San Jose State University, South Campus Multi-level Parking Structure and Sports Field Facility

Initial Study – Mitigated Negative Declaration

prepared by

The Trustees of the California State University
for San Jose State University
One Washington Square
San Jose, California 95192

prepared with the assistance of

Rincon Consultants, Inc.
449 15th Street, Suite 303
Oakland, California 94612

July 2019

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
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Initial Study

1. Project Title

San Jose State University South Campus Multi-level Parking Structure and Sports Field Facility

2. Lead Agency Name and Address

The Trustees of the California State University
400 Golden Shore
Long Beach, California 90802

Locally Represented by:

Chia Tsai, Associate Director of Planning
Planning, Design & Construction
Facilities Development & Operations
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One Washington Square
San Jose, California 95192
Phone: 408-924-8139

3. Purpose and Legal Authority

This document has been prepared to analyze the potential environmental effects of the San Jose State University Parking Structure and Sports Field Project ("proposed project") in order to satisfy the requirements of the California Environmental Quality Act (CEQA) (Pub. Res. Code Section 21000 et seq.) and the *CEQA Guidelines* (14 California Code of Regulations [CCR] 15000 et seq.). CEQA requires that all State and local government agencies consider the environmental consequences of projects for which they have discretionary authority before they approve or implement such projects.

The Initial Study (IS) is a public document used by the decision-making lead agency to determine whether a project may have a significant effect on the environment. In the case of the proposed project, the Board of Trustees of the California State University is the lead agency. If the lead agency finds substantial evidence that any aspect of the project, either alone or in combination with other projects, may have a significant effect on the environment, that agency is required to prepare an Environmental Impact Report (EIR), a supplement to a previously prepared EIR, or a subsequent EIR to analyze the project. If the lead agency finds no substantial evidence that the project or any of its aspects may cause a significant impact on the environment, a Negative Declaration (ND) shall be prepared. If, over the course of the analysis, the project is found to have a significant impact on the environment that can be reduced to a less-than-significant level with the implementation of project-specific mitigation measures, a Mitigated Negative Declaration (MND) shall be prepared.

4. Project Location

The project site is located on the San Jose State University (SJSU) South Campus in the center of the City of San Jose, California (Figure 1). The SJSU South Campus is located to the south of Interstate 280/Joseph P. Sinclair Freeway and to the west of US Highway 101. The South Campus occupies an approximately 53-acre, rectangular-shaped area bordered by East Humboldt Street on the north, East Alma Avenue on the south, South 7th Street on the west, and Senter Road on the east. The proposed project includes a four-level parking structure and adjacent sports field, described below, which would be located adjacent to the east side of South 10th Street, northeast of its intersection with East Alma Avenue, in the southcentral portion of South Campus (Figure 2). The project site occupies 6.7 acres and contains the SJSU running track and the Bud Winter Field. The site also contains gravel and paved areas that are used for parking, which can accommodate approximately 600 vehicles. Parking on the project site is generally used for campus sporting events, including SJSU home football games at Spartan Stadium in the southwestern corner of the South Campus.

5. Description of Project

The proposed project would involve removal of the existing running track and Bud Winter Field, and construction of a new four-story parking structure with an adjacent sports field. The project would meet SJSU's goals of providing on-site athletic facilities for students and members of the surrounding community as well as adequate parking for nearby athletic uses. The project concept plan is plan in Figure 3.

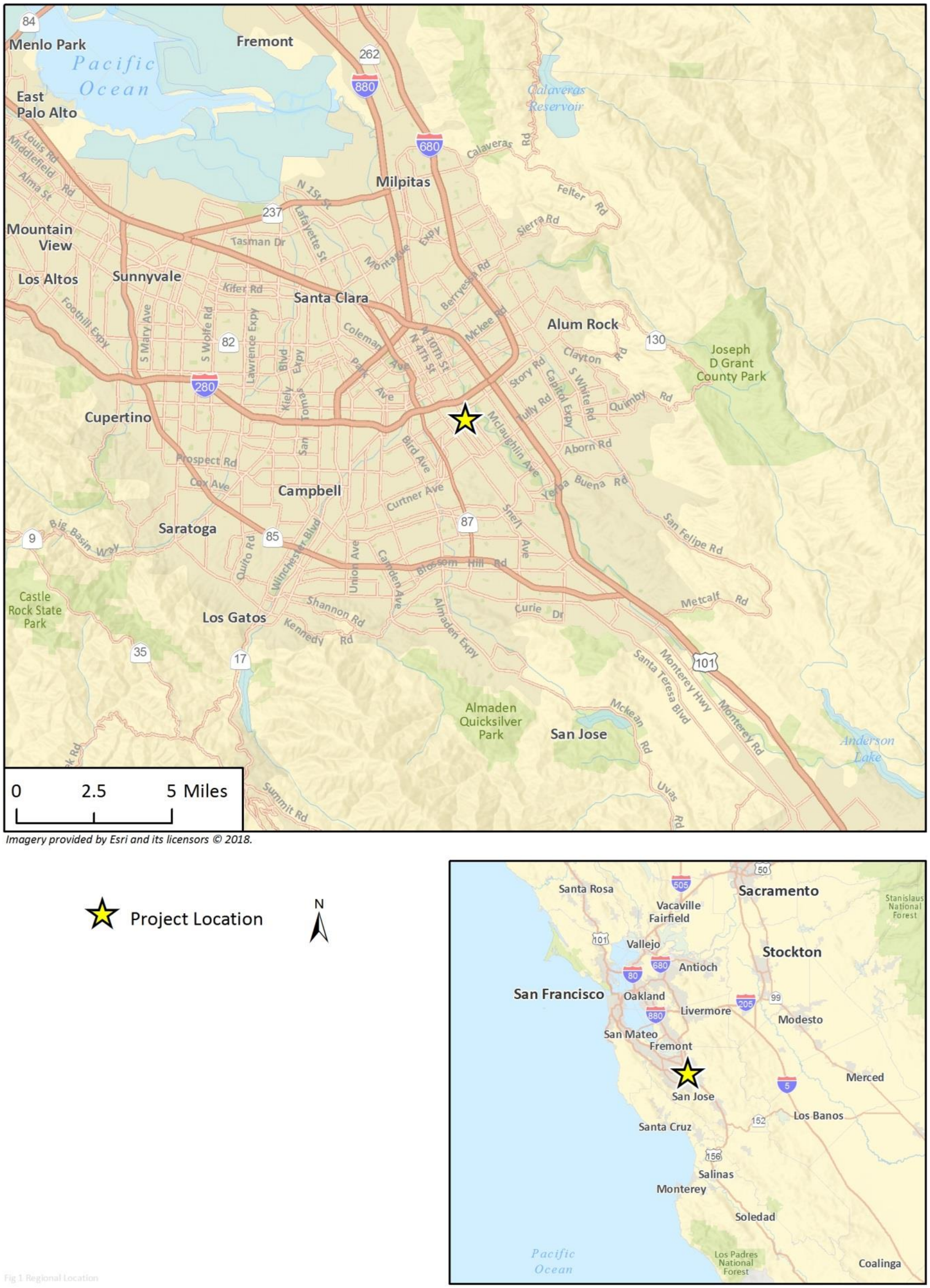
Parking Structure

The parking structure included under the proposed project would be approximately 480,702 square feet and would provide 1,500 vehicular parking spaces. Of these spaces, 15 would be for ADA (Americans with Disabilities Act) accessibility, 9 would be for oversized vehicles such as vans, and 120 would be CalGreen-designated stalls (including 84 EV and 36 carpool/vanpool spaces). The parking structure would be 34 feet, 6 inches tall and would contain three elevators and four stairways. The top level of the structure would have 25 thirty-foot-tall lighting poles, arranged as five lights per parking row. The parking garage would provide paid parking for the public, three restrooms on the ground floor of the parking structure adjacent to the sports field for SJSU students and affiliates, and storage/utility space. The main vehicle entrances and exits to the parking structure would be located midblock on 10th Street and East Alma Street (see Figure 2). A fire access road would be located on the eastern edge of the project site.

Sports Field

The proposed sports field would be surrounded by fencing and a public walking path, as well as a tailgating area. Lighting for the sports field would include light emitting diode (LED) luminaires (i.e., lights) supported on six poles ranging in height from approximately 70 to 80 feet tall, arranged around the perimeter of the field. As needed, the lights would be in use from 6:00 a.m. until sunrise, and from sunset until 10:00 p.m. up to seven days per week; throughout the year, sunrise varies between approximately 6:00 a.m. (summer) and 7:00 a.m. (winter), while sunset varies between approximately 5:30 p.m. (winter) and 8:30 p.m. (summer). On average, this equates to approximately 24 hours per week of lighting usage.

Figure 1 Regional Location



Imagery provided by Esri and its licensors © 2018.

Fig 1 Regional Location

Figure 2 Project Site Location

Imagery provided by Google and its licensors © 2018.

Fig 2 Project Location noCars

Figure 3 Project Concept Plan

Source: WATRY DESIGN, INC.

Source: WATRY DESIGN, INC.

The lighting components would conform to the California Energy Efficiency Standards, Title 24, Chapter 2-53, 2016 Edition. The profile, elevation, and luminaire details of a standard athletic field lighting pole, which are anticipated to be used on-site, are shown in Figure 4.

The sports field would consist of synthetic turf that would be compliant with National Collegiate Athletic Association (NCAA) soccer regulations. The sports field is anticipated to be used intermittently between 6:00 a.m. and 10:00 p.m. daily by people authorized to access the site, including SJSU students, staff, and University affiliates.

Safety and Security

A fire alarm, smoke detector, and sprinkler system would be installed, including manual pull stations and heat detectors in the parking garage. There would be four blue-light emergency phones provided on each of the four parking levels. Security cameras would be located in every stair/elevator lobby and at driveway entrances. Signage would be placed in visible locations, and mad of a material that is highly resistant to vandalism and defacing (e.g., porcelain enamel, embedded phenolic, and high performance acrylic polyurethane paints with anti-graffiti top coating). Safety lighting would be provided on ingress/egress ramps in the parking structure. Lighting features would have shatter resistant lenses. An access lane would be provided along the eastern side of the project site.

