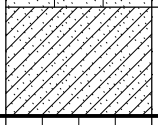
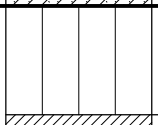
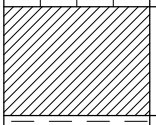
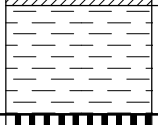
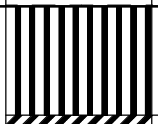
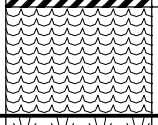
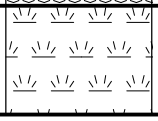
Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

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BORING B01

DATE STARTED:	10/10/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/10/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	21.5 ft	**LOGGED BY:**	R. Zeidan
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	52 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.983849°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.713432°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**EFFICIENCY**	N/A
OFFSET:	N/A	**REVIEWED BY:**	R. Zeidan

REMARKS:

Water Not Encountered

BORING LOCATION:
Southwest near Access Road

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
50	0					**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.					
					18			9-12-13	5	×	DD = 98 pcf
	5				18			3-5-5	5	×	
45					18			7-9-12	4	×	DD = 111 pcf
	10				18		SP-SM	6-7-9	4	×	
40					18			4-7-9	7	×	
	15				18			3-7-7	6	×	
35											
	20				18			5-11-14	5	×	
						Boring terminated at 21.5 feet. Boring backfilled with grout.					

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Professional Service Industries, Inc.
16170 Vineyard Blvd., Suite 170
Morgan Hill, CA 95037
Telephone: (408) 699-5500

PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B02

DATE STARTED:	10/10/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/10/23	**DRILLER:** R. Humphries	**LOGGED BY:** R. Zeidan
COMPLETION DEPTH	21.5 ft	**DRILL RIG:**	CME-55
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	55 ft	**SAMPLING METHOD:**	SS: CMS & SPT
LATITUDE:	37.983514°	**HAMMER TYPE:**	Automatic
LONGITUDE:	-121.713568°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	R. Zeidan

REMARKS:

Water: Not Encountered

BORING LOCATION:
Southwest near C-Store

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.					
					18			9-8-11	3	×	DD = 101 pcf
50	5				18			4-5-7	4	×	5% passing #200
					18		SP-SM	8-10-15	4	×	DD = 96 pcf
45	10				18			5-6-7	5	×	
					18			5-7-10	5	×	
40	15				18	**Poorly graded SAND**, medium dense, light brown, fine grained, slightly moist.		4-8-8	4	×	4% passing #200
							SP				
35	20				18			4-6-6	5	×	
						Boring terminated at 21.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B03

DATE STARTED:	10/10/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/10/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	21.5 ft	**LOGGED BY:**	R. Zeidan
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	51 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.983688°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.713881°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water Not Encountered

BORING LOCATION:
Southwest near O'Hara

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
50	0					**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.					
					18			7-10-13	3	×	DD = 117 pcf
45	5				18			4-7-8	4	×	Sieve Analysis
					18			8-13-16	4	×	DD = 108 pcf Direct Shear
40	10				18		SP-SM	5-8-9	4	×	
					18			5-7-8	4	×	
35	15				18			4-4-6	4	×	
30	20				18			6-7-7	6	×	
						Boring terminated at 21.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B04

DATE STARTED:	10/10/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/10/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	21.5 ft	**LOGGED BY:**	R. Zeidan
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	48 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.984082°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.713864°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**EFFICIENCY**	N/A
OFFSET:	N/A	**REVIEWED BY:**	R. Zeidan

Water Not Encountered

BORING LOCATION:
West near Pad 2

See Figure 2

REMARKS:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
45	0				18	**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.		10-8-10	4	×	DD = 108 pcf
	5				18			4-5-6	4	×	7% passing #200
40					18			8-10-13	4	×	DD = 114 pcf
	10				18		SP-SM	5-7-9	4	×	
35					18			5-7-10	4	×	
	15				18			5-7-7	4	×	
30											
	20				18			6-8-12	5	×	8% passing #200
						Boring terminated at 21.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B05

DATE STARTED:	10/10/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/10/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	21.5 ft	**LOGGED BY:**	R. Zeidan
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	45 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.984318°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.713629°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water Not Encountered

BORING LOCATION:
West near Pad 2

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0				36	**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.					>>◎ Corrosion Series
					18			7-8-9	4	×	DD = 100 pcf
40	5				18	...loose.		3-3-5	4	×	8% passing #200
					18	...medium dense.		7-10-11	4	×	DD = 106 pcf
35	10				18		SP-SM	4-5-7	5	×	
					18			6-10-14	7	×	
30	15				18			8-9-12	4	×	
25	20				18	... mixed with sandy lean clay, low plasticity.		10-13-16	21	×	
						Boring terminated at 21.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B06

DATE STARTED:	10/10/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/10/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	21.5 ft	**LOGGED BY:**	R. Zeidan
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	42 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.984589°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.713775°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water Upon Completion 18 feet

BORING LOCATION:
Northwest near Pad 1

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
40	0				18	**Poorly graded SAND with silt**, medium dense, reddish brown, fine grained, slightly moist.		7-9-15	6	×	DD = 98 pcf 8% passing #200
	5				18	...loose.	SP-SM	4-5-4	6	×	
35					18			5-6-7	9	×	DD = 107 pcf
	10				18	**Clayey SAND**, medium dense, brown, fine grained, moist.	SC	5-12-15	15	×	
30					18	**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.		8-11-12	6	×	
	15				18		SP-SM	8-10-10	6	×	
25											
	20				18	...mixed with sandy lean clay, low plasticity, wet.		1-5-9	25	×	
						Boring terminated at 21.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B07

DATE STARTED:	10/11/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/11/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	11.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	38 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.985012°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.713408°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**EFFICIENCY**	N/A
OFFSET:	N/A	**REVIEWED BY:**	R. Zeidan

REMARKS:

Water ▽ Not Encountered

BORING LOCATION:
Northwest Drive Aisle

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0				12	**Poorly graded SAND with silt**, medium dense, light brown, slightly moist.		4-10-14	3	×	
35					18			10-10-11	4	×	DD = 104 pcf
	5				18		SP-SM	7-7-6	6	×	Sieve Analysis
30					18			5-6-7	5	×	DD = 106 pcf
	10				18			5-5-6	6	×	
						Boring terminated at 11.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B08

DATE STARTED:	10/11/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/11/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	26.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	38 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.985008°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.712894°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**EFFICIENCY**	N/A
OFFSET:	N/A	**REVIEWED BY:**	R. Zeidan

REMARKS:

Water Upon Completion 17.5 feet

BORING LOCATION:
Northwest Corner Safeway Bldg.

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.					
35					18			8-12-14	7	×	DD = 101 pcf
	5				18	...loose.	SP-SM	5-5-4	6	×	8% passing #200
30					18	...medium dense.		5-6-7	4	×	DD = 101 pcf
	10				18			4-5-5	5	×	
25					18	**Silty SAND**, light brown to brown, medium dense, fine grained, moist.		5-6-8			13% passing #200
	15				18			5-6-8	16	×	
20							SM				
	20				18	...dense.		9-16-22	24	×	
15						**Clayey SAND**, brown, medium dense, fine grained, moist to wet.	SC				
	25				18			5-7-11	32	×	
						Boring terminated at 26.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B09

DATE STARTED:	10/11/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/11/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	26.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	37 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.984874°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.712042°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water Upon Completion 18 feet

BORING LOCATION:
Northeast Corner/Truck Dock

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
35	0				18	**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.		5-10-11	2	×	Corrosion Series
					18			7-8-7	5	×	DD = 108 pcf
30	5				18	...loose.	SP-SM	3-4-3	4	×	
					18	...medium dense.		6-8-9	5	×	DD = 112 pcf
25	10				18			5-5-7			6% passing #200
					18	**Silty SAND**, light brown to brown, medium dense, fine grained, moist.		6-7-8	4	×	
20	15				18		SM	5-7-7	12	×	
	20				18	...dense.		11-17-27	22	×	
15						**Clayey SAND**, brown, medium dense, fine grained, moist to wet.	SC				
	25				18			5-7-12	23	×	
						Boring terminated at 26.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B10

DATE STARTED:	10/11/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/11/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	26.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	40 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.984603°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.712066°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**EFFICIENCY**	N/A
OFFSET:	N/A	**REVIEWED BY:**	R. Zeidan

REMARKS:

Water Upon Completion 19.5 feet

BORING LOCATION:
Southeast Corner Safeway Bldg.

See Figure 2

Elevation (feet)	Depth, (feet)	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
40	0	14	**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.		6-13-11	3	
		18			9-9-10	5	DD = 106 pcf
35	5	18			5-5-6	5	
		18			7-10-11	4	DD = 104 pcf
30	10	18			6-7-9	5	
		18		SP-SM	5-8-8	3	
25	15	18	...dense.		7-13-18	5	
20	20	18			5-7-8	22	
15	25	18	**Clayey SAND**, brown, medium dense, fine grained, moist to wet.	SC	5-8-7	24	
			Boring terminated at 26.5 feet. Boring backfilled with grout.				

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◪ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B11

DATE STARTED:	10/11/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/11/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	11.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	44 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.984142°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.711921°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**EFFICIENCY**	N/A
OFFSET:	N/A	**REVIEWED BY:**	R. Zeidan

REMARKS:

Water Not Encountered

BORING LOCATION:
East Side Drive Aisle

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0				15	**Poorly graded SAND with silt**, medium dense, light brown, slightly moist.		4-5-7	2	×	
40					18			12-12-12	3	×	DD = 92 pcf
	5				18		SP-SM	5-7-8	4	×	
					18			9-11-14	4	×	DD = 103 pcf
35											
	10				18			6-8-9	5	×	
						Boring terminated at 11.5 feet. Boring backfilled with grout.					

intertek psi

Professional Service Industries, Inc.
16170 Vineyard Blvd., Suite 170
Morgan Hill, CA 95037
Telephone: (408) 699-5500

PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B12

DATE STARTED:	10/12/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/12/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	21.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	41 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.984534°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.713043°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water ▽ Upon Completion 19.5 feet

BORING LOCATION:
Center near Shops Bldg.

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
40	0				15	**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.		5-7-6	3	×	
					18			6-7-11	3	×	DD = 107 pcf
35	5				18			5-7-10	4	×	5% passing #200
					18			11-15-20	3	×	DD = 104 pcf
30	10				18		SP-SM	8-10-13	13	×	
					18			8-10-15	5	×	
25	15				18			10-13-16	6	×	
20	20				18	... dense, mixed with sandy lean clay, low plasticity, moist to wet.		7-12-19	20	×	
						Boring terminated at 21.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B13

DATE STARTED:	10/12/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/12/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	11.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	45 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.984198°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.713219°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water Not Encountered

BORING LOCATION:
Center parking area

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0				14	**Poorly graded SAND with silt**, medium dense, light brown, slightly moist.		11-11-8	6	×	
					18			7-7-10	4	×	DD = 100 pcf
40	5				18		SP-SM	4-6-7	6	×	
					18			8-10-14	10	×	DD = 126 pcf
35	10				18			6-8-11	5	×	
						Boring terminated at 11.5 feet. Boring backfilled with grout.					

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Professional Service Industries, Inc.
16170 Vineyard Blvd., Suite 170
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Telephone: (408) 699-5500

PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B14

DATE STARTED:	10/12/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/12/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	11.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	49 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.983803°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.712938°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water Not Encountered

BORING LOCATION:
Center parking area

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
	0				12	**Poorly graded SAND with silt**, loose to medium dense, light brown, slightly moist.		3-4-5	2	×	
45					18			5-6-10	4	×	DD = 102 pcf
	5				18		SP-SM	4-6-7	4	×	
					18			8-11-14	4	×	DD = 100 pcf
40	10				18			5-5-7	5	×	
						Boring terminated at 11.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B15

DATE STARTED:	10/12/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/12/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	21.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	55 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.983492°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.712799°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water Not Encountered

BORING LOCATION:
South near Pad 3

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0				18	**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.		6-13-16	2	×	
					18			12-12-12	4	×	DD = 107 pcf
50	5				18	...loose.		4-4-4	4	×	Sieve Analysis
					18	...medium dense, increase in silt content.		6-7-10	4	×	DD = 103 pcf
45	10				18		SP-SM	5-5-7	5	×	
					18			5-6-7	6	×	
40	15				18			6-6-7	6	×	
35	20				18			9-12-14	8	×	
						Boring terminated at 21.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B16

DATE STARTED:	10/12/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/12/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	21.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	48 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.983683°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.71229°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water Not Encountered

BORING LOCATION:
Southeast near Pad 4

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0				13	**Poorly graded SAND with silt**, medium dense, light brown, fine grained, slightly moist.		5-11-12	3	×	Corrosion Series
45					18			9-11-11	4	×	
	5				18	...loose.		4-5-5	5	×	
40					18	...medium dense, increase in silt content.		8-9-7	4	×	DD = 105 pcf
	10				18		SP-SM	4-5-6	5	×	
35					18			4-6-6	5	×	
	15				18			6-12-14	12	×	
30											
	20				18			6-8-11	8	×	
						Boring terminated at 21.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B17

DATE STARTED:	10/12/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/12/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	11.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	45 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.98373°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.711902°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water Not Encountered

BORING LOCATION:
Southeast Drive Aisle

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0				12	**Poorly graded SAND with silt**, medium dense, light brown, slightly moist.		3-6-6	2	×	4% passing #200
					18			6-5-5	4	×	DD = 97 pcf
40	5				18	...loose.	SP-SM	2-1-2	5	×	
					18	...medium dense.		6-9-10	4	×	DD = 110 pcf
35	10				18			5-5-6	12	×	
						Boring terminated at 11.5 feet. Boring backfilled with grout.					

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PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B18

DATE STARTED:	10/12/23	**DRILL COMPANY:**	H1 Drilling, Inc.
DATE COMPLETED:	10/12/23	**DRILLER:**	R. Humphries
COMPLETION DEPTH	11.5 ft	**LOGGED BY:**	C. Hoadley
BENCHMARK:	N/A	**DRILL RIG:**	CME-55
ELEVATION:	48 ft	**DRILLING METHOD:**	Solid Stem Auger
LATITUDE:	37.984168°	**SAMPLING METHOD:**	SS: CMS & SPT
LONGITUDE:	-121.712519°	**HAMMER TYPE:**	Automatic
STATION:	N/A	**OFFSET:**	N/A
REMARKS:		**EFFICIENCY**	N/A
		REVIEWED BY:	R. Zeidan

Water Not Encountered

BORING LOCATION:
Center parking area

See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0										
					16	**Poorly graded SAND with silt**, medium dense, light brown, slightly moist.		6-10-12	2	×	
45					18			7-10-12	3	×	DD = 105 pcf
	5				18		SP-SM	10-13-14	5	×	
40					18			8-9-13	4	×	DD = 103 pcf
	10				18			5-6-7	5	×	
						Boring terminated at 11.5 feet. Boring backfilled with grout.					

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Telephone: (408) 699-5500

PROJECT NO.: 0587814
PROJECT: Regency Centers, LP Oakley Dev
LOCATION: Laurel Road and O'Hara Avenue
Oakley, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

Job No:	23-56-26659
Client:	Intertek PSI
Project:	Regency Centers, LP, Oakley Dev
Start Date:	2023-10-09
End Date:	2023-10-09

CONE PENETRATION TEST SUMMARY

Sounding ID	File Name	Date	Rig	Cone	Cone Area (cm^2)	Assumed Phreatic Surface[1] (ft)	Final Depth (ft)	Shear Wave Velocity Tests	Northing[2] (m)	Easting[2] (m)	Surface Elevation[3] (ft)	Refer to Notation Number
CPT-01	23-56-26659_CP01	2023-10-09	C05-032	964:T1500F15U35	15	22.3	50.44		4204764	612948	43	4
SCPT-02	23-56-26659_SP02	2023-10-09	C05-032	964:T1500F15U35	15	22.3	88.83	27	4204887	613027	34	
CPT-03	23-56-26659_CP03	2023-10-09	C05-032	964:T1500F15U35	15	19.9	50.52		4204936	613115	28	
Totals	3 Soundings						189.79	27				

1. The assumed phreatic surface was based off the shallowest pore pressure dissipation tests performed within or nearest the sounding. Hydrostatic conditions were assumed for the calculated parameters.
2. The coordinates were collected using a MR-350 Global Sat GPS receiver. EPSG number: 32610 (WGS84 / UTM Zone 10).
3. Elevations are referenced to the ground surface and were acquired from the Google Earth Elevation for the recorded coordinates.
4. The assumed phreatic surface was based on SCPT-02.

Job No:	23-56-26659
Client:	Intertek PSI
Project:	Regency Centers, LP, Oakley Dev
Start Date:	2023-10-09
End Date:	2023-10-09

CPTu PORE PRESSURE DISSIPATION SUMMARY

Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U_{eq} (ft.)	Calculated Phreatic Surface (ft.)	Refer to Notation Number
CPT-01	23-56-26659_CP01	15	600	31.0			1
SCPT-02	23-56-26659_SP02	15	600	34.4	12.1	22.3	
CPT-03	23-56-26659_CP03	15	600	33.7	13.8	19.9	
Total:			**30.0 Mins**				

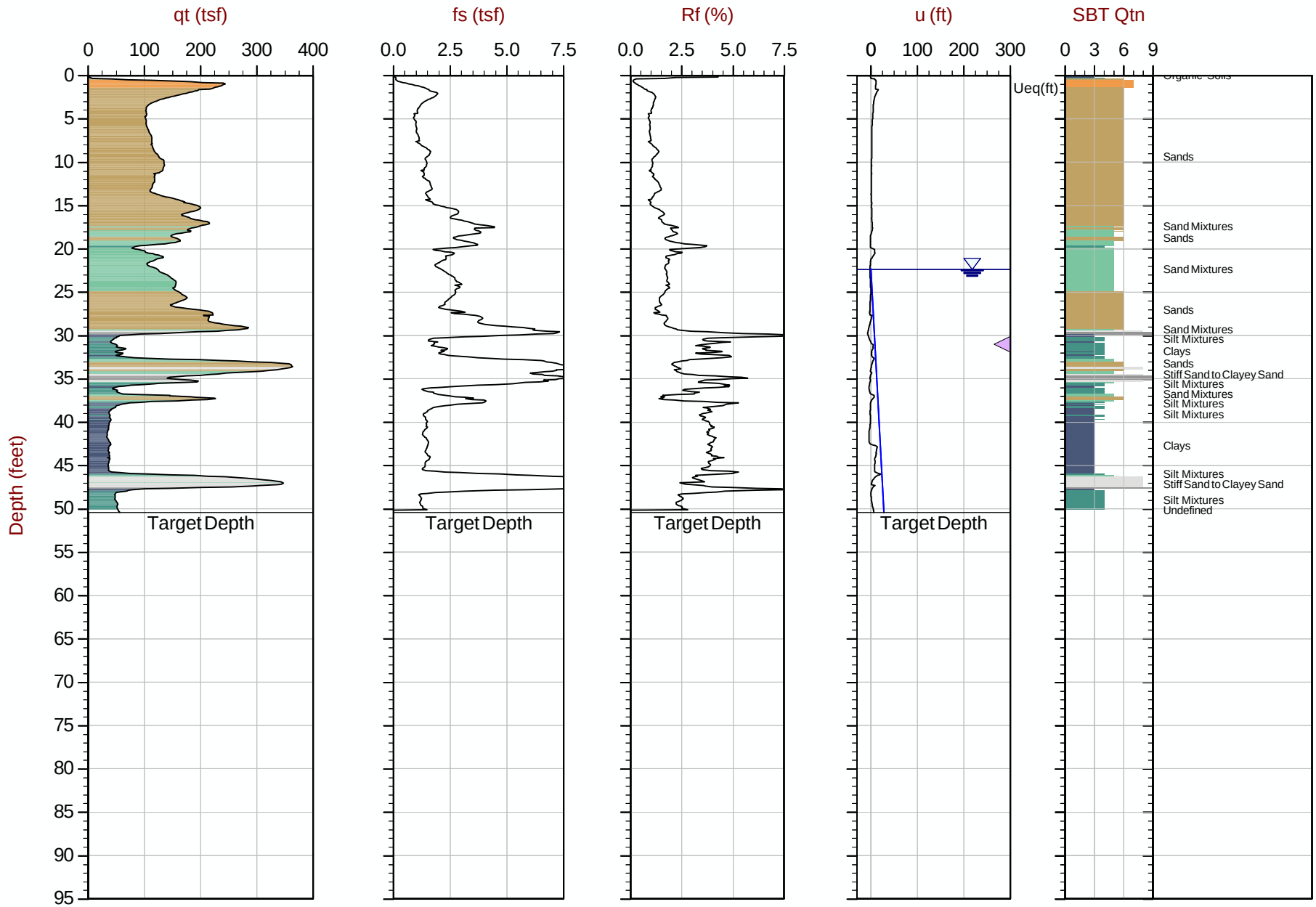
1. Equilibrium pore pressure not achieved.

CONETEC

Intertek PSI

Job No: 23-56-26659
Date: 2023-10-09 10:09
Site: Regency Centers, LP, Oakley Dev

Sounding: CPT-01
Cone: 964:T1500F15U35



Max Depth: 15.375 m / 50.44 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-26659_CP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM ZONE 10) N: 4204764m E: 612948m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

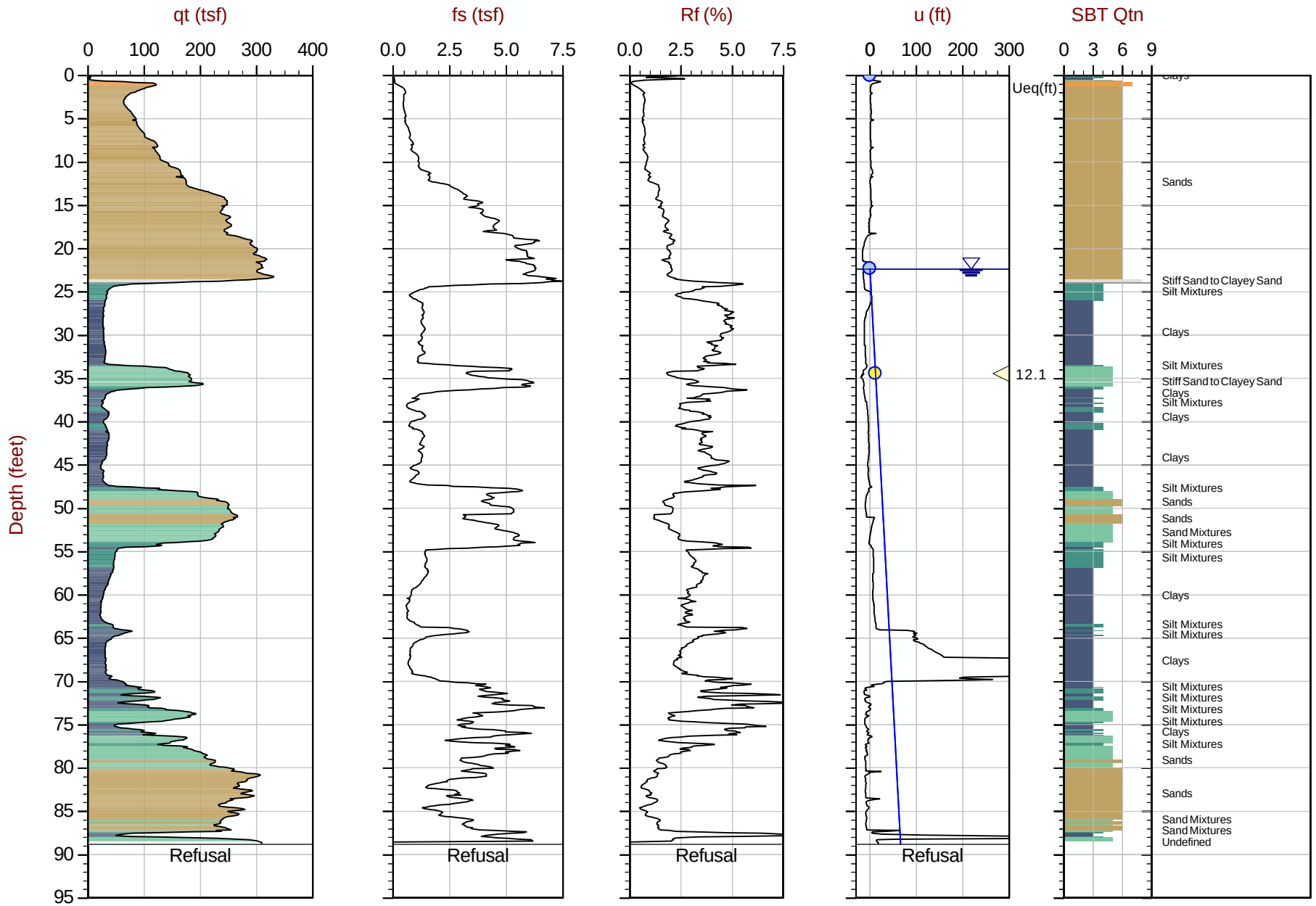
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Intertek PSI

Job No: 23-56-26659
Date: 2023-10-09 12:19
Site: Regency Centers, LP, Oakley Dev

Sounding: SCPT-02
Cone: 964:T1500F15U35



Max Depth: 27.075 m / 88.83 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-26659_SP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM ZONE 10) N: 4204887m E: 613027m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

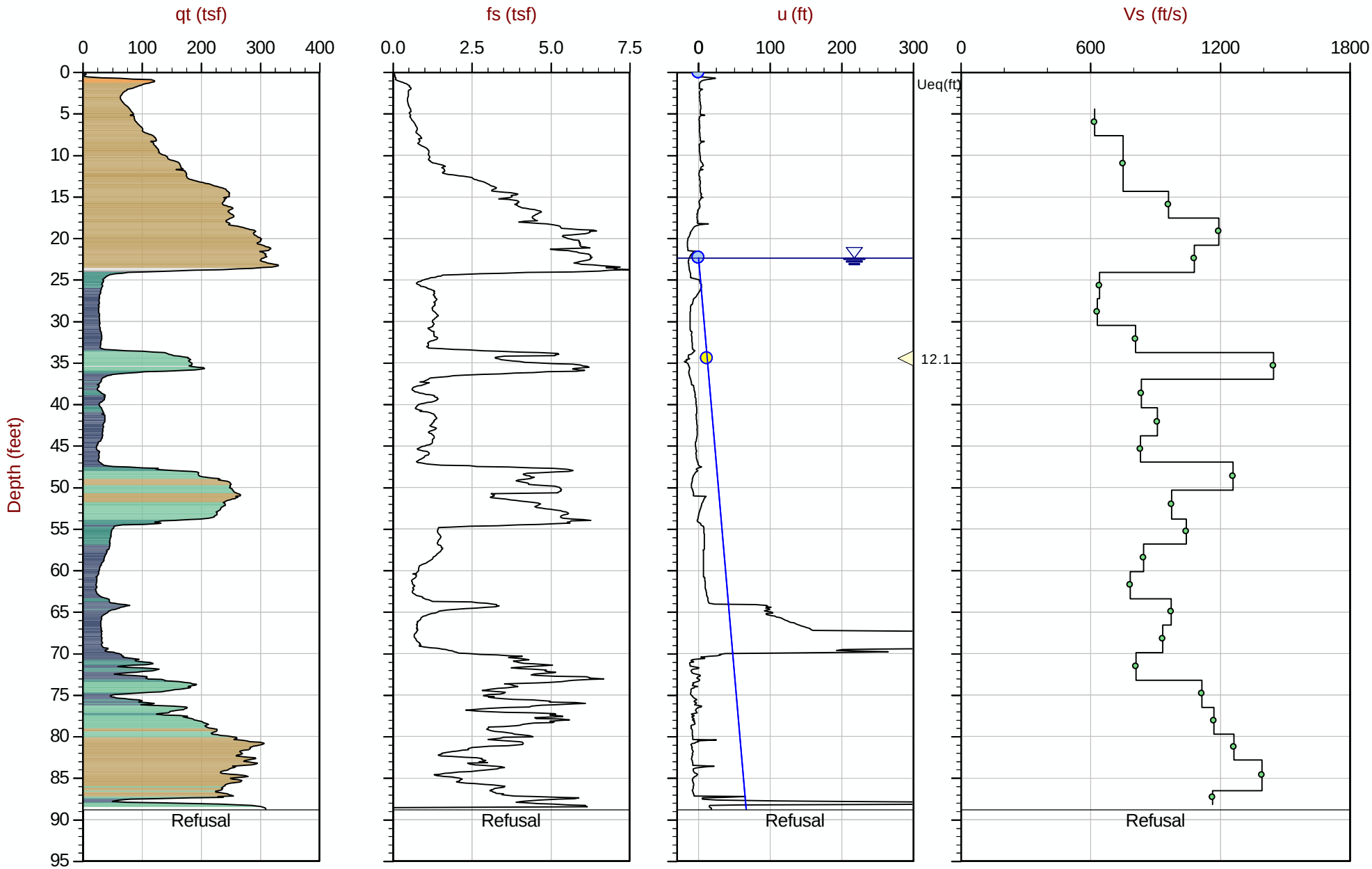
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Intertek PSI

Job No: 23-56-26659
Date: 2023-10-09 12:19
Site: Regency Centers, LP, Oakley Dev

Sounding: SCPT-02
Cone: 964:T1500F15U35



Max Depth: 27.075 m / 88.83 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-26659_SP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM ZONE 10) N: 4204887m E: 613027m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

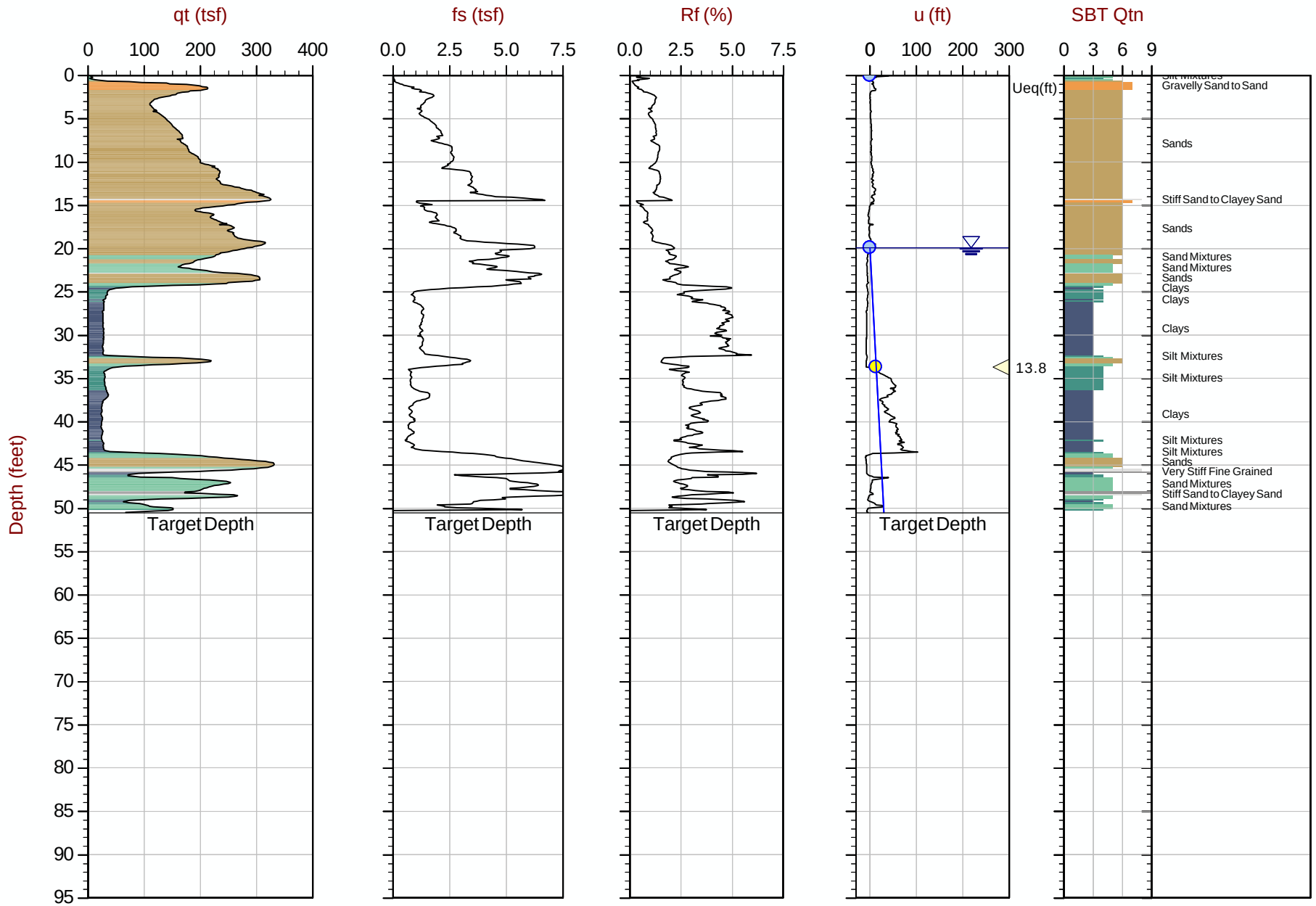
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Intertek PSI

Job No: 23-56-26659
Date: 2023-10-09 14:43
Site: Regency Centers, LP, Oakley Dev

Sounding: CPT-03
Cone: 964:T1500F15U35



Max Depth: 15.400 m / 50.52 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-26659_CP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM ZONE 10) N: 4204936m E: 613115m

Hydrostatic Line ○ Ueq ● Assumed Ueq ◁ PPD, Ueq achieved ◁ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

LABORATORY TESTING PROGRAM AND PROCEDURES

The soil samples obtained during the field exploration were transported to soil laboratories and selected soil samples were tested to determine the material properties for evaluation. Laboratory testing on selected samples included moisture content (ASTM D2216), density (ASTM D2937), gradation wash (ASTM D1140), sieve analysis (ASTM D6913), and direct shear (ASTM D3080). Corrosion series for pH, Sulfate, Chloride, and minimum Electrical Resistivity were tested according to CTM-417, -422, and -643, and ASTM G 57-78. Laboratory testing was performed in general accordance with ASTM and Caltrans procedures. Unless otherwise informed, the soil samples will be discarded 60 days from the issuance of this report. Laboratory test results are provided below.

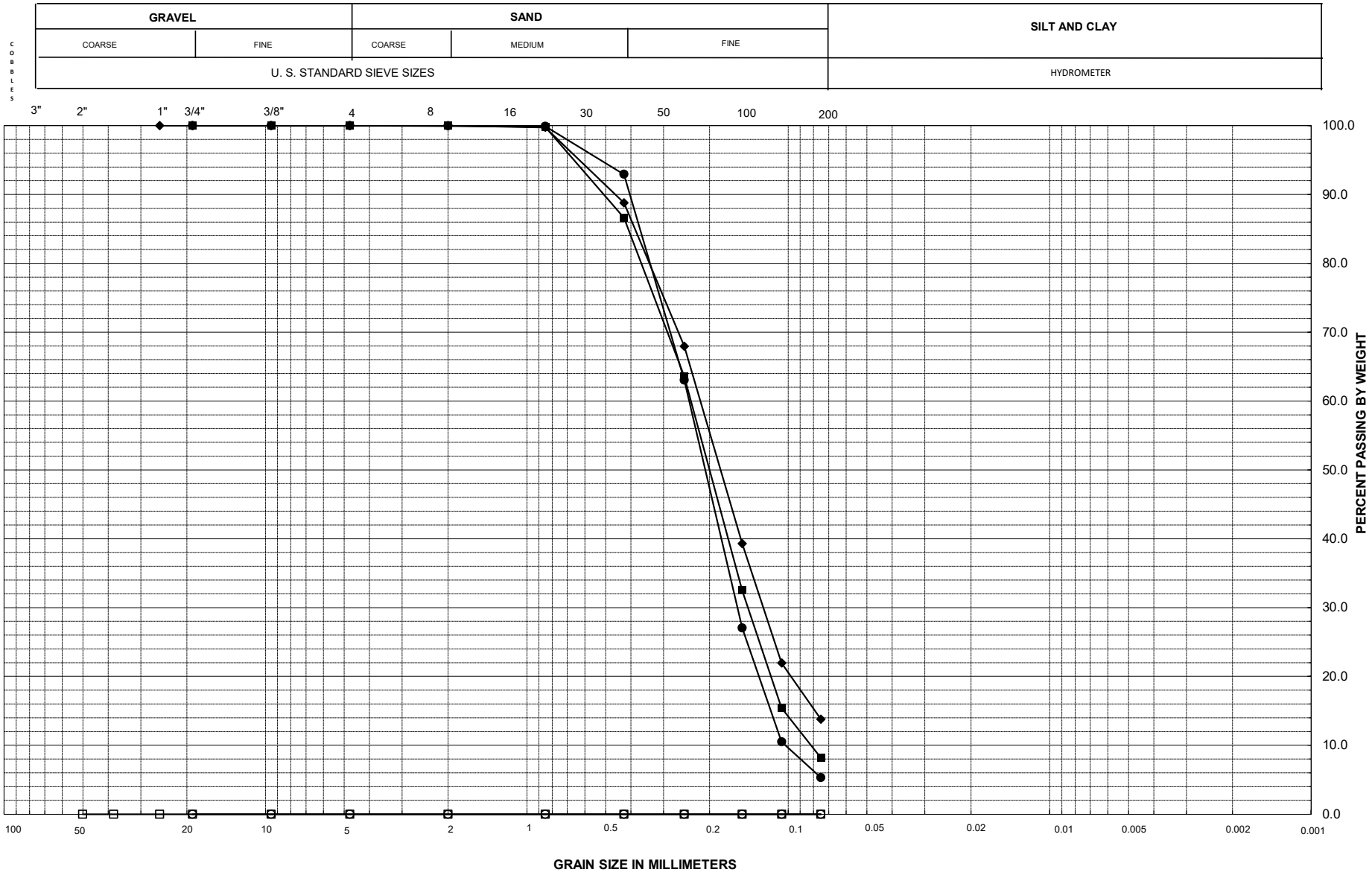
Visual-Manual Classification

The soil samples were classified in general accordance with guidelines presented in ASTM D2487. Certain terminology incorporating current local engineering practice, as provided in the Soil Classification Chart, is included with, or in lieu of, ASTM terminology. The term which best described the major portion of the sample was used in determining the soil type (i.e., gravel, sand, silt or clay).

LABORATORY TEST RESULTS SUMMARY TABLE

Boring	Depth (ft.)	USCS Soil Type	Test	Result
B02	5	Poorly graded SAND with silt (SP-SM)	Gradation Wash	5% Passing #200
B02	15	Poorly graded SAND (SP)	Gradation Wash	4% Passing #200
B03	5	Poorly graded SAND with silt (SP-SM)	Sieve Analysis	See Plot
B03	7.5	Poorly graded SAND with silt (SP-SM)	Direct Shear	See Attached
B04	5	Poorly graded SAND with silt (SP-SM)	Gradation Wash	7% Passing #200
B04	20	Poorly graded SAND with silt (SP-SM)	Gradation Wash	8% Passing #200
B05	5	Poorly graded SAND with silt (SP-SM)	Gradation Wash	8% Passing #200
B05	1-3	Poorly graded SAND with silt (SP-SM)	Corrosion Series	See Attached
B06	2.5	Poorly graded SAND with silt (SP-SM)	Gradation Wash	8% Passing #200
B07	5	Poorly graded SAND with silt (SP-SM)	Sieve Analysis	See Plot
B08	5	Poorly graded SAND with silt (SP-SM)	Gradation Wash	8% Passing #200
B08	12.5	Silty SAND (SM)	Gradation Wash	13% Passing #200
B09	10	Poorly graded SAND with silt (SP-SM)	Gradation Wash	6% Passing #200
B09	1-3	Poorly graded SAND with silt (SP-SM)	Corrosion Series	See Attached
B12	5	Poorly graded SAND with silt (SP-SM)	Gradation Wash	5% Passing #200
B15	5	Poorly graded SAND with silt (SP-SM)	Sieve Analysis	See Plot
B16	1-3	Poorly graded SAND with silt (SP-SM)	Corrosion Series	See Attached
B17	1	Poorly graded SAND (SP)	Gradation Wash	4% Passing #200

UNIFIED SOIL CLASSIFICATION



Exploration No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% Fines	Description and Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
B03		5-6.5	●	4.0	NP	NP	6	Poorly Graded SAND with Silt (SP-SM)	0.24	0.16	0.11	2.2	1.0
B07		5-6.5	◆	6.0	NP	NP	14	Poorly Graded SAND with Silt (SP-SM)	0.22	0.12	0.06	3.7	1.1
B15		5-6.5	■	4.0	NP	NP	8	Poorly Graded SAND with Silt (SP-SM)	0.24	0.15	0.08	3.0	1.2

REGENCY CENTERS, LP OAKLEY DEV

PROJECT NO. 0587814

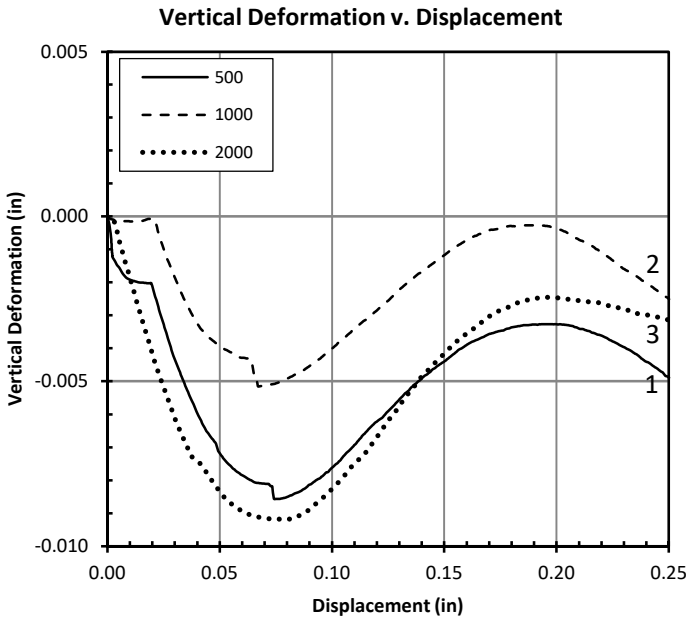
PARTICLE-SIZE DISTRIBUTION CURVES ASTM D6913

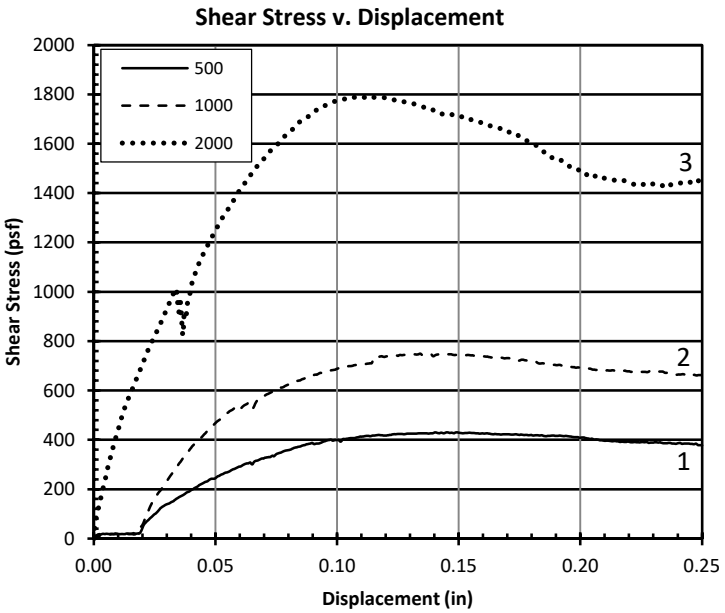
intertek psi

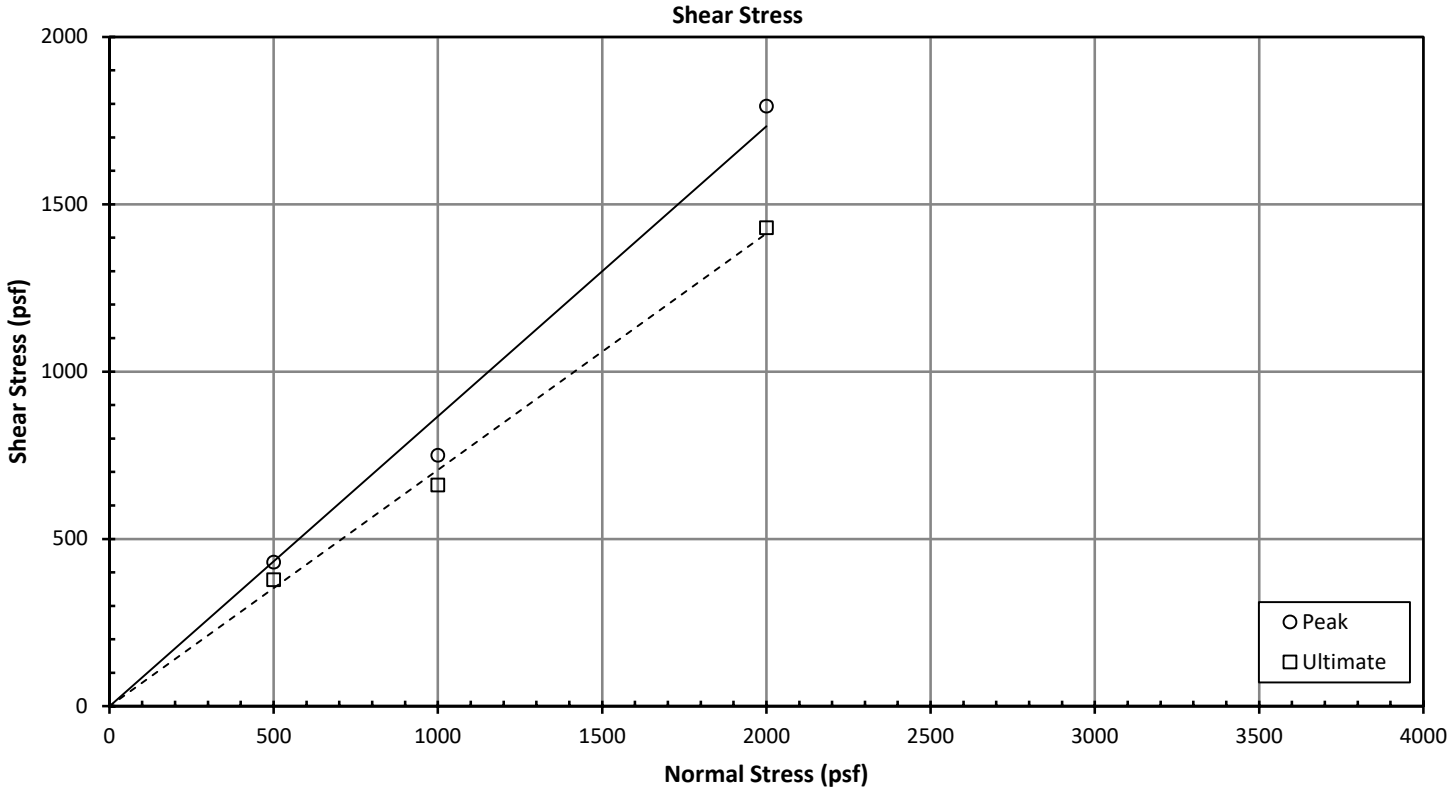
Samples Tested	1	2	3
Boring ID	**B3**	**B3**	**B3**
Depth (in/ft.)	**7.5**	**7.5**	**7.5**
Initial Moisture Content (%)	3.62	3.62	3.62
Initial Dry Density (pcf)	114.79	108.13	110.13
Final Moisture Content (%)	16.46	18.63	17.63
Normal Stress (psf)	500	1000	2000
Maximum Shear Stress (psf)	431	749	1792
Ultimate Shear Stress (psf)	378	661	1429
ASTM D3080 Soil Type	SP-SM		

	Peak	Ultim.
Friction, ϕ (Deg)	41	35
Cohesion (psf)	0	0

Sample Type:	InSitu
Method:	Drained
Consolidation:	Yes
Saturation:	Yes
Strain Rate (in/min):	0.0032







intertek psi

DIRECT SHEAR TEST RESULTS

Regency Centers LLP

NEC Laurel Rd+O'Hara Ave., Oakley, CA

P.N.: 0587814

Date: 10/19/2023

Corrosivity Tests Summary

CTL # 781-052 **Date:** 10/17/2023 **Tested By:** PJ **Checked:** PJ

Client: Intertek-PSI **Project:** Regency Centers/Oakley **Proj. No:** 0587814

Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP (Redox)		Sulfide	Moisture	Soil Visual Description
			As Rec.	Min	Sat.	mg/kg	mg/kg	%				Qualitative	At Test	
						Dry Wt.	Dry Wt.	Dry Wt.		E_H (mv)	At Test	by Lead	%	
Boring	Sample, No.	Depth, ft.	ASTM G57	Cal 643	ASTM G57	ASTM D4327	ASTM D4327	ASTM D4327	ASTM G51	ASTM G200	Temp °C	Acetate Paper	ASTM D2216	
B5	-	1-3		-	-	<2	15	0.0015	7.6	-	-	-	1.0	Brown Silty SAND, trace organics
B9	-	1-3	7,508	-	-	11	17	0.0017	8.0	-	-	-	13.9	Brown SAND w/ Silt, trace organics
B16	-	1-3	15,750	-	-	2	11	0.0011	8.1	-	-	-	9.3	Yellowish Brown Silty SAND, trace organics

APPENDIX B

LIQUEFACTION ANALYSIS

Intertek-PSI
16170 Vineyard Blvd., Ste 170
Morgan Hill, CA 95037

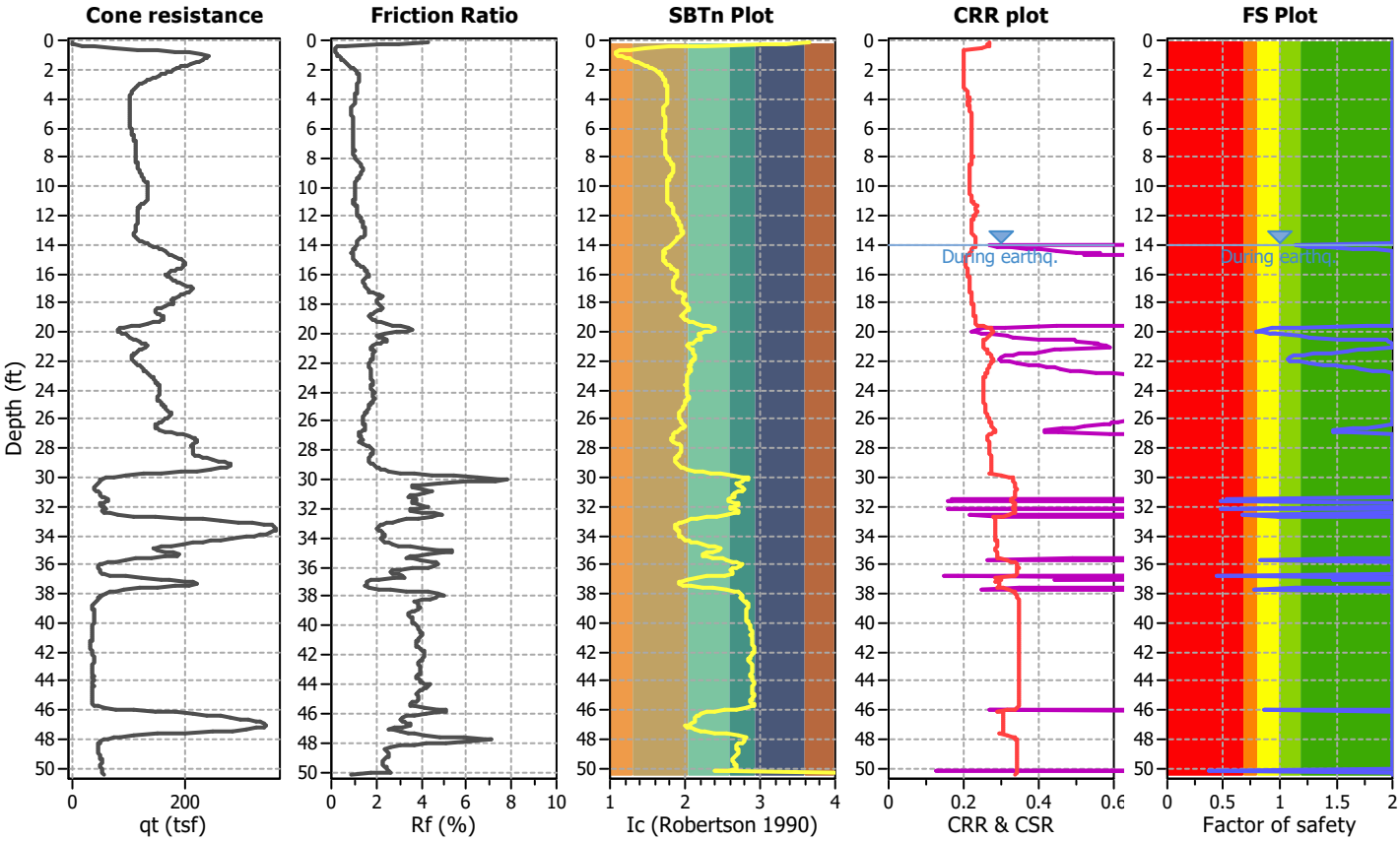
LIQUEFACTION ANALYSIS REPORT

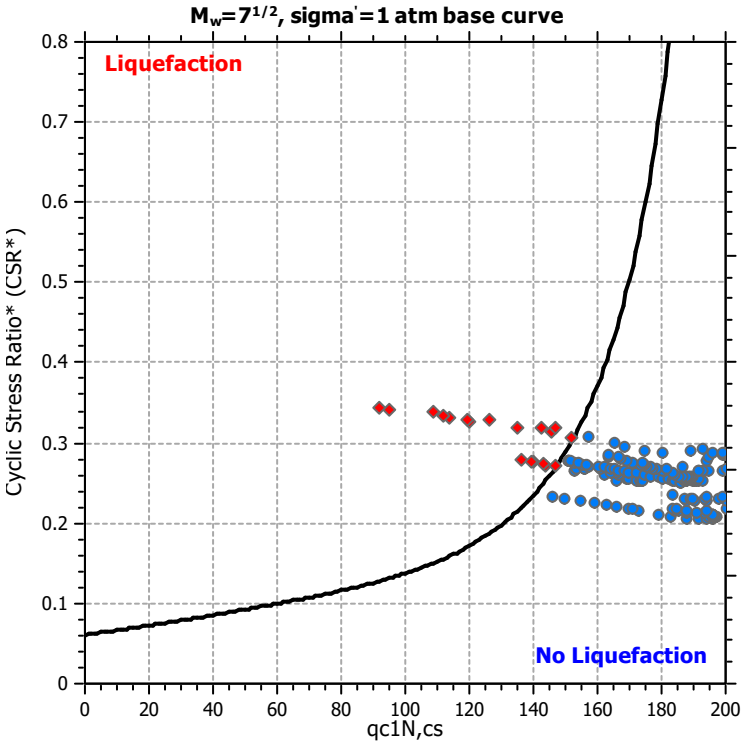
Project title : Oakley Shops at Laurel Fields **Location : Oakley, California**

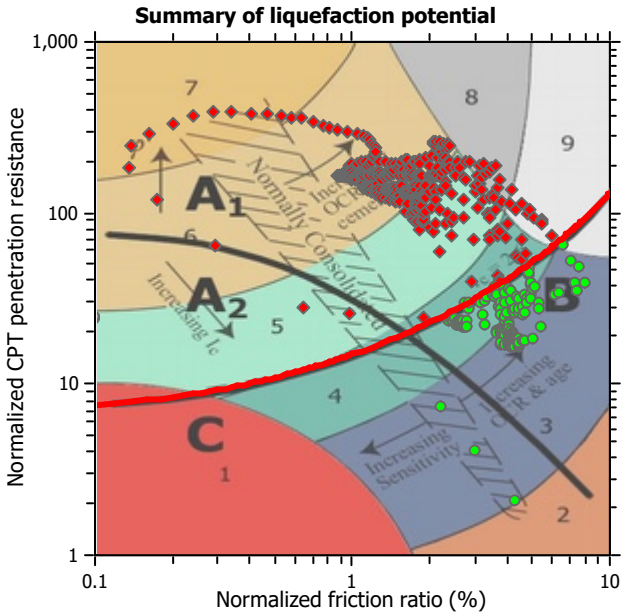
CPT file : CPT-01

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	17.50 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	14.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	6.60	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.47	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

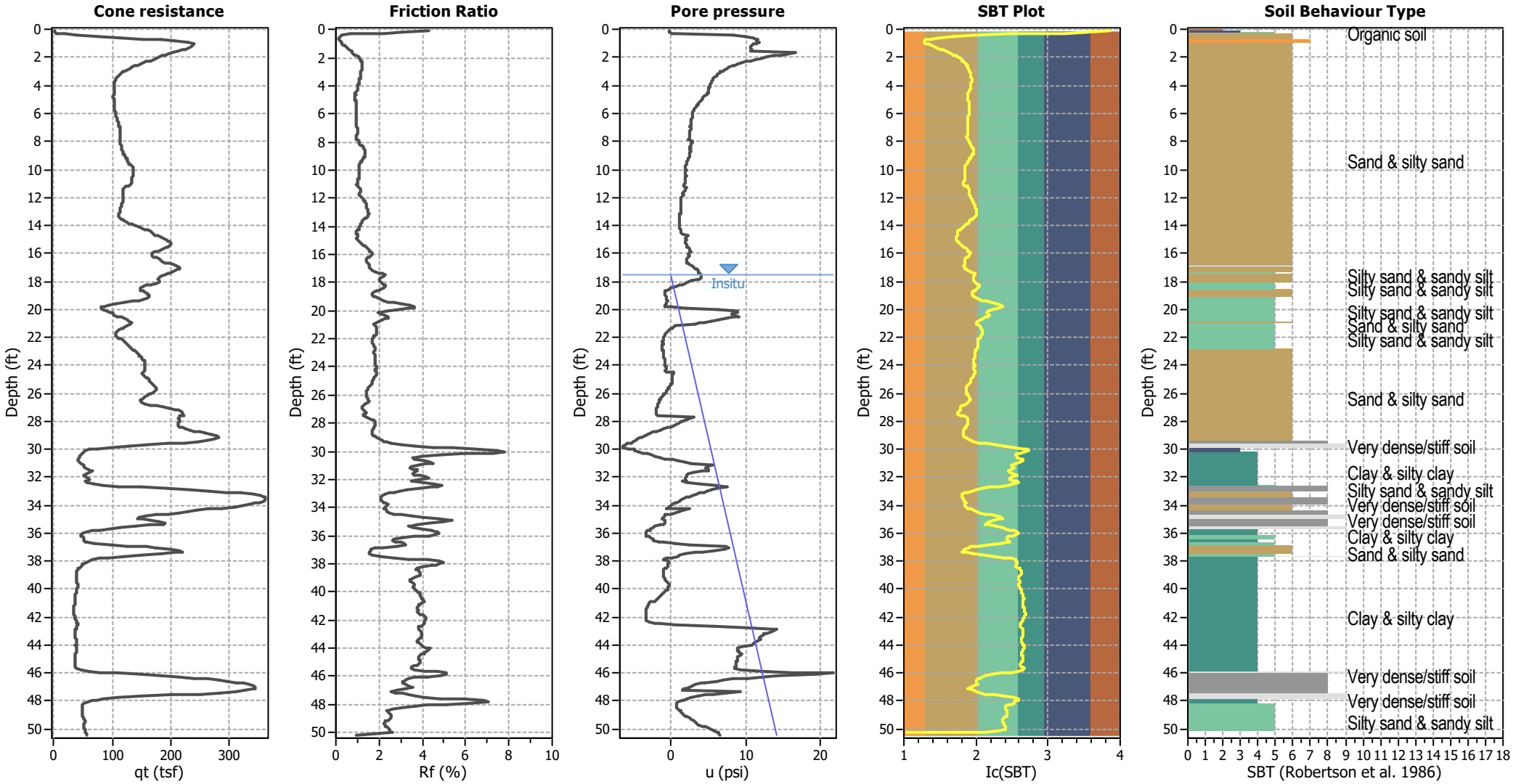






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



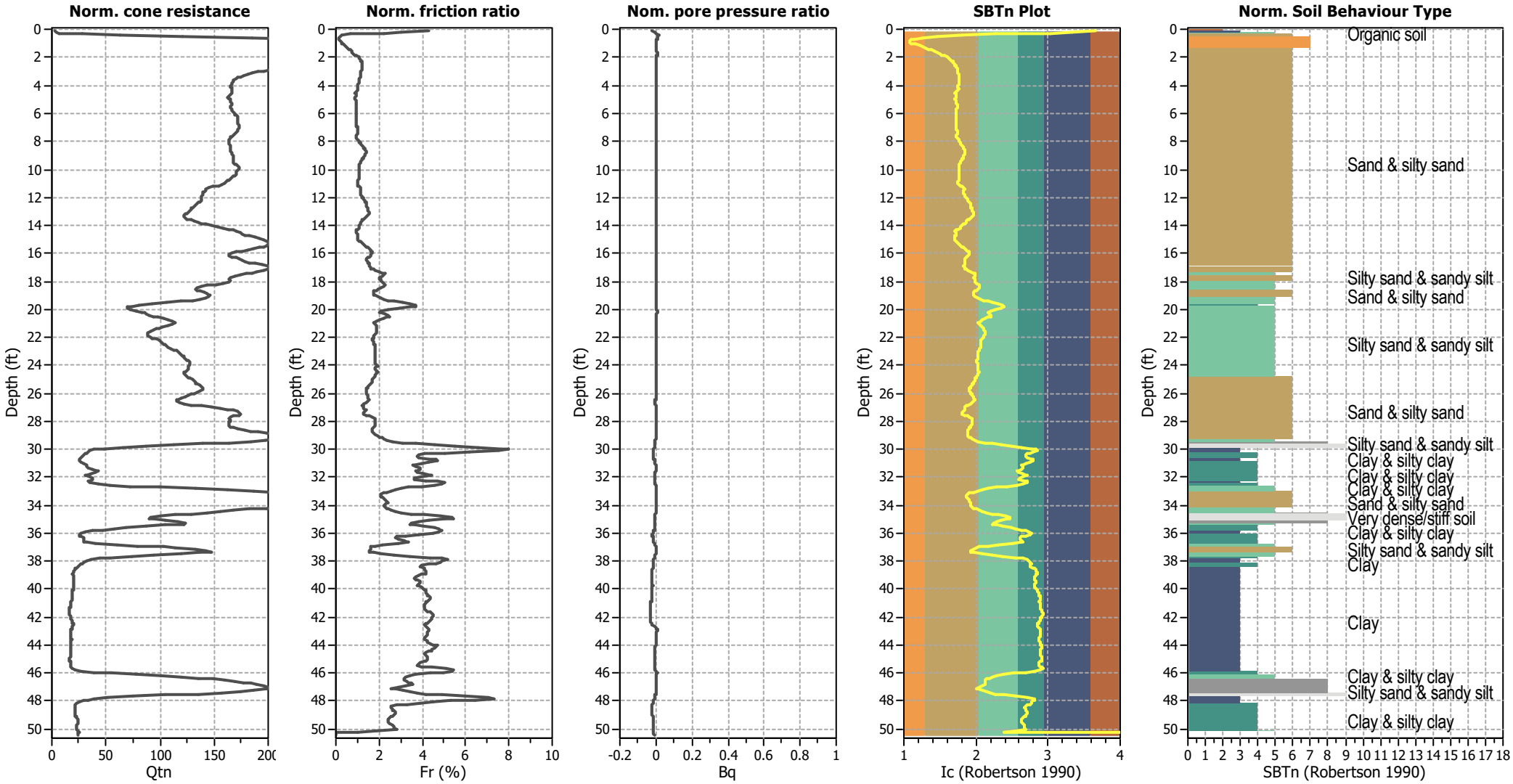
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



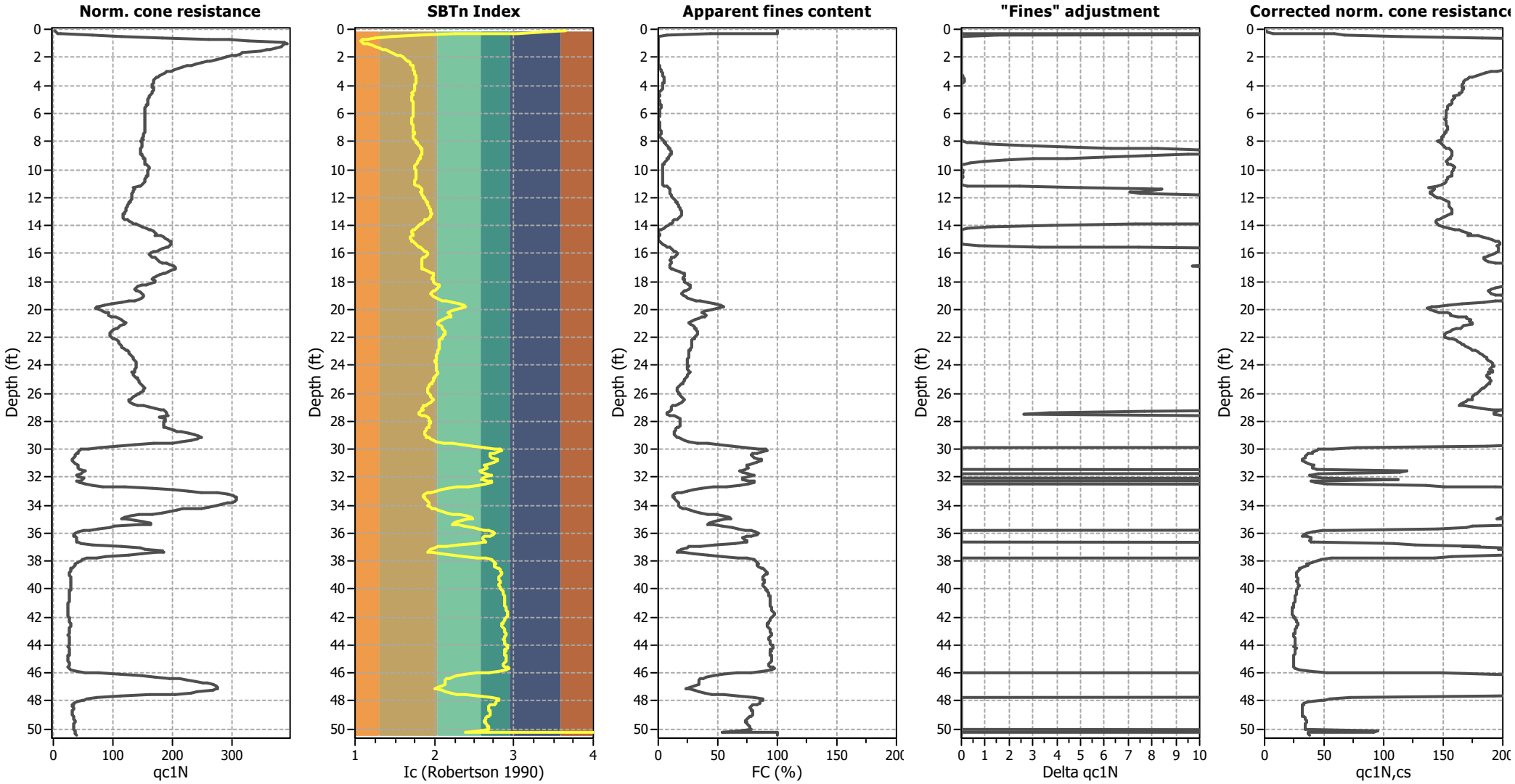
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

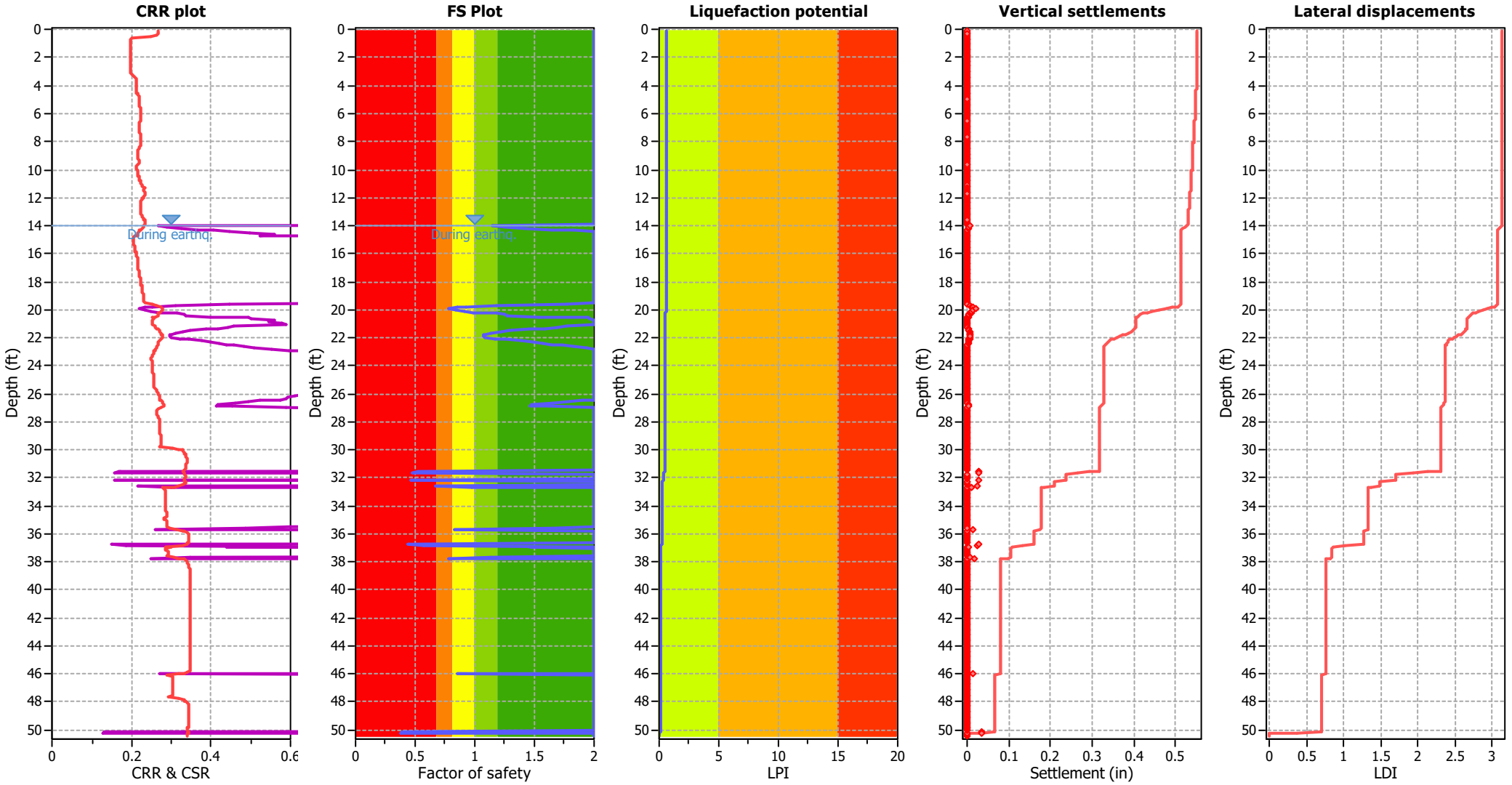
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

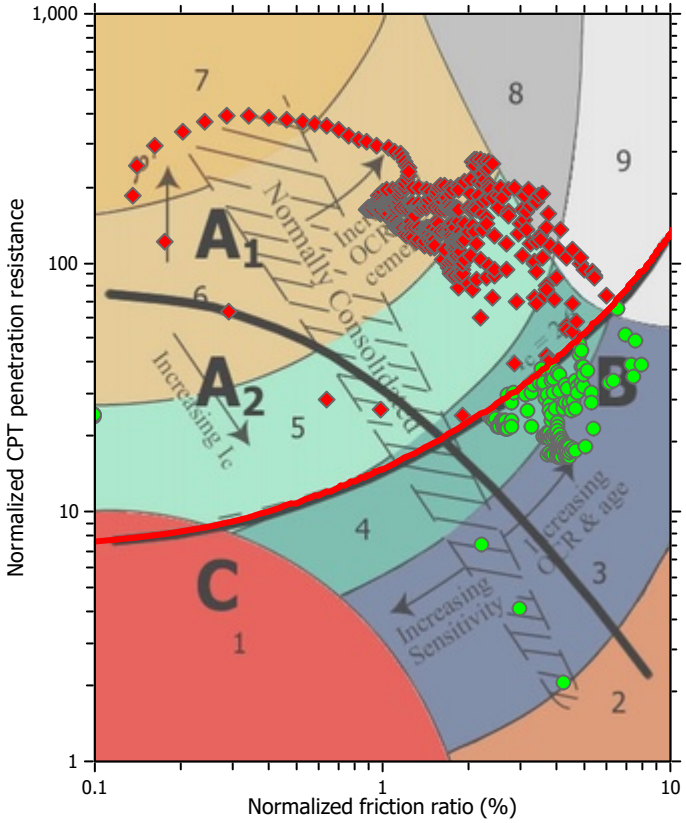
F.S. color scheme

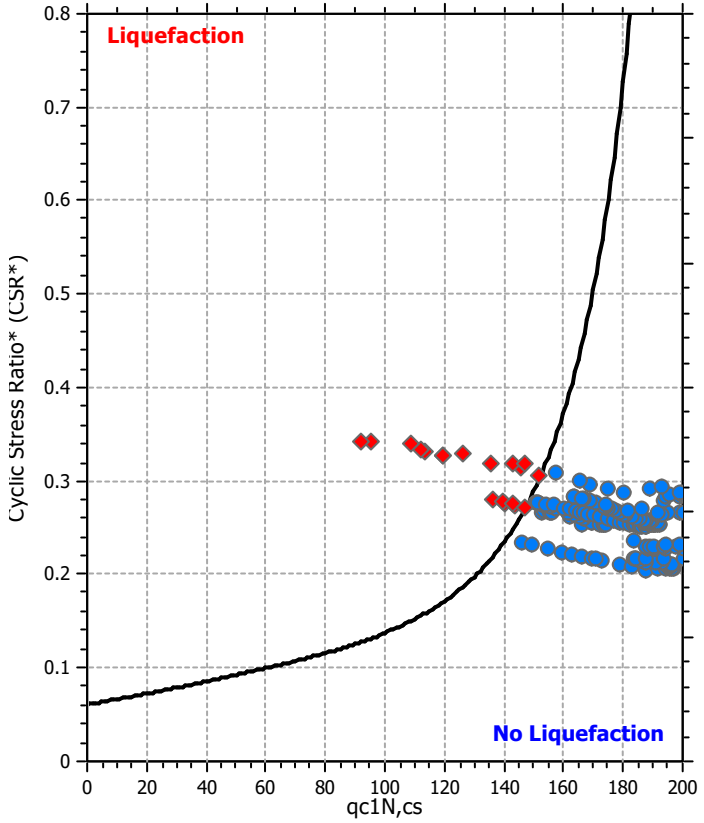
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

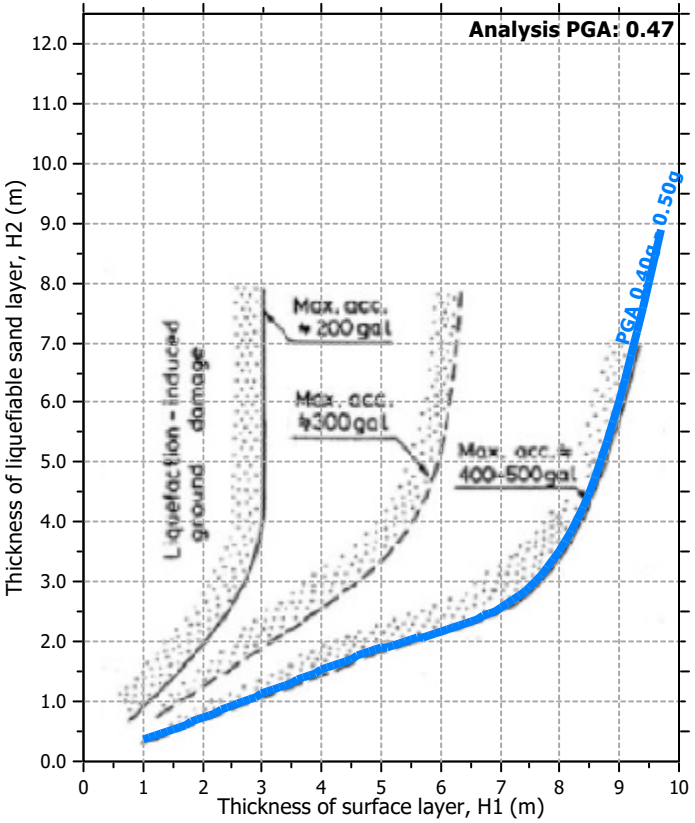
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