Utilities

The fire sprinkler system would connect to an existing water line located near the project site, and potable water for the restroom building would be provided by SJSU via SJSU’s existing water source. SJSU has had potable water wells on campus since the 1940s, and SJSU well water is treated to the highest municipal water standards and is tested weekly to ensure compliance with water quality standards. The San Jose Water Company serves as a backup to the SJSU campus wells, supplying water when one or more of the wells is off-line. Since 2000, SJSU has increased the use of recycled water provided by the San Jose Water Company. In addition to other uses on campus, recycled water is used to irrigate South Campus athletic fields.

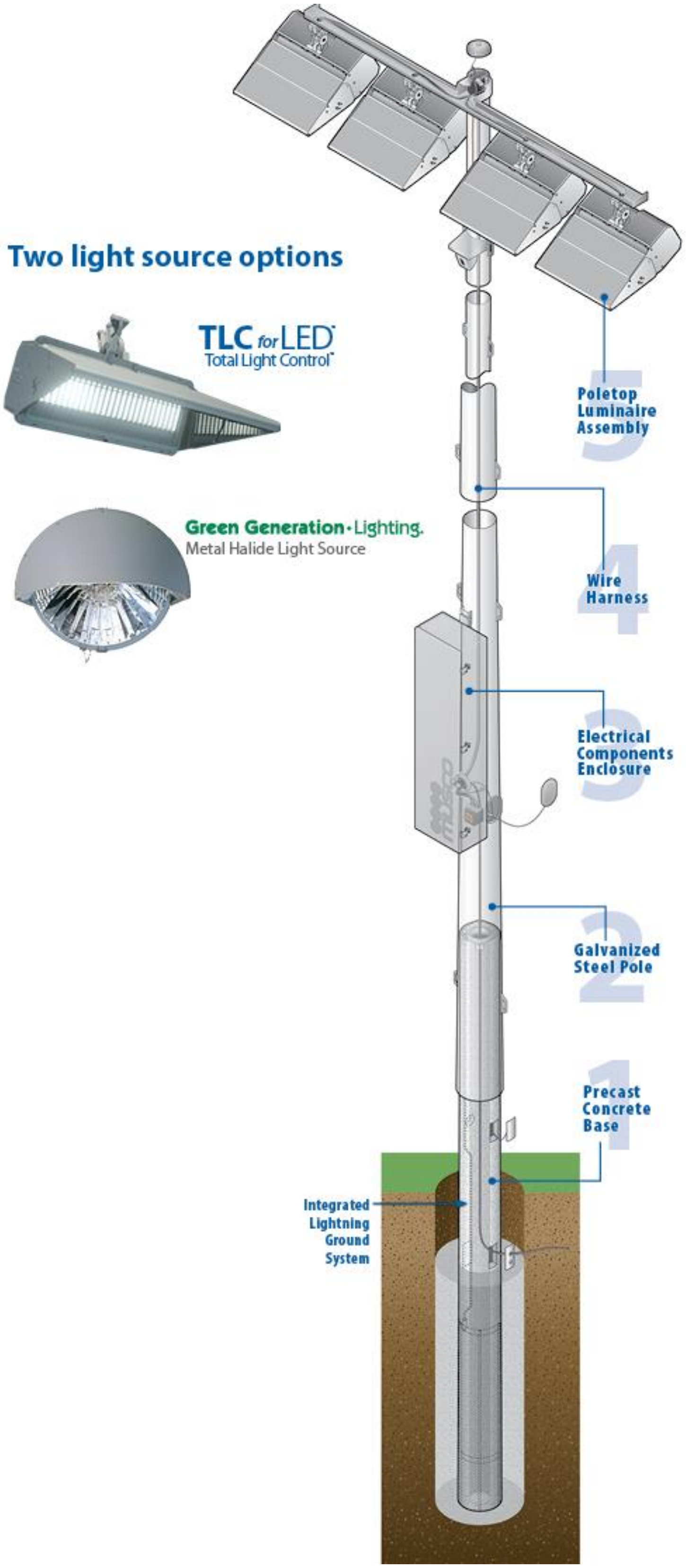
Stormwater runoff from the top of the parking structure would be directed to an oil interceptor, which would remove pollutants and discharge runoff by gravity flow to the existing storm drainage system on-site. The restrooms would be connected to the existing sewer system.

Pacific Gas and Electric (PG&E) is the electrical utility provider to the campus via a 115-kilovolt (kV) substation known as the Markham Substation. The substation has been owned and operated by SJSU since it was purchased from PG&E in 2002. The incoming 115-kV service is stepped down to 12.47-kV for campus distribution. Electricity would be provided to the project by an existing 12-kV electrical feeder line.

Other Project Components

Before demolition, SJSU would document the significance of Bud Winter Field and the importance it played in the social history of SJSU with both recordation and physical features at the subject site. The recordation would be documented by an historian or architectural historian who meets the Secretary of the Interior’s Professional Qualifications. It would include narrative text and photography per Historic American Building Survey/Historic American Engineering Record, Documentation Level III. Photographs and text would describe the history and use of the site. This pre-demolition documentation be subsequently provided to SJSU Special Collections and Archives in archival and digital formats.

Figure 4 Conceptual Lighting Pole Details



The project would also include an on-site interpretive program interpreting and illustrating the history of Bud Winter Field, and its role in the larger social history of the 1960s era Track and Field program at SJSU. The program includes placement of a commemorative plaque in a visible and public area on or within the proposed parking structure. The plaque would include information collected as part of the pre-demolition documentation.

Additionally, the following physical features would be incorporated into the project:

- The installation of an exterior perforated metal panel onto the parking structure that would depict imagery conveying the historical “Speed City” era; and
- The naming of a public pathway in recognition of the significant events and persons associated with the site.

6. Surrounding Land Uses and Setting

North of the SJSU South Campus, along East Humboldt Street, land use is residential, consisting of one- and two-story residences. Kelley Park is located along Senter Road, east of the campus. Adjacent land uses to the south of the campus include the San Jose Municipal Stadium, an indoor ice rink facility, an industrial concrete business, and a large parking lot. An SJSU park-and-ride lot is located to the west of the campus, along South 7th Street. Other nearby businesses and land uses include a recycling center and roofing supply shop to the west, and a trucking logistics and distribution business to the south.

7. Required Approvals

The Trustees of the California State University is the lead agency for the proposed project. The project requires the following discretionary land use approvals by the Trustees of the California State University:

- Campus Master Plan Revision Approval
- Schematic Plan Approval
- Others, as necessary

Environmental Factors Potentially Affected

This project would potentially affect the environmental factors checked below, involving impacts that are “Potentially Significant Unless Mitigation Incorporated” as indicated by the checklist on the following pages.

- ☐ Aesthetics
- ☐ Agriculture and Forestry 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/Traffic
- ■ Tribal Cultural Resources
- ☐ Utilities and Service Systems
- ☐ Wildfire
- ■ Mandatory Findings of Significance

Determination

Based on this initial evaluation:

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

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

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

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

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

Signature

Date

Printed Name

Title

Environmental Checklist

1 Aesthetics

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☐	■
b. Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	■
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? 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 that would adversely affect daytime or nighttime views in the area?	☐	☐	■	☐

a. Would the project have a substantial adverse effect on a scenic vista?

b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

The proposed project would be constructed within the SJSU South Campus. The campus is not designated as, or visible from, a scenic vista, and the project site is not visible from a designated scenic highway. Therefore, no impact to scenic vistas or highways would occur as a result of this project.

NO IMPACT

c. *In non-urbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?*

The project is located in an urbanized area of San Jose, on the SJSU South Campus. According to the SJSU Master Plan (2001), the campus property was chosen and designed to be a contiguous pedestrian campus that connects to the urban development surrounding the site in downtown San Jose (SJSU 2001). The SJSU Master Plan includes campus design guidelines to shape how project development occurs on the campus. These guidelines include policies to maintain or improve the existing open space, access to parking, pedestrian access, and appropriate signage. The proposed parking structure and sports field would be similar in aesthetics to what is existing at the project site and in the surrounding viewshed, including other parking and sports facilities. The function and aesthetic quality of the sports field would be similar to the existing use and would not represent a substantial change.

Aesthetics of the proposed parking garage would be similar in context with existing large surface parking areas nearby, including the lot to the south of the campus and the SJSU park-and-ride lot to the west. The structure would be equipped with exterior treatments typical of nearby campus facilities and would be a concrete color, consistent with surrounding structures. The proposed parking structure would have solid railings on the perimeter of the building and the elevator towers would be glass-backed.

Several existing buildings and parking areas would separate the proposed parking structure from the existing residences to the north of the campus. These existing features would partially screen views of the project and would also reduce the visual contrast that the addition of a new structure would have within the viewshed. The proposed sports field and adjacent parking structure would be consistent with the SJSU Master Plan campus design guideline polices and would not conflict with any other with applicable zoning and other regulations governing scenic quality. Therefore, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. *Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?*

The proposed parking garage and sports field would be equipped with exterior lighting for nighttime use, thereby introducing new permanent lighting. However, the proposed LED lighting system is specifically designed to minimize light spillage and would not operate beyond 10:00 p.m. The 70- to 80-foot-tall stanchions would enable each luminaire to be mounted with a narrow beam angle, which would focus light downward while still providing sufficient lighting for the project, thereby limiting off-site light trespass.

The proposed lights around the sports field would be used from approximately 6:00 a.m. until sunrise and from 6:00 p.m. until 10:00 p.m. for up to seven days per week. Lights would be turned off after 10:00 p.m. During operation, narrow beam angle, reflectors, and visors would minimize the exposure of nearby residents to lighting. Nonetheless, the proposed lighting system would produce illuminance in and around the project site during hours of use. The SJSU Exterior Lighting Master Plan (Strata 2016) contains specific requirements for outdoor lighting to ensure that lighting would integrates with campus aesthetics, would be low-maintenance and energy efficient, and would result in minimal light trespass and reduced light pollution while providing good nighttime visibility.

According to the photometric analysis (Appendix A) performed by Musco Lighting in January 2019, illumination from the sports field lights would dissipate to no measurable foot-candle difference from ambient light approximately 100 feet from the site on both the horizontal and vertical planes. As the nearest residences are approximately 500 feet from the project site and the parking structure lighting would be less intense compared to the sports field lighting, light trespass from the project would be less than significant.

Discomfort glare is typically measured in terms of candelas, which is a unit of measurement based on luminous power per unit solid angle emitted by a point light source in a particular direction. In layman's terms, the degree of discomfort glare decreases the further that a viewer is located from a light source, due to the dispersion of light across distance. The International Commission on Illumination (CIE) has set limits on candelas from outdoor lighting installations for lighting zones from E1 to E4 (CIE 2003). The E3 lighting zone, which applies to the site, denotes areas of medium ambient brightness, such as urban residential areas. In the E3 lighting zone, the CIE finds that light intensity from luminaires may not exceed 10,000 candelas during pre-curfew hours from dusk until 11 pm). According to Appendix A, light intensity reaches a maximum of 5,137 candelas approximately 100 feet from the site. Therefore, glare from the project would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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2 Agriculture and Forestry Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance (Farmland), as shown on 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?	☐	☐	☐	■

a. Would the project convert Prime Farmland, Unique Farmland, 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. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

c. Would the project 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. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

e. Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?

The project site is located entirely within the existing SJSU South Campus, and the campus is adjacent to residential and industrial uses and existing city streets. The SJSU South Campus is located near the urban center of the City of San Jose. There are no agricultural or forest land uses on campus or adjacent to campus. The project would not convert agricultural land to a non-agricultural use, conflict with the existing zoning of forest land or timberland, result in the loss or conversion of forest land to non-forest uses, or interrupt ongoing agricultural activity. The proposed project would have no impact on agriculture or forestry resources.

NO IMPACT

3 Air Quality

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

Air Quality Standards and Attainment

The project site is located in the San Francisco Bay Area Air Basin (the Basin), which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). As the local air quality management agency, the BAAQMD is required to monitor air pollutant levels to ensure that state and federal air quality standards are met and, if they are not met, to develop strategies to meet the standards.

Depending on whether air quality standards are met or exceeded, the Basin is classified as being in "attainment" or "nonattainment." Under state law, air districts are required to prepare a plan for air quality improvement for pollutants for which the district is in non-compliance. The BAAQMD is in non-attainment for the state and federal ozone standards, the state and federal $PM_{2.5}$ (particulate matter up to 2.5 microns in size) standards, and the state PM_{10} (particulate matter up to 10 microns in size) standards and is required to prepare a plan for improvement (BAAQMD 2017a).

The health effects associated with criteria pollutants for which the Basin is in non-attainment are described in Table 1.

Table 1 Health Effects Associated with Non-Attainment Criteria Pollutants

Pollutant	Adverse Effects
Ozone	(1) Short-term exposures: (a) pulmonary function decrements and localized lung edema in humans and animals and (b) risk to public health implied by alterations in pulmonary morphology and host defense in animals; (2) long-term exposures: risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (3) vegetation damage; and (4) property damage.
Suspended particulate matter (PM_{10})	(1) Excess deaths from short-term and long-term exposures; (2) excess seasonal declines in pulmonary function, especially in children; (3) asthma exacerbation and possibly induction; (4) adverse birth outcomes including low birth weight; (5) increased infant mortality; (6) increased respiratory symptoms in children such as cough and bronchitis; and (7) increased hospitalization for both cardiovascular and respiratory disease (including asthma).[1]
Suspended particulate matter ($PM_{2.5}$)	(1) Excess deaths from short- and long-term exposures; (2) excess seasonal declines in pulmonary function, especially in children; (3) asthma exacerbation and possibly induction; (4) adverse birth outcomes, including low birth weight; (5) increased infant mortality; (6) increased respiratory symptoms in children, such as cough and bronchitis; and (7) increased hospitalization for both cardiovascular and respiratory disease, including asthma.[a]

[1] More detailed discussions on the health effects associated with exposure to suspended particulate matter can be found in the following documents: EPA, Air Quality Criteria for Particulate Matter, October 2004.

Source: U.S. EPA, http://www.epa.gov/airquality/urbanair/

Air Quality Management

The Bay Area 2017 Clean Air Plan (2017 Plan) provides a plan to improve Bay Area air quality and protect public health as well as the climate. The legal impetus for the 2017 Plan is to update the most recent ozone plan, the 2010 Clean Air Plan, to comply with state air quality planning requirements as codified in the California Health & Safety Code. Steady progress in reducing ozone levels in the Bay Area has been made, however the region continues to be designated as non-attainment for both the one-hour and eight-hour state ozone standards. In addition, emissions of ozone precursors in the Bay Area contribute to air quality problems in neighboring air basins. Under these circumstances, state law requires the Clean Air Plan to include all feasible measures to reduce emissions of ozone precursors and reduce transport of ozone precursors to neighboring air basins (BAAQMD 2017b).

In 2006, the U.S. Environmental Protection Agency (USEPA) tightened the national 24-hour $PM_{2.5}$ standard regarding short-term exposure to fine particulate matter from 65 $\mu g/m^3$ (micro-grams per cubic meter) to 35 $\mu g/m^3$. Air quality monitoring data for years 2006 through 2008 show that the region was slightly above the standard, and USEPA designated the Bay Area as non-attainment for the 24-hour national standard in December 2008. This triggered the requirement for the Bay Area to prepare a State Implementation Plan (SIP) submittal to demonstrate how the region would attain the standard. However, data for both the 2008-2010 and the 2009-2011 cycles showed that Bay Area $PM_{2.5}$ levels currently meet the standard. On October 29, 2012, the USEPA issued a proposed rule-making to determine that the Bay Area now attains the 24-hour $PM_{2.5}$ national standard. Based on this, the Bay Area is required to prepare an abbreviated SIP submittal which includes an emission inventory for primary (directly-emitted) $PM_{2.5}$, as well as precursor pollutants that contribute to formation of secondary PM in the atmosphere and amendments to the BAAQMD New Source

Review (NSR) to address $PM_{2.5}$ (adopted December 2012).[1] However, key SIP requirements to demonstrate how a region will achieve the standard (i.e., the requirement to develop a plan to attain the standard) will be suspended as long as monitoring data continues to show that the Bay Area attains the standard.

In addition to preparing the “abbreviated” SIP submittal, the BAAQMD has prepared a report entitled “Understanding Particulate Matter: Protecting Public Health in the San Francisco Bay Area” (BAAQMD 2012). The report will help to guide the BAAQMD’s on-going efforts to analyze and reduce PM in the Bay Area in order to better protect public health. The Bay Area will continue to be designated as “non-attainment” for the national 24-hour $PM_{2.5}$ standard until such time as the Air District elects to submit a “redesignation request” and a “maintenance plan” to the USEPA, and the USEPA approves the proposed redesignation.

Air Emission Thresholds

This analysis uses the BAAQMD’s May 2017 *CEQA Air Quality Guidelines* to evaluate air quality. Therefore, the numeric thresholds in the May 2017 BAAQMD *CEQA Air Quality Guidelines* were used for this analysis to determine whether the impacts of the project exceed the thresholds identified in Appendix G of the State CEQA Guidelines.

Table 2 presents the significance thresholds for construction and operational-related criteria air pollutant and precursor emissions being used for the purposes of this analysis. These 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 Basin’s existing air quality conditions. For the purposes of this analysis, the proposed project would result in a significant impact if construction or operational emissions would exceed any of the thresholds shown in Table 2.[2]

Table 2 Air Quality Thresholds of Significance

	Construction Related Thresholds	Operation Related Thresholds	
Pollutant/ Precursor	Average Daily Emissions (pounds per day)	Maximum Annual Emissions (tpy)	Average Daily Emissions (lbs/day)
ROG	54	10	54
NO_X	54	10	54
PM_{10}	82 (exhaust)	15	82
$PM_{2.5}$	54 (exhaust)	10	54

Notes: tpy = tons per year; lbs/day = pounds per day; NOX = oxides of nitrogen; PM2.5 = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM10 = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; tpy = tons per year.

Source: Table 2-1, Bay Area Air Quality Management District, CEQA Air Quality Guidelines, May 2017

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[1] PM is made up of particles that are emitted directly, such as soot and fugitive dust, as well as secondary particles that are formed in the atmosphere from chemical reactions involving precursor pollutants such as oxides of nitrogen (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOCs), and ammonia (NH_3).

[2] Note the thresholds for PM_{10} and $PM_{2.5}$ apply to construction exhaust emissions only.

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

Vehicle use, energy consumption, and associated air pollutant emissions are directly related to population growth. A project may be inconsistent with the applicable air quality plan if it would result in either population or employment growth that exceeds growth estimates included in the plan. Such growth would generate emissions not accounted for in the applicable air quality plan emissions budget. Therefore, projects need to be evaluated to determine whether they would generate population and employment growth and, if so, whether that growth would exceed the growth rates included in the applicable air quality plan. The most recent and applicable adopted air quality plan is the 2017 Clean Air Plan.

The project would not impact overall enrollment at SJSU. The project would replace the existing track and field facilities on the site with a parking structure and sports field but would not increase the number of athletic events that occur at the project site. Instead, it would formalize the currently informal parking use pattern, and develop a sports field that would be utilized by existing SJSU students and a walking path located along the fenced exterior of the field that can be used by local residents. The proposed project would not result in an increase in population or employment. Therefore, the project would not conflict with or obstruct the implementation of the 2017 Plan. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project 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?