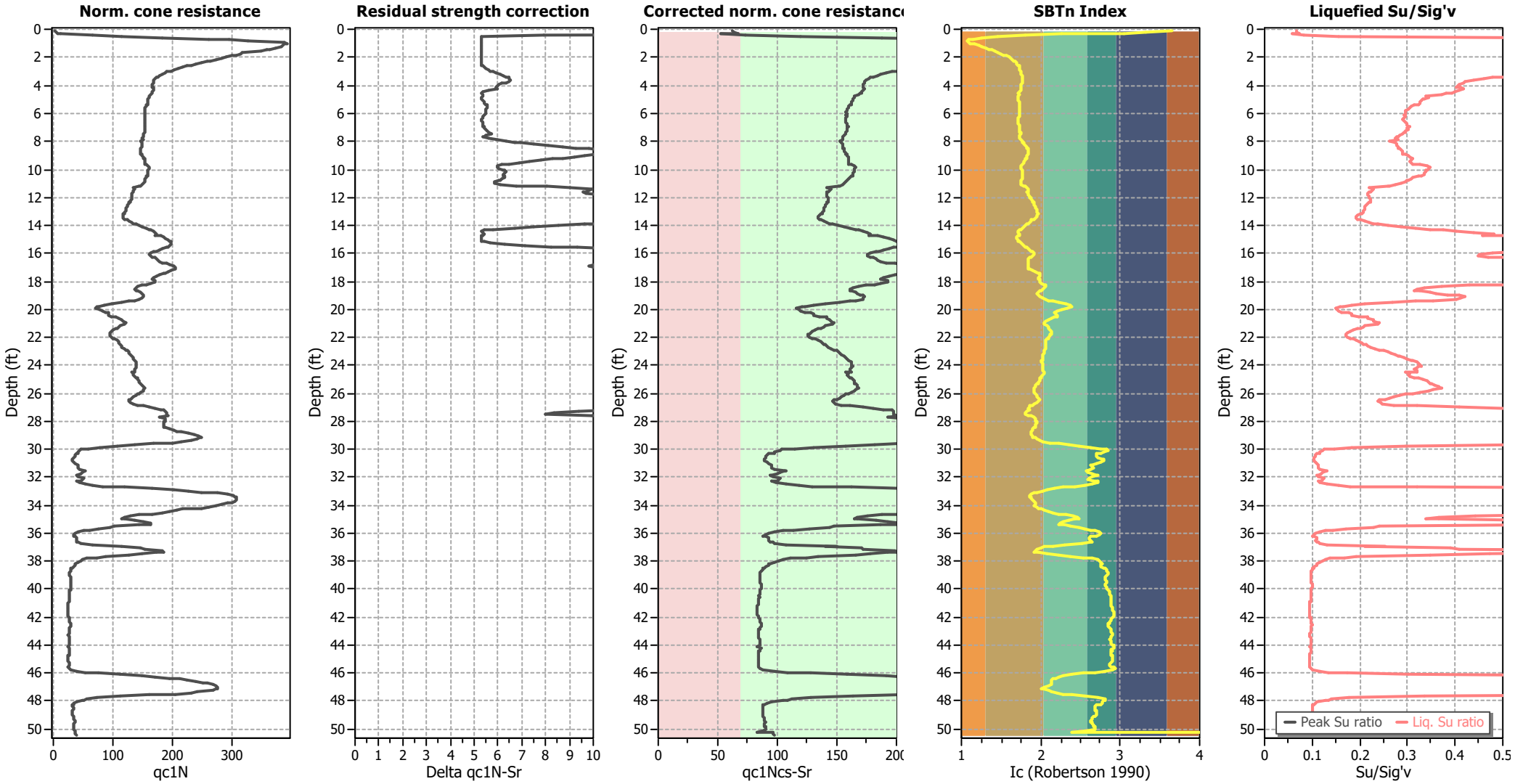




Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

Intertek-PSI
16170 Vineyard Blvd., Ste 170
Morgan Hill, CA 95037

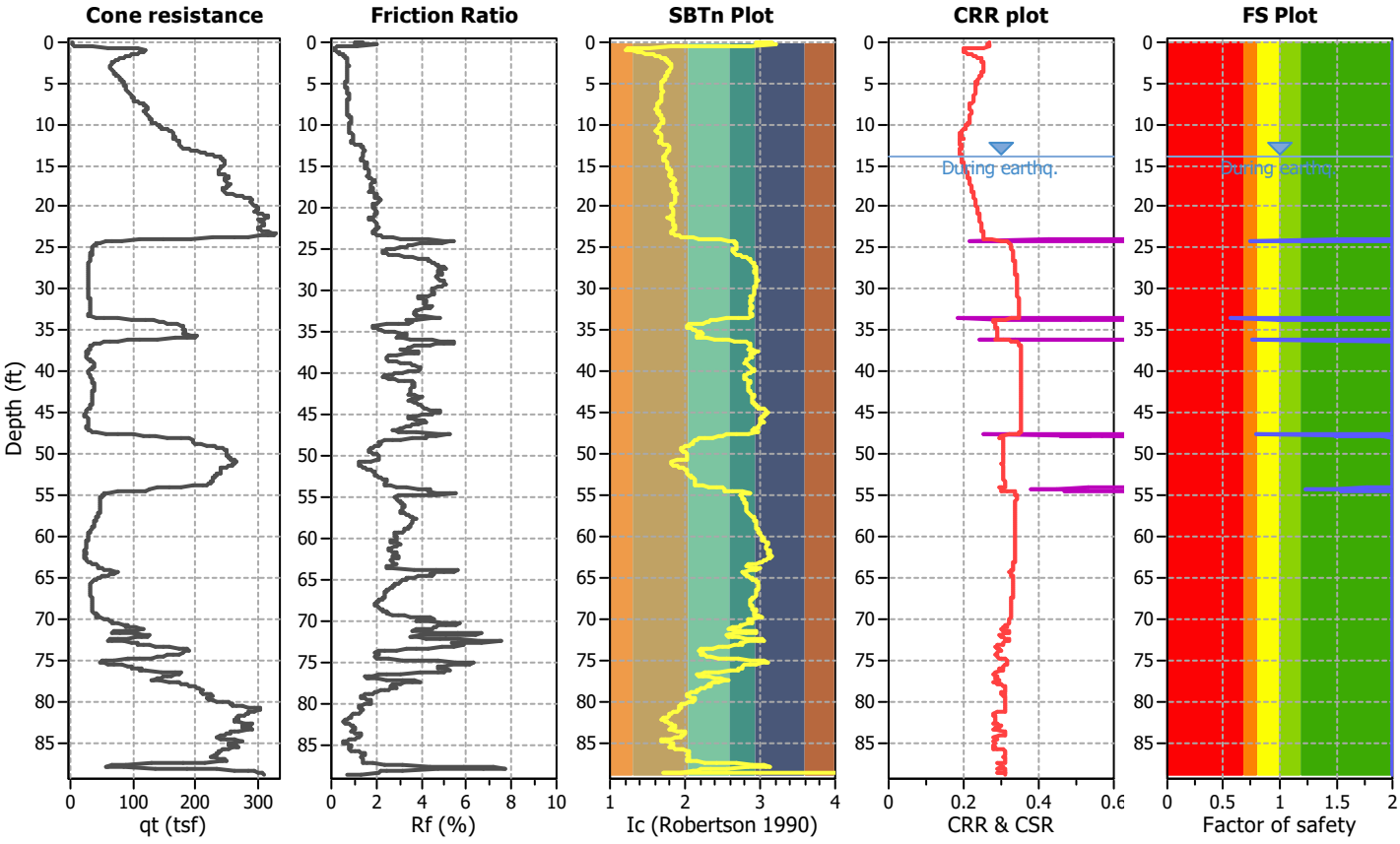
LIQUEFACTION ANALYSIS REPORT

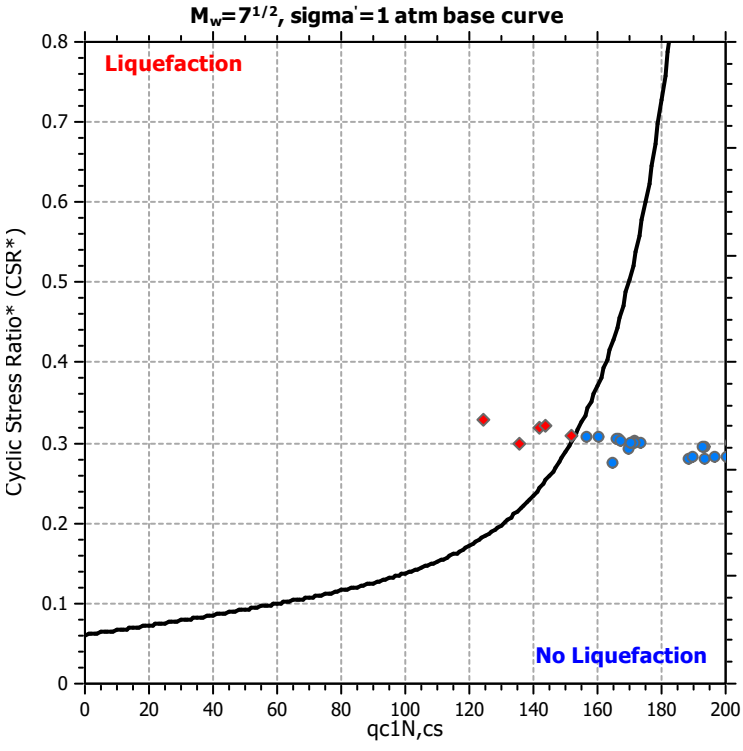
Project title : Oakley Shops at Laurel Fields **Location : Oakley, California**

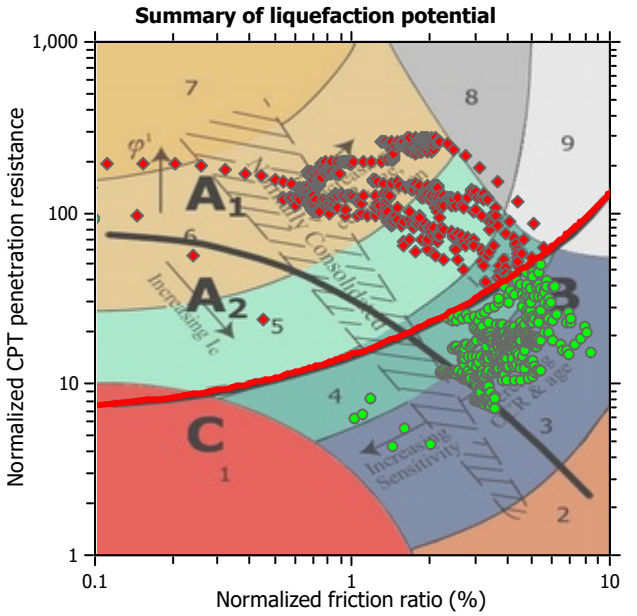
CPT file : SCPT-02

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	17.50 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	14.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	6.60	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.47	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

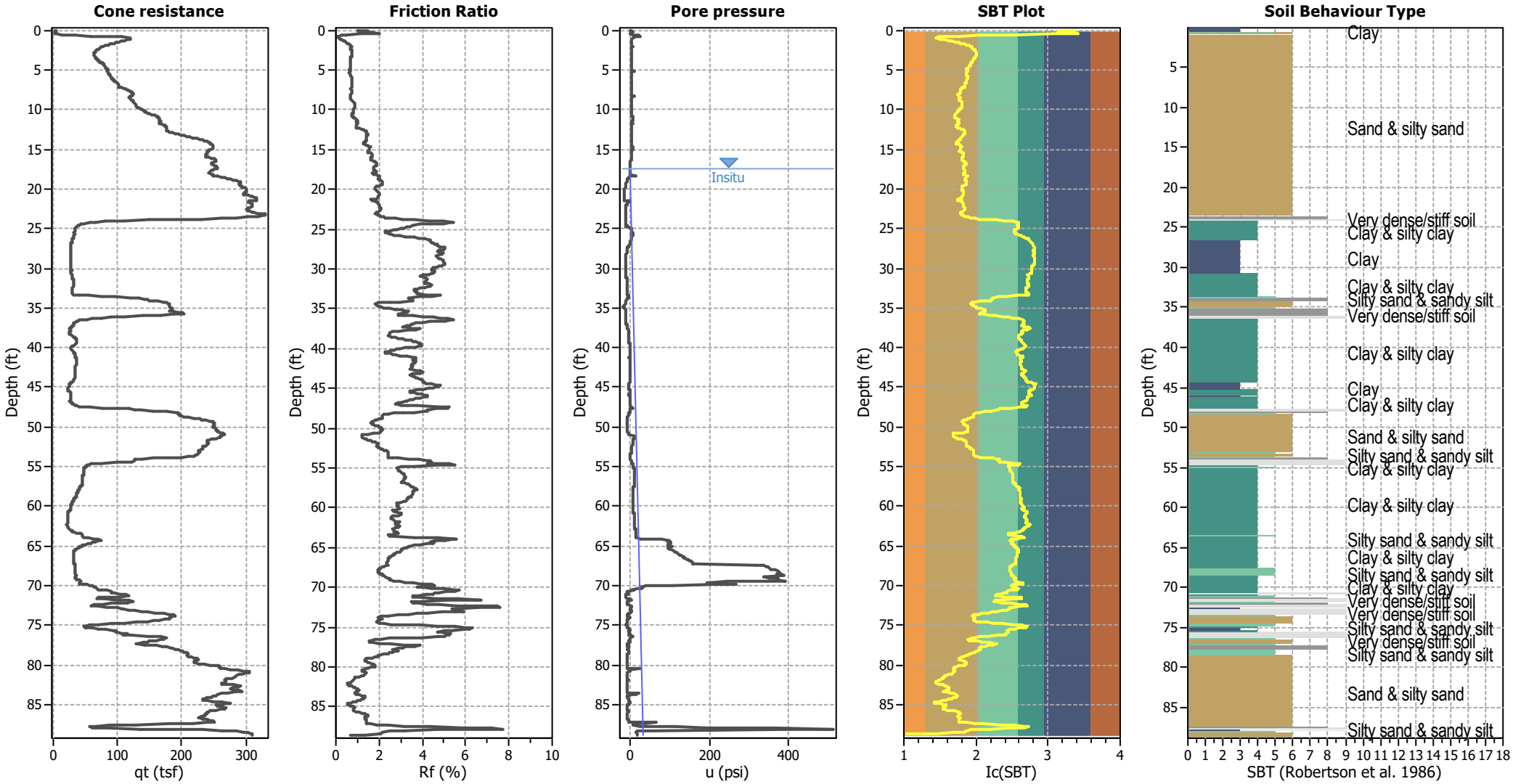






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



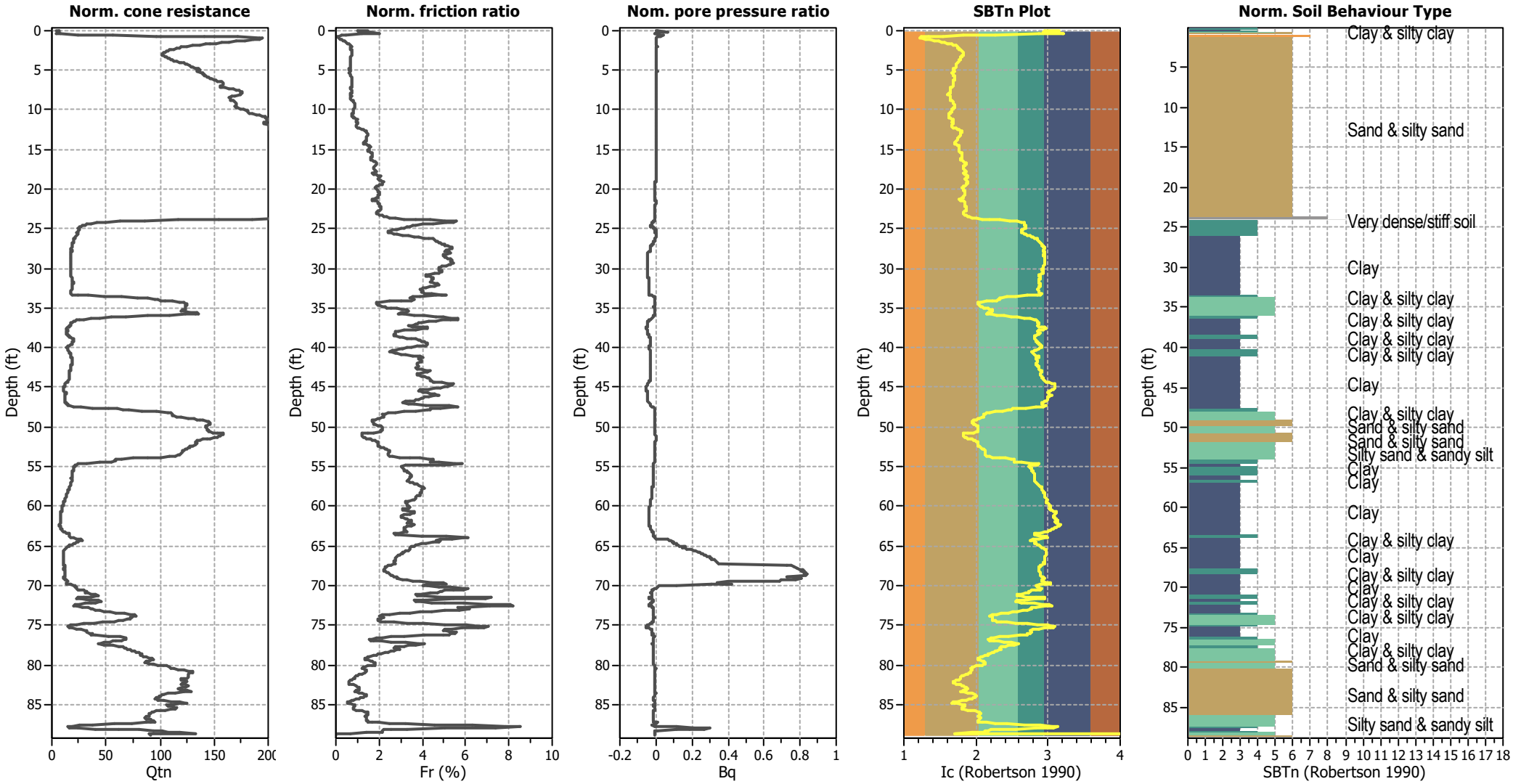
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



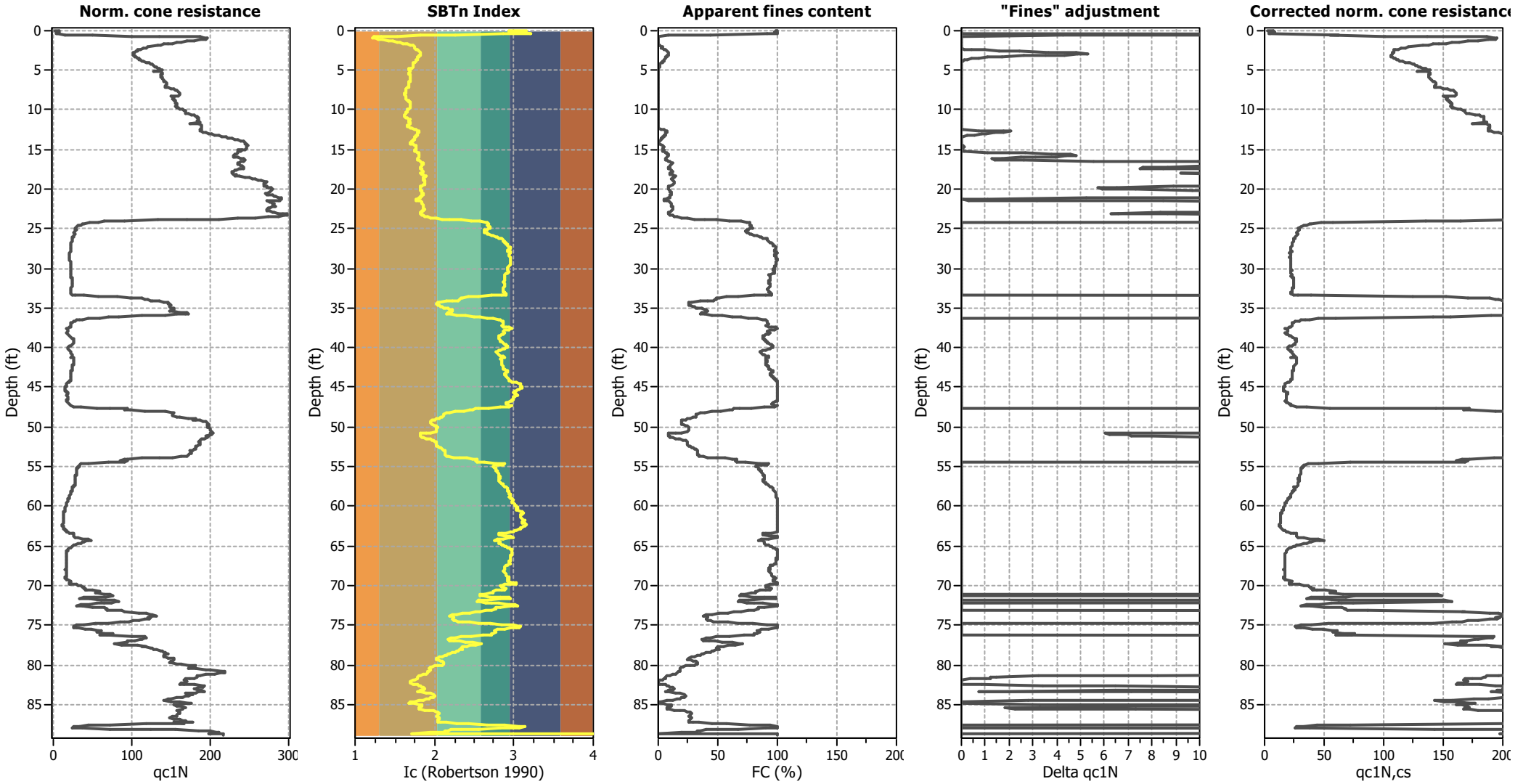
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
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7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

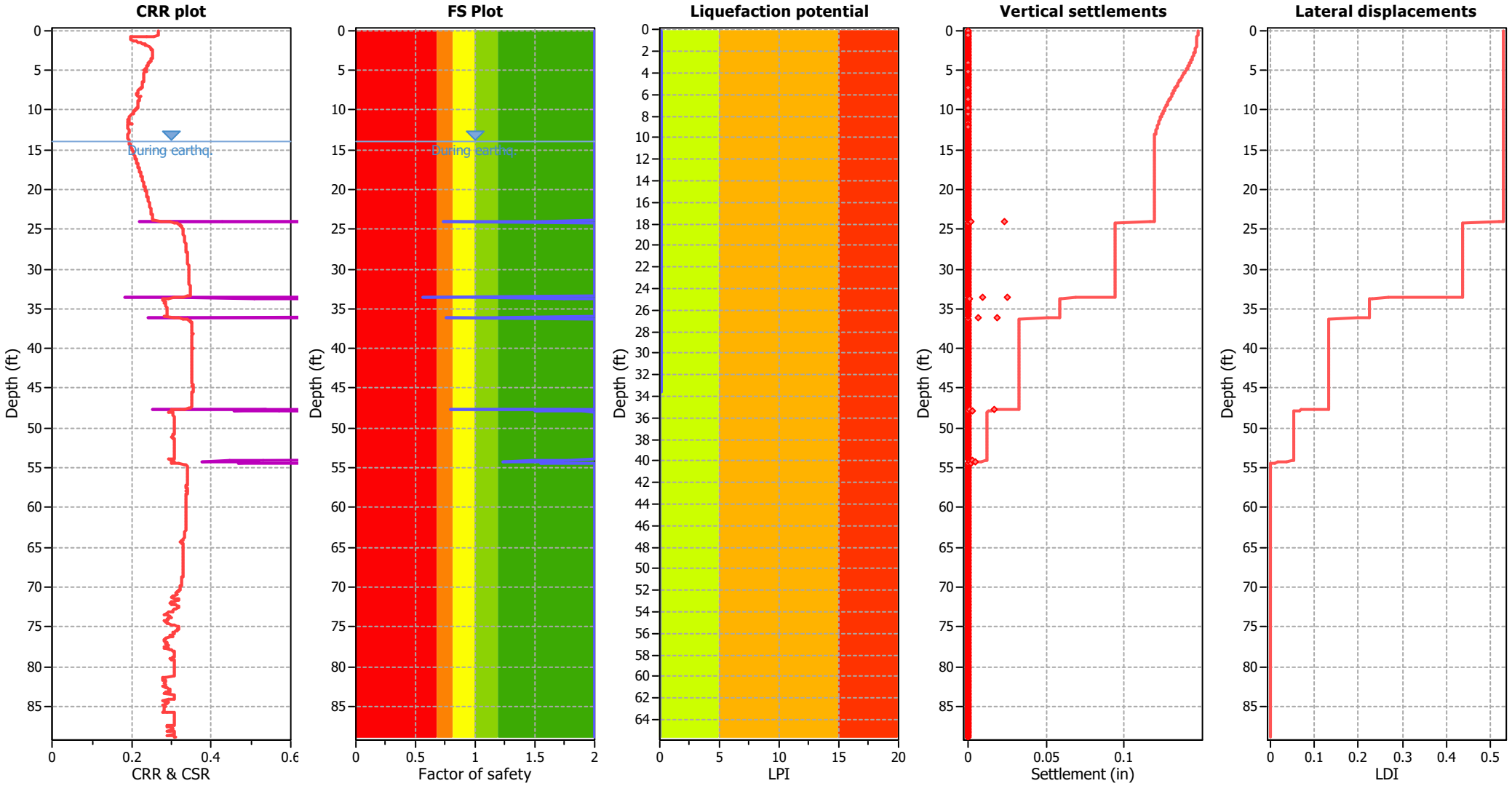
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

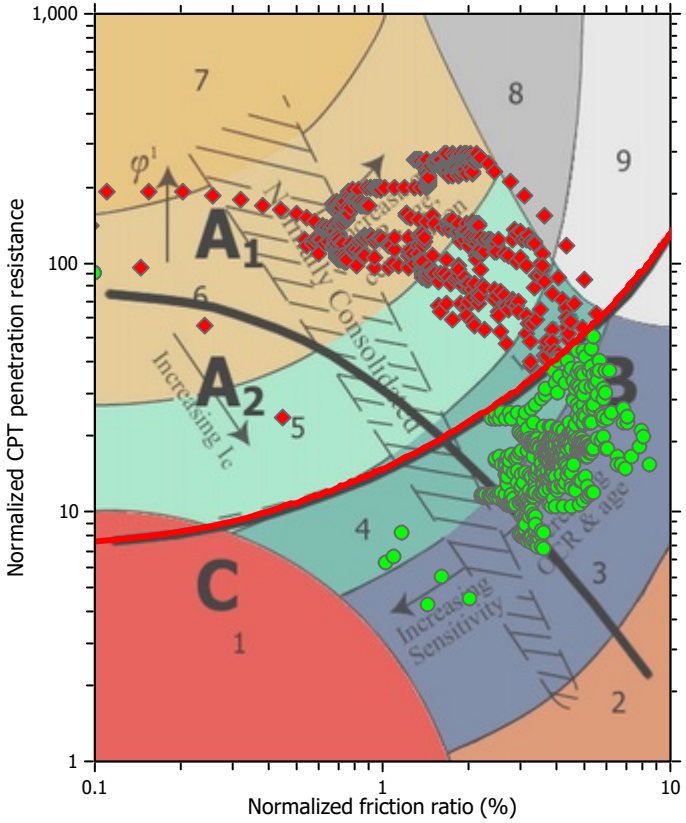
F.S. color scheme

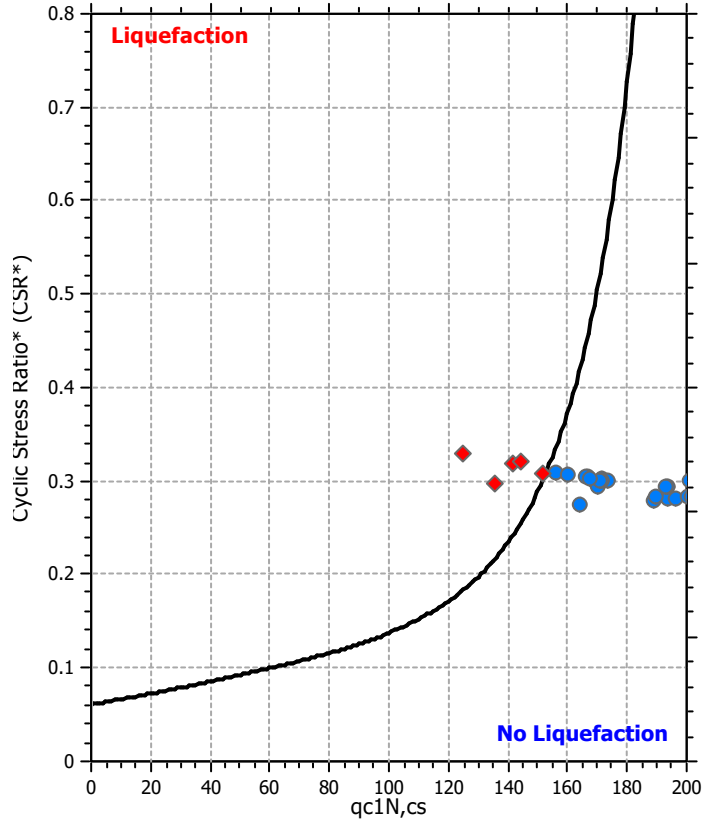
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

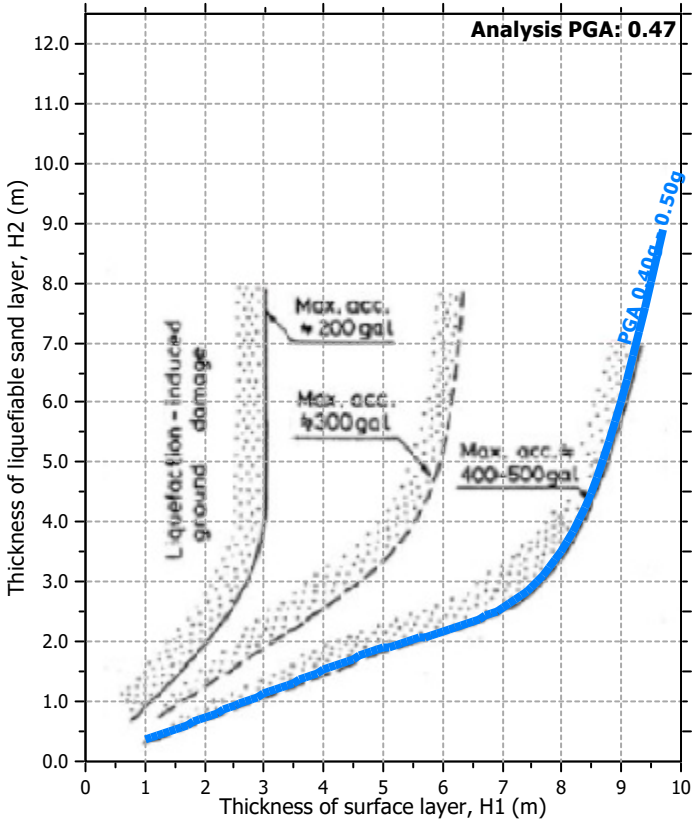
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



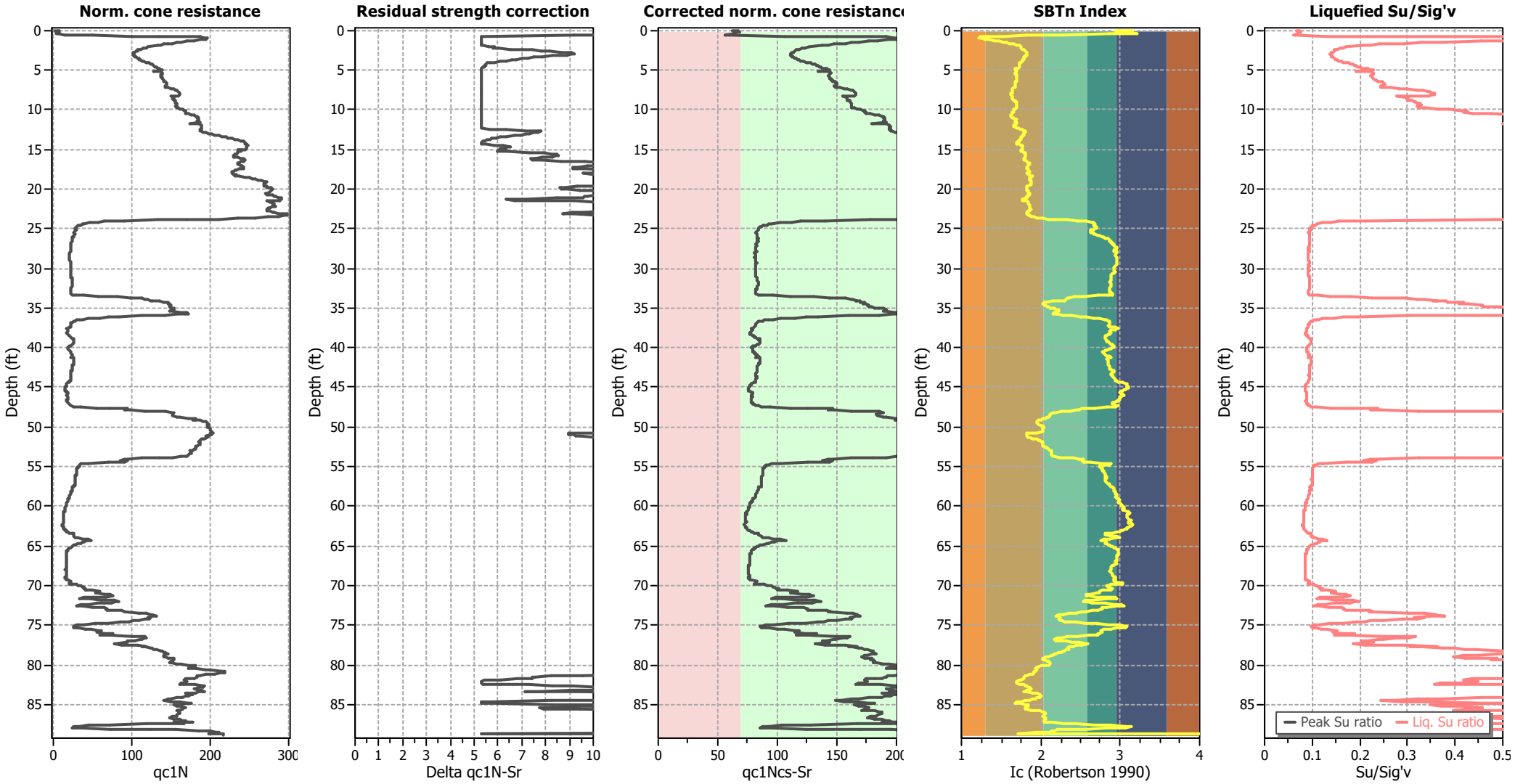




Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

Intertek-PSI
16170 Vineyard Blvd., Ste 170
Morgan Hill, CA 95037

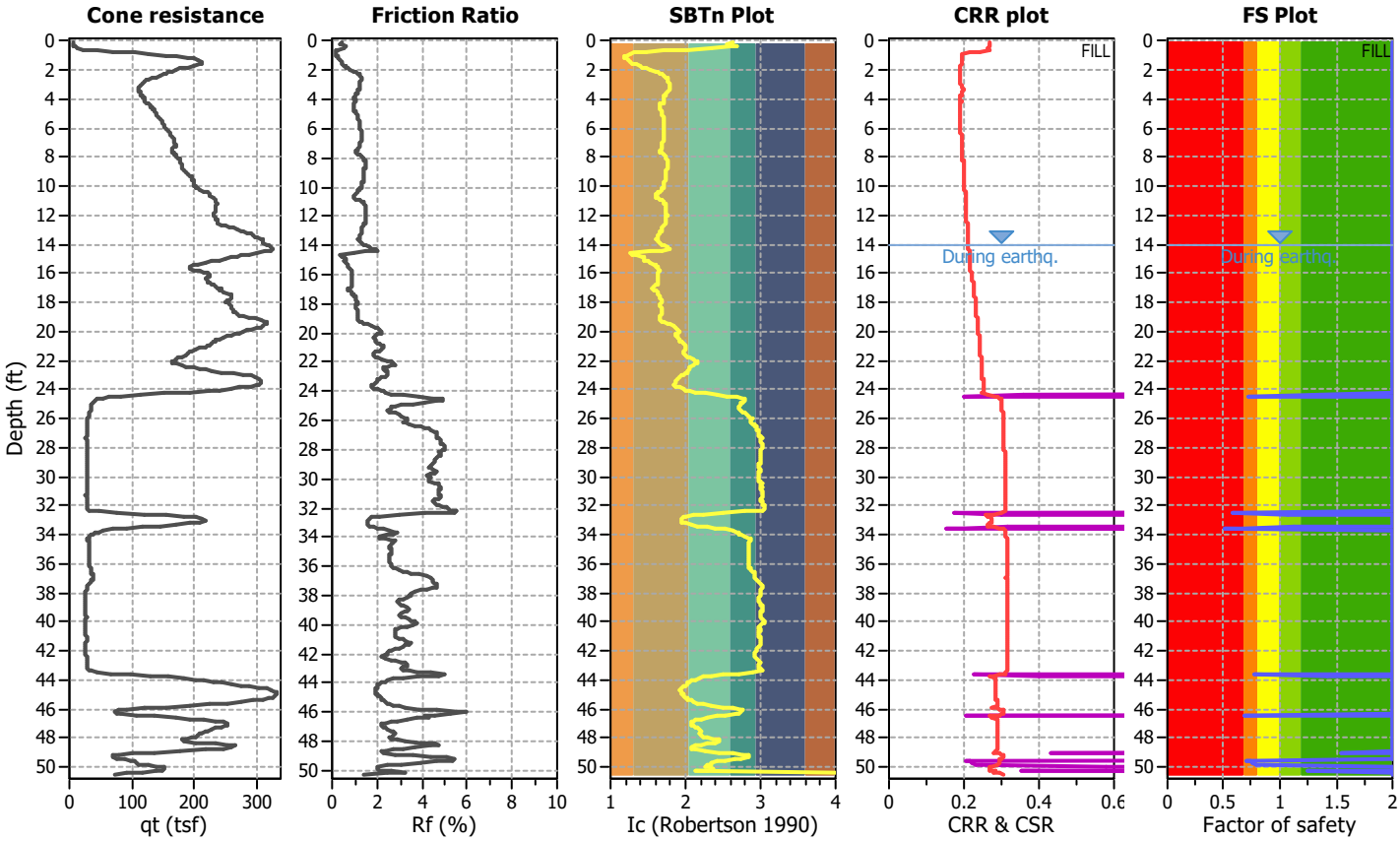
LIQUEFACTION ANALYSIS REPORT

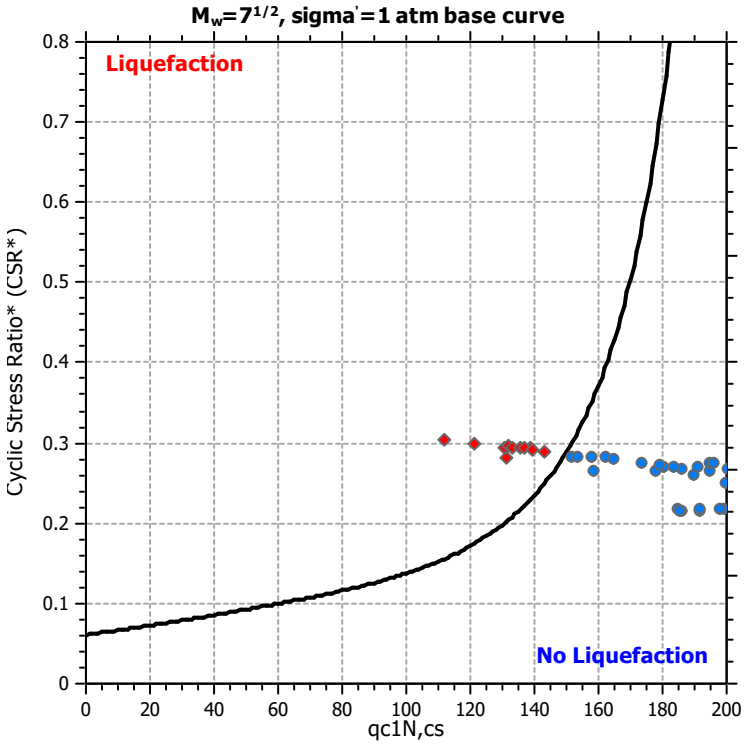
Project title : Oakley Shops at Laurel Fields **Location : Oakley, California**

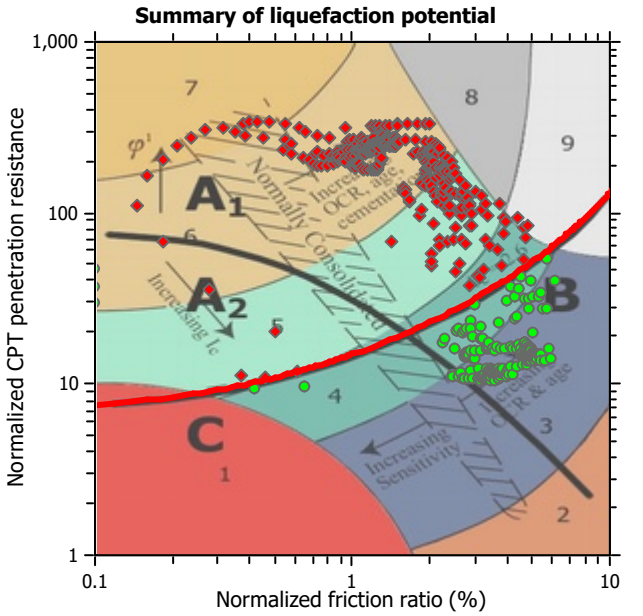
CPT file : CPT-03

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	25.50 ft	Use fill:	Yes	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	22.00 ft	Fill height:	8.00 ft	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	110.00 lb/ft³	Limit depth:	60.00 ft
Earthquake magnitude M_w:	6.60	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.47	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

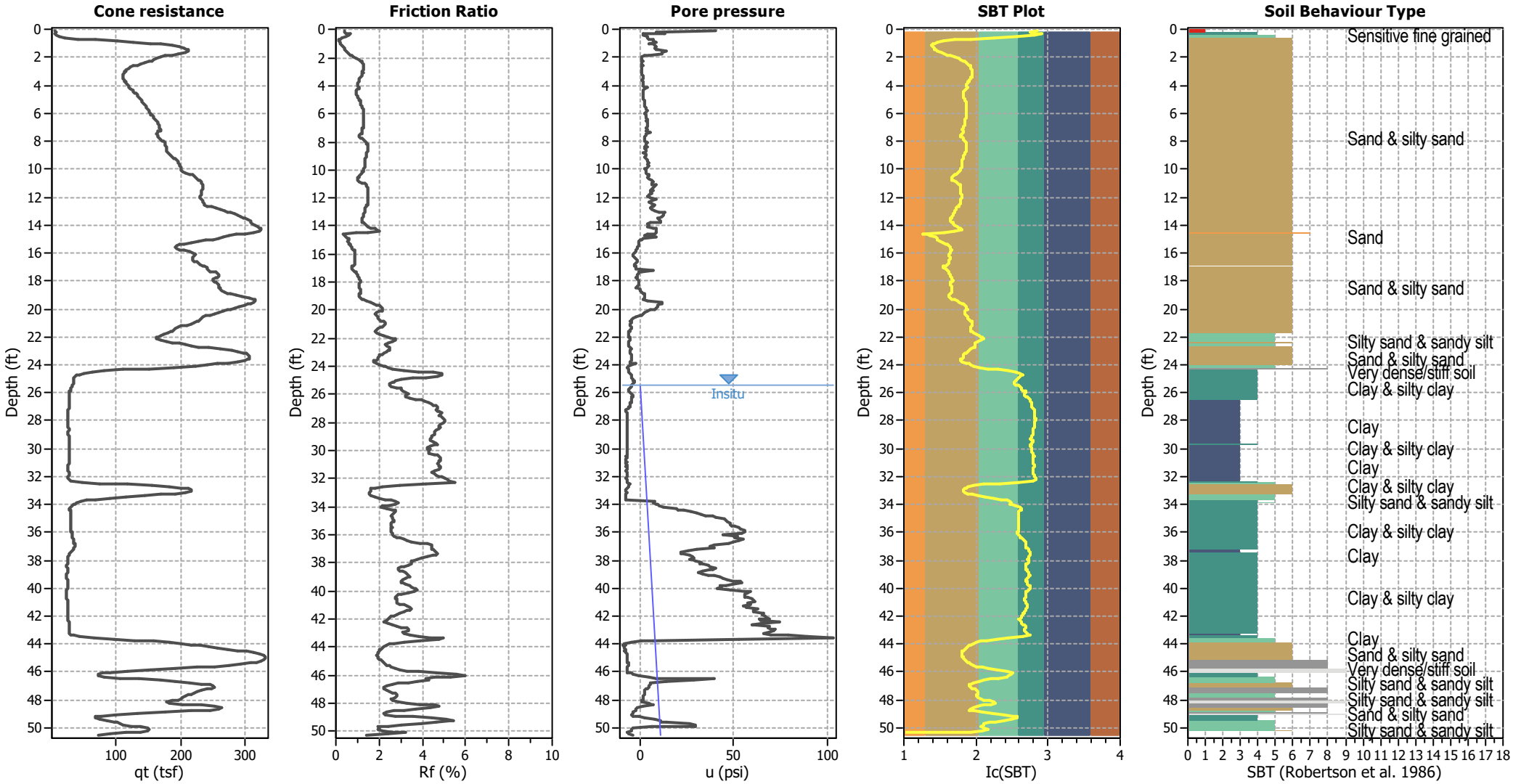






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



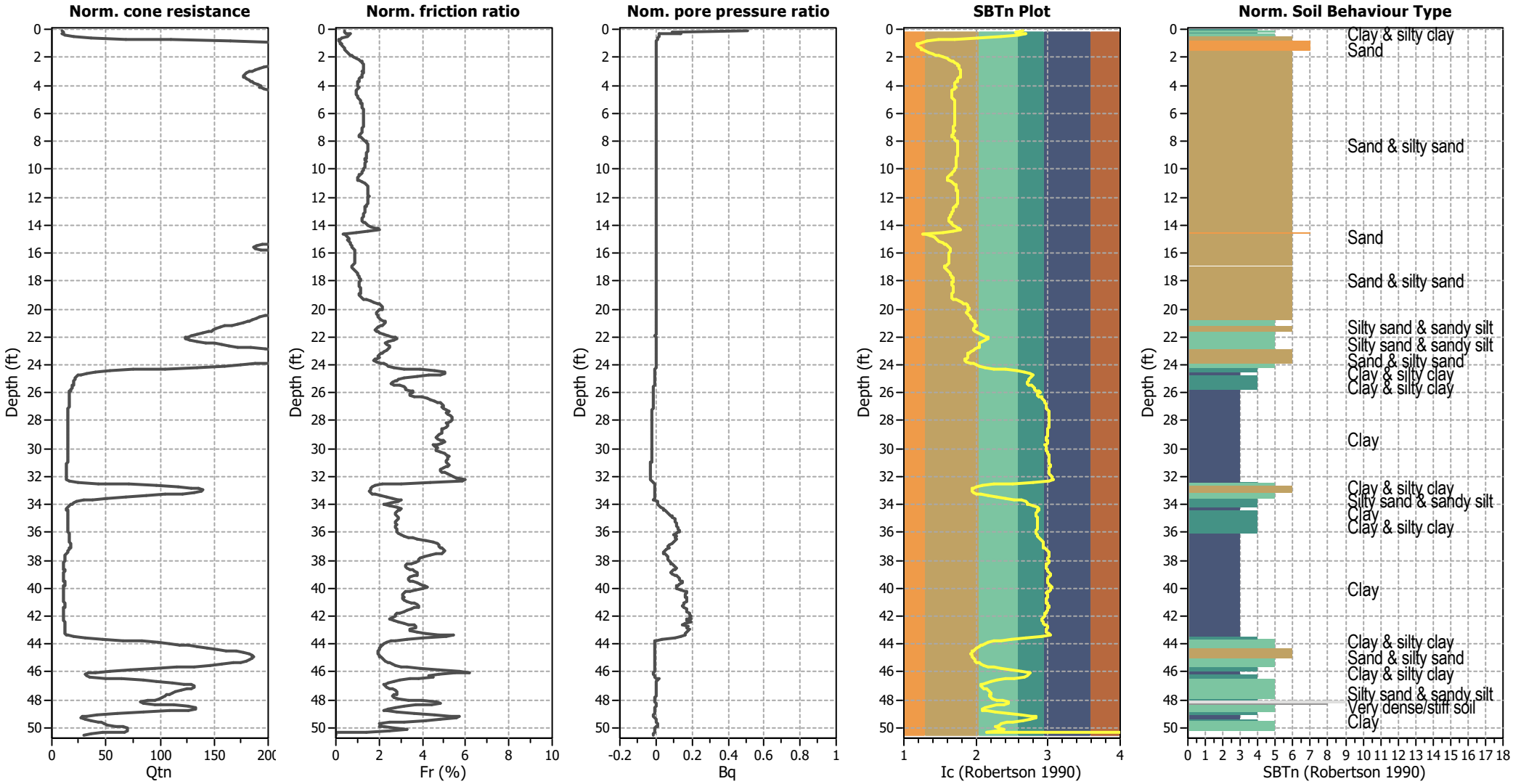
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



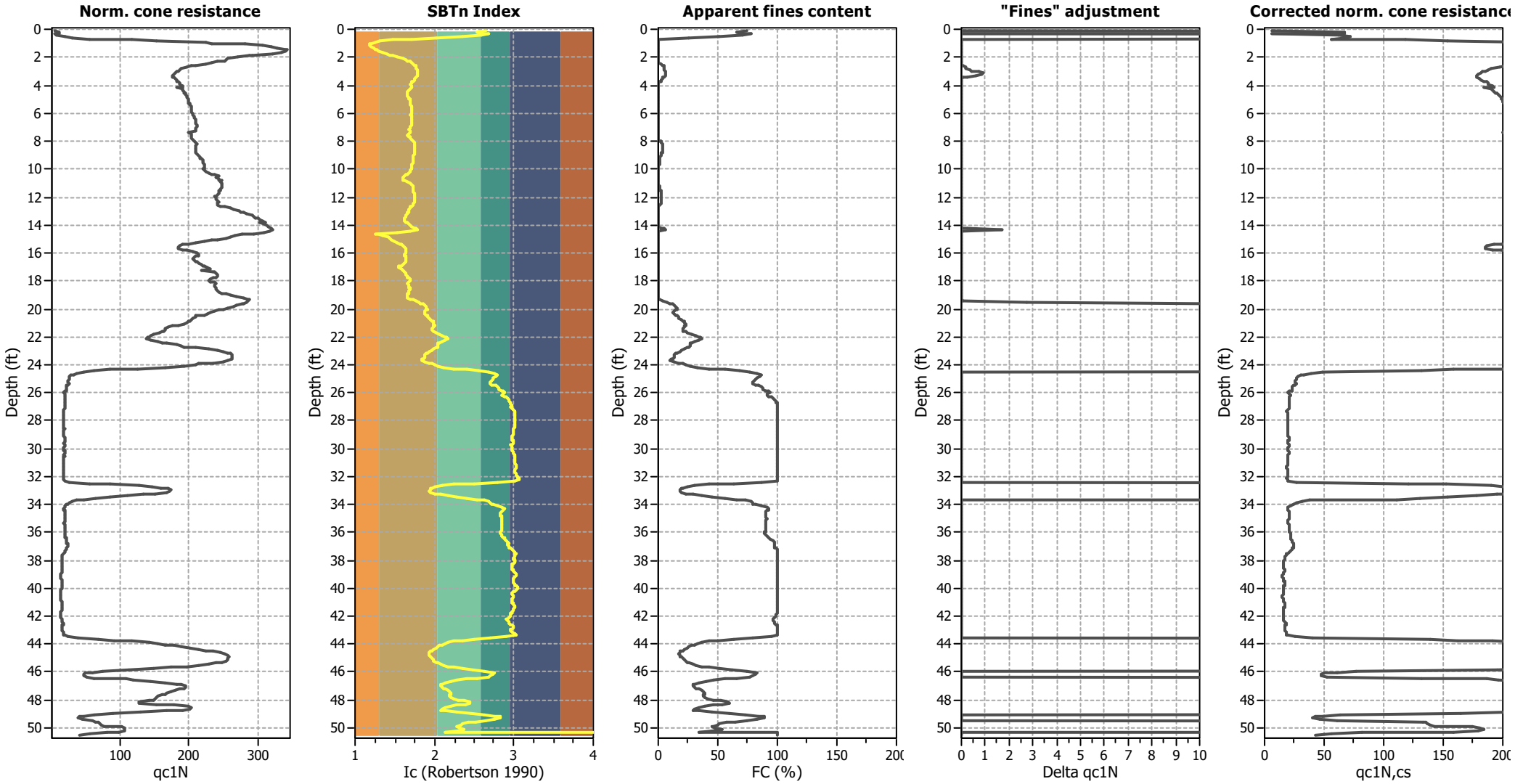
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

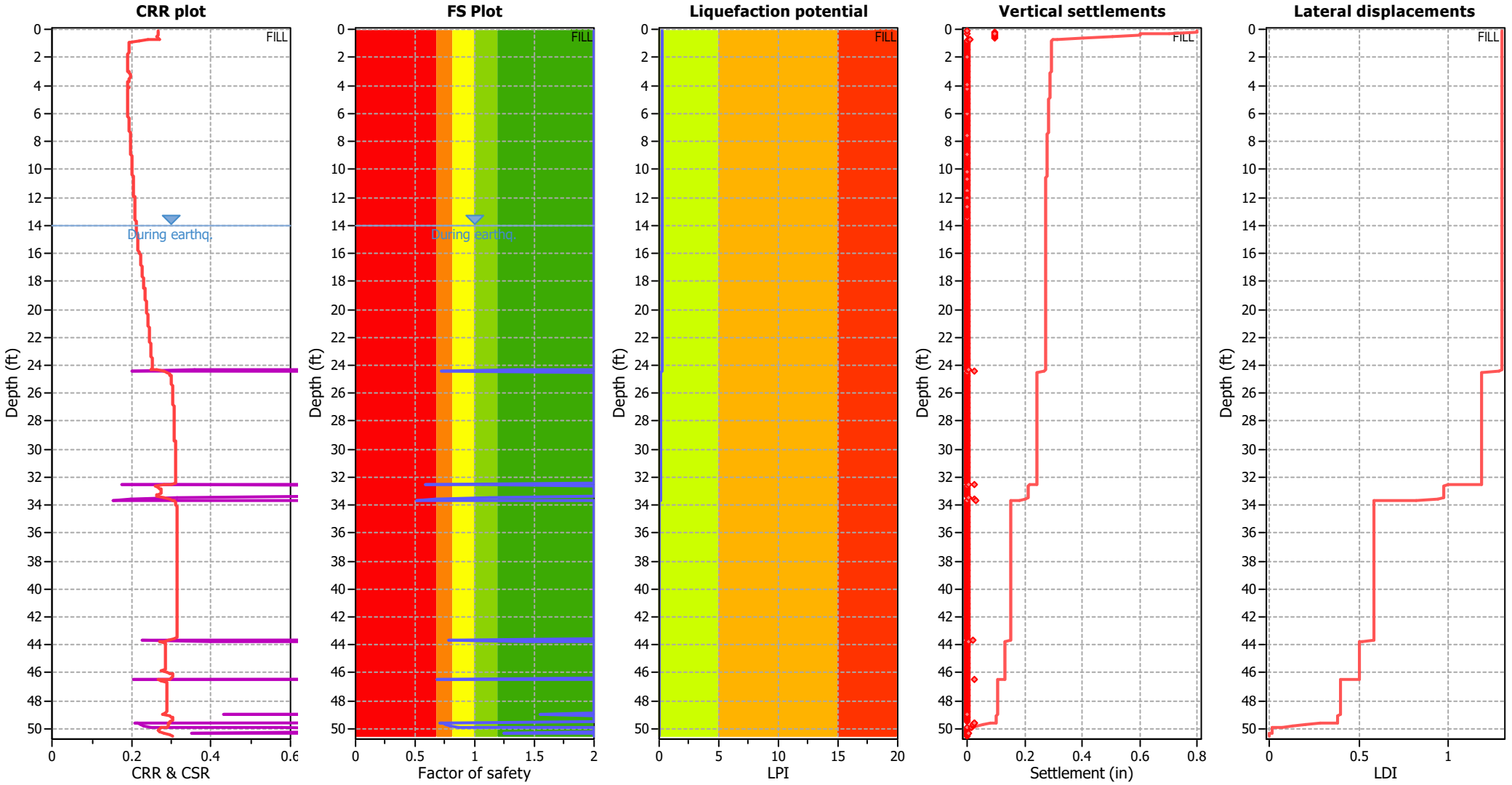
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

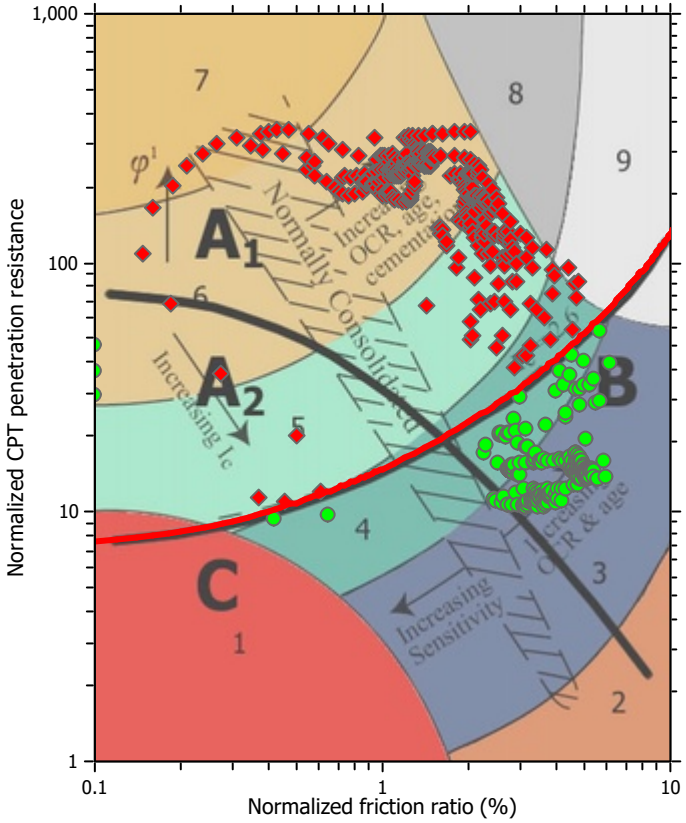
F.S. color scheme

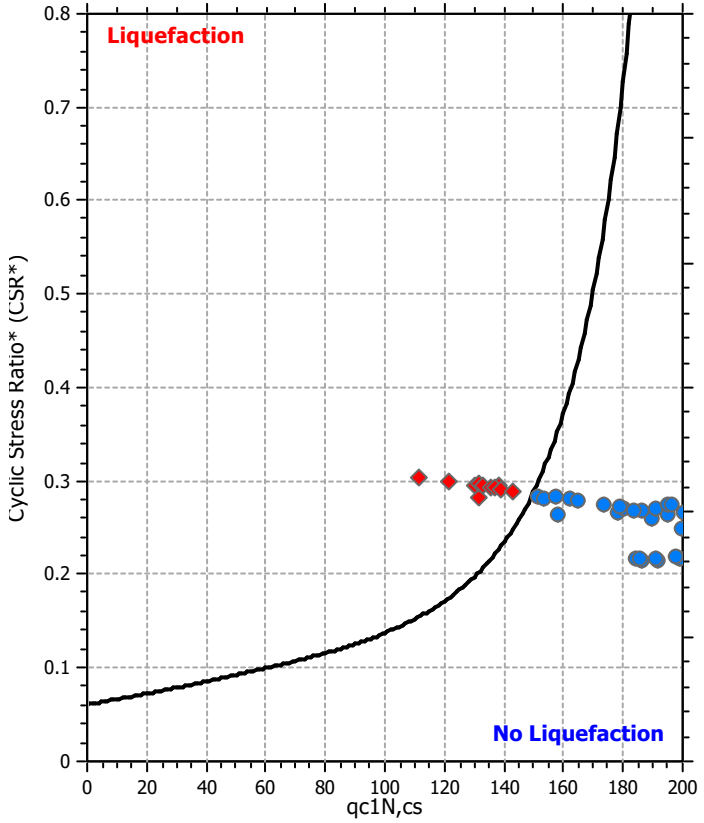
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

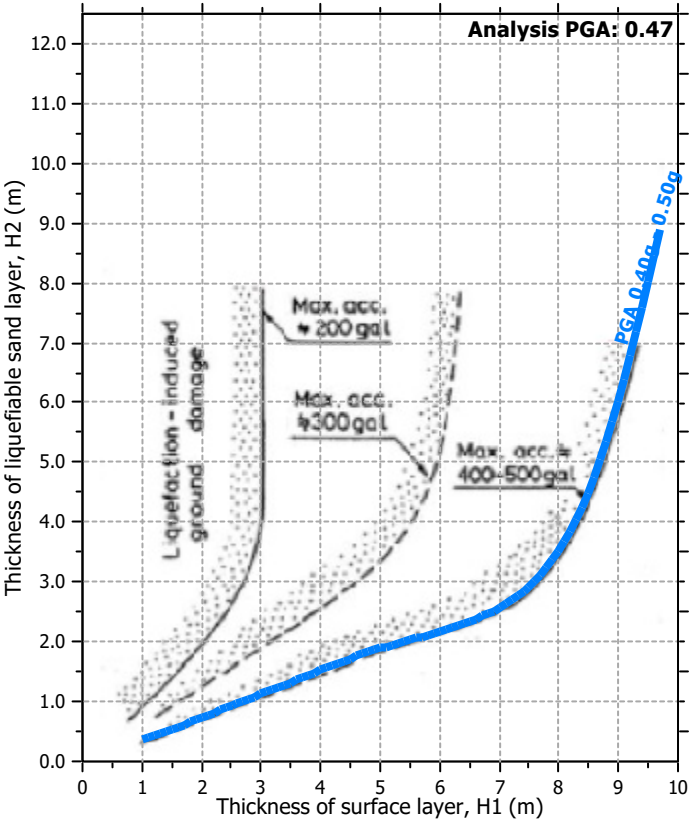
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



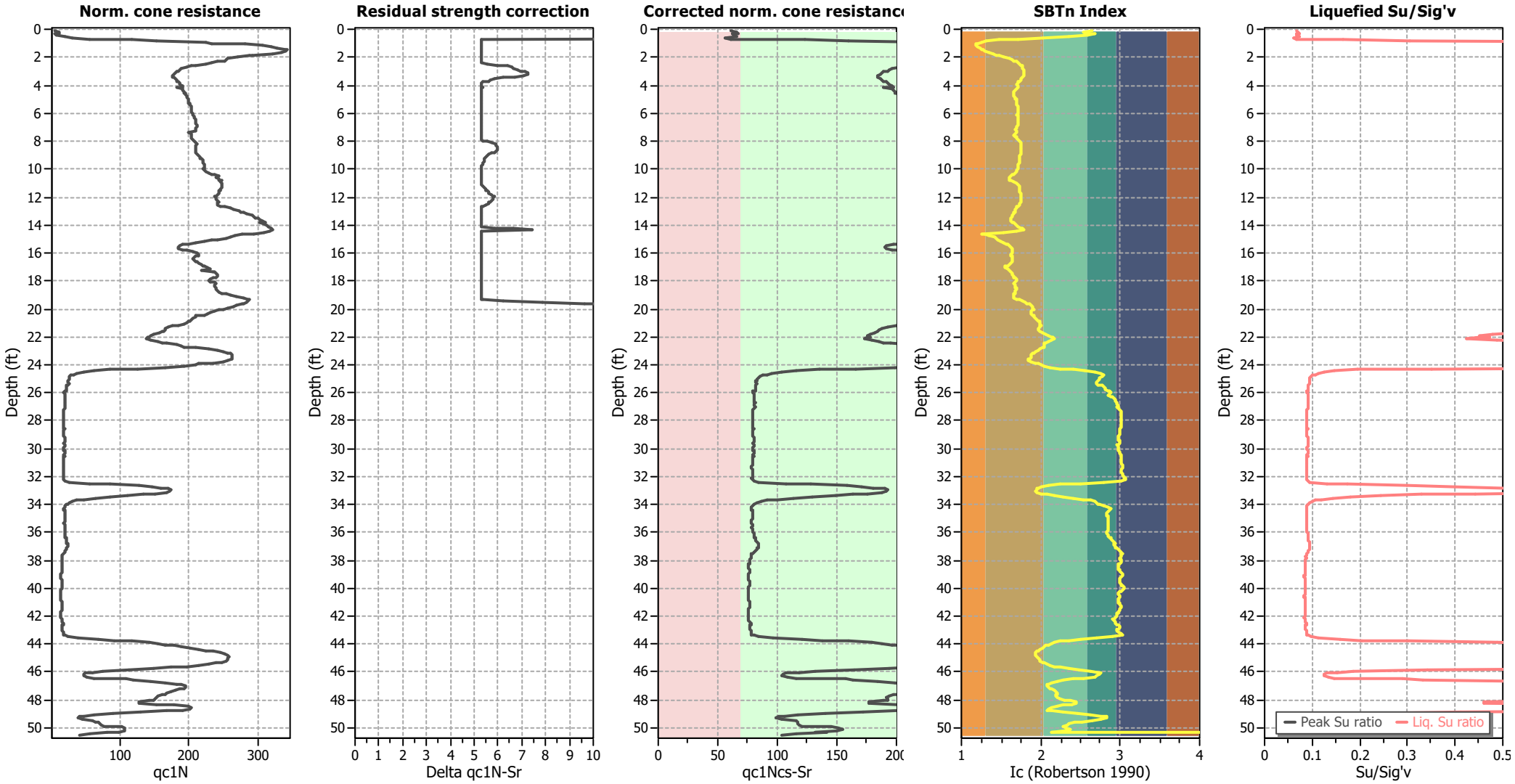




Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.47	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

Appendix E
Geotechnical Engineering Report Addendum #1

Professional Service Industries, Inc.
16170 Vineyard Blvd., Suite 170
Morgan Hill, CA 95037
phone: 408.669.5500
intertek.com/building

April 16, 2024

Regency Centers, LP
1777 Botelho Drive, Ste 200
Walnut Creek, California 94596

Attention: **Michelle Rooney**
Construction Department
Phone: 925.279.1801
Michelle.rooney@regencycenters.com

Subject: **Geotechnical Engineering Report Addendum #1; Supplemental Recommendations**
Proposed Oakley Shops at Laurel Fields
998 Laurel road
APN: 035-220-028
Oakley, California 94561
PSI Project No. 0587814

As requested, Professional Services Industries, Inc. (PSI), an Intertek company, is pleased to provide this addendum of supplemental recommendations and responses to review comments for the referenced project in Oakley, California. This work was performed based on change order agreement 1, and authorized on April 12, 2024 (6099201/PO 5682). PSI's previous work at the site is summarized in our October 30, 2023, report titled "*Geotechnical Engineering Report, Proposed Oakley Shops at Laurel Fields, 998 Laurel Road, APN: 035-220-028, Oakley, California, PSI PROJECT NO. 0587814*" which was performed for the proposed project. The purpose of this letter is to respond to the review comments presented in the memorandum letter, dated April 1, 2024, prepared by the City of Oakley.

Responses to Review Comments

Review Comment 21.a.i "*This section (Section 3.5) should note that the Site Class classification made takes into account the exception in Section 20.3.1 of ASCE 7-16. Otherwise, the Site Class would have been classified a Site Class F due to the site's liquefaction potential.*

Response: Based on the proposed development and our experience with similar structures, we anticipate that the exception listed in Section 20.3.1 is applicable and the site may be classified as Site Class D. However, the fundamental periods of vibration for the proposed structures should be determined by the project structural engineer.

Review Comment 21.a.ii "*This section of the report should reference Supplements 1 and 3 of ASCE 7-16".*

Response: We have reviewed Supplements 1 and 3 of ASCE 7-16 and have incorporated the appropriate revisions below.

Review Comment 21.a.iii "*Per Supplement 1 of ASCE 7-16, the Fv value provided should only be used to calculate Ts".*

Response: A revised value of Fv is provided in the table below. The project structural engineer should determine the appropriate period of vibration for the proposed structures.

Review Comment 21.a.iv "*SM1 should be 1.263g according to the coordinates provided in the report and the 50% increase required by Supplement 3 of ASCE 7- 16 for Site Class D sites".*

Response: A revised value of SM1 is provided in the table below.

Review Comment 21.a.v "*SD1 should be 0.843g according to the coordinates provided in the report and the 50% increase required by Supplement 3 of ASCE 7- 16 for Site Class D sites".*

Response: A revised value of SD1 is provided in the table below.

Review Comment 21.b "*Section 4.1 (Liquefaction and Dry Sand Settlement Analysis): The analyses performed were based on a PGAM of 0.47g. However, the 2022 CBC PGAM value should be 0.6g based on the site coordinates presented in Section 3.5 of the report. Therefore, the analyses should be revised based on the higher PGAM value".*

Response: Our liquefaction analysis utilizing a PGA_M value of 0.6g has been performed and the results are included as an attachment to this letter.

Review Comment 21.c "*Section 5.4.2 (Settlement): This section should be revised to indicate that the total and differential static settlements provided are in addition to the estimated total and differential liquefaction-induced settlements presented in Section 4.1.1 of the report".*

Response: As discussed in Section 4.1.1 of our referenced geotechnical report, it is PSI's opinion based on the liquefaction evaluation performed, that the potential for liquefaction-induced ground surface manifestations to occur at the site appears to be low, therefore, the total and differential static settlement estimates provided in Section 5.4.2 are still applicable to the proposed project.

Review Comment 21.d "*Due to the significant amounts of cut and fill anticipated for the site, special precautions should be included in the earthwork recommendations, such as scarification of cut/native areas and recompaction to avoid creating hardpoints along cut/fill transition lines".*

Response: With respect to Comment 21.d, site grading should be performed in accordance with the recommendations presented in our geotechnical report. Fill placed in horizontal lifts adjacent to slopes greater than 5:1 (H:V) should be keyed and benched. Benches should be approximately 6 feet wide and up to 4 feet in height within firm native ground or engineered fill. To minimize risk of differential settlement between cut and fill areas, the native soils (cut areas) should be scarified a minimum of 9 inches, moisture conditioned as necessary and recompacted.

Updated Seismic Design Parameters

The ground motion values provided below supersede the values presented in our referenced report. The values for SM_1 and SD_1 have been increased by 50 percent as required for Site Class D sites in Supplement 3 of ASCE 7-16 (November 2022). As discussed above, the site may be classified as Site Class D based on the soil conditions and shear wave velocity measurements obtained from our previous investigation at the site.

Ground Motion Values*

Period (sec)	Mapped MCE Spectral Response Acceleration(g)		Site Coefficients		Adjusted MCE_R Spectral Response Acceleration (g)		Design Spectral Response Acceleration (g)	
0.2	S_s	1.338	F_a	1.0	S_{Ms}	1.338	S_{Ds}	0.892
1.0	S_1	0.468	F_v	1.83**	S_{M1}	1.263	S_{D1}	0.843

**2% Probability of Exceedance in 50 years*
***Fv value should only be used in the calculation of Ts, per Supplement 1 of ASCE-7-16*
MCE_R = Maximum Considered Earthquake

Liquefaction Evaluation and Dry Sand Settlement

PSI performed a liquefaction triggering analysis for an earthquake magnitude of 6.6 and peak ground acceleration of 0.60g. For this liquefaction study, we have estimated the historic high groundwater table as being located at a depth of 14 feet bgs based on our subsurface exploration and previous investigations at the subject site. The program CLiq v.3.5.2.17, developed by GeoLogismiki, and CPT data obtained was used to evaluate the potential for earthquake-induced liquefaction of the soils at the site. The program applied several published methodologies, including Roberston (2009) and Boulanger and Idriss (2014). The results of the liquefaction analysis are described below and included as an attachment to this letter.

PSI estimated the potential for liquefaction-induced free-field settlement using the empirical methodologies developed by Boulanger and Idriss (2014) and NCEER and Robertson (2009). The empirical methods are based on case histories of areas that have undergone liquefaction. The results of our parametric studies indicate that liquefaction-induced total settlements on the order of ¾ inches could occur within the liquefiable sand layers encountered in the subsurface exploration. Differential settlement due to liquefaction of less than ½-inch is estimated across a horizontal distance of about 50 feet. Based on the analysis, a majority of the vertical settlements are projected to occur at the location of CPT-01, near the southwest corner of the site. The depth of liquefaction settlement is expected to occur in the poorly graded sand to silty sand layers at depths of approximately 20 to 23 feet, and between 31 to 33 feet in CPT-01. However, the potential for liquefaction-induced ground surface manifestations (i.e. sand boils and ground fissures) to occur across the site is considered low. Provided that these settlement estimates are tolerable, it is PSI's opinion that mitigation for liquefaction is not a design constraint for this project. As discussed in our referenced report, PSI does not anticipate that dry sand settlement to be a design concern for this project, provided that site preparation and earthwork is performed as recommended.

Plan Review

Once these recommendations have been incorporated into the current structural designs and calculations, PSI should review these for geotechnical consistency with our referenced reports listed below.

Limitations

PSI warrants that our services and the findings, recommendations, specifications, or professional advice contained herein have been made with that level of care and skill ordinarily exercised by members of the profession currently practicing in this area. No warranty, expressed or implied, is made. The recommendations provided are based on our review of the referenced report and drawings and are contingent on conducting an adequate testing and monitoring program during construction of the proposed development. Unless the construction monitoring and testing program is provided by PSI, we cannot be held responsible for compliance with design recommendations presented in this report.

If you have any questions pertaining to these recommendations, or if we may be of further service, please contact our office.

Respectfully Submitted for,

PROFFESSIONAL SERVICE INDUSTRIES, INC.



Ramsey S. Zeidan, PE
Project Engineer

Tyler K. Bernius
Senior Engineer

References

1. City of Oakley, "Oakley Shops at Laurel Fields Tentative Parcel Map, Conditional Use Permit, Variance, and Design Review (TPM 01-24, CUP 01-24, VA 01-24, DR 02-24) – Letter of Application Status", April 4, 2024, with Memorandum, dated, April 1, 2024.
2. Professional Service Industries, Inc, October 30, 2023, "Geotechnical Engineering Report, Proposed Oakley Shops at Laurel Fields, 998 Laurel Road, APN: 035-220-028, Oakley, California," PSI Project No. 0587814.

Attachments

Liquefaction Evaluation

Intertek-PSI
16170 Vineyard Blvd., Ste 170
Morgan Hill, CA 95037

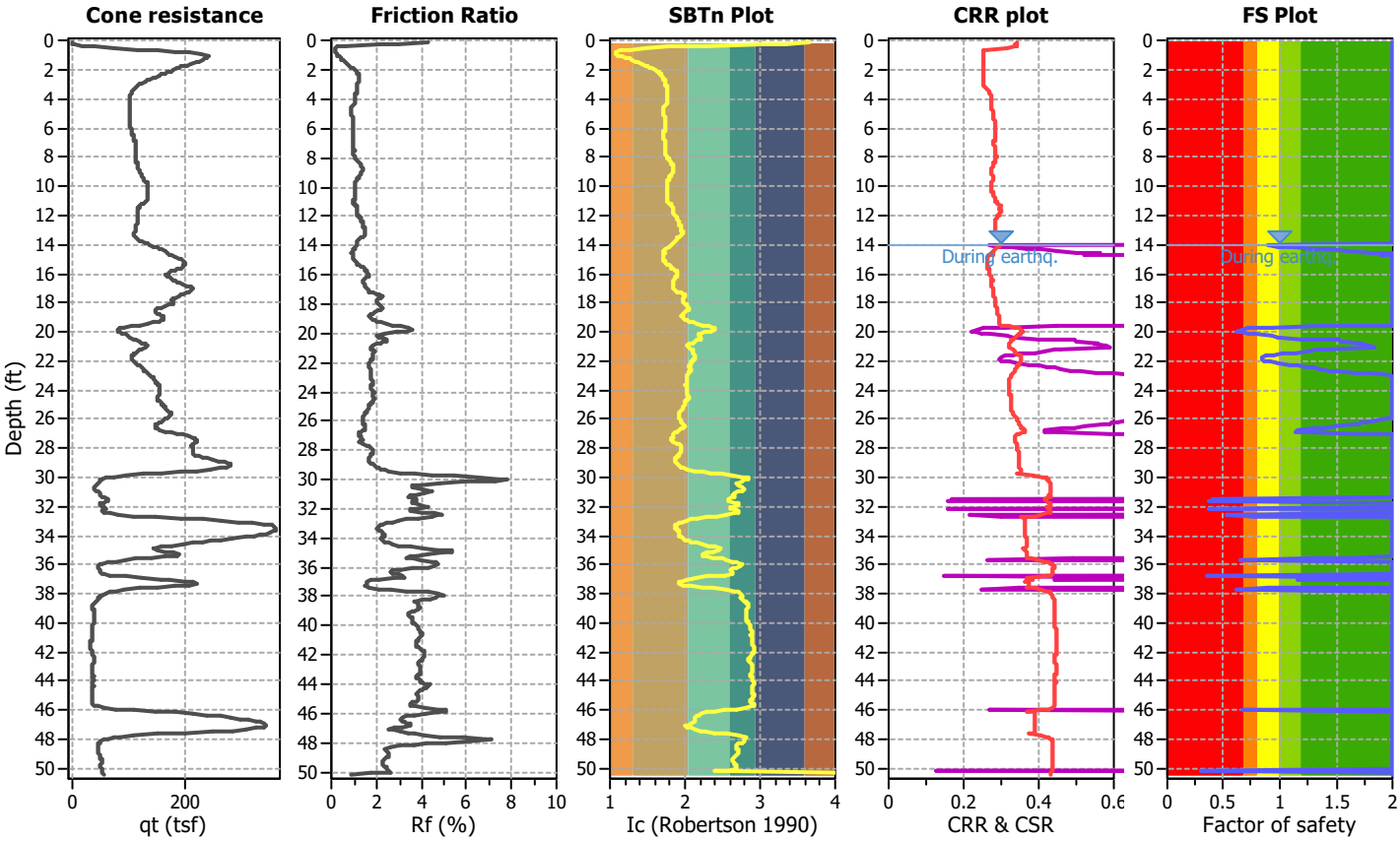
LIQUEFACTION ANALYSIS REPORT

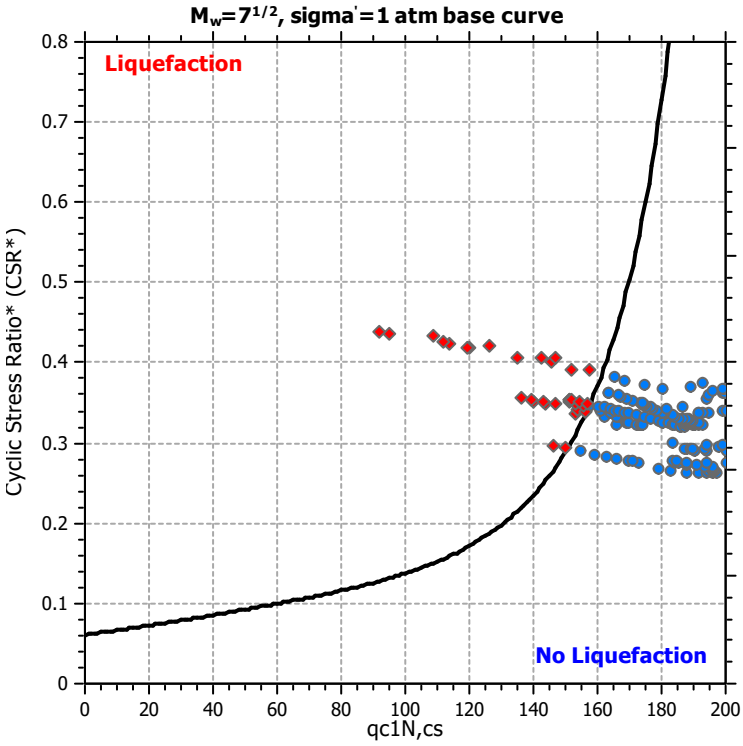
Project title : Oakley Shops at Laurel Fields **Location : Oakley, California**

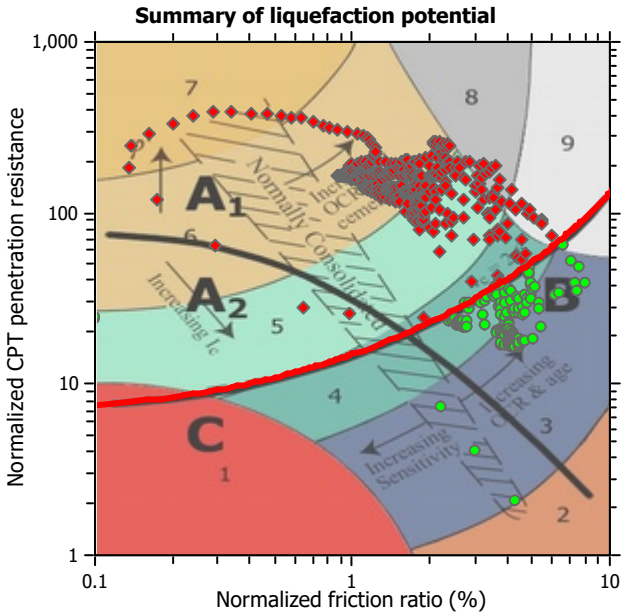
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Input parameters and analysis data

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Fines correction method:	B&I (2014)	G.W.T. (earthq.):	14.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	6.60	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.60	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

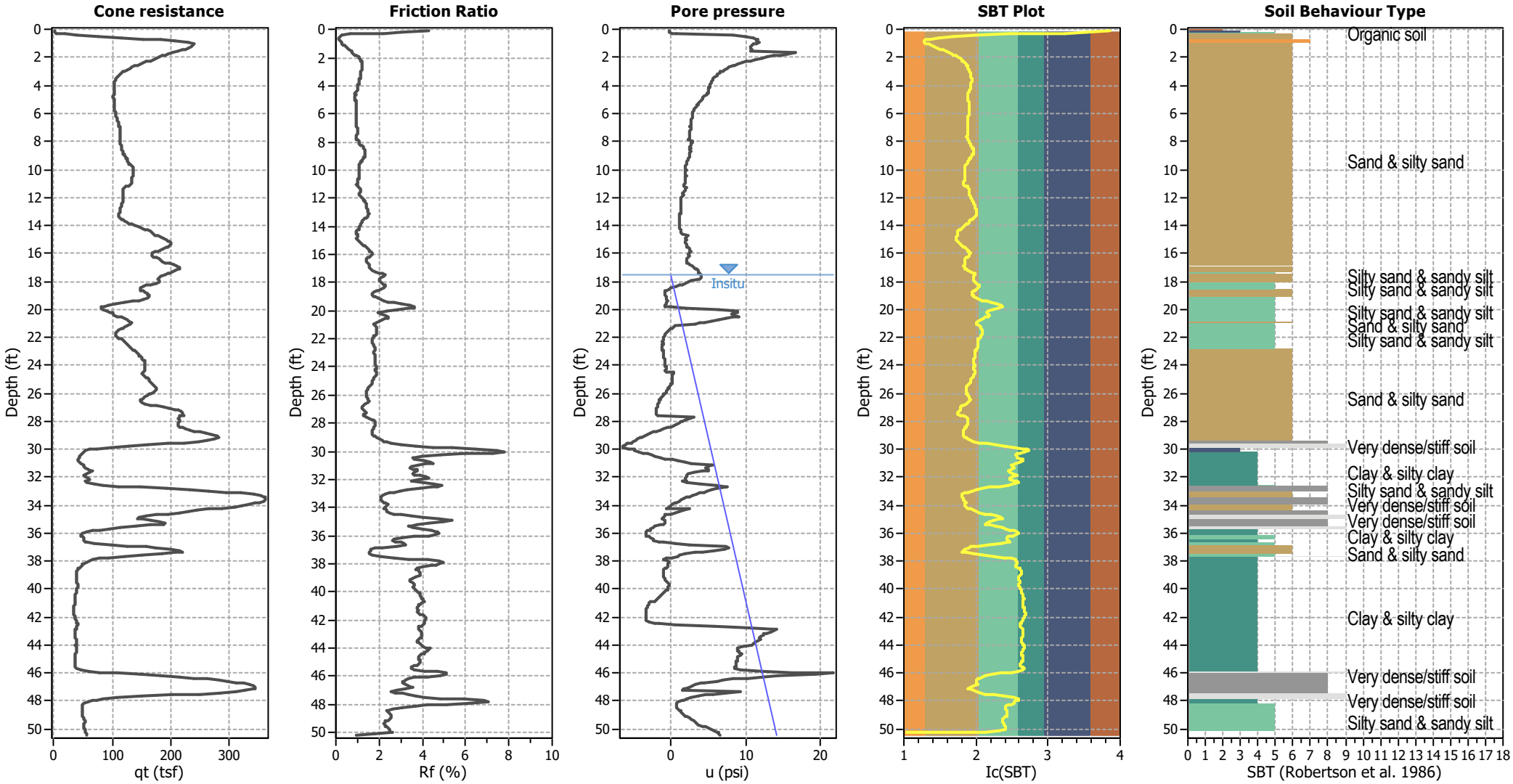






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



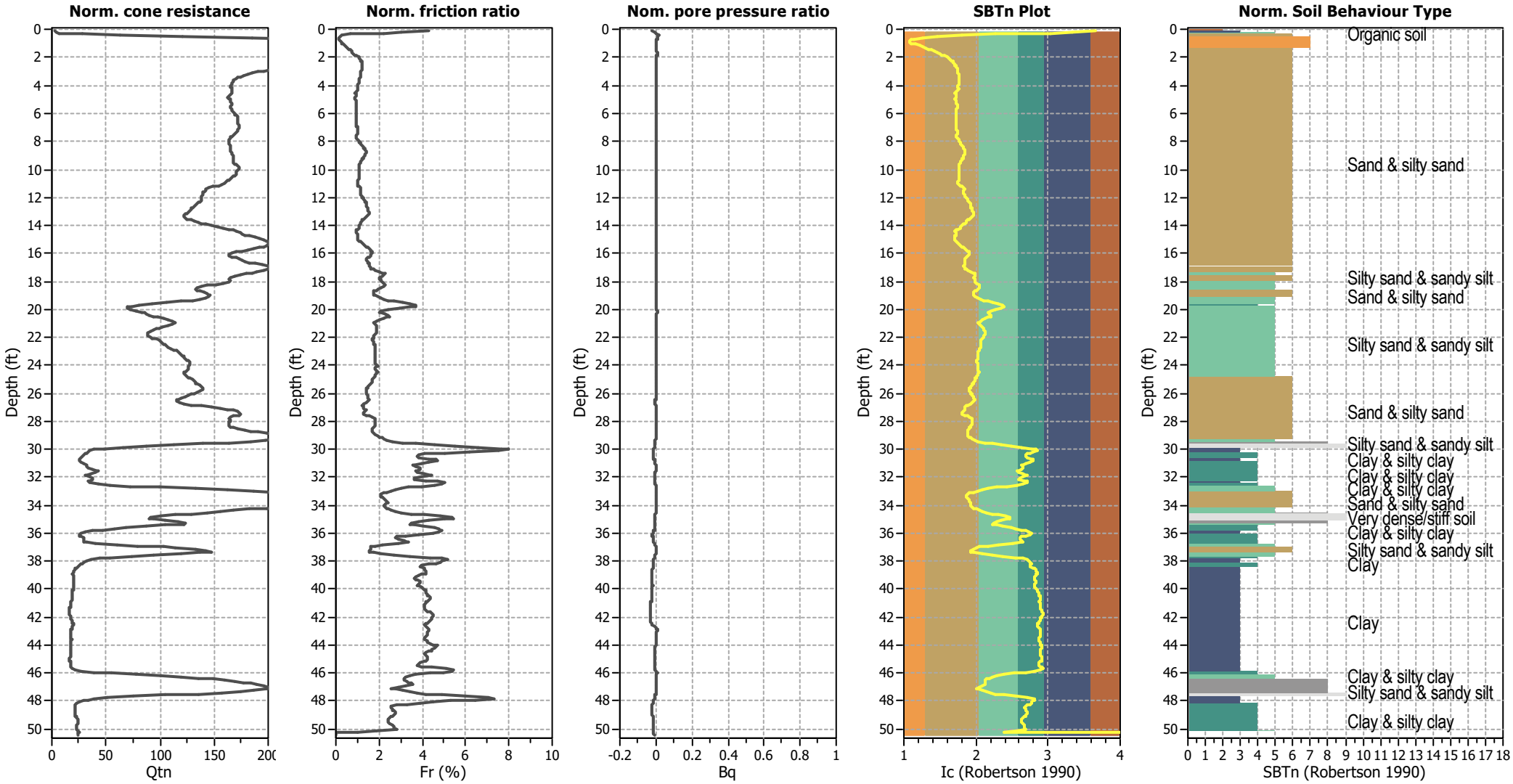
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



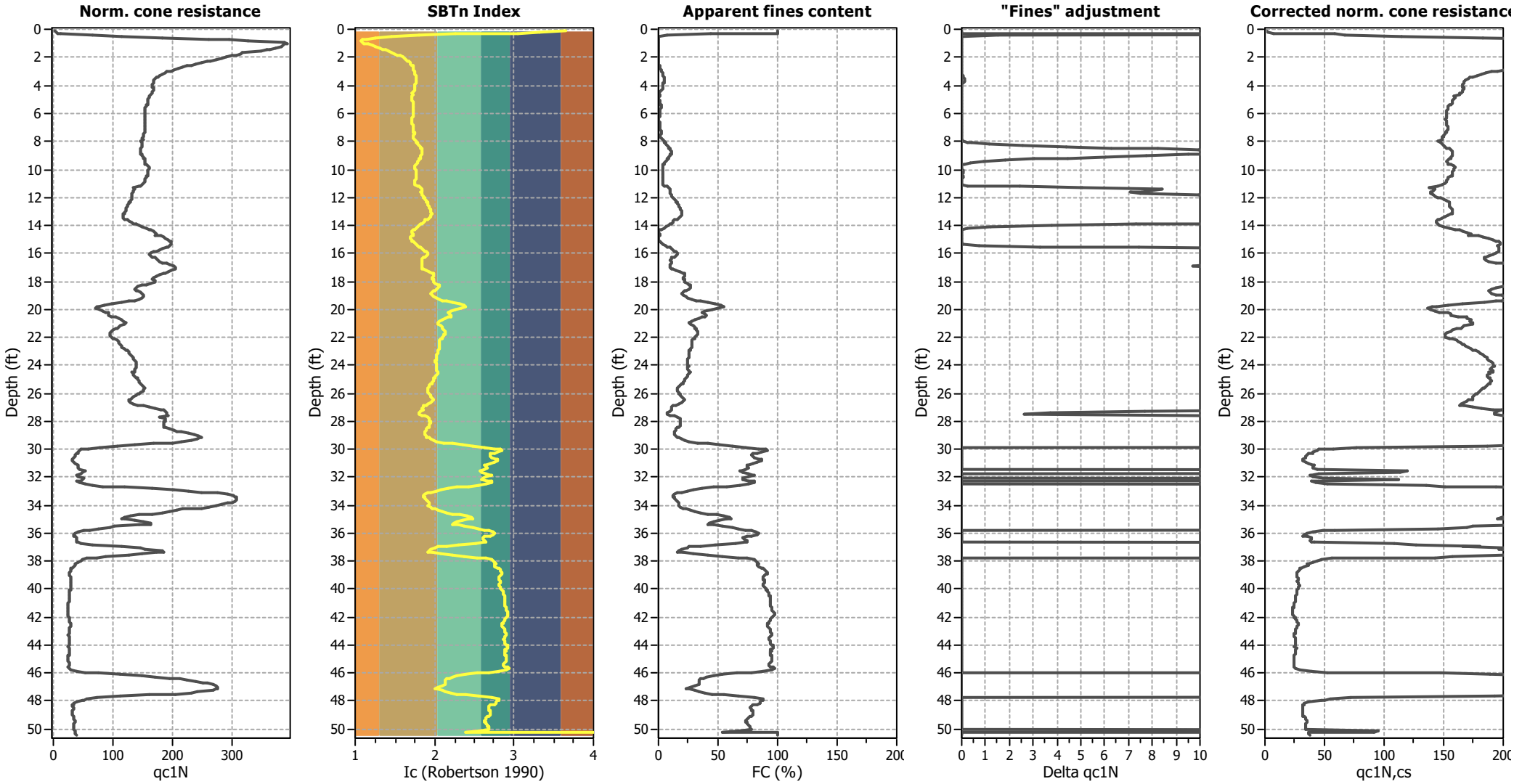
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

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8. Very stiff sand to
9. Very stiff fine grained

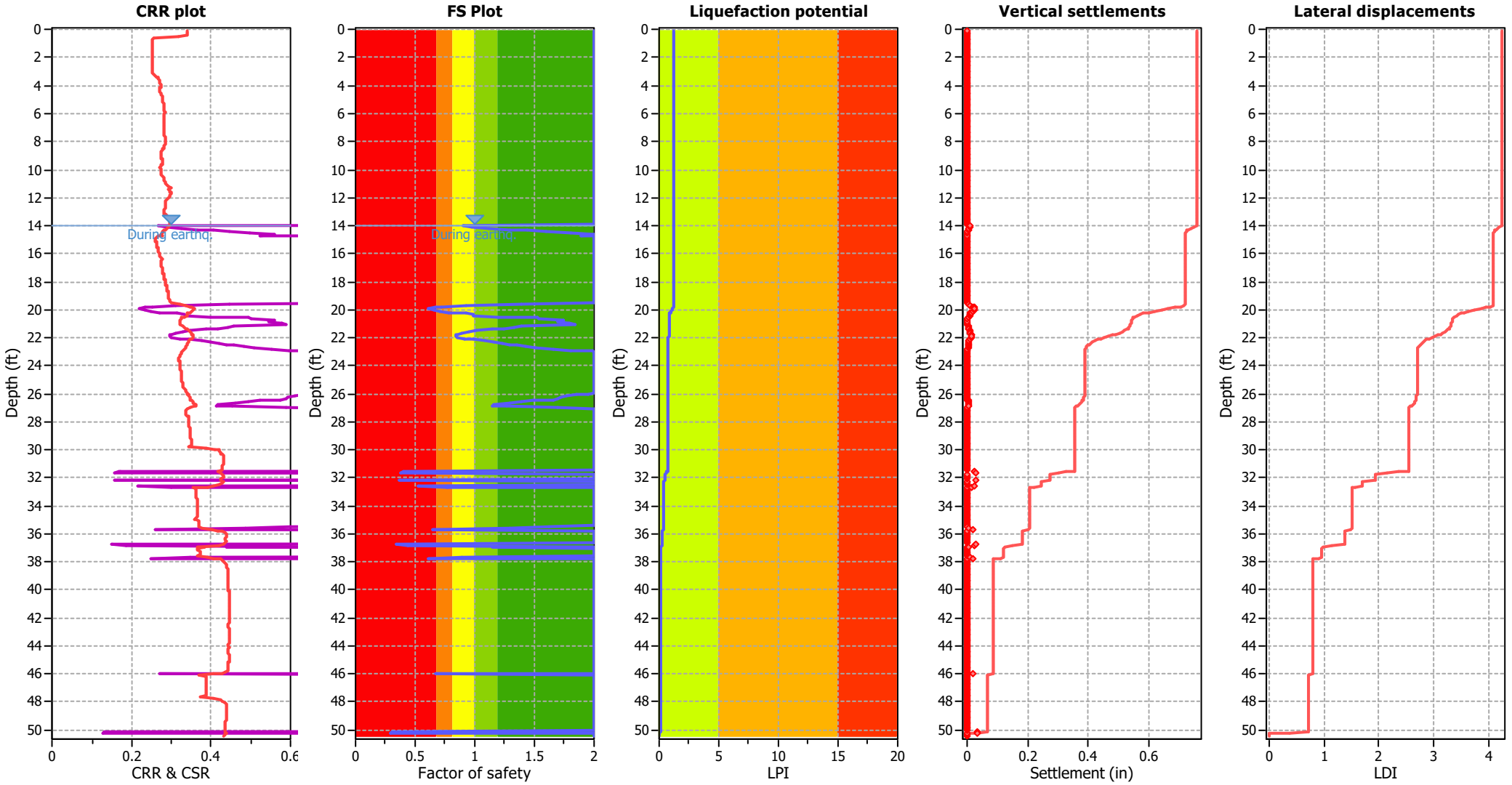
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

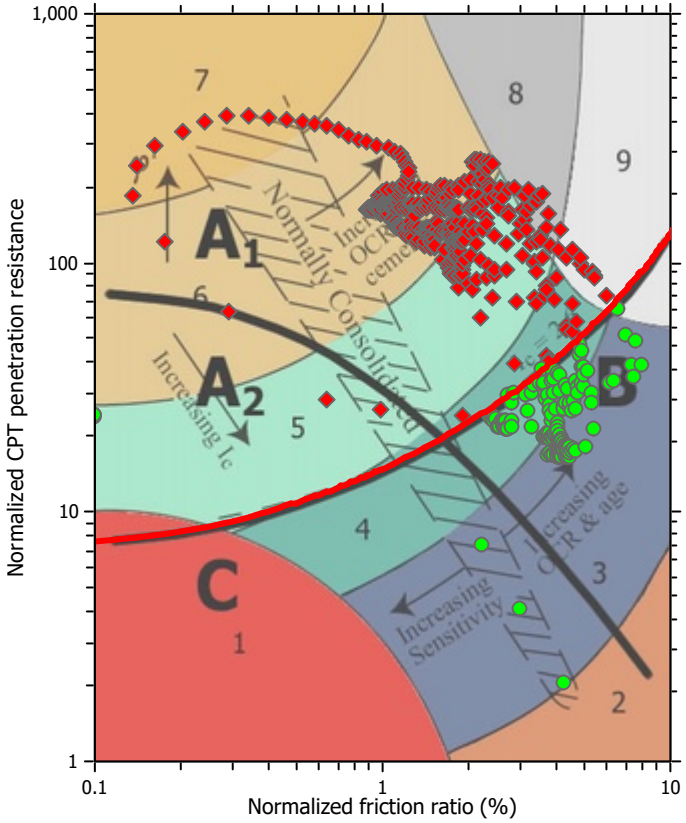
F.S. color scheme

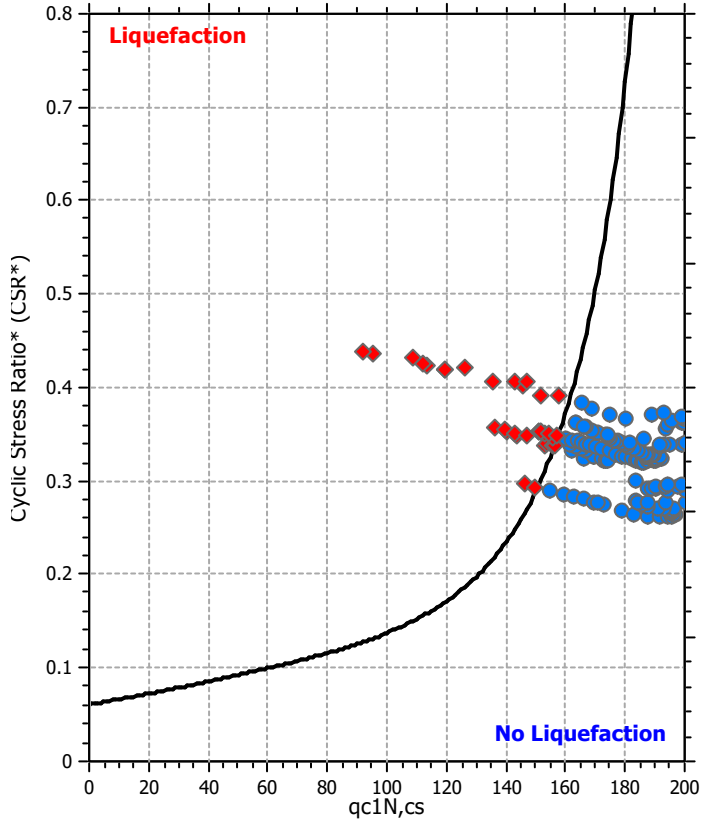
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

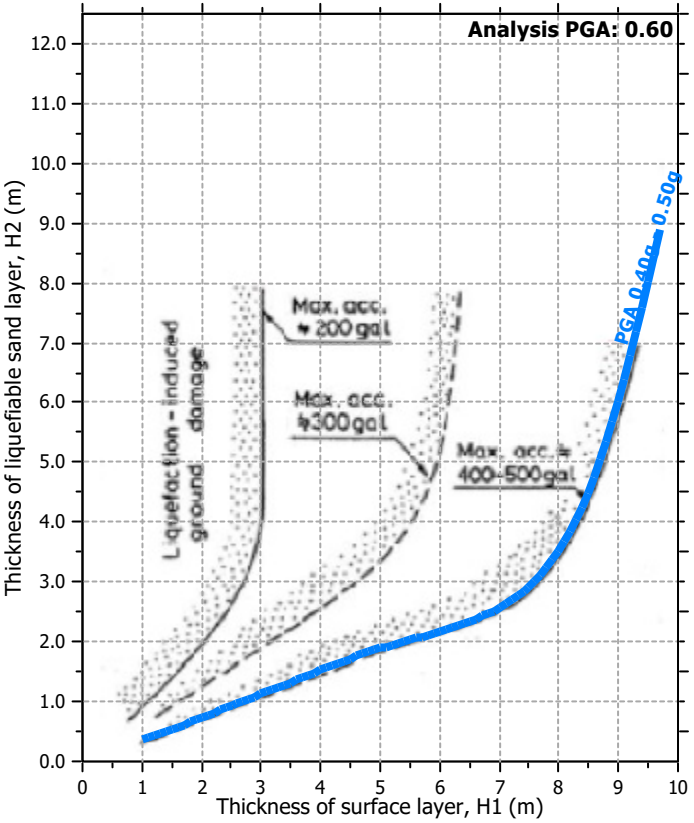
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



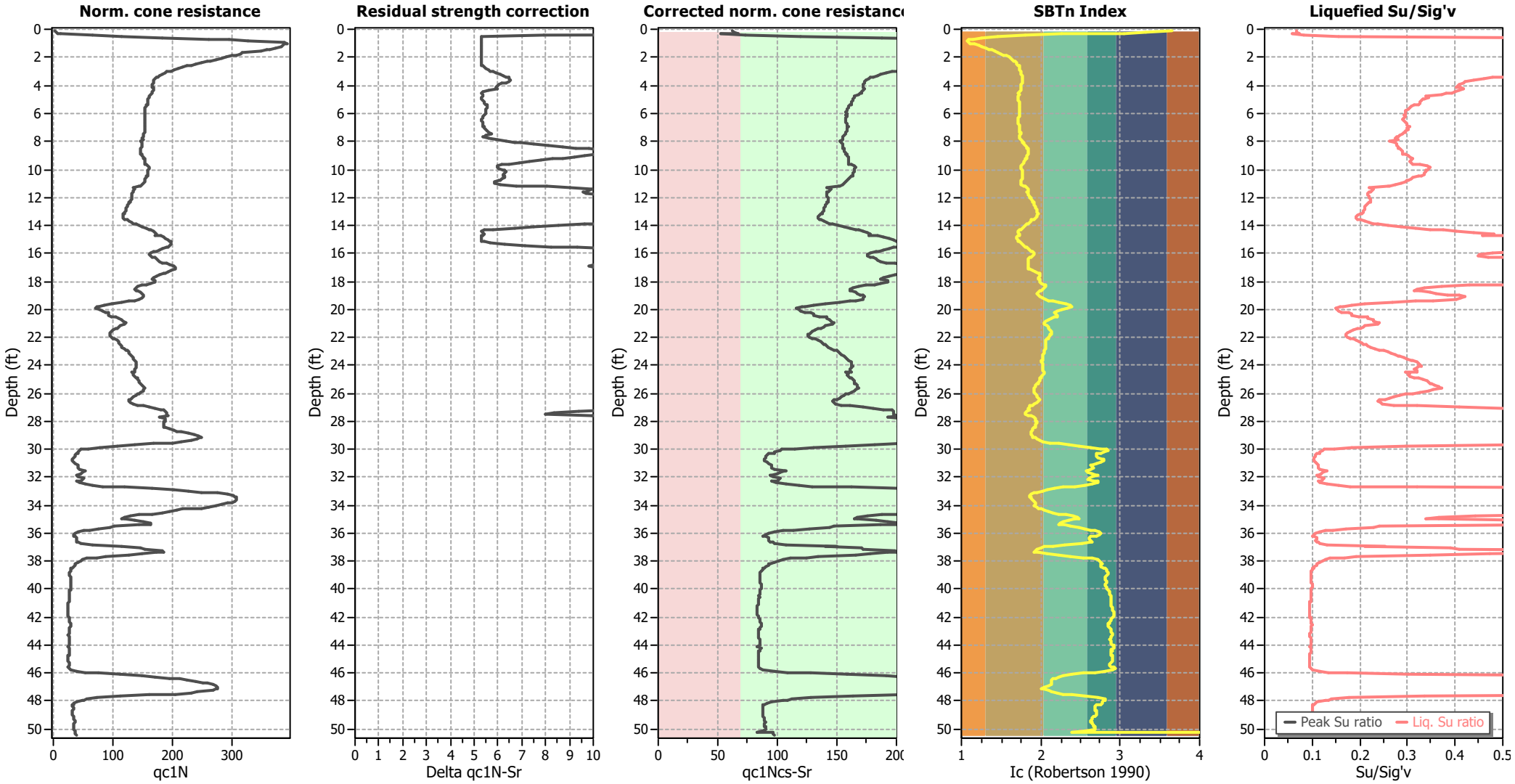




Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

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Morgan Hill, CA 95037

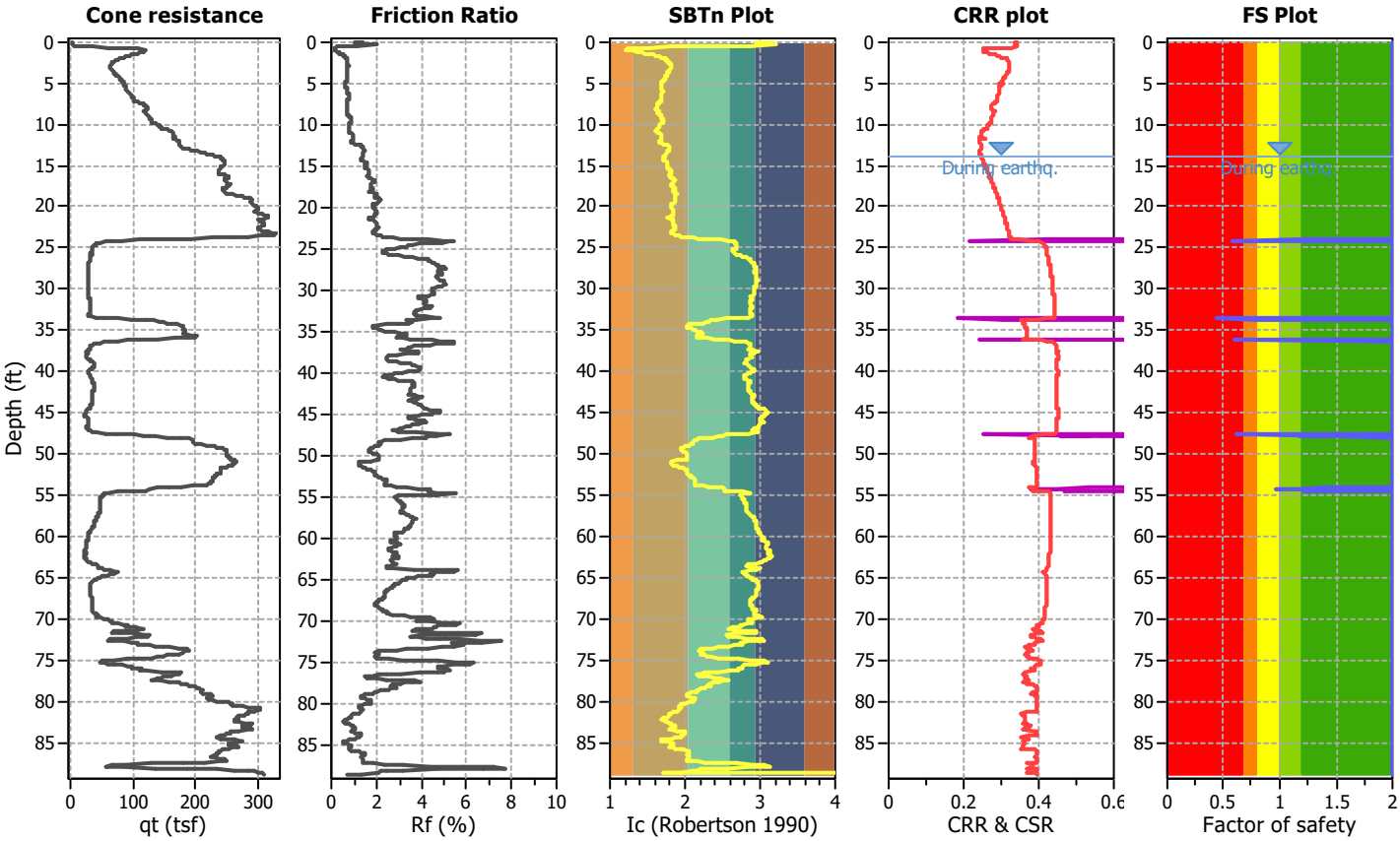
LIQUEFACTION ANALYSIS REPORT

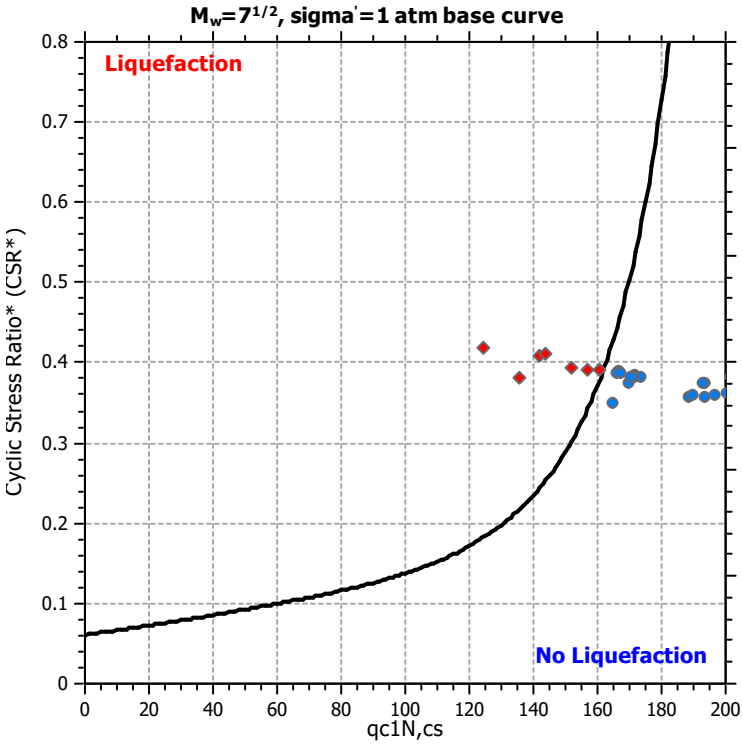
Project title : Oakley Shops at Laurel Fields **Location : Oakley, California**

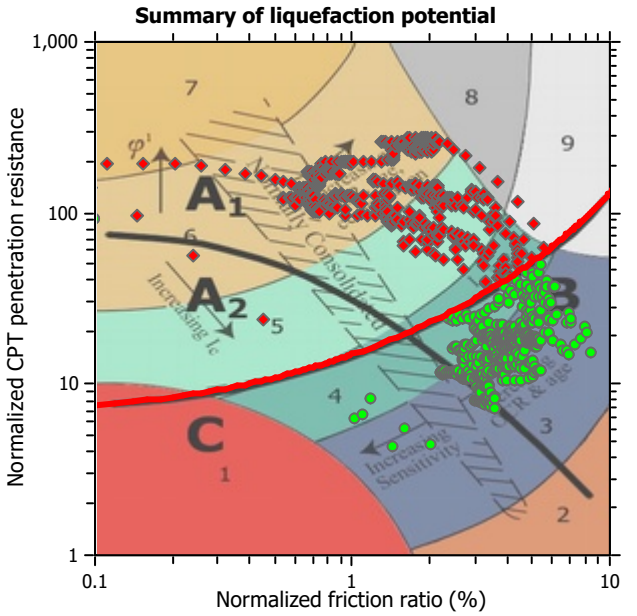
CPT file : SCPT-02

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	17.50 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	14.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	6.60	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.60	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

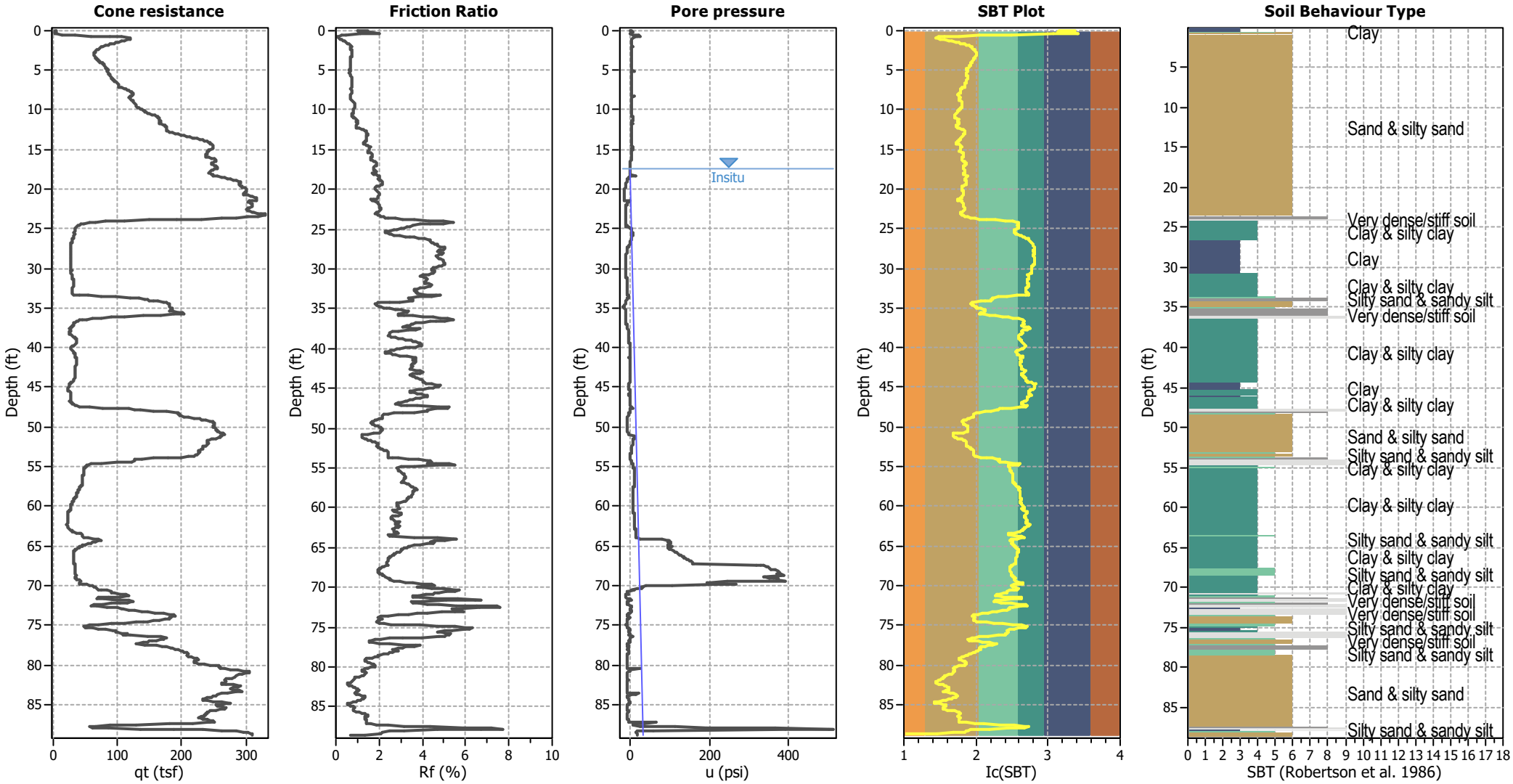






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



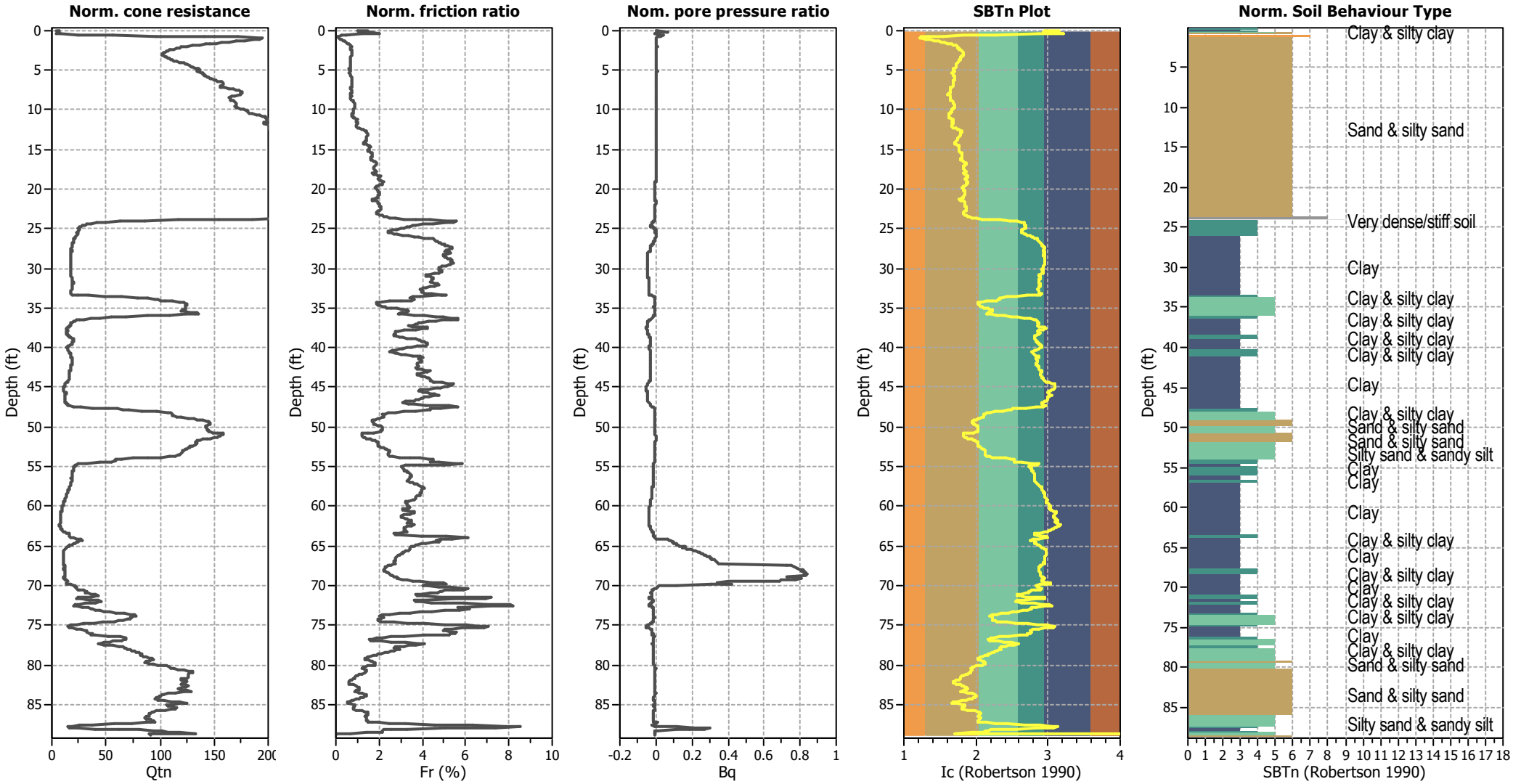
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



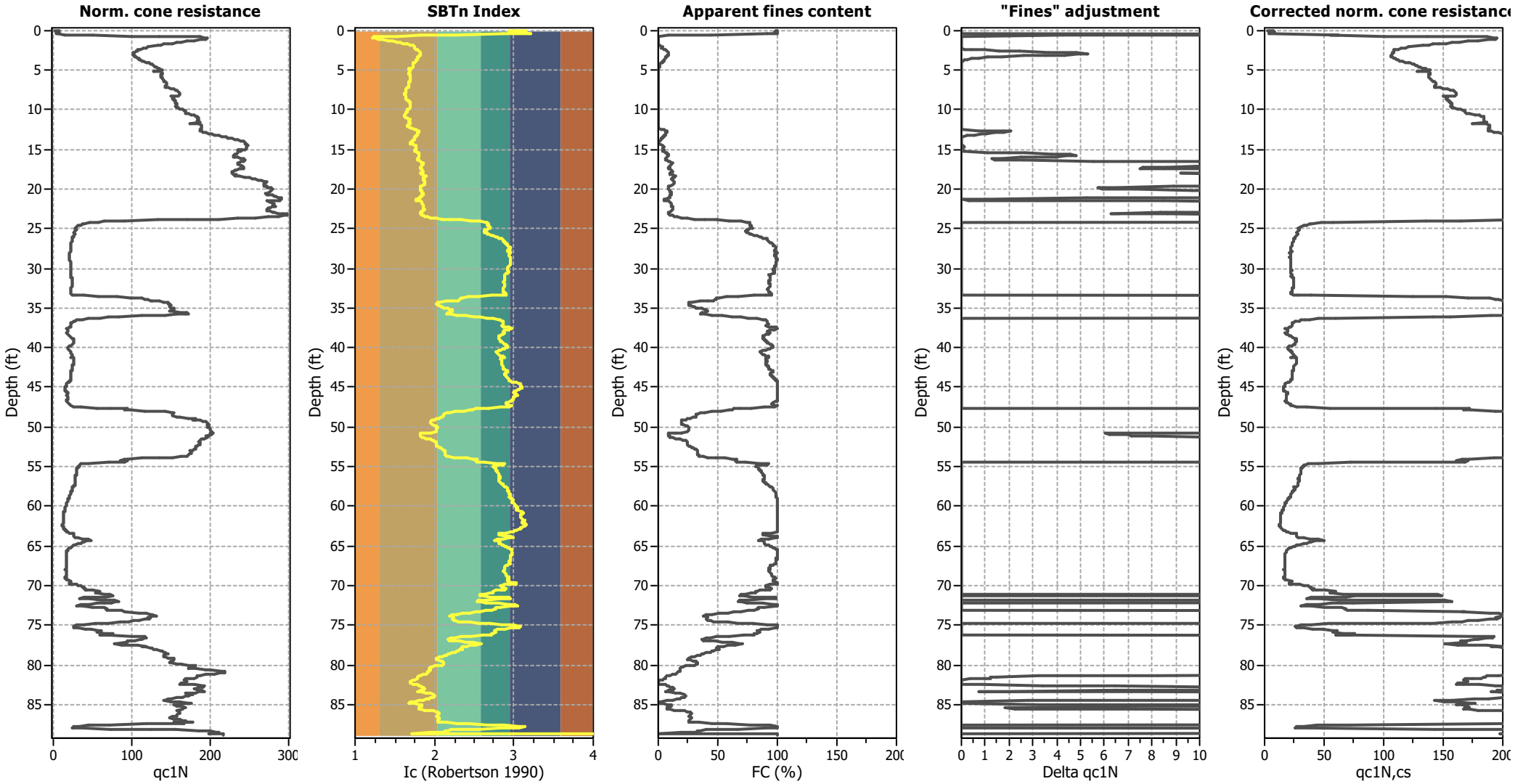
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

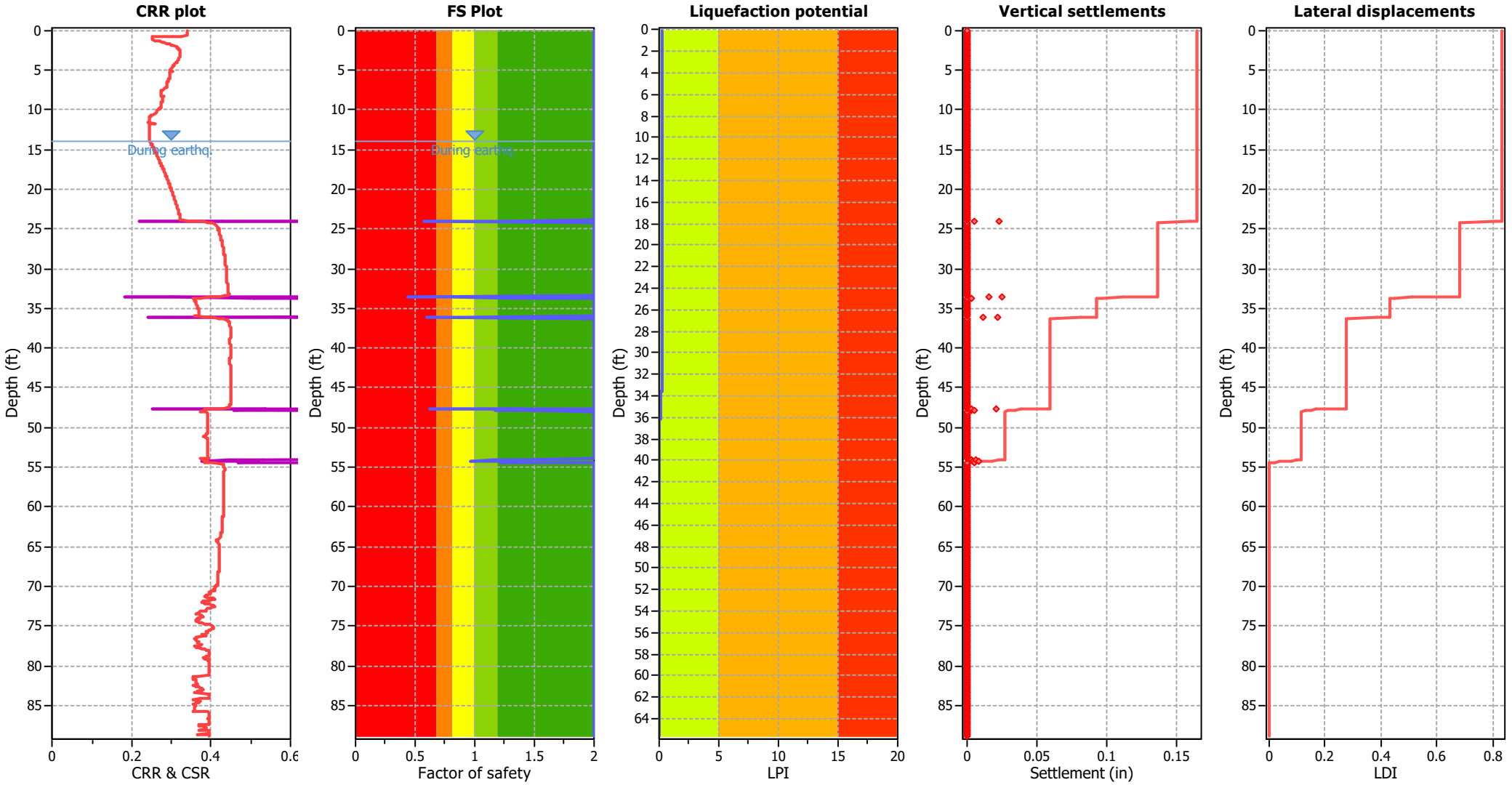
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

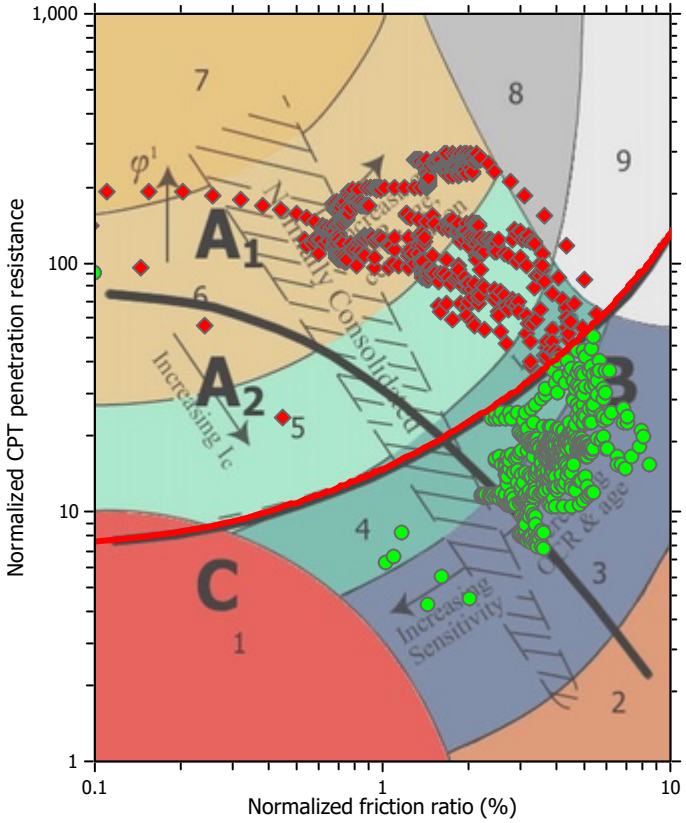
F.S. color scheme

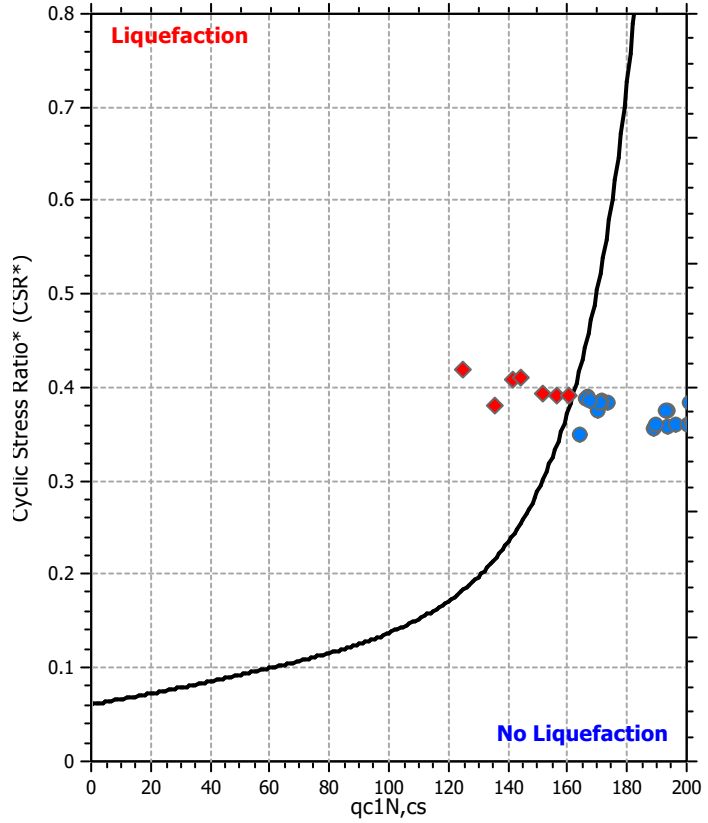
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

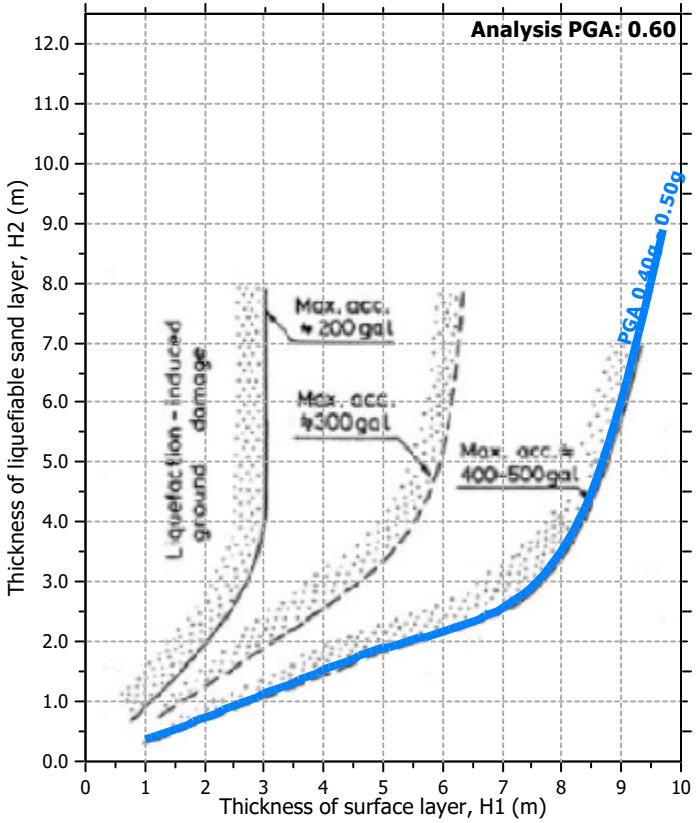
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



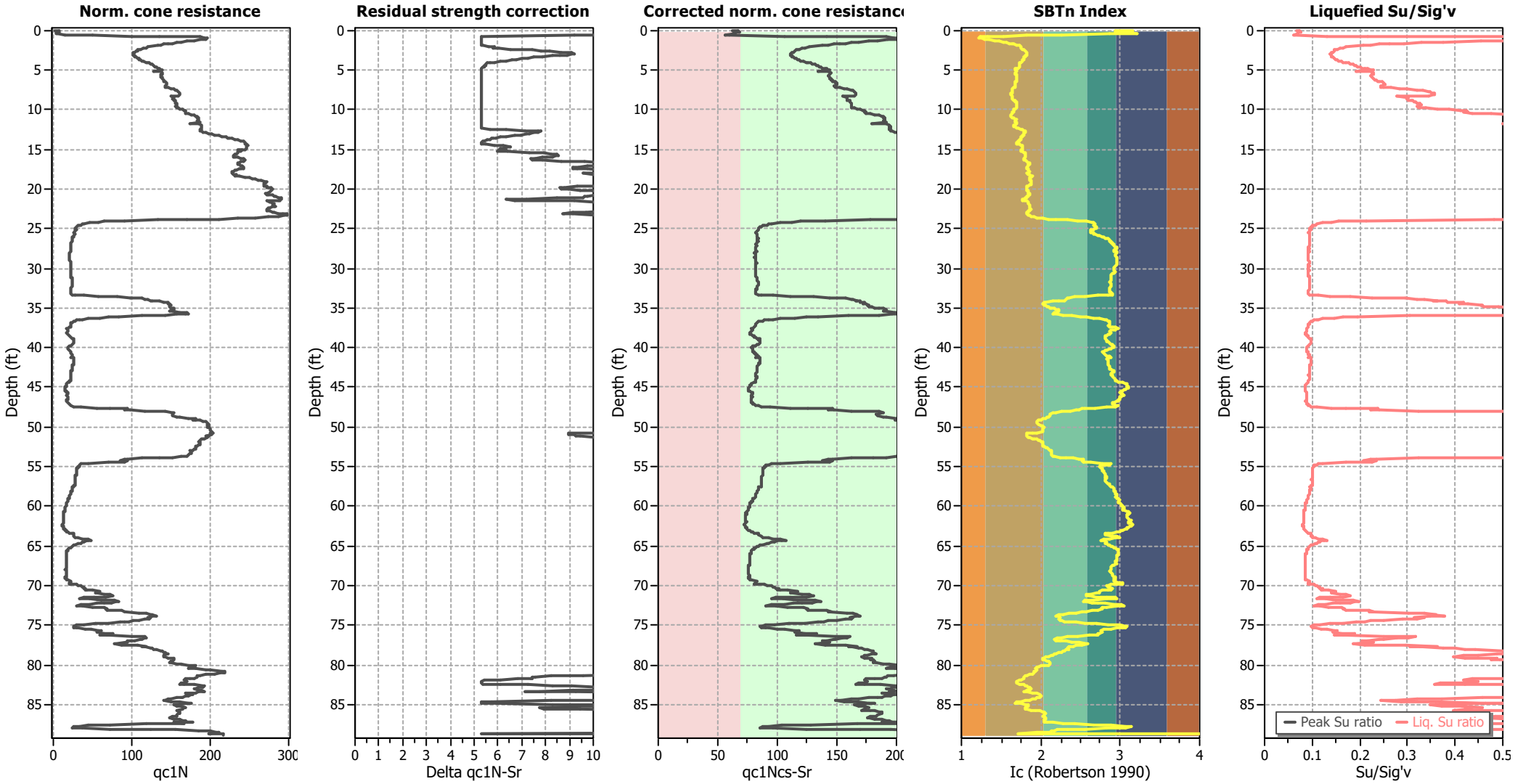




Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	60.00 ft

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Morgan Hill, CA 95037

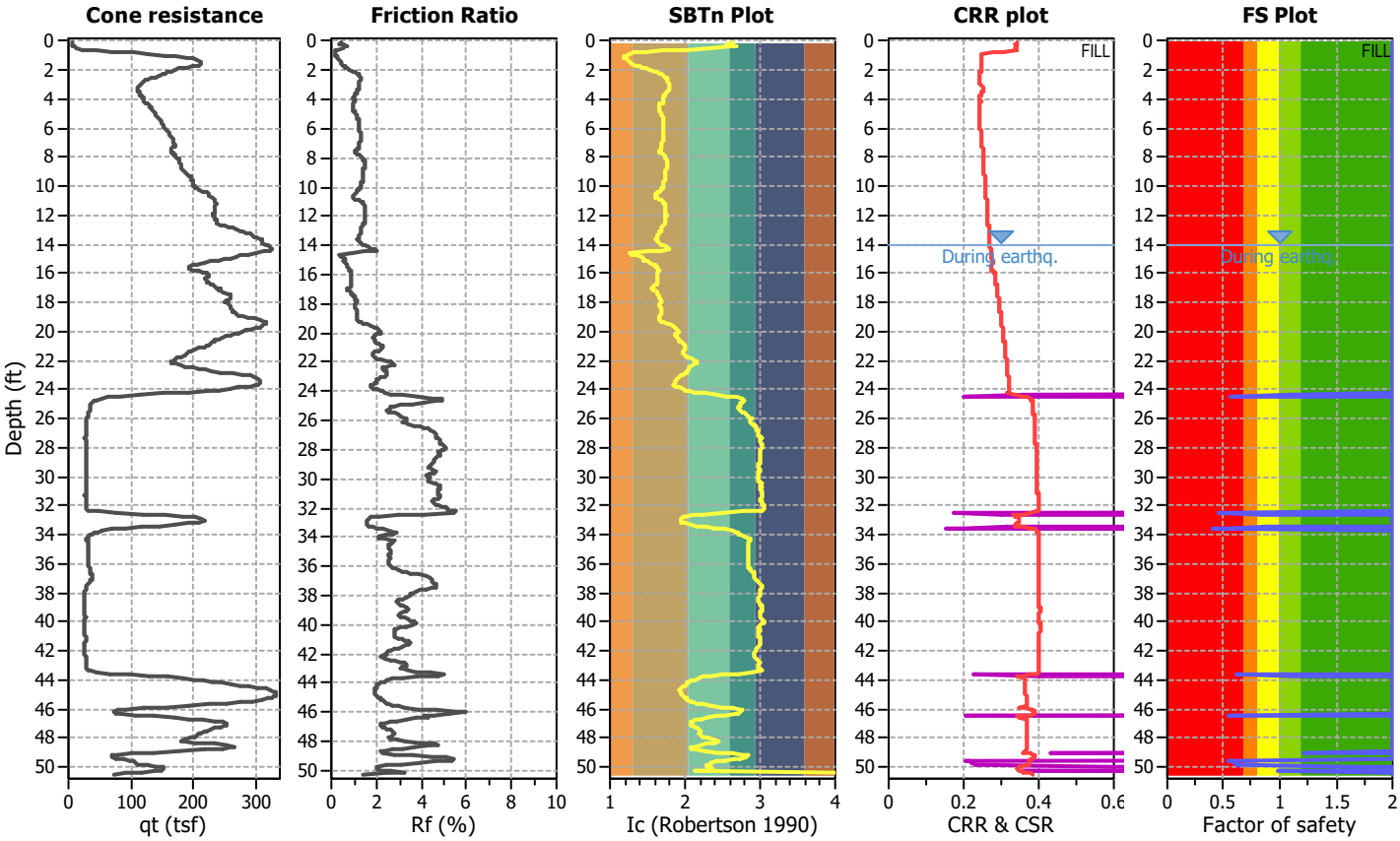
LIQUEFACTION ANALYSIS REPORT

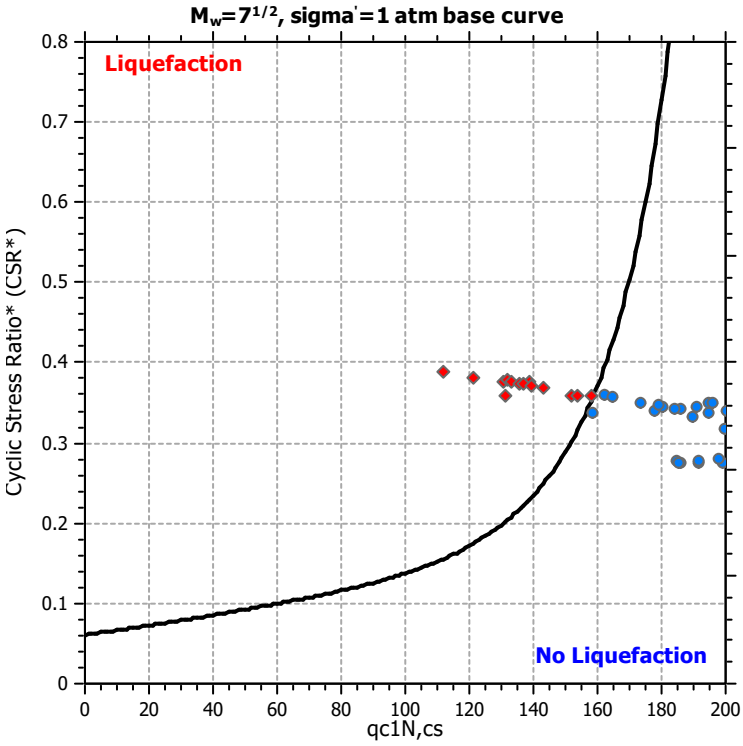
Project title : Oakley Shops at Laurel Fields **Location : Oakley, California**

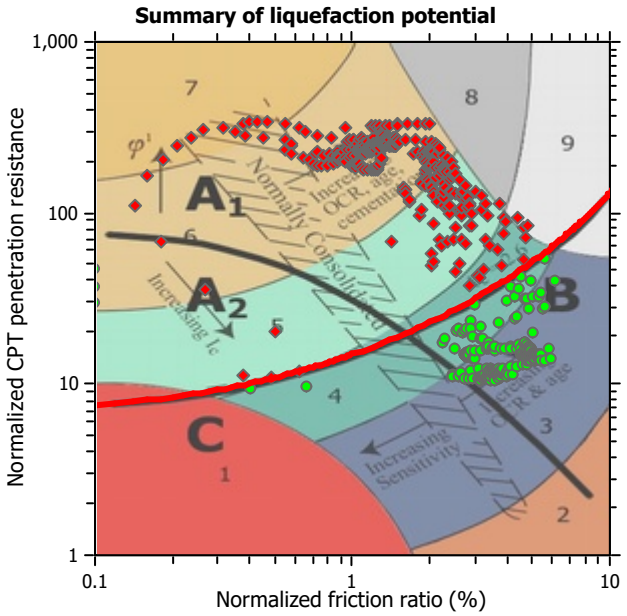
CPT file : CPT-03

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	25.50 ft	Use fill:	Yes	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	22.00 ft	Fill height:	8.00 ft	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	110.00 lb/ft³	Limit depth:	60.00 ft
Earthquake magnitude M_w:	6.60	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.60	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

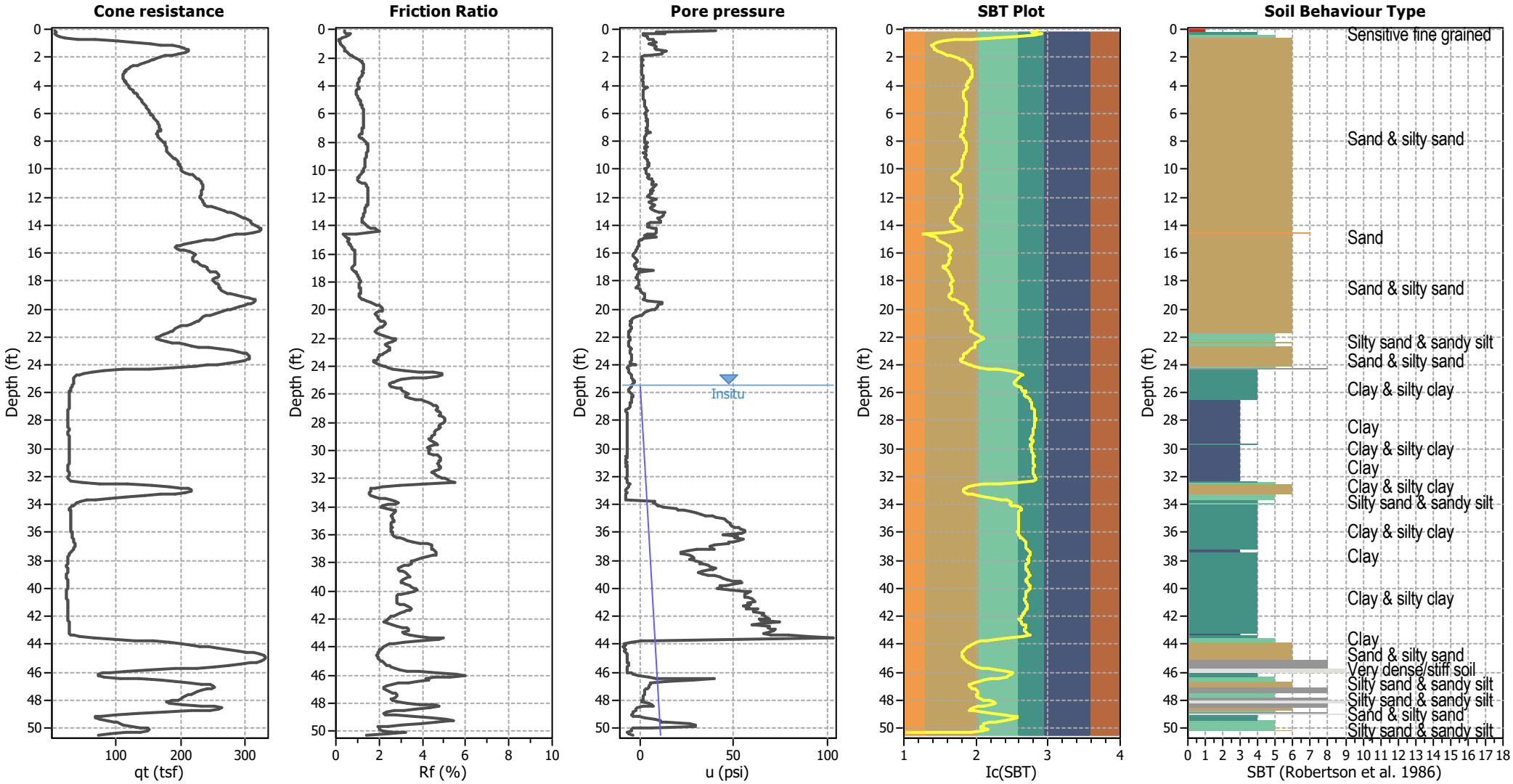






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



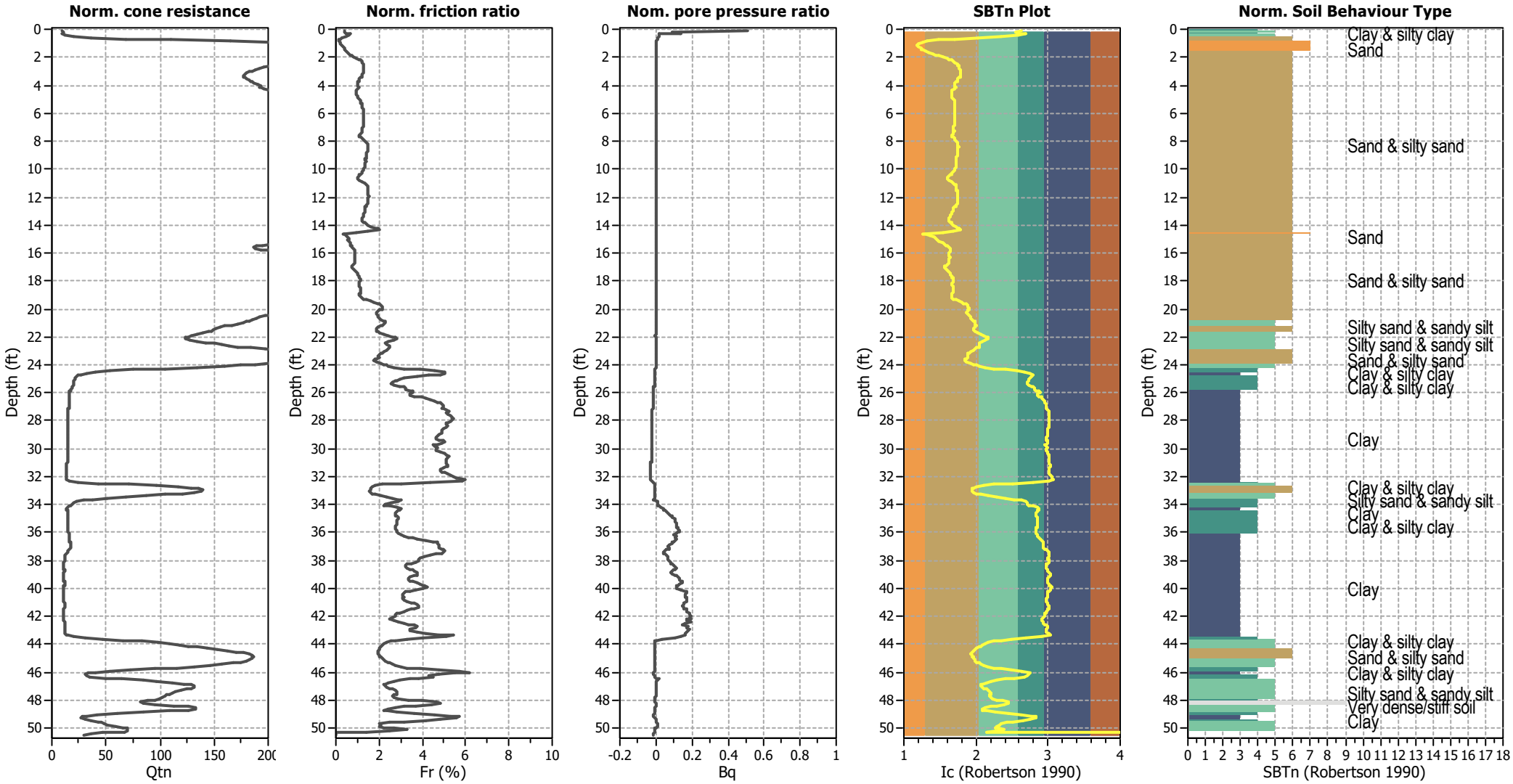
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



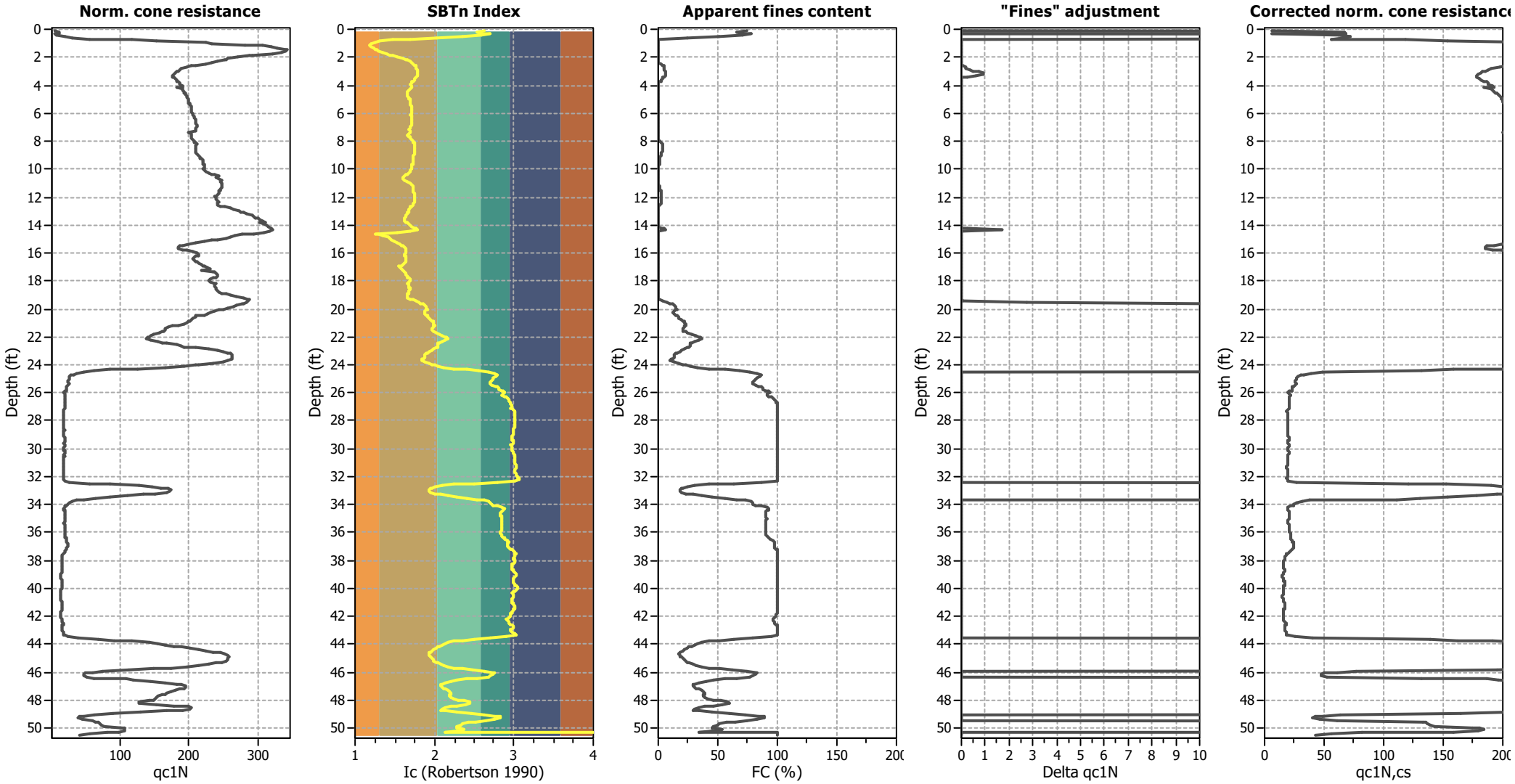
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
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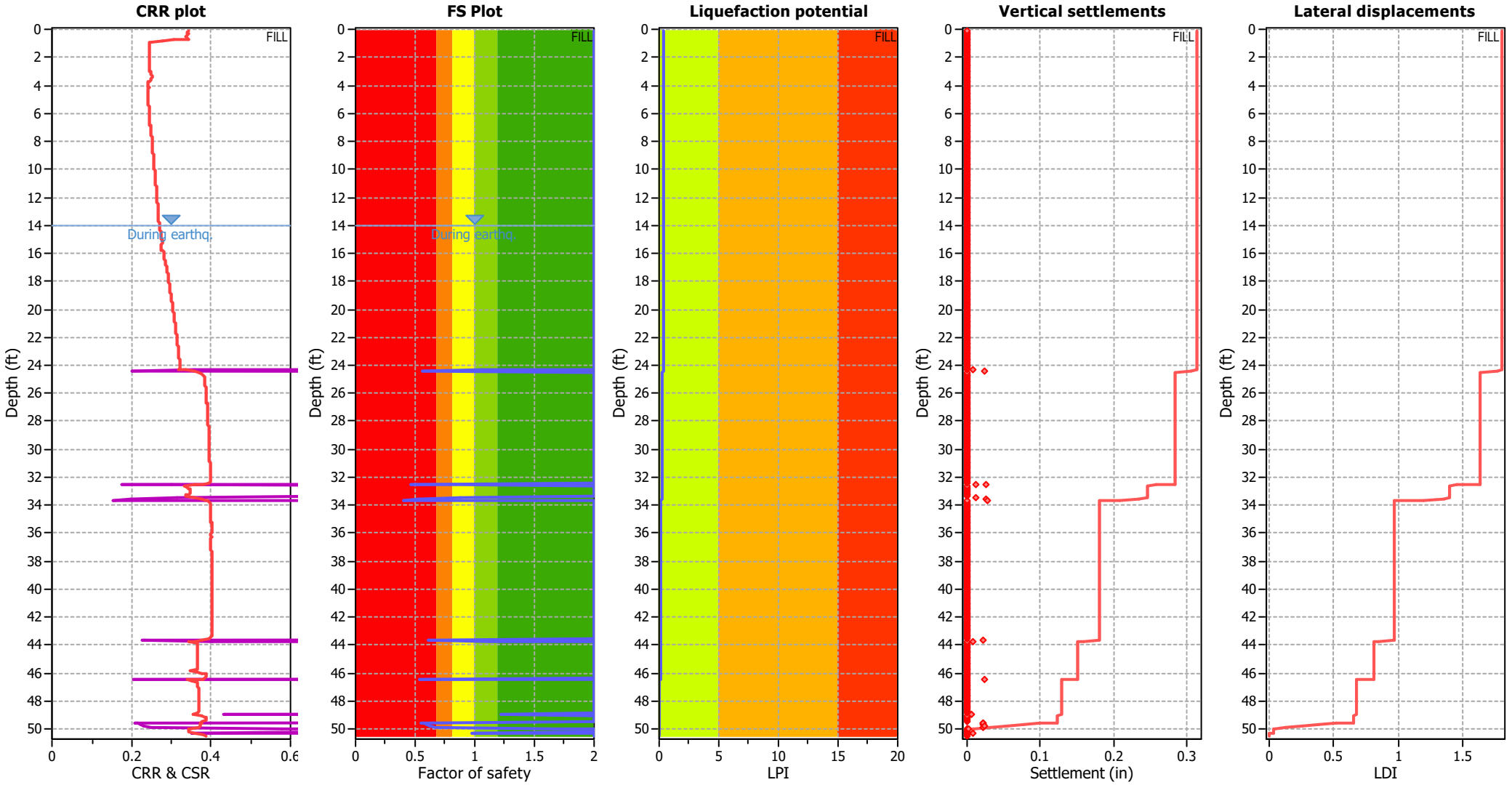
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

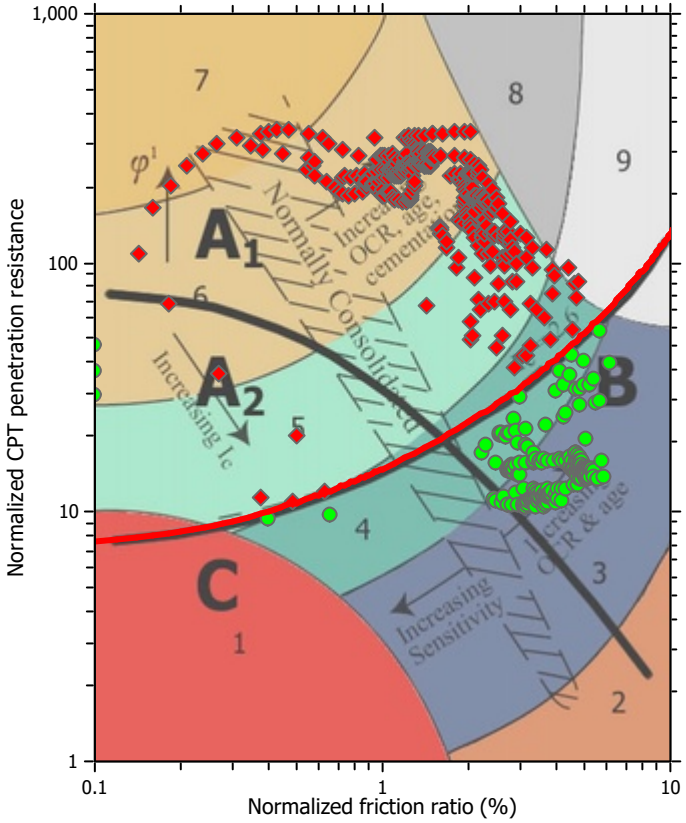
F.S. color scheme

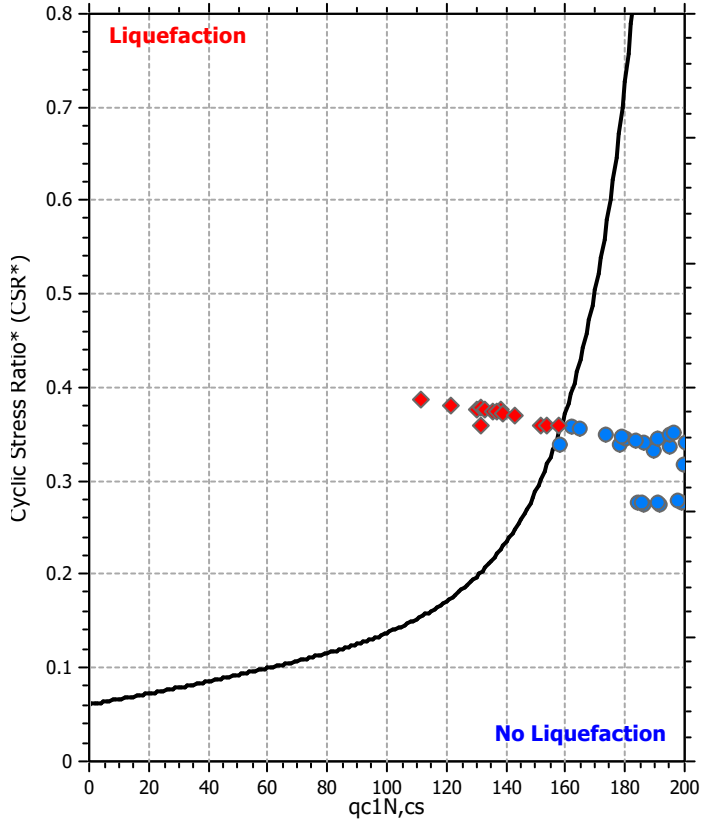
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

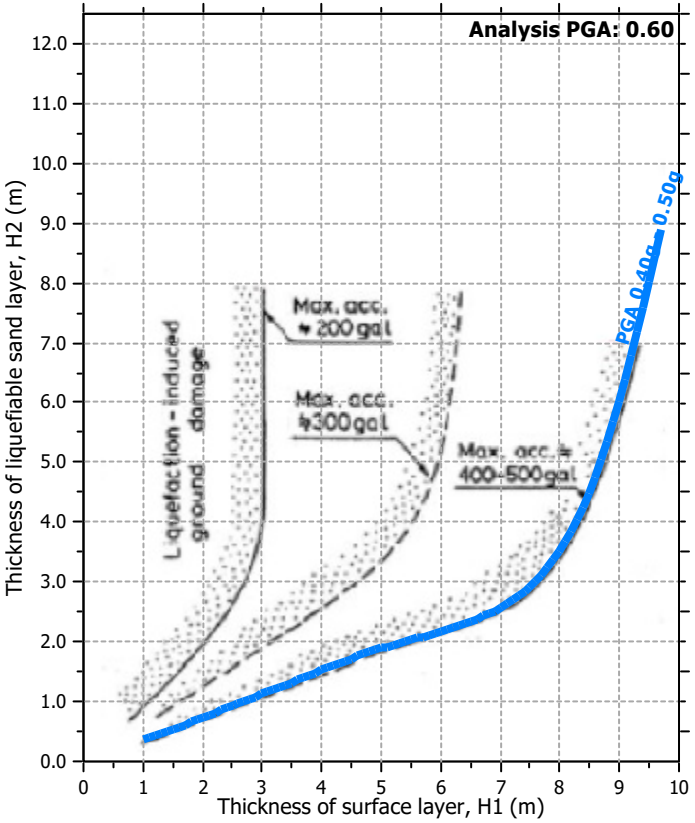
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



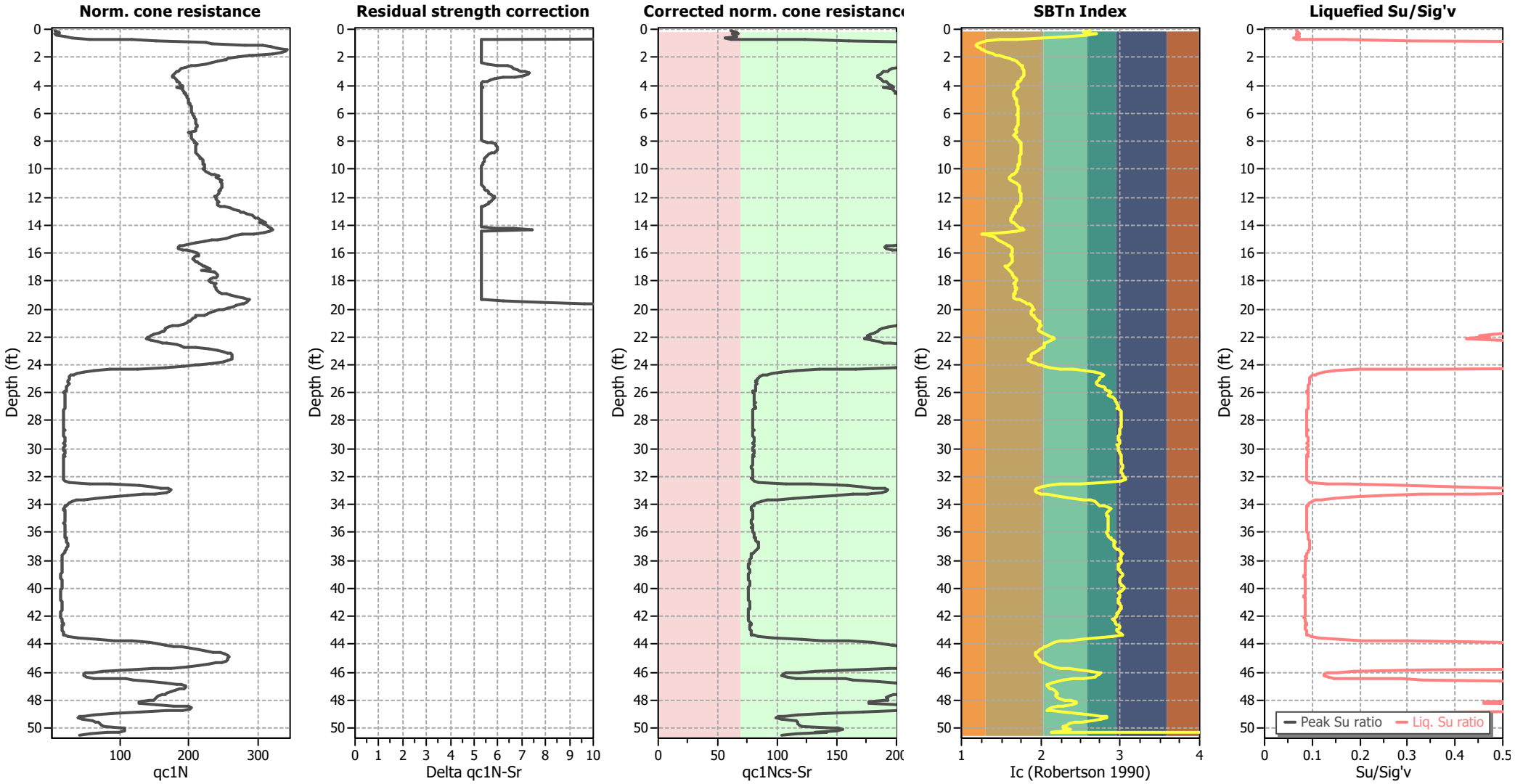




Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	22.00 ft	Fill weight:	110.00 lb/ft³
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.60	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	25.50 ft	Fill height:	8.00 ft	Limit depth:	60.00 ft

Appendix F
Preliminary Stormwater Control Plan

STORMWATER CONTROL PLAN

for

Oakley Shops at Laurel Fields

January 31, 2024

City of Oakley
Planning Division

MAR 7, 2024

RECEIVED

Regency Centers
Craig Ramey
1777 Botelho Drive, Suite 200
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(925) 279-1800

prepared by:

SAGE Consulting Engineers Inc.
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Attachment 1 – Vicinity Map

Attachment 2 - Stormwater Control Plan Exhibit

This Stormwater Control Plan was prepared using the template dated February 2023.