Project construction would generate temporary construction-related emissions (direct emissions) and long-term operational emissions (indirect emissions). Emissions associated with the project were estimated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2. The project was modeled as an enclosed parking garage with elevator and city park land uses. In addition, the parking garage was modeled to include LED efficiency lighting. Complete CalEEMod results and assumptions can be viewed in Appendix B.

Construction Emissions

Project construction would generate temporary air pollutant emissions. These impacts are associated with fugitive dust (PM_{10} and $PM_{2.5}$) and exhaust emissions from heavy construction vehicles, in addition to reactive organic gases (ROG) that would be released during the drying phase upon application of architectural coatings. The proposed project would be required to comply with all BAAQMD rules and regulations regarding construction emission control measures. These include using equipment with Best Available Control Technology (BACT) and using low volatile organic compound (VOC) architectural coatings. Although required, CalEEMod was run without using equipment with BACT and used default VOC architectural coatings. Thus, the modeling results provide a conservative estimate of emissions.

It was assumed that project construction would start in June 2019 and be completed by April 2020. CalEEMod defaults were used for construction schedule and equipment. Construction would include demolition, grading, construction, paving, and architectural coating. Architectural coating was assumed to begin halfway through building construction, consistent with typical construction schedules. Construction activities would result in temporary air quality impacts that may vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Table 3 summarizes the estimated maximum daily emissions of pollutants during construction on the project site.

Table 3 Construction Emissions

	Emissions (lbs/day)					
Year	ROG	NO_X	CO	PM_{10} (exhaust)	$PM_{2.5}$ (exhaust)	SO_X
2019 Maximum Daily Emissions	4.2	37.1	30.4	1.8	1.7	0.1
2020 Maximum Daily Emissions	7.6	35.5	32.2	1.3	1.2	0.1
Maximum Daily Emissions	7.6	37.1	32.2	1.8	1.7	0.1
BAAQMD Thresholds (average daily emissions)	54	54	N/A	82	54	N/A
Threshold Exceeded?	No	No	N/A	No	No	N/A

[a] See Table 2.0 “Overall Construction-unmitigated” emissions. Winter emissions results are shown for all emissions except CO, which has higher summer emissions. CalEEMod worksheets in Appendix B.

N/A = not applicable; no BAAQMD threshold for CO or SO_X

As shown in Table 3, project construction would not exceed BAAQMD thresholds. Therefore, construction impacts would be less than significant.

Operational Emissions

Long-term emissions associated with project operation, as shown in Table 4, would include emissions from vehicle trips (mobile sources), electricity use (energy sources), and landscape maintenance equipment, consumer products and architectural coating associated with on-site development (area sources). The project would not result in natural gas combustion. Therefore, this source is not discussed further. To be conservative, CalEEMod defaults were used for trip generation rates. Although there are similar existing uses on the project site, the air quality analysis conservatively does not account for the elimination of existing operational emissions.

Table 4 Operational Emissions

	Estimated Emissions					
Sources	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**SO_X**
Average Daily Emissions (lbs/day)						
Area	0.3	<0.1	0.2	<0.1	<0.1	<0.1
Energy[1]	N/A	N/A	N/A	N/A	N/A	N/A
Mobile	0.1	0.4	1.2	0.3	<0.1	0.1
Total Emissions (lbs/day)	0.4	0.4	1.3	0.3	0.1	<0.1
BAAQMD Thresholds	54	54	N/A	82	54	N/A
Threshold Exceeded?	No	No	N/A	No	No	N/A

See Appendix B for CalEEMod worksheets

[1] CalEEMod calculates the carbon intensity of electricity use as well as natural gas, but only calculates the NO_X intensity of natural gas. The project would not result in natural gas combustion. There are no air quality impacts due to electricity as they are emitted elsewhere.

N/A = not applicable; no BAAQMD threshold for CO or SO_X

Emissions would not exceed BAAQMD thresholds for any criteria pollutant. Operational impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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

The California Air Resources Board (CARB) has identified diesel particulate matter as a carcinogen for humans (CARB 2018). A primary source of diesel particulate matter is exhaust from vehicle traffic on highways. In addition, the BAAQMD recommends analyzing permitted stationary sources. In order to assess potential exposure to toxic air contaminants (TAC) for new sensitive receptors near highways and stationary sources, the BAAQMD recommends a risk and hazard screening using BAAQMD's screening tools if the project would subject sensitive receptors to an excess cancer risk level.

The project does not include construction of new highways or roads which could be considered a new permitted or non-permitted source of TAC or $PM_{2.5}$ in proximity to receptors. In addition, the project does not include construction of new stationary sources which could be considered a new permitted or non-permitted source of TAC or $PM_{2.5}$ in proximity to receptors. Therefore, impacts under this criterion would be less than significant.

Thresholds from BAAQMD's 2017 *CEQA Air Quality Guidelines* are intended to apply to projects that would site new permitted or non-permitted sources in proximity to receptors and for projects that would site new sensitive receptors in proximity to permitted or non-permitted sources of TAC or $PM_{2.5}$ emissions. The project would not site a new source or new receptor at the project site, as a sports field currently exists on the project site. Similarly, a parking lot currently exists on the project site and is not considered a sensitive receptor. As discussed above, grading and construction of the project site would not create emissions that would exceed BAAQMD thresholds for any pollutant.

Therefore, it would not expose sensitive receptors to substantial pollutant concentrations. There would be no impact.

NO IMPACT

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

Table 3-3 in the BAAQMD's 2017 *CEQA Air Quality Guidelines* provides odor screening distances for land uses that have the potential to generate substantial odor complaints. The uses in the table include wastewater treatment plants, landfills or transfer stations, refineries, composting facilities, confined animal facilities, food manufacturing, smelting plants, and chemical plants (BAAQMD 2017c). None of the uses identified in the table would occur with the project. The proposed project would not generate objectionable odors affecting a substantial number of people during operation.

During construction activities, heavy equipment and vehicles would emit odors associated with vehicle and engine exhaust and during idling. However, these odors would be temporary and would cease upon completion. Overall, the proposed project would not generate objectionable odors affecting a substantial number of people. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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4 Biological Resources

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

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

d. *Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*

In some cases, lighting has been shown to impact bird species; however, this typically occurs where light is otherwise scarce, such as on offshore oil platforms (Hüppop et al. 2015) and in forests (The Nature Conservancy 2015). There is no evidence that shows birds are attracted to urban lights (Evans Ogden 1996). Since lighting would occur for only a few hours per night and, with implementation of Mitigation Measure AES-1, little light trespass would occur, the proposed sports field lighting is unlikely to result in birds becoming trapped within the light zone, known as the “trapping effect” (Evans Ogden 1996), especially on diurnal (daytime active) birds (Outen 2002). In addition, lighting events would primarily occur during the winter, which falls mostly outside the typical nesting bird season in California (February 1st to August 31st). Therefore, operational lighting would have a less than significant impact on bird species.

There are no rivers or waterbodies on the SJSU South Campus. Therefore, migratory fish do not occur on the project site.

Although the project site is developed with athletic facilities and asphalt pavement, there are several ornamental conifer trees at the northern, southern, and western boundary of the project site. Project construction could require the removal of up to 12 of these trees. If removal of trees occurs during the typical nesting bird nesting season in California (February 1st through August 31st), and trees are used for nesting, migratory birds could be adversely impacted. This impact would be would be potentially significant unless mitigation is incorporated.

Mitigation Measures

The following mitigation measure would be required to reduce impacts to migratory birds to a less than significant level.

BIO-1 Native/Breeding Native Bird Protection

To avoid impacts to nesting birds, including birds protected under the Migratory Bird Treaty Act, all tree removal shall be limited to the period between September 1 and January 31 (i.e., outside the nesting season) if feasible. If tree removal cannot be conducted during this period, a pre-construction survey for active nests within the project site shall be conducted by a qualified biologist at the site no more than two weeks prior to removal of the trees. If an active bird nest is located, the nest site shall be fenced at a distance commensurate with the particular species and in consultation with the California Department of Fish and Wildlife (CDFW) until juveniles have fledged and when there is no evidence of a second attempt at nesting. Limits of construction to avoid a nest should be established in the field with flagging and stakes or construction fencing. Construction personnel shall be instructed on the sensitivity of the area. The project proponent shall record the results of the recommended protective measures described above to document compliance with applicable state and federal laws pertaining to protection of native birds.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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

The project site is fully developed and disturbed and lacks native biological habitat that could support sensitive natural communities. The surrounding areas of the campus also are developed and lack native habitat capable of supporting special-status species. Because the project site and larger campus area are developed, and because there are no streams or waterbodies onsite, riparian habitat or other sensitive natural communities do not occur at the project site. Therefore, the proposed project would have no impact on riparian habitat, and other sensitive natural communities because these resources do not occur on the project site or surrounding vicinity.

NO IMPACT

c. *Would the project 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?*

As described above, the project site is located on the existing SJSU South Campus and is developed with a running track, athletic field, and gravel and paved areas. A review of aerial photography and the U.S. Fish and Wildlife (USFWS) National Wetland Inventory indicates that there are no federally protected wetlands or other waters on the SJSU South Campus, including the project site. The nearest mapped wetland areas are several small ponds in Kelly Park, which is approximately 800 feet east of the project site, on the opposite side of Senter Road from the campus. Therefore, the proposed project would have no impact to jurisdictional wetlands.

NO IMPACT

e. *Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?*

Neither the California State University system nor SJSU have a tree protection and replacement ordinance or policy. Therefore, the project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. The proposed project would have no impact.

NO IMPACT

f. *Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*

The City of San Jose has entered into a regional partnership with five local partners (the cities of Gilroy and Morgan Hill, County of Santa Clara, the Santa Clara Valley Transportation Authority, and the Santa Clara Valley Water District) and two Wildlife Agencies (the USFWS and CDFW) to develop Habitat Conservation Plan and Natural Communities Conservation Plan for Santa Clara Valley. The Final Santa Clara Valley Habitat Plan (County of Santa Clara, et al., 2012) was released in August 2012. In January 2013, the Plan was adopted by the City of San Jose.

Although the Habitat Plan does not directly apply to SJSU lands, much of the Habitat Plan, as discussed in the City of San Jose's General Plan, focuses on urban development being contained within urban areas. The proposed project is aligned with this goal because it would involve redeveloping an existing area of the SJSU South Campus, which is developed and disturbed and located in an urban setting.

The Habitat Plan requires that projects avoid direct impacts on legally protected plant and wildlife species; the proposed project has no direct impacts on protected species other than those discussed above regarding migratory nesting birds. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

5 Cultural Resources

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

This section provides an analysis of the project's impacts on cultural resources, including historical and archaeological resources, as well as human remains.

CEQA requires a lead agency determine whether a project may have a significant effect on historical resources (Public Resources Code [PRC], Section 21084.1) and tribal cultural resources (PRC Section 21074 [a][1][A]-[B]). A historical resource is a resource listed in, or determined to be eligible for listing, in the California Register of Historical Resources (CRHR), a resource included in a local register of historical resources, or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant (State CEQA Guidelines, Section 15064.5[a][1-3]).

A resource shall be considered historically significant if it:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, if it can be demonstrated that a project would cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that resources cannot be left undisturbed, mitigation measures are required (PRC, Section 21083.2[a], [b]).

PRC, Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Historical and Archaeological Resources

Rincon conducted a search of the California Historical Resources Information System (CHRIS) at the Northwest Information Center (NWIC) located at Sonoma State University on February 28, 2018. The search was performed to identify previously recorded cultural resources, as well as previously conducted cultural resources studies within the project site and a 0.8-kilometer (0.5-mile) radius surrounding it. The CHRIS search included a review of available records at the NWIC, as well as the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), the Office of Historic Preservation Historic Properties Directory, the California Inventory of Historic Resources, the Archaeological Determinations of Eligibility list, and historic maps.

The NWIC records search identified 37 cultural resources studies conducted within a 0.5-mile radius of the project site, none of which included the project site.

The NWIC records search identified seven previously recorded cultural resources within a 0.5-mile radius of the project site, all of which are recorded outside of the project site. One resource (P-43-000024) is recorded in close proximity to the project site in the vicinity of Spartan Stadium. The resource consists of a prehistoric habitation site including burials that were uncovered at an approximate depth of 10 feet below ground surface when the original stadium was constructed in 1933. When the stadium was rebuilt in 1972, Miley Holman conducted limited testing that did not recover evidence of an archaeological site but the depth and location of testing is unknown. Limited archaeological testing and augering was conducted again in 1973 by Joseph C. Winter at an unknown location to a depth of 7 feet. No evidence of an archaeological site was identified, though the site was previously recorded at a depth of 10 feet and thus may be present below the depth of Winter's investigation. The SJSU campus is considered an archaeologically sensitive area (Dixon 1977).

On February 23, 2018, Rincon contacted the Native American Heritage Commission (NAHC) and requested a search of the Sacred Lands File (SLF). The NAHC provided a response on March 5, 2018 stating that the SLF results were negative. Rincon prepared and mailed anticipatory letters to Native Americans known to be interested in the general project vicinity on February 23, 2018. No responses were received.

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

In accordance with Section 15064.5(3) of the CEQA Guidelines, SJSU has determined that Bud Winter Field is a historical resource as defined by CEQA. The field appears to possess limited associations with notable track and field coach Lloyd "Bud" Winter and the successful track program known as "Speed City" which produced numerous record-setting athletes ranked among the best in the world from approximately the 1950s through the 1970s (Lynch 2017; SJSU 2019). Bud Winter Field was constructed in 1968 and replaced an earlier track located at South 7th and East Humboldt streets. This earlier track was most closely associated with Speed City and Bud Winter, who oversaw the program until 1970 (Del Rio 2018). Two of Speed City's most notable athletes are Tommie Smith and John Carlos who were actively involved in the Olympic Project for Human Rights, a civil rights organization organized in 1967 by sociologist and SJSU lecturer Harry Edwards, Ph.D. which sought to protest racial inequality through athlete activism (Anderson 2018). After winning gold and bronze medal respectively in the 200-meter dash at the 1968 Summer Olympics in Mexico City, Smith and Carlos raised their fists during the medal ceremony in to create one of the most iconic images of sports and political activism in the twentieth century (Brown 2017). The action captured what became to be known as the "black power salute." In a later autobiography, Smith said the action was in fact a "human rights" salute.

Bud Winter Field appears to have limited direct associations with these significant events and persons. Dr. Edwards states Winters, Smith, and Carlos never ran competitively or trained at Bud Winter Field and rather these activities occurred at the no-longer-extant track at South 7th Street and East Humboldt streets (Edwards 2019). The track was constructed in 1968 two years prior to Winters departure from the SJSU program and during the lead up to the 1968 Summer Olympics, which occurred in October of that year. Further, social rights activities at SJSU associated with Edwards, Smith, Carlos, and many others were not limited to one track, but likely occurred in many other areas on and off the SJSU campus. Finally, in 2005, the University unveiled a sculpture in the center of the campus designed by a Portuguese artist, Rigo, that memorialized the two runners and the events at the Mexico City Olympic Games.

Nonetheless, SJSU recognizes that Bud Winter Field has potential limited associations with these significant events and individuals and is a historical resource as defined by CEQA.

As currently proposed, the project would involve removal of the existing running track and Bud Winter Field, and construction of a new four-story parking structure with an adjacent sports field on the same site. According to the CEQA Guidelines, a project would result in a significant impact to historical resources if it would cause a substantial adverse change in the significance of an historical resource. A substantial adverse change is defined in CEQA Guidelines §15064.5(4)(b)(1), as "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." While the project would materially impair Bud Winter Field, it is possible that, through appropriate mitigation, the track's removal would not cause a significant impact under CEQA.

Both historically and currently, the track features no major built environment or developed features, and there are limited physical characteristics which are able convey its significant associations. The site is not visibly distinguishable from other similar athletic facilities and is geographically isolated from the main SJSU campus. Bud Winter Field is visually nondescript and undistinguishable and as a result its history and significance is largely intangible and unable to be conveyed by the site alone.

As presented in the project description, certain elements have been included in the project to mitigate impacts to Bud Winter Field by documenting and widely presenting the significance of Bud Winter Field. The Historic American Building Survey (HABS)-like documentation package would produce a detailed narrative report with historic and contemporary photographs of the site, which would provide present and future generations with a deeper understanding of the resource's significance. Oral histories will further help to capture the history and significance of the site. Information gathered through the HABS-like documentation package and oral history program will also provide the necessary data to inform the on-site interpretive program described below. Collectively these project components would further distinguish the property as a historical resource and would create opportunities for the public gain a significantly more thorough understanding of the property's role athletic and civil rights history.

LESS THAN SIGNIFICANT IMPACT

b. Would the project cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?

The cultural resources records search indicated that the project vicinity is sensitive for archaeological resources, which could be considered historical resources. Archaeological site P-43-000024 is recorded in close proximity to the project site and was identified as buried approximately 10 feet below the ground surface at the time it was originally recorded. The boundaries and precise location of P-43-000024 have not been clearly defined and it is possible that the site is present within the project site. The site has been described as located approximately 10 feet below ground surface, and project ground disturbance is expected to reach depths of up to 12 feet (for the lighting pole foundations). As such, the project has the potential to disturb P-43-000024 or other unrecorded archaeological resources if they exist below the ground surface in the location of this project. Based on these factors, the following mitigation measures are required.

Mitigation Measures

The following mitigation measures would be required to reduce impacts to cultural resources a less than significant level.

CUL-1 Worker's Environmental Awareness Program (WEAP)

A qualified archaeologist shall be retained who meets the Secretary of the Interior's Professional Qualifications Standards for archaeology to conduct a WEAP training for archaeological sensitivity for all construction personnel prior to the commencement of any ground disturbing activities. Archaeological sensitivity training shall include a description of the types of cultural material that may be encountered, cultural sensitivity issues, regulatory issues, and the proper protocol for treatment of the materials in the event of a find. If construction stops for more than one month, a WEAP training must be conducting before construction commences again.

CUL-2 Archaeological and Native American Monitoring

Initial project-related ground-disturbing activities shall be observed by a qualified archaeological monitor under the direction of an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology (NPS 1983). Initial ground disturbance is defined as activities within previously undisturbed native soils. A Native American monitor shall be retained for the duration of project ground disturbance. If archaeological resources are encountered during ground-disturbing activities, work in the immediate area must halt and the find evaluated for significance under CEQA. Monitoring may be reduced or halted at the discretion of the monitors as warranted by conditions such as encountering bedrock, sediments being excavated are fill, soils occur within formations unlikely to yield cultural resources (e.g., soils formations predating human occupation of the region), or negative findings during the first 60 percent of rough grading. If monitoring is reduced to spot-checking, spot-checking shall occur when ground-disturbance moves to a new location within the project site and when ground disturbance will extend to depths not previously reached (unless those depths are within bedrock). Upon completion of monitoring, a monitoring report and accompanying monitoring logs shall be submitted to SJSU and NWIC.

CUL-3 Unanticipated Discovery of Cultural Resources

If cultural resources are encountered during ground disturbing activities, work within 50 feet of the find shall be halted, SJSU shall be informed, and an archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for archaeology (NPS 1983) shall be contacted immediately to evaluate the find. If necessary, the evaluation may require preparation of a treatment plan and testing for the California Register of Historical Resources (CRHR) eligibility. If the discovery proves to be significant under CEQA and cannot be avoided by the project, additional work, such as data recovery excavation, shall be required to mitigate any significant impacts to historical and/or archaeological resources. All documentation, including any Department of Parks and Recreation Series 523 form(s), excavation report(s), and accompanying field forms, shall be submitted to SJSU and to NWIC, as appropriate.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c. Would the project disturb any human remains, including those interred outside of formal cemeteries?