I. PROJECT DATA

Table 1. Project Data

Project Name/Number	Oakley Shops at Laurel Fields
Application Submittal Date	1/31/2024
Project Location	998 Laurel Road, Oakley, CA APN 035-220-028-1
Name of Developer	Regency Centers
Project Phase No.	N/A
Project Type and Description	Retail development including a 55,500 square foot (sf) Safeway store with an adjoining 5,000 sf retail store, 4 retail buildings, a shops building, and a fuel center.
Project Watershed	Lower Marsh Creek
Total Project Site Area (acres)	9.06
Total Area of Land Disturbed (acres)	8.98
Total New Impervious Surface Area (sq. ft.)	342,800
Total Replaced Impervious Surface Area	0
Total Pre-Project Impervious Surface Area	3,300
Total Post-Project Impervious Surface Area	346,100
50% Rule[*]	Applies
Project Density	N/A
Applicable Special Project Categories [Complete even if all treatment is LID]	N/A
Percent LID and non-LID treatment	100% LID
HM Compliance [†]	Applies

[*50% rule applies if:
Total Replaced Impervious Surface Area > 0.5 x Pre-Project Impervious Surface Area]

[†HM required (unless project meets one of the exemptions on *Guidebook* p. 9) if:
(Total New Impervious Surface Area + Total Replaced Impervious Surface Area) ≥ 1 acre]

II. SETTING

II.A. Project Location and Description

The Project is proposed on an approximately 8.77-acre parcel located at the northeast corner of Laurel Road & O'Hara Avenue, in the City of Oakley ("Project Site"). The Project Site is currently zoned RB - Residential Business. The proposed retail development includes a 55,500 square foot (sf) Safeway store, adjacent 5,000 sf retail store, four retail buildings, and a fuel center. The retail development will provide approximately 350 parking stalls.

The Project Site is bounded by Laurel Road to the south, O'Hara Avenue to the west, residential property to the north, and a public park with baseball fields to the east. Vehicular access to the site will be provided by five new driveways, two along Laurel Road and three along O'hara Avenue. The project will construct a new traffic signal at the intersection of Laurel Road and the project's eastern driveway. The proposed site will drain to an existing 66" storm drain line that runs along the northerly boundary of the site and then discharge into the adjacent detention basin located off-site at Laurel Fields.

II.B. Existing Site Features and Conditions

The Project Site is a vacant lot with no on-site improvements. The square parcel gently slopes at an average grade of 2.5% from the southwest to the northeast corners with a maximum elevation around 56.0 and a minimum elevation of 35.0 in the northeast corner of the site.

The Project frontage along Laurel Road is improved with curb, gutter, a meandering sidewalk, and street lighting along the north side of Laurel. O'hara is partially improved with curb and gutter but no sidewalks. On both Laurel and O'hara, openings in the curb allow stormwater to drain into depressed landscape areas between the curb and sidewalk to provide treatment for some of the runoff from the roadways.

There is an existing 66" public storm drain culvert located in a 16-foot-wide easement located on the parcel, along the northly boundary. This storm drain outfalls onto the adjoining park to the east, Laurel Fields, which functions as a detention basin for Contra Costa County Drainage Area 30A. Drainage from the Project Site will be routed to this 66" culvert for discharge to the Laurel Road Detention Basin (Laurel Basin).

Per the geotechnical investigation conducted in late 2023, the subsurface was characterized as medium dense to dense poorly graded to silty sand to the maximum depth explored of 26.5 below ground surface. Clayey sand to sandy lean clay of low plasticity was encountered near the bottom of some of the borings at a depth of about 26 feet. Pore pressure dissipation testing indicated that groundwater is located approximately 20 to 22 feet below grade. The Natural Resources Conservation Service has classified the soil at the site as Hydrologic Soils Group A, with anticipated infiltration rates of high to very high (5.95 to 19.98 in/hr).

II.C. Opportunities and Constraints for Stormwater Control

The proposed development's objective of providing an economically sustainable neighborhood retail center requires the developer to maximize the leasable space, resulting in a high intensity use that leaves little space for stormwater control measures. Neighborhood retail has been contemplated at this site for over 20 years but has not yet progressed beyond the entitlement phase. The City of Oakley is providing the developer with the opportunity to improve stormwater treatment capabilities of the adjacent detention basin, where the stormwater runoff from this site is conveyed, in-lieu of constructing stormwater treatment facilities on-site.

The development will drain to an on-site drainage system that will convey runoff north to the existing 66" public storm drain culvert running along the northly boundary of the site. The project proposes to improve Laurel Basin by constructing a bioretention area that has the capacity to treat a volume of stormwater equivalent to the volume of stormwater discharged from the new development.

III. LOW IMPACT DEVELOPMENT DESIGN STRATEGIES

III.A. Optimization of Site Layout

III.A.1. Limitation of development envelope

To provide an economically sustainable neighborhood retail center, the developer needs to maximize leasable space, thus the development envelope extends across nearly the entire site, leaving little space for stormwater treatment facilities.

III.A.2. Minimization of imperviousness

Impervious surfacing has been provided at landscape areas located in parking islands and building sidewalks; however, much of the site will consist of retail buildings and vehicle parking which will be impervious.

III.B. Use of Permeable Pavements

Permeable pavement was considered for the project; however, the type and frequency of vehicular traffic could adversely affect the lifespan and maintenance required of any permeable pavement.

III.C. Dispersal of Runoff to Pervious Areas

There is very limited pervious area on-site, however, the project will convey its runoff to the adjacent ballpark/detention basin that is entirely pervious. In addition, the soil is classified as Hydrologic Soils Group A with anticipated infiltration rates of high to very high so much of this stormwater can infiltrate into the subgrade.

III.D. Bioretention or other Integrated Management Practices

This project proposes to improve the adjacent detention basin at Laurel Fields by constructing a bioretention area that has the capacity to treat a volume of stormwater equivalent to the volume of stormwater discharged from new impervious surfacing. To accomplish this, approximately 1,400 cubic yards of existing material will be excavated and replaced with 18" of bioretention soil mix over 12" of Caltrans Class II permeable material. This will facilitate removal of pollutants by filtering the runoff as it infiltrates through the soil mix and permeable material base.

IV. DOCUMENTATION OF DRAINAGE DESIGN

As noted above, this project will meet its stormwater treatment requirements by providing treatment at the detention basin located on the adjacent Laurel Fields. Detailed design will be completed during the permitting phase; however, the design concept is documented in the following sections.

IV.A. Descriptions of each Drainage Management Area

The stormwater control area evaluated includes all disturbed surfacing, including on- and off-site areas, as indicated in the Stormwater Control Exhibit. The on-site area generally drains to the 66" storm drain line that runs in the storm drain easement along the north boundary of the site. The on-site area has been divided into three DMAs that drain to this SD line, depending on the surfacing

type. The bioretention area designated as IMP-1 has been sized to accommodate the runoff from the on-site DMAs.

The frontage areas that are outside of the development parcel consist of landscape areas between the sidewalk and curb as well as existing sidewalk to remain along the Laurel Road frontage. The table below indicates the DMAs that comprise the stormwater control area.

IV.A.1. Table of Drainage Management Areas

Table 2. Drainage Management Areas

DMA Name	*Area (SF)*	*Surface Type/Description*	*DMA Type/Drains to*
Areas Draining to IMPs			
DMA-1R	91,000	Conventional Roof	IMP-1 Bioretention Area
DMA-1P	251,800	Asphalt/Concrete Pavement	IMP-1 Bioretention Area
DMA-1L	43,500	Landscaping	IMP-1 Bioretention Area
Subtotal	**386,300**		
Areas Draining to Self-Retaining Areas			
EIS-L	3,300	Existing Concrete Sidewalk	SR-L Bioretention Area
Self-Retaining Areas			
SR-L	2,700	Self-Retaining Landscaping	Landscape areas on Laurel frontage
Self-Treating Areas			
ST-O	2,200	Landscaping	Landscape areas on O'hara frontage
TOTAL AREA			
TOTAL	**394,500**		

Drainage Management Area Descriptions

DMAs with the suffix "R" indicate roof, "L" indicates landscaping, and "P" indicates impervious paving (concrete or asphalt).

DMA-1R, with area as shown above, encompasses roof areas of all buildings, will drain to the on-site drainage system that conveys drainage to the Laurel Basin.

DMA-1P, with area as shown above, includes impervious surfacing such as asphalt and concrete paving, will also drain to the on-site drainage system before being discharge to the Laurel Basin.

DMA-1L, with area as shown above, is on-site landscaping. While most stormwater in these areas will infiltrate into the ground, any overflow will drain to the on-site drainage system that is conveyed to the Laurel Basin.

EIS-L, with area as shown above, is existing impervious sidewalk along Laurel Road that will remain. This area drains to the self-retaining landscape area located between the sidewalk and curb on Laurel Road.

SR-L, with area as shown above, is a self-retaining landscape located between existing sidewalk and curb along Laurel Road.

ST-O, with area as shown above, is self-treating landscape located between new sidewalk and curb along O'hara Avenue.

IV.B. Integrated Management Practice Descriptions

Runoff from impervious areas on the site, including roofs and paved areas, will be routed to the Laurel Basin as shown on the Stormwater Control Exhibit. IMP-1, the bioretention area proposed at the southwest corner of the park, has been sized to treat runoff from the site.

The bioretention area will be designed and constructed to the criteria in the Stormwater C.3 Guidebook, 8th Edition, including the following features:

- Bioretention facilities are located in a visible, well-trafficked area.
- Top of soil elevation is as high as possible. High walls and steep slopes adjacent to the facility are avoided.
- A soil section consisting of 18 inches sand/compost mix meeting the specifications approved by the Regional Water Quality Control Board in April 2016, over 12 inches Class 2 permeable, Caltrans specification 68-2.02F(3).
- Location and footprint of facility are congruent on the site plan, landscaping plan, and grading plan.
- Bioretention area is designed as a basin (level edges) or a series of basins, and grading plan is consistent with these elevations. Check dams, if any, are set so the lip or weir of each dam is at least as high as the toe of the next upstream dam.
- Area of soil mix meets or exceeds minimum. Volume or depth of surface reservoir meets or exceeds minimum.
- Freeboard above overflow is not included in surface reservoir volume.
- No filter fabric.

IV.C. Tabulation and Sizing Calculations

All treatment areas are sized to meet or exceed the minimum treatment areas as calculated with Contra Costa County's IMP Sizing Calculator. Results of the calculations are included below.

Table 3. IMP Sizing Calculations

IMP Name: IMP-1				
IMP Type: Bioretention Area				
DMA Name	*Area (SF)*	*Surface Type*	*DMA Runoff Factor*	*DMA Area x Runoff Factor*
DMA-1R	91,000	Conventional Roof	1.00	91,000
DMA-1P	251,800	Asphalt/Concrete Pavement	1.00	251,800
DMA-1L	43,500	Landscaping	0.10	4,350
Total	**386,300**		**Total**	**347,150**

		IMP Sizing			
		IMP Sizing Factor	*Rain Adjustment Factor*	*Minimum Area or Volume*	*Proposed Area or Volume*
Total Area (sf)	**347,150**	0.04	1.00	13,886	14,000

V. SOURCE CONTROL MEASURES

V.A. Site Activities and Potential Sources of Pollutants

This commercial project will create few potential sources of storm water pollutants. Sources to be controlled are:

- Potential dumping of wash water or other liquids into storm drain inlets.
- Need for future indoor or structural pest control.
- Fertilizers and pesticides used in landscape maintenance.
- Litter and debris on-site.

The table below lists potential pollutant sources on the development site and the corresponding source control measures specified in the Contra Costa Clean Water Program Stormwater C.3 Guidebook. All areas where these activities occur will drain to an IMP. To further reduce the potential for pollutants to enter runoff, permanent and operational BMPs will be implemented as described below.

V.B. Source Control Table

Table 4. Source Controls

Potential source of runoff pollutants	*Permanent source control BMPs*	*Operational source control BMPs*
Inlets (overflow drains)	All inlets will be marked with "No Dumping! Flows to Local Waterways" or similar	Markings will be regularly inspected and repainted or replaced as needed. Lessees will receive stormwater pollution prevention brochures. Lease agreements will include the following provision: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
Landscape maintenance	Landscaping will minimize irrigation and runoff and be selected for pest resistance and will minimize the need for fertilizers and pesticides. Plants will be selected appropriate to site soils, slopes, climate, sun, wind rain, land use, air movement, ecological consistency, and plant interactions.	Landscaping will be maintained using minimum or no pesticides.

Potential source of runoff pollutants	*Permanent source control BMPs*	*Operational source control BMPs*
Refuse area	Refuse and recycled materials will be handled within the building and/or parking structure. This area is to be equipped with a drain to a grease interceptor and then to the sanitary sewer.	All dumpsters will be posted with signs stating "Do not dump hazardous materials here" or similar.
Courtyards, patios, sidewalks, and parking lots		Trash receptacles to be provided on-site and emptied daily. Site to be policed at least twice daily for trash. Plazas, sidewalks, and parking lots will be swept regularly. Debris and wash water from periodic pressure washing will be collected and disposed of to the sanitary sewer.
Need for future indoor and structural pest control		Integrated Pest Management (IPM) information will be provided to new tenants.

V.C. Features, Materials, and Methods of Construction of Source Control BMPs

There are no known conflicts between the storm water control BMPs and other Contra Costa County codes or other development requirements.

VI. STORMWATER FACILITY MAINTENANCE

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

Source control measures and operational BMPs at the retail center will be the responsibility of the property management and will be performed by the owner's contractors or employees as part of routine maintenance of buildings, grounds, and landscaping. The applicant has reviewed Contra Costa County's standard agreement regarding the maintenance of stormwater facilities and commits to execute any necessary agreements prior to completion of construction.

The Laurel Basin is a functioning detention basin currently maintained by municipal staff. The developer's contractors will maintain the bioretention improvements until they are accepted by the Cit of Oakley. Once accepted, routine maintenance will continue to be performed by municipal staff as part of the maintenance for the detention basin and park.

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

Bioretention removes pollutants primarily by filtering runoff slowly through an active layer of soil. Routine maintenance is needed to ensure that flow is unobstructed, that erosion is prevented, and that soils are held together by plant roots and are biologically active. The stormwater treatment facilities will be maintained on the following schedule at a minimum. Details of maintenance responsibilities and procedures will be included in a Stormwater Facility Operation and Maintenance Plan to be submitted for approval as required in the conditions of approval.

At no time will synthetic pesticides or fertilizers be applied, nor will any soil amendments, other than aged compost mulch or sand/compost mix, be introduced.

Daily: The facilities will be examined for visible trash during regular policing of the site, and trash will be removed.

After Significant Rain Events: A significant rain event is one that produces approximately a half-inch or more rainfall in a 24-hour period. Within 24 hours after each such event, the following will be conducted:

The surface of the facility will be observed to confirm there is no ponding.

- Inlets will be inspected, and any accumulations of trash or debris will be removed.
- The surface of the mulch layer will be inspected for movement of material. Mulch will be replaced and raked smooth if needed.

Prior to the Start of the Rainy Season: In September or each year, the facility will be inspected to confirm the following:

- Inspect inlets for channels, exposure of soils, or other evidence of erosion. Clear any obstructions and remove any accumulation of sediment. Examine rock or other material used as a splash pad and replenish if necessary.
- Inspect outlets for erosion or plugging.
- Inspect inlets and clear any obstructions and remove any accumulation of sediment.
- Inspect pumps to ensure they are properly operating. Replace pump as necessary to make certain operation is as designed.
- Inspect soils for evidence of instability or erosion and correct as necessary.
- Observe soil at the bottom of the IMPs for uniform percolation throughout. If portions of the IMPs do not drain within 48 hours after the end of a storm, the soil should be tilled and replanted. Remove any debris or accumulations of sediment.
- Examine the vegetation to ensure that it is healthy and dense enough to provide filtering and to protect soils from erosion. Replenish mulch as necessary, remove fallen leaves and debris, prune large shrubs or trees, and mow turf areas. Confirm that irrigation is adequate and not excessive. Replace dead plants and remove invasive vegetation.
- Abate any potential vectors by filling holes in the ground and by ensuring that there are no areas where water stands longer than 48 hours following a storm. If mosquito larvae are present and persistent, contact the Contra Costa County Vector Control District for information and advice. Mosquito larvicides should be applied only when absolutely necessary and then only by a licensed individual or contractor.

Annual Landscape Maintenance: In December – February of each year, vegetation will be cut back as needed, debris removed, and plants and mulch replaced as needed. The concrete work will be inspected for damage. The elevation of the top of soil and mulch layer will be confirmed to be consistent with the 6-inch reservoir depth.

VII. CONSTRUCTION PLAN C.3 CHECKLIST

Table 5. Construction Plan C.3 Checklist

Stormwater Control Plan Page #	*BMP Description*	*See Plan Sheet #s*
Exhibit	IMP-1 – bioretention area, see Stormwater Control Exhibit.	TBD

VIII. CERTIFICATIONS

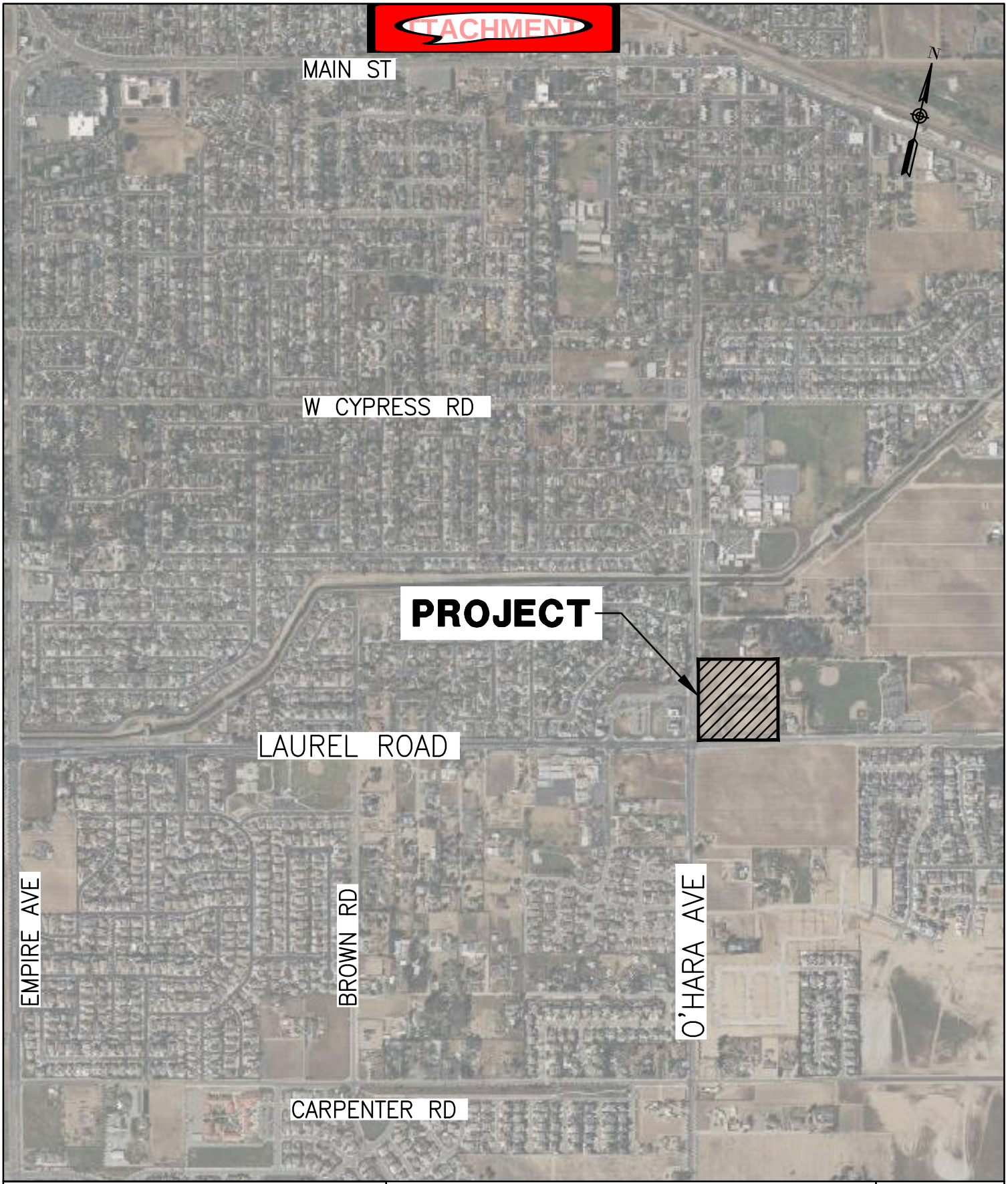
The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R2-2015-0049.

By

Kirsten M. H

Kirsten Hanson 1/31/2024





SAGE
Consulting Engineers, Inc.
12 Geary Street, Suite 605
San Francisco, CA 94108

VICINITY MAP

OAKLEY SHOPS AT LAUREL FIELDS
998 LAUREL ROAD
OAKLEY, CALIFORNIA

DATE	1/31/2024
SCALE	1" = 1000'
PROJECT NO.	J0155
DRAWING NO.	VM

PLOTTED: 1/31/2024 2:42:17 PM
PATH: S:\3-Projects\J0050_Oakley Safeway\5_Production\1_Drawings\3_Exhibits\EXH_Vicinity Map.dwg

LEGEND

- STORMWATER CONTROL BOUNDARY
- BIORETENTION AREA BOUNDARY
- DIRECTION OF SURFACE FLOW
- DIRECTION OF PIPE FLOW
- IMPROVED BIORETENTION AREA SEE DETAIL 1, THIS SHEET
- CONVENTIONAL ROOF IMPERVIOUS
- EXISTING SIDEWALK TO REMAIN, IMPERVIOUS
- LANDSCAPING PERVIOUS
- LANDSCAPING SELF-TREATING
- LANDSCAPING SELF-RETAINING

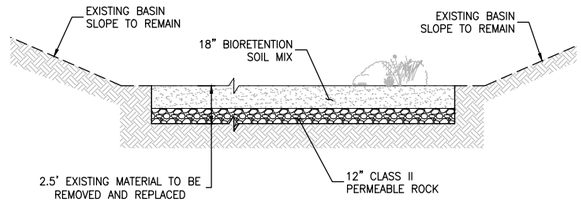
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IMP Type: Bioretention Area

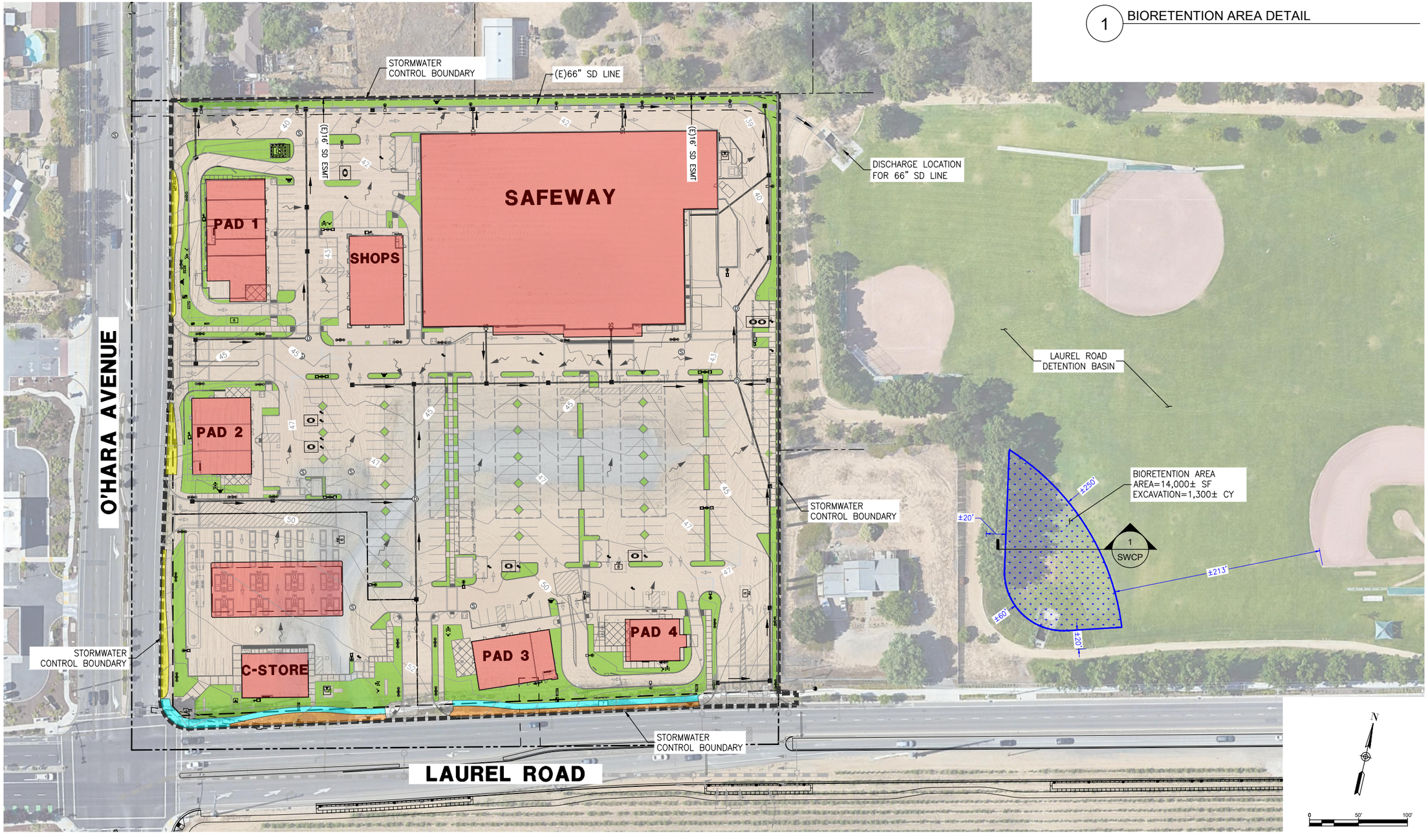
DMA Name	*Area (SF)*	*Surface Type*	*DMA Runoff Factor*	*DMA Area x Runoff Factor*
DMA-1R	91,000	Conventional Roof	1.00	91,000
DMA-1P	251,800	Asphalt/Concrete Pavement	1.00	251,800
DMA-1L	43,500	Landscaping	0.10	4,350
Total	**386,300**		**Total**	**347,150**

IMP Sizing

IMP Sizing Factor	*Rain Adjustment Factor*	*Minimum Area or Volume*	*Proposed Area or Volume*
0.04	1.00	13,886	14,000



1 BIORETENTION AREA DETAIL



NO.	DATE	BY	DESCRIPTION
1			
2			
3			
4			
5			
6			
7			

ISSUE: SUBMITTAL #1
DATE: 1/31/2024
SCALE: 1" = 100'
DESIGNED: KH
DRAWN: PA
CHECKED: KH
PROJ. MGR: KH
JOB NO.: J0155

SAGE Consulting Engineers, Inc.
12 Geary Street, Suite 605
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STORMWATER CONTROL EXHIBIT

OAKLEY SHOPS AT LAUREL FIELDS

998 LAUREL ROAD
OAKLEY, CALIFORNIA

CONTRACT NO.
J0155

DRAWING NO.
SWCP

SHEET 1 OF 1

PLOTTED: 1/31/2024 12:15:13 PM
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Appendix G
Environmental Noise Assessment

Environmental Noise Assessment

Oakley Shops at Laurel Fields

City of Oakley, California

June 6, 2024

Project #240308

Prepared for:

Raney Planning & Management
1501 Sports Drive
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Prepared by:

Saxelby Acoustics LLC





Luke Saxelby, INCE Bd. Cert.
Principal Consultant
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INTRODUCTION

The Oakley Shops at Laurel Fields project is located in the City of Oakley, California. The project includes the construction of a Safeway shopping center, retail buildings, restaurants, and a fueling station. The project will be bordered by O'Hara Avenue to the west, Laurel Road to the south, and single-family residences to the east and north.

Figure 1 shows the project site plan. **Figure 2** shows an aerial photo of the project site.

ENVIRONMENTAL SETTING

BACKGROUND INFORMATION ON NOISE

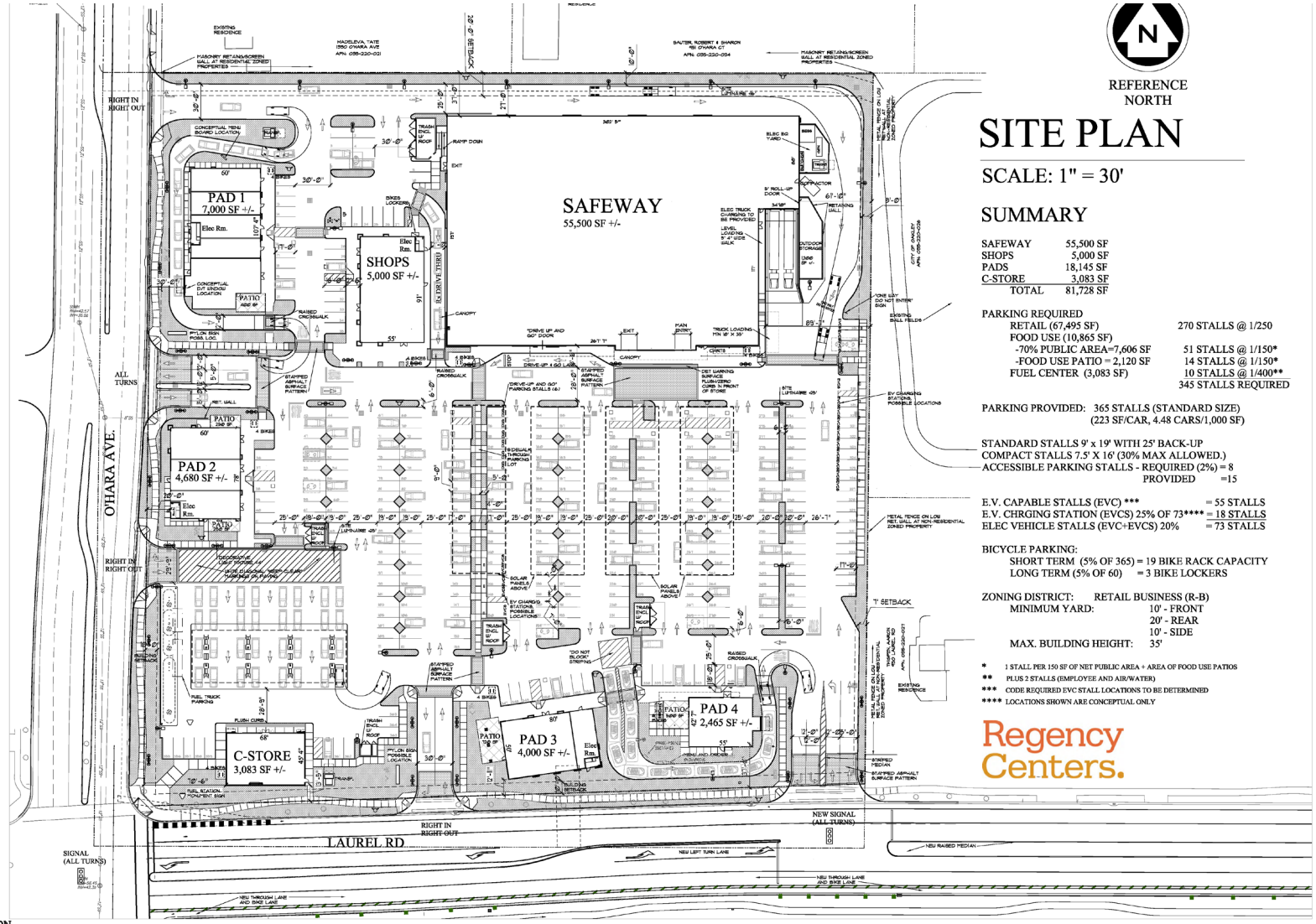
Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.



SITE PLAN

SCALE: 1" = 30'

SUMMARY

SAFEWAY	55,500 SF
SHOPS	5,000 SF
PADS	18,145 SF
C-STORE	3,083 SF
TOTAL	81,728 SF

PARKING REQUIRED

RETAIL (67,495 SF)	270 STALLS @ 1/250
FOOD USE (10,865 SF)	
-70% PUBLIC AREA=7,606 SF	51 STALLS @ 1/150*
-FOOD USE PATIO = 2,120 SF	14 STALLS @ 1/150*
FUEL CENTER (3,083 SF)	10 STALLS @ 1/400**
	345 STALLS REQUIRED

PARKING PROVIDED: 365 STALLS (STANDARD SIZE)
(223 SF/CAR, 4.48 CARS/1,000 SF)

STANDARD STALLS 9' x 19' WITH 25' BACK-UP
COMPACT STALLS 7.5' X 16' (30% MAX ALLOWED.)
ACCESSIBLE PARKING STALLS - REQUIRED (2%) = 8
PROVIDED =15

E.V. CAPABLE STALLS (EVC) *** = 55 STALLS
E.V. CHRGING STATION (EVCS) 25% OF 73**** = 18 STALLS
ELEC VEHICLE STALLS (EVC+EVCS) 20% = 73 STALLS

BICYCLE PARKING:
SHORT TERM (5% OF 365) = 19 BIKE RACK CAPACITY
LONG TERM (5% OF 60) = 3 BIKE LOCKERS

ZONING DISTRICT: RETAIL BUSINESS (R-B)
MINIMUM YARD: 10' - FRONT
20' - REAR
10' - SIDE
MAX. BUILDING HEIGHT: 35'

* 1 STALL PER 150 SF OF NET PUBLIC AREA + AREA OF FOOD USE PATIOS
** PLUS 2 STALLS (EMPLOYEE AND AIR/WATER)
*** CODE REQUIRED EVC STALL LOCATIONS TO BE DETERMINED
**** LOCATIONS SHOWN ARE CONCEPTUAL ONLY

Regency Centers.

JOHNSON LYMAN ARCHITECTS

Oakley Shops at Laurel Fields

Site Plan

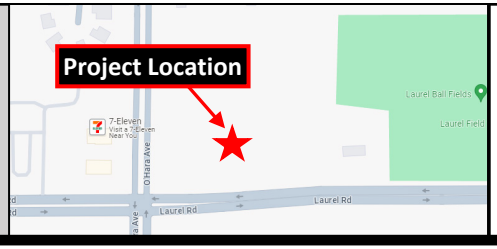
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Oakley Shops at Laurel Fields

City of Oakley, California

Figure 1

Project Site Plan



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Oakley Shops at Laurel Fields

City of Oakley, California

Figure 2

Noise Measurement Sites

Legend

- Project Site
- Noise Measurement Site - Long Term
- Noise Measurement Site - Short Term

0 ft 250 ft 500 ft 750 ft

Projection: UTM Zone 10 / WGS84 / meters
Rev. Date: 10/07/2022

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The decibel scale is logarithmic, not linear. In other words, two sound levels 10-dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10-dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (DNL or L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of the noise levels associated with common situations. **Appendix A** provides a summary of acoustical terms used in this report.

TABLE 1: TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft.)	--100--	
Gas Lawn Mower at 1 m (3 ft.)	--90--	
Diesel Truck at 15 m (50 ft.), at 80 km/hr. (50 mph)	--80--	Food Blender at 1 m (3 ft.) Garbage Disposal at 1 m (3 ft.)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft.)	--70--	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area Heavy Traffic at 90 m (300 ft.)	--60--	Normal Speech at 1 m (3 ft.)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. September, 2013.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6-dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING NOISE AND VIBRATION ENVIRONMENTS

EXISTING NOISE RECEPTORS

Some land uses are considered more sensitive to noise than others. Land uses often associated with sensitive receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Sensitive noise receptors may also include threatened or endangered noise sensitive biological species, although many jurisdictions have not adopted noise standards for wildlife areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

Sensitivity is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. In the vicinity of the project site, sensitive land uses include existing single-family residential uses to the north, west, and east of the project site. It should be noted that the residence located southeast of the proposed project is a legal non-conforming use and therefore not analyzed as a sensitive receptor.

EXISTING GENERAL AMBIENT NOISE LEVELS

The primary noise source on the project site is traffic noise emanating from O'Hara Avenue and Laurel Road. To quantify the existing ambient noise environment in the project vicinity, Saxelby Acoustics conducted continuous (24-hr.) noise level measurements at three locations on the project site. Noise measurement locations are shown on **Figure 2**. A summary of the noise level measurement survey results is provided in **Table 2**. **Appendix B** contains the complete results of the noise monitoring.

The sound level meters were programmed to record the maximum, median, and average noise levels at each site during the survey. The maximum value, denoted L_{max}, represents the highest noise level measured. The average value, denoted L_{eq}, represents the energy average of all the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L_{50}, represents the sound level exceeded 50 percent of the time during the monitoring period.

Larson Davis Laboratories (LDL) model 820 and 831 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with a CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

TABLE 2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA

Location	Date	L_{dn}	Daytime L_{eq}	Daytime L_{50}	Daytime L_{max}	Nighttime L_{eq}	Nighttime L_{50}	Nighttime L_{max}
LT-1: 175 ft. to CL of Laurel Rd.	5/7/24	61	55	53	72	54	51	68
LT-2: 525 ft. to CL of O'Hara Ave.	5/7/24	54	48	47	65	47	45	59
LT-3: 180 ft. to CL of O'Hara Ave.	5/7/24	54	50	48	67	47	44	61

- *All values shown in dBA*
- *Daytime hours: 7:00 a.m. to 10:00 p.m.*
- *Nighttime Hours: 10:00 p.m. to 7:00 a.m.*
- *Source: Saxelby Acoustics, 2024.*

FUTURE TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS

OFF-SITE TRAFFIC NOISE IMPACT ASSESSMENT METHODOLOGY

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at sensitive receptors for existing and future, project and no-project conditions.

Existing and Cumulative noise levels due to traffic are calculated using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108). The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. To predict traffic noise levels in terms of L_{dn}, it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Project trip generation volumes were provided by the project traffic engineer (Fehr & Peers 2024), truck usage and vehicle speeds on the local area roadways were estimated from field observations. The predicted increases in traffic noise levels on the local roadway network for Existing and Cumulative conditions which would result from the project are provided in terms of L_{dn}.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations, sensitive receptors may not receive full shielding from noise barriers or may be located at distances which vary from the assumed calculation distance.

Tables 3 and 4 summarize the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the project area. **Appendix C** provides the complete inputs and results of the FHWA traffic modeling.

TABLE 3: PREDICTED TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Existing No Project	Existing + Project	Change
O'Hara Avenue	North of Laurel Road	60.0	60.7	0.7
O'Hara Avenue	South of Laurel Road	57.2	57.6	0.4
Laurel Road	East of Rose Avenue	60.0	60.4	0.4
Laurel Road	West of Rose Avenue	60.2	60.6	0.4
Laurel Road	West of Mercedes Lane	60.8	61.2	0.4

TABLE 4: CUMULATIVE TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Cumulative No Project	Cumulative + Project	Change
O'Hara Avenue	North of Laurel Road	60.9	61.5	0.6
O'Hara Avenue	South of Laurel Road	58.2	58.5	0.3
Laurel Road	East of Rose Avenue	61.0	61.3	0.3
Laurel Road	West of Rose Avenue	61.1	61.5	0.4
Laurel Road	West of Mercedes Lane	61.8	62.1	0.3

Based upon the data in **Tables 3 and 4**, the proposed project is predicted to result in an increase in a maximum traffic noise level increase of 0.7 dBA.

EVALUATION OF PROJECT OPERATIONAL NOISE ON EXISTING SENSITIVE RECEPTORS

Loading dock activity, the emergency backup generator, rooftop HVAC equipment, on-site vehicle circulation, and drive-thru speakers are considered to be the primary noise sources for this project. The following assumptions were used to predict noise produced by the proposed project.

LOADING DOCK AND TRUCK CIRCULATION NOISE GENERATION

To determine typical noise levels associated with the proposed loading docks, Saxelby Acoustics utilized average sound level data collected at similar grocery store loading docks. Activities during the peak hour of loading dock activities included truck arrival/departures, truck idling, truck backing, air brake release, operation of truck-mounted refrigeration units, and operation of truck lifts. The results of the loading dock noise measurements indicate that the loading docks produce an average noise level of 57 dBA L_{eq} at a distance of 100 feet from the center of the loading dock area. Assumes both daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) operation.

EMERGENCY BACKUP GENERATOR

As the specific model of backup generator at the time of the study was unknown, Saxelby Acoustics modeled the generator noise levels based on data available for a similar backup unit. Backup generators are typically equipped with weather-proof enclosures; some enclosures are sound-reducing. Saxelby Acoustics referenced sound data for a 150 kW Kohler backup generator. The generator was reported to produce noise levels of up to 69 dBA L_{eq} at 23 feet with a high-performance sound enclosure. These noise levels are typical of generators of this capacity. Due to close proximity to nearby residences, Saxelby Acoustics assumed the generator would be equipped with a high-performance sound enclosure.

ROOFTOP HVAC

Based on the proposed roof plans for the project buildings, Saxelby Acoustics assumed that each retail space would on average utilize one seven-to-twelve-ton packaged HVAC units, each fast-foot restaurant and the gas station convenience store would utilize two seven-to-twelve-ton packaged units, and the grocery store would utilize up to twelve seven-to-twelve-ton packaged units. Each packaged unit is estimated to have a sound level rating of approximately 88 dBA based on manufacturer's data for similar units. All equipment is assumed to operate continuously during the daytime, and 25% of the time at night. Saxelby Acoustics assumed that the HVAC units would be installed on the rooftop of the proposed commercial buildings surrounded by four-foot parapets.

PARKING LOT CIRCULATION

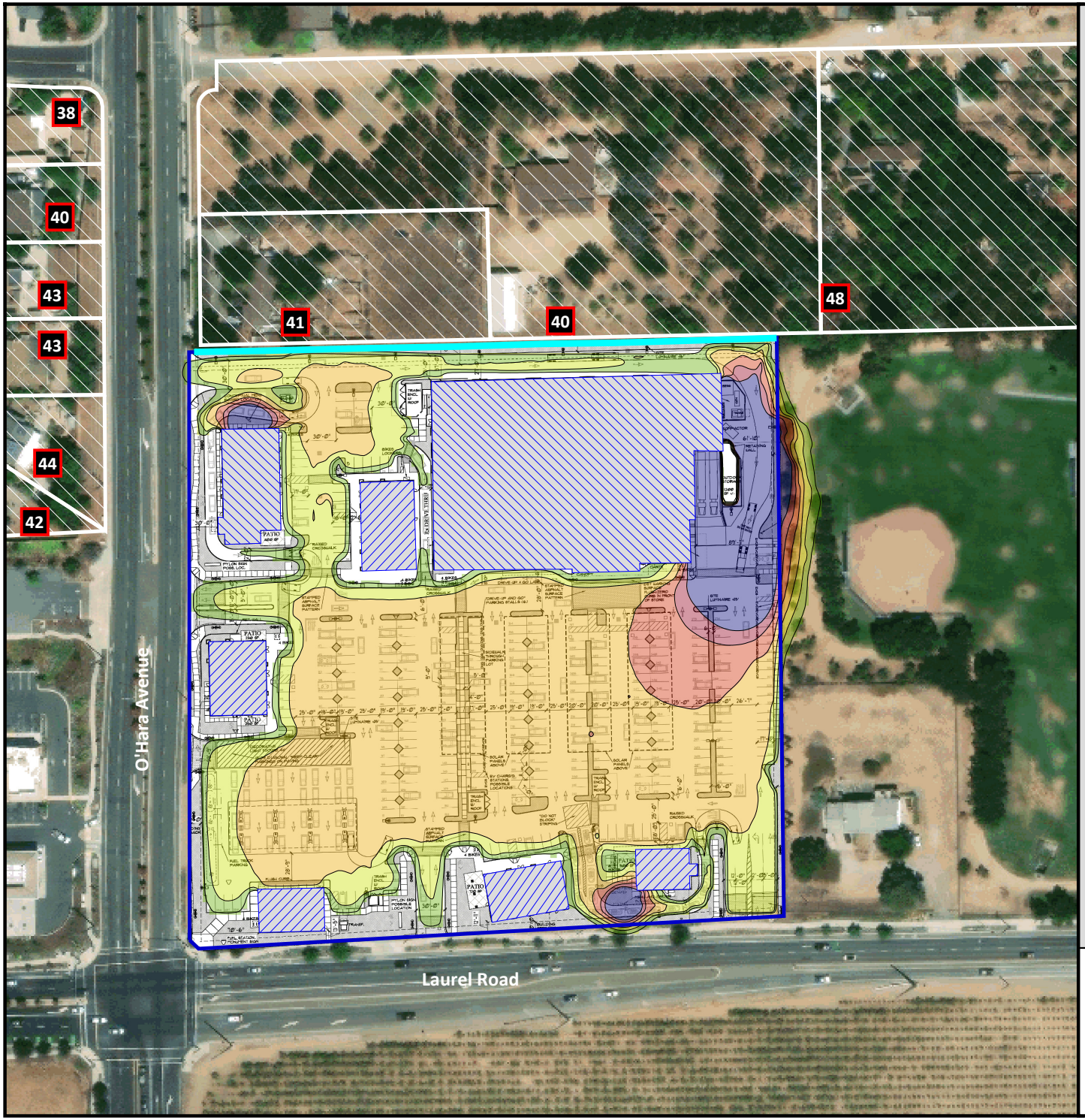
The commercial component of the project is projected to generate 1,054 on-site trips in the afternoon peak hour (Fehr & Peers 2024). Saxelby Acoustics assumed that 1% of these trips could be heavy trucks. Parking lot movements are predicted to generate a sound exposure level (SEL) of 71 dBA SEL at 50 feet for cars and 85 dBA SEL at 50 feet for trucks. Nighttime traffic outside of the AM or PM peak hour is estimated to be approximately 25% of daytime trips during nighttime hours (10:00 p.m. to 7:00 a.m.). Saxelby Acoustics data.

DRIVE-THRU SPEAKER BOX NOISE

The proposed quick service restaurants will likely use speaker boxes to collect customer orders. Saxelby Acoustics assumed that speaker boxes would produce an average noise level of 68 dBA L_{eq} at a distance of 3 feet. It was assumed that each quick service restaurant would utilize up to 2 speakers.

RESULTS

Saxelby Acoustics used the SoundPLAN noise model to calculate noise levels at the nearest sensitive receptors. Input data included loading dock activity, rooftop HVAC equipment, on-site vehicle circulation, and drive-thru speakers as discussed above. The project noise level contours for the daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) average (L_{eq}) are shown in **Figure 3** and **Figure 4,** respectively.



Oakley Shops at Laurel Fields

City of Oakley, California

Figure 3

Daytime Project Noise Contours

Leq, dB(A)

Noise Level, dB(A)

55 <	<=	56	
56 <	<=	57	
57 <	<=	58	
58 <	<=	59	
59 <	<=	60	
60 <			

Legend

- Project Building
- Noise Sensitive Parcels
- Project 8-ft Wall
- Noise Level Point

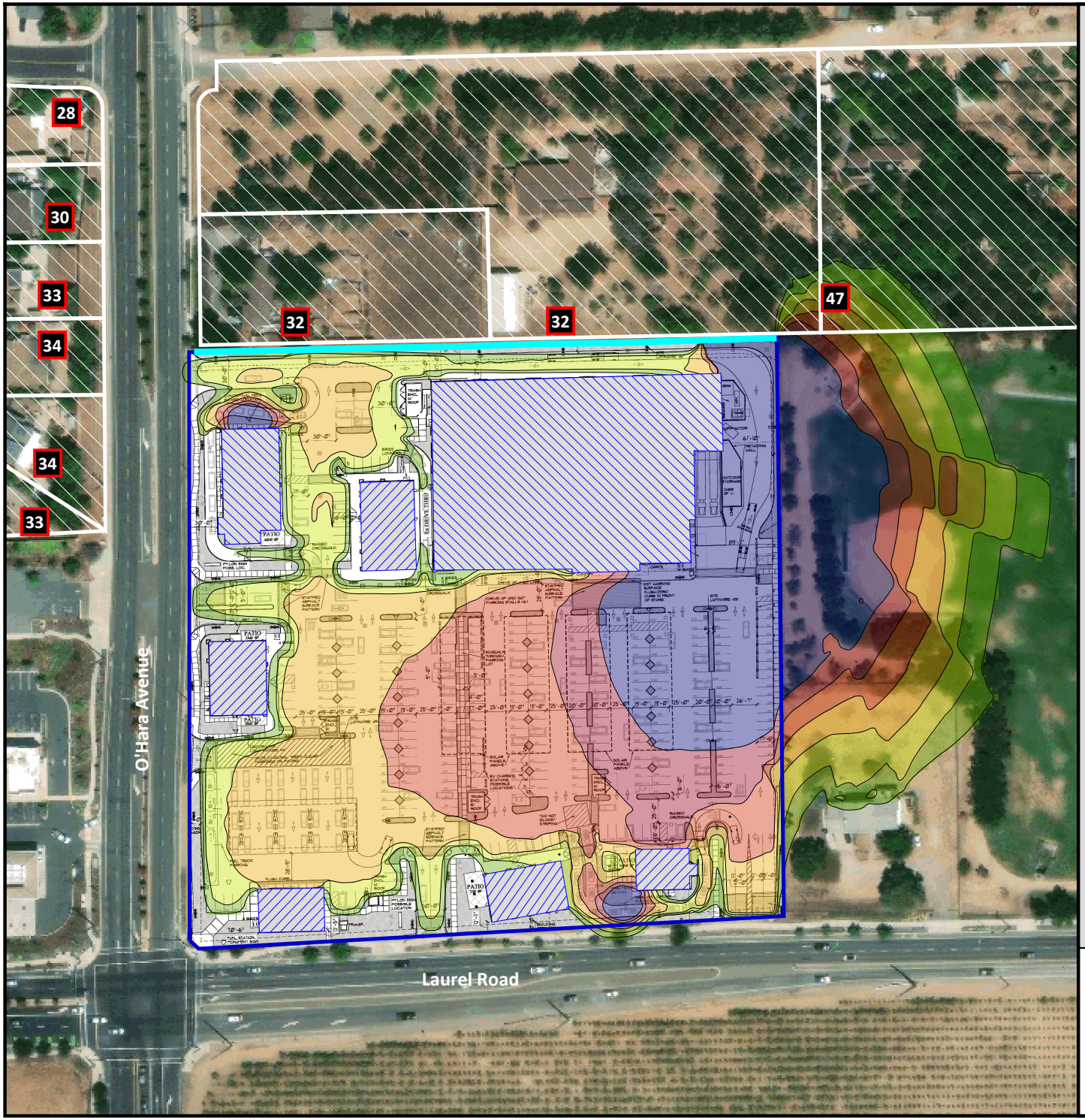
Scale 1:150

0 30 60 120 180 240 feet

N

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Oakley Shops at Laurel Fields

City of Oakley, California

Figure 4

Nighttime Project Noise Contours

Leq, dB(A)

Noise Level, dB(A)

45 <	<=	46
46 <	<=	47
47 <	<=	48
48 <	<=	49
49 <	<=	50
50 <		

Legend

- Project Building
- Noise Sensitive Parcels
- Project 8-ft Wall
- Noise Level Point

Scale 1:150

0 30 60 120 180 240 feet

N

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CONSTRUCTION NOISE ENVIRONMENT

During the construction of the proposed project, noise from construction activities would temporarily add to the noise environment in the project vicinity. As shown in **Table 5**, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet.

TABLE 5: CONSTRUCTION EQUIPMENT NOISE

Type of Equipment	Maximum Level, dBA at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: Roadway Construction Noise Model User's Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

CONSTRUCTION VIBRATION ENVIRONMENT

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and parking lot construction occur. **Table 6** shows the typical vibration levels produced by construction equipment.

TABLE 6: VIBRATION LEVELS FOR VARIOUS CONSTRUCTION EQUIPMENT

Type of Equipment	Peak Particle Velocity at 25 feet (inches/second)	Peak Particle Velocity at 50 feet (inches/second)	Peak Particle Velocity at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (Less than 0.20 at 26 feet)	0.074	0.026

Source: Transit Noise and Vibration Impact Assessment Guidelines. Federal Transit Administration. May 2006.

REGULATORY CONTEXT

FEDERAL

There are no federal regulations related to noise that apply to the Proposed Project.

STATE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, indicate that a significant noise impact may occur if a project exposes persons to noise or vibration levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels. CEQA standards are discussed more below under the Thresholds of Significance section.

LOCAL

City of Oakley General Plan

9.1.1 New development shall use the land use compatibility table shown in Figure 9-1 and the standards contained within Table 9-7 and 9-8 for determining noise compatibility.

TABLE 7: NOISE LEVEL PERFORMANCE STANDARDS FOR NEW PROJECTS AFFECTED BY OR INCLUDING NON-TRANSPORTATION NOISE SOURCES

Noise Level Descriptor	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
Hourly L_{eq}, dB	55	45

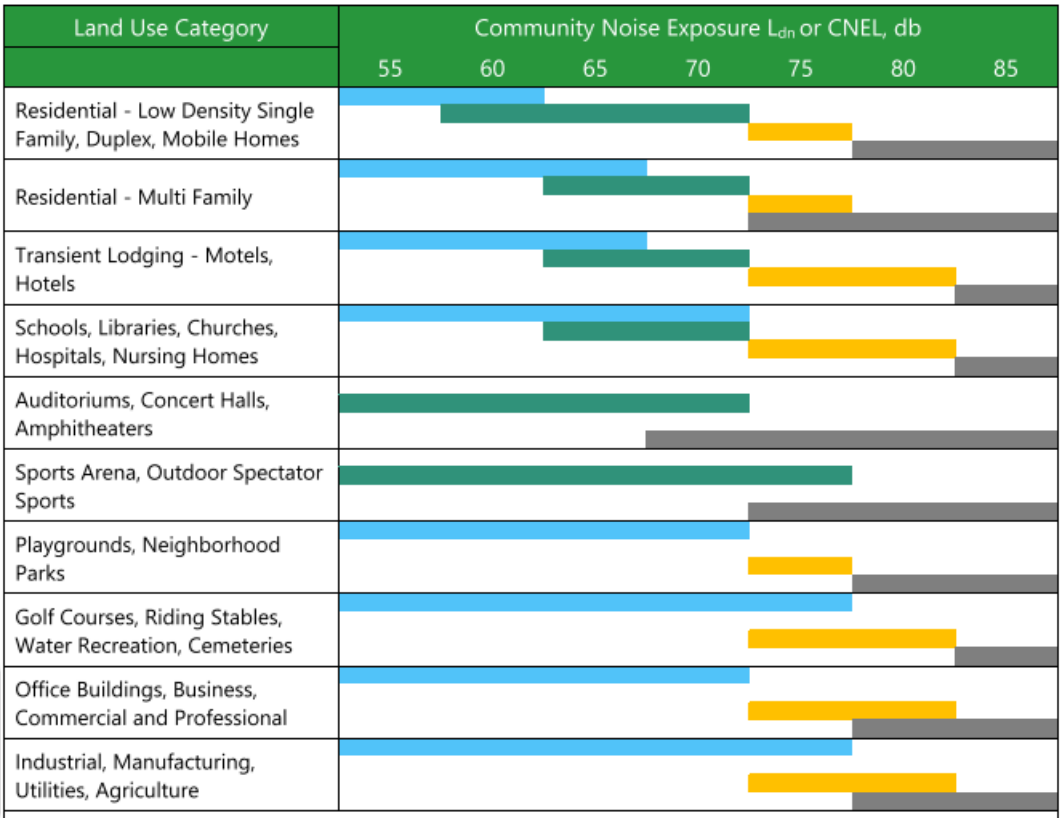
1. *Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises conisting primarily of speech or music, or for recurring impulsive noises (e.g. hummingsounds, outdoor speaker systems). These noise level standards do not apply to residential units etablished in conjuction with industrial or commercial uses (e.g., caretaker dwellings).*
2. *The City can impose noise level standards which are more restrictive that those specified above based upon determination of existing low ambient noise levels.*
3. *Fixed noise sources which are typically of concern include, but are not limited to the following:*

HVAC Systems	
Pump Stations	*Cooling Towers/Evaporative Condensers*
Emergency Generators	*Lift Stations*
Steam Valves	*Boilers*
Generators	*Steam Turbines*
Air Compressors	*Fans*
Conveyor Systems	*Heavy Equipment*
Pile Drivers	*Transformers*
Drill Rigs	*Grinders*
Welders	*Cutting Equipment*
Outdoor Speakers	*Blowers*

4. *The tpyes of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities including pump stations, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recylcing centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.*

Source: Oakley General Plan Table 9-7

TABLE 8: LAND COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS



	NORMALLY ACCEPTABLE: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements
	CONDITIONALLY ACCEPTABLE: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.
	NORMALLY UNACCEPTABLE: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
	CLEARLY UNACCEPTABLE: New construction or development clearly should not be undertaken.

Source: City of Oakley General Plan Figure 9-1

City of Oakley Municipal Code

The City of Oakley Municipal Code provides noise level criteria for stationary noise sources affecting sensitive receptors. The standards are reproduced below:

4.2.206 General Noise Regulations.

a. It is unlawful for a person to willfully make a loud, unnecessary or unusual noise which disturbs the peace or quiet of a neighborhood or which causes discomfort or annoyance to a reasonable person of normal sensitiveness residing in the area.

4.2.208 Prohibitions

d. Operate or perform construction or repair work (which creates noise) within or adjacent to a residential land use district except during the following hours

   1) Mondays through Fridays: 7:30 a.m. to 7:00 p.m.

   2) Saturdays, Sundays and holidays: 9:00 a.m. to 7:00 p.m ;

CRITERIA FOR ACCEPTABLE VIBRATION

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. **Table 9**, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

Table 9 indicates that the threshold for architectural damage to structures is 0.20 in/sec p.p.v. A threshold of 0.20 in/sec p.p.v. is considered to be a reasonable threshold for short-term construction projects.

TABLE 9: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS

Peak Particle Velocity		Human Reaction	Effect on Buildings
mm/second	in/second		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Transportation Related Earthborne Vibrations. Caltrans. TAV-02-01-R9601. February 20, 2002.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans or if noise generated by the project would substantially increase existing noise levels at sensitive receivers on a permanent or temporary basis. Significance criteria for noise impacts are drawn from CEQA Guidelines Appendix G (Items XI [a-c]).

Would the project:

a. 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?

b. Generate excessive groundborne vibration or groundborne noise levels?

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

The proposed project is not located within two miles of a public or private airport, therefore item "c" is not discussed any further in this study.

Noise Level Increase Criteria for Long-Term Project-Related Noise Level Increases

The City of Oakley provides criteria to be used as a test of significance for roadway improvement projects in section 9.1.6 of the General Plan:

- Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in noise levels due to roadway improvement projects will be considered significant; and
- Where existing traffic noise levels are between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in noise levels due to roadway improvement projects will be considered significant; and
- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +1.5 dB L_{dn} increase in noise levels due to roadway improvement projects will be considered significant.

Temporary Construction Noise Impacts

With temporary noise impacts (construction), identification of "substantial increases" depends upon the duration of the impact, the temporal daily nature of the impact, and the absolute change in decibel levels. Per the City of Oakley Municipal Code, construction is permitted between the hours of 7:30 a.m. to 7:00 p.m. Monday through Friday and 9:00 a.m. to 7:00 p.m. on Saturdays, Sundays and holidays.

The City of Oakley has not adopted any formal standard for evaluating temporary construction noise which occurs within allowable hours. For short-term noise associated with Project construction, Saxelby Acoustics recommends use of the Caltrans increase criteria of 12 dBA (Caltrans Traffic Noise Protocol, 2020), applied to existing residential receptors in the project vicinity. This level of increase is approximately equivalent to a doubling of sound energy and has been the standard of significance for Caltrans projects at the state level for many years. Application of this standard to construction activities is considered reasonable considering the temporary nature of construction activities.

PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

Impact 1: ***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?***

Traffic Noise Increases at Off-Site Receptors

Based upon the City of Oakley long-term significant increase criteria, where existing traffic noise levels are greater than 65 dBA L_{dn}, at the outdoor activity areas of noise-sensitive uses, a +1.5 dBA L_{dn} increase in roadway noise levels will be considered significant. Where traffic noise levels are between 60 dBA L_{dn} and 65 dBA L_{dn}, a +3.0 dB L_{dn} increase in roadway noise levels will be considered significant. Where traffic noise levels are less than 60 dBA L_{dn}, a +5.0 dB L_{dn} increase in roadway noise levels will be considered significant.

According to **Tables 3 and 4**, the maximum increase in traffic noise at the nearest sensitive receptors is predicted to be 0.7 dBA under the Existing Plus Project scenario. This increase is less than the minimum significance criteria of +1.5 dB. Therefore, impacts resulting from increased traffic noise would be considered ***less-than-significant***, and no mitigation is required.

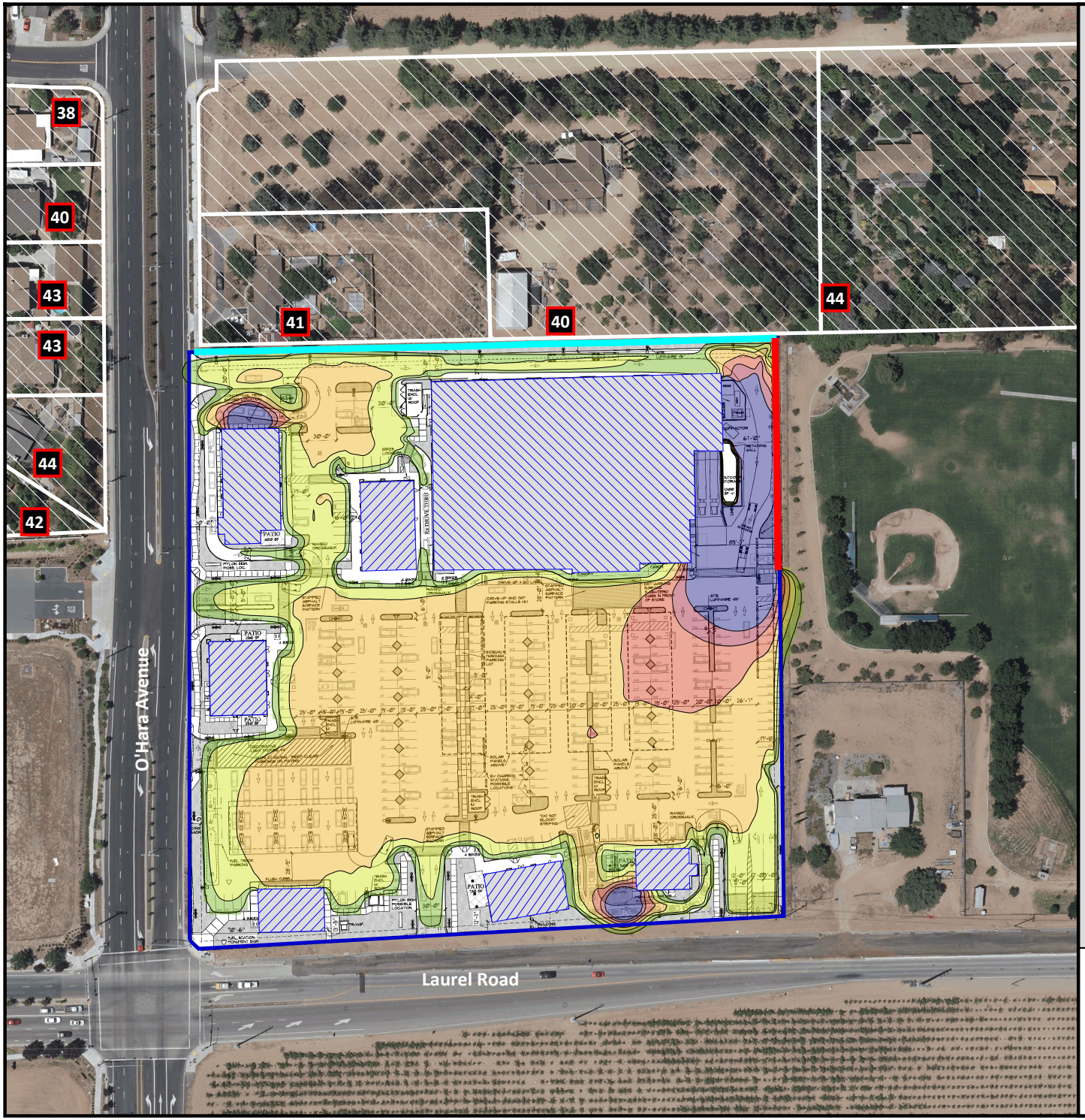
Operational Noise at Existing Sensitive Receptors

Compliance with City of Oakley Standards

As shown on **Figures 3 and 4**, the project is predicted to expose nearby residences to noise levels up to 48 dBA, L_{eq} during daytime (7:00 a.m. to 10:00 p.m.) hours and 47 dBA L_{eq} during nighttime (10:00 p.m. to 7:00 a.m.) hours. It should be noted that the residence located southeast of the proposed project is a legal non-conforming use and therefore not analyzed as a sensitive receptor. The predicted project noise levels would meet the City of Oakley noise level standards for non-transportation noise sources of 55 dBA L_{eq} during daytime hours but exceed the 45 dBA L_{eq} standard during nighttime hours. Therefore, this is a ***potentially significant*** impact and requires mitigation.

Mitigation Measure 1(a) would reduce this impact by requiring the construction of a barrier along the eastern project site boundary to shield the residences to the northeast and southeast from project operational noise. **Figure 5** and **Figure 6** show resulting noise level contours including the recommended 8-foot-tall noise barrier. As shown, the barrier would reduce project noise levels from 47 dBA L_{eq} at night to 43 dBA L_{eq}, which complies with the City's 45 dBA L_{eq} nighttime standard.

It should also be noted that this analysis assumes that the proposed generator would produce no greater than 69 dBA at a distance of 23 feet. Generators which do not utilize sound-attenuating enclosures can produce noise levels higher than this level. If an unshrouded generator were selected for this project, noise levels could exceed the City of Oakley noise level standards. Therefore, this is ***potentially significant***, and can be mitigated by ensuring the generator will not produce noise levels greater than 69 dBA at 23 feet as described in Mitigation Measure 1(b).



Oakley Shops at Laurel Fields

City of Oakley, California

Figure 5

Daytime Project Noise Contours with Recommended Sound Walls

Leq, dB(A)

Noise Level, dB(A)

55 <		<=	56
56 <		<=	57
57 <		<=	58
58 <		<=	59
59 <		<=	60
60 <			

Legend

- Project Building
- Noise Sensitive Parcels
- Project 8-ft Wall
- Noise Level Point
- Recommended 8-ft Wall

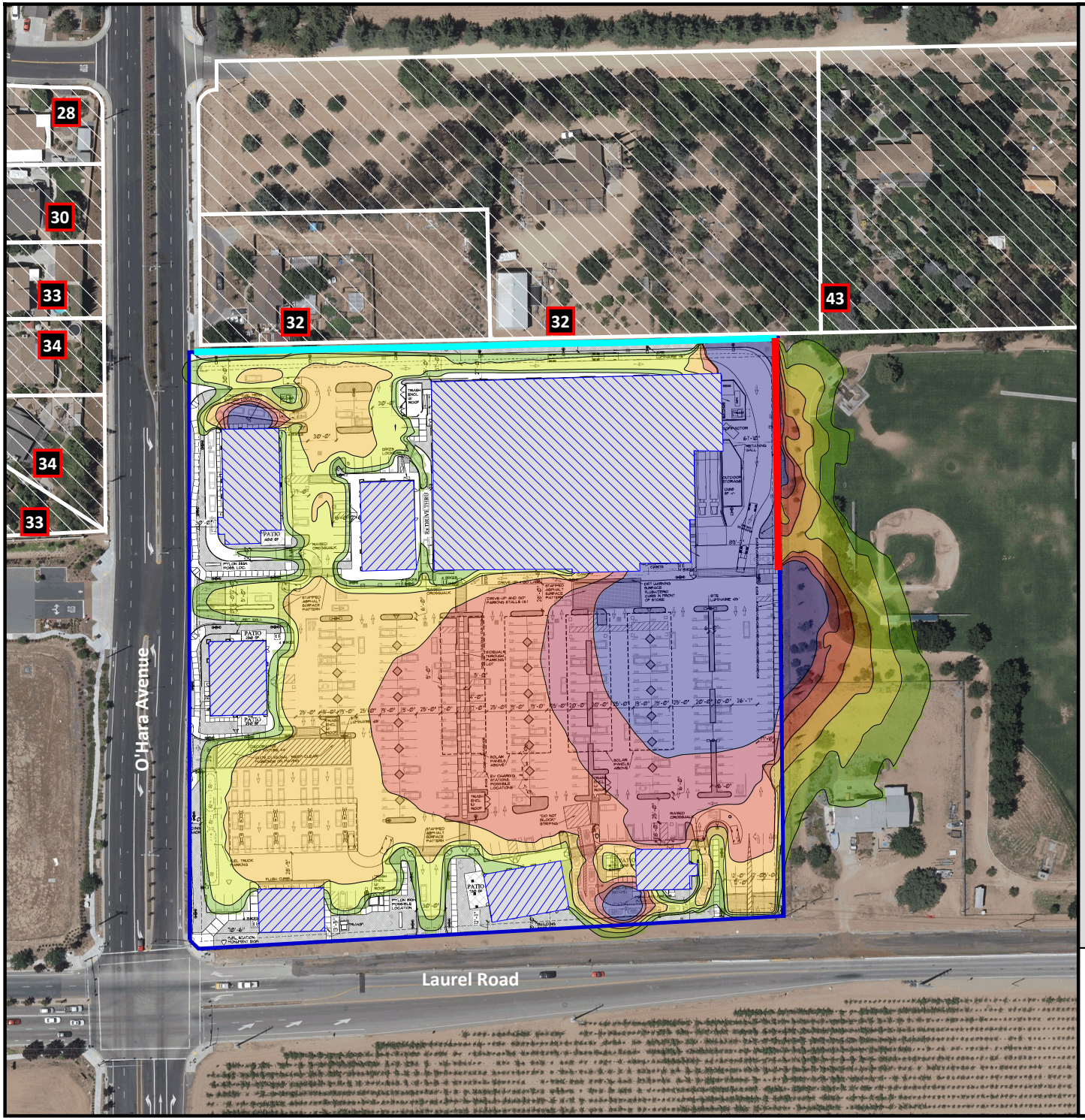
Scale 1:150

0 30 60 120 180 240 feet

N

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Oakley Shops at Laurel Fields

City of Oakley, California

Figure 6

Nighttime Project Noise Contours with Recommended Sound Walls

Leq, dB(A)

Noise Level, dB(A)

45 <	<=	46	
46 <	<=	47	
47 <	<=	48	
48 <	<=	49	
49 <	<=	50	
50 <			

Legend

- Project Building
- Noise Sensitive Parcels
- Project 8-ft Wall
- Noise Level Point
- Recommended 8-ft Wall

Scale 1:150

0 30 60 120 180 240 feet

N

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Analysis of Significance of Long-Term Project-Related Noise Increases

The City of Oakley does not establish a significance threshold for increases in stationary noise sources. In the absence of a specific threshold, Saxelby Acoustics utilizes the criteria for transportation noise sources to assess increases in ambient noise environment. The northeast corner of the project site was measured to have the lowest ambient noise level; therefore, analysis of significant increases is calculated at this location. As shown on **Figures 5 and 6**, the average ambient noise level at the nearby residences is predicted to be 44 dBA L_{eq} during the day and 43 dBA at night based upon the ambient noise level survey. An increase of +5.0 dBA or greater would constitute a significant increase. The resulting sum of ambient noise (47 dBA L_{eq}) plus project generated noise (43 dBA L_{eq}) would be 48.5 dBA. This would represent an increase of 1.5 dBA over ambient, which is less than the +5 dBA increase criterion.

Therefore, this is a ***less-than-significant*** impact, and no mitigation is required.

Construction Noise

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. As indicated in **Table 5,** activities involved in construction would generate maximum noise levels ranging from 76 to 90 dBA L_{max} at a distance of 50 feet. Construction activities would also be temporary in nature and are anticipated to occur during normal daytime working hours. The City of Oakley permits construction between the hours of 7:30 a.m. to 7:00 p.m. Monday through Friday and 9:00 a.m. to 7:00 p.m. on Saturdays, Sundays and holidays.

Caltrans defines a significant increase due to noise as an increase of 12 dBA over existing ambient noise levels; Saxelby Acoustics used this criterion to evaluate increases due to construction noise associated with the project. As shown in **Table 5**, construction equipment is predicted to generate noise levels of up to 90 dBA L_{max} at 50 feet. Construction noise is evaluated as occurring at the center of the site to represent average noise levels generated over the duration of construction across the project site. The nearest residential uses are located approximately 280 feet to the north as measured from the center of the project site. At this distance, maximum construction noise levels would be up to 75 dBA. Existing maximum noise levels in the vicinity of the sensitive receptors ranged from 60-76 dBA during acceptable hours of construction. This would result in an increase of 1 dBA above existing ambient maximum noise levels. Therefore, project construction would not cause an increase of greater than 12 dBA over existing ambient noise levels.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from the construction site. This noise increase would be of short duration and would occur during daytime hours.

Although construction activities are temporary in nature and would occur during normal daytime working hours, construction-related noise could result in sleep interference at existing noise-sensitive land uses in the vicinity of the construction if construction activities were to occur outside the normal daytime hours. Therefore, impacts resulting from noise levels temporarily exceeding the threshold of significance due to construction would be considered ***potentially significant***. Mitigation measure 1(c) would reduce construction noise impacts to ***less-than-significant***.

Mitigation Measures

1(a) An eight-foot-tall sound wall shall be constructed along the eastern boundary of the project site so as to shield single-family residences to the northeast and southwest from loading dock and backup generator noise. **Figures 5 and 6** show the required location of the wall. The soundwall shall be constructed from masonry units. The total height of the wall shall be relative to the pad of the commercial uses or the nearby residences, whichever is greater. The total height of the wall may be achieved through use of masonry wall and earthern berm. The sound wall design shall be approved by the Ci*ty.*

1(b) The proposed backup generator shall not produce an average noise level of greater than 69 dBA at a distance of 23 feet.

1(c) The City shall establish the following as conditions of approval for any permit that results in the use of construction equipment:

- Construction shall be limited to the hours of 7:30 a.m. to 7:00 p.m. Monday through Friday and 9:00 a.m. to 7:00 p.m. on Saturdays, Sundays and holidays.
- All construction equipment powered by internal combustion engines shall be properly muffled and maintained.
- Quiet construction equipment, particularly air compressors, are to be selected whenever possible.
- All stationary noise-generating construction equipment such as generators or air compressors are to be located as far as is practical from existing residences. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- Unnecessary idling of internal combustion engines is prohibited.
- The construction contractor shall, to the maximum extent practical, locate on-site equipment staging areas to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

Timing/Implementation: Implemented prior to approval of grading and/or building permits
Enforcement/Monitoring: City of Oakley

Implementation of mitigation measures 1(a) would help to reduce construction-generated noise levels. With mitigation, this impact would be considered ***less-than-significant***.

Impact 2: Would the project generate excessive groundborne vibration or groundborne noise levels?

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural.

With the exception of vibratory compactors, the **Table 6** data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distance of 26 feet. However, the proposed project includes parking lot and building construction which would occur at distances of less than 10 feet from

the adjacent single-family residential uses. Therefore, use of vibratory compactors within 26 feet of the adjacent residential buildings could cause vibrations in excess of 0.2 in/sec. Therefore, this is a ***potentially significant*** impact.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a ***less-than-significant*** level.

2(a) Any compaction required less than 26 feet from the adjacent residential structures to the south should be accomplished by using static drum rollers which use weight instead of vibrations to achieve soil compaction. As an alternative to this requirement, pre-construction crack documentation and construction vibration monitoring could be conducted to ensure that construction vibrations do not cause damage to any adjacent structures.

2(b) Use of bulldozers, loaded trucks, auger/drill rigs, and vibratory hammers shall occur at distances of 15 feet or greater from adjacent residential structures.

Impact 3: ***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 airports within two miles of the project vicinity. Therefore, this impact is not applicable to the proposed project.