The discovery of human remains is always a possibility during ground disturbing activities. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately. If the human remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission which will determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site and provide recommendations for treatment to the landowner within 48 hours of being granted access. With adherence to existing regulations, impacts to human remains would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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6 Energy

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Result in potentially significant environmental impacts 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?	☐	☐	■	☐

Energy consumption accounts for energy consumed during construction and operation of the proposed project, such as fuel consumed by vehicles, natural gas consumed for heating and/or power, and electricity consumed for power. The analysis of energy consumption herein involves the quantification of anticipated vehicle and equipment fuel, natural gas, and electricity consumption during construction and operation of the proposed project, to the extent feasible, as well as a qualitative discussion of the efficiency, necessity, and wastefulness of that energy consumption.

a. Would the project result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Removal of the existing on-site sports field would result in short-term consumption of energy from the use of construction equipment and processes. The California Green Building Standards Code includes specific requirements related to recycling, construction materials, and energy efficiency standards that would apply to construction of the proposed project to minimize wasteful, inefficient, and unnecessary energy consumption.

The proposed project would involve the use of energy during construction and operation. Energy use during construction would be primarily from fuel consumption to operate heavy equipment, light-duty vehicles, machinery, and generators. Temporary grid power may also be provided to construction trailers or electric construction equipment. Table 5 illustrates the anticipated energy consumption from construction equipment and vehicles, including construction worker trips to and from the project site. As shown therein, construction of the proposed project, which would last nine months, would require approximately 250 gallons of gasoline and 135,000 gallons of diesel fuel.

Table 5 Proposed Project Construction Energy Use

	Fuel Consumption (Gallons)	
Source	**Gasoline**	**Diesel**
Construction Equipment & Hauling Trips	–	134,871.94
Worker Vehicle Trips	249.18	–

See Appendix B for CalEEMod default values for fleet mix and average distance of travel, and Appendix F for energy calculation sheets.

Operation of the project would generate energy demand in the form of transportation fuel from vehicle trips; however, the proposed project would result in a comparable volume of daily vehicle trips to existing conditions (Appendix E). Therefore, the proposed project would not substantially increase demand for transportation fuel compared to existing conditions. Moreover, the parking structure would include 84 parking spaces with preferential parking for electric vehicles, thereby encouraging the use of electric vehicles over the use of petroleum-fueled vehicles. This would result in reduced energy use from fuels because the existing site does not have any electric vehicle charging stations.

In addition to transportation energy use, operation of the project would require permanent grid connections for electricity to power 25 light poles atop the parking structure, six light poles on the sports field, and additional lighting for the parking garage interior and entry/exit points. Light poles would be fitted with LED bulbs, which allow for longer replacement intervals than traditional light bulbs. While the light poles would generate additional operational energy demand as compared to existing conditions, the minimal amount of electricity required to power the light poles would serve to improve security for vehicle left at the parking structure and safety for people using the sports field.

Overall, operation of the proposed project would result in consumption of fuels from vehicle trips, electricity from lighting, and use of the restrooms. Project energy consumed would represent an incremental increase in energy usage compared to existing conditions, and the proposed project would implement energy-efficient components to reduce energy demand. Therefore, construction and operation of the proposed project would not result in potentially significant environmental effects due to the wasteful, inefficient, or unnecessary consumption of energy. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

SJSU projects are required to be consistent with the California State University's (CSU) Sustainability Plan (2017). The CSU's Sustainability Plan contains university sustainability goals and climate action goals that directly relate to energy efficiency and conservation. Goals applicable to the proposed project include:

- The CSU will pursue sustainable practices in all areas of the university, including: business operations such as procurement; information technology; students services; food services; facilities operations; design and construction.
- The CSU will strive to reduce systemwide facility GHG emissions to 1990 levels, or below, by 2020 consistent with Assembly Bill 32.

- The CSU will strive to reduce facility GHG emissions to 80 percent below 1990 levels by 2040.
- The CSU will encourage and promote the use of alternative transportation and/or alternative fuels to reduce GHG emissions related to university-associated transportation, including commuter and business travel that generates GHG; reducing energy usage will inherently reduce GHG emissions.

The proposed project involves the installation of 31 light poles utilizing LED light bulbs instead of traditional lighting methods; therefore, the proposed project would be more energy efficient than if the project implemented traditional lighting methods. In addition, the parking structure would include 84 preferential parking spaces designated for electric vehicles, which would encourage electric vehicle use and reduce GHG emissions in comparison with fossil fueled vehicles. Use of LED features and electric vehicle parking would result in reduced energy consumption and thus reduced project GHG emissions, consistent with the CSU Sustainability Plan, and the goal for implementing sustainable practices in the design of the proposed project. Potential impacts associated with renewable energy and energy efficiency would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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7 Geology and Soils

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Directly or indirectly cause potentially substantial adverse effects, including the risk of loss, injury, or death involving:				
1. 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?	☐	☐	■	☐
2. Strong seismic ground shaking?	☐	☐	■	☐
3. Seismic-related ground failure, including liquefaction?	☐	☐	■	☐
4. 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 offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	■	☐
d. Be located on expansive soil, as defined in Table 1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	■	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	■
f. Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☐	☐	■

a.1. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving 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?

Ninyo & Moore conducted a geotechnical evaluation of the project site in March 2019 (Appendix C*).* According to Appendix C and the California Geological Survey's map of earthquake zones for the San Jose East Quadrangle (California Geological Survey 2001), the project area is not located within an Alquist-Priolo earthquake fault zone for surface fault rupture. No active faults are located on the project area or the SJSU South Campus, and the closest known active fault is the southern segment of the Hayward fault, located approximately four miles northeast (Appendix C). Therefore, impacts related to surface rupture would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.2. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

a.3. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

c. Would the project be located on a geologic unit or soil that is made unstable as a result of the project, and potentially result in on or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

The City of San Jose is located in a region of seismic activity and geotechnical instability (City of San Jose 2011). According to the City's General Plan (2011), major earthquake faults in the region are the San Andreas, near the crest of the Santa Cruz Mountains, and the Hayward and Calaveras fault system in the Diablo Range. Other potentially active faults, located in both the hills and valley areas of the City of San Jose, are the Berryessa, Crosley, Clayton, Quimby, Shannon, Evergreen, and Silver Creek faults (City of San Jose 2011). The closest known fault to the project area is the Silver Creek Fault, which is located approximately 0.9 mile northeast of the project site (California Department of Conservation, 2010). The site is located within a liquefaction hazard zone established by the state geologist and by Santa Clara County (Appendix C). Regional studies of liquefaction susceptibility indicate that liquefaction susceptibility in the project vicinity is moderate (Appendix C).

Based on site topography and location, lateral spreading is not anticipated to occur near the project site. Additionally, based on laboratory testing of soil samples from the project site, the site's near-surface soil has low expansive potential (Appendix C).

The project site is located in an area subject to seismic shaking and liquefaction. New construction in areas with such hazards can expose structures and occupants to geotechnical hazards. However, the California State University Board of Trustees has enacted stringent requirements for structural assessment of seismic performance of buildings within California State University campus locations than the 2016 California Building Code as adopted by the California Building Standards Commission. According to California State University Seismic Requirements (2016), seismic parameters are required to be reported for California State University campus locations. This policy applies to all construction activity undertaken by California State University for new and existing buildings, where university operations and activities occur. Adherence to the California State University Seismic

Design Parameters and the requirements of the California Building Code would reduce impacts associated with strong seismic ground shaking and liquefaction to less than significant.

LESS THAN SIGNIFICANT IMPACT

a.4. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

The project site is not located within an earthquake-induced landslide zone (California Geological Survey 2001). Landslides are most likely to occur on or near a slope or hillside area, rather than in generally level areas, such as the project site. The project site and the surrounding area are relatively flat, and the project does not include grading substantial slopes. As such, the proposed project would have no impact related to exposing people or structures to landslides.

NO IMPACT

b. Would the project result in substantial soil erosion or the loss of topsoil?

Soil excavation up to approximately five feet below existing grade would be required for construction of the parking structure, and ground improvement to a depth of at least 18 feet below the surface (Appendix C). Excavation for the lighting pole foundations may extend up to 12 feet below ground surface. Minor grading could also be required for construction, depending on site conditions. Disturbance to soils from these construction activities would increase the potential for erosion, as soils would be loosened and exposed to precipitation and wind. Project construction would disturb more than one acre of land, which would require coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (adopted September 2, 2009) (the “Construction General Permit”), administered by the State Water Resources Control Board (SWRCB). To obtain coverage under this Construction General Permit, the landowner or other applicable entity must file Permit Registration Documents prior to the commencement of construction activity, which includes a stormwater pollution prevention plan (SWPPP). The SWPPP must include best management practices (BMPs) to control runoff and prevent soil erosion and sedimentation. Given the relatively flat topography of the site, the minimal grading and excavation required for construction, and implementation of the required SWPPP, substantial soil erosion during project construction would be avoided.

During operation of the proposed project, the site would be developed with the proposed parking garage and sports deck, as well as sidewalks and landscaping. Top soil would not be exposed to erosion forces, such as precipitation and wind. Therefore, impacts of the proposed project would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project be located on expansive soil, as defined in Table 1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Based on the laboratory testing summarized in Appendix C, near-surface on-site soils have a low potential for expansion. Additionally, the 2016 California Building Code includes requirements to address soil-related hazards, and the proposed project would be constructed in compliance with the requirements of the 2016 California Building Code. Impacts related to expansive soils would therefore be less than significant.

LESS THAN SIGNIFICANT IMPACT

e. Would the project 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?

The proposed project would be served by the existing municipal sanitary sewer system. Septic tanks or alternative wastewater disposal systems would not be utilized. Therefore, the proposed project would have no impact.