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Appendix A: Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
ASTC	Apparent Sound Transmission Class. Similar to STC but includes sound from flanking paths and correct for room reverberation. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by +5 dBA and nighttime hours weighted by +10 dBA.
DNL	See definition of Ldn.
IIC	Impact Insulation Class. An integer-number rating of how well a building floor attenuates impact sounds, such as footsteps. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one-hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
NIC	Noise Isolation Class. A rating of the noise reduction between two spaces. Similar to STC but includes sound from flanking paths and no correction for room reverberation.
NNIC	Normalized Noise Isolation Class. Similar to NIC but includes a correction for room reverberation.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
RT60	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is a rating, in decibels, of a discrete event, such as an aircraft flyover or train pass by, that compresses the total sound energy into a one-second event.
SPC	Speech Privacy Class. SPC is a method of rating speech privacy in buildings. It is designed to measure the degree of speech privacy provided by a closed room, indicating the degree to which conversations occurring within are kept private from listeners outside the room.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations. The STC rating is typically used to rate the sound transmission of a specific building element when tested in laboratory conditions where flanking paths around the assembly don't exist. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

Appendix B: Continuous Long-Term Ambient Noise Measurement Results

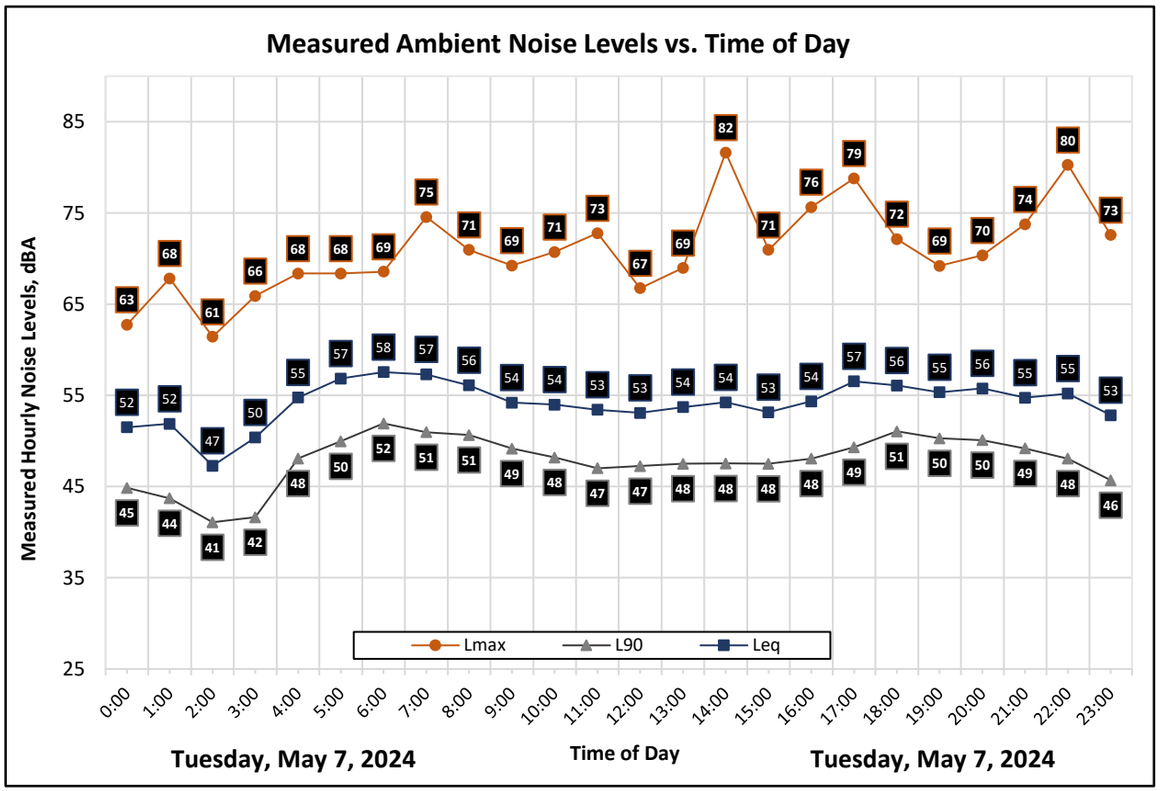


Appendix B1: Continuous Noise Monitoring Results

Site: LT-1
Project: Oakley Shops at Laurel Field
Location: Southeast Project Boundary
Coordinates: (37.9838376, -121.7117548)
Meter: LDL 820-7
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Tuesday, May 7, 2024	0:00	52	63	50	45
Tuesday, May 7, 2024	1:00	52	68	48	44
Tuesday, May 7, 2024	2:00	47	61	44	41
Tuesday, May 7, 2024	3:00	50	66	47	42
Tuesday, May 7, 2024	4:00	55	68	53	48
Tuesday, May 7, 2024	5:00	57	68	55	50
Tuesday, May 7, 2024	6:00	58	69	56	52
Tuesday, May 7, 2024	7:00	57	75	55	51
Tuesday, May 7, 2024	8:00	56	71	55	51
Tuesday, May 7, 2024	9:00	54	69	53	49
Tuesday, May 7, 2024	10:00	54	71	52	48
Tuesday, May 7, 2024	11:00	53	73	51	47
Tuesday, May 7, 2024	12:00	53	67	51	47
Tuesday, May 7, 2024	13:00	54	69	52	48
Tuesday, May 7, 2024	14:00	54	82	51	48
Tuesday, May 7, 2024	15:00	53	71	52	48
Tuesday, May 7, 2024	16:00	54	76	52	48
Tuesday, May 7, 2024	17:00	57	79	54	49
Tuesday, May 7, 2024	18:00	56	72	54	51
Tuesday, May 7, 2024	19:00	55	69	54	50
Tuesday, May 7, 2024	20:00	56	70	54	50
Tuesday, May 7, 2024	21:00	55	74	53	49
Tuesday, May 7, 2024	22:00	55	80	52	48
Tuesday, May 7, 2024	23:00	53	73	50	46

Statistics	Leq	Lmax	L50	L90
Day Average	55	72	53	49
Night Average	54	68	51	46
Day Low	53	67	51	47
Day High	57	82	55	51
Night Low	47	61	44	41
Night High	58	80	56	52
Ldn	60	Day %		70
CNEL	61	Night %		30



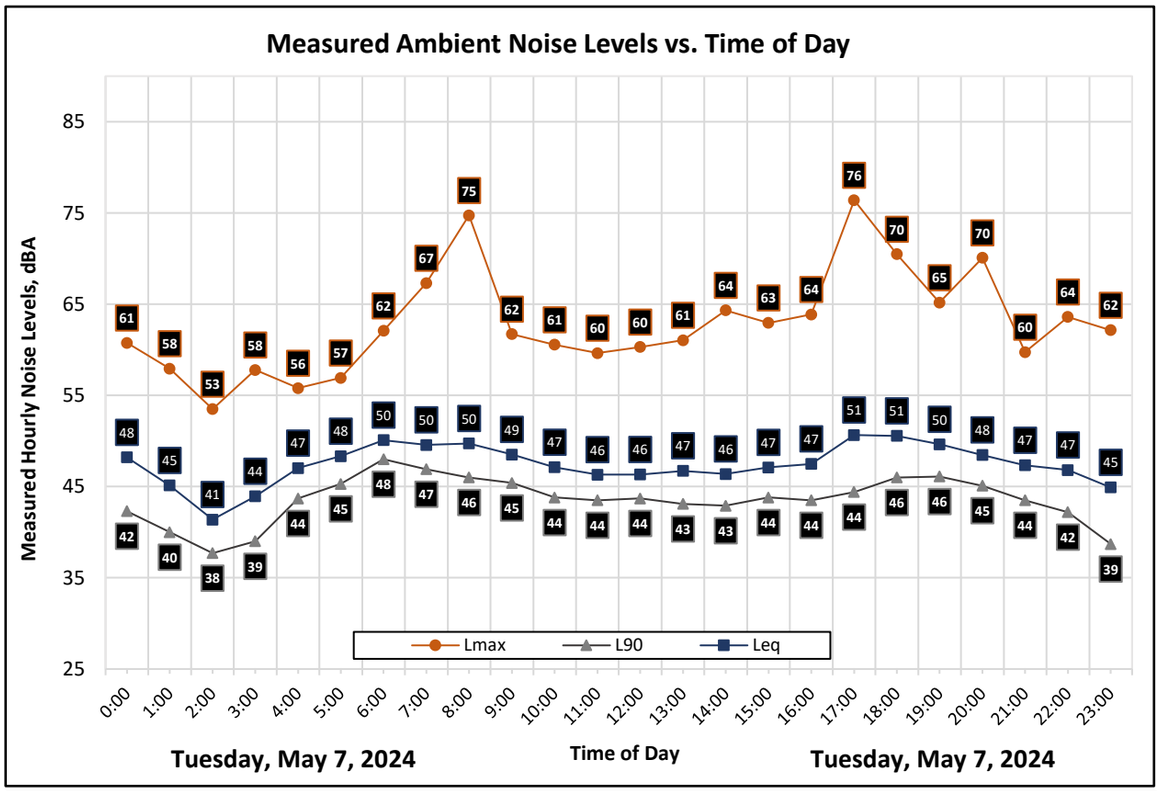


Appendix B2: Continuous Noise Monitoring Results

Site: LT-2
Project: Oakley Shops at Laurel Field
Location: Northeast Project Boundary
Coordinates: (37.9851113, -121.7122155)
Meter: LDL 821-1
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Tuesday, May 7, 2024	0:00	48	61	46	42
Tuesday, May 7, 2024	1:00	45	58	44	40
Tuesday, May 7, 2024	2:00	41	53	41	38
Tuesday, May 7, 2024	3:00	44	58	43	39
Tuesday, May 7, 2024	4:00	47	56	46	44
Tuesday, May 7, 2024	5:00	48	57	48	45
Tuesday, May 7, 2024	6:00	50	62	49	48
Tuesday, May 7, 2024	7:00	50	67	49	47
Tuesday, May 7, 2024	8:00	50	75	48	46
Tuesday, May 7, 2024	9:00	49	62	48	45
Tuesday, May 7, 2024	10:00	47	61	46	44
Tuesday, May 7, 2024	11:00	46	60	45	44
Tuesday, May 7, 2024	12:00	46	60	46	44
Tuesday, May 7, 2024	13:00	47	61	46	43
Tuesday, May 7, 2024	14:00	46	64	45.1	43
Tuesday, May 7, 2024	15:00	47	63	46	44
Tuesday, May 7, 2024	16:00	47	64	46	44
Tuesday, May 7, 2024	17:00	51	76	47.2	44
Tuesday, May 7, 2024	18:00	51	70	49	46
Tuesday, May 7, 2024	19:00	50	65	48	46
Tuesday, May 7, 2024	20:00	48	70	47	45
Tuesday, May 7, 2024	21:00	47	60	46	44
Tuesday, May 7, 2024	22:00	47	64	45	42
Tuesday, May 7, 2024	23:00	45	62	42	39

Statistics	Leq	Lmax	L50	L90
Day Average	48	65	47	45
Night Average	47	59	45	42
Day Low	46	60	45	43
Day High	51	76	49	47
Night Low	41	53	41	38
Night High	50	64	49	48
Ldn	53	Day %		73
CNEL	54	Night %		27



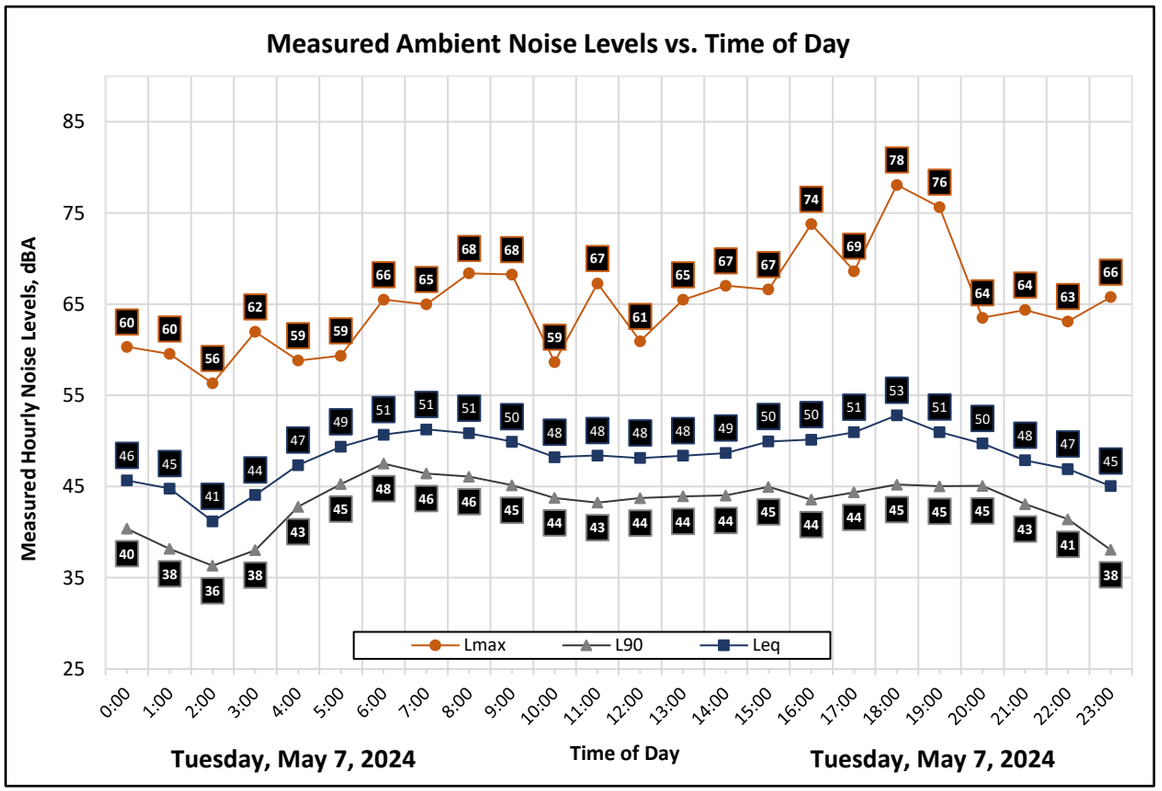


Appendix B3: Continuous Noise Monitoring Results

Site: LT-3
Project: Oakley Shops at Laurel Field
Meter: LDL 820-1
Location: Northwest Project Boundary
Calibrator: CAL200
Coordinates: (37.985120, -121.713328)

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Tuesday, May 7, 2024	0:00	46	60	44	40
Tuesday, May 7, 2024	1:00	45	60	43	38
Tuesday, May 7, 2024	2:00	41	56	40	36
Tuesday, May 7, 2024	3:00	44	62	42	38
Tuesday, May 7, 2024	4:00	47	59	46	43
Tuesday, May 7, 2024	5:00	49	59	48	45
Tuesday, May 7, 2024	6:00	51	66	50	48
Tuesday, May 7, 2024	7:00	51	65	50	46
Tuesday, May 7, 2024	8:00	51	68	50	46
Tuesday, May 7, 2024	9:00	50	68	48	45
Tuesday, May 7, 2024	10:00	48	59	47	44
Tuesday, May 7, 2024	11:00	48	67	47	43
Tuesday, May 7, 2024	12:00	48	61	47	44
Tuesday, May 7, 2024	13:00	48	65	47	44
Tuesday, May 7, 2024	14:00	49	67	47	44
Tuesday, May 7, 2024	15:00	50	67	48	45
Tuesday, May 7, 2024	16:00	50	74	48	44
Tuesday, May 7, 2024	17:00	51	69	49	44
Tuesday, May 7, 2024	18:00	53	78	49	45
Tuesday, May 7, 2024	19:00	51	76	48	45
Tuesday, May 7, 2024	20:00	50	64	48	45
Tuesday, May 7, 2024	21:00	48	64	46	43
Tuesday, May 7, 2024	22:00	47	63	45	41
Tuesday, May 7, 2024	23:00	45	66	42	38

Statistics	Leq	Lmax	L50	L90
Day Average	50	67	48	45
Night Average	47	61	44	41
Day Low	48	59	46	43
Day High	53	78	50	46
Night Low	41	56	40	36
Night High	51	66	50	48
Ldn	54	Day %		79
CNEL	54	Night %		21





Appendix C: Traffic Noise Calculation Inputs and Results



Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240308 Oakley Shops at Laurel Fields
Description: Existing Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	O'Hara Avenue	North of Laurel Road	5,930	79	0	21	1.0%	1.0%	35	80	0	79	37	17	60.0
2	O'Hara Avenue	South of Laurel Road	7,300	79	0	21	1.0%	1.0%	35	65	-5	91	42	20	57.2
3	Laurel Road	East of Rose Avenue	12,760	70	0	30	1.0%	1.0%	40	90	-5	193	90	42	60.0
4	Laurel Road	West of Rose Avenue	14,430	70	0	30	1.0%	1.0%	40	95	-5	210	97	45	60.2
5	Laurel Road	West of Mercedes Lane	16,130	70	0	30	1.0%	1.0%	35	75	-5	183	85	39	60.8

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Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240308 Oakley Shops at Laurel Fields
Description: Existing Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	O'Hara Avenue	North of Laurel Road	7,020	79	0	21	1.0%	1.0%	35	80	0	89	41	19	60.7
2	O'Hara Avenue	South of Laurel Road	8,070	79	0	21	1.0%	1.0%	35	65	-5	98	45	21	57.6
3	Laurel Road	East of Rose Avenue	14,020	70	0	30	1.0%	1.0%	40	90	-5	206	96	44	60.4
4	Laurel Road	West of Rose Avenue	16,050	70	0	30	1.0%	1.0%	40	95	-5	225	105	49	60.6
5	Laurel Road	West of Mercedes Lane	17,740	70	0	30	1.0%	1.0%	35	75	-5	194	90	42	61.2

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Appendix C-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240308 Oakley Shops at Laurel Fields
Description: Cumulative Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	O'Hara Avenue	North of Laurel Road	7,420	79	0	21	1.0%	1.0%	35	80	0	92	43	20	60.9
2	O'Hara Avenue	South of Laurel Road	9,140	79	0	21	1.0%	1.0%	35	65	-5	106	49	23	58.2
3	Laurel Road	East of Rose Avenue	15,960	70	0	30	1.0%	1.0%	40	90	-5	224	104	48	61.0
4	Laurel Road	West of Rose Avenue	18,060	70	0	30	1.0%	1.0%	40	95	-5	244	113	52	61.1
5	Laurel Road	West of Mercedes Lane	20,170	70	0	30	1.0%	1.0%	35	75	-5	212	98	46	61.8

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Appendix C-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240308 Oakley Shops at Laurel Fields
Description: Cumulative Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	O'Hara Avenue	North of Laurel Road	8,520	79	0	21	1.0%	1.0%	35	80	0	101	47	22	61.5
2	O'Hara Avenue	South of Laurel Road	9,930	79	0	21	1.0%	1.0%	35	65	-5	112	52	24	58.5
3	Laurel Road	East of Rose Avenue	17,190	70	0	30	1.0%	1.0%	40	90	-5	236	109	51	61.3
4	Laurel Road	West of Rose Avenue	19,650	70	0	30	1.0%	1.0%	40	95	-5	258	120	56	61.5
5	Laurel Road	West of Mercedes Lane	21,780	70	0	30	1.0%	1.0%	35	75	-5	223	103	48	62.1

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Appendix H
Transportation Impact Assessment

FINAL

Oakley Shops at Laurel Fields

Transportation Impact Assessment

Prepared for:
Regency Centers and The City of Oakley

May 2024

WC23-4021

FEHR PEERS

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1. Introduction

This report presents the analysis and findings of the Draft Transportation Impact Assessment (TIA) prepared for the proposed Oakley Shops at Laurel Fields commercial development project in Oakley, California. This section discusses the TIA's purpose, analysis locations and scenarios, analysis methods, criteria used to identify significant impacts, and report organization.

1.1 Study Purpose

The study's purpose is to evaluate the potential transportation impacts of the Oakley Shops at Laurel Fields project. The California Environmental Quality Act (CEQA) Guidelines were updated in 2020 per Senate Bill 743 (SB 743) to require the use of VMT to evaluate a project's environmental effect on the transportation system. The passage of SB 743 includes the elimination of automobile delay, LOS, and other similar measures of vehicular capacity or traffic congestion as a basis for determining a project's significant impacts to the transportation system. However, lead agencies may elect to utilize LOS for informational purposes or non-CEQA analysis. This report summarizes the project's effect on VMT for CEQA purposes and LOS analysis for informational/non-CEQA analysis to ensure consistency with the goals of *City of Oakley's 2020 General Plan (Focused General Plan Update, Adopted January 11, 2022, City of Oakley)*.

The study has been prepared in accordance with the City of Oakley's *Traffic Impact Analysis Guidelines* (Final, October 15, 2018) and follows industry standard approaches and methodologies. CEQA's Appendix G checklist questions for transportation impacts are answered including VMT, impacts to bicycle/pedestrian facilities, transit facilities and services, emergency vehicle access, and roadway safety-related impacts including nonstandard design features.

1.2 Project Description

The project would be constructed on a currently undeveloped site in the northeast corner of the Laurel Road/O'Hara Avenue intersection in the central portion of the City of Oakley, as shown on **Figure 1**. The project would construct a 55,500 square foot Safeway grocery store, along with 18,280 square feet of retail space (which could include restaurants), 4,865 square feet of fast-food restaurants, and a 3,083 square foot convenience store with 16 fueling stations. The site would also include 365 off-street parking stalls. A conceptual project site plan for the full buildout of the center is shown in **Figure 2**. Vehicular access to the site would be given through five new driveways, two along Laurel Road and three along O'Hara Avenue. The project would construct a new traffic signal at the intersection of Laurel Road and the project's eastern driveway. The western driveway on Laurel Road and the northern and southern driveways on O'Hara Avenue would be right in-right out only.

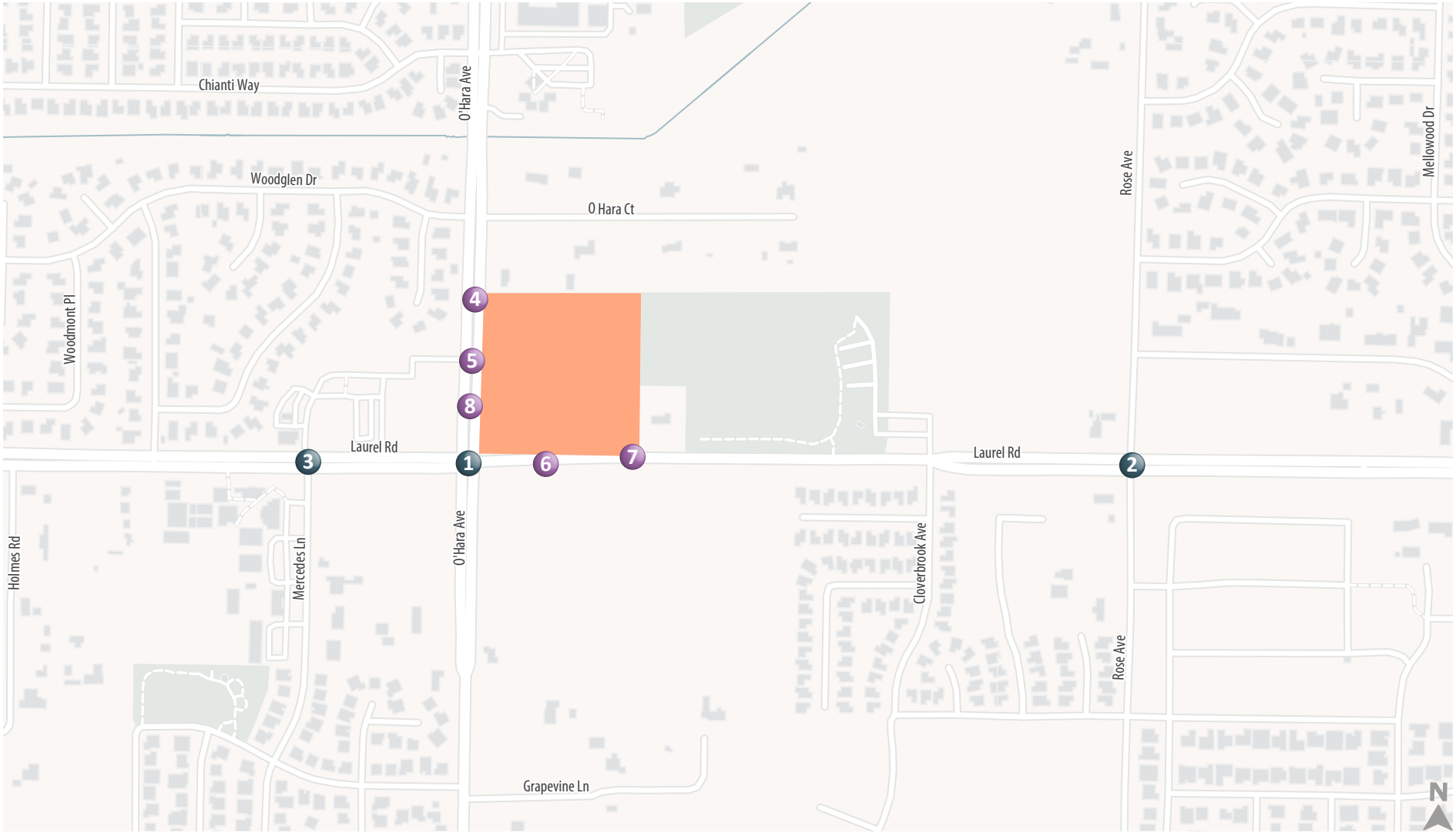
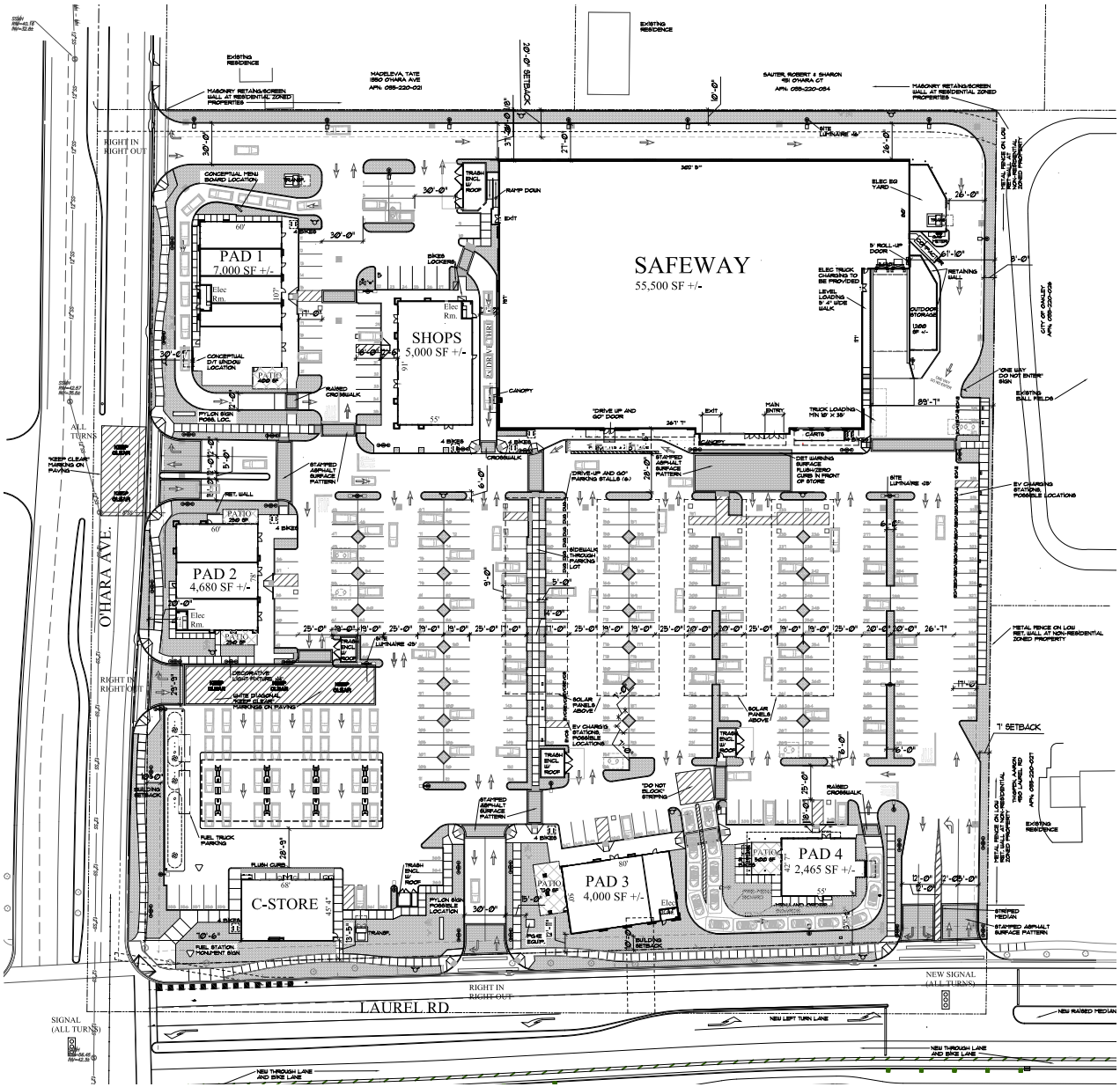


Figure 1

Project Site and Study Intersections



Site Plan Source: Johnson Lyman Architects, LLP, 1/18/2024

Figure 2

Project Site Plan

1.3 Report Organization

This report is divided into ten chapters as described below:

- **Chapter 1 – Introduction** discusses the purpose and organization of the report.
- **Chapter 2 – Analysis Methods** documents the regulations and methodology used for the VMT and LOS analyses.
- **Chapter 3 – Existing Conditions** describes the transportation system in the project's vicinity, including the surrounding roadway network, morning, midday and evening peak hour intersection turning movement volumes, existing bicycle, pedestrian, and transit facilities, and intersection operations.
- **Chapter 4 – Project Characteristics** presents relevant project information, such as the project components and project trip generation, distribution, and assignment.
- **Chapter 5 – Vehicle Miles Traveled Assessment** discusses the assessment of project's effects on total VMT and compares them to the relevant thresholds of significance.
- **Chapter 6 – Existing Plus Project Conditions** addresses the existing conditions with the project and discusses project vehicular impacts.
- **Chapter 7 – Cumulative Traffic Conditions** addresses the long-term future conditions, both without and with the project, and discusses project vehicular impacts.
- **Chapter 8 – Environmental Assessment** discusses the project's potential impacts regarding transportation related environmental topics, including Vehicle Miles Traveled, Pedestrian Facilities, Bicycle Facilities, Transit Facilities, Emergency Vehicle Access, and Hazards.
- **Chapter 9 – Site Plan Review** discusses the operations and review of the project's proposed site plan, including an assessment of the adequacy of the proposed parking supply.
- **Chapter 10 – Summary of Findings** provides a summary of the report's findings and recommendations.

2. Analysis Methods

This section describes the assumptions and methodologies utilized in the Vehicle Miles Traveled (VMT) analysis and Level of Service (LOS) analysis.

2.1 Vehicle Miles Traveled (VMT) Analysis

On September 27, 2013, Senate Bill (SB) 743 was signed into law. The California state legislature found that with the adoption of the Sustainable Communities and Climate Protection Act of 2008 (SB 375), the State had signaled its commitment to encourage land use and transportation planning decisions and investments that reduce vehicle miles traveled and thereby contribute to the reduction of greenhouse gas emissions, as required by the California Global Warming Solutions Act of 2006 (Assembly Bill 32). In December 2018, the Governor's Office of Planning and Research (OPR) finalized new CEQA guidelines (CEQA Guidelines section 15064.3), that identify vehicle-miles traveled as the most appropriate criteria to evaluate a project's transportation impacts.

The implementation of SB 743 eliminated the use of criteria such as auto delay, level of service, and similar measures of vehicle capacity of traffic congestion as the basis for determining significant impacts as part of CEQA compliance. The SB 743 VMT criteria promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.

In November 2017, OPR released a technical advisory containing recommendations regarding the assessment of VMT, proposed thresholds of significance, and potential mitigation measures for lead agencies to use while implementing the required changes contained in Senate Bill 743. Also in November 2017, OPR released the proposed text for Section 15064.3, "Determining the Significance of Transportation Impacts," which summarized the criteria for analyzing transportation impacts for land use projects and transportation projects and directs lead agencies to "choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure." OPR recommends that for most instances a per service population threshold should be adopted and that a fifteen percent reduction below that of existing development would be a reasonable threshold.

On July 15, 2020, the Contra Costa Transportation Authority (CCTA) adopted criteria, standards, and thresholds for the assessment of VMT (CCTA, *Approval of the Vehicle Miles Traveled Analysis Methodology for Land Use Projects in the Growth Management Program*, July 15, 2020). The methods and thresholds adopted by CCTA follow the guidance and recommendations of OPR pertaining to the implementation of SB 743.

As the City of Oakley has not yet formally adopted its own VMT criteria, standards, or thresholds at the time this report was prepared, this assessment follows the current OPR and CCTA guidance related to



VMT. Goal 3.7.12 of the *City of Oakley's 2020 General Plan (Focused General Plan Update, Adopted January 11, 2022, City of Oakley)* states the following:

> *"Support development that helps to reduce greenhouse gas emissions and vehicle miles traveled (VMT). Strive to reduce the rate of VMT per Resident in Oakley by at least 15 percent compared to year 2020. Strive to ensure the rate of VMT per Employee in Oakley remains lower than the countywide average."*

The City's General Plan does not provide any specific VMT guidance for local infill retail uses such as the ones proposed as part of the project.

2.1.1 CCTA VMT Guidelines

The methods and thresholds adopted by CCTA follow the guidance and recommendations of OPR pertaining to the implementation of SB 743. Specifically, CCTA guidance defines the following criteria that lead agencies can apply to screen projects out of conducting project-level VMT analysis:

- CEQA Exemption – Any project that is exempt from CEQA is not required to conduct a VMT analysis.
- Small projects – Small projects can be presumed to cause a less-than-significant VMT impact. Small projects are defined as having 10,000 square feet or less of non-residential space or 20 residential units or less, or otherwise generating less than 836 VMT per day.
- Local-Serving Uses – Projects that consist of Local-Serving Uses can generally be presumed to have a less-than-significant impact absent substantial evidence to the contrary, since these types of projects will primarily draw users and customers from a relatively small geographic area that will lead to short-distance trips and trips that are linked to other destinations.
- Projects Located in Transit Priority Areas (TPAs) – Projects located within a TPA can be presumed to have a less-than-significant impact absent substantial evidence to the contrary.
- Projects located in Low VMT Areas – residential and employment-generating projects located within a low VMT-generating area can be presumed to have a less-than-significant impact absent substantial evidence to the contrary. A Low VMT area is defined as follows:
    - For housing projects: Cities, towns and unincorporated portions within Contra Costa that have existing home-based VMT per capita that is 85% or less of the existing county-wide average.
    - For employment-generating projects: Cities, towns, and unincorporated portions within Contra Costa that have existing home-work VMT per worker that is 85% or less of the existing regional average.

The project is best categorized as a local serving use, however given its size it does not meet the CCTA's screening criteria. The CCTA does not provide specific guidance or thresholds related to retail projects of the size proposed by the project.

2.1.2 California Technical Advisory on Evaluating Transportation Impacts in CEQA

The *Technical Advisory* provides advice and recommendations to CEQA lead agencies on how to implement SB 743 changes. This includes technical recommendations regarding the assessment of VMT, thresholds of significance, VMT mitigation measures, and screening thresholds for certain land use projects. Lead agencies may consider and use these recommendations at their discretion and with the provision of substantial evidence to support alternative approaches. The *Technical Advisory* describes considerations agencies may use in selecting VMT metrics, calculation methodologies, and significance thresholds. The *Technical Advisory* does not mandate the use of specific metrics, methodologies, or significance thresholds, because agencies have discretion to select those that are appropriate for the local land use and transportation context.

The *Technical Advisory* identifies "screening thresholds" to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study. The *Technical Advisory* suggests that projects meeting one or more of the following criteria should be expected to have a less-than-significant impact on VMT.

- Small projects – projects consistent with Sustainable Communities Strategies (SCS) and local general plans that generate or attract fewer than 110 trips per day.
- Projects near major transit stops – certain projects (residential, retail, office, or a mix of these uses) proposed within one half-mile of an existing major transit stop or an existing stop along a high-quality transit corridor.
- Affordable residential development – a project consisting of a high percentage of affordable housing may be a basis to find a less-than-significant impact on VMT.
- Local-serving retail – local-serving retail development tends to shorten trips and reduce VMT. The Technical Advisory encourages lead agencies to decide when a project will likely be local-serving, but generally acknowledges that retail development including stores larger than 50,000 square feet might be considered regional-serving. The Technical Advisory suggests lead agencies analyze whether regional-serving retail would increase or decrease VMT (i.e., not presume a less-than-significant outcome).
- Projects in low VMT areas – residential and office projects that incorporate similar features (i.e., density, mix of uses, transit accessibility) as existing development in areas with low VMT will tend to exhibit similarly low VMT.

The *Technical Advisory* also identifies recommended numeric VMT thresholds for retail projects.

- Retail projects (and other non-residential/non-office projects) that result in a net increase in total VMT may indicate a significant transportation impact.

2.1.3 VMT Methodology and Thresholds

Following the guidelines of the State of California's *Technical Advisory*, the project's effect on total VMT was used to assess environmental significance. The CCTA's regional travel demand model and applicable

off-model calculations were used to assess the project's effects on VMT. If the project is found to result in a net increase in VMT, a significant adverse impact may be indicated.

2.2 Level of Service (LOS) Analysis

2.2.1 Study Locations

Potential project violations of the city's established level of service policies at study area roadway facilities were determined by measuring the effect project traffic would have on intersections in the vicinity of the project site during the weekday morning (7:00 to 9:00 AM), midday (12:00 to 2:00 PM), and evening (4:00 to 6:00 PM) peak periods. As shown on **Figure 1**, the following intersections were selected based on a review of the project location, estimates of the added traffic from the project, and locations of planned roadways in the area:

1. Laurel Road/O'Hara Avenue
2. Laurel Road/Mercedes Lane
3. Laurel Road/Rose Avenue

2.2.2 Data Collection and Field Observations

Weekday morning (7:00 to 9:00 AM), midday (12:00 to 2:00 PM), and evening (4:00 to 6:00 PM) peak period intersection turning movement counts were collected at the study intersections in the fall of 2023 when schools were in session at the above study intersections. Peak hour intersection volumes are summarized on **Figure 4** along with existing lane configurations and traffic controls. The traffic count data collection worksheets are provided in **Appendix A**.

Signal timing data was collected from the City of Oakley. Field observations took place to confirm existing signal timing, traffic patterns, queue lengths, lane geometries, bicycle facilities, and pedestrian facilities at the study locations to inform the existing baseline conditions.

2.2.3 Study Scenarios

The following scenarios were evaluated the weekday AM, midday, and PM peak hours:

- ***Existing without Project***– Existing (2023) traffic conditions based on existing intersection turning movement counts.
- ***Existing Plus Project*** – Existing without project conditions plus traffic volume estimates for the proposed project.
- ***Cumulative without Project*** – Forecasted year 2040 without project traffic conditions based on the CCTA Travel Model.
- ***Cumulative Plus Project*** – Cumulative baseline conditions plus traffic volume estimates for the proposed project.

2.2.4 LOS Analysis Methodology

The operations of roadway facilities are described with the term "level of service." LOS is a qualitative description of traffic flow from a vehicle driver's perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (free-flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result, and operations are designated LOS F.

2.2.4.1 Signalized Intersections

Traffic conditions at signalized intersections were evaluated using methods developed by the Transportation Research Board (TRB), as documented in the *Highway Capacity Manual 6th Edition* (HCM 6th) for vehicles. The HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors. Control delay is defined as the delay directly associated with the traffic control device (i.e., a stop sign or a traffic signal) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The relationship between LOS and control delay is summarized in **Table 1**.

Table 1: Signalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0

Source: *Highway Capacity Manual 6th Edition (Transportation Research Board).*

2.2.4.2 Unsignalized Intersections

For unsignalized (all-way stop controlled and side-street stop controlled) intersections, the HCM 6th method for unsignalized intersections was used. With this method, operations are defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 2** summarizes the relationship between LOS and delay for unsignalized intersections. At side-street stop-controlled intersections, the delay is calculated for each stop-controlled movement, the left turn movement from the major street, as well as the intersection average. The intersection average delay and highest movement/approach delay are reported for side-street stop-controlled intersections.

Table 2: Unsignalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic, delays where intersection capacity exceeded	> 50.0

Source: *Highway Capacity Manual 6th Edition (Transportation Research Board).*

Goal 3.1.4 of the *City of Oakley's 2020 General Plan (Focused General Plan Update, Adopted January 11, 2022, City of Oakley)* states the following:

> *"Strive to maintain Level of Service D for motor vehicle traffic as the minimum acceptable service standard for intersections during peak periods (except those facilities identified as Routes of Regional Significance, or where pedestrian travel is prioritized)."*

There are no designated routes of regional significance in the immediate study area. LOS D is applied as the prevailing LOS standard within this report.

2.3 Environmental Assessment

Based on the updated Appendix G of the State of California's Environmental Checklist Form, significant transportation-related impact could occur if the project would:

a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including roadway, transit, bicycle, and pedestrian facilities.
b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? Specifically, cause substantial additional VMT per capita, per service population, or other appropriate efficiency measure.
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
d. Result in inadequate emergency access.

These topics are each addressed in their applicable sections of the report.

3. Existing Conditions

This chapter describes transportation facilities in the study area, including the surrounding roadway network as well as transit, pedestrian, and bicycle facilities in the project site vicinity. Existing intersection operations are also described.

3.1 Existing Transportation System

3.1.1 Roadway System

The currently undeveloped project site is in the central portion of the City of Oakley on the north side of Laurel Road, east of O'Hara Avenue. It is northeast of Laurel Elementary School and just west of Laurel Ballfields Park. Oakley is in eastern Contra Costa County, adjacent to the cities of Antioch and Brentwood, located west and south, respectively. Land uses surrounding the project site are primarily residential. Access to the site is provided by O'Hara Avenue and Laurel Road. The following discusses the roadways that provide access to the site and are most likely to experience direct transportation impacts, if any, from the proposed project.

O'Hara Avenue is a north-south roadway that forms the western boundary of the project site. The roadway provides two travel lanes in both directions, plus turn pockets at intersections, north of Laurel Road. South of Laurel Road, O'Hara Avenue has one northbound travel lane and two southbound travel lanes. O'Hara Avenue connects to the City of Brentwood in the south. Class II bicycle lanes and sidewalks are provided continuously on one or both sides of the roadway. The posted speed limit is 35 mph north of Laurel Road and 40 mph south of Laurel Road. No on-street parking is permitted.

Laurel Road is an east-west roadway that forms the southern boundary of the project site. The roadway provides two travel lanes in both directions west of O'Hara Avenue, narrowing to one lane eastbound between O'Hara Avenue and Cloverbrook Avenue (two lanes westbound). Laurel Road connects to State Route 4 to the west. Class II bicycle lanes and sidewalks are provided continuously on one or both sides of the roadway. The posted speed limit is 35 mph west of O'Hara Avenue and 40 mph east of O'Hara Avenue. No on-street parking is permitted.

Rose Avenue is a north-south roadway located east of the project site. The roadway provides one travel lane in both directions. Rose Avenue connects to Main Street to the north. There are discontinuous Class II bicycle lanes and sidewalks on both sides of the street south of Laurel Road. The posted speed limit is 40 mph. No on-street parking is permitted.

Mercedes Lane is a north-south roadway located west of the project site. The roadway provides one travel lane in both directions. Mercedes Lane connects to a residential neighborhood and Laurel Elementary School. There are sidewalks on one or both sides of the street and no bicycle facilities. The posted speed limit is 25 mph. Parallel on-street parking is permitted on both sides of the street south of Laurel Elementary School.

3.1.2 Existing Pedestrian and Bicycle Facilities

Pedestrian facilities in the study area include sidewalks, crosswalks, and pedestrian signals. At signalized intersections in the area, crosswalks and pedestrian push-button actuated signals are provided. In general, all roadways within the study area provide sidewalks except for the following:

- East side of O'Hara Avenue along the project frontage
- East side of O'Hara Avenue from Laurel Road to approximately 340 feet south of Grapevine Lane
- South side of Laurel Road from O'Hara Avenue to approximately 520 feet west of Cloverbrook Avenue

Figure 3A illustrates the pedestrian facilities on O'Hara Avenue and Laurel Road in the study area.

Bicycle facilities in the study area include the following:

- **Bike Paths (Class I)** - Bike paths provide a separate right-of-way and are designated for the exclusive use of people riding bicycles and walking with minimal crossflow traffic. Such paths can be well situated along creeks, canals, and rail lines. Class I Bikeways can also offer opportunities not provided by the road system by serving as both recreational areas and/or desirable commuter routes.
- **Bike lanes (Class II)** – Bike lanes provide designated street space for bicyclists, typically adjacent to the outer vehicle travel lanes. Bike lanes include special lane markings, pavement legends, and signage. Bike lanes may be enhanced with painted buffers between vehicle lanes and/or parking, and green paint at conflict zones (such as driveways or intersections).

In the immediate study area, there are Class II bike lanes along O'Hara Avenue, Laurel Road, and Rose Avenue. The Via Delta de Anza Class I bicycle path is approximately 630 feet north of the project site accessed via O'Hara Avenue. The Via Delta de Anza trail is a paved, multi-use hiking, bicycling and equestrian trail that currently spans over 15 miles. It connects the cities of Concord, Bay Point, Pittsburg, Antioch, and Oakley and provides access to Contra Loma Regional Park (and Black Diamond Mines Regional Preserve) through Antioch Community Park.

The existing and planned bike facilities are shown on **Figure 3B**.

3.1.3 Existing Transit Service

Eastern Contra Costa Transit Authority (Tri Delta Transit) provides transit service in eastern Contra Costa County, serving the communities of Brentwood, Antioch, Oakley, Concord, Discovery Bay, Bay Point and Pittsburg.

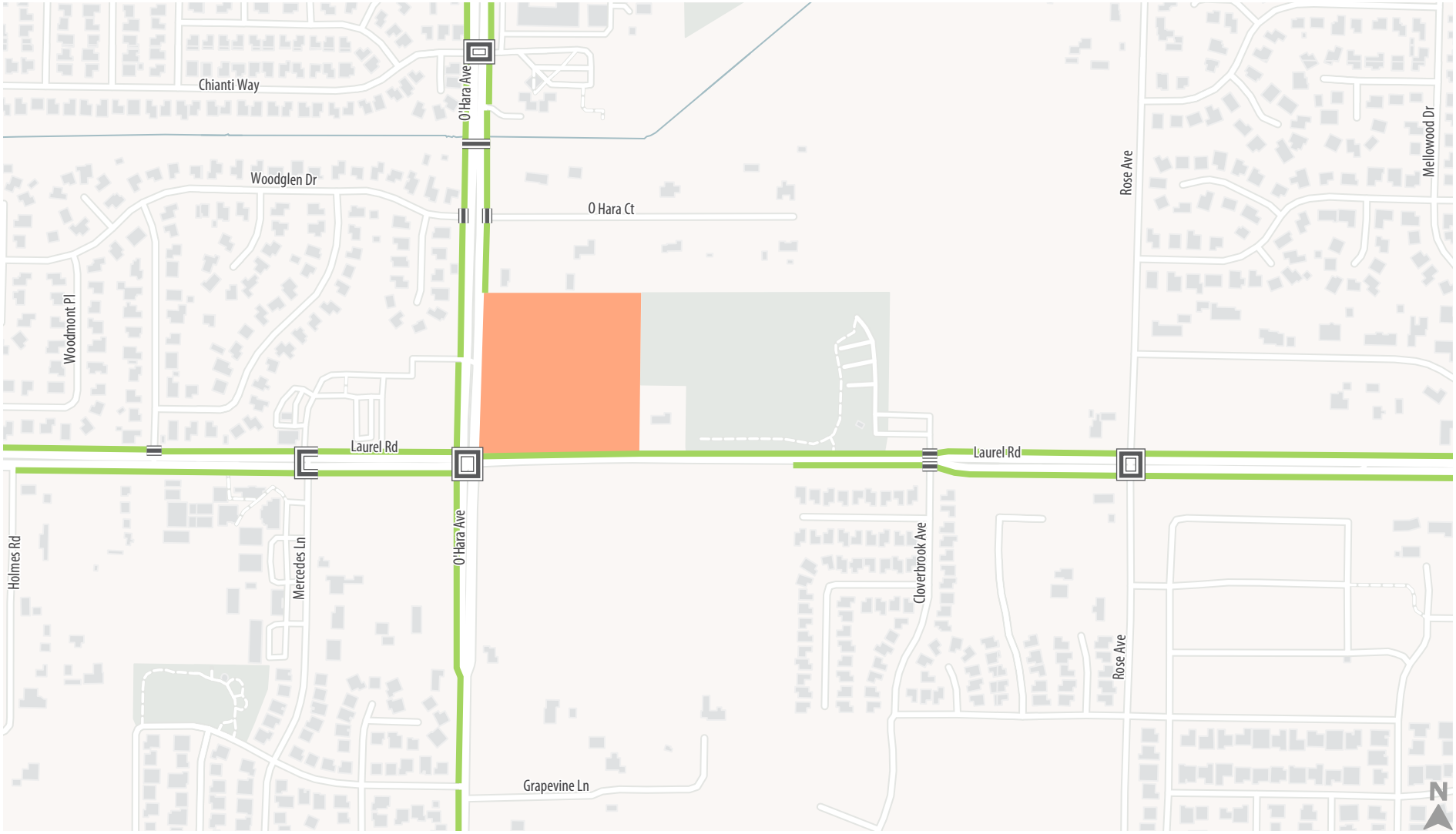


Figure 3A

Existing Pedestrian Facilities

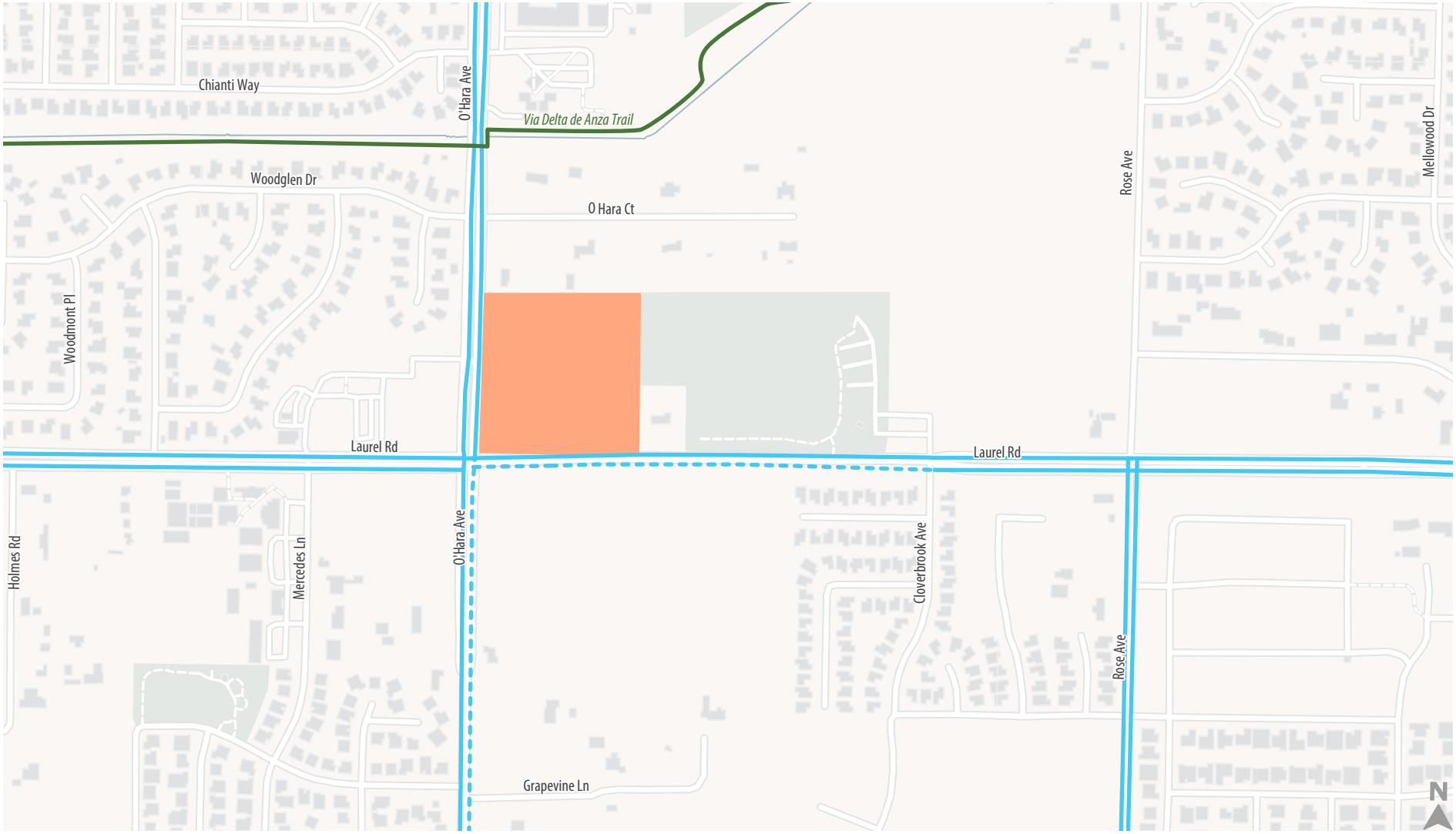


Figure 3B

Existing and Planned Bicycle Facilities

Currently, fifteen routes operate on weekdays, with five routes operating on weekends. One route currently serves the area near the project site – Route 383. In the project's vicinity, Route 383 operates along Laurel Road and O'Hara Avenue with a stop 0.4 miles east of the site at Laurel Road and Rose Avenue. Route 383 operates on weekdays only with one-hour headways from 5:00 AM to 7:00 PM. The services run between the Antioch BART Station and Blue Goose Park in Brentwood.

3.2 Existing Operations Assessment

3.2.1 Intersection Levels of Surface

Existing operations were evaluated using the methods described in Chapter 2 for the weekday AM. midday and PM peak hours at the study intersections. The results of this assessment are summarized in **Table 3**. The analysis was based on the volumes, lane configurations, and traffic control presented on **Figure 4**. Observed peak hour factors[1] were used at all intersections for the existing analysis. Detailed intersection LOS calculation worksheets are presented in **Appendix B**.

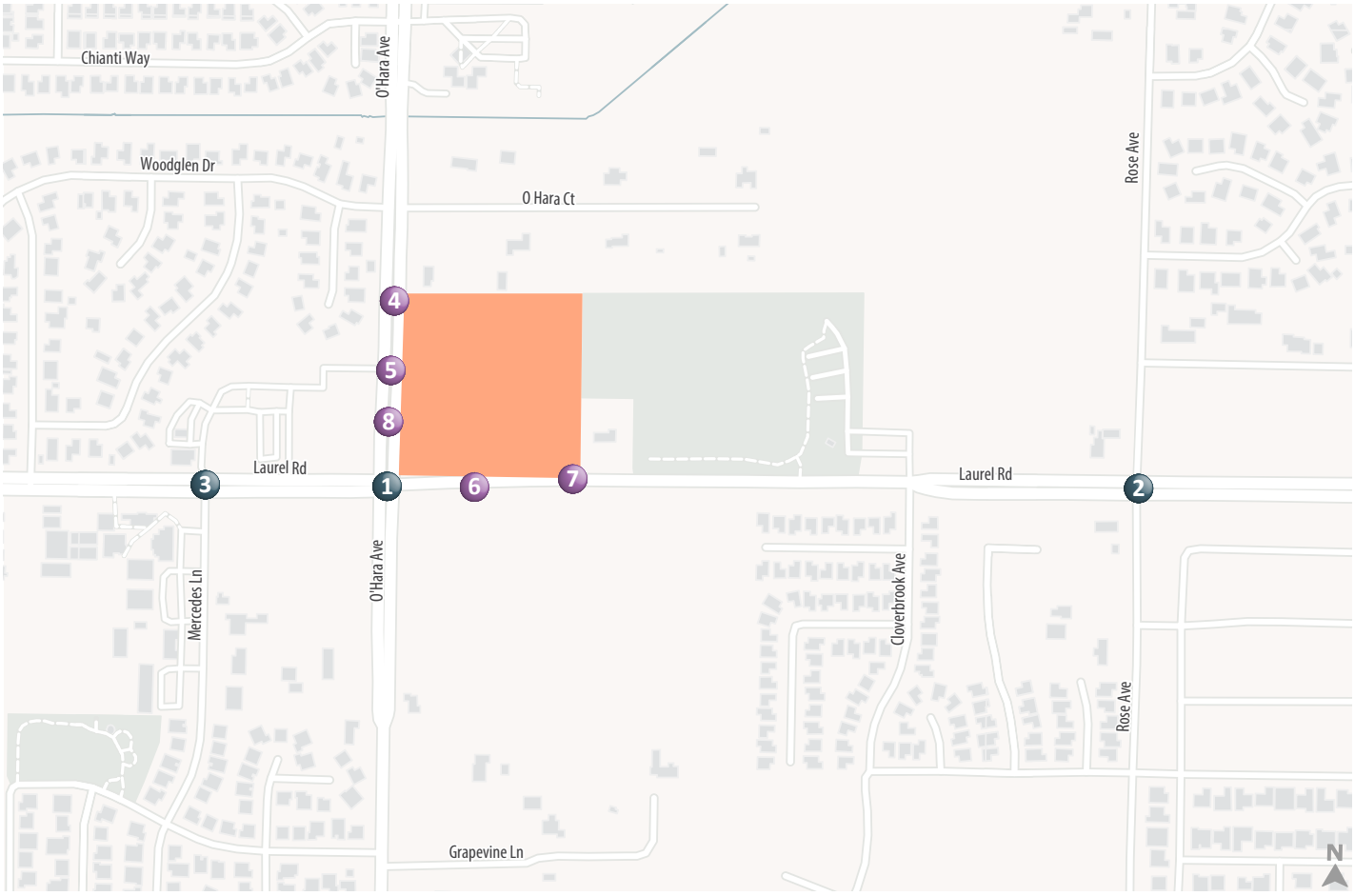
Table 3: Existing Conditions LOS Results

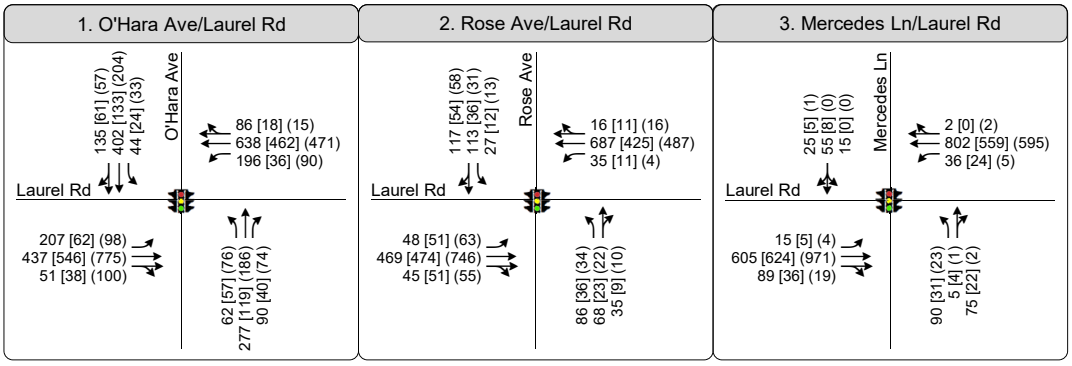
Intersection	Control[1]	Time Period	LOS Standard	Existing	
				Delay[2]	LOS[3]
1. Laurel Road/O'Hara Avenue	Signal	AM Midday PM	D D D	29.6 17.6 21.3	C B C
2. Laurel Road/Rose Avenue	Signal	AM Midday PM	D D D	23.5 13.3 13.2	C B B
3. Laurel Road/Mercedes Lane	Signal	AM Midday PM	D D D	26.0 8.9 5.1	C A A
5. Driveway #2/O'Hara Avenue	SSSC	AM Midday PM	D D D	*Intersection does not exist in this scenario.*	
7. Laurel Road/Driveway #4	Signal	AM Midday PM	D D D	*Intersection does not exist in this scenario.*	

Notes:
1. SSSC = Side-Street Stop-Controlled; AWSC = All-Way Stop-Controlled; Signal = Signalized
2. Whole intersection average delay was reported for signalized intersections and all-way stop-controlled intersections. Side-street stop-controlled delay presented as Whole Intersection Average Delay (Worst Approach Delay). Delay calculated per HCM 6th Edition methodologies.
3. LOS designation per HCM 6th Edition.

Source: Fehr & Peers, 2024.

[1] The peak hour factor is the relationship between the peak 15-minute flow rate and the full hourly volume: PHF = Hourly volume / (4 x (volume during the peak 15 minutes of flow)). The analysis level of served is based on peak rates of flow occurring within the peak hour because substantial short term fluctuations typically occurring during an hour.





XX [YY] (ZZ) AM [Midday] (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Project Driveway

Figure 4

Existing Peak Hour Traffic Volumes and Lane Configurations

As shown, all signalized and unsignalized study intersections currently operate within the overall level of service standards set by the City of Oakley.

3.2.2 Vehicle Queues

Although the intersections currently operate within the operation standard of LOS D or better, there can be periodic vehicle spillback and delays for some individual movements. **Table 4** presents the AM, midday, and PM peak hour 95th percentile queues for raised and/or painted turn pockets where vehicle queues may occasionally exceed the vehicle storage length. These queues are indicative of maximum design queues occurring during periods of peak traffic. Queue worksheets are provided in **Appendix D**.

Table 4: Existing Conditions 95th Percentile Turn Pocket Queue Summary

Intersection	Movement	Storage Length (ft)[1]	AM Peak Hour	Midday Peak Hour	PM Peak Hour
1. Laurel Road/O'Hara Avenue	EBL	330	300	100	150
	WBL	300	275	75	150
	NBR	60	**75**	25	50
	SBL	180	100	50	75
2. Laurel Road/Rose Avenue	EBL	170	75	75	75
	NBL	250	100	50	50
3. Laurel Road/Mercedes Lane	WBL	100	75	50	25
	NBTR	50	50	50	25

Notes:
1. An additional 60 to 90 feet of storage is typically provided in the taper area outside of the through lane, which is not reflected in the storage length above.

Bold indicates queue potentially extends beyond available storage.
Source: Fehr & Peers, 2024.

As shown in **Table 4**, all intersection movements currently have acceptable 95th percentile queue lengths under existing conditions, except for the northbound right movement at the Laurel Road/O'Hara Avenue intersection in the AM peak hour.

4. Project Characteristics

This chapter provides an overview of the proposed project components and addresses the proposed project trip generation, distribution, and assignment characteristics, allowing for an evaluation of project impacts on the surrounding roadway network. The amount of traffic associated with the project was estimated using a three-step process:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the project site was estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the site was projected.
3. **Trip Assignment** – Trips were then *assigned* to specific roadway segments and intersection turning movements.

4.1 Project Description

The Oakley Shops at Laurel Fields project seeks to build a new mixed-use shopping center on a currently undeveloped plot of land. The project would construct a 55,500 square foot Safeway grocery store, along with 18,280 square feet of retail space (which could include restaurants), 4,865 square feet of fast-food restaurants, and a 3,083 square foot convenience store with 16 fueling stations. The site would also include 365 off-street parking stalls. A conceptual project site plan for the full buildout of the center is shown in **Figure 2**.

Vehicular access to the site is proposed to be provided by two driveways along Laurel Road and three driveways along O'Hara Avenue. The project would construct a traffic signal at the intersection of Laurel Road and the eastern driveway. The western driveway on Laurel Road and the northern and southern driveways on O'Hara Avenue would be right in-right out only.

4.2 Project Trip Generation

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Estimates are created on a weekday daily basis for the peak one-hour period in the morning and the evening when traffic on adjacent streets are the highest. The project trip generation was estimated based on the project description and formulas from the Institute of Transportation Engineers *Trip Generation Manual, 11th Edition,* as presented in **Table 5**.

The ITE *Trip Generation* methodology is primarily based on data collected at suburban, single-use, freestanding sites. These defining characteristics limit their applicability to mixed-use or multi-use development projects, or projects with unique design features and settings. To account for internal trips between complementary on-site land uses a fifteen percent internalization rate, based on data at similar sites published in the Institute of Transportation Engineers *Trip Generation Handbook, 3rd Edition and* ITE *Traffic Engineering Handbook, 7th Edition* were applied. The 18,280 square feet of retail space was evaluated using ITE's Land Use Code 822 "Strip Retail Plaza". This land use code encompasses a wide

range of potential retail spaces such as restaurants, banks, post offices, dry cleaners, and other miscellaneous retail uses.

In addition to internal trips, the analysis accounts for pass-by trips. A "pass-by" trip is made by a motorist already on the adjacent street while in route to a different primary destination. Pass-by trips do not add traffic to the adjacent street but contribute trips to the driveways serving the shopping center. Pass-by trip percentages are based on data from the ITE *Trip Generation Manual, 11th Edition*.

Table 5 presents the trip generation analysis results including ITE's Gross Project Trips, Net External Vehicular Project Trips which account for internal trips, and Net New External Vehicular Project Trips which further refines the trip estimate by removing vehicle trips that are "pass-by" from the adjacent street. As shown in the table, the project would result in a net increase in approximately 5,518 new daily vehicle trips, with 270 occurring during the AM peak hour, 499 occurring in the midday peak hour, and 497 occurring during the PM peak hour.

Table 5: Vehicle Trip Generation Estimates

ITE Land Use	Units	Unit Type	Direction	Vehicle Trips			
				Daily	AM	Midday	PM
(850) Supermarket	55.5	KSF	In		94	210	240
			Out		65	210	240
			Total	**5,167**	**159**	**420**	**480**
(822) Strip Retail Plaza	18.28	KSF	In		26	71	60
			Out		17	71	60
			Total	**995**	**43**	**142**	**120**
(934) Fast-Food Restaurant with Drive-Through Window	4.865	KSF	In		111	146	84
			Out		106	134	77
			Total	**2,274**	**217**	**280**	**161**
(945) Convenience Store/Gasoline Station	16	Gas Pumps	In		129	114	148
			Out		129	114	148
			Total	**3,383**	**258**	**228**	**296**
Gross Project Trips				**11,819**	**677**	**1,070**	**1,057**
Internal Trips				-1,773	-102	-160	-159
Net External Vehicular Project Trips				**10,046**	**575**	**910**	**898**
Pass-by Trips				-4,528	-305	-411	-401
Net New External Vehicular Project Trips				**5,518**	**270**	**499**	**497**

Notes:
ITE 850 (Supermarket) Trip Generation Calculations:
Daily: T = 83.39(X) + 539.33
AM Peak Hour: T = 2.86(X) (62% in, 38% out)

Midday Peak Hour: T = 0.88 * e^(0.81 * ln(X) + 2.92) (51% in, 49% out)
PM Peak Hour: Ln(T) = 0.81 * ln(X) + 2.92 (51% in, 49% out)
Pass-by Trips = 24%
ITE 822 (Strip Retail Plaza <40k) Trip Generation Calculations:
Daily: T = 54.45(X)
AM Peak Hour: T = 2.36(X) (60% in, 40% out)
Midday Peak Hour: T = 7.78(X) (50% in, 50% out)
PM Peak Hour: T = 6.59(X) (50% in, 50% out)
Pass-by Trips = 40%
ITE 934 (Fast-Food Restaurant with Drive-Through Window) Trip Generation Calculations:
Daily: T = 467.48(X)
AM Peak Hour: T = 44.61(X) (51% in, 49% out)
Midday Peak Hour: T = 57.47(X) (52% in, 48% out)
PM Peak Hour: T = 33.03(X) (52% in, 48% out)
Pass-by Trips = 50% AM peak hour, 55% Midday peak hour, 55% PM peak hour
ITE 945 (Convenience Store/Gas Station) Trip Generation Calculations:
Daily: T = 158.28(X) + 850.23
AM Peak Hour: T = 16.06(X) (50% in, 50% out)
Midday Peak Hour: T = 14.18(X) (50% in, 50% out)
Pass-by Trips = 76% AM peak hour, 75% Midday peak hour, 75% PM peak hour
PM Peak Hour: T = 18.42(X) (50% in, 50% out)
Source: Fehr & Peers, 2024; Institute of Transportation Engineers, *Trip Generation, 11th Edition*; Institute of Transportation Engineers, *Traffic Engineering Handbook, 7th Edition*

4.3 Project Trip Distribution and Assignment

Project trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Estimates of project trip distribution were developed based on existing travel patterns in the area, information from the Contra Costa Transportation Authority travel demand model, and the location of complementary land uses. As shown in **Figure 5**, the following trip distribution of project generated vehicle traffic is expected:

- 20% North on O'Hara Avenue
- 5% North on Rose Avenue
- 15% South on O'Hara Avenue
- 2.5% South on Rose Avenue
- 2.5% South on Mercedes Lane
- 25% East on Laurel Road
- 30% West on Laurel Road

The project trip generation, in combination with the expected trip distribution patterns, was used to assign the peak hour vehicle trips to the local roadway network and study intersections, as shown on **Figure 6**. It should be noted that the detailed traffic analysis was conducted on a slightly different project description based on a previous sight plan with 265 fewer square feet of development. This small difference in size resulted in a negligible increase in total trip generation.



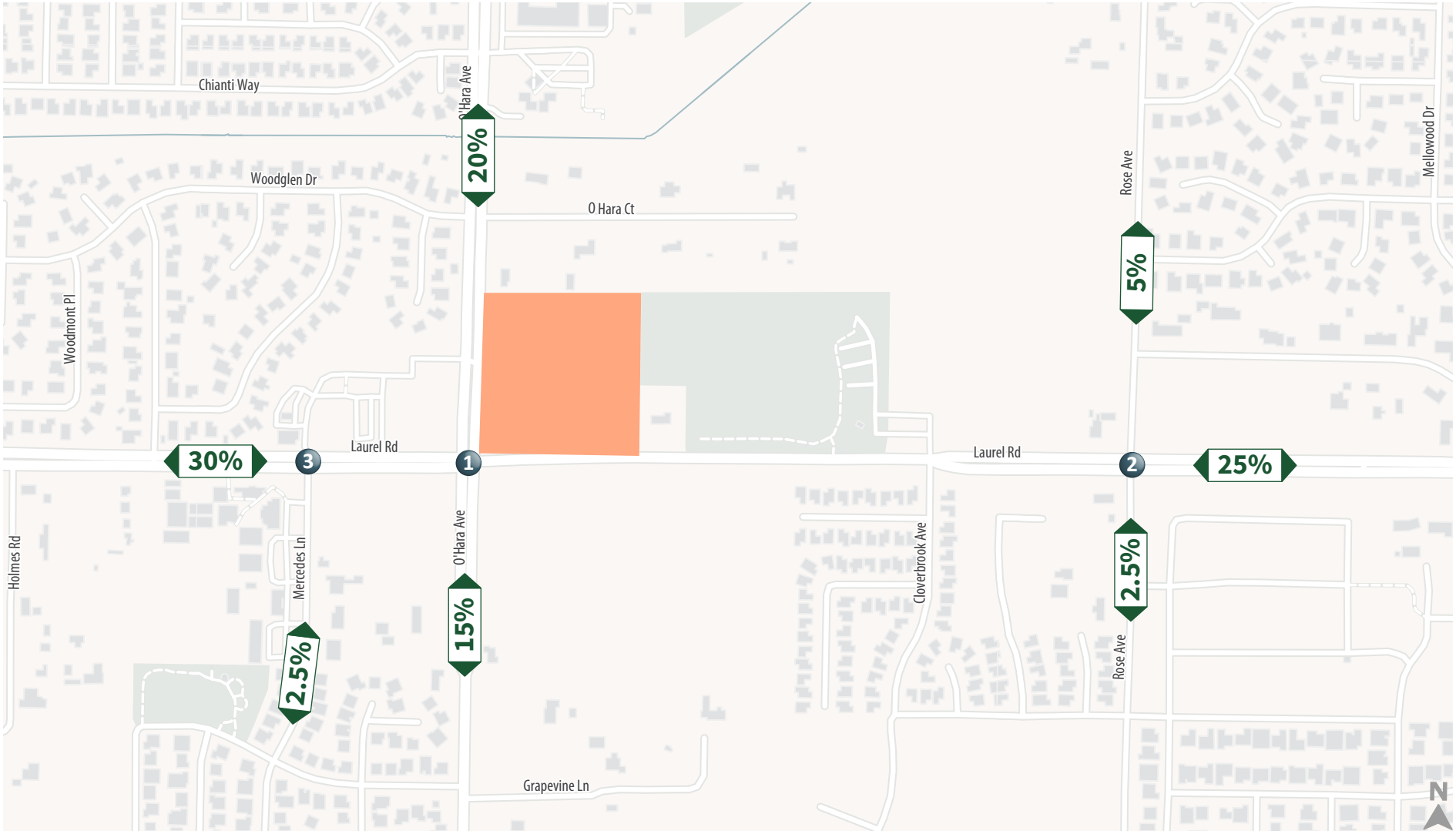
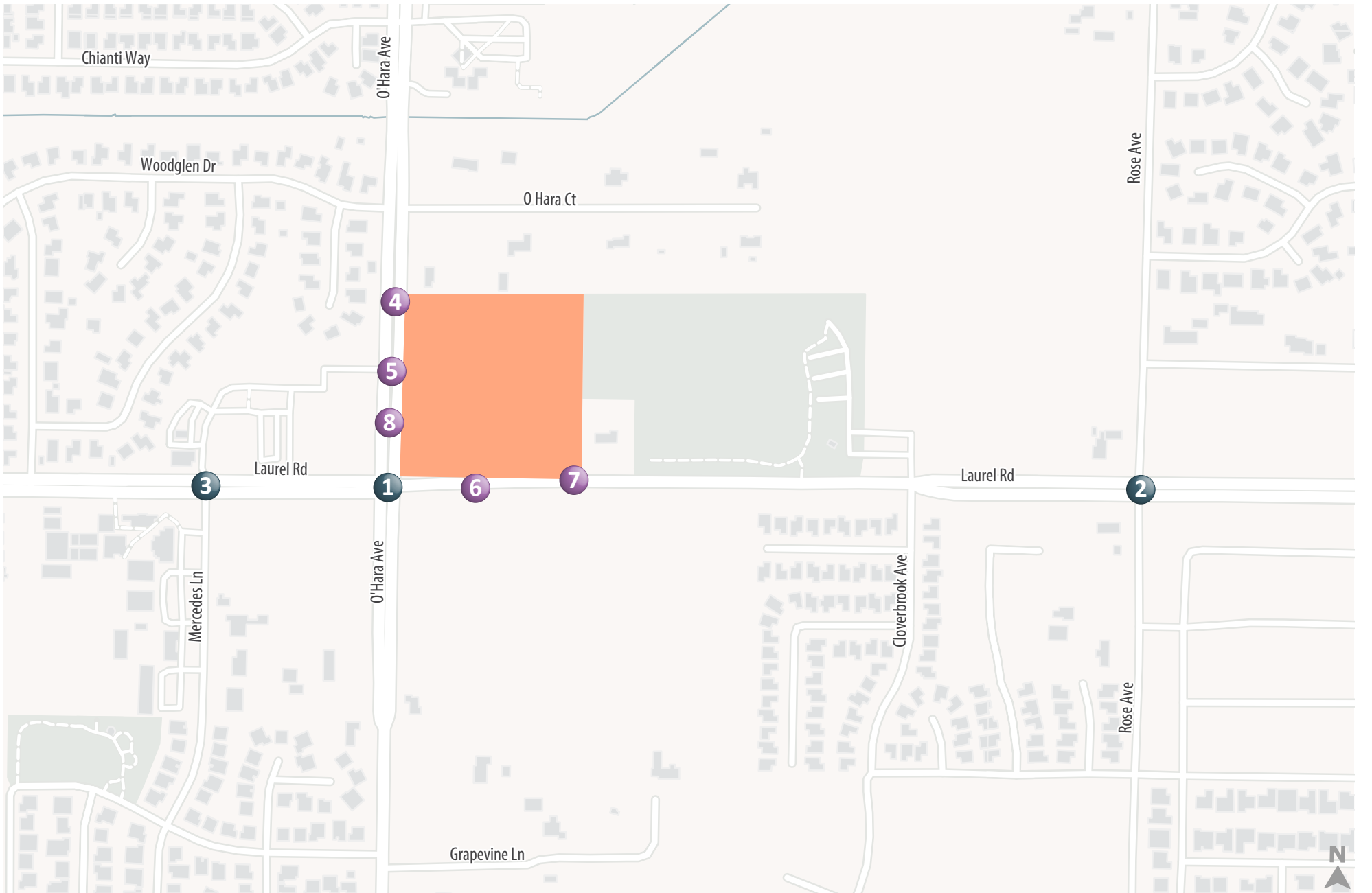
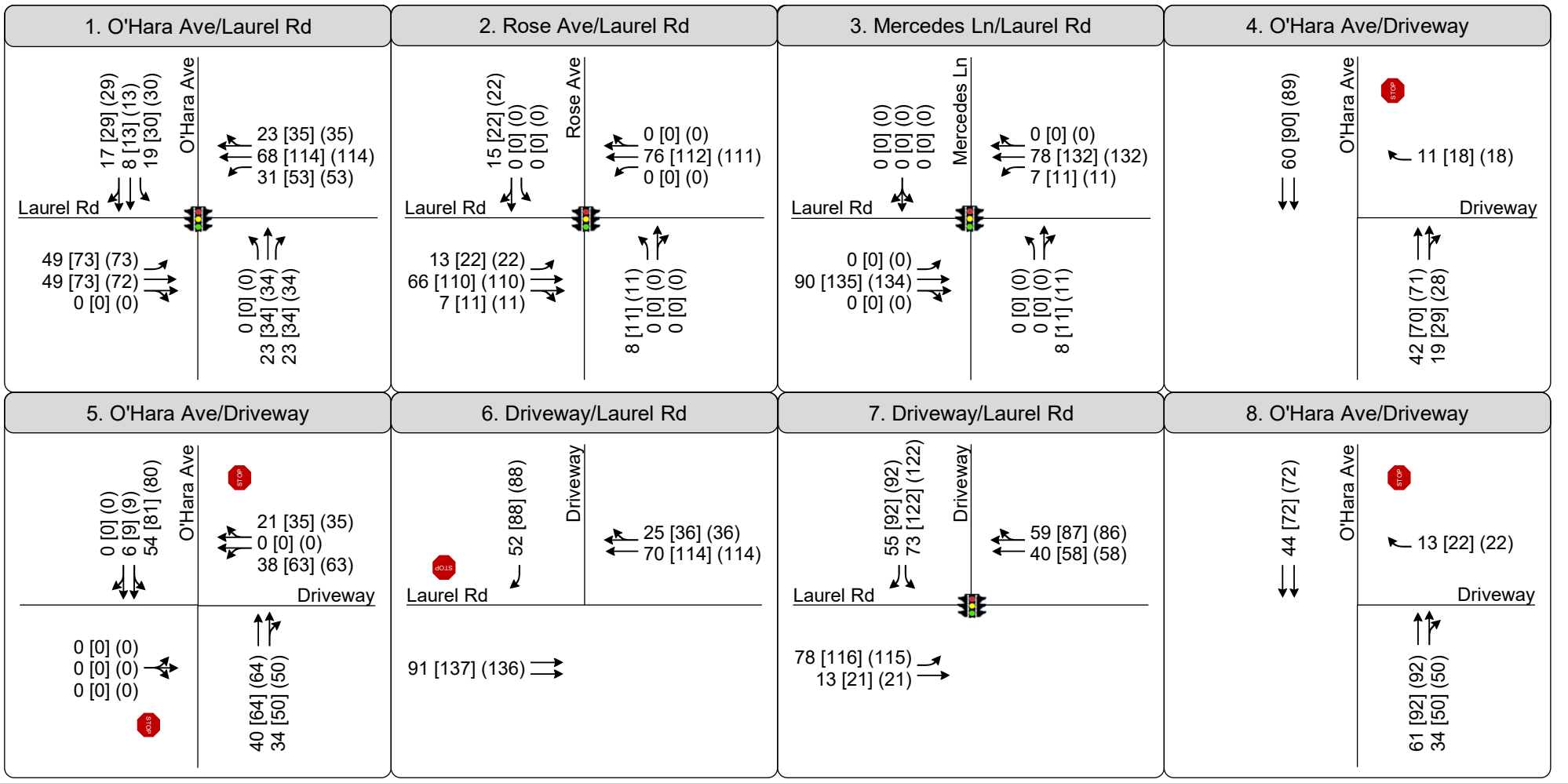


Figure 5

Project Trip Distribution





XX [YY] (ZZ) AM [Midday] (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Project Driveway

Figure 6

Project Trip Assignment

5. Vehicle Miles Traveled (VMT) Assessment

This section describes the evaluation of the project's potential impacts relative to VMT using the methodology and criteria described in Section 2.1. The project is best categorized as a collection of local serving retail land uses. New long distance or regionally significant vehicle trips to and from the project are not expected. Current vehicle trips on the roadway network traveling to other grocery stores, convenience stores, or restaurants are expected to travel to the project site rather than existing alternative retail locations further away. Local-serving retail development tends to shorten trips and reduce VMT.

As previously discussed, neither the CCTA nor City of Oakley have specific thresholds relative to VMT for local serving retail land uses. However, the State of California's *Technical Advisory* identifies the following recommended numeric VMT thresholds for retail projects.

- Retail projects (and other non-residential/non-office projects) that result in a net increase in total VMT may indicate a significant transportation impact.

Following the guidelines of the State's *Technical Advisory*, the project's effect on total VMT was used to assess environmental significance. The CCTA's regional travel demand model and applicable off-model calculations have been used to assess the project's effects on VMT. If the project is found to result in a net increase in VMT, a significant adverse impact may be indicated.

5.1 Baseline VMT Results

To conduct the VMT assessment, the CCTA travel demand model was used to estimate the project's effect on average daily vehicle miles of travel. The project was coded into the model and baseline total VMT was estimated both with and without the project's proposed land uses. Some small off-model adjustments were made to better account for the specific locations of competing retail establishments within the surrounding community. The boundary method for assessing total VMT was then used to calculate vehicle miles traveled with and without the proposed project. For the purposes of the assessment the boundary for the measurement was the City of Oakley. **Table 6** presents the total daily baseline VMT within the City of Oakley's boundaries with and without the project.

Table 6: Project VMT Assessment

Scenario	Total Weekday Daily VMT[1]		Change
	No Project	With Project	
Baseline	244,652	243,970	-682 (-0.3%)

Notes:
1. Based on the CCTA travel demand model, boundary method (total for all trips within the City of Oakley).
Source: Fehr & Peers, 2024.

As illustrated in Table 6, the project is expected to have a small decrease in total VMT. Per the applicable standards of significance outlined above, the project is expected to have a **less than significant impact** related to VMT.

6. Existing Plus Project Conditions

This section evaluates the effects of the proposed project on the local roadway network.

6.1 Existing Plus Project Traffic Volumes

Project trip assignment volumes presented on **Figure 6** were added to the existing traffic volumes from **Figure 4** to estimate the Existing Plus Project traffic volumes, as shown on **Figure 7**. Roadway modifications to the network include five new driveways along the project site's western and southern boundaries on O'Hara Avenue and Laurel Road, respectively. The project would install a new traffic signal at the intersection of Laurel Road and the project's eastern driveway on Laurel Road. The project's proposed driveway locations are illustrated in **Figure 2**.

6.2 Existing Plus Project Operations Assessment

6.2.1 Intersection Level of Service

Existing Plus Project intersection operations were evaluated using the methods described in section 2. The Existing Plus Project analysis results are presented in **Table 7**, based on the traffic volumes presented on **Figure 7**.

Table 7: Existing Plus Project Conditions LOS Results Summary

Intersection	Control[1]	Time Period	LOS Standard	Existing		Existing Plus Project	
				Delay[2]	LOS[3]	Delay[2]	LOS[3]
1. Laurel Road/O'Hara Avenue	Signal	AM Midday PM	D D D	29.6 17.6 21.3	C B C	32 19.4 23.4	C B C
2. Laurel Road/Rose Avenue	Signal	AM Midday PM	D D D	23.5 13.3 13.2	C B B	24.5 13.8 13.8	C B B
3. Laurel Road/Mercedes Lane	Signal	AM Midday PM	D D D	26.0 8.9 5.1	C A A	26.9 9.0 5.2	C A A
5. Driveway #2/O'Hara Avenue	SSSC	AM Midday PM	D D D	*Intersection does not exist in this scenario.*		1.9 (38.3) 3.2 (15.0) 2.8 (18.7)	A (E) A (C) A (C)
7. Laurel Road/Driveway #4	Signal	AM Midday PM	D D D	*Intersection does not exist in this scenario.*		11.6 13.3 16.2	B B B

Notes:
1. SSSC = Side-Street Stop-Controlled; AWSC = All-Way Stop-Controlled; Signal = Signalized

2. Whole intersection average delay was reported for signalized intersections and all-way stop-controlled intersections. Side-street stop-controlled delay presented as Whole Intersection Average Delay (Worst Approach Delay). Delay calculated per HCM 6th Edition methodologies.
3. LOS designation per HCM 6th Edition.

Bold indicates deficient operations below the City's LOS standard.
Source: Fehr & Peers, 2024.

In the Existing Baseline condition, all study intersections operate within the City's overall level of service standard. The addition of project traffic would slightly increase delay at the study intersections.

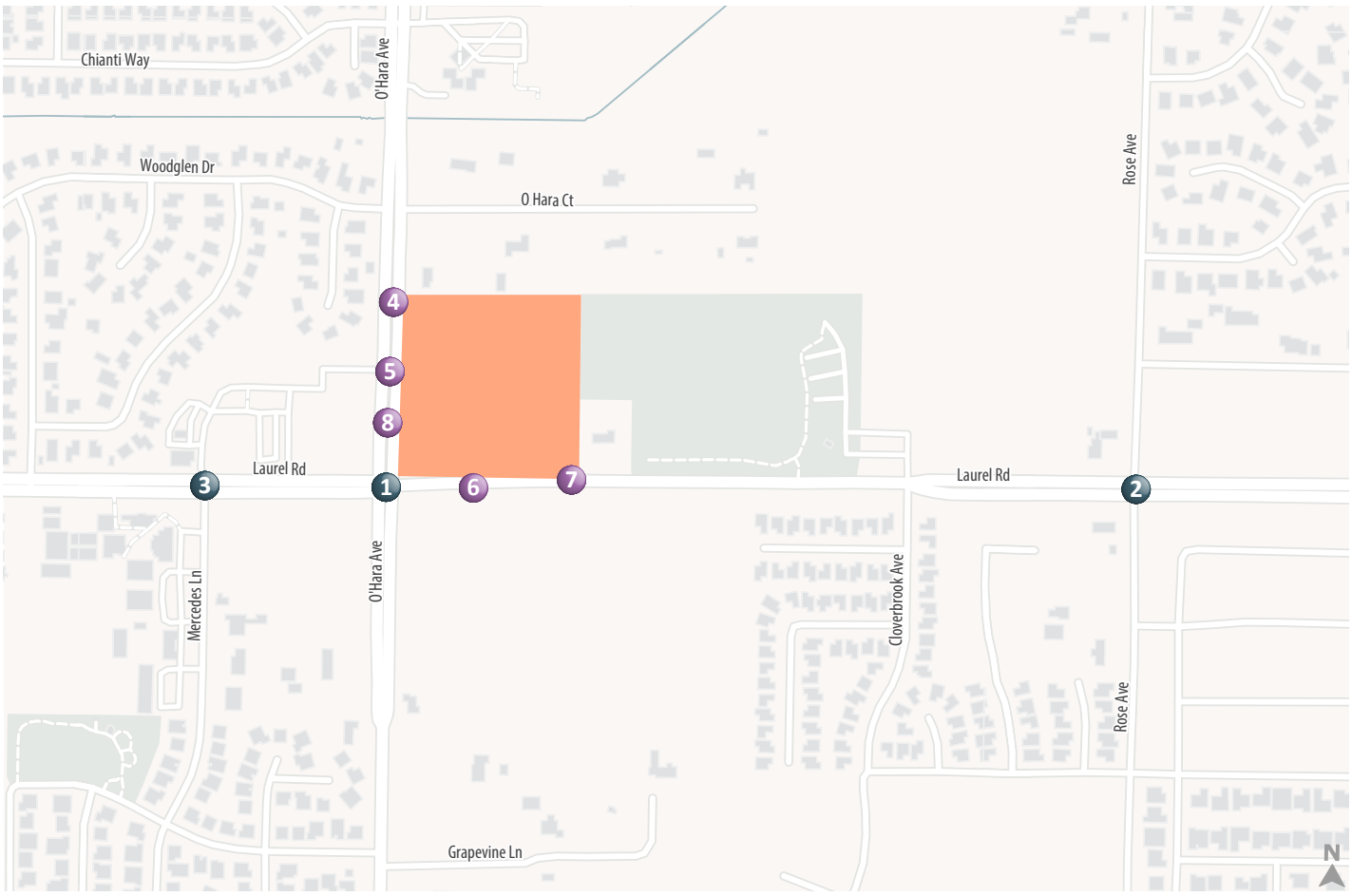
While not presented in Table 7, intersection levels of service and delays were also checked at the two right turn in/right turn out driveways on O'Hara Avenue and the one proposed on Laurel Road (intersections 4, 6 and 8). Operations at these locations were assessed to be LOS A/B with low levels of vehicular delay.

6.2.2 Signal Warrants

To assess the need for signalization of stop-controlled intersections, the *Manual of Uniform Traffic Control* (MUTCD) (Federal Highway Administration 2009) presents nine signal warrants. The Peak Hour Volume Warrant and the Peak Hour Delay Warrant (Warrants 3A and 3B) were used in this study as a supplemental analysis tool to assess operations at the two full movement project driveway intersections, and the calculations are provided in **Appendix C**. The signal warrants analysis results are as follows:

- Driveway #2/O'Hara Avenue (study intersection #5): signal not warranted.
- Laurel Road/Driveway #4 (study intersection #7): meets signal warrants 3A in the midday and PM peak hours and signal warrant 3B in the PM peak hour.

As shown, Existing Plus Project volumes meet peak hour signal warrants in the midday and PM peak hour at the Laurel Road/Driveway #4 (study intersection #7) intersection. The project would install a traffic signal at this location, which is reflected in this study's analyses.



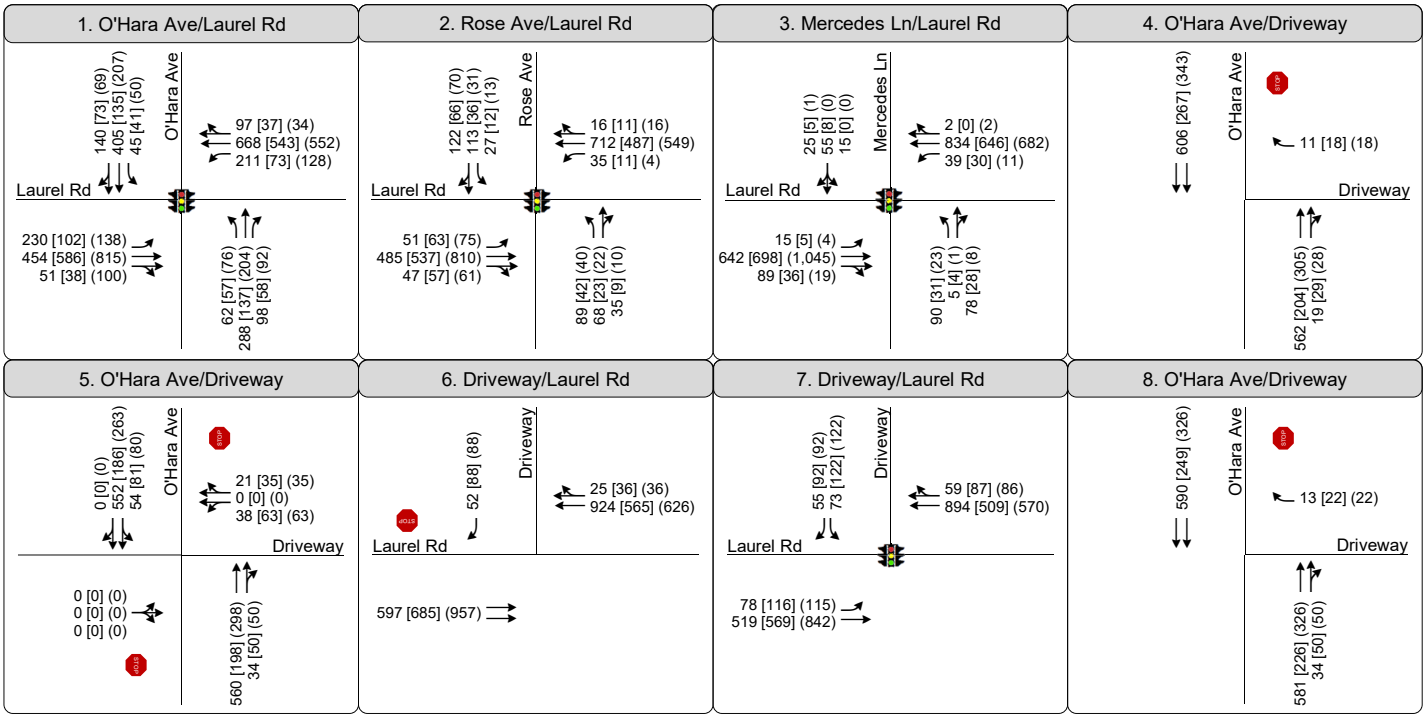


Figure 7

Existing Plus Project Peak Hour Traffic Volumes and Lane Configurations

6.2.3 Vehicle Queues

Table 8 presents AM and PM peak hour 95th percentile queues for movements where vehicle queues may occasionally exceed the vehicle storage length in the Existing Plus Project condition. These queues are indicative of maximum design queues occurring during periods of peak traffic. Queue worksheets are provided in **Appendix D**.

Table 8: Existing Plus Project Conditions 95th Percentile Turn Pocket Queue Summary

Intersection	Movement	Storage Length (ft)[1]	Existing			Existing Plus Project		
			AM Peak Hour	Midday Peak Hour	PM Peak Hour	AM Peak Hour	Midday Peak Hour	PM Peak Hour
1. Laurel Road/O'Hara Avenue	EBL	330	300	100	150	325	150	200
	WBL	300	275	75	150	300	100	175
	NBR	60	**75**	25	50	**100**	50	**75**
	SBL	180	100	50	75	100	75	100
2. Laurel Road/Rose Avenue	EBL	170	75	75	75	75	75	75
	NBL	250	100	50	50	125	50	50
3. Laurel Road/Mercedes Lane	WBL	100	75	50	25	75	75	50
	NBTR	50	50	50	25	50	50	25

Notes:
1. An additional 60 to 90 feet of storage is typically provided in the taper area outside of the through lane, which is not reflected in the storage length above.

Bold indicates queue potentially extends beyond available storage.
Source: Fehr & Peers, 2024.

As shown in **Table 8**, all intersection movements are expected to have acceptable 95th percentile queue lengths under Existing Plus Project conditions, except for the northbound right movement at the Laurel Road/O'Hara Avenue intersection in the AM and PM peak hours.

7. Cumulative Traffic Conditions

This section discusses Cumulative traffic conditions both without and with the project. The future conditions analysis considers forecast development within the City of Oakley and is supplemented by a check of traffic forecasts for the study area in the 2040 Contra Costa Countywide travel demand model. The City of Oakley is planning on improving and widening Laurel Road between O'Hara Avenue and Cloverbrook Avenue to two lanes in each direction, with on-street Class II bike lanes and sidewalks. This project includes improvements to the O'Hara Avenue/Laurel Road intersection and is illustrated in **Figure 8**. The widening project is included in the cumulative conditions assessment.

7.1 Cumulative Traffic Forecasts

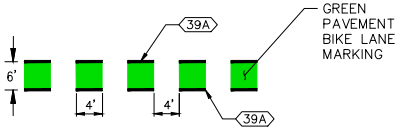
To assess future growth with planned development in the City of Oakley and surrounding communities, several sources of data were reviewed, including the Contra Costa County Travel Demand Model (CCTA Model) and future projections from the City of Oakley Focused General Plan Update (January 2022). Growth rates from these sources, primarily the CCTA travel demand model, were used to develop Cumulative baseline traffic forecasts at the study intersections. The resulting Cumulative without Project forecasts are presented on **Figure 9**, representative of conditions over the next 15 to 20 years. The project volumes from **Figure 6** were added to the Cumulative without Project traffic volumes to represent Cumulative plus Project conditions, as presented on **Figure 10**.

NOTES:

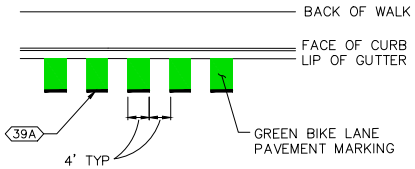
1. REMOVE CONFLICTING (E) STRIPING AND MARKING.
2. ALL PERMANENT STRIPING AND PAVEMENT MARKING SHALL BE THERMOPLASTIC, UNLESS OTHERWISE NOTED.
3. EXACT LOCATION AND POSITION OF ROADSIDE SIGNS TO BE DETERMINED BY ENGINEER.
4. EXACT LOCATION AND POSITION OF PAVEMENT MARKINGS TO BE DETERMINED BY ENGINEER.
5. UNLESS INDICATED OTHERWISE, ALL SIGN TYPES SHOWN ON THIS PLAN ARE PER THE 2014 CALIFORNIA MUTCD.
6. ALL DIMENSIONS SHOWN ARE TO CENTERLINE OF STRIPING.
7. NOSES OF ISLANDS SHALL BE PAINTED WITH REFLECTIVE YELLOW PAINT.
8. NEW STRIPING AND PAVEMENT MARKINGS SHALL BE CAT TRACKED AND APPROVED BY CITY ENGINEER BEFORE PLACING NEW STRIPING OR PAVEMENT MARKINGS.

LEGEND:

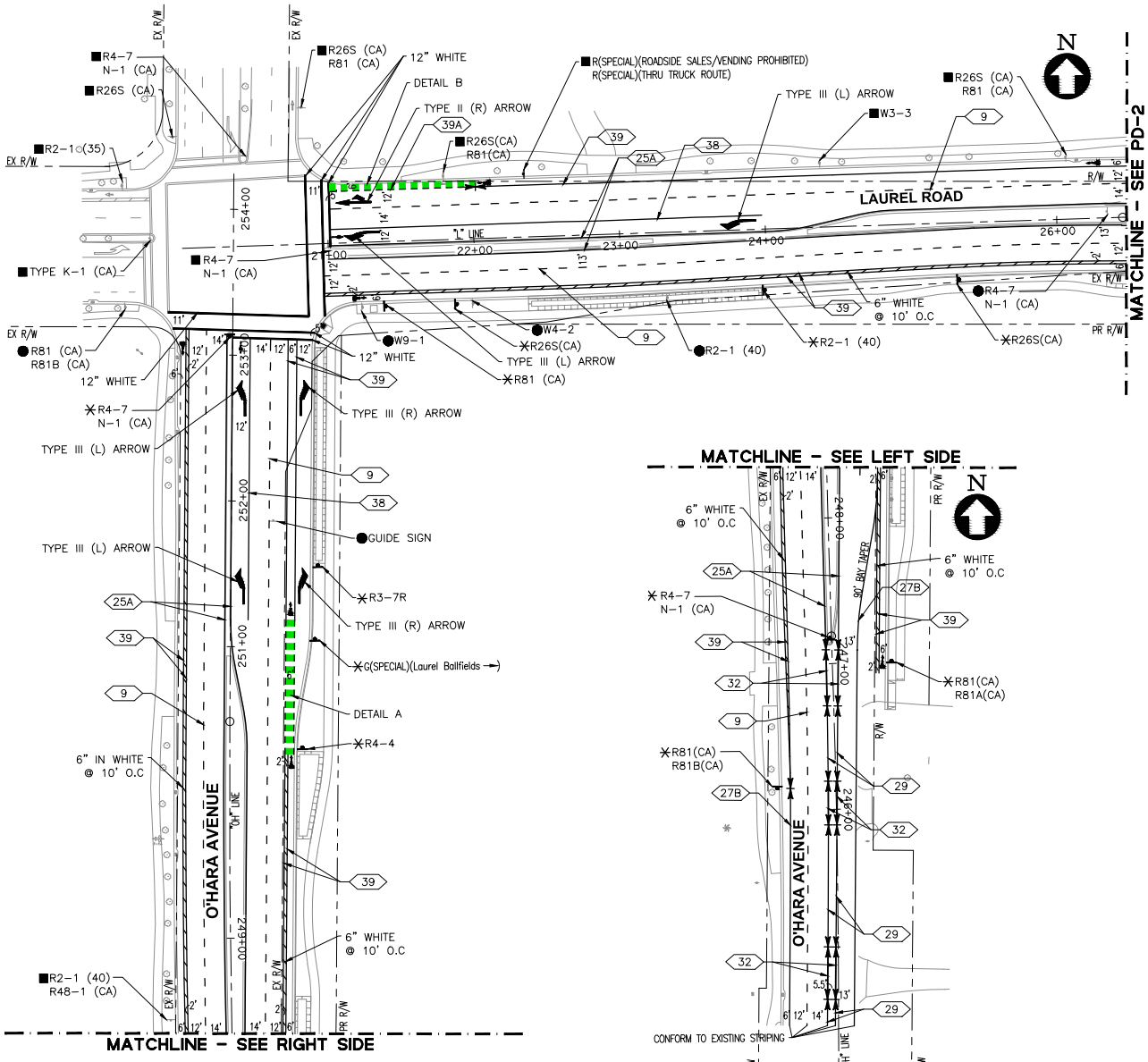
- EXISTING ROADSIDE SIGN
- PROPOSED ROADSIDE SIGN
- INSTALL NEW ROADSIDE SIGN ON EXISTING POLE
- PAVEMENT DELINEATION DETAIL PER 2022 CALTRANS STANDARD PLANS
- CHANGE OF PAVEMENT DELINEATION DETAIL
- INSTALL NEW ROADSIDE SIGN
- PAVEMENT MARKING
- EXISTING ROADSIDE SIGN TO REMAIN
- REMOVE EXISTING ROADSIDE SIGN
- BIKE LANE PAVEMENT MARKING
- BIKE DETECTOR MARKING



DETAIL A
GREEN PAVEMENT BIKE LANE STRIPING (TYP.)
NTS



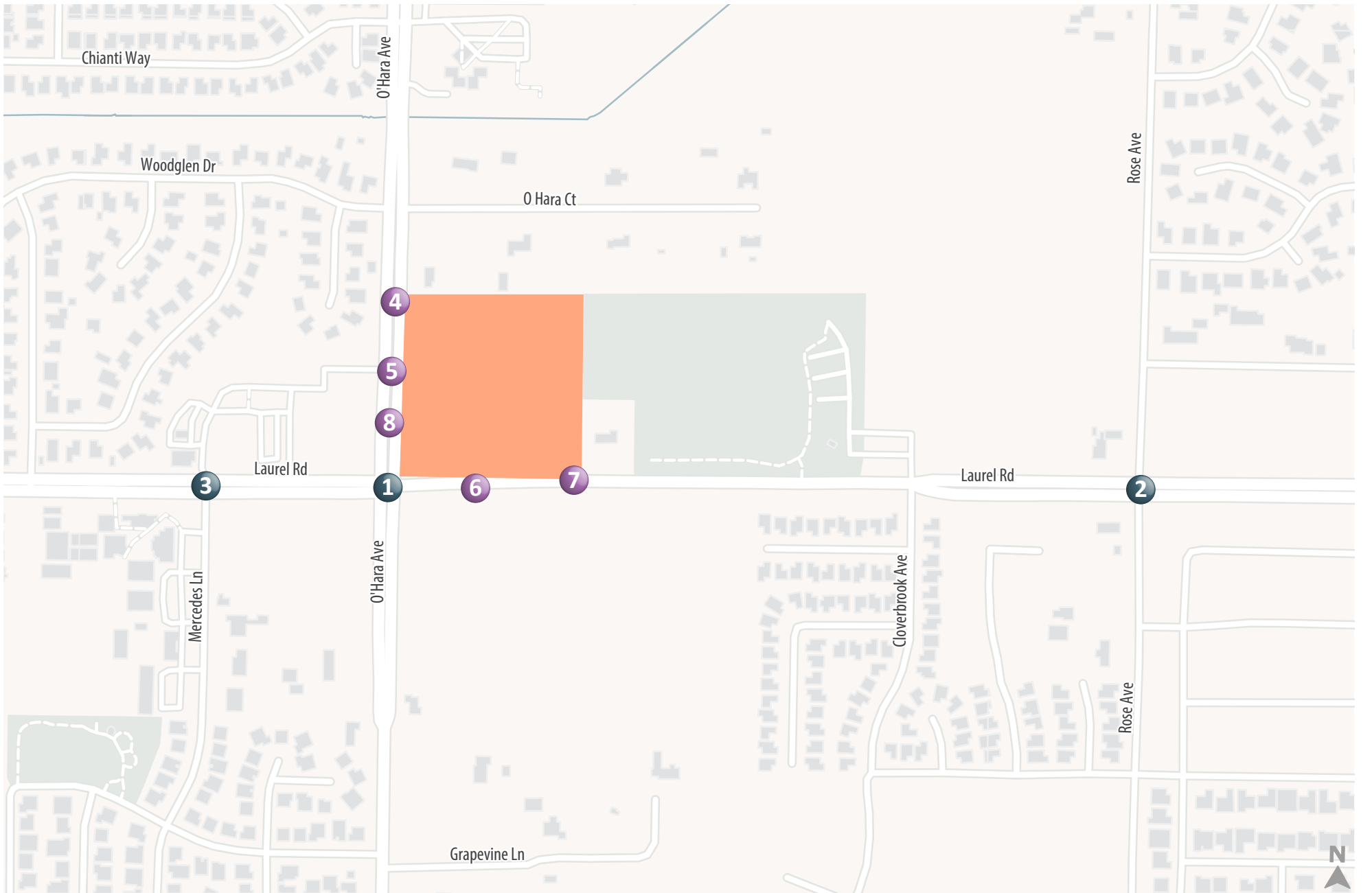
DETAIL B
NTS

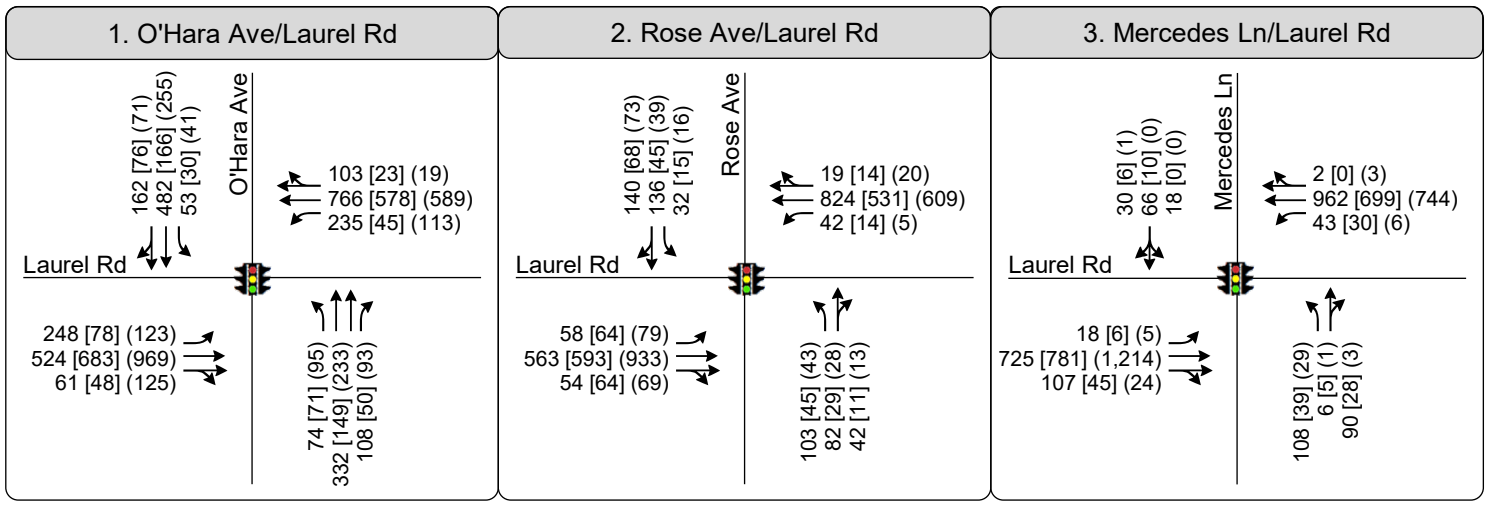


Site Plan Source: BKF Engineers, 5/10/2023

Figure 8

Laurel Road Widening Project





XX [YY] (ZZ) AM [Midday] (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

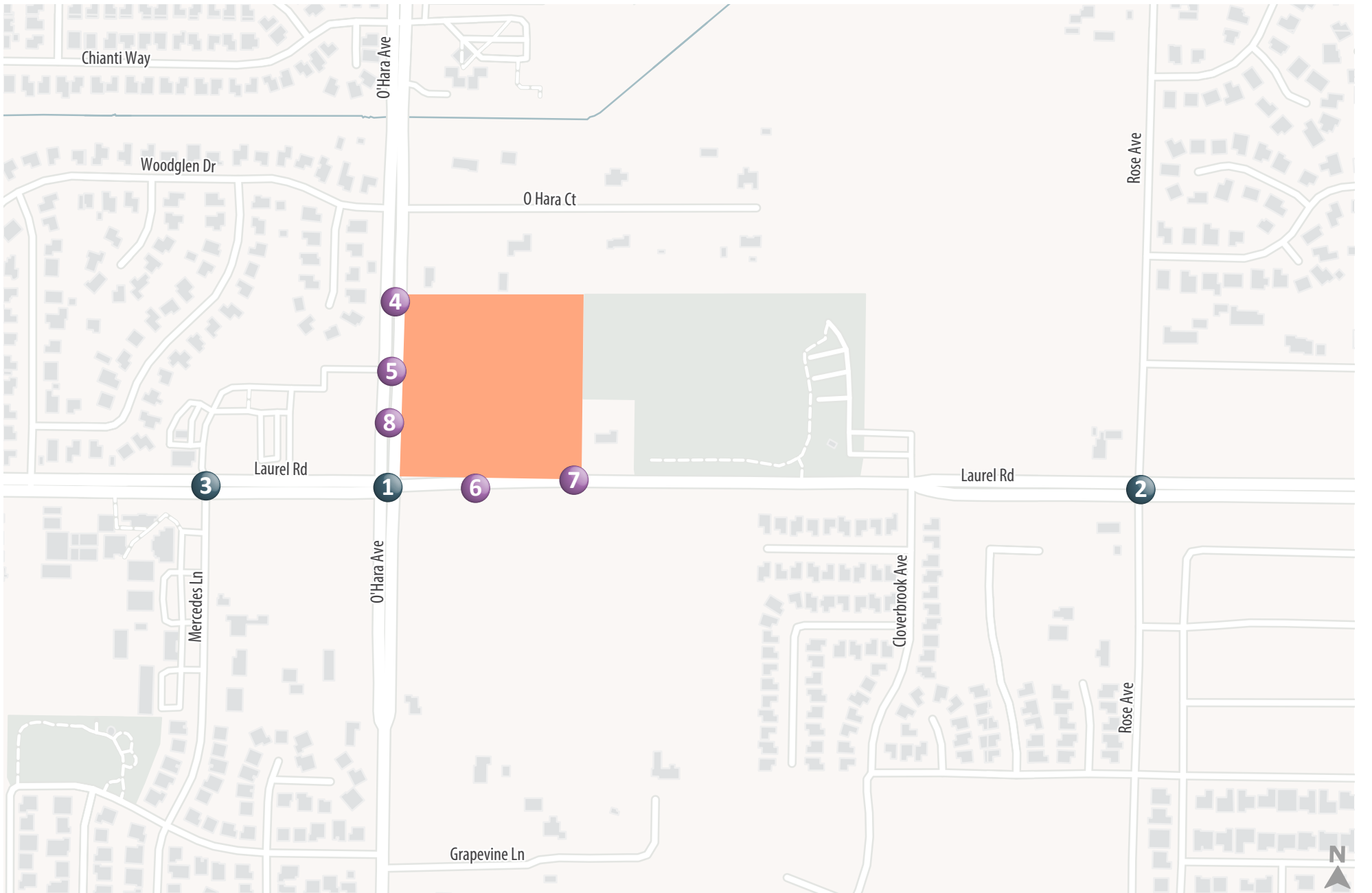
Project Site

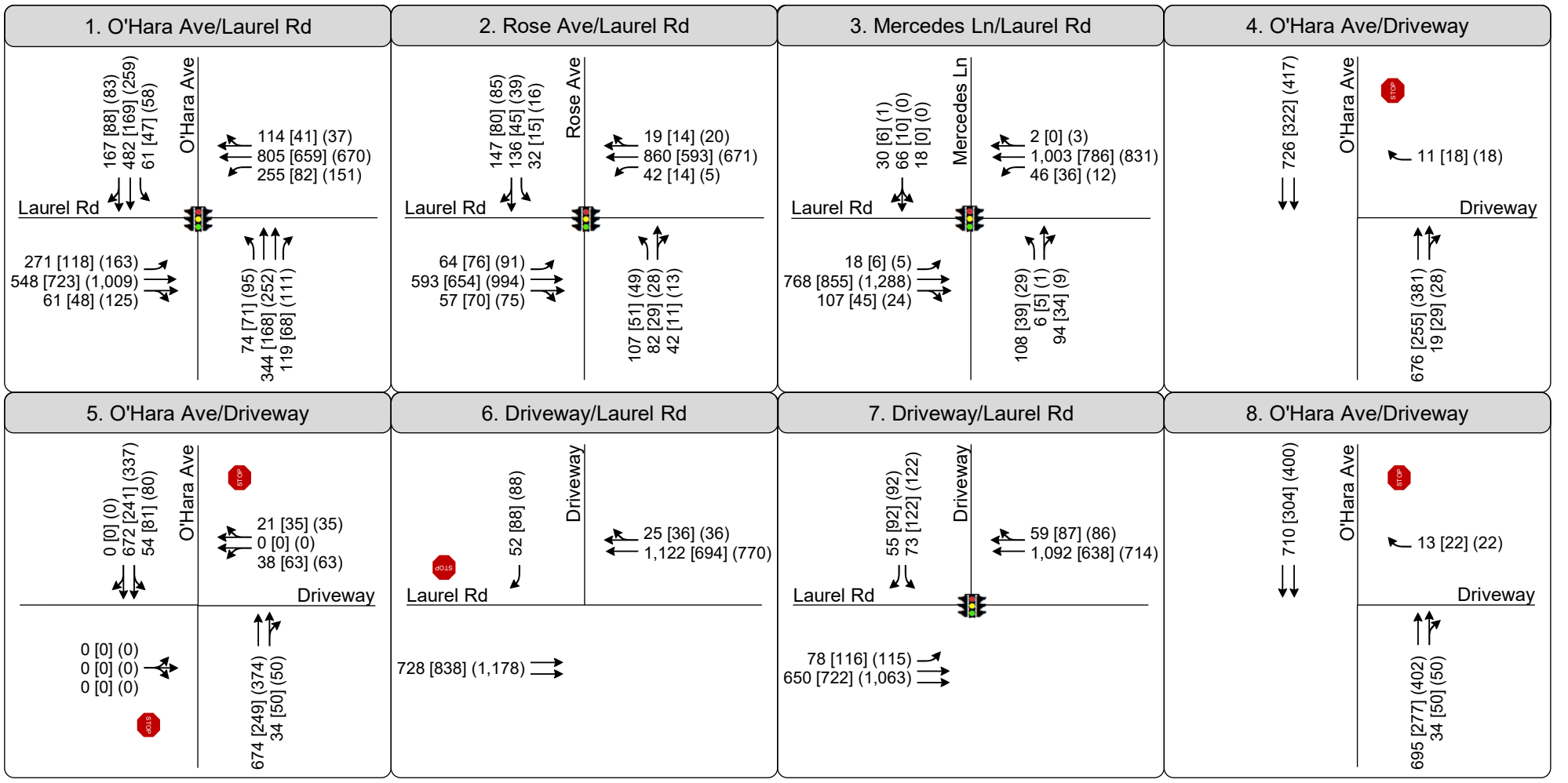
Study Intersection

Project Driveway

Figure 9

Cumulative Peak Hour Traffic Volumes and Lane Configurations





XX [YY] (ZZ) AM [Midday] (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Project Driveway

Figure 10

Cumulative Plus Project Peak Hour Traffic Volumes and Lane Configurations

7.2 Cumulative and Cumulative Plus Project Operations Assessment

7.2.1 Intersection Level of Service

Cumulative without and with Project conditions were evaluated using the methods described in Section 2. For the analysis of Cumulative conditions, peak hour factors, pedestrian, bicycle, and heavy vehicle volumes were left unchanged from the analysis of existing conditions; however, signal timings were optimized to accommodate long term changes in traffic volumes as the City of Oakley regularly reviews traffic signal timings and adjusts to better accommodate travel patterns. The analysis results are presented in **Table 9**, based on the traffic volumes presented on **Figure 9** and **Figure 10**.

Table 9: Cumulative and Cumulative Plus Project Conditions LOS Results Summary

Intersection	Control[1]	Time Period	LOS Standard	Cumulative		Cumulative Plus Project	
				Delay[2]	LOS[3]	Delay[2]	LOS[3]
1. Laurel Road/O'Hara Avenue	Signal	AM Midday PM	D D D	40.6 19.0 25.7	D B C	46.2 20.8 29.2	D C C
2. Laurel Road/Rose Avenue	Signal	AM Midday PM	D D D	30.0 15.1 15.5	C B B	32.0 15.7 16.3	C B B
3. Laurel Road/Mercedes Lane	Signal	AM Midday PM	D D D	31.8 9.3 5.2	C A A	33.5 9.5 5.4	C A A
5. Driveway #2/O'Hara Avenue	SSSC	AM Midday PM	D D D	*Intersection does not exist in this scenario.*		2.3 (60.9) 2.9 (16.8) 2.8 (22.9)	A (F) A (C) A (C)
7. Laurel Road/Driveway #4	Signal	AM Midday PM	D D D	*Intersection does not exist in this scenario.*		11.3 9.9 10.2	B A B

Notes:
1. SSSC = Side-Street Stop-Controlled; AWSC = All-Way Stop-Controlled; Signal = Signalized
2. Whole intersection average delay was reported for signalized intersections and all-way stop-controlled intersections. Side-street stop-controlled delay presented as Whole Intersection Average Delay (Worst Approach Delay). Delay calculated per HCM 6th Edition methodologies.
3. LOS designation per HCM 6th Edition.

Bold text indicates potentially unacceptable intersection operations. ***Bold Italics*** indicates potential significant impact.
Source: Fehr & Peers, 2024.

In the Cumulative Baseline condition, no intersections are projected to operate at deficient service levels. The addition of project traffic would slightly increase delay at the study intersections. While the left turn out of the unsignalized full movement driveway on O'Hara Avenue would operate with high levels of vehicular delay during the AM peak hour, a signal is not warranted at this location.

While not presented in Table 9, intersection levels of service and delays were also checked at the two right turn in/right turn out driveways on O'Hara Avenue and the one proposed on Laurel Road (intersections 4, 6 and 8). Operations at these locations were assessed to be LOS A/B with low levels of vehicular delay.

7.2.2 Signal Warrants

The peak hour signal warrants (Warrant 3A and Warrant 3B) from the *Manual on Uniform Traffic Control Devices* (MUTCD) were used to determine if a traffic signal is warranted at the two full movement project driveway intersections (calculations provided in **Appendix C**). The signal warrants analysis results are as follows:

- Driveway #2/O'Hara Avenue (study intersection #5): signal not warranted.
- Laurel Road/Driveway #4 (study intersection #7): meets signal warrants 3A and 3B in the midday and PM peak hours.

As shown, Cumulative Plus Project volumes meet peak hour signal warrants in the midday and PM peak hour for the Laurel Road/Driveway #4 intersection (study intersection #7). The project would install a traffic signal at this location, which is reflected in this study's analyses.

7.2.3 Vehicle Queues

Table 10 presents AM and PM peak hour 95th percentile queues for movements where vehicle queues may occasionally exceed the vehicle storage length in the Cumulative No Project and Cumulative Plus Project condition. These queues are indicative of maximum design queues occurring during periods of peak traffic. Queue worksheets are provided in **Appendix D**.

Table 10: Cumulative and Cumulative Plus Project Conditions 95th Percentile Turn Pocket Queue Summary

Intersection	Movement	Storage Length (ft)[1]	Cumulative			Cumulative Plus Project		
			AM Peak Hour	Midday Peak Hour	PM Peak Hour	AM Peak Hour	Midday Peak Hour	PM Peak Hour
1. Laurel Road/O'Hara Avenue	EBL	330	**400**	125	175	**450**	175	225
	WBL	300	**350**	75	175	**400**	125	225
	NBR	60	50	25	50	50	50	50
	SBL	180	125	75	75	125	100	100
2. Laurel Road/Rose Avenue	EBL	170	100	75	75	100	75	100
	NBL	250	125	75	50	125	75	75
3. Laurel Road/Mercedes Lane	WBL	100	75	75	25	100	75	50
	NBTR	50	50	50	25	50	50	25

Notes:
1. An additional 60 to 90 feet of storage is typically provided in the taper area outside of the through lane, which is not reflected in the storage length above.

Bold indicates queue potentially extends beyond available storage.
Source: Fehr & Peers, 2024.

As shown in **Table 10**, most intersection movements are expected to have acceptable 95th percentile queue lengths under the Cumulative and Cumulative Plus Project conditions. Exceptions include the eastbound left and westbound left turn movements at the Laurel Road/O'Hara Avenue intersection in the AM peak hour.

8. Environmental Assessment

This chapter presents the results of the assessment of the project's potential impacts regarding transportation related environmental topics, including vehicle miles traveled, pedestrian facilities, bicycle facilities, transit facilities, emergency vehicle access and hazards.

8.1 Pedestrian System Impacts

The project would create a significant impact related to the pedestrian system if any of the following criteria are met:

- The project design would not provide or would eliminate adequate pedestrian connectivity to the area circulation system, or
- The project design would create hazardous conditions for pedestrians, or
- The project conflicts with existing or planned pedestrian facilities.

As illustrated in Figure 2, the project would construct a sidewalk along its O'Hara Avenue frontage, which would link the Laurel Road sidewalks with the existing sidewalk on the east side of O'Hara Avenue just north of the site. The existing sidewalk along the project's Laurel Road frontage would be retained. A network of sidewalks and crosswalks would be constructed internally to the site connecting the internal land uses and the external pedestrian network.

> **Improvement Recommendation #1** – The City of Oakley's Ordinance No. 3-23 *(An Ordinance of the City Council of the City of Oakley Adopting the Zoning Text Amendments to Article 12 of Chapter 1 of Title 9 of the Oakley Municipal Code ["Special Land Uses"] – Adding three Subsections to Address Drive-Through Restaurants, Carwashes and Gas Stations [RZ04-21]), Section 9.1.1.1236 Drive Through Restaurants Subsection c. Performance Standards* states the following:
>
> > *7) The entire drive through shall be screened from adjacent street and residential views to a height of at least three feet. Screening devices shall be a combination of berming, hedge and landscape materials and solid walls as approved by the Community Development Director.*
> >
> > *12) Site plans shall be designed so access to the building from adjacent parcels and public rights of way is accomplished without direct interference with a drive through or queuing lane. In the event such a design is not achievable, the crossing shall be located a reasonable distance away from any building corners and enhanced with a raised crossing, signage and an automatic or pedestrian operated warning light to vehicles.*

> *13) Site plans shall be designed so that all pedestrian walkways adjacent to a drive-through lane shall contain a pedestrian barrier to prevent pedestrians from cutting though the drive-through lane. The barrier shall direct the pedestrian to safe areas to exit the walkway.*

To be compliant with this ordinance, the project should implement the following:

> For the drive through lanes serving Pad 1 and Pad 4 (see Figure 2), which abut the sidewalks along O'Hara Avenue and Laurel Road respectively, some combination of screening devices and/or fencing, which could be a combination of berming, hedge and landscape materials and solid walls, should be installed between the drive through lanes and adjacent sidewalks.
>
> The site plan shows crosswalks crossing the drive through lanes downstream of the pickup windows at all three proposed drive throughs (Pad 1, Pad 4 and between the Shops and Safeway store. All three crosswalks should be enhanced with a raised crossing, signage and an automatic or pedestrian operated warning light for vehicles. These locations are identified in **Figure 11**.

With the implementation of the improvement measure above, the proposed project would be expected to have a **less than significant impact** related to pedestrian facilities.

8.2 Bicycle System Impacts

The project would create a significant impact related to the bicycle system if any of the following criteria are met:

- The project design would not provide or would eliminate adequate bicycle connectivity to the area circulation system; or
- The project design would create hazardous conditions for bicyclists; or
- The project conflicts with existing or planned bicycle facilities.

As shown in Figure 3, there are several designated bicycle facilities in the study area in the form of Class I and Class II bike lanes. Bicycles are not prohibited from utilizing any of the roadways in the vicinity of the site.

The project proposes on-site bicycle parking in accordance with the 2022 California Green Building Code, as follows:

- Short Term Bike Parking (racks) - Five percent of the number of vehicle parking spaces provided – rack with a capacity of 19 bicycles (five percent of 365).
- Long Term Bike Parking (lockers) – Five percent of the tenant employees working onsite – 3 bike lockers (five percent of 60 employees).

The project does not eliminate bicycle connectivity, create hazardous conditions for bicyclists or conflict with any existing or planned bicycle facilities. The proposed project is expected to have a **less than significant impact** related to bicycle facilities.

8.3 Transit System Impacts

The project would create a significant impact related to transit service if either of the following criteria are met:

- The project generates a substantial increase in transit riders that cannot be adequately served by existing transit services; or,
- The project conflicts with existing or planned transit facilities.

As described in Section 3.1.3, the project site is served by a local Tri Delta Transit bus route. This bus line provides connections to the Bay Area's regional transit system via a link to the Antioch BART Station. Bus stops for Route 383 are located east of the site near the intersection of Laurel Road and Rose Avenue. This stop is accessible to pedestrians by the sidewalk on the north side of Laurel Road.

The project proposes no features which conflict with existing or planned transit services. The project is not expected to result in increases in ridership on local or regional transit facilities that would exceed their capacity. The proposed project is expected to have a **less than significant impact** related to transit.

8.4 Vehicle Miles Traveled

Section 5 of this report details the VMT calculations for the proposed project. To conduct the VMT assessment, the CCTA travel demand model was used to estimate the project's effect on total average daily vehicle miles of travel. The project was coded into the model and baseline total VMT was estimated both with and without the project. The boundary method for assessing total VMT was then used to calculate vehicle miles traveled with and without the proposed project, using the City of Oakley as the study area. As would be expected, of a local serving retail use, the project was found to result in a small decrease in total VMT. Local-serving retail development tends to shorten trips and reduce VMT. Per the prevailing standards of significance outlined, the project is expected to have a **less than significant impact** related to VMT.

8.5 Emergency Vehicle Access Impacts

The project would create a significant impact related to emergency vehicle access if the following criterion is met:

- The project incorporates design features that limit or result in inadequate emergency vehicle access.

Several factors determine whether a project has sufficient access for emergency vehicles, including the following:

1. Number of access points (both public and emergency access only)
2. Width of access points
3. Width of internal roadways

Each of these factors is discussed in further detail below.

Emergency vehicle access to the project site is provided via three vehicle access points on O'Hara Avenue and two on Laurel Road. Project driveways are of sufficient width to accommodate emergency vehicles. The project design does not pose any features that would limit emergency vehicle access to the site and significant adverse project impacts related to emergency vehicle access were not identified.

8.6 Hazards

Along the project's frontages the posted speed limit on O'Hara Avenue is 35 miles per hour and the posted speed limit on Laurel Road is 40 miles per hour. Observed speeds on both roadways generally range from 35 to 45 miles per hour. Table 201.1 of the Caltrans Highway Design Manual (HDM) states that the stopping sight distance standard for a design speed of 45 miles per hour is 360 feet. Field observations of existing sight distance at the proposed driveways on O'Hara Avenue and Laurel Road indicate sight distances greater than 360 feet. Thus, adequate sight distance appears to be provided at the proposed driveway locations. However, as the project's design is finalized, these distances should be checked, and the project should propose no features (signs, landscaping, etc.) that would compromise driveway sight distance.

> **Improvement Recommendation #2:** The final site plan for the project should be analyzed by the project's Civil Engineer to ensure that adequate sight distance is maintained at all driveways. No objects (landscaping, monument signs, etc.) greater than three feet in height should be allowed within the sight distance triangles at driveway intersections. Review available speed survey information from the City and adjust required sight distance if necessary.

9. Site Plan Review

This section provides a review of site access and internal circulation for vehicles, pedestrians, bicycles, emergency vehicles, and parking based on the site plan presented on Figure 2.

9.1 Site Access and Circulation

Vehicular access to the site would be provided by three driveways on O'Hara Avenue and two driveways on Laurel Road. The eastern driveway on Laurel Road would be a full movement access point controlled by a new project-installed traffic signal. The middle driveway on O'Hara Avenue would be a full movement intersection with stop control on the project driveway approach. The other three project driveways would be right-in/right-out only, with left turns being prohibited by the presence of a median.

A total of 365 off-street 90-degree vehicular parking spaces would be provided on site within an at-grade parking lot. Most vehicular parking would be in the middle of the site, south of the proposed Safeway store. This area would provide 281 90-degree angled parking spaces that allow access to the many different uses in the site. A two-way road would be provided around the perimeter of this parking section, as well as six internal rows for vehicles to access parking. The site's remaining 84 parking spaces are 90-degree angled spaces dispersed along the site's borders or adjacent to buildings. There would also be a road provided behind the Safeway along the northern and eastern borders of the site that would provide access for heavy trucks to the grocery store's loading docks and directly connects to the northern driveway on O'Hara Avenue.

9.2 Parking

9.2.1 Municipal Code Requirements

Table 11 summarizes the project's parking requirements based on the City of Oakley's Municipal Code (Section 9.1.1402 Off Street Parking). For retail stores and shops, the City of Oakley's Municipal Code requires 1 space for each 250 square-feet of gross floor area (GFA). For eating and drinking establishments, the city requires 1 space for each 150 square-feet of net public area (NPA). For gasoline service stations with mini-markets, the city requires 1 space per 400 square-feet of GFA with a minimum of 5 spaces. The site would require 345 off-street parking spaces to satisfy City Code requirements. The project's proposed supply of 365 off-street parking spaces would satisfy code requirements.

Table 11: Oakley Municipal Code Parking Requirements (Project Buildout)

Land Use	Size	Code	Required Parking
Retail Stores and Shops	*67,495 sq ft*	*1 space per 250 sq ft GFA*	*270*
Eating and Drinking Establishments	*9,726 sq ft*[1]	*1 space per 150 sq ft NPA*	*65*
Gasoline Service Station with Mini-Market	*3,803 sq ft*	*1 space per 400 sq ft GFA*	*10*
TOTAL CODE PARKING REQUIREMENT			**345**

[1] Food use patio = 2,120 s.f. plus 70% Food use public area 7,606 s.f.
Source: Oakley Municipal Code Section 9.1.1402 – Off Street Parking; Fehr & Peers, 2024

9.2.2 Parking Demand

In addition to the City's Municipal Code requirements regarding parking, the project's anticipated demand for off-street parking was calculated. The Institute of Transportation Engineer's *Parking Generation Manual, 5th Edition* provides a collection of parking demand data observations made throughout the United States by land use type. Based on ITE data, the average parking generation rate on a weekday for a supermarket is 2.93 spaces per 1,000 square-feet GFA, a shopping center is 1.95 spaces per 1,000 square-feet GFA, and a fast-food restaurant with a drive-through window is 8.66 spaces per 1,000 square-feet GFA. **Table 12** presents a summary of the forecast parking demand of the proposed uses based on ITE data. The site would require 241 off-street parking spaces to satisfy ITE's anticipated parking demand. The project's proposed supply of 365 off-street parking spaces would satisfy the anticipated parking demand.

Table 12: ITE Project Off-Street Parking Demand

Land Use	Size	Parking Demand/Student	Parking Demand
Supermarket	55,500 sq ft	2.93	163
Shopping Center[1]	18,280 sq ft	1.95	36
Fast-Food Restaurant with a Drive-Through Window	4,865 sq ft	8.66	42
TOTAL PARKING DEMAND			**241**

[1] ITE's Shopping Center land use statistics reflect a range of potential retail establishments including restaurants, banks, dry cleaners, coffee shops, miscellaneous retail uses and others.
Source: ITE *Parking Generation Manual*, 5th Edition, 2018; Fehr & Peers, 2024

9.3 Truck and Loading Access

Heavy trucks are expected to frequently service the proposed Safeway store to make deliveries. Trucks would be required to enter the store via a northbound right turn movement into the project's northern driveway on O'Hara Road. Trucks would use the internal roadway along the site's northern boundary before making a back in maneuver into the loading docks proposed on the eastern side of the Safeway store. Trucks would then exit the facility via the signalized full movement driveway on Laurel Road. Truck

turning templates were reviewed for each truck turning maneuver and found to be acceptable. Figure 2 illustrates the results of this assessment.

9.4 On-Site Queueing Assessment

On-site vehicular queuing at the two proposed drive through restaurants and the gas station was assessed. This analysis was conducted to ensure the site's functionality and compliance with the previously mentioned City of Oakley's Ordinance No. 3-23 (*An Ordinance of the City Council of the City of Oakley Adopting the Zoning Text Amendments to Article 12 of Chapter 1 of Title 9 of the Oakley Municipal Code ["Special Land Uses"] – Adding three Subsections to Address Drive-Through Restaurants, Carwashes and Gas Stations [RZ04-21]),* Section 9.1.1.1236 Drive Through Restaurants Subsection c. Performance Standards. Related to on-site queuing this ordinance states the following:

> *4) An application for a proposed drive-through restaurant shall include a traffic analysis that specifically analyzes onsite and nearby pedestrian/bicycle safety and drive-through lane queuing for the purposes of providing recommendations to avoid conflicts between various modes of transportation. The traffic analysis shall also analyze drive-through vehicle queueing and make recommendations to the site planning design that results in avoiding or minimizing negative impacts to the surrounding area on- and off-site, including but not limited to:*
>
> > *i. Blocking access to parking spaces;*
> >
> > *ii. Creating conflicts to internal circulation; or*
> >
> > *iii. Spill back into adjacent main drive aisles or rights of way causing interference to vehicular, bicycle or pedestrian flow or reduction in road capacity.*
>
> *6) No portion of the drive-through lane or its required queueing as determined in the traffic analysis shall obstruct any drive aisles or off-street parking. The drive-through shall not take ingress or egress from a local residential road.*

9.4.1 Restaurant Drive Through Queuing

Based on the expected trip generation and arrival rates average and 95th percentile queues were calculated for the two proposed restaurants with drive throughs. Queueing calculations were performed for two potential users on pad 4 – a fast food restaurant with drive through and a coffee shop with drive through. This pad has been designed with a larger queuing area that could accommodate higher flows. **Table 13** presents the results for the 2,400 square foot facility proposed on Pad 1 while **Table 14** presents the results for the 2,465 square foot facility on Pad 4.

As presented in Tables 13 and 14, both facilities have sufficient planned storage to accommodate the anticipated queue lengths. The highest calculated queue lengths were identified in the morning peak hour for the coffee shop use.

Table 13: Drive Through Queuing Assessment – 2,400 s.f. Facility (Pad 1)

	Time of Day	Average Queue	95th Percentile Queue	Available Storage
Fast Food Restaurant	AM Peak Hour	4.2 vehicles	8.4 vehicles	10 vehicles
	PM Peak Hour	3.7 vehicles	7.7 vehicles	10 vehicles

Source: Fehr & Peers, 2024

Table 14: Drive Through Queuing Assessment – 2,465 s.f. Facility (Pad 4)

	Time of Day	Average Queue	95th Percentile Queue	Available Storage
Fast Food Restaurant	AM Peak Hour	4.5 vehicles	8.8 vehicles	16 vehicles
	PM Peak Hour	4.2 vehicles	8.4 vehicles	16 vehicles
Coffee Shop with Drive Through	AM Peak Hour	8.7 vehicles	14.4 vehicles	16 vehicles
	PM Peak Hour	1.6 vehicles	4.5 vehicles	16 vehicles

Source: Fehr & Peers, 2024

9.4.2 Fueling Station Queuing Review

The project proposes a fueling station in its southwest corner with 16 gas pumps. As proposed, the fueling station would provide space for 16 vehicles to queue in addition to the 16 fueling locations, as illustrated in Figure 2. This amount of fueling space and queueing is adequate to serve the forecast rates of arrival and departure predicted in Table 5 (project trip generation). Given the unique nature of the gas station's configuration and the potential for a Safeway fueling center to operate in a different manner than a typical center, additional data collection, observation, and analysis was conducted.

An operating Safeway fueling center identical to the one proposed at the site currently exists at 19555 Mountain House Parkway in Mountain House, California. That existing facility includes 16 gas pumps with space for 16 vehicles to queue abutting an internal drive aisle accessed via a right turn in/right turn out driveway on a four-lane arterial roadway. Safeway management provided summaries of hourly transaction data at the center from May 21, 2023, to June 15, 2023, which is summarized in **Table 15**. That data shows consistent use throughout the day with peak activity between 2 and 7 PM.

Observations of queue lengths at the fueling center at 19555 Mountain House Parkway were conducted on Tuesday September 26, 2023. **Table 16** presents the maximum observed queues present at the center from 8 AM to 8 PM on that day. The values in Table 16 represent the total number of cars in queue waiting for a pump to open for them to use. As previously in the table, the maximum observed queue was four vehicles (queueing capacity equal to 16), which did not spill into the abutting drive aisle.

Table 15: Mountain House Safeway Fueling Station Activity (Transactions/Hour)

Date	5:00 - 5:59 AM	6:00 - 6:59 AM	7:00 - 7:59 AM	8:00 - 8:59 AM	9:00 - 9:59 AM	10:00 - 10:59 AM	11:00- 11:59 AM	12:00- 12:59 PM	1:00 - 1:59 PM	2:00 - 2:59 PM	3:00 - 3:59 PM	4:00 - 4:59 PM	5:00 - 5:59 PM	6:00 - 6:59 PM	7:00 - 7:59 PM	8:00 - 8:59 PM	9:00 - 9:59 PM	10:00- 10:59 PM
21-May	7	20	33	50	53	95	101	91	110	99	85	92	91	79	87	133	88	19
22-May	22	64	51	98	68	56	63	70	84	84	89	105	98	89	79	71	45	13
23-May	32	54	75	81	66	49	64	58	71	75	90	102	81	94	74	81	37	9
24-May	39	63	55	91	70	58	61	65	82	90	107	101	74	104	71	65	43	12
25-May	27	52	61	94	73	61	57	71	73	87	97	101	117	99	71	67	39	12
26-May	36	61	72	95	104	93	77	98	123	102	116	106	92	95	65	86	53	23
27-May	16	30	57	74	67	92	89	116	97	88	92	69	74	72	66	58	52	15
28-May	8	20	26	64	55	83	99	93	89	82	84	62	53	61	54	9	3	12
29-May	9	22	29	49	74	96	113	105	116	102	93	99	102	89	72	82	25	16
30-May	32	52	56	50	64	68	65	74	75	89	75	110	91	89	85	52	33	18
31-May	34	46	56	46	69	60	72	70	78	93	101	96	98	86	84	54	33	12
1-Jun	33	58	54	53	62	81	78	85	83	80	84	82	100	96	72	74	37	13
2-Jun	27	59	58	75	73	79	88	82	87	95	103	113	86	87	94	60	54	21
3-Jun	15	27	40	65	88	99	97	104	95	81	94	72	61	65	59	65	38	2
4-Jun	9	22	29	46	50	87	86	95	89	92	93	78	70	68	95	61	46	23
5-Jun	28	55	59	56	54	68	70	61	58	91	72	85	87	84	85	49	34	11
6-Jun	31	40	57	67	66	47	68	68	61	77	83	99	92	98	67	58	33	10
7-Jun	29	56	66	65	66	74	59	70	90	56	82	96	103	91	98	68	34	11
8-Jun	30	40	75	73	61	53	55	86	54	88	86	81	93	74	77	70	41	21
9-Jun	27	53	47	60	55	96	80	75	92	72	107	86	97	96	95	68	47	23
10-Jun	16	28	42	60	98	90	92	96	80	88	78	81	90	84	54	66	38	14
11-Jun	0	25	28	34	79	69	99	100	80	87	86	72	82	83	73	56	56	15
12-Jun	32	67	50	65	58	55	67	63	79	83	96	76	94	93	84	55	44	20
13-Jun	29	56	59	67	72	64	67	78	66	81	86	93	100	100	79	54	43	17
14-Jun	28	45	57	56	67	63	82	68	76	93	93	98	84	90	65	86	55	8
15-Jun	31	55	65	70	91	75	79	82	78	74	109	97	101	89	84	69	37	22
Average	**22**	**42**	**48**	**61**	**64**	**68**	**72**	**76**	**77**	**80**	**85**	**84**	**83**	**81**	**71**	**61**	**39**	**14**

Source: Fehr & Peers, 2024.

Table 16: Mountain House Safeway Fueling Station Observed Queues (9/26/23)

Time of Day	Maximum Observed Queue	Time of Day	Maximum Observed Queue
8:00 AM	2	2:00 PM	0
8:15 AM	2	2:15 PM	0
8:30 AM	3	2:30 PM	1
8:45 AM	1	2:45 PM	1
9:00 AM	0	3:00 PM	1
9:15 AM	1	3:15 PM	2
9:30 AM	0	3:30 PM	1
9:45 AM	0	3:45 PM	4
10:00 AM	0	4:00 PM	1
10:15 AM	1	4:15 PM	2
10:30 AM	0	4:30 PM	2
10:45 AM	0	4:45 PM	2
11:00 AM	1	5:00 PM	1
11:15 AM	0	5:15 PM	2
11:30 AM	0	5:30 PM	1
11:45 AM	0	5:45 PM	0
12:00 PM	0	6:00 PM	1
12:15 PM	0	6:15 PM	1
12:30 PM	1	6:30 PM	1
12:45 PM	1	6:45 PM	2
1:00 PM	0	7:00 PM	2
1:15 PM	0	7:15 PM	0
1:30 PM	0	7:30 PM	1
1:45 PM	0	7:45 PM	2

Source: Fehr & Peers, 2024

A similar, but not identical Safeway fueling station exists at 7497 Dublin Boulevard in Dublin, California. That station provides 8 pumps with 8 spaces for vehicle queueing adjacent to an internal roadway accessed via a right turn in/right turn out driveway. Weekday peak hour observations of queues at that location did not find queue spillback onto the adjacent internal roads or onto Dublin Boulevard.

Based on the anticipated trip generation rates and fuel station processing times, excessive queuing is not anticipated at the proposed Safeway fueling center. This finding is consistent with queuing measurements at two similar existing Safeway facilities at 19555 Mountain House Parkway and 7497

Dublin Boulevard. However, the following improvement measure is recommended to ensure that the internal driving aisle is not blocked, and queues do not extend onto O'Hara Avenue.

> **Improvement Recommendation #3:** As shown on **Figure 11**, install diagonal hatched white striping and "KEEP CLEAR" markings in the portion of the internal drive aisle abutting the fuel station queuing area.

9.4.3 Pharmacy Queuing Review

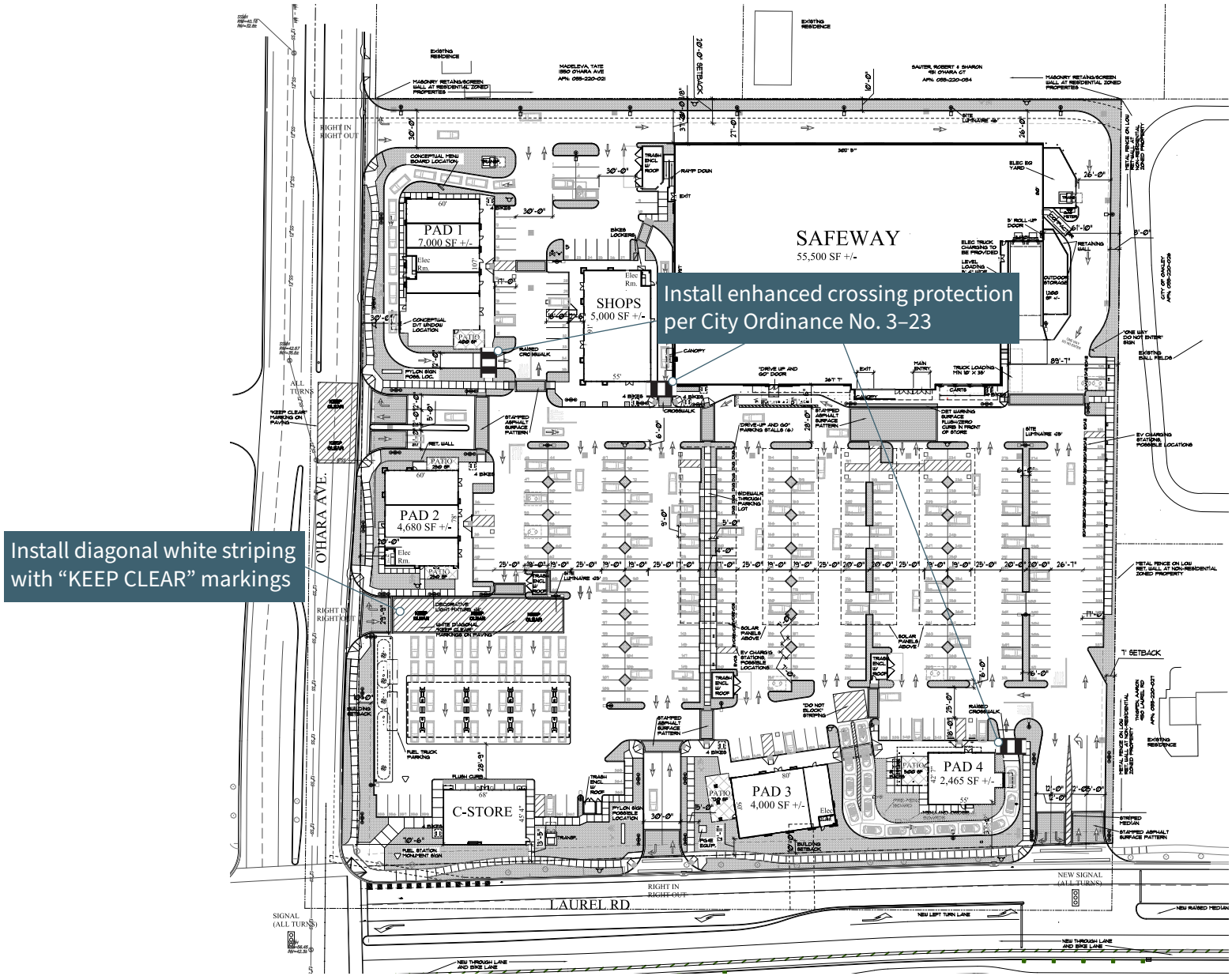
The project proposes a drive through pharmacy window on the north side of the Safeway store. As proposed, the pharmacy drive through would provide space for four vehicles to queue in addition to the vehicle waiting at the window, as illustrated in Figure 2. An operating Safeway drive through pharmacy like the one proposed at the site currently exists at 19555 Mountain House Parkway in Mountain House, California. The pharmacy window is open from 9 AM to 1 PM and from 1:45 PM to 8 PM on weekdays (it closes at 5 PM on weekends). Observations of queue lengths at the pharmacy drive through at 19555 Mountain House Parkway were conducted on Wednesday January 10, 2024. **Table 17** presents the average and 95th percentile queue lengths based on the observations of existing pharmacy drive through activity.

Table 17: Pharmacy Drive Through Queuing

Time of Day	Average Queue	95th Percentile Queue	Available Storage
9 AM to 8 PM	<1.0 vehicles	<2.0 vehicles	5 vehicles

Source: Fehr & Peers, 2024

The proposed pharmacy storage of five vehicles is adequate to serve the anticipated average and 95th percentile queue lengths.



Site Plan Source: Johnson Lyman Architects, LLP, 1/18/2024

Figure 11

Site Plan Recommendations

10. Summary of Findings

This report presents the analysis and findings of the Draft Transportation Impact Assessment (TIA) prepared for the proposed Oakley Shops at Laurel Fields project in the City of Oakley, California. The project proposes a Safeway store, retail shops, fast-food eateries, and a gas station with a convenience store on a site located northeast of the Laurel Road/O'Hara Avenue intersection. Vehicle access to the site would be provided via three new driveways on O'Hara Avenue and two on Laurel Road. As part of the project, a new traffic signal would be installed at the easternmost intersection on Laurel Road.

The project was found to generate approximately 5,518 new weekday daily vehicle trips with roughly 270 trips occurring during the morning peak hour, 499 trips occurring during the midday peak hour, and 497 trips occurring in the evening peak hour. Traffic operations were assessed at the critical intersections and driveways around the project site providing key points of access. Intersection operations were evaluated under Existing and Cumulative conditions both with and without project traffic. No violations of the City's level of service policies were identified. In addition, the project's effects on pedestrian facilities, bicycle facilities, transit facilities, emergency vehicle access, vehicle miles traveled, hazards, and parking were assessed.

Based on the established standards of significance, the project was found to have a less than significant impact related to pedestrian facilities, bicycle facilities, transit, emergency vehicle access and hazards. The project's effects on VMT were assessed using the CCTA regional travel demand model. As would be expected of a local serving retail use, the project was found to result in a small decrease in total VMT. Local-serving retail development tends to shorten trips and reduce VMT.

The project was found to provide adequate parking relative to City Code requirements and the anticipated parking demand.

Based on the findings and conclusions of the analysis, the following recommendations are made to provide for adequate and efficient operations across all modes of travel.

> **Improvement Recommendation #1**: For the drive through lanes serving Pads 1 and 4, which abut the sidewalks along O'Hara Avenue and Laurel Road respectively, some combination of screening devices and/or fencing, which could be a combination of berming, hedge and landscape materials and solid walls, should be installed between the drive through lanes and adjacent sidewalks.
>
> The site plan shows crosswalks crossing the drive through lanes downstream of the pickup windows at all three proposed drive throughs (Pad 1, Pad 4 and between the Shops and Safeway store. All three crosswalks should be enhanced with a raised crossing, signage and an automatic or pedestrian operated warning light for vehicles.



Improvement Recommendation #2: The final site plan for the project should be analyzed by the project's Civil Engineer to ensure that adequate sight distance is maintained at all driveways. No objects (landscaping, monument signs, etc.) greater than three feet in height should be allowed within the sight distance triangles at driveway intersections. Review available speed survey information from the City and adjust required sight distance if necessary.

Improvement Recommendation #3: As shown on Figure 11, install diagonal hatched white striping and "KEEP CLEAR" markings in the portion of the internal drive aisle abutting the fuel station queuing area.