NO IMPACT

f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Paleontological sensitivity of the geologic units that underlie the project area were evaluated using the results of the paleontological locality search and review of existing information in the primary literature concerning known fossils within those geologic units. Fossil collections records from the University of California Museum of Paleontology (UCMP) online database, which contains known fossil localities in Santa Clara County, were reviewed, as well as geologic maps and literature including: California Geological Survey (CGS) 2002; Fossen 2010; Norris and Webb 1990; UCMP online database 2018; Wentworth et al. 1999.

Following the literature review and museum record search, a paleontological sensitivity classification was assigned to the geologic units within the project area. The potential for impacts to significant paleontological resources is based on the potential for ground disturbance to directly impact paleontologically sensitive geologic units. The Society of Vertebrate Paleontology (SVP) (2010) has developed a system for assessing paleontological sensitivity and describes sedimentary rock units as having high, low, undetermined, or no potential for containing scientifically significant nonrenewable paleontological resources. This criterion is based on rock units within which vertebrate or significant invertebrate fossils have been determined by previous studies to be present or likely to be present. The project area is situated within the Diablo Range of the Coast Ranges, one of 11 geomorphic provinces of California (CGS 2002; Norris and Webb 1990). The Coast Ranges is composed of a complex assemblage of geologic units, including Jurassic to Cretaceous metasedimentary rock of the Franciscan Group, to younger Cenozoic marine and nonmarine shale, sandstone, and conglomerate. The Diablo Range extends approximately 200 miles from Contra Costa County south to Monterey County, and is characterized by grass-covered rolling hills – the surface expression of highly folded and faulted underlying geologic structure (Fossen 2010). Near the project area, the Diablo Range is transected by several major active or recently active faults, including the northwest-trending Hayward fault to the east of the project area. The project area is mapped at a scale of 1:100,000 by Wentworth et al. (1999) and includes one (1) geologic unit mapped at ground surface: Holocene flood plain deposits (Qhfp), composed of unconsolidated mud and fine-grained sand.

A search of the paleontological locality records on the UCMP online database resulted in no previously recorded vertebrate fossil localities within Holocene sedimentary deposits in the project vicinity. Holocene sedimentary deposits, particularly those younger than 5,000 years old, are generally too young to contain fossilized material. Therefore, the Holocene flood plain deposits sediments mapped in the project area have been assigned a low paleontological sensitivity, in accordance with SVP (2010) guidelines. However, according to a paleontological resources study included in the City of San Jose 2020 General Plan Environmental Impact Report (EIR) (2011), these Holocene deposits may be underlain by older Pleistocene alluvium at an unspecified depth. The City of San Jose 2020 General Plan EIR indicates that the floodplain deposits have low paleontological sensitivity at the surface and grade into older paleontologically-sensitive strata at an unspecified depth that "varies geographically" (City of San Jose 2011, 677).

The Holocene flood plain deposits mapped in the project area are determined to have a low paleontological resource potential at shallow to moderate depth because they are likely too young to contain fossilized material. At an unknown but likely substantial depth, the Holocene deposits may grade into older Pleistocene sedimentary deposits that would have the potential to contain fossilized remains and would thus be considered to have a high paleontological sensitivity. Project ground disturbance is expected to reach a depth of up to 12 feet below ground surface (for the lighting pole foundations) and paleontologically-sensitive strata are not expected to be encountered above this moderate depth; therefore, project impacts to paleontological resources are not anticipated.

NO IMPACT

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8 Greenhouse Gas Emissions

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

Climate change is the observed increase in the average temperature of the earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period. Climate change is the result of numerous, cumulative sources of greenhouse gases (GHG), gases that trap heat in the atmosphere, analogous to the way in which a greenhouse retains heat. Common GHGs include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases, and ozone (O_3). GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Anthropogenic GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases, such as hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6) (National Aeronautics and Space Administration [NASA] 2018).

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of GHGs, the average temperature of the Earth would be about 15 degrees Celsius (° C) cooler (NASA 1998). However, emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

Thresholds

Pursuant to the requirements of Senate Bill (SB) 97, the California Natural Resources Agency adopted amendments to the CEQA Guidelines for the feasible mitigation of GHG emissions and analysis of the effects of GHG emissions. The adopted CEQA Guidelines provide regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts.

Most individual projects do not generate sufficient GHG emissions to influence climate change directly. However, physical changes caused by a project can contribute incrementally to significant cumulative effects, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15064[h][1]).

To evaluate whether a project may generate a quantity of GHG emissions that may have a significant impact on the environment, State agencies have developed a number of operational bright-line significance thresholds. Significance thresholds are numeric mass emissions thresholds that identify the level at which additional analysis of project GHG emissions is necessary. Projects that attain the significance target, with or without mitigation, would result in less than significant GHG emissions. Many significance thresholds have been developed to reflect a 90 percent capture rate tied to the 2020 reduction target established in Assembly Bill (AB) 32. Numerous lead agencies have identified as appropriate significance screening tools for residential, commercial, industrial, and public land uses and facilities projects with horizon years before 2020.

In the 2017 BAAQMD *CEQA Air Quality Guidelines*, the BAAQMD outlines an approach to determine the significance of projects. For residential, commercial, industrial, and public land use development projects, the thresholds of significance for operational-related GHG emissions are as follows:

- Compliance with a qualified GHG Reduction Strategy
- Annual emissions less than 1,100 metric tons (MT) per year (MT/yr) of carbon dioxide equivalent (CO_2e)
- Service person (SP) threshold of 4.6 MT CO_2e/SP/year (residents + employees)

The BAAQMD annual emissions threshold of 1,100 MT of CO_2e per year was designed to capture 90 percent of all emissions associated with projects in the Basin and require implementation of mitigation so that a considerable reduction in emissions from new projects would be achieved. According to the California Air Pollution Control Officers Association (CAPCOA) white paper, *CEQA & Climate Change*, a quantitative threshold based on a 90 percent market capture rate is generally consistent with AB 32 (CAPCOA 2008). Senate Bill 32, codified in 2016, sets a more conservative emission reduction target of 40 percent below the 1990 level by 2030.

The annual emissions threshold of 1,100 MT of CO_2e per year applies best to the proposed project as SJSU does not have a qualified GHG reduction plan and the project is not a high-density project whose impacts would be more appropriately quantified by a service population threshold to reflect the per-person emission efficiency. Additionally, the Association of Environmental Professionals (AEP) white paper, *Beyond Newhall and 2020*, recommends that for projects with a horizon of 2020 or earlier, a threshold based on meeting AB 32 targets should be used (AEP 2016). Thus, projects with horizon years of 2020 or earlier and emissions below the BAAQMD threshold are not expected to require GHG mitigation for State mandates to be achieved. The project would be fully operational in 2020; therefore, its horizon year is 2020.

Methodology

CalEEMod version 2016.3.2 was used to calculate total GHG project emissions, which include construction and operational emissions. This methodology is recommended by the CAPCOA CEQA and Climate Change white paper (CAPCOA 2008). The analysis focuses on CO_2, N_2O, and CH_4 as these are the GHG emissions that on-site development would generate in the largest quantities.

Fluorinated gases, such as HFCs, PFCs, and SF_6, were also considered for the analysis. However, the proposed project is not expected to be a significant contributor of fluorinated gases since fluorinated gases are primarily associated with industrial processes. Calculations were based on the methodologies discussed in the CAPCOA white paper and included the use of the California Climate Action Registry (CCAR) General Reporting Protocol (CCAR 2009).

Operational Emissions

Operational emissions for the proposed project were modeled using CalEEMod and compared to BAAQMD thresholds. CalEEMod provides operational emissions of CO_2, N_2O, and CH_4. Emissions from energy use include electricity and natural gas use. The emissions factors for natural gas combustion are based on EPA's AP-42 (Compilation of Air Pollutant Emissions Factors) and CCAR. Electricity emissions are calculated by multiplying the energy use times the carbon intensity of the utility district per kilowatt hour. The default electricity consumption values in CalEEMod include the California Energy Commission-sponsored California Commercial End Use Survey and Residential Appliance Saturation Survey studies. CalEEMod incorporates 2016 Title 24 CALGreen Building Standards, which are the most recent and thus apply to the proposed project.

Emissions associated with area sources, including consumer products, landscape maintenance, and architectural coating were calculated in CalEEMod and utilize standard emission rates from CARB, USEPA, and emission factor values provided by the local air district (CAPCOA 2017).

Emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CAPCOA 2017). Waste disposal rates by land use and overall composition of municipal solid waste in California was based primarily on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the California Energy Commission's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and Southern California.

For mobile sources, CO_2 and CH_4 emissions were quantified in CalEEMod. Because CalEEMod does not calculate N_2O emissions from mobile sources, N_2O emissions were quantified using the CCAR General Reporting Protocol (CCAR 2009) direct emissions factors for mobile combustion. Estimates of vehicle trips associated with the proposed development were based on default rates provided in CalEEMod. Emission rates for N_2O emissions were based on the vehicle mix output generated by CalEEMod and the emission factors found in the CCAR General Reporting Protocol.

Although the project would comply with 2016 CALGreen Building Standards, the specific sustainability features that would be applied to the project are not known to the level of detail required for applying reductions in CalEEMod. Thus, the analysis excludes these sustainability features and is thus a conservative analysis of operational emissions.

Construction Emissions

Project construction would generate temporary GHG emissions primarily due to construction equipment and truck trips. Site preparation and grading typically generate the greatest amount of emissions due to the use of grading equipment and soil hauling. Although construction activity is addressed in this analysis, CAPCOA does not discuss whether any of the suggested threshold approaches adequately address impacts from temporary construction activity. As stated in the CEQA and Climate Change white paper, "more study is needed to make this assessment or to develop separate thresholds for construction activity" (CAPCOA 2008). Additionally, the BAAQMD does not have specific quantitative thresholds for construction activity. Therefore, although estimated in CalEEMod and provided for informational purposes, construction activity is not included in the total emissions calculations.