Appendix A: Data Collection

Prepared by National Data & Surveying Services

O'Hara Ave & Laurel Rd

Peak Hour Turning Movement Count

ID: 23-080243-001
City: Oakley

Day: Tuesday
Date: 8/15/2023

PEAK HOURS

AM	07:45 AM - 08:45 AM
NOON	01:00 PM - 02:00 PM
PM	05:00 PM - 06:00 PM

COUNT PERIODS

AM	7:00 AM - 09:00 AM
NOON	12:00 PM - 02:00 PM
PM	4:00 PM - 06:00 PM

SOUTHBOUND (O'Hara Ave)

AM	135	402	42	2	568	AM
NOON	61	133	21	3	199	NOON
PM	57	204	30	3	291	PM

EASTBOUND (Laurel Rd)

AM	NOON	PM	
839	581	614	
4	3	11	0
203	59	87	1
437	546	775	2
51	38	100	0
AM	NOON	PM	

WESTBOUND (Laurel Rd)

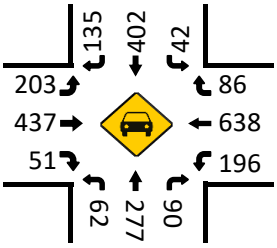
	PM	NOON	AM
0.5	15	18	86
1.5	471	462	638
1	90	36	196
0	0	0	0
	879	607	569
	PM	NOON	AM

NORTHBOUND (O'Hara Ave)

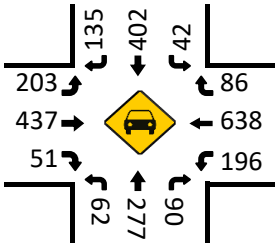
PM	395	1	75	186	74	PM
NOON	209	2	55	119	40	NOON
AM	649	0	62	277	90	AM

CONTROL			
Signalized			
TEV	2625	1596	2179
	AM	NOON	PM
PHF	0.87	0.95	0.95

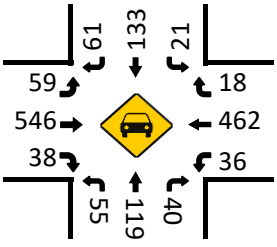
Totals (AM)



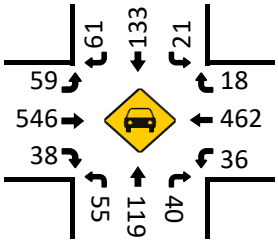
Totals (AM)



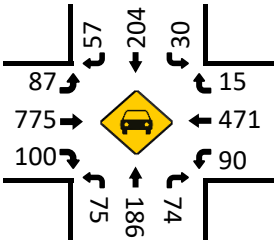
Totals (NOON)



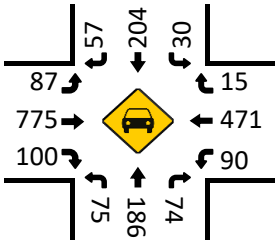
Totals (NOON)



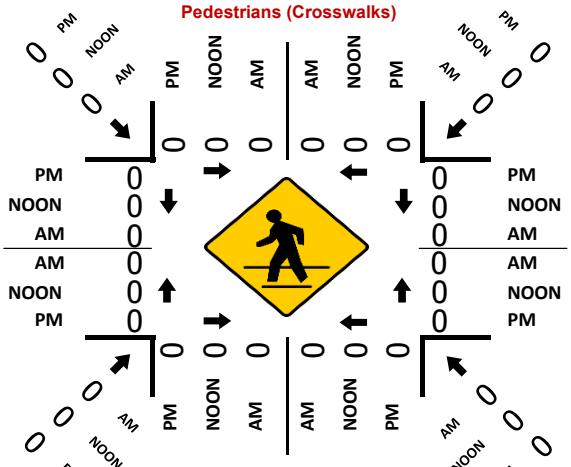
Totals (PM)



Totals (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Rose Ave & Laurel Rd

Peak Hour Turning Movement Count

ID: 23-080243-002
City: Oakley

Day: Tuesday
Date: 8/15/2023

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	7:00 AM - 09:00 AM
01:00 PM - 02:00 PM	12:00 PM - 02:00 PM
04:30 PM - 05:30 PM	4:00 PM - 06:00 PM

SOUTHBOUND (Rose Ave)

AM	117	113	27	0	132	AM
NOON	54	36	12	0	85	NOON
PM	65	35	7	0	109	PM

EASTBOUND (Laurel Rd)

AM	NOON	PM		
890	515	613	⇦	
0	0	1	↶	0
48	51	66	↰	1
469	474	714	→	2
45	51	57	↷	0
AM	NOON	PM		

WESTBOUND (Laurel Rd)

PM	NOON	AM		
14	11	16	↶	0
508	425	687	←	2
2	11	35	↰	1
0	0	0	↷	0
725	495	531	⇨	
PM	NOON	AM		

NORTHBOUND (Rose Ave)

PM	94	0	39	29	4	PM
NOON	98	0	36	23	9	NOON
AM	193	0	86	68	35	AM

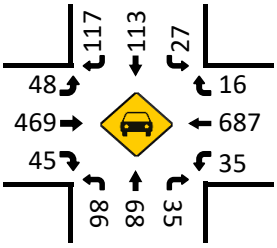
⇩	0	1	1	0
	↶	↰	↑	↷

CONTROL

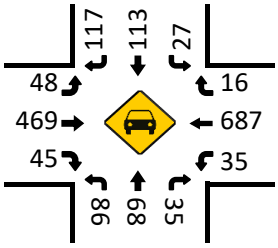
Signalized

	AM	NOON	PM
TEV	1746	1193	1541
PHF	0.85	0.95	0.94

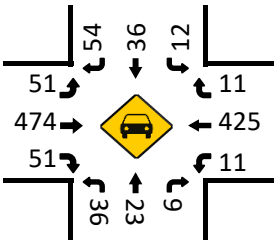
Totals (AM)



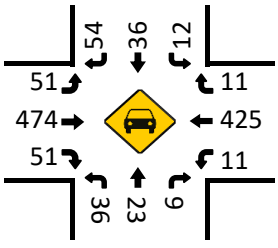
Totals (AM)



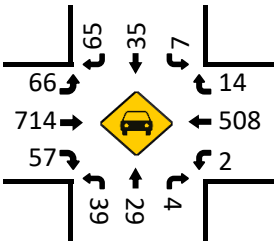
Totals (NOON)



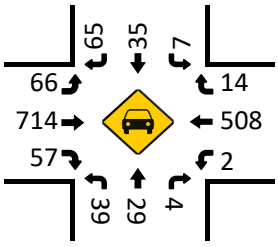
Totals (NOON)



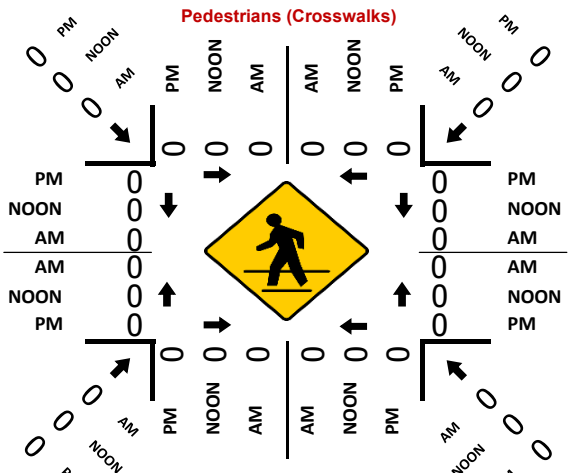
Totals (PM)



Totals (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Mercedes Ln & Laurel Rd

Peak Hour Turning Movement Count

ID: 23-080243-003
City: Oakley

Day: Tuesday
Date: 8/15/2023

PEAK HOURS

AM	07:45 AM - 08:45 AM
NOON	01:00 PM - 02:00 PM
PM	04:30 PM - 05:30 PM

COUNT PERIODS

AM	7:00 AM - 09:00 AM
NOON	12:00 PM - 02:00 PM
PM	4:00 PM - 06:00 PM

SOUTHBOUND (Mercedes Ln)

AM	25	55	15	0	17	AM
NOON	5	8	0	0	9	NOON
PM	0	0	0	0	11	PM

EASTBOUND (Laurel Rd)

AM	NOON	PM	
922	595	679	⇦
5	0	1	0
10	5	10	1
607	635	933	2
89	36	20	0
AM	NOON	PM	

WESTBOUND (Laurel Rd)

PM	NOON	AM	
0	0	2	0
641	559	802	2
5	23	35	1
1	1	1	0
937	658	698	⇨
PM	NOON	AM	

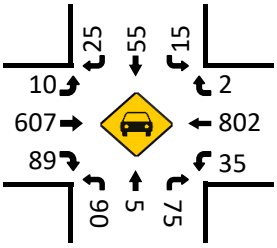
NORTHBOUND (Mercedes Ln)

PM	25	0	37	1	3	PM
NOON	67	0	31	4	22	NOON
AM	179	0	90	5	75	AM

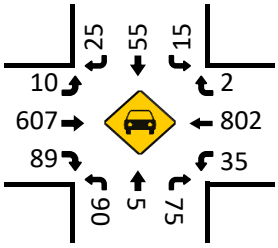
0.3	0.3	0.3	0
0	1	0.5	0.5

CONTROL			
Signalized			
TEV	1816	1329	1652
	AM	NOON	PM
PHF	0.81	0.93	0.93

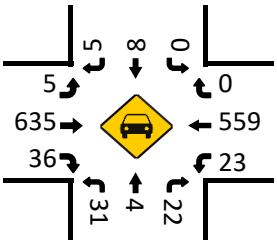
Totals (AM)



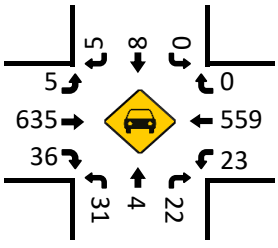
Totals (AM)



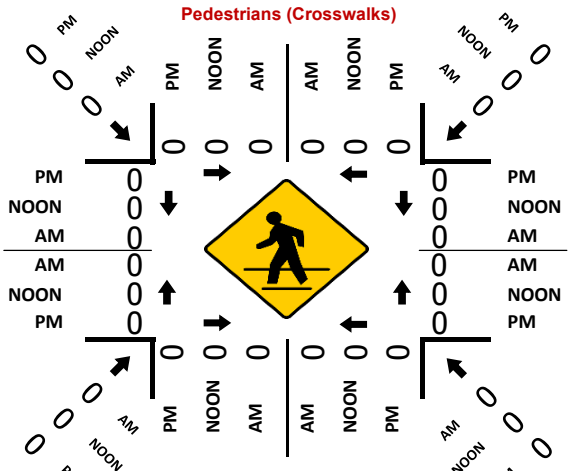
Totals (NOON)



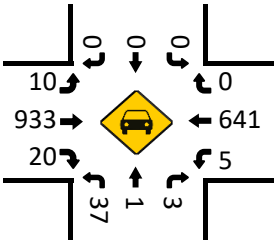
Totals (NOON)



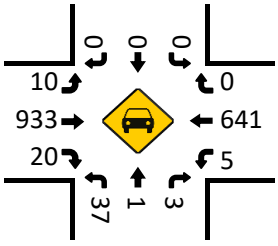
Pedestrians (Crosswalks)



Totals (PM)



Totals (PM)



Appendix B: LOS Calculations

HCM 6th Signalized Intersection Summary
1: O'Hara Ave & Laurel Rd

Existing without Project AM

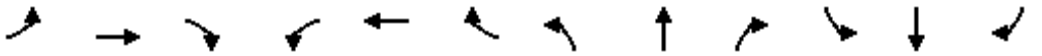
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	437	51	196	638	86	62	277	90	44	402	135
Future Volume (veh/h)	207	437	51	196	638	86	62	277	90	44	402	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	238	502	54	225	733	93	71	318	51	51	462	134
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	1079	116	272	1033	131	104	438	366	89	610	176
Arrive On Green	0.16	0.33	0.33	0.15	0.33	0.33	0.06	0.23	0.23	0.05	0.23	0.23
Sat Flow, veh/h	1781	3231	346	1781	3166	402	1781	1870	1565	1781	2705	778
Grp Volume(v), veh/h	238	275	281	225	411	415	71	318	51	51	302	294
Grp Sat Flow(s),veh/h/ln	1781	1777	1801	1781	1777	1791	1781	1870	1565	1781	1777	1706
Q Serve(g_s), s	10.6	10.0	10.1	10.1	16.7	16.7	3.2	12.9	2.1	2.3	13.0	13.2
Cycle Q Clear(g_c), s	10.6	10.0	10.1	10.1	16.7	16.7	3.2	12.9	2.1	2.3	13.0	13.2
Prop In Lane	1.00		0.19	1.00		0.22	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	286	593	601	272	579	584	104	438	366	89	401	385
V/C Ratio(X)	0.83	0.46	0.47	0.83	0.71	0.71	0.68	0.73	0.14	0.57	0.75	0.76
Avail Cap(c_a), veh/h	651	974	987	651	974	982	651	911	762	651	866	831
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	21.5	21.6	33.7	24.3	24.3	37.9	29.0	24.9	38.1	29.7	29.7
Incr Delay (d2), s/veh	6.2	0.8	0.8	6.3	2.3	2.3	2.9	0.9	0.1	2.1	1.1	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	4.1	4.2	4.6	6.8	6.9	1.4	5.5	0.8	1.0	5.4	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.6	22.3	22.4	40.0	26.6	26.5	40.8	29.9	25.0	40.2	30.7	30.9
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		794			1051			440			647	
Approach Delay, s/veh		27.5			29.4			31.1			31.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.5	32.8	8.8	23.9	17.2	32.2	8.1	24.6
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	12.1	12.1	5.2	15.2	12.6	18.7	4.3	14.9
Green Ext Time (p_c), s	0.6	5.4	0.1	2.3	0.6	7.6	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	29.6
HCM 6th LOS	C

Notes

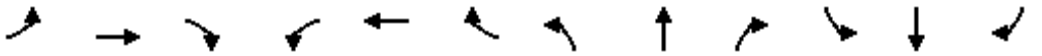
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	469	45	35	687	16	86	68	35	27	113	117
Future Volume (veh/h)	48	469	45	35	687	16	86	68	35	27	113	117
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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	56	552	49	41	808	18	101	80	25	32	133	107
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	1234	109	84	1293	29	161	124	39	310	167	134
Arrive On Green	0.06	0.37	0.37	0.05	0.36	0.36	0.09	0.09	0.09	0.17	0.17	0.17
Sat Flow, veh/h	1781	3302	292	1781	3554	79	1781	1366	427	1781	959	772
Grp Volume(v), veh/h	56	296	305	41	404	422	101	0	105	32	0	240
Grp Sat Flow(s),veh/h/ln	1781	1777	1818	1781	1777	1856	1781	0	1793	1781	0	1731
Q Serve(g_s), s	2.1	8.6	8.7	1.5	12.9	12.9	3.8	0.0	3.9	1.0	0.0	9.1
Cycle Q Clear(g_c), s	2.1	8.6	8.7	1.5	12.9	12.9	3.8	0.0	3.9	1.0	0.0	9.1
Prop In Lane	1.00		0.16	1.00		0.04	1.00		0.24	1.00		0.45
Lane Grp Cap(c), veh/h	102	664	679	84	646	675	161	0	162	310	0	302
V/C Ratio(X)	0.55	0.45	0.45	0.49	0.63	0.63	0.63	0.00	0.65	0.10	0.00	0.80
Avail Cap(c_a), veh/h	259	664	679	259	646	675	1114	0	1122	1114	0	1083
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	31.5	16.2	16.2	31.9	18.0	18.0	30.1	0.0	30.2	23.9	0.0	27.2
Incr Delay (d2), s/veh	1.7	2.2	2.1	1.6	4.5	4.3	1.5	0.0	1.6	0.1	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.5	3.5	0.7	5.4	5.6	1.6	0.0	1.6	0.4	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.2	18.3	18.3	33.5	22.5	22.3	31.6	0.0	31.8	23.9	0.0	29.0
LnGrp LOS	C	B	B	C	C	C	C	A	C	C	A	C
Approach Vol, veh/h		657			867			206			272	
Approach Delay, s/veh		19.6			23.0			31.7			28.4	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	31.1		17.4	9.3	30.4		11.6				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.0	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	3.5	10.7		11.1	4.1	14.9		5.9				
Green Ext Time (p_c), s	0.0	2.9		0.9	0.0	3.5		0.5				

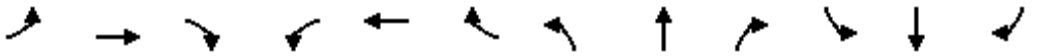
Intersection Summary												
HCM 6th Ctrl Delay			23.5									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	605	89	36	802	2	90	5	75	15	55	25
Future Volume (veh/h)	15	605	89	36	802	2	90	5	75	15	55	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.89
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	19	747	110	44	990	2	111	6	12	19	68	22
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	46	1081	159	83	1345	3	148	46	92	92	330	107
Arrive On Green	0.03	0.35	0.35	0.05	0.37	0.37	0.08	0.08	0.08	0.30	0.30	0.30
Sat Flow, veh/h	1781	3097	456	1781	3638	7	1781	555	1110	303	1085	351
Grp Volume(v), veh/h	19	428	429	44	483	509	111	0	18	109	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1776	1781	1777	1869	1781	0	1666	1739	0	0
Q Serve(g_s), s	0.9	16.8	16.9	2.0	19.2	19.2	5.0	0.0	0.8	3.8	0.0	0.0
Cycle Q Clear(g_c), s	0.9	16.8	16.9	2.0	19.2	19.2	5.0	0.0	0.8	3.8	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.00	1.00		0.67	0.17		0.20
Lane Grp Cap(c), veh/h	46	620	620	83	657	691	148	0	138	529	0	0
V/C Ratio(X)	0.41	0.69	0.69	0.53	0.74	0.74	0.75	0.00	0.13	0.21	0.00	0.00
Avail Cap(c_a), veh/h	437	873	872	437	873	918	547	0	511	854	0	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	39.1	22.7	22.7	38.0	22.2	22.2	36.5	0.0	34.6	21.0	0.0	0.0
Incr Delay (d2), s/veh	2.2	2.0	2.0	2.0	2.9	2.7	2.9	0.0	0.2	0.1	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	0.4	7.2	7.2	0.9	8.2	8.6	2.3	0.0	0.3	1.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	24.7	24.7	39.9	25.1	24.9	39.4	0.0	34.8	21.1	0.0	0.0
LnGrp LOS	D	C	C	D	C	C	D	A	C	C	A	A
Approach Vol, veh/h		876			1036			129			109	
Approach Delay, s/veh		25.1			25.6			38.7			21.1	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	33.5		11.4	6.1	35.2		28.8				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0				
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s	4.0	18.9		7.0	2.9	21.2		5.8				
Green Ext Time (p_c), s	0.0	8.2		0.2	0.0	8.9		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		26.0	
HCM 6th LOS		C	



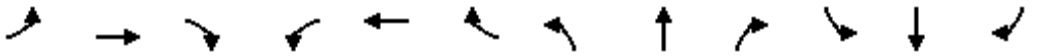
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	546	38	36	462	18	57	119	40	24	133	61
Future Volume (veh/h)	62	546	38	36	462	18	57	119	40	24	133	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	65	575	37	38	486	18	60	125	13	25	140	32
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	124	1048	67	86	1005	37	118	470	389	62	631	140
Arrive On Green	0.07	0.31	0.31	0.05	0.29	0.29	0.07	0.25	0.25	0.03	0.22	0.22
Sat Flow, veh/h	1781	3390	218	1781	3492	129	1781	1870	1549	1781	2874	637
Grp Volume(v), veh/h	65	301	311	38	247	257	60	125	13	25	85	87
Grp Sat Flow(s),veh/h/ln	1781	1777	1831	1781	1777	1844	1781	1870	1549	1781	1777	1734
Q Serve(g_s), s	1.9	7.4	7.5	1.1	6.1	6.1	1.7	2.8	0.3	0.7	2.1	2.2
Cycle Q Clear(g_c), s	1.9	7.4	7.5	1.1	6.1	6.1	1.7	2.8	0.3	0.7	2.1	2.2
Prop In Lane	1.00		0.12	1.00		0.07	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	124	549	566	86	511	531	118	470	389	62	390	381
V/C Ratio(X)	0.52	0.55	0.55	0.44	0.48	0.48	0.51	0.27	0.03	0.40	0.22	0.23
Avail Cap(c_a), veh/h	1013	1515	1561	1013	1515	1572	1013	1418	1174	1013	1347	1314
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	15.2	15.2	24.4	15.5	15.6	23.8	15.9	14.9	24.9	16.9	16.9
Incr Delay (d2), s/veh	3.4	1.2	1.2	3.5	1.0	1.0	1.2	0.1	0.0	1.6	0.1	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.8	2.9	0.5	2.2	2.3	0.7	1.0	0.1	0.3	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	16.4	16.4	27.9	16.6	16.5	25.0	16.0	14.9	26.5	17.0	17.0
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		677			542			198			197	
Approach Delay, s/veh		17.4			17.3			18.6			18.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.6	21.7	7.5	17.0	7.7	20.6	5.8	18.7
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	3.1	9.5	3.7	4.2	3.9	8.1	2.7	4.8
Green Ext Time (p_c), s	0.1	6.1	0.1	0.6	0.1	4.5	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Notes

* 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)	51	474	51	11	425	11	36	23	9	12	36	54
Future Volume (veh/h)	51	474	51	11	425	11	36	23	9	12	36	54
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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	499	51	12	447	11	38	24	0	13	38	6
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	1555	158	32	1543	38	117	123	0	111	98	16
Arrive On Green	0.06	0.48	0.48	0.02	0.44	0.44	0.07	0.07	0.00	0.06	0.06	0.06
Sat Flow, veh/h	1781	3256	332	1781	3544	87	1781	1870	0	1781	1577	249
Grp Volume(v), veh/h	54	272	278	12	224	234	38	24	0	13	0	44
Grp Sat Flow(s),veh/h/ln	1781	1777	1811	1781	1777	1855	1781	1870	0	1781	0	1826
Q Serve(g_s), s	1.7	5.4	5.5	0.4	4.7	4.7	1.2	0.7	0.0	0.4	0.0	1.3
Cycle Q Clear(g_c), s	1.7	5.4	5.5	0.4	4.7	4.7	1.2	0.7	0.0	0.4	0.0	1.3
Prop In Lane	1.00		0.18	1.00		0.05	1.00		0.00	1.00		0.14
Lane Grp Cap(c), veh/h	107	849	865	32	774	808	117	123	0	111	0	114
V/C Ratio(X)	0.50	0.32	0.32	0.37	0.29	0.29	0.33	0.20	0.00	0.12	0.00	0.39
Avail Cap(c_a), veh/h	310	849	865	310	774	808	1334	1401	0	1334	0	1367
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	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.1	9.2	9.3	27.9	10.5	10.5	25.6	25.4	0.0	25.4	0.0	25.9
Incr Delay (d2), s/veh	1.3	1.0	1.0	2.6	0.9	0.9	0.6	0.3	0.0	0.2	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.8	1.9	0.2	1.7	1.7	0.5	0.3	0.0	0.2	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	10.2	10.2	30.5	11.4	11.4	26.2	25.7	0.0	25.6	0.0	26.7
LnGrp LOS	C	B	B	C	B	B	C	C	A	C	A	C
Approach Vol, veh/h		604			470			62			57	
Approach Delay, s/veh		11.8			11.9			26.0			26.4	
Approach LOS		B			B			C			C	

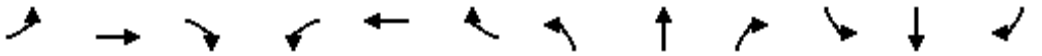
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	32.8		9.0	8.9	30.4		9.2				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.0	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	2.4	7.5		3.3	3.7	6.7		3.2				
Green Ext Time (p_c), s	0.0	2.9		0.1	0.0	2.3		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			13.3									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	624	36	24	559	0	31	4	22	0	8	5
Future Volume (veh/h)	5	624	36	24	559	0	31	4	22	0	8	5
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		0.99	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	678	39	26	608	0	34	4	1	0	9	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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	1390	80	68	1552	0	95	77	19	0	61	0
Arrive On Green	0.01	0.41	0.41	0.04	0.44	0.00	0.05	0.05	0.05	0.00	0.03	0.00
Sat Flow, veh/h	1781	3415	196	1781	3647	0	1781	1440	360	0	1870	0
Grp Volume(v), veh/h	5	353	364	26	608	0	34	0	5	0	9	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1834	1781	1777	0	1781	0	1800	0	1870	0
Q Serve(g_s), s	0.1	5.5	5.5	0.5	4.4	0.0	0.7	0.0	0.1	0.0	0.2	0.0
Cycle Q Clear(g_c), s	0.1	5.5	5.5	0.5	4.4	0.0	0.7	0.0	0.1	0.0	0.2	0.0
Prop In Lane	1.00		0.11	1.00		0.00	1.00		0.20	0.00		0.00
Lane Grp Cap(c), veh/h	14	723	747	68	1552	0	95	0	96	0	61	0
V/C Ratio(X)	0.35	0.49	0.49	0.38	0.39	0.00	0.36	0.00	0.05	0.00	0.15	0.00
Avail Cap(c_a), veh/h	944	1884	1945	944	3768	0	1181	0	1193	0	1983	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	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	18.6	8.3	8.3	17.7	7.2	0.0	17.2	0.0	16.9	0.0	17.7	0.0
Incr Delay (d2), s/veh	5.2	0.7	0.7	1.3	0.2	0.0	0.8	0.0	0.1	0.0	0.4	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	0.1	1.7	1.8	0.2	1.2	0.0	0.3	0.0	0.0	0.0	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.8	9.0	9.0	19.0	7.4	0.0	18.1	0.0	17.0	0.0	18.2	0.0
LnGrp LOS	C	A	A	B	A	A	B	A	B	A	B	A
Approach Vol, veh/h		722			634			39			9	
Approach Delay, s/veh		9.1			7.9			17.9			18.2	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.4	20.5		6.6	4.3	21.6		5.2				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0				
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s	2.5	7.5		2.7	2.1	6.4		2.2				
Green Ext Time (p_c), s	0.0	7.7		0.0	0.0	6.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		8.9	
HCM 6th LOS		A	



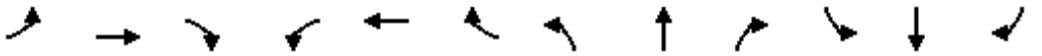
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	775	100	90	471	15	76	186	74	33	204	57
Future Volume (veh/h)	98	775	100	90	471	15	76	186	74	33	204	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	816	100	95	496	15	80	196	25	35	215	43
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	1270	156	130	1393	42	122	393	325	76	542	106
Arrive On Green	0.08	0.40	0.40	0.07	0.40	0.40	0.07	0.21	0.21	0.04	0.18	0.18
Sat Flow, veh/h	1781	3180	390	1781	3520	106	1781	1870	1545	1781	2944	576
Grp Volume(v), veh/h	103	456	460	95	250	261	80	196	25	35	128	130
Grp Sat Flow(s),veh/h/ln	1781	1777	1793	1781	1777	1849	1781	1870	1545	1781	1777	1743
Q Serve(g_s), s	3.9	14.2	14.2	3.6	6.8	6.8	3.0	6.3	0.9	1.3	4.3	4.5
Cycle Q Clear(g_c), s	3.9	14.2	14.2	3.6	6.8	6.8	3.0	6.3	0.9	1.3	4.3	4.5
Prop In Lane	1.00		0.22	1.00		0.06	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	137	710	716	130	703	732	122	393	325	76	327	321
V/C Ratio(X)	0.75	0.64	0.64	0.73	0.36	0.36	0.66	0.50	0.08	0.46	0.39	0.41
Avail Cap(c_a), veh/h	781	1168	1178	781	1168	1215	781	1093	903	781	1038	1018
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	16.6	16.6	31.1	14.5	14.5	31.1	23.9	21.7	32.0	24.5	24.6
Incr Delay (d2), s/veh	8.1	1.4	1.4	7.5	0.4	0.4	2.2	0.4	0.0	1.6	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	5.5	5.6	1.7	2.5	2.6	1.3	2.6	0.3	0.6	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	18.0	18.0	38.6	15.0	15.0	33.3	24.2	21.7	33.6	24.8	24.9
LnGrp LOS	D	B	B	D	B	B	C	C	C	C	C	C
Approach Vol, veh/h		1019			606			301			293	
Approach Delay, s/veh		20.1			18.7			26.4			25.9	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	32.7	8.7	18.0	9.3	32.5	6.9	19.8
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	5.6	16.2	5.0	6.5	5.9	8.8	3.3	8.3
Green Ext Time (p_c), s	0.2	9.7	0.1	0.9	0.2	4.5	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

Notes

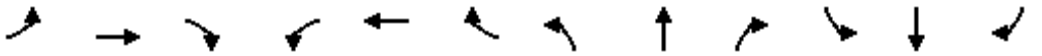
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	746	55	4	487	16	34	22	10	13	31	58
Future Volume (veh/h)	63	746	55	4	487	16	34	22	10	13	31	58
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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	65	769	55	4	502	15	35	23	1	13	32	5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	1669	119	12	1534	46	113	113	5	102	91	14
Arrive On Green	0.07	0.50	0.50	0.01	0.44	0.44	0.06	0.06	0.06	0.06	0.06	0.06
Sat Flow, veh/h	1781	3363	240	1781	3523	105	1781	1779	77	1781	1579	247
Grp Volume(v), veh/h	65	406	418	4	253	264	35	0	24	13	0	37
Grp Sat Flow(s),veh/h/ln	1781	1777	1827	1781	1777	1851	1781	0	1856	1781	0	1826
Q Serve(g_s), s	2.0	8.6	8.6	0.1	5.4	5.4	1.1	0.0	0.7	0.4	0.0	1.1
Cycle Q Clear(g_c), s	2.0	8.6	8.6	0.1	5.4	5.4	1.1	0.0	0.7	0.4	0.0	1.1
Prop In Lane	1.00		0.13	1.00		0.06	1.00		0.04	1.00		0.14
Lane Grp Cap(c), veh/h	120	882	907	12	773	806	113	0	118	102	0	105
V/C Ratio(X)	0.54	0.46	0.46	0.35	0.33	0.33	0.31	0.00	0.20	0.13	0.00	0.35
Avail Cap(c_a), veh/h	310	882	907	310	773	806	1334	0	1390	1334	0	1367
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	25.9	9.4	9.4	28.4	10.7	10.7	25.7	0.0	25.5	25.7	0.0	26.0
Incr Delay (d2), s/veh	1.4	1.7	1.7	6.5	1.1	1.1	0.6	0.0	0.3	0.2	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.9	3.0	0.1	1.9	2.0	0.4	0.0	0.3	0.2	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	11.2	11.1	35.0	11.8	11.8	26.2	0.0	25.8	25.9	0.0	26.8
LnGrp LOS	C	B	B	C	B	B	C	A	C	C	A	C
Approach Vol, veh/h		889			521			59			50	
Approach Delay, s/veh		12.3			12.0			26.1			26.6	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	33.9		8.7	9.3	30.4		9.1				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.0	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	2.1	10.6		3.1	4.0	7.4		3.1				
Green Ext Time (p_c), s	0.0	4.2		0.1	0.0	2.6		0.1				

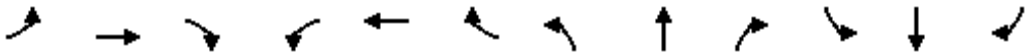
Intersection Summary												
HCM 6th Ctrl Delay			13.2									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	971	19	5	595	2	23	1	2	0	0	1
Future Volume (veh/h)	4	971	19	5	595	2	23	1	2	0	0	1
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		0.98	0.99		1.00	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	1033	20	5	633	2	24	1	0	0	0	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	12	2031	39	14	2076	7	65	69	0	0	5	0
Arrive On Green	0.01	0.57	0.57	0.01	0.57	0.57	0.04	0.04	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3566	69	1781	3633	11	1769	1870	0	0	1870	0
Grp Volume(v), veh/h	4	515	538	5	310	325	24	1	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1858	1781	1777	1868	1769	1870	0	0	1870	0
Q Serve(g_s), s	0.1	6.2	6.2	0.1	3.2	3.2	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	6.2	6.2	0.1	3.2	3.2	0.5	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.01	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	12	1012	1058	14	1015	1067	65	69	0	0	5	0
V/C Ratio(X)	0.34	0.51	0.51	0.35	0.30	0.30	0.37	0.01	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	1002	1999	2090	1002	1999	2101	1243	1315	0	0	2104	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	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	17.6	4.6	4.6	17.5	4.0	4.0	16.7	16.5	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.4	0.6	0.5	5.2	0.2	0.2	1.3	0.0	0.0	0.0	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	0.0	1.2	1.2	0.1	0.6	0.6	0.2	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	5.2	5.2	22.7	4.2	4.2	18.0	16.5	0.0	0.0	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	B	A	A	A	A
Approach Vol, veh/h		1057			640			25			0	
Approach Delay, s/veh		5.3			4.3			17.9			0.0	
Approach LOS		A			A			B				

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.3	25.4		5.9	4.2	25.4		0.0				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0				
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s	2.1	8.2		2.5	2.1	5.2		0.0				
Green Ext Time (p_c), s	0.0	12.0		0.0	0.0	6.3		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			5.1									
HCM 6th LOS			A									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	454	51	211	668	97	62	288	98	45	405	140
Future Volume (veh/h)	230	454	51	211	668	97	62	288	98	45	405	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	264	522	54	243	768	105	71	331	60	52	466	139
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	310	1119	115	288	1042	142	100	433	362	87	603	178
Arrive On Green	0.17	0.34	0.34	0.16	0.33	0.33	0.06	0.23	0.23	0.05	0.22	0.22
Sat Flow, veh/h	1781	3245	335	1781	3134	428	1781	1870	1565	1781	2685	794
Grp Volume(v), veh/h	264	285	291	243	435	438	71	331	60	52	307	298
Grp Sat Flow(s),veh/h/ln	1781	1777	1803	1781	1777	1786	1781	1870	1565	1781	1777	1703
Q Serve(g_s), s	12.7	11.0	11.1	11.7	19.1	19.1	3.5	14.6	2.7	2.5	14.3	14.5
Cycle Q Clear(g_c), s	12.7	11.0	11.1	11.7	19.1	19.1	3.5	14.6	2.7	2.5	14.3	14.5
Prop In Lane	1.00		0.19	1.00		0.24	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	310	612	621	288	590	593	100	433	362	87	399	382
V/C Ratio(X)	0.85	0.47	0.47	0.84	0.74	0.74	0.71	0.76	0.17	0.60	0.77	0.78
Avail Cap(c_a), veh/h	606	907	920	606	907	911	606	849	710	606	806	772
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	22.6	22.6	35.9	26.0	26.0	40.9	31.6	27.1	41.1	32.0	32.1
Incr Delay (d2), s/veh	6.6	0.8	0.8	6.7	2.6	2.6	3.5	1.1	0.1	2.4	1.2	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	4.6	4.7	5.4	7.9	8.0	1.6	6.4	1.0	1.1	6.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.0	23.3	23.4	42.6	28.6	28.6	44.4	32.7	27.1	43.5	33.2	33.4
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		840			1116			462			657	
Approach Delay, s/veh		29.2			31.7			33.8			34.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.2	35.8	8.9	25.2	19.3	34.7	8.3	25.8
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	13.7	13.1	5.5	16.5	14.7	21.1	4.5	16.6
Green Ext Time (p_c), s	0.6	5.6	0.1	2.3	0.7	7.9	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C

Notes

* 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)	51	485	47	35	712	16	89	68	35	27	113	122
Future Volume (veh/h)	51	485	47	35	712	16	89	68	35	27	113	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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	60	571	51	41	838	18	105	80	25	32	133	112
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	106	1230	110	84	1283	28	162	124	39	316	166	140
Arrive On Green	0.06	0.37	0.37	0.05	0.36	0.36	0.09	0.09	0.09	0.18	0.18	0.18
Sat Flow, veh/h	1781	3300	294	1781	3557	76	1781	1366	427	1781	938	790
Grp Volume(v), veh/h	60	307	315	41	419	437	105	0	105	32	0	245
Grp Sat Flow(s),veh/h/ln	1781	1777	1817	1781	1777	1857	1781	0	1793	1781	0	1728
Q Serve(g_s), s	2.3	9.1	9.1	1.6	13.6	13.7	3.9	0.0	3.9	1.0	0.0	9.4
Cycle Q Clear(g_c), s	2.3	9.1	9.1	1.6	13.6	13.7	3.9	0.0	3.9	1.0	0.0	9.4
Prop In Lane	1.00		0.16	1.00		0.04	1.00		0.24	1.00		0.46
Lane Grp Cap(c), veh/h	106	663	678	84	641	670	162	0	163	316	0	306
V/C Ratio(X)	0.57	0.46	0.46	0.49	0.65	0.65	0.65	0.00	0.64	0.10	0.00	0.80
Avail Cap(c_a), veh/h	257	663	678	257	641	670	1105	0	1113	1105	0	1072
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	31.7	16.5	16.5	32.2	18.5	18.5	30.4	0.0	30.4	23.9	0.0	27.3
Incr Delay (d2), s/veh	1.8	2.3	2.3	1.6	5.1	4.9	1.6	0.0	1.6	0.1	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.7	3.8	0.7	5.8	6.0	1.7	0.0	1.6	0.4	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	18.8	18.8	33.8	23.6	23.4	32.1	0.0	32.0	23.9	0.0	29.2
LnGrp LOS	C	B	B	C	C	C	C	A	C	C	A	C
Approach Vol, veh/h		682			897			210			277	
Approach Delay, s/veh		20.1			24.0			32.0			28.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	31.2		17.7	9.5	30.4		11.7				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.6	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	3.6	11.1		11.4	4.3	15.7		5.9				
Green Ext Time (p_c), s	0.0	3.0		0.9	0.0	3.4		0.5				

Intersection Summary		
HCM 6th Ctrl Delay	24.1	
HCM 6th LOS	C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	642	89	39	834	2	90	5	78	15	55	25
Future Volume (veh/h)	15	642	89	39	834	2	90	5	78	15	55	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.89
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	19	793	110	48	1030	2	111	6	10	19	68	22
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	46	1109	154	86	1374	3	147	52	86	91	326	106
Arrive On Green	0.03	0.35	0.35	0.05	0.38	0.38	0.08	0.08	0.08	0.30	0.30	0.30
Sat Flow, veh/h	1781	3124	433	1781	3639	7	1781	629	1048	303	1084	351
Grp Volume(v), veh/h	19	451	452	48	503	529	111	0	16	109	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1781	1781	1777	1869	1781	0	1677	1738	0	0
Q Serve(g_s), s	0.9	18.2	18.2	2.2	20.4	20.4	5.1	0.0	0.7	3.9	0.0	0.0
Cycle Q Clear(g_c), s	0.9	18.2	18.2	2.2	20.4	20.4	5.1	0.0	0.7	3.9	0.0	0.0
Prop In Lane	1.00		0.24	1.00		0.00	1.00		0.63	0.17		0.20
Lane Grp Cap(c), veh/h	46	631	632	86	671	706	147	0	138	523	0	0
V/C Ratio(X)	0.42	0.72	0.72	0.56	0.75	0.75	0.76	0.00	0.12	0.21	0.00	0.00
Avail Cap(c_a), veh/h	429	856	858	429	856	900	536	0	505	837	0	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	39.8	23.2	23.2	38.6	22.4	22.4	37.3	0.0	35.3	21.6	0.0	0.0
Incr Delay (d2), s/veh	2.2	2.4	2.4	2.1	3.3	3.2	3.0	0.0	0.1	0.1	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	0.4	7.8	7.8	1.0	8.8	9.3	2.3	0.0	0.3	1.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	25.6	25.6	40.7	25.8	25.6	40.2	0.0	35.4	21.7	0.0	0.0
LnGrp LOS	D	C	C	D	C	C	D	A	D	C	A	A
Approach Vol, veh/h		922			1080			127			109	
Approach Delay, s/veh		25.9			26.4			39.6			21.7	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.0	34.6		11.5	6.1	36.5		29.0
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0
Max Q Clear Time (g_c+I1), s	4.2	20.2		7.1	2.9	22.4		5.9
Green Ext Time (p_c), s	0.0	8.4		0.2	0.0	9.0		0.4

Intersection Summary		
HCM 6th Ctrl Delay	26.7	
HCM 6th LOS	C	

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	562	19	0	606
Future Vol, veh/h	0	11	562	19	0	606
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	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	13	646	22	0	697

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	334	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	662	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	662	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	662	-
HCM Lane V/C Ratio	-	-	0.019	-
HCM Control Delay (s)	-	-	10.5	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	38	0	21	0	560	34	54	552	0
Future Vol, veh/h	0	0	0	38	0	21	0	560	34	54	552	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	44	0	24	0	644	39	62	634	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1080	1441	317	1105	1422	342	-	0	0	683	0	0
Stage 1	758	758	-	664	664	-	-	-	-	-	-	-
Stage 2	322	683	-	441	758	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	172	131	679	165	135	654	0	-	-	906	-	-
Stage 1	365	413	-	416	456	-	0	-	-	-	-	-
Stage 2	664	447	-	565	413	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	152	117	679	152	121	654	-	-	-	906	-	-
Mov Cap-2 Maneuver	152	117	-	152	121	-	-	-	-	-	-	-
Stage 1	365	369	-	416	456	-	-	-	-	-	-	-
Stage 2	639	447	-	505	369	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	28.3	0	1.2
HCM LOS	A	D		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	-	-	-	152	654	906	-	-
HCM Lane V/C Ratio	-	-	-	0.287	0.037	0.069	-	-
HCM Control Delay (s)	-	-	0	38	10.7	9.3	0.4	-
HCM Lane LOS	-	-	A	E	B	A	A	-
HCM 95th %tile Q(veh)	-	-	-	1.1	0.1	0.2	-	-

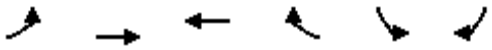
Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	597	924	25	0	52
Future Vol, veh/h	0	597	924	25	0	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	686	1062	29	0	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	546
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	482
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	482
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	482
HCM Lane V/C Ratio	-	-	-	0.124
HCM Control Delay (s)	-	-	-	13.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.4



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	78	519	894	59	73	55
Future Volume (veh/h)	78	519	894	59	73	55
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	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	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	90	597	1028	57	84	43
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	270	899	1646	91	622	554
Arrive On Green	0.48	0.48	0.48	0.48	0.35	0.35
Sat Flow, veh/h	520	1870	3517	190	1781	1585
Grp Volume(v), veh/h	90	597	534	551	84	43
Grp Sat Flow(s),veh/h/ln	520	1870	1777	1836	1781	1585
Q Serve(g_s), s	8.2	12.9	11.8	11.8	1.7	1.0
Cycle Q Clear(g_c), s	20.0	12.9	11.8	11.8	1.7	1.0
Prop In Lane	1.00			0.10	1.00	1.00
Lane Grp Cap(c), veh/h	270	899	854	883	622	554
V/C Ratio(X)	0.33	0.66	0.62	0.62	0.14	0.08
Avail Cap(c_a), veh/h	339	1148	1090	1127	622	554
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	17.6	10.5	10.2	10.2	11.8	11.5
Incr Delay (d2), s/veh	0.7	1.0	0.8	0.7	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	4.0	3.4	3.6	0.7	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.4	11.5	11.0	10.9	12.2	11.8
LnGrp LOS	B	B	B	B	B	B
Approach Vol, veh/h		687	1085		127	
Approach Delay, s/veh		12.4	10.9		12.1	
Approach LOS		B	B		B	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		30.0		23.0	30.0
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		32.5		18.5	32.5
Max Q Clear Time (g_c+I1), s		22.0		3.7	13.8
Green Ext Time (p_c), s		3.4		0.3	6.6

Intersection Summary	
HCM 6th Ctrl Delay	11.5
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	13	581	34	0	590
Future Vol, veh/h	0	13	581	34	0	590
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	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	15	668	39	0	678

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	354	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	642	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	642	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	642	-
HCM Lane V/C Ratio	-	-	0.023	-
HCM Control Delay (s)	-	-	10.7	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

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	583	9	0	923	0	0	0	0	0	0	30
Future Vol, veh/h	0	583	9	0	923	0	0	0	0	0	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	670	10	0	1061	0	0	0	0	0	0	34

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1061	0	0	680	0	0	1206	1736	675	1736	1741	531
Stage 1	-	-	-	-	-	-	675	675	-	1061	1061	-
Stage 2	-	-	-	-	-	-	531	1061	-	675	680	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	654	-	-	910	-	-	149	87	453	62	86	494
Stage 1	-	-	-	-	-	-	443	452	-	240	300	-
Stage 2	-	-	-	-	-	-	501	300	-	443	450	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	654	-	-	910	-	-	139	87	453	62	86	494
Mov Cap-2 Maneuver	-	-	-	-	-	-	139	87	-	62	86	-
Stage 1	-	-	-	-	-	-	443	452	-	240	300	-
Stage 2	-	-	-	-	-	-	466	300	-	443	450	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	12.8
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	654	-	-	910	-	-	494
HCM Lane V/C Ratio	-	-	-	-	-	-	-	0.07
HCM Control Delay (s)	0	0	-	-	0	-	-	12.8
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.2

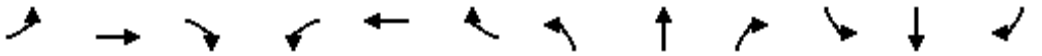
Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	735	870	0	0	5
Future Vol, veh/h	0	735	870	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	799	946	0	0	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	473
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	538
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	538
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	538
HCM Lane V/C Ratio	-	-	-	0.01
HCM Control Delay (s)	-	-	-	11.8
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)	102	586	38	73	543	37	57	137	58	41	135	73
Future Volume (veh/h)	102	586	38	73	543	37	57	137	58	41	135	73
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		0.98	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	107	617	37	77	572	36	60	144	16	43	142	32
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	1078	65	133	1033	65	116	417	345	93	606	132
Arrive On Green	0.09	0.32	0.32	0.07	0.30	0.30	0.06	0.22	0.22	0.05	0.21	0.21
Sat Flow, veh/h	1781	3406	204	1781	3391	213	1781	1870	1547	1781	2881	630
Grp Volume(v), veh/h	107	322	332	77	299	309	60	144	16	43	86	88
Grp Sat Flow(s),veh/h/ln	1781	1777	1834	1781	1777	1827	1781	1870	1547	1781	1777	1734
Q Serve(g_s), s	3.3	8.5	8.5	2.4	7.9	8.0	1.8	3.7	0.5	1.3	2.3	2.4
Cycle Q Clear(g_c), s	3.3	8.5	8.5	2.4	7.9	8.0	1.8	3.7	0.5	1.3	2.3	2.4
Prop In Lane	1.00		0.11	1.00		0.12	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	154	563	580	133	541	557	116	417	345	93	374	365
V/C Ratio(X)	0.69	0.57	0.57	0.58	0.55	0.55	0.52	0.35	0.05	0.46	0.23	0.24
Avail Cap(c_a), veh/h	949	1419	1465	949	1419	1460	949	1328	1098	949	1262	1231
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	16.1	16.1	25.2	16.4	16.4	25.5	18.4	17.2	25.9	18.5	18.5
Incr Delay (d2), s/veh	5.5	1.3	1.3	4.0	1.3	1.2	1.3	0.2	0.0	1.3	0.1	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.3	3.4	1.0	2.9	3.0	0.7	1.4	0.1	0.6	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	17.4	17.3	29.2	17.6	17.6	26.8	18.6	17.2	27.3	18.6	18.6
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		761			685			220			217	
Approach Delay, s/veh		19.2			18.9			20.8			20.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	23.2	7.7	17.2	8.9	22.6	6.9	18.0
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	4.4	10.5	3.8	4.4	5.3	10.0	3.3	5.7
Green Ext Time (p_c), s	0.2	6.6	0.1	0.6	0.3	5.6	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	19.4
HCM 6th LOS	B

Notes

* 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)	63	537	57	11	487	11	42	23	9	12	36	66
Future Volume (veh/h)	63	537	57	11	487	11	42	23	9	12	36	66
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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	66	565	57	12	513	11	44	24	1	13	38	8
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	1560	157	32	1526	33	123	123	5	113	95	20
Arrive On Green	0.07	0.48	0.48	0.02	0.43	0.43	0.07	0.07	0.07	0.06	0.06	0.06
Sat Flow, veh/h	1781	3260	328	1781	3557	76	1781	1783	74	1781	1498	315
Grp Volume(v), veh/h	66	307	315	12	256	268	44	0	25	13	0	46
Grp Sat Flow(s),veh/h/ln	1781	1777	1811	1781	1777	1857	1781	0	1857	1781	0	1814
Q Serve(g_s), s	2.1	6.4	6.4	0.4	5.6	5.6	1.4	0.0	0.7	0.4	0.0	1.4
Cycle Q Clear(g_c), s	2.1	6.4	6.4	0.4	5.6	5.6	1.4	0.0	0.7	0.4	0.0	1.4
Prop In Lane	1.00		0.18	1.00		0.04	1.00		0.04	1.00		0.17
Lane Grp Cap(c), veh/h	120	850	867	32	762	797	123	0	129	113	0	115
V/C Ratio(X)	0.55	0.36	0.36	0.37	0.34	0.34	0.36	0.00	0.19	0.12	0.00	0.40
Avail Cap(c_a), veh/h	306	850	867	306	762	797	1315	0	1370	1315	0	1338
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	26.3	9.6	9.6	28.3	11.1	11.1	25.9	0.0	25.6	25.7	0.0	26.2
Incr Delay (d2), s/veh	1.4	1.2	1.2	2.6	1.2	1.1	0.6	0.0	0.3	0.2	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.2	2.2	0.2	2.0	2.1	0.6	0.0	0.3	0.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	10.8	10.8	30.9	12.3	12.2	26.5	0.0	25.9	25.9	0.0	27.1
LnGrp LOS	C	B	B	C	B	B	C	A	C	C	A	C
Approach Vol, veh/h		688			536			69			59	
Approach Delay, s/veh		12.4			12.7			26.3			26.8	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.5	33.3		9.1	9.3	30.4		9.4				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.0	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	2.4	8.4		3.4	4.1	7.6		3.4				
Green Ext Time (p_c), s	0.0	3.2		0.1	0.0	2.7		0.1				

Intersection Summary		
HCM 6th Ctrl Delay	13.8	
HCM 6th LOS	B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	698	36	30	646	0	31	4	28	0	8	5
Future Volume (veh/h)	5	698	36	30	646	0	31	4	28	0	8	5
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		0.99	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	759	39	33	702	0	34	4	2	0	9	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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	1476	76	82	1660	0	96	63	31	0	61	0
Arrive On Green	0.01	0.43	0.43	0.05	0.47	0.00	0.05	0.05	0.05	0.00	0.03	0.00
Sat Flow, veh/h	1781	3438	177	1781	3647	0	1781	1170	585	0	1870	0
Grp Volume(v), veh/h	5	392	406	33	702	0	34	0	6	0	9	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1838	1781	1777	0	1781	0	1756	0	1870	0
Q Serve(g_s), s	0.1	6.5	6.5	0.7	5.3	0.0	0.7	0.0	0.1	0.0	0.2	0.0
Cycle Q Clear(g_c), s	0.1	6.5	6.5	0.7	5.3	0.0	0.7	0.0	0.1	0.0	0.2	0.0
Prop In Lane	1.00		0.10	1.00		0.00	1.00		0.33	0.00		0.00
Lane Grp Cap(c), veh/h	14	763	789	82	1660	0	96	0	94	0	61	0
V/C Ratio(X)	0.35	0.51	0.51	0.40	0.42	0.00	0.36	0.00	0.06	0.00	0.15	0.00
Avail Cap(c_a), veh/h	883	1761	1822	883	3522	0	1103	0	1087	0	1854	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	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	19.9	8.4	8.4	18.7	7.1	0.0	18.4	0.0	18.1	0.0	19.0	0.0
Incr Delay (d2), s/veh	5.2	0.8	0.7	1.2	0.2	0.0	0.8	0.0	0.1	0.0	0.4	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	0.1	2.0	2.1	0.3	1.5	0.0	0.3	0.0	0.1	0.0	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	9.2	9.2	19.9	7.4	0.0	19.3	0.0	18.2	0.0	19.4	0.0
LnGrp LOS	C	A	A	B	A	A	B	A	B	A	B	A
Approach Vol, veh/h		803			735			40			9	
Approach Delay, s/veh		9.3			7.9			19.1			19.4	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	22.4		6.8	4.3	24.0		5.3
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0
Max Q Clear Time (g_c+I1), s	2.7	8.5		2.7	2.1	7.3		2.2
Green Ext Time (p_c), s	0.0	8.7		0.0	0.0	8.2		0.0

Intersection Summary		
HCM 6th Ctrl Delay	9.0	
HCM 6th LOS	A	

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	18	204	29	0	267
Future Vol, veh/h	0	18	204	29	0	267
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, %	2	2	2	2	2	2
Mvmt Flow	0	19	215	31	0	281

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	123	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	905	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	905	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	905	-
HCM Lane V/C Ratio	-	-	0.021	-
HCM Control Delay (s)	-	-	9.1	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	63	0	35	0	198	50	81	186	0
Future Vol, veh/h	0	0	0	63	0	35	0	198	50	81	186	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	66	0	37	0	208	53	85	196	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	470	627	98	503	601	131	-	0	0	261	0	0
Stage 1	366	366	-	235	235	-	-	-	-	-	-	-
Stage 2	104	261	-	268	366	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	477	399	939	451	413	894	0	-	-	1300	-	-
Stage 1	626	621	-	747	709	-	0	-	-	-	-	-
Stage 2	890	691	-	714	621	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	432	370	939	426	383	894	-	-	-	1300	-	-
Mov Cap-2 Maneuver	432	370	-	426	383	-	-	-	-	-	-	-
Stage 1	626	576	-	747	709	-	-	-	-	-	-	-
Stage 2	853	691	-	662	576	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12.9	0	2.6
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	-	-	-	426	894	1300	-	-
HCM Lane V/C Ratio	-	-	-	0.156	0.041	0.066	-	-
HCM Control Delay (s)	-	-	0	15	9.2	8	0.2	-
HCM Lane LOS	-	-	A	C	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0.5	0.1	0.2	-	-

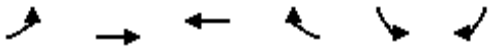
Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	685	565	36	0	88
Future Vol, veh/h	0	685	565	36	0	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	721	595	38	0	93

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	317
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	679
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	679
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	679
HCM Lane V/C Ratio	-	-	-	0.136
HCM Control Delay (s)	-	-	-	11.1
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.5



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	116	569	509	87	122	92
Future Volume (veh/h)	116	569	509	87	122	92
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	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	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	122	599	536	61	128	39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	380	731	1256	143	730	650
Arrive On Green	0.39	0.39	0.39	0.39	0.41	0.41
Sat Flow, veh/h	821	1870	3310	365	1781	1585
Grp Volume(v), veh/h	122	599	295	302	128	39
Grp Sat Flow(s),veh/h/ln	821	1870	1777	1805	1781	1585
Q Serve(g_s), s	5.8	13.0	5.5	5.5	2.1	0.7
Cycle Q Clear(g_c), s	11.3	13.0	5.5	5.5	2.1	0.7
Prop In Lane	1.00			0.20	1.00	1.00
Lane Grp Cap(c), veh/h	380	731	694	705	730	650
V/C Ratio(X)	0.32	0.82	0.43	0.43	0.18	0.06
Avail Cap(c_a), veh/h	469	933	886	900	730	650
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	14.2	12.3	10.0	10.1	8.5	8.1
Incr Delay (d2), s/veh	0.5	4.7	0.4	0.4	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	4.7	1.6	1.6	0.7	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.7	17.0	10.5	10.5	9.0	8.2
LnGrp LOS	B	B	B	B	A	A
Approach Vol, veh/h		721	597		167	
Approach Delay, s/veh		16.6	10.5		8.8	
Approach LOS		B	B		A	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		22.1		23.0	22.1
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		22.5		18.5	22.5
Max Q Clear Time (g_c+I1), s		15.0		4.1	7.5
Green Ext Time (p_c), s		2.7		0.4	3.0

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	22	226	50	0	249
Future Vol, veh/h	0	22	226	50	0	249
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, %	2	2	2	2	2	2
Mvmt Flow	0	23	238	53	0	262

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	146	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	875	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	875	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	875	-
HCM Lane V/C Ratio	-	-	0.026	-
HCM Control Delay (s)	-	-	9.2	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	657	34	0	595	0	0	0	0	0	0	1
Future Vol, veh/h	0	657	34	0	595	0	0	0	0	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	692	36	0	647	0	0	0	0	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	647	0	0	728	0	0	1034	1357	710	1357	1375	324
Stage 1	-	-	-	-	-	-	710	710	-	647	647	-
Stage 2	-	-	-	-	-	-	324	647	-	710	728	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	937	-	-	873	-	-	198	148	433	117	145	672
Stage 1	-	-	-	-	-	-	424	436	-	427	466	-
Stage 2	-	-	-	-	-	-	663	466	-	424	428	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	937	-	-	873	-	-	198	148	433	117	145	672
Mov Cap-2 Maneuver	-	-	-	-	-	-	198	148	-	117	145	-
Stage 1	-	-	-	-	-	-	424	436	-	427	466	-
Stage 2	-	-	-	-	-	-	662	466	-	424	428	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	10.4
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	937	-	-	873	-	-	672
HCM Lane V/C Ratio	-	-	-	-	-	-	-	0.002
HCM Control Delay (s)	0	0	-	-	0	-	-	10.4
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	726	673	0	0	3
Future Vol, veh/h	0	726	673	0	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	789	732	0	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	366
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	631
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	631
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	631
HCM Lane V/C Ratio	-	-	-	0.005
HCM Control Delay (s)	-	-	-	10.7
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	18	305	28	0	343
Future Vol, veh/h	0	18	305	28	0	343
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	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	19	324	30	0	365

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	177	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	835	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	835	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	835	-
HCM Lane V/C Ratio	-	-	0.023	-
HCM Control Delay (s)	-	-	9.4	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	957	626	36	0	88
Future Vol, veh/h	0	957	626	36	0	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1018	666	38	0	94

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	352
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	644
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	644
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	644
HCM Lane V/C Ratio	-	-	-	0.145
HCM Control Delay (s)	-	-	-	11.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	22	326	50	0	326
Future Vol, veh/h	0	22	326	50	0	326
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	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	23	347	53	0	347

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	200	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	808	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	808	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	808	-
HCM Lane V/C Ratio	-	-	0.029	-
HCM Control Delay (s)	-	-	9.6	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	946	18	0	656	3	0	0	0	0	0	0
Future Vol, veh/h	0	946	18	0	656	3	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1028	20	0	713	3	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	716	0	0	1048	0	0	1395	1754	1038	1753	1763	358
Stage 1	-	-	-	-	-	-	1038	1038	-	715	715	-
Stage 2	-	-	-	-	-	-	357	716	-	1038	1048	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	883	-	-	662	-	-	109	85	280	60	84	639
Stage 1	-	-	-	-	-	-	278	307	-	389	434	-
Stage 2	-	-	-	-	-	-	634	433	-	278	304	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	883	-	-	662	-	-	109	85	280	60	84	639
Mov Cap-2 Maneuver	-	-	-	-	-	-	109	85	-	60	84	-
Stage 1	-	-	-	-	-	-	278	307	-	389	434	-
Stage 2	-	-	-	-	-	-	634	433	-	278	304	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	883	-	-	662	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1053	695	2	0	0
Future Vol, veh/h	0	1053	695	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1145	755	2	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	379
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	619
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	619
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

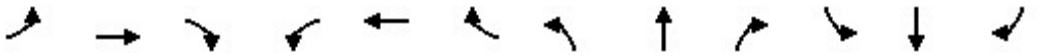
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	248	524	61	235	766	103	74	332	108	53	482	162
Future Volume (veh/h)	248	524	61	235	766	103	74	332	108	53	482	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	285	602	65	270	880	112	85	382	73	61	554	166
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	1125	121	306	1076	137	109	924	407	83	658	196
Arrive On Green	0.18	0.35	0.35	0.17	0.34	0.34	0.06	0.26	0.26	0.05	0.25	0.25
Sat Flow, veh/h	1781	3229	348	1781	3165	403	1781	3554	1565	1781	2680	800
Grp Volume(v), veh/h	285	331	336	270	494	498	85	382	73	61	367	353
Grp Sat Flow(s),veh/h/ln	1781	1777	1800	1781	1777	1791	1781	1777	1565	1781	1777	1703
Q Serve(g_s), s	17.0	16.2	16.3	16.1	27.6	27.6	5.1	9.7	3.9	3.7	21.3	21.5
Cycle Q Clear(g_c), s	17.0	16.2	16.3	16.1	27.6	27.6	5.1	9.7	3.9	3.7	21.3	21.5
Prop In Lane	1.00		0.19	1.00		0.22	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	321	619	627	306	604	609	109	924	407	83	436	418
V/C Ratio(X)	0.89	0.53	0.54	0.88	0.82	0.82	0.78	0.41	0.18	0.74	0.84	0.85
Avail Cap(c_a), veh/h	492	736	746	492	736	742	492	1309	576	492	655	627
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.4	28.3	28.3	43.9	32.8	32.8	50.3	33.3	31.2	51.1	39.0	39.0
Incr Delay (d2), s/veh	12.1	1.0	1.0	10.7	6.7	6.7	4.5	0.1	0.1	4.7	3.9	4.4
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	8.5	7.0	7.1	7.8	12.5	12.6	2.4	4.1	1.5	1.7	9.6	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.5	29.3	29.4	54.6	39.5	39.5	54.8	33.4	31.3	55.8	42.9	43.4
LnGrp LOS	E	C	C	D	D	D	D	C	C	E	D	D
Approach Vol, veh/h		952			1262			540			781	
Approach Delay, s/veh		37.2			42.7			36.5			44.1	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.7	43.2	10.6	32.0	23.6	42.3	9.0	33.6
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	18.1	18.3	7.1	23.5	19.0	29.6	5.7	11.7
Green Ext Time (p_c), s	0.6	6.4	0.1	2.7	0.6	7.3	0.1	1.6

Intersection Summary	
HCM 6th Ctrl Delay	40.6
HCM 6th LOS	D

Notes

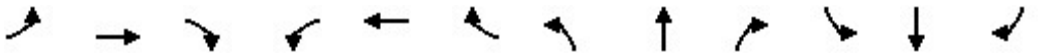
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	563	54	42	824	19	103	82	42	32	136	140
Future Volume (veh/h)	58	563	54	42	824	19	103	82	42	32	136	140
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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	662	60	49	969	21	121	96	33	38	160	136
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	1143	104	92	1200	26	185	138	47	367	193	164
Arrive On Green	0.06	0.35	0.35	0.05	0.34	0.34	0.10	0.10	0.10	0.21	0.21	0.21
Sat Flow, veh/h	1781	3295	298	1781	3556	77	1781	1331	457	1781	934	794
Grp Volume(v), veh/h	68	357	365	49	484	506	121	0	129	38	0	296
Grp Sat Flow(s),veh/h/ln	1781	1777	1817	1781	1777	1856	1781	0	1788	1781	0	1727
Q Serve(g_s), s	2.8	12.1	12.2	2.0	18.4	18.4	4.8	0.0	5.2	1.3	0.0	12.2
Cycle Q Clear(g_c), s	2.8	12.1	12.2	2.0	18.4	18.4	4.8	0.0	5.2	1.3	0.0	12.2
Prop In Lane	1.00		0.16	1.00		0.04	1.00		0.26	1.00		0.46
Lane Grp Cap(c), veh/h	109	617	630	92	600	626	185	0	186	367	0	356
V/C Ratio(X)	0.63	0.58	0.58	0.53	0.81	0.81	0.65	0.00	0.70	0.10	0.00	0.83
Avail Cap(c_a), veh/h	240	617	630	240	600	626	1034	0	1038	1034	0	1003
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	34.0	19.8	19.8	34.3	22.3	22.3	31.9	0.0	32.1	23.8	0.0	28.2
Incr Delay (d2), s/veh	2.2	3.9	3.9	1.8	11.2	10.7	1.5	0.0	1.8	0.0	0.0	1.9
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	5.2	5.3	0.9	8.7	9.0	2.0	0.0	2.2	0.5	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	23.7	23.6	36.1	33.5	33.1	33.4	0.0	33.8	23.9	0.0	30.1
LnGrp LOS	D	C	C	D	C	C	C	A	C	C	A	C
Approach Vol, veh/h		790			1039			250			334	
Approach Delay, s/veh		24.7			33.4			33.6			29.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.2	31.1		20.7	9.9	30.4		13.1				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.0	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	4.0	14.2		14.2	4.8	20.4		7.2				
Green Ext Time (p_c), s	0.0	3.1		1.1	0.0	2.4		0.6				

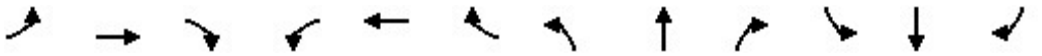
Intersection Summary			
HCM 6th Ctrl Delay		30.0	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	725	107	43	962	2	108	6	90	18	66	30
Future Volume (veh/h)	18	725	107	43	962	2	108	6	90	18	66	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	895	132	53	1188	2	133	7	13	22	81	27
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	1162	171	86	1440	2	170	56	103	84	311	104
Arrive On Green	0.03	0.38	0.38	0.05	0.40	0.40	0.10	0.10	0.10	0.29	0.29	0.29
Sat Flow, veh/h	1781	3096	457	1781	3640	6	1781	585	1086	293	1080	360
Grp Volume(v), veh/h	22	514	513	53	580	610	133	0	20	130	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1776	1781	1777	1869	1781	0	1671	1733	0	0
Q Serve(g_s), s	1.1	23.3	23.3	2.7	26.8	26.8	6.7	0.0	1.0	5.3	0.0	0.0
Cycle Q Clear(g_c), s	1.1	23.3	23.3	2.7	26.8	26.8	6.7	0.0	1.0	5.3	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.00	1.00		0.65	0.17		0.21
Lane Grp Cap(c), veh/h	50	667	666	86	703	740	170	0	159	499	0	0
V/C Ratio(X)	0.44	0.77	0.77	0.61	0.82	0.82	0.78	0.00	0.13	0.26	0.00	0.00
Avail Cap(c_a), veh/h	389	775	775	389	775	816	486	0	456	756	0	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	43.8	25.2	25.2	42.8	24.9	24.9	40.6	0.0	38.0	25.1	0.0	0.0
Incr Delay (d2), s/veh	2.2	4.6	4.6	2.6	7.2	6.9	3.0	0.0	0.1	0.1	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	0.5	10.4	10.4	1.2	12.3	12.9	3.1	0.0	0.4	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.1	29.8	29.8	45.4	32.0	31.7	43.6	0.0	38.1	25.2	0.0	0.0
LnGrp LOS	D	C	C	D	C	C	D	A	D	C	A	A
Approach Vol, veh/h		1049			1243			153			130	
Approach Delay, s/veh		30.1			32.5			42.8			25.2	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	39.5		13.3	6.6	41.4		30.4				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0				
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s	4.7	25.3		8.7	3.1	28.8		7.3				
Green Ext Time (p_c), s	0.0	8.0		0.2	0.0	7.4		0.5				

Intersection Summary			
HCM 6th Ctrl Delay		31.8	
HCM 6th LOS		C	



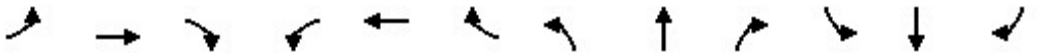
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	683	48	45	578	23	71	149	50	30	166	76
Future Volume (veh/h)	78	683	48	45	578	23	71	149	50	30	166	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	719	49	47	608	23	75	157	14	32	175	47
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	134	1193	81	97	1162	44	128	830	361	74	563	146
Arrive On Green	0.07	0.35	0.35	0.05	0.33	0.33	0.07	0.23	0.23	0.04	0.20	0.20
Sat Flow, veh/h	1781	3376	230	1781	3489	132	1781	3554	1547	1781	2770	720
Grp Volume(v), veh/h	82	378	390	47	309	322	75	157	14	32	110	112
Grp Sat Flow(s),veh/h/ln	1781	1777	1829	1781	1777	1844	1781	1777	1547	1781	1777	1714
Q Serve(g_s), s	2.6	10.4	10.4	1.5	8.3	8.4	2.4	2.1	0.4	1.0	3.1	3.3
Cycle Q Clear(g_c), s	2.6	10.4	10.4	1.5	8.3	8.4	2.4	2.1	0.4	1.0	3.1	3.3
Prop In Lane	1.00		0.13	1.00		0.07	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	134	628	646	97	592	614	128	830	361	74	361	348
V/C Ratio(X)	0.61	0.60	0.60	0.48	0.52	0.52	0.59	0.19	0.04	0.43	0.31	0.32
Avail Cap(c_a), veh/h	901	1349	1388	901	1349	1400	901	2398	1044	901	1199	1156
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	15.7	15.7	27.2	16.0	16.0	26.7	18.2	17.6	27.7	20.1	20.1
Incr Delay (d2), s/veh	4.5	1.3	1.3	3.7	1.0	1.0	1.6	0.0	0.0	1.5	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.0	4.1	0.7	3.0	3.2	1.0	0.8	0.1	0.4	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.1	17.1	17.0	30.9	17.0	17.0	28.3	18.3	17.6	29.2	20.2	20.3
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	C	C
Approach Vol, veh/h		850			678			246			254	
Approach Delay, s/veh		18.4			17.9			21.3			21.4	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	26.4	8.3	17.4	8.4	25.1	6.5	19.2
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	3.5	12.4	4.4	5.3	4.6	10.4	3.0	4.1
Green Ext Time (p_c), s	0.1	8.0	0.1	0.8	0.2	5.8	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Notes

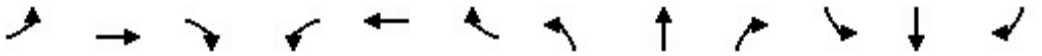
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	593	64	14	531	14	45	29	11	15	45	68
Future Volume (veh/h)	64	593	64	14	531	14	45	29	11	15	45	68
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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	67	624	64	15	559	14	47	31	1	16	47	23
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	1514	155	39	1487	37	131	132	4	136	91	44
Arrive On Green	0.07	0.47	0.47	0.02	0.42	0.42	0.07	0.07	0.07	0.08	0.08	0.08
Sat Flow, veh/h	1781	3254	333	1781	3543	89	1781	1802	58	1781	1186	580
Grp Volume(v), veh/h	67	340	348	15	280	293	47	0	32	16	0	70
Grp Sat Flow(s),veh/h/ln	1781	1777	1810	1781	1777	1854	1781	0	1860	1781	0	1766
Q Serve(g_s), s	2.2	7.5	7.6	0.5	6.5	6.5	1.5	0.0	1.0	0.5	0.0	2.3
Cycle Q Clear(g_c), s	2.2	7.5	7.6	0.5	6.5	6.5	1.5	0.0	1.0	0.5	0.0	2.3
Prop In Lane	1.00		0.18	1.00		0.05	1.00		0.03	1.00		0.33
Lane Grp Cap(c), veh/h	120	827	842	39	746	779	131	0	137	136	0	135
V/C Ratio(X)	0.56	0.41	0.41	0.38	0.38	0.38	0.36	0.00	0.23	0.12	0.00	0.52
Avail Cap(c_a), veh/h	299	827	842	299	746	779	1286	0	1343	1286	0	1275
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	26.9	10.5	10.5	28.7	11.9	11.9	26.3	0.0	26.0	25.6	0.0	26.4
Incr Delay (d2), s/veh	1.5	1.5	1.5	2.2	1.4	1.4	0.6	0.0	0.3	0.1	0.0	1.1
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	0.9	2.7	2.7	0.2	2.4	2.5	0.6	0.0	0.4	0.2	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	12.0	12.0	30.9	13.3	13.3	26.9	0.0	26.3	25.8	0.0	27.6
LnGrp LOS	C	B	B	C	B	B	C	A	C	C	A	C
Approach Vol, veh/h		755			588			79			86	
Approach Delay, s/veh		13.5			13.8			26.7			27.2	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	33.1		10.0	9.4	30.4		9.8				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.0	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	2.5	9.6		4.3	4.2	8.5		3.5				
Green Ext Time (p_c), s	0.0	3.5		0.2	0.0	2.9		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		15.1	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	781	45	30	699	0	39	5	28	0	10	6
Future Volume (veh/h)	6	781	45	30	699	0	39	5	28	0	10	6
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		0.99	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	7	849	49	33	760	0	42	5	2	0	11	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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	20	1552	90	81	1737	0	110	78	31	0	66	0
Arrive On Green	0.01	0.45	0.45	0.05	0.49	0.00	0.06	0.06	0.06	0.00	0.04	0.00
Sat Flow, veh/h	1781	3414	197	1781	3647	0	1781	1265	506	0	1870	0
Grp Volume(v), veh/h	7	442	456	33	760	0	42	0	7	0	11	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1834	1781	1777	0	1781	0	1771	0	1870	0
Q Serve(g_s), s	0.2	7.9	7.9	0.8	6.1	0.0	1.0	0.0	0.2	0.0	0.3	0.0
Cycle Q Clear(g_c), s	0.2	7.9	7.9	0.8	6.1	0.0	1.0	0.0	0.2	0.0	0.3	0.0
Prop In Lane	1.00		0.11	1.00		0.00	1.00		0.29	0.00		0.00
Lane Grp Cap(c), veh/h	20	808	834	81	1737	0	110	0	109	0	66	0
V/C Ratio(X)	0.35	0.55	0.55	0.41	0.44	0.00	0.38	0.00	0.06	0.00	0.17	0.00
Avail Cap(c_a), veh/h	812	1620	1673	812	3240	0	1015	0	1009	0	1705	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	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	21.5	8.7	8.7	20.4	7.3	0.0	19.8	0.0	19.4	0.0	20.5	0.0
Incr Delay (d2), s/veh	3.9	0.8	0.8	1.2	0.2	0.0	0.8	0.0	0.1	0.0	0.4	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	0.1	2.5	2.6	0.3	1.8	0.0	0.4	0.0	0.1	0.0	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	9.5	9.5	21.6	7.5	0.0	20.6	0.0	19.5	0.0	21.0	0.0
LnGrp LOS	C	A	A	C	A	A	C	A	B	A	C	A
Approach Vol, veh/h		905			793			49			11	
Approach Delay, s/veh		9.6			8.1			20.4			21.0	
Approach LOS		A			A			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	25.0		7.3	4.5	26.5		5.5				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0				
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s	2.8	9.9		3.0	2.2	8.1		2.3				
Green Ext Time (p_c), s	0.0	10.0		0.1	0.0	8.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		9.3	
HCM 6th LOS		A	

HCM 6th Signalized Intersection Summary
1: O'Hara Ave & Laurel Rd

Cumulative without Project PM

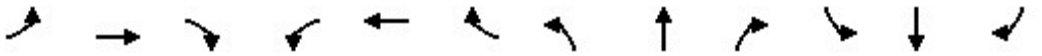
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	969	125	113	589	19	95	233	93	41	255	71
Future Volume (veh/h)	123	969	125	113	589	19	95	233	93	41	255	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	129	1020	127	119	620	19	100	245	45	43	268	58
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	167	1358	169	155	1481	45	129	749	326	81	533	113
Arrive On Green	0.09	0.43	0.43	0.09	0.42	0.42	0.07	0.21	0.21	0.05	0.18	0.18
Sat Flow, veh/h	1781	3174	395	1781	3518	108	1781	3554	1545	1781	2896	614
Grp Volume(v), veh/h	129	571	576	119	313	326	100	245	45	43	162	164
Grp Sat Flow(s),veh/h/ln	1781	1777	1792	1781	1777	1849	1781	1777	1545	1781	1777	1734
Q Serve(g_s), s	5.8	22.2	22.3	5.4	10.2	10.2	4.5	4.8	1.9	1.9	6.7	7.0
Cycle Q Clear(g_c), s	5.8	22.2	22.3	5.4	10.2	10.2	4.5	4.8	1.9	1.9	6.7	7.0
Prop In Lane	1.00		0.22	1.00		0.06	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	167	760	767	155	748	778	129	749	326	81	327	319
V/C Ratio(X)	0.77	0.75	0.75	0.77	0.42	0.42	0.77	0.33	0.14	0.53	0.50	0.51
Avail Cap(c_a), veh/h	651	973	982	651	973	1013	651	1730	753	651	865	844
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	19.8	19.8	36.7	16.7	16.7	37.4	27.5	26.3	38.3	30.1	30.2
Incr Delay (d2), s/veh	7.4	3.0	3.0	7.8	0.5	0.5	3.7	0.1	0.1	2.0	0.4	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	9.2	9.3	2.6	3.9	4.0	2.0	1.9	0.7	0.9	2.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.8	22.8	22.8	44.5	17.3	17.2	41.1	27.6	26.4	40.3	30.5	30.7
LnGrp LOS	D	C	C	D	B	B	D	C	C	D	C	C
Approach Vol, veh/h		1276			758			390			369	
Approach Delay, s/veh		24.9			21.5			30.9			31.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	40.5	10.0	20.5	11.7	40.0	7.8	22.7
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	7.4	24.3	6.5	9.0	7.8	12.2	3.9	6.8
Green Ext Time (p_c), s	0.3	10.9	0.1	1.2	0.3	5.8	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

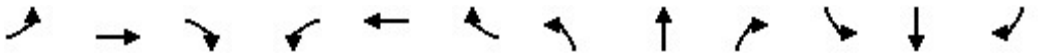
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	933	69	5	609	20	43	28	13	16	39	73
Future Volume (veh/h)	79	933	69	5	609	20	43	28	13	16	39	73
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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	81	962	69	5	628	20	44	29	1	16	40	14
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	133	1640	118	14	1480	47	127	128	4	123	92	32
Arrive On Green	0.07	0.49	0.49	0.01	0.42	0.42	0.07	0.07	0.07	0.07	0.07	0.07
Sat Flow, veh/h	1781	3363	241	1781	3515	112	1781	1797	62	1781	1324	463
Grp Volume(v), veh/h	81	508	523	5	317	331	44	0	30	16	0	54
Grp Sat Flow(s),veh/h/ln	1781	1777	1827	1781	1777	1850	1781	0	1859	1781	0	1787
Q Serve(g_s), s	2.6	12.2	12.2	0.2	7.5	7.5	1.4	0.0	0.9	0.5	0.0	1.7
Cycle Q Clear(g_c), s	2.6	12.2	12.2	0.2	7.5	7.5	1.4	0.0	0.9	0.5	0.0	1.7
Prop In Lane	1.00		0.13	1.00		0.06	1.00		0.03	1.00		0.26
Lane Grp Cap(c), veh/h	133	866	891	14	748	779	127	0	132	123	0	124
V/C Ratio(X)	0.61	0.59	0.59	0.35	0.42	0.42	0.35	0.00	0.23	0.13	0.00	0.44
Avail Cap(c_a), veh/h	300	866	891	300	748	779	1290	0	1347	1290	0	1294
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	26.6	10.9	10.9	29.3	12.1	12.1	26.2	0.0	26.0	25.9	0.0	26.5
Incr Delay (d2), s/veh	1.7	2.9	2.8	5.4	1.8	1.7	0.6	0.0	0.3	0.2	0.0	0.9
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	4.3	4.5	0.1	2.8	2.9	0.6	0.0	0.4	0.2	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	13.8	13.7	34.7	13.9	13.8	26.9	0.0	26.3	26.1	0.0	27.4
LnGrp LOS	C	B	B	C	B	B	C	A	C	C	A	C
Approach Vol, veh/h		1112			653			74			70	
Approach Delay, s/veh		14.8			14.0			26.6			27.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.9	34.3		9.5	9.8	30.4		9.6				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.0	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	2.2	14.2		3.7	4.6	9.5		3.4				
Green Ext Time (p_c), s	0.0	4.6		0.2	0.0	3.3		0.1				

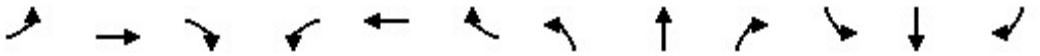
Intersection Summary			
HCM 6th Ctrl Delay		15.5	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1214	24	6	744	3	29	1	3	0	0	1
Future Volume (veh/h)	5	1214	24	6	744	3	29	1	3	0	0	1
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		0.98	0.99		1.00	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	1291	26	6	791	3	31	1	0	0	0	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	2222	45	17	2270	9	78	83	0	0	4	0
Arrive On Green	0.01	0.62	0.62	0.01	0.63	0.63	0.04	0.04	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3562	72	1781	3631	14	1766	1870	0	0	1870	0
Grp Volume(v), veh/h	5	644	673	6	387	407	31	1	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1857	1781	1777	1867	1766	1870	0	0	1870	0
Q Serve(g_s), s	0.1	9.1	9.1	0.1	4.4	4.4	0.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	9.1	9.1	0.1	4.4	4.4	0.7	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.01	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	14	1108	1158	17	1111	1168	78	83	0	0	4	0
V/C Ratio(X)	0.35	0.58	0.58	0.35	0.35	0.35	0.40	0.01	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	838	1672	1747	838	1672	1757	1039	1100	0	0	1760	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	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	21.0	4.7	4.7	20.9	3.8	3.8	19.8	19.4	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	5.2	0.7	0.7	4.4	0.3	0.3	1.2	0.0	0.0	0.0	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	0.1	1.8	1.8	0.1	0.8	0.9	0.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	5.4	5.4	25.4	4.1	4.1	21.0	19.4	0.0	0.0	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	C	B	A	A	A	A
Approach Vol, veh/h		1322			800			32			0	
Approach Delay, s/veh		5.5			4.2			20.9			0.0	
Approach LOS		A			A			C				

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	31.6		6.5	4.3	31.7		0.0				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0				
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s	2.1	11.1		2.7	2.1	6.4		0.0				
Green Ext Time (p_c), s	0.0	15.4		0.0	0.0	8.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		5.2	
HCM 6th LOS		A	



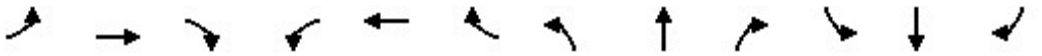
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	548	61	255	805	114	74	344	119	61	482	167
Future Volume (veh/h)	271	548	61	255	805	114	74	344	119	61	482	167
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	311	630	65	293	925	125	85	395	86	70	554	171
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	344	1147	118	326	1078	146	108	898	395	90	645	198
Arrive On Green	0.19	0.35	0.35	0.18	0.34	0.34	0.06	0.25	0.25	0.05	0.24	0.24
Sat Flow, veh/h	1781	3246	334	1781	3139	424	1781	3554	1565	1781	2658	817
Grp Volume(v), veh/h	311	344	351	293	524	526	85	395	86	70	370	355
Grp Sat Flow(s),veh/h/ln	1781	1777	1803	1781	1777	1786	1781	1777	1565	1781	1777	1699
Q Serve(g_s), s	20.0	18.2	18.3	18.9	32.2	32.2	5.5	11.0	5.1	4.6	23.3	23.5
Cycle Q Clear(g_c), s	20.0	18.2	18.3	18.9	32.2	32.2	5.5	11.0	5.1	4.6	23.3	23.5
Prop In Lane	1.00		0.19	1.00		0.24	1.00		1.00	1.00		0.48
Lane Grp Cap(c), veh/h	344	628	637	326	610	614	108	898	395	90	431	412
V/C Ratio(X)	0.91	0.55	0.55	0.90	0.86	0.86	0.78	0.44	0.22	0.77	0.86	0.86
Avail Cap(c_a), veh/h	456	682	692	456	682	685	456	1212	534	456	606	579
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.3	30.4	30.4	46.9	35.8	35.8	54.3	36.8	34.7	55.0	42.5	42.5
Incr Delay (d2), s/veh	17.7	1.1	1.1	16.1	10.4	10.4	4.6	0.1	0.1	5.2	6.4	7.1
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	10.5	8.0	8.1	9.6	15.2	15.3	2.6	4.7	1.9	2.2	10.8	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.0	31.5	31.5	63.0	46.2	46.2	59.0	37.0	34.8	60.2	48.9	49.6
LnGrp LOS	E	C	C	E	D	D	E	D	C	E	D	D
Approach Vol, veh/h		1006			1343			566			795	
Approach Delay, s/veh		41.6			49.9			39.9			50.2	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.4	46.9	11.1	33.9	26.6	45.7	9.9	35.0
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	20.9	20.3	7.5	25.5	22.0	34.2	6.6	13.0
Green Ext Time (p_c), s	0.6	6.5	0.1	2.6	0.6	6.1	0.1	1.7

Intersection Summary	
HCM 6th Ctrl Delay	46.2
HCM 6th LOS	D

Notes

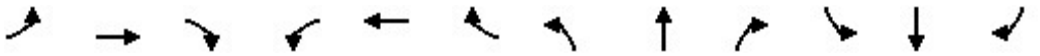
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	593	57	42	860	19	107	82	42	32	136	147
Future Volume (veh/h)	64	593	57	42	860	19	107	82	42	32	136	147
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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	75	698	63	49	1012	21	126	96	33	38	160	142
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	1142	103	91	1190	25	185	138	47	374	192	170
Arrive On Green	0.06	0.35	0.35	0.05	0.33	0.33	0.10	0.10	0.10	0.21	0.21	0.21
Sat Flow, veh/h	1781	3296	297	1781	3560	74	1781	1331	457	1781	914	811
Grp Volume(v), veh/h	75	376	385	49	505	528	126	0	129	38	0	302
Grp Sat Flow(s),veh/h/ln	1781	1777	1817	1781	1777	1857	1781	0	1788	1781	0	1724
Q Serve(g_s), s	3.1	13.1	13.1	2.0	19.8	19.8	5.1	0.0	5.2	1.3	0.0	12.5
Cycle Q Clear(g_c), s	3.1	13.1	13.1	2.0	19.8	19.8	5.1	0.0	5.2	1.3	0.0	12.5
Prop In Lane	1.00		0.16	1.00		0.04	1.00		0.26	1.00		0.47
Lane Grp Cap(c), veh/h	113	616	629	91	594	621	185	0	185	374	0	362
V/C Ratio(X)	0.66	0.61	0.61	0.54	0.85	0.85	0.68	0.00	0.70	0.10	0.00	0.83
Avail Cap(c_a), veh/h	238	616	629	238	594	621	1024	0	1028	1024	0	992
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	34.2	20.3	20.3	34.6	23.1	23.1	32.3	0.0	32.4	23.9	0.0	28.3
Incr Delay (d2), s/veh	2.5	4.5	4.4	1.8	14.2	13.7	1.7	0.0	1.8	0.0	0.0	2.0
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	1.3	5.7	5.8	0.9	9.7	10.1	2.2	0.0	2.2	0.5	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.7	24.7	24.7	36.4	37.4	36.8	34.0	0.0	34.1	23.9	0.0	30.3
LnGrp LOS	D	C	C	D	D	D	C	A	C	C	A	C
Approach Vol, veh/h		836			1082			255			340	
Approach Delay, s/veh		25.8			37.1			34.1			29.6	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.2	31.3		21.1	10.1	30.4		13.1				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.0	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	4.0	15.1		14.5	5.1	21.8		7.2				
Green Ext Time (p_c), s	0.0	3.1		1.2	0.0	1.8		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			32.0									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	768	107	46	1003	2	108	6	94	18	66	30
Future Volume (veh/h)	18	768	107	46	1003	2	108	6	94	18	66	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	948	132	57	1238	2	133	7	14	22	81	27
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	1185	165	89	1461	2	169	53	106	84	308	103
Arrive On Green	0.03	0.38	0.38	0.05	0.40	0.40	0.10	0.10	0.10	0.29	0.29	0.29
Sat Flow, veh/h	1781	3123	435	1781	3640	6	1781	555	1111	293	1080	360
Grp Volume(v), veh/h	22	539	541	57	604	636	133	0	21	130	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1780	1781	1777	1869	1781	0	1666	1733	0	0
Q Serve(g_s), s	1.1	25.2	25.2	2.9	28.7	28.7	6.8	0.0	1.1	5.4	0.0	0.0
Cycle Q Clear(g_c), s	1.1	25.2	25.2	2.9	28.7	28.7	6.8	0.0	1.1	5.4	0.0	0.0
Prop In Lane	1.00		0.24	1.00		0.00	1.00		0.67	0.17		0.21
Lane Grp Cap(c), veh/h	50	674	676	89	713	750	169	0	158	495	0	0
V/C Ratio(X)	0.44	0.80	0.80	0.64	0.85	0.85	0.79	0.00	0.13	0.26	0.00	0.00
Avail Cap(c_a), veh/h	383	764	766	383	764	804	479	0	448	745	0	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	44.5	25.7	25.7	43.4	25.3	25.3	41.2	0.0	38.6	25.7	0.0	0.0
Incr Delay (d2), s/veh	2.3	5.9	5.9	2.9	8.8	8.4	3.0	0.0	0.1	0.1	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	0.5	11.5	11.5	1.4	13.5	14.1	3.1	0.0	0.4	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	31.6	31.7	46.3	34.1	33.7	44.2	0.0	38.7	25.8	0.0	0.0
LnGrp LOS	D	C	C	D	C	C	D	A	D	C	A	A
Approach Vol, veh/h		1102			1297			154			130	
Approach Delay, s/veh		32.0			34.5			43.4			25.8	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	40.4		13.4	6.6	42.4		30.6				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0				
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s	4.9	27.2		8.8	3.1	30.7		7.4				
Green Ext Time (p_c), s	0.0	7.6		0.2	0.0	6.6		0.5				

Intersection Summary			
HCM 6th Ctrl Delay		33.5	
HCM 6th LOS		C	

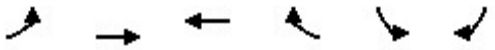
Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	38	0	21	0	674	34	54	672	0
Future Vol, veh/h	0	0	0	38	0	21	0	674	34	54	672	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	44	0	24	0	775	39	62	772	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1284	1710	386	1305	1691	407	-	0	0	814	0	0
Stage 1	896	896	-	795	795	-	-	-	-	-	-	-
Stage 2	388	814	-	510	896	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	122	90	612	118	92	593	0	-	-	809	-	-
Stage 1	301	357	-	347	398	-	0	-	-	-	-	-
Stage 2	607	390	-	514	357	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	105	78	612	106	80	593	-	-	-	809	-	-
Mov Cap-2 Maneuver	105	78	-	106	80	-	-	-	-	-	-	-
Stage 1	301	309	-	347	398	-	-	-	-	-	-	-
Stage 2	582	390	-	445	309	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	43.2	0	1.3
HCM LOS	A	E		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	-	-	-	106	593	809	-	-
HCM Lane V/C Ratio	-	-	-	0.412	0.041	0.077	-	-
HCM Control Delay (s)	-	-	0	60.9	11.3	9.8	0.6	-
HCM Lane LOS	-	-	A	F	B	A	A	-
HCM 95th %tile Q(veh)	-	-	-	1.7	0.1	0.2	-	-



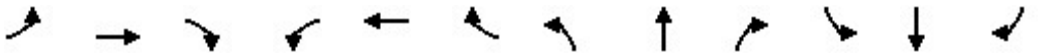
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	78	650	1092	59	73	55
Future Volume (veh/h)	78	650	1092	59	73	55
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	90	747	1255	60	84	54
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	233	1888	1835	88	562	500
Arrive On Green	0.53	0.53	0.53	0.53	0.32	0.32
Sat Flow, veh/h	418	3647	3546	165	1781	1585
Grp Volume(v), veh/h	90	747	645	670	84	54
Grp Sat Flow(s),veh/h/ln	418	1777	1777	1841	1781	1585
Q Serve(g_s), s	11.9	7.3	15.7	15.7	2.0	1.4
Cycle Q Clear(g_c), s	27.6	7.3	15.7	15.7	2.0	1.4
Prop In Lane	1.00			0.09	1.00	1.00
Lane Grp Cap(c), veh/h	233	1888	944	978	562	500
V/C Ratio(X)	0.39	0.40	0.68	0.68	0.15	0.11
Avail Cap(c_a), veh/h	242	1968	984	1019	562	500
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	20.3	8.2	10.1	10.1	14.4	14.2
Incr Delay (d2), s/veh	1.0	0.1	1.9	1.8	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.1	4.8	5.0	0.8	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.3	8.3	12.0	12.0	15.0	14.7
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		837	1315		138	
Approach Delay, s/veh		9.7	12.0		14.9	
Approach LOS		A	B		B	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		35.7		23.0	35.7
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		32.5		18.5	32.5
Max Q Clear Time (g_c+I1), s		29.6		4.0	17.7
Green Ext Time (p_c), s		1.6		0.3	7.4

Intersection Summary	
HCM 6th Ctrl Delay	11.3
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: O'Hara Ave & Laurel Rd

Cumulative Plus Project Midday



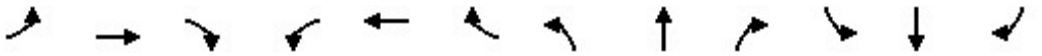
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	723	48	82	659	41	71	168	68	47	169	88
Future Volume (veh/h)	118	723	48	82	659	41	71	168	68	47	169	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	124	761	49	86	694	40	75	177	18	49	178	50
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	165	1222	79	132	1167	67	124	748	325	98	536	146
Arrive On Green	0.09	0.36	0.36	0.07	0.34	0.34	0.07	0.21	0.21	0.05	0.20	0.20
Sat Flow, veh/h	1781	3390	218	1781	3411	196	1781	3554	1545	1781	2740	744
Grp Volume(v), veh/h	124	399	411	86	361	373	75	177	18	49	113	115
Grp Sat Flow(s),veh/h/ln	1781	1777	1831	1781	1777	1831	1781	1777	1545	1781	1777	1707
Q Serve(g_s), s	4.3	11.6	11.6	2.9	10.5	10.5	2.6	2.6	0.6	1.7	3.4	3.6
Cycle Q Clear(g_c), s	4.3	11.6	11.6	2.9	10.5	10.5	2.6	2.6	0.6	1.7	3.4	3.6
Prop In Lane	1.00		0.12	1.00		0.11	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	165	640	660	132	608	626	124	748	325	98	347	334
V/C Ratio(X)	0.75	0.62	0.62	0.65	0.59	0.60	0.60	0.24	0.06	0.50	0.33	0.34
Avail Cap(c_a), veh/h	852	1276	1314	852	1276	1314	852	2268	986	852	1134	1089
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	16.5	16.5	28.2	17.0	17.0	28.3	20.6	19.8	28.8	21.7	21.7
Incr Delay (d2), s/veh	6.7	1.4	1.4	5.3	1.3	1.3	1.8	0.1	0.0	1.5	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.5	4.6	1.3	3.9	4.0	1.1	1.0	0.2	0.7	1.3	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	17.9	17.9	33.5	18.4	18.3	30.1	20.6	19.8	30.3	21.9	22.0
LnGrp LOS	C	B	B	C	B	B	C	C	B	C	C	C
Approach Vol, veh/h		934			820			270			277	
Approach Delay, s/veh		20.1			19.9			23.2			23.4	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.7	28.0	8.4	17.7	9.8	26.8	7.4	18.6
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	4.9	13.6	4.6	5.6	6.3	12.5	3.7	4.6
Green Ext Time (p_c), s	0.2	8.5	0.1	0.8	0.3	7.0	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	20.8
HCM 6th LOS	C

Notes

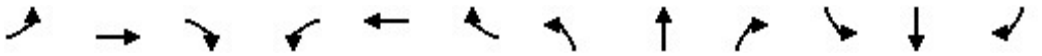
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	654	70	14	593	14	51	29	11	15	45	80
Future Volume (veh/h)	76	654	70	14	593	14	51	29	11	15	45	80
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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	688	71	15	624	14	54	31	1	16	47	26
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	131	1516	156	39	1474	33	135	137	4	137	87	48
Arrive On Green	0.07	0.47	0.47	0.02	0.41	0.41	0.08	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	1781	3252	335	1781	3553	80	1781	1802	58	1781	1132	626
Grp Volume(v), veh/h	80	376	383	15	312	326	54	0	32	16	0	73
Grp Sat Flow(s),veh/h/ln	1781	1777	1810	1781	1777	1856	1781	0	1860	1781	0	1758
Q Serve(g_s), s	2.6	8.6	8.6	0.5	7.5	7.5	1.7	0.0	1.0	0.5	0.0	2.4
Cycle Q Clear(g_c), s	2.6	8.6	8.6	0.5	7.5	7.5	1.7	0.0	1.0	0.5	0.0	2.4
Prop In Lane	1.00		0.19	1.00		0.04	1.00		0.03	1.00		0.36
Lane Grp Cap(c), veh/h	131	829	844	39	737	770	135	0	141	137	0	136
V/C Ratio(X)	0.61	0.45	0.45	0.38	0.42	0.42	0.40	0.00	0.23	0.12	0.00	0.54
Avail Cap(c_a), veh/h	296	829	844	296	737	770	1271	0	1327	1271	0	1254
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	27.1	10.9	10.9	29.1	12.5	12.5	26.5	0.0	26.2	25.9	0.0	26.8
Incr Delay (d2), s/veh	1.7	1.8	1.8	2.2	1.8	1.7	0.7	0.0	0.3	0.1	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.1	3.1	0.2	2.8	2.9	0.7	0.0	0.4	0.2	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.8	12.7	12.6	31.3	14.3	14.2	27.2	0.0	26.5	26.0	0.0	28.0
LnGrp LOS	C	B	B	C	B	B	C	A	C	C	A	C
Approach Vol, veh/h		839			653			86			89	
Approach Delay, s/veh		14.2			14.6			26.9			27.7	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	33.5		10.0	9.8	30.4		10.0				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.0	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	2.5	10.6		4.4	4.6	9.5		3.7				
Green Ext Time (p_c), s	0.0	3.8		0.2	0.0	3.2		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			15.7									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	855	45	36	786	0	39	5	34	0	10	6
Future Volume (veh/h)	6	855	45	36	786	0	39	5	34	0	10	6
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		0.99	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	7	929	49	39	854	0	42	5	3	0	11	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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	20	1624	86	91	1823	0	109	67	40	0	66	0
Arrive On Green	0.01	0.47	0.47	0.05	0.51	0.00	0.06	0.06	0.06	0.00	0.04	0.00
Sat Flow, veh/h	1781	3433	181	1781	3647	0	1781	1089	653	0	1870	0
Grp Volume(v), veh/h	7	481	497	39	854	0	42	0	8	0	11	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1837	1781	1777	0	1781	0	1742	0	1870	0
Q Serve(g_s), s	0.2	9.1	9.1	1.0	7.2	0.0	1.1	0.0	0.2	0.0	0.3	0.0
Cycle Q Clear(g_c), s	0.2	9.1	9.1	1.0	7.2	0.0	1.1	0.0	0.2	0.0	0.3	0.0
Prop In Lane	1.00		0.10	1.00		0.00	1.00		0.38	0.00		0.00
Lane Grp Cap(c), veh/h	20	841	869	91	1823	0	109	0	107	0	66	0
V/C Ratio(X)	0.35	0.57	0.57	0.43	0.47	0.00	0.38	0.00	0.07	0.00	0.17	0.00
Avail Cap(c_a), veh/h	764	1524	1576	764	3048	0	955	0	934	0	1604	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	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	22.9	8.9	8.9	21.5	7.3	0.0	21.0	0.0	20.6	0.0	21.8	0.0
Incr Delay (d2), s/veh	3.9	0.9	0.8	1.2	0.3	0.0	0.8	0.0	0.1	0.0	0.4	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	0.1	2.9	3.0	0.4	2.1	0.0	0.4	0.0	0.1	0.0	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	9.8	9.7	22.7	7.6	0.0	21.9	0.0	20.8	0.0	22.3	0.0
LnGrp LOS	C	A	A	C	A	A	C	A	C	A	C	A
Approach Vol, veh/h		985			893			50			11	
Approach Delay, s/veh		9.9			8.2			21.7			22.3	
Approach LOS		A			A			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	27.2		7.5	4.5	29.0		5.6				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0				
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s	3.0	11.1		3.1	2.2	9.2		2.3				
Green Ext Time (p_c), s	0.0	10.9		0.1	0.0	10.2		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		9.5	
HCM 6th LOS		A	

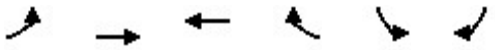
Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	63	0	35	0	249	50	81	241	0
Future Vol, veh/h	0	0	0	63	0	35	0	249	50	81	241	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	66	0	37	0	262	53	85	254	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	555	739	127	586	713	158	-	0	0	315	0	0
Stage 1	424	424	-	289	289	-	-	-	-	-	-	-
Stage 2	131	315	-	297	424	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	414	344	900	394	356	859	0	-	-	1242	-	-
Stage 1	578	585	-	694	672	-	0	-	-	-	-	-
Stage 2	859	654	-	687	585	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	372	316	900	370	328	859	-	-	-	1242	-	-
Mov Cap-2 Maneuver	372	316	-	370	328	-	-	-	-	-	-	-
Stage 1	578	538	-	694	672	-	-	-	-	-	-	-
Stage 2	822	654	-	632	538	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	14.2	0	2.2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	-	-	-	370	859	1242	-	-
HCM Lane V/C Ratio	-	-	-	0.179	0.043	0.069	-	-
HCM Control Delay (s)	-	-	0	16.8	9.4	8.1	0.2	-
HCM Lane LOS	-	-	A	C	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0.6	0.1	0.2	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	116	722	638	87	122	92
Future Volume (veh/h)	116	722	638	87	122	92
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	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	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	122	760	672	68	128	39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	424	1925	1765	178	549	489
Arrive On Green	0.54	0.54	0.54	0.54	0.31	0.31
Sat Flow, veh/h	719	3647	3352	329	1781	1585
Grp Volume(v), veh/h	122	760	366	374	128	39
Grp Sat Flow(s),veh/h/ln	719	1777	1777	1811	1781	1585
Q Serve(g_s), s	7.1	7.5	7.1	7.2	3.2	1.0
Cycle Q Clear(g_c), s	14.2	7.5	7.1	7.2	3.2	1.0
Prop In Lane	1.00			0.18	1.00	1.00
Lane Grp Cap(c), veh/h	424	1925	962	981	549	489
V/C Ratio(X)	0.29	0.39	0.38	0.38	0.23	0.08
Avail Cap(c_a), veh/h	424	1925	962	981	549	489
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	12.1	8.0	7.9	7.9	15.5	14.7
Incr Delay (d2), s/veh	1.7	0.6	1.1	1.1	1.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.2	2.3	2.3	1.3	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.8	8.6	9.1	9.1	16.5	15.0
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h		882	740		167	
Approach Delay, s/veh		9.3	9.1		16.1	
Approach LOS		A	A		B	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			37.0		23.0	37.0
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			32.5		18.5	32.5
Max Q Clear Time (g_c+I1), s			16.2		5.2	9.2
Green Ext Time (p_c), s			5.4		0.4	4.4

Intersection Summary		
HCM 6th Ctrl Delay	9.9	
HCM 6th LOS	A	

HCM 6th Signalized Intersection Summary
1: O'Hara Ave & Laurel Rd

Cumulative Plus Project PM

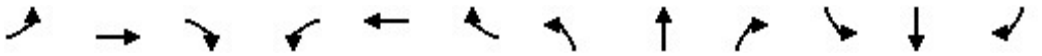
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	1009	125	151	670	37	95	252	111	58	259	83
Future Volume (veh/h)	163	1009	125	151	670	37	95	252	111	58	259	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	172	1062	127	159	705	37	100	265	63	61	273	67
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	1350	161	199	1424	75	129	719	313	93	515	124
Arrive On Green	0.12	0.42	0.42	0.11	0.41	0.41	0.07	0.20	0.20	0.05	0.18	0.18
Sat Flow, veh/h	1781	3191	381	1781	3431	180	1781	3554	1545	1781	2820	677
Grp Volume(v), veh/h	172	591	598	159	365	377	100	265	63	61	170	170
Grp Sat Flow(s),veh/h/ln	1781	1777	1795	1781	1777	1834	1781	1777	1545	1781	1777	1720
Q Serve(g_s), s	8.4	25.7	25.7	7.8	13.5	13.5	4.9	5.7	3.0	3.0	7.7	8.0
Cycle Q Clear(g_c), s	8.4	25.7	25.7	7.8	13.5	13.5	4.9	5.7	3.0	3.0	7.7	8.0
Prop In Lane	1.00		0.21	1.00		0.10	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	213	752	759	199	737	761	129	719	313	93	324	314
V/C Ratio(X)	0.81	0.79	0.79	0.80	0.49	0.50	0.78	0.37	0.20	0.65	0.52	0.54
Avail Cap(c_a), veh/h	599	896	905	599	896	925	599	1592	692	599	796	771
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	22.3	22.3	38.7	19.2	19.2	40.7	30.7	29.6	41.5	33.0	33.1
Incr Delay (d2), s/veh	7.1	4.4	4.5	7.3	0.7	0.7	3.8	0.1	0.1	2.9	0.5	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	11.1	11.2	3.7	5.3	5.5	2.2	2.4	1.1	1.4	3.3	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	26.7	26.7	46.0	20.0	19.9	44.5	30.8	29.7	44.4	33.5	33.6
LnGrp LOS	D	C	C	D	B	B	D	C	C	D	C	C
Approach Vol, veh/h		1361			901			428			401	
Approach Delay, s/veh		29.1			24.5			33.8			35.2	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	43.2	10.4	21.7	14.7	42.4	8.7	23.5
Change Period (Y+Rc), s	4.0	5.4	4.0	* 5.4	4.0	* 5.4	4.0	5.4
Max Green Setting (Gmax), s	30.0	45.0	30.0	* 40	30.0	* 45	30.0	40.0
Max Q Clear Time (g_c+I1), s	9.8	27.7	6.9	10.0	10.4	15.5	5.0	7.7
Green Ext Time (p_c), s	0.4	10.0	0.1	1.3	0.4	6.9	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	29.2
HCM 6th LOS	C

Notes

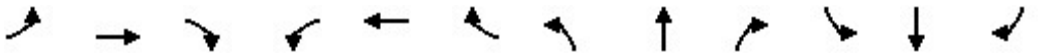
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	994	75	5	671	20	49	28	13	16	39	85
Future Volume (veh/h)	91	994	75	5	671	20	49	28	13	16	39	85
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		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	94	1025	75	5	692	20	51	29	1	16	40	16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	141	1638	120	14	1470	42	132	133	5	124	89	36
Arrive On Green	0.08	0.49	0.49	0.01	0.42	0.42	0.07	0.07	0.07	0.07	0.07	0.07
Sat Flow, veh/h	1781	3357	246	1781	3527	102	1781	1797	62	1781	1271	508
Grp Volume(v), veh/h	94	542	558	5	348	364	51	0	30	16	0	56
Grp Sat Flow(s),veh/h/ln	1781	1777	1826	1781	1777	1852	1781	0	1859	1781	0	1779
Q Serve(g_s), s	3.1	13.5	13.5	0.2	8.5	8.5	1.6	0.0	0.9	0.5	0.0	1.8
Cycle Q Clear(g_c), s	3.1	13.5	13.5	0.2	8.5	8.5	1.6	0.0	0.9	0.5	0.0	1.8
Prop In Lane	1.00		0.13	1.00		0.06	1.00		0.03	1.00		0.29
Lane Grp Cap(c), veh/h	141	867	891	14	741	772	132	0	138	124	0	124
V/C Ratio(X)	0.67	0.63	0.63	0.35	0.47	0.47	0.39	0.00	0.22	0.13	0.00	0.45
Avail Cap(c_a), veh/h	297	867	891	297	741	772	1277	0	1333	1277	0	1275
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	26.8	11.3	11.3	29.6	12.7	12.7	26.5	0.0	26.1	26.2	0.0	26.8
Incr Delay (d2), s/veh	2.0	3.4	3.3	5.4	2.1	2.1	0.7	0.0	0.3	0.2	0.0	0.9
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	1.3	4.9	5.0	0.1	3.2	3.3	0.7	0.0	0.4	0.2	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	14.7	14.6	35.0	14.8	14.8	27.2	0.0	26.4	26.4	0.0	27.7
LnGrp LOS	C	B	B	C	B	B	C	A	C	C	A	C
Approach Vol, veh/h		1194			717			81			72	
Approach Delay, s/veh		15.8			14.9			26.9			27.4	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.9	34.7		9.6	10.1	30.4		9.8				
Change Period (Y+Rc), s	5.4	5.4		5.4	5.4	5.4		5.4				
Max Green Setting (Gmax), s	10.0	25.0		43.0	10.0	25.0		43.0				
Max Q Clear Time (g_c+I1), s	2.2	15.5		3.8	5.1	10.5		3.6				
Green Ext Time (p_c), s	0.0	4.6		0.2	0.0	3.5		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			16.3									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1288	24	12	831	3	29	1	9	0	0	1
Future Volume (veh/h)	5	1288	24	12	831	3	29	1	9	0	0	1
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		0.98	0.99		1.00	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	1370	26	13	884	3	31	1	0	0	0	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	2255	43	36	2340	8	78	82	0	0	4	0
Arrive On Green	0.01	0.63	0.63	0.02	0.64	0.64	0.04	0.04	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3567	68	1781	3632	12	1765	1870	0	0	1870	0
Grp Volume(v), veh/h	5	682	714	13	432	455	31	1	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1858	1781	1777	1868	1765	1870	0	0	1870	0
Q Serve(g_s), s	0.1	10.3	10.3	0.3	5.2	5.2	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	10.3	10.3	0.3	5.2	5.2	0.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.01	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	14	1123	1175	36	1145	1203	78	82	0	0	4	0
V/C Ratio(X)	0.35	0.61	0.61	0.36	0.38	0.38	0.40	0.01	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	790	1576	1648	790	1576	1657	979	1037	0	0	1659	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	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	22.2	4.9	5.0	21.8	3.8	3.8	21.0	20.6	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	5.3	0.8	0.7	2.3	0.3	0.3	1.2	0.0	0.0	0.0	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	0.1	2.1	2.2	0.1	1.0	1.0	0.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	5.7	5.7	24.1	4.1	4.1	22.2	20.6	0.0	0.0	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	C	C	A	A	A	A
Approach Vol, veh/h		1401			900			32			0	
Approach Delay, s/veh		5.8			4.3			22.2			0.0	
Approach LOS		A			A			C				

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	33.6		6.6	4.4	34.1		0.0				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.0				
Max Green Setting (Gmax), s	20.0	40.0		25.0	20.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s	2.3	12.3		2.8	2.1	7.2		0.0				
Green Ext Time (p_c), s	0.0	16.2		0.0	0.0	9.6		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		5.4	
HCM 6th LOS		A	

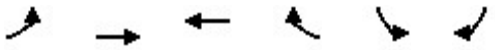
Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	63	0	35	0	374	50	80	337	0
Future Vol, veh/h	0	0	0	63	0	35	0	374	50	80	337	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	67	0	37	0	398	53	85	359	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	728	980	180	775	954	226	-	0	0	451	0	0
Stage 1	529	529	-	425	425	-	-	-	-	-	-	-
Stage 2	199	451	-	350	529	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	311	248	832	288	257	777	0	-	-	1106	-	-
Stage 1	501	525	-	578	585	-	0	-	-	-	-	-
Stage 2	784	569	-	639	525	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	274	224	832	267	232	777	-	-	-	1106	-	-
Mov Cap-2 Maneuver	274	224	-	267	232	-	-	-	-	-	-	-
Stage 1	501	475	-	578	585	-	-	-	-	-	-	-
Stage 2	746	569	-	578	475	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	18.3	0	1.9
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	-	-	-	267	777	1106	-	-
HCM Lane V/C Ratio	-	-	-	0.251	0.048	0.077	-	-
HCM Control Delay (s)	-	-	0	22.9	9.9	8.5	0.3	-
HCM Lane LOS	-	-	A	C	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	1	0.2	0.2	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	115	1063	714	86	122	92
Future Volume (veh/h)	115	1063	714	86	122	92
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	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	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	121	1119	752	71	128	43
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	373	1827	1687	159	582	518
Arrive On Green	0.51	0.51	0.51	0.51	0.33	0.33
Sat Flow, veh/h	665	3647	3375	310	1781	1585
Grp Volume(v), veh/h	121	1119	407	416	128	43
Grp Sat Flow(s),veh/h/ln	665	1777	1777	1815	1781	1585
Q Serve(g_s), s	7.9	12.6	8.2	8.2	2.9	1.1
Cycle Q Clear(g_c), s	16.1	12.6	8.2	8.2	2.9	1.1
Prop In Lane	1.00			0.17	1.00	1.00
Lane Grp Cap(c), veh/h	373	1827	913	933	582	518
V/C Ratio(X)	0.32	0.61	0.45	0.45	0.22	0.08
Avail Cap(c_a), veh/h	648	3297	1649	1684	582	518
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	13.8	9.8	8.7	8.7	13.8	13.2
Incr Delay (d2), s/veh	0.5	0.3	0.3	0.3	0.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.6	2.4	2.4	1.2	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.3	10.1	9.0	9.0	14.7	13.5
LnGrp LOS	B	B	A	A	B	B
Approach Vol, veh/h		1240	823		171	
Approach Delay, s/veh		10.5	9.0		14.4	
Approach LOS		B	A		B	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		33.6		23.0	33.6
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		52.5		18.5	52.5
Max Q Clear Time (g_c+I1), s		18.1		4.9	10.2
Green Ext Time (p_c), s		11.0		0.4	5.6

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Appendix C: Signal Warrants

FEHR PEERS

Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	AM
Major Street	O'Hara Avenue
Minor Street	Driveway #2

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	54	0	38
Through	560	552	0	0
Right	34	0	0	21
Total	594	606	0	59

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	38.3
Approach with Worst Case Delay	WB
Total Vehicles on Approach	59

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing Plus Project	**0.6**	**59**	**1,259**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

Major Street	O'Hara Avenue
Minor Street	Driveway #2

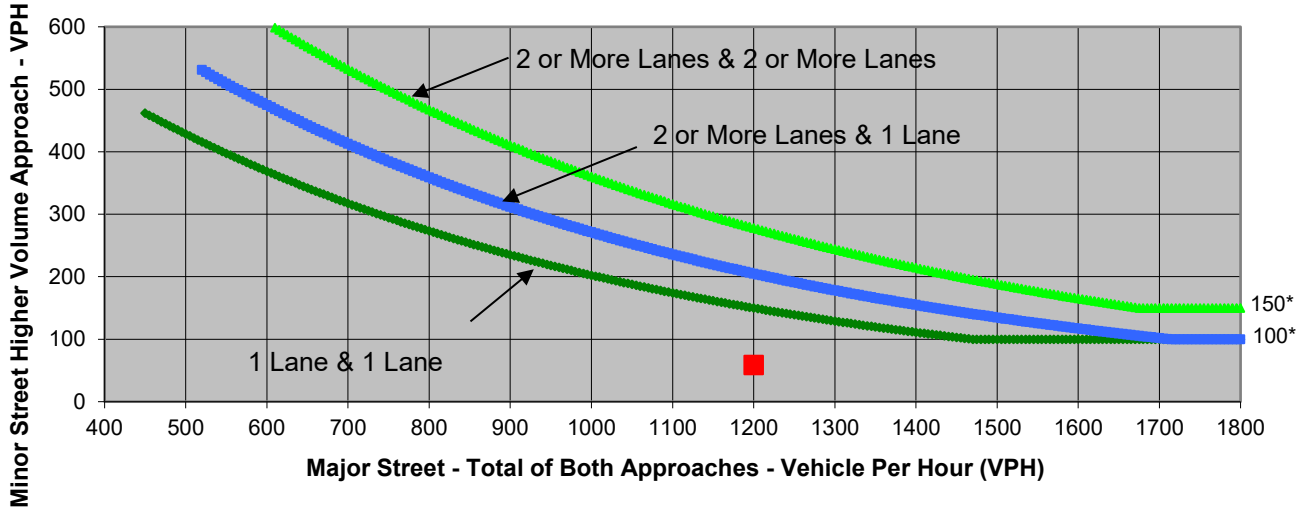
Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left		54		38
Through	560	552		
Right	34			21
Total	594	606	0	59

Major Street Direction

x	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	O'Hara Avenue	Driveway #2	
Number of Approach Lanes	**2**	**2**	**NO**
Traffic Volume (VPH) *	**1,200**	**59**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	O'Hara Avenue
Minor Street	Driveway #2

Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	Midday

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	81	0	63
Through	198	186	0	0
Right	50	0	0	35
Total	248	267	0	98

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	15
Approach with Worst Case Delay	WB
Total Vehicles on Approach	98

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing Plus Project	**0.4**	**98**	**613**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Not Met**	**Not Met**	**Not Met**
Warrant Met	**NO**		

FEHR PEERS

Major Street	O'Hara Avenue
Minor Street	Driveway #2

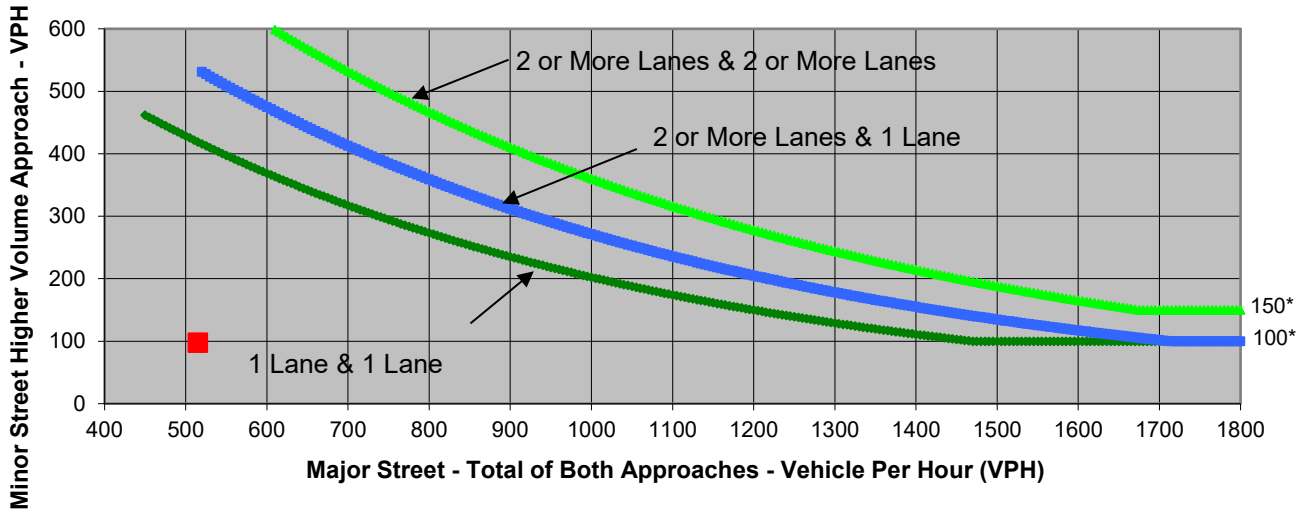
Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	Midday

Turn Movement Volumes

	NB	SB	EB	WB
Left		81		63
Through	198	186		
Right	50			35
Total	248	267	0	98

Major Street Direction

x	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	O'Hara Avenue	Driveway #2	
Number of Approach Lanes	**2**	**2**	**NO**
Traffic Volume (VPH) *	**515**	**98**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	O'Hara Avenue
Minor Street	Driveway #2

Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	80	0	63
Through	298	263	0	0
Right	50	0	0	35
Total	348	343	0	98

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	18.7
Approach with Worst Case Delay	WB
Total Vehicles on Approach	98

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing Plus Project	**0.5**	**98**	**789**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

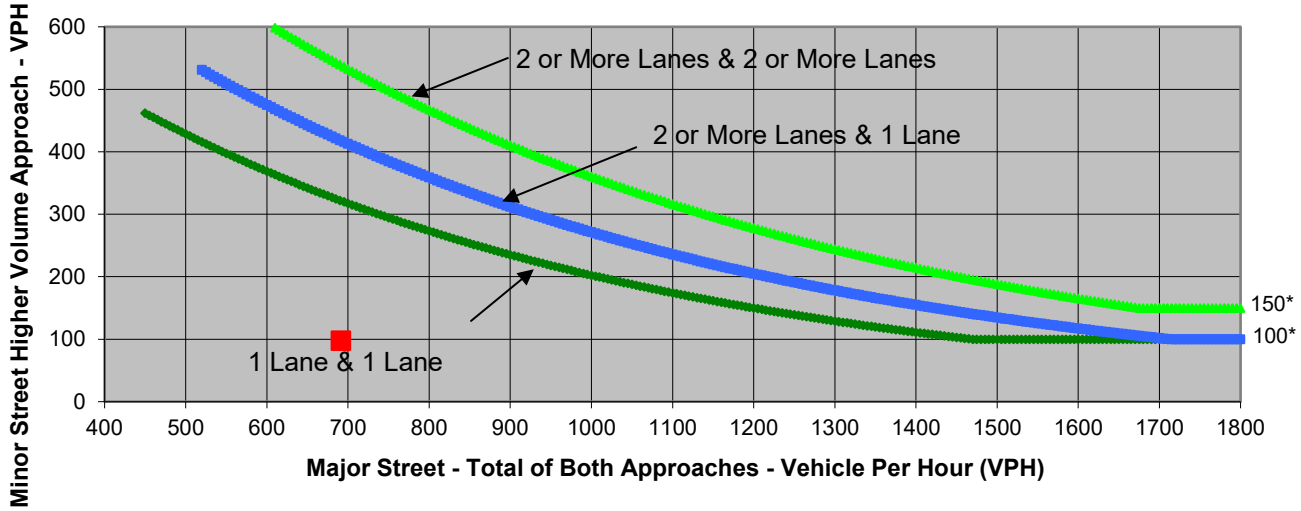
Major Street	O'Hara Avenue	Project	Oakley Regency Center
Minor Street	Driveway #2	Scenario	Existing Plus Project
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left		80		63
Through	298	263		
Right	50			35
Total	348	343	0	98

Major Street Direction

x	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	O'Hara Avenue	Driveway #2	
Number of Approach Lanes	**2**	**2**	**NO**
Traffic Volume (VPH) *	**691**	**98**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	AM
Major Street	Laurel Road
Minor Street	Driveway #4

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	73	78	0
Through	0	0	519	894
Right	0	55	0	59
Total	0	128	597	953

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	209.8
Approach with Worst Case Delay	SB
Total Vehicles on Approach	128

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing Plus Project	**7.5**	**128**	**1,678**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

Major Street	Laurel Road
Minor Street	Driveway #4

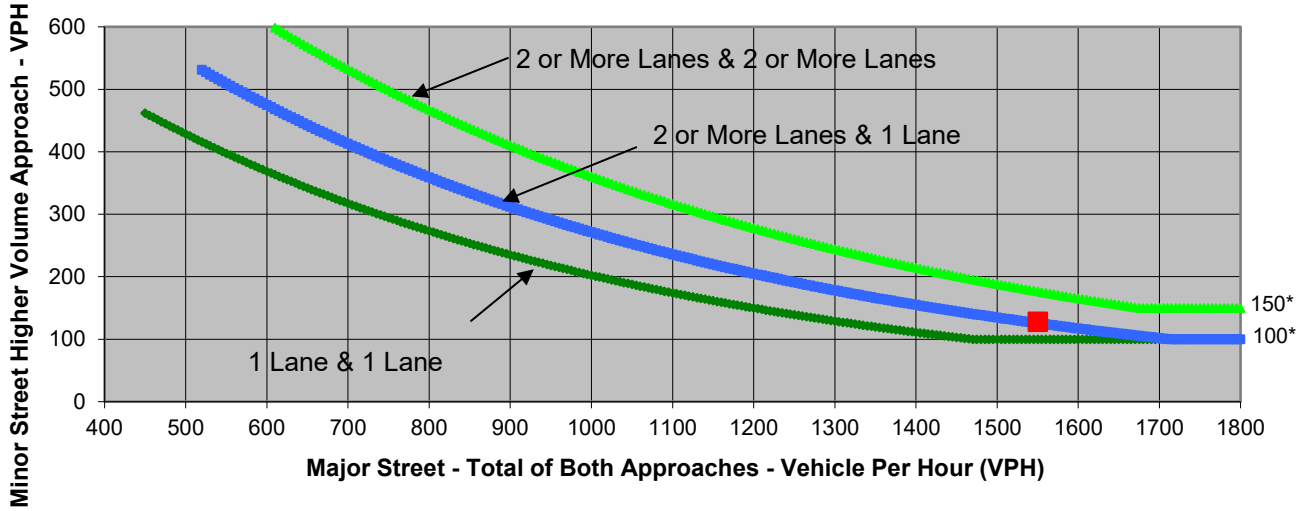
Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left		73	78	
Through			519	894
Right		55		59
Total	0	128	597	953

Major Street Direction

	North/South
x	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Laurel Road	Driveway #4	
Number of Approach Lanes	**2**	**2**	**NO**
Traffic Volume (VPH) *	**1,550**	**128**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	Midday
Major Street	Laurel Road
Minor Street	Driveway #4

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	122	116	0
Through	0	0	569	509
Right	0	92	0	87
Total	0	214	685	596

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	104.9
Approach with Worst Case Delay	SB
Total Vehicles on Approach	214

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing Plus Project	**6.2**	**214**	**1,495**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Met**	**Met**	**Met**
Warrant Met	**YES**		

FEHR PEERS

Major Street	Laurel Road
Minor Street	Driveway #4

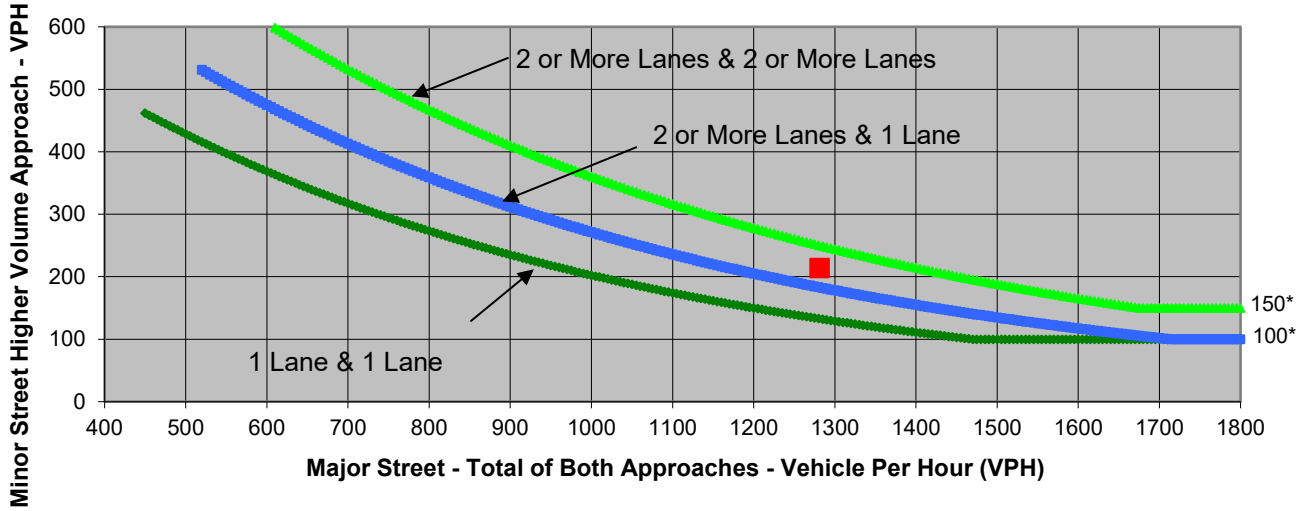
Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	Midday

Turn Movement Volumes

	NB	SB	EB	WB
Left		122	116	
Through			569	509
Right		92		87
Total	0	214	685	596

Major Street Direction

	North/South
x	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Laurel Road	Driveway #4	
Number of Approach Lanes	**2**	**2**	**NO**
Traffic Volume (VPH) *	**1,281**	**214**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	PM
Major Street	Laurel Road
Minor Street	Driveway #4

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	122	115	0
Through	0	0	842	570
Right	0	92	0	86
Total	0	214	957	656

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	295.9
Approach with Worst Case Delay	SB
Total Vehicles on Approach	214

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing Plus Project	**17.6**	**214**	**1,827**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Met**	**Met**	**Met**
Warrant Met	**YES**		

FEHR PEERS

Major Street	Laurel Road
Minor Street	Driveway #4

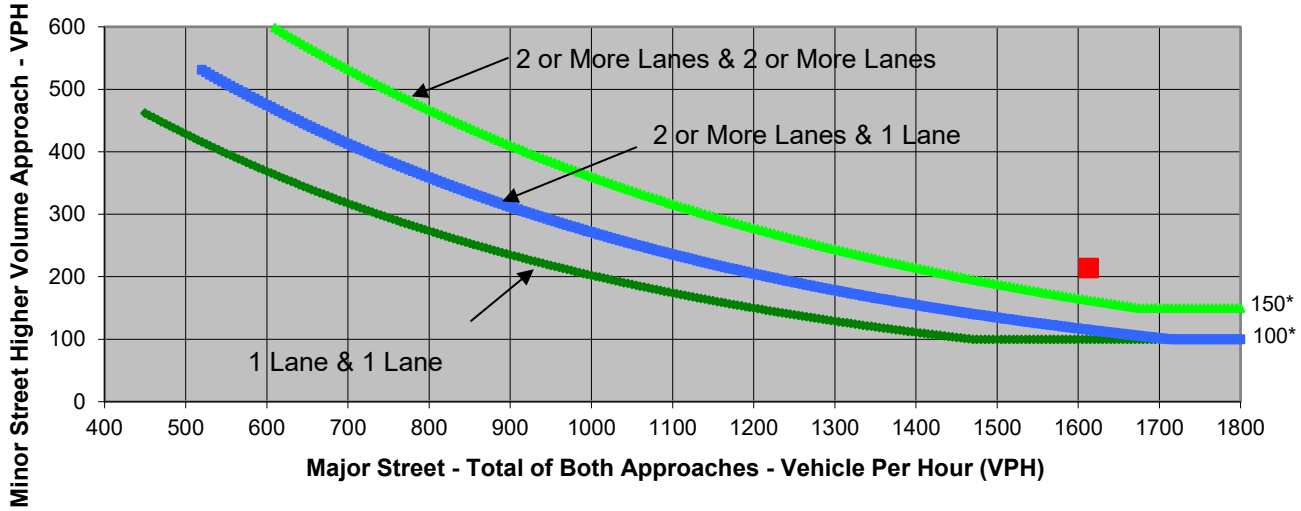
Project	Oakley Regency Center
Scenario	Existing Plus Project
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left		122	115	
Through			842	570
Right		92		86
Total	0	214	957	656

Major Street Direction

	North/South
x	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Laurel Road	Driveway #4	
Number of Approach Lanes	**2**	**2**	**YES**
Traffic Volume (VPH) *	**1,613**	**214**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	AM

Major Street	O'Hara Avenue
Minor Street	Driveway #2

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	54	0	38
Through	674	672	0	0
Right	34	0	0	21
Total	708	726	0	59

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	60.9
Approach with Worst Case Delay	WB
Total Vehicles on Approach	59

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Cumulative Plus Project	**1**	**59**	**1,493**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

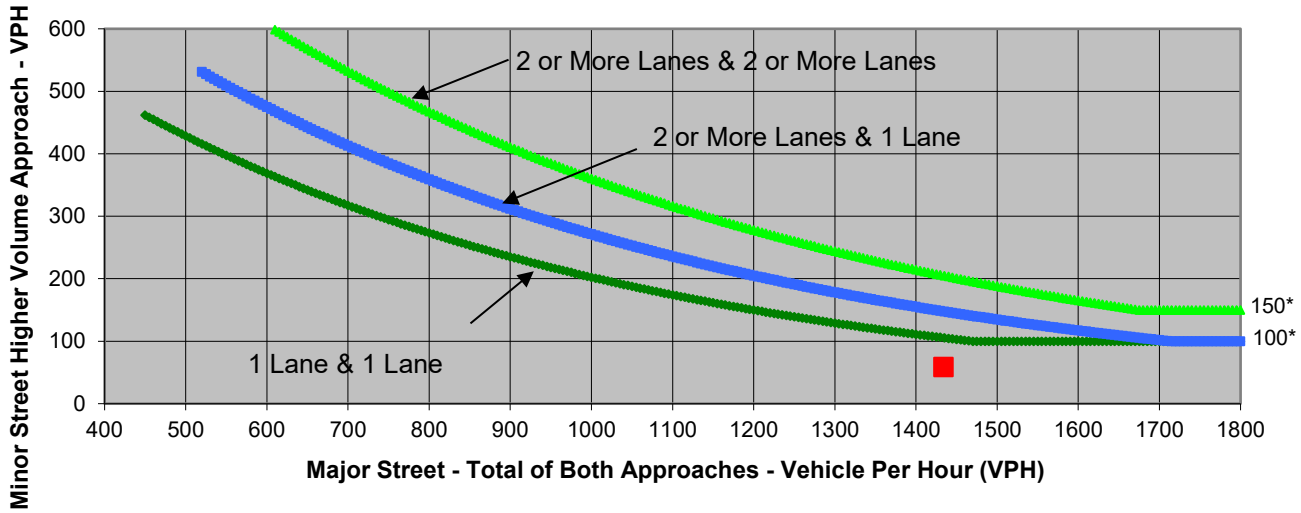
Major Street	O'Hara Avenue	Project	Oakley Regency Center
Minor Street	Driveway #2	Scenario	Cumulative Plus Project
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left		54		38
Through	674	672		
Right	34			21
Total	708	726	0	59

Major Street Direction

x	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	O'Hara Avenue	Driveway #2	
Number of Approach Lanes	**2**	**2**	**NO**
Traffic Volume (VPH) *	**1,434**	**59**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	O'Hara Avenue
Minor Street	Driveway #2

Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	Midday

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	81	0	63
Through	249	241	0	0
Right	50	0	0	35
Total	299	322	0	98

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	16.8
Approach with Worst Case Delay	WB
Total Vehicles on Approach	98

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Cumulative Plus Project	**0.5**	**98**	**719**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

Major Street	O'Hara Avenue
Minor Street	Driveway #2

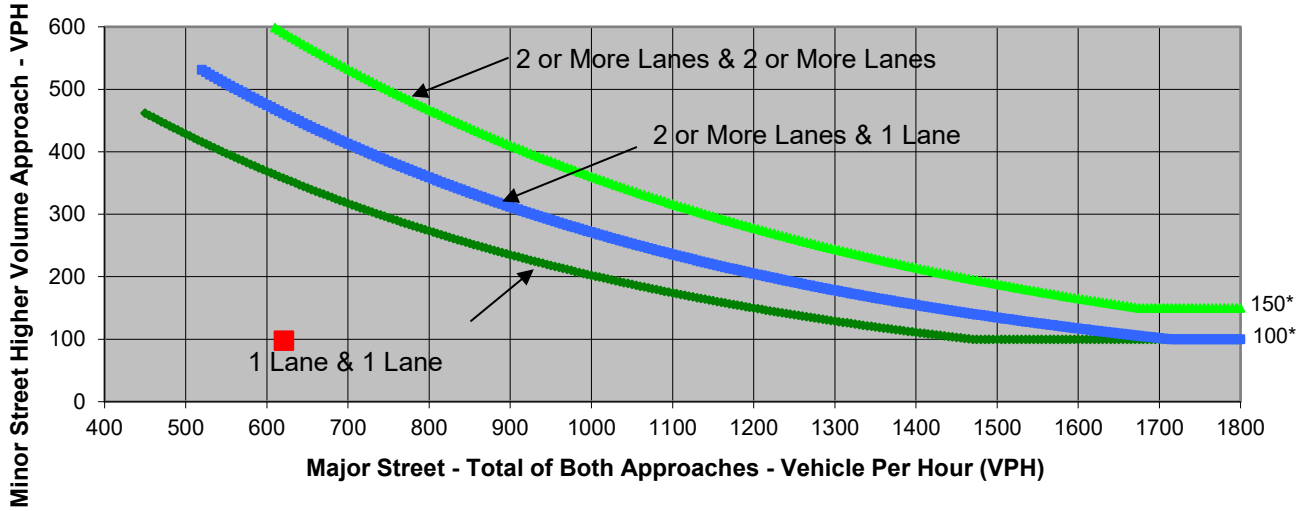
Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	Midday

Turn Movement Volumes

	NB	SB	EB	WB
Left		81		63
Through	249	241		
Right	50			35
Total	299	322	0	98

Major Street Direction

x	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	O'Hara Avenue	Driveway #2	
Number of Approach Lanes	**2**	**2**	**NO**
Traffic Volume (VPH) *	**621**	**98**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	PM

Major Street	O'Hara Avenue
Minor Street	Driveway #2

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	80	0	63
Through	374	337	0	0
Right	50	0	0	35
Total	424	417	0	98

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	22.9
Approach with Worst Case Delay	WB
Total Vehicles on Approach	98

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Cumulative Plus Project	**0.6**	**98**	**939**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

Major Street	O'Hara Avenue
Minor Street	Driveway #2

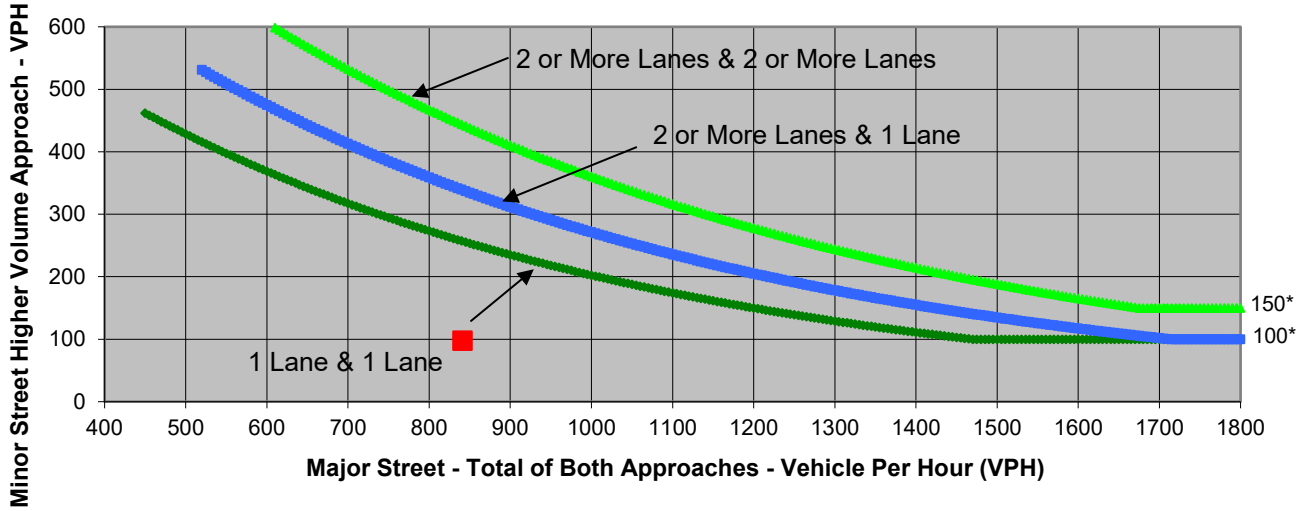
Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left		80		63
Through	374	337		
Right	50			35
Total	424	417	0	98

Major Street Direction

x	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	O'Hara Avenue	Driveway #2	
Number of Approach Lanes	**2**	**2**	**NO**
Traffic Volume (VPH) *	**841**	**98**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	AM

Major Street	Laurel Road
Minor Street	Driveway #4

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	73	78	0
Through	0	0	650	1,092
Right	0	55	0	59
Total	0	128	728	1,151

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	508.7
Approach with Worst Case Delay	SB
Total Vehicles on Approach	128

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Cumulative Plus Project	**18.1**	**128**	**2,007**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

Major Street	Laurel Road
Minor Street	Driveway #4

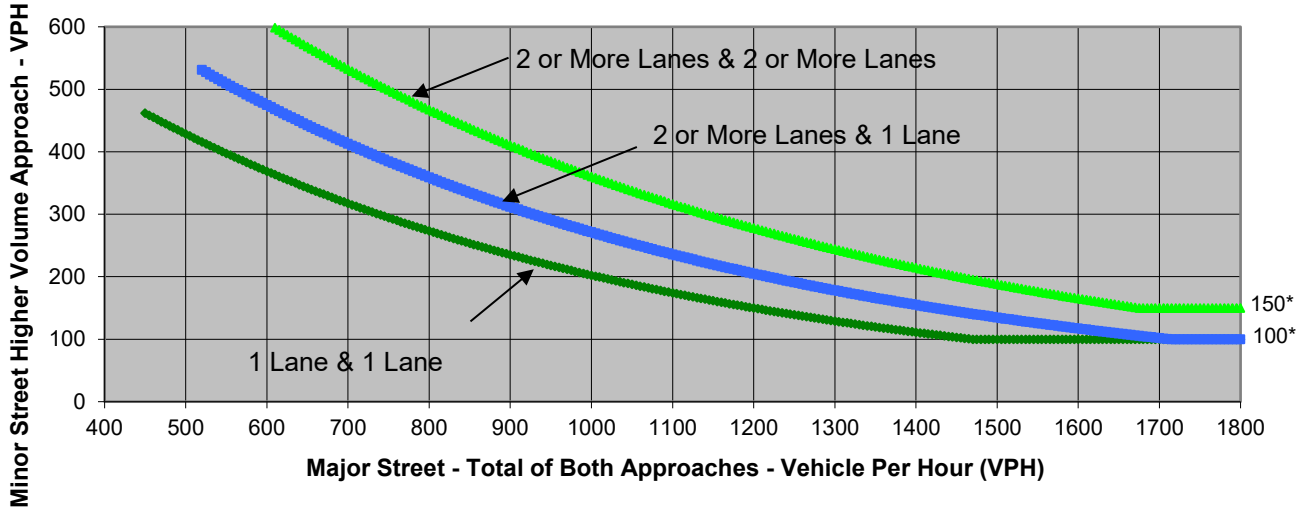
Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left		73	78	
Through			650	1,092
Right		55		59
Total	0	128	728	1,151

Major Street Direction

	North/South
x	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Laurel Road	Driveway #4	
Number of Approach Lanes	**2**	**2**	**NO**
Traffic Volume (VPH) *	**1,879**	**128**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	Midday

Major Street	Laurel Road
Minor Street	Driveway #4

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	122	116	0
Through	0	0	722	638
Right	0	92	0	87
Total	0	214	838	725

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	263.2
Approach with Worst Case Delay	SB
Total Vehicles on Approach	214

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Cumulative Plus Project	**15.6**	**214**	**1,777**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Met**	**Met**	**Met**
Warrant Met	**YES**		

FEHR PEERS

Major Street	Laurel Road
Minor Street	Driveway #4

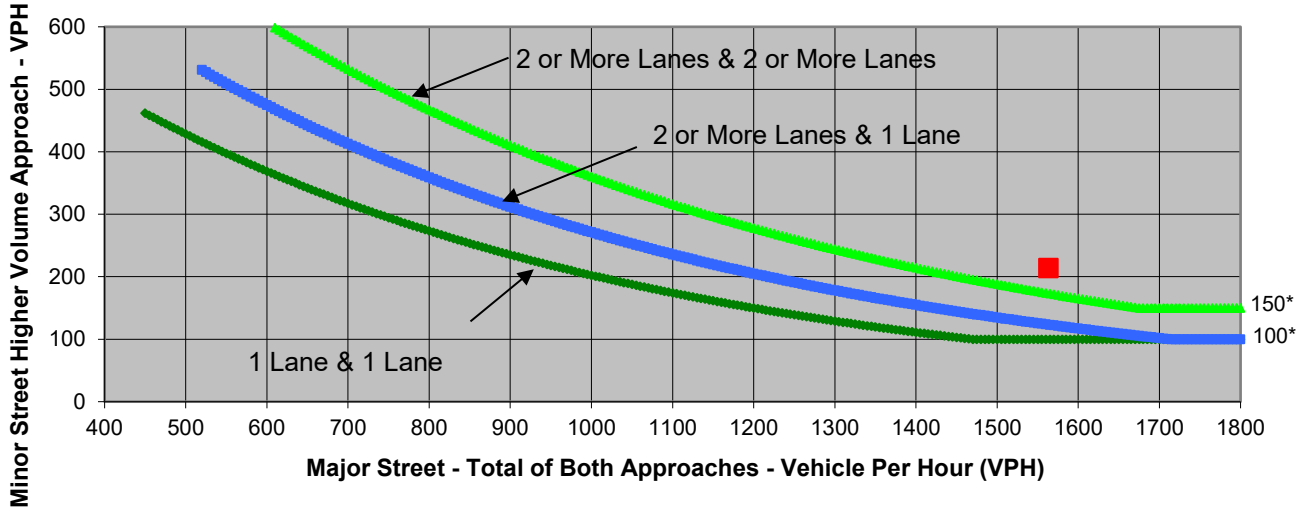
Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	Midday

Turn Movement Volumes

	NB	SB	EB	WB
Left		122	116	
Through			722	638
Right		92		87
Total	0	214	838	725

Major Street Direction

	North/South
x	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Laurel Road	Driveway #4	
Number of Approach Lanes	**2**	**2**	**YES**
Traffic Volume (VPH) *	**1,563**	**214**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Laurel Road
Minor Street	Driveway #4

Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	122	115	0
Through	0	0	1,063	714
Right	0	92	0	86
Total	0	214	1,178	800

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	716.8
Approach with Worst Case Delay	SB
Total Vehicles on Approach	214

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Cumulative Plus Project	**42.6**	**214**	**2,192**
Limiting Value	**5**	**150**	**650**
Condition Satisfied?	**Met**	**Met**	**Met**
Warrant Met	**YES**		

FEHR PEERS

Major Street	Laurel Road
Minor Street	Driveway #4

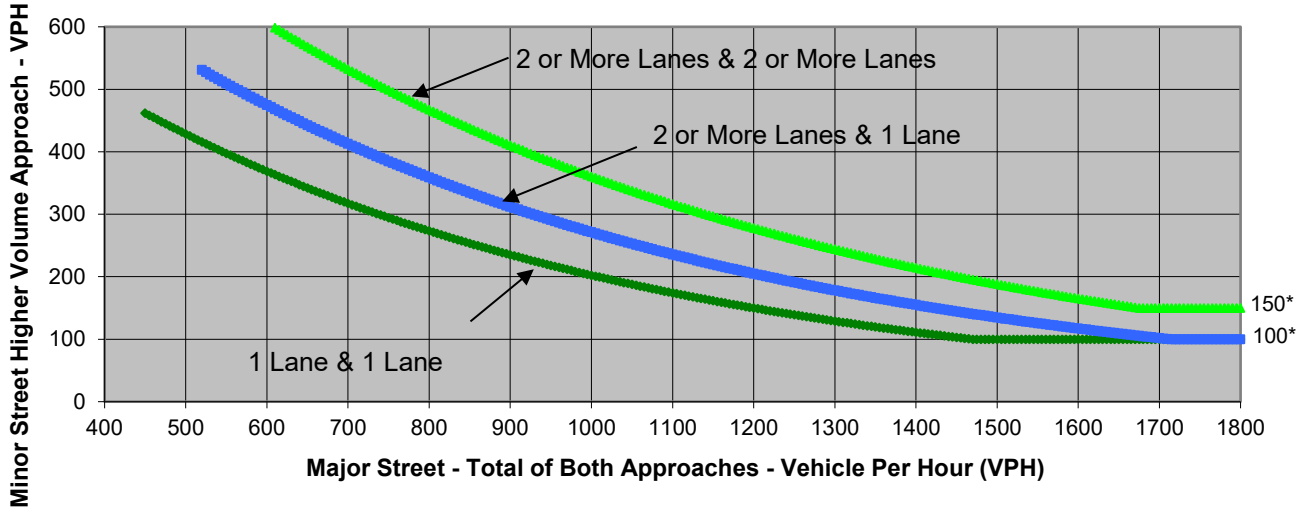
Project	Oakley Regency Center
Scenario	Cumulative Plus Project
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left		122	115	
Through			1,063	714
Right		92		86
Total	0	214	1,178	800

Major Street Direction

	North/South
x	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Laurel Road	Driveway #4	
Number of Approach Lanes	**2**	**2**	**YES**
Traffic Volume (VPH) *	**1,978**	**214**	

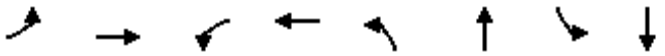
* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Appendix D: Queue Length Calculations



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	238	561	225	832	71	318	103	51	617
v/c Ratio	0.69	0.48	0.67	0.71	0.46	0.70	0.24	0.38	0.75
Control Delay	56.6	32.7	56.8	38.6	65.9	50.3	17.4	65.5	46.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	32.7	56.8	38.6	65.9	50.3	17.4	65.5	46.5
Queue Length 50th (ft)	166	167	157	278	51	218	20	37	217
Queue Length 95th (ft)	292	274	275	428	113	358	69	89	323
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		80		60	180	
Base Capacity (vph)	506	1500	506	1503	506	710	638	506	1315
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.37	0.44	0.55	0.14	0.45	0.16	0.10	0.47

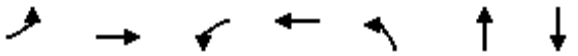
Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	605	41	827	101	121	32	271
v/c Ratio	0.33	0.47	0.25	0.70	0.47	0.52	0.09	0.73
Control Delay	41.8	22.9	41.1	29.4	41.7	37.7	27.4	38.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	22.9	41.1	29.4	41.7	37.7	27.4	38.0
Queue Length 50th (ft)	26	123	19	187	47	48	13	108
Queue Length 95th (ft)	65	207	52	#306	98	103	36	190
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	236	1299	236	1178	1016	1023	1016	1004
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.47	0.17	0.70	0.10	0.12	0.03	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



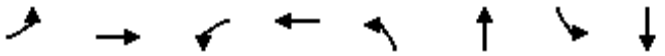
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	19	857	44	992	111	99	118
v/c Ratio	0.14	0.58	0.29	0.62	0.53	0.37	0.30
Control Delay	52.9	27.0	52.8	25.2	53.3	15.6	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	27.0	52.8	25.2	53.3	15.6	29.1
Queue Length 50th (ft)	13	262	29	261	74	4	53
Queue Length 95th (ft)	35	321	63	366	122	42	99
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	428	1675	428	1798	535	542	836
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.51	0.10	0.55	0.21	0.18	0.14

Intersection Summary



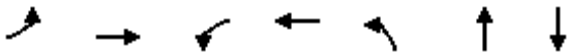
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	65	615	38	505	60	125	42	25	204
v/c Ratio	0.26	0.49	0.17	0.46	0.27	0.21	0.08	0.13	0.25
Control Delay	39.4	22.7	40.6	24.5	40.9	22.3	2.8	42.6	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	22.7	40.6	24.5	40.9	22.3	2.8	42.6	20.5
Queue Length 50th (ft)	24	97	14	80	22	37	0	9	31
Queue Length 95th (ft)	85	235	58	197	81	108	12	44	72
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		80		60	180	
Base Capacity (vph)	923	2394	923	2412	923	1172	998	923	2120
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.26	0.04	0.21	0.07	0.11	0.04	0.03	0.10

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	553	12	459	38	33	13	95
v/c Ratio	0.26	0.25	0.07	0.24	0.19	0.16	0.06	0.39
Control Delay	31.1	9.2	30.3	13.1	30.9	25.2	28.3	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	9.2	30.3	13.1	30.9	25.2	28.3	20.2
Queue Length 50th (ft)	20	52	4	65	14	9	5	15
Queue Length 95th (ft)	54	131	20	116	43	34	20	57
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	307	2200	307	1937	1324	1338	1324	1281
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.25	0.04	0.24	0.03	0.02	0.01	0.07

Intersection Summary



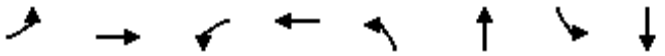
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	5	717	26	608	34	28	14
v/c Ratio	0.02	0.29	0.10	0.23	0.13	0.11	0.04
Control Delay	33.6	11.1	32.0	8.9	31.4	18.1	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	11.1	32.0	8.9	31.4	18.1	18.4
Queue Length 50th (ft)	1	32	6	26	8	1	2
Queue Length 95th (ft)	16	263	44	211	53	30	19
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	813	2861	813	2887	1016	931	1439
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.25	0.03	0.21	0.03	0.03	0.01

Intersection Summary



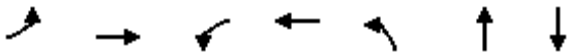
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	103	921	95	512	80	196	78	35	275
v/c Ratio	0.47	0.64	0.45	0.35	0.45	0.45	0.19	0.25	0.42
Control Delay	52.9	27.4	53.0	23.0	56.0	37.2	11.1	55.4	35.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	27.4	53.0	23.0	56.0	37.2	11.1	55.4	35.0
Queue Length 50th (ft)	59	207	55	100	47	115	5	21	78
Queue Length 95th (ft)	137	419	129	214	114	197	43	63	128
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		80		60	180	
Base Capacity (vph)	602	1770	602	1808	602	844	738	602	1560
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.52	0.16	0.28	0.13	0.23	0.11	0.06	0.18

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	826	4	518	35	33	13	92
v/c Ratio	0.31	0.37	0.02	0.29	0.19	0.17	0.07	0.38
Control Delay	31.7	9.8	29.8	14.2	31.1	24.8	28.8	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	9.8	29.8	14.2	31.1	24.8	28.8	18.8
Queue Length 50th (ft)	25	87	2	76	13	9	5	12
Queue Length 95th (ft)	61	203	10	131	40	34	21	53
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	299	2251	299	1810	1290	1299	1290	1241
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.37	0.01	0.29	0.03	0.03	0.01	0.07

Intersection Summary



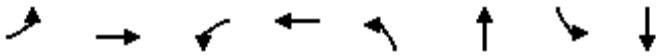
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	4	1053	5	635	24	3	1
v/c Ratio	0.02	0.36	0.03	0.22	0.13	0.02	0.00
Control Delay	36.5	8.9	36.2	7.7	35.4	29.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	8.9	36.2	7.7	35.4	29.3	0.0
Queue Length 50th (ft)	1	0	1	0	7	0	0
Queue Length 95th (ft)	14	402	16	217	42	10	0
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	587	2908	587	2918	734	691	1237
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.36	0.01	0.22	0.03	0.00	0.00

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	264	581	243	879	71	331	113	52	627
v/c Ratio	0.72	0.48	0.71	0.75	0.48	0.74	0.26	0.40	0.77
Control Delay	58.9	33.5	60.1	41.0	69.3	54.4	19.7	68.6	49.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	33.5	60.1	41.0	69.3	54.4	19.7	68.6	49.4
Queue Length 50th (ft)	200	184	186	318	56	250	28	41	243
Queue Length 95th (ft)	324	286	299	461	113	374	79	90	328
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		80		60	180	
Base Capacity (vph)	475	1418	475	1411	475	667	604	475	1236
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.41	0.51	0.62	0.15	0.50	0.19	0.11	0.51

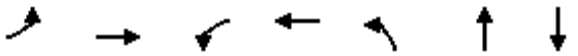
Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	626	41	857	105	121	32	277
v/c Ratio	0.35	0.48	0.26	0.73	0.48	0.51	0.09	0.74
Control Delay	42.5	23.4	41.5	30.6	42.5	37.9	27.4	38.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	23.4	41.5	30.6	42.5	37.9	27.4	38.3
Queue Length 50th (ft)	29	130	20	199	50	48	13	111
Queue Length 95th (ft)	69	216	52	#342	102	103	36	195
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	234	1295	234	1170	1009	1016	1009	995
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.48	0.18	0.73	0.10	0.12	0.03	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



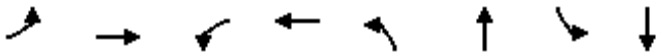
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	19	903	48	1032	111	102	118
v/c Ratio	0.15	0.58	0.33	0.61	0.55	0.38	0.31
Control Delay	53.7	26.6	54.2	24.9	55.1	15.7	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	26.6	54.2	24.9	55.1	15.7	29.7
Queue Length 50th (ft)	13	278	33	276	76	4	55
Queue Length 95th (ft)	36	339	66	385	123	42	99
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	399	1572	399	1705	499	515	781
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.57	0.12	0.61	0.22	0.20	0.15

Intersection Summary



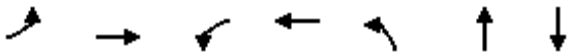
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	107	657	77	611	60	144	61	43	219
v/c Ratio	0.37	0.55	0.31	0.53	0.28	0.29	0.13	0.22	0.27
Control Delay	40.8	26.0	41.8	26.8	43.9	28.3	6.6	44.5	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	26.0	41.8	26.8	43.9	28.3	6.6	44.5	21.0
Queue Length 50th (ft)	44	120	32	113	26	61	0	18	34
Queue Length 95th (ft)	126	269	99	256	84	133	27	66	77
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		80		60	180	
Base Capacity (vph)	857	2261	857	2266	857	1108	948	857	1997
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.29	0.09	0.27	0.07	0.13	0.06	0.05	0.11

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	625	12	525	44	33	13	107
v/c Ratio	0.33	0.29	0.07	0.30	0.24	0.17	0.07	0.44
Control Delay	33.1	10.1	31.1	15.6	32.4	25.4	28.8	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	10.1	31.1	15.6	32.4	25.4	28.8	20.1
Queue Length 50th (ft)	25	61	5	78	17	9	5	16
Queue Length 95th (ft)	63	152	21	138	48	35	20	60
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	285	2148	285	1743	1230	1244	1230	1189
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.29	0.04	0.30	0.04	0.03	0.01	0.09

Intersection Summary



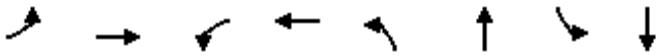
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	5	798	33	702	34	34	14
v/c Ratio	0.02	0.32	0.13	0.27	0.14	0.14	0.04
Control Delay	35.2	11.1	33.0	8.8	32.9	17.6	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	11.1	33.0	8.8	32.9	17.6	19.6
Queue Length 50th (ft)	1	36	8	31	8	1	2
Queue Length 95th (ft)	16	298	54	246	54	34	20
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	783	2823	783	2862	979	897	1418
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.28	0.04	0.25	0.03	0.04	0.01

Intersection Summary



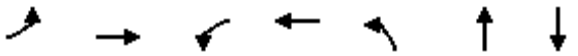
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	145	963	135	617	80	215	97	53	291
v/c Ratio	0.58	0.65	0.56	0.42	0.48	0.58	0.27	0.37	0.45
Control Delay	55.3	29.8	55.6	25.5	60.3	45.5	16.0	59.6	36.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	29.8	55.6	25.5	60.3	45.5	16.0	59.6	36.8
Queue Length 50th (ft)	90	250	83	141	50	136	16	34	85
Queue Length 95th (ft)	183	467	174	276	117	230	63	86	140
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		80		60	180	
Base Capacity (vph)	538	1585	538	1611	538	755	667	538	1391
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.61	0.25	0.38	0.15	0.28	0.15	0.10	0.21

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	77	898	4	582	41	33	13	104
v/c Ratio	0.36	0.41	0.02	0.33	0.22	0.17	0.07	0.43
Control Delay	33.2	11.0	30.5	15.9	32.4	25.0	29.2	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	11.0	30.5	15.9	32.4	25.0	29.2	18.8
Queue Length 50th (ft)	29	97	2	88	16	9	5	12
Queue Length 95th (ft)	70	229	10	153	46	34	21	56
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	285	2173	285	1738	1227	1236	1227	1179
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.41	0.01	0.33	0.03	0.03	0.01	0.09

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	4	1132	12	728	24	10	1
v/c Ratio	0.03	0.39	0.07	0.25	0.15	0.06	0.00
Control Delay	38.2	9.3	38.2	7.7	37.8	24.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	9.3	38.2	7.7	37.8	24.1	0.0
Queue Length 50th (ft)	1	0	4	0	7	0	0
Queue Length 95th (ft)	14	447	27	253	42	17	0
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	533	2931	533	2943	667	605	1170
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.39	0.02	0.25	0.04	0.02	0.00

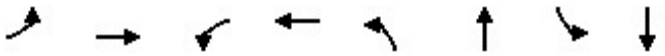
Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	285	672	270	998	85	382	124	61	740
v/c Ratio	0.81	0.56	0.81	0.85	0.59	0.39	0.24	0.50	0.86
Control Delay	71.5	40.2	72.4	51.3	78.8	42.2	7.5	77.7	58.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.5	40.2	72.4	51.3	78.8	42.2	7.5	77.7	58.4
Queue Length 50th (ft)	245	261	234	449	76	151	0	55	327
Queue Length 95th (ft)	#380	351	345	#596	132	200	45	104	404
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		200		200	180	
Base Capacity (vph)	396	1198	396	1178	396	1073	560	396	1035
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.56	0.68	0.85	0.21	0.36	0.22	0.15	0.71

Intersection Summary

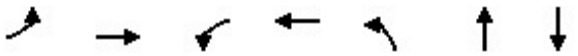
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	68	726	49	991	121	145	38	325
v/c Ratio	0.40	0.59	0.31	0.90	0.51	0.58	0.09	0.78
Control Delay	47.1	28.5	45.5	43.0	44.4	41.6	27.5	41.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	28.5	45.5	43.0	44.4	41.6	27.5	41.1
Queue Length 50th (ft)	35	175	25	271	61	64	16	145
Queue Length 95th (ft)	82	287	63	#488	120	129	41	242
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	221	1222	221	1104	952	959	952	942
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.59	0.22	0.90	0.13	0.15	0.04	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



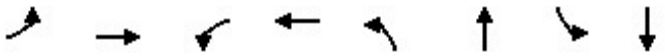
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	22	1027	53	1190	133	118	140
v/c Ratio	0.18	0.70	0.37	0.70	0.62	0.41	0.37
Control Delay	55.1	31.4	56.7	27.9	57.9	14.7	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.1	31.4	56.7	27.9	57.9	14.7	32.8
Queue Length 50th (ft)	15	348	37	350	92	5	69
Queue Length 95th (ft)	40	418	73	481	144	45	118
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	376	1470	376	1699	469	501	735
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.70	0.14	0.70	0.28	0.24	0.19

Intersection Summary



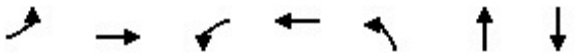
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	82	770	47	632	75	157	53	32	255
v/c Ratio	0.33	0.54	0.23	0.51	0.34	0.16	0.11	0.18	0.33
Control Delay	43.8	23.5	45.3	25.6	45.7	26.2	5.1	47.2	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	23.5	45.3	25.6	45.7	26.2	5.1	47.2	25.4
Queue Length 50th (ft)	36	144	21	118	34	35	0	15	50
Queue Length 95th (ft)	109	314	72	261	102	72	20	56	102
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		200		200	180	
Base Capacity (vph)	820	2209	820	2225	820	2060	929	820	1964
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.35	0.06	0.28	0.09	0.08	0.06	0.04	0.13

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	691	15	574	47	43	16	119
v/c Ratio	0.35	0.36	0.09	0.38	0.26	0.23	0.08	0.50
Control Delay	34.3	11.2	32.1	16.7	33.6	26.4	28.8	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	11.2	32.1	16.7	33.6	26.4	28.8	25.0
Queue Length 50th (ft)	26	73	6	90	18	12	6	25
Queue Length 95th (ft)	65	177	24	157	51	42	23	74
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	267	1922	267	1517	1148	1163	1148	1118
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.36	0.06	0.38	0.04	0.04	0.01	0.11

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	7	898	33	760	42	35	18
v/c Ratio	0.04	0.40	0.16	0.32	0.19	0.16	0.06
Control Delay	38.5	13.4	36.7	10.5	36.4	19.0	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	13.4	36.7	10.5	36.4	19.0	21.5
Queue Length 50th (ft)	2	42	8	34	10	1	3
Queue Length 95th (ft)	20	351	53	273	64	35	22
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	665	2524	665	2596	831	769	1263
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.36	0.05	0.29	0.05	0.05	0.01

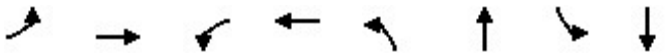
Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	129	1152	119	640	100	245	98	43	343
v/c Ratio	0.58	0.78	0.56	0.43	0.56	0.30	0.23	0.34	0.56
Control Delay	57.7	34.0	57.9	26.1	61.7	36.2	8.1	60.6	41.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.7	34.0	57.9	26.1	61.7	36.2	8.1	60.6	41.4
Queue Length 50th (ft)	80	322	74	147	63	75	0	27	106
Queue Length 95th (ft)	168	#651	159	290	139	121	43	75	168
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		200		200	180	
Base Capacity (vph)	502	1479	502	1509	502	1339	646	502	1306
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.78	0.24	0.42	0.20	0.18	0.15	0.09	0.26

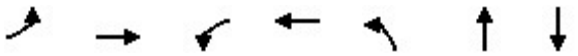
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	1033	5	649	44	42	16	115
v/c Ratio	0.39	0.53	0.03	0.43	0.25	0.22	0.08	0.48
Control Delay	34.4	12.6	31.0	17.2	33.4	25.8	29.4	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	12.6	31.0	17.2	33.4	25.8	29.4	21.8
Queue Length 50th (ft)	31	121	2	104	17	11	6	18
Queue Length 95th (ft)	74	283	12	176	48	40	24	65
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	267	1960	267	1516	1149	1158	1149	1114
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.53	0.02	0.43	0.04	0.04	0.01	0.10

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	5	1317	6	794	31	4	1
v/c Ratio	0.03	0.45	0.04	0.27	0.19	0.03	0.00
Control Delay	39.2	10.2	39.0	8.0	38.7	29.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	10.2	39.0	8.0	38.7	29.0	0.0
Queue Length 50th (ft)	2	0	2	0	11	0	0
Queue Length 95th (ft)	16	#612	18	284	51	11	0
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	520	2932	520	2938	651	603	1147
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.45	0.01	0.27	0.05	0.01	0.00

Intersection Summary

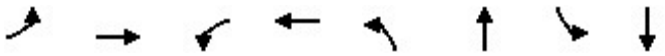
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	311	700	293	1056	85	395	137	70	746
v/c Ratio	0.84	0.60	0.83	0.92	0.60	0.41	0.26	0.55	0.87
Control Delay	73.4	41.9	74.0	58.8	80.1	43.7	7.5	79.6	59.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	41.9	74.0	58.8	80.1	43.7	7.5	79.6	59.8
Queue Length 50th (ft)	272	283	254	489	76	158	0	63	331
Queue Length 95th (ft)	#438	367	#400	#657	132	209	47	115	408
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		200		200	180	
Base Capacity (vph)	387	1179	387	1150	387	1042	556	387	1012
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.59	0.76	0.92	0.22	0.38	0.25	0.18	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

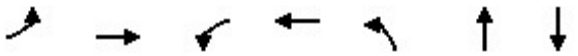


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	765	49	1034	126	145	38	333
v/c Ratio	0.43	0.69	0.31	0.95	0.53	0.58	0.09	0.77
Control Delay	48.1	32.0	46.1	50.8	45.5	41.9	27.5	40.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	32.0	46.1	50.8	45.5	41.9	27.5	40.8
Queue Length 50th (ft)	39	188	25	~295	65	65	16	151
Queue Length 95th (ft)	89	#328	64	#525	125	130	41	247
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	217	1113	217	1085	935	943	935	926
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.69	0.23	0.95	0.13	0.15	0.04	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



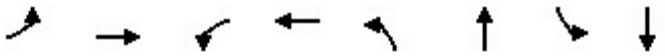
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	22	1080	57	1240	133	123	140
v/c Ratio	0.18	0.73	0.39	0.73	0.62	0.42	0.37
Control Delay	55.3	32.2	57.1	28.7	58.1	14.7	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	32.2	57.1	28.7	58.1	14.7	32.9
Queue Length 50th (ft)	15	371	40	372	93	5	69
Queue Length 95th (ft)	40	444	77	508	144	45	119
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	375	1476	375	1703	469	503	734
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.73	0.15	0.73	0.28	0.24	0.19

Intersection Summary



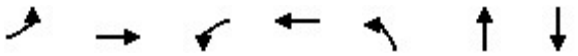
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	124	812	86	737	75	177	72	49	271
v/c Ratio	0.45	0.56	0.38	0.61	0.38	0.24	0.19	0.29	0.39
Control Delay	46.8	26.0	48.1	28.7	50.5	31.7	9.1	51.0	27.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	26.0	48.1	28.7	50.5	31.7	9.1	51.0	27.6
Queue Length 50th (ft)	59	167	42	155	37	44	0	24	56
Queue Length 95th (ft)	156	354	118	328	108	88	37	79	113
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		200		200	180	
Base Capacity (vph)	693	2061	693	2072	693	1847	841	693	1765
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.39	0.12	0.36	0.11	0.10	0.09	0.07	0.15

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	80	762	15	639	54	43	16	131
v/c Ratio	0.39	0.40	0.09	0.43	0.30	0.22	0.08	0.53
Control Delay	35.2	11.7	32.9	17.8	34.6	26.5	29.2	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	11.7	32.9	17.8	34.6	26.5	29.2	24.9
Queue Length 50th (ft)	32	84	6	106	22	12	6	26
Queue Length 95th (ft)	75	202	24	181	57	42	24	78
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	263	1926	263	1500	1134	1148	1134	1102
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.40	0.06	0.43	0.05	0.04	0.01	0.12

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	7	978	39	854	42	42	18
v/c Ratio	0.04	0.42	0.21	0.35	0.22	0.21	0.07
Control Delay	40.0	13.4	38.6	10.5	38.6	18.7	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	13.4	38.6	10.5	38.6	18.7	22.4
Queue Length 50th (ft)	2	47	11	40	12	1	3
Queue Length 95th (ft)	20	394	61	314	64	38	23
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	578	2345	578	2461	723	675	1148
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.42	0.07	0.35	0.06	0.06	0.02

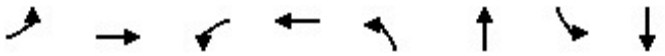
Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	172	1194	159	744	100	265	117	61	360
v/c Ratio	0.65	0.83	0.63	0.52	0.56	0.35	0.27	0.44	0.59
Control Delay	59.0	38.2	59.3	29.5	64.0	39.4	8.4	63.8	43.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	38.2	59.3	29.5	64.0	39.4	8.4	63.8	43.5
Queue Length 50th (ft)	111	368	102	193	66	86	0	40	116
Queue Length 95th (ft)	219	#731	206	364	145	140	48	100	184
Internal Link Dist (ft)		250		225		1031			133
Turn Bay Length (ft)	330		300		200		200	180	
Base Capacity (vph)	486	1433	486	1455	486	1295	640	486	1260
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.83	0.33	0.51	0.21	0.20	0.18	0.13	0.29

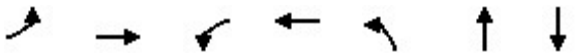
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	1102	5	713	51	42	16	128
v/c Ratio	0.43	0.56	0.03	0.52	0.29	0.22	0.09	0.51
Control Delay	35.3	13.4	31.6	19.2	34.4	25.9	29.8	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	13.4	31.6	19.2	34.4	25.9	29.8	21.5
Queue Length 50th (ft)	37	135	2	121	20	12	6	19
Queue Length 95th (ft)	85	315	12	200	54	41	23	68
Internal Link Dist (ft)		717		1197		1090		1153
Turn Bay Length (ft)	170		125		250		50	
Base Capacity (vph)	261	1972	261	1371	1123	1132	1123	1089
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.56	0.02	0.52	0.05	0.04	0.01	0.12

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	5	1396	13	887	31	11	1
v/c Ratio	0.03	0.50	0.08	0.32	0.19	0.07	0.00
Control Delay	39.2	11.3	39.3	8.8	39.4	23.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	11.3	39.3	8.8	39.4	23.6	0.0
Queue Length 50th (ft)	2	81	5	42	13	0	0
Queue Length 95th (ft)	15	#682	28	325	50	19	0
Internal Link Dist (ft)		1071		238		773	192
Turn Bay Length (ft)	120		100				
Base Capacity (vph)	507	2766	507	2776	633	575	1129
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.50	0.03	0.32	0.05	0.02	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.