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

The project's proposed construction activities, energy use, daily operational activities, and mobile sources (traffic) would generate GHG emissions. CalEEMod was used to calculate emissions resulting from project construction and long-term operation (see Appendix B for model output).

Construction Emissions

Emissions generated by project construction are estimated at approximately 740 MT of CO_2e. The BAAQMD does not have a recommended threshold for construction-related GHG emissions, and therefore emissions associated with construction would not result in a significant impact under CEQA are not included in Table 6.

Operational Indirect and Stationary Direct Emissions

Long-term emissions relate to area sources, energy use, solid waste, water use, and transportation. Each of the operational sources of emissions is discussed further below.

Area Source Emissions

CalEEMod was used to calculate direct sources of air emissions associated with the proposed project. These include consumer product use and landscape maintenance equipment. Area emissions are estimated at less than one MT of CO_2e per year.

Energy Use Emissions

Project operation would consume electricity, primarily for lighting. The generation of electricity through combustion of fossil fuels emits CO_2, and to a smaller extent, N_2O and CH_4. The project would generate approximately 784 MT of CO_2e per year associated with overall energy use.

Solid Waste Emissions

Based on the estimate of GHG emissions from project-generated solid waste as it decomposes, solid waste associated with the proposed project would generate less than one MT of CO_2e per year.

Water Use Emissions

Based on the amount of electricity generated to supply and convey water for the project, the proposed project would generate an estimated four MT of CO_2e per year.

Transportation Emissions

As calculated by CalEEMod, the proposed project would generate an estimated 44,777 annual vehicle miles travelled (VMT). Although the project would not result in an increase in VMT, as described in Section 17, *Transportation*, this assumption was used to ensure a conservative analysis of GHG emissions. As noted above, CalEEMod does not calculate N_2O emissions related to mobile sources. As such, N_2O emissions were calculated based on the project's VMT using calculation methods provided by the CCAR General Reporting Protocol (CCAR 2009). The proposed project would emit an estimated 19 MT of CO_2e per year from mobile sources.

Combined Stationary and Mobile Source Emissions

Table 6 combines the operational and mobile GHG emissions associated with the proposed project. The annual emissions would total approximately 857 MT of CO_2e per year. These emissions would not exceed the 1,100 MT of CO_2e per year threshold for compliance with BAAQMD thresholds. This impact would be less than significant.

Table 6 Operational GHG Emissions

Emissions Source	Annual Emissions (MT of CO2e/year)
Operational	
Area	<0.1
Energy	784
Waste	0.1
Water	4
Mobile	
CO_2 and CH_4	18
N_2O	1
Total	**807**
BAAQMD Threshold	1,100
Exceeds Threshold?	Yes

See Table 2.2 “Overall Operational” emissions. CalEEMod worksheets in Appendix B.

LESS THAN SIGNIFICANT IMPACT

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

Senate Bill 375, signed in August 2008, requires the inclusion of Sustainable Communities’ Strategies (SCS) in Regional Transportation Plans (RTPs) for the purpose of reducing GHG emissions. The Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) adopted an SCS that meets GHG reduction targets. Plan Bay Area 2040 is a State-mandated, integrated long-range transportation, land-use, and housing plan that would support a growing economy, provide more housing and transportation choices, and reduce transportation-related pollution in the nine-county San Francisco Bay Area (ABAG 2017). The SCS builds on earlier efforts to develop an efficient transportation network and grow in a financially and environmentally responsible way. Plan Bay Area 2040 will be updated every four years to reflect new priorities. A goal of the SCS is to reduce vehicles miles traveled (VMT) per capita by 10 percent (ABAG 2017b).

The proposed project would demolish the existing track and field facility and parking area, and would construct a new parking garage and a sports field to the west of the garage. The project site is located within walking distance of a residential community and served by the VTA Bus Line 73.

Pedestrian sidewalks are located along both Alma Avenue and 10th Street, which border the project site. Furthermore, the intersection of Alma Avenue and 10th Street at the southwest corner of the project site features sidewalks and crosswalks, with pedestrian signals for the crossing of both streets. Since the project site can be accessed via bicyclists, pedestrians, and public transit users, increased alternative transportation could reduce vehicle trips, thereby reducing mobile-related GHG emissions and contributing to achieving the goals of SB 32. Additionally, the proposed project would include 84 electric vehicle/clean air spaces and 36 carpool/vanpool spaces. Promoting alternative fuels, electric vehicles, and carpooling would further reduce GHG emissions from vehicles at the project site.

Another goal of the SCS is to boost the number or trips taken without a car across the Bay Area by 10 percent. As mentioned, the proposed project would include bicycle lockers and is located within 0.15 mile of public transportation. With viable alternative transportation options, people would be encouraged to actively commute or take public transportation to the project site.

Based on this analysis, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs and would be consistent with the objectives of the RTP/SCS, AB 32, SB 32, SB 97 and SB 375. Therefore, impacts related to GHG emissions would be less than significant.

LESS THAN SIGNIFICANT IMPACT

9 Hazards and Hazardous Materials

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	■
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	■	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?	☐	☐	☐	■
d. Be located on a site that is included on a list of hazardous material 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 in 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 for excessive noise for people residing or working in the project area?	☐	☐	☐	■
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	■	☐
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires, including where wildlands?	☐	☐	■	☐

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Project construction would be short-term and temporary. Project operation would not require the routine transport, use, or disposal of hazardous materials. Therefore, the proposed project would have no impacts related to the routine transport, use, or disposal of hazardous materials.

NO IMPACT

b. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Project construction would require the limited use of heavy machinery and construction equipment, such as dozers, backhoes, and front-end loaders. The operation of this equipment and machinery could result in a spill or accidental release of hazardous materials, including fuel, engine oil, engine coolant, and lubricants. As described above for threshold "b" under Geology and Soils, construction of the proposed project would require coverage under the Construction General Permit. Compliance with these requirements would include preparation of a construction SWPPP, which would specify BMPs to quickly contain and clean up any accidental spills or leaks. Mandatory implementation a construction SWPPP and associated BMPs would prevent an accidental release of hazardous materials to create a substantial hazard to the public or the environment during project construction. Project operation would not require the use or storage of hazardous materials, and therefore, there would be no potential for accidental release. Therefore, impacts related to accidental releases of hazardous materials would be less than significant and temporary for the duration of construction.

LESS THAN SIGNIFICANT IMPACT

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

The proposed project would be located on the SJSU South Campus. Although the South Campus is developed with athletic facilities and not classrooms and dormitories, it is a college campus. No other schools are located within 0.25 mile of the project site. Project operation would not emit hazardous emissions or require the handling of hazardous materials, substances, or wastes. Therefore, the proposed project would have no impact.

NO IMPACT

d. Would the project be located on a site included on a list of hazardous material 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?

The following databases and listings compiled pursuant to Government Code Section 65962.5 were queried on March 2, 2018, for known hazardous materials contamination at the project site:

- **United States Environmental Protection Agency (USEPA)**
  - Superfund Enterprise Management System (SEMS) database (2018a)
  - Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database (2018b)

- **SWRCB**
    - GeoTracker search for leaking underground storage tanks and other cleanup sites
- **Department of Toxic Substances Control (DTSC)**
    - EnviroStor database (2018a) for hazardous waste facilities or known contamination sites
    - Hazardous Waste and Substances Site List (Cortese) (2018b)

The SJSU South Campus, including the project site, does not appear on any of the above databases or lists. The project site is not identified on the Hazardous Waste and Substance Site List database compiled pursuant to Government Code Section 65962.5 (the "Cortese" list) (USEPA, 2018a; USEPA, 2018b; SWRCB, 2015; DTSC, 2018a; DTSC, 2018b). The SWRCB's GeoTracker database identified two leaking underground storage tanks within the 500 feet of the project site. Both tank sites are located south of the project site and East Alma Avenue, near the existing indoor ice rink facility. Both leaking underground storage tanks have been cleaned and the cases have been closed (SWRCB, 2015).

Although the project site is not listed on the Cortese List, a contaminated groundwater plume flows beneath the project site. Remediation is underway to remove groundwater contamination resulting from the Lorentz Barrel and Drum Co. site, located south of the project site, on the south side of East Alma Avenue. This site is associated with a barrel and drum recycling business that operated from 1947 through 1987. Improper waste handling practices during the drum recycling operation resulted in chemical contamination of soil and groundwater at the site, specifically dioxin contamination (DTSC, 2018a). The site is currently capped with asphalt pavement and used as a vehicle parking lot, and is an active cleanup site with the USEPA as the lead agency. This Superfund site is more than 500 feet from the project site and is undergoing active clean-up with the USEPA as the lead agency. Groundwater monitoring wells are located within the project site. Multiple additional groundwater monitoring wells surround the project site. Recent sample data from these nearby wells indicates that concentrations of pollutants exceed drinking water standards.

Ground improvement activities may encounter groundwater, and construction activities may require dewatering (Appendix C). Excavation of up to 5 feet below ground surface for the parking structure and up to 12 feet for the lighting pole foundations is proposed, with ground improvement at a depth of at least 18 feet (Appendix C). Groundwater at monitoring wells on-site was not encountered until at least 14 feet below ground surface (Pioneer Technologies Corporation 2011). Appendix C also states that the historic high groundwater level below the project site is approximately 10 feet below existing grade. Therefore, Mitigation Measure HAZ-1 is required to address the potential encounter of contaminated groundwater during construction dewatering, pursuant to the provisions of the Soil and Groundwater Management Plan prepared by Ninyo & Moore in May 2019 (Appendix C). In addition, groundwater would not be used for human consumption as part of the proposed project. While vapor migration could occur, causing the hazardous materials to travel up from the groundwater, the project does not include closed structures that would present health hazards related to vapor migration.

Mitigation Measures

The following mitigation measures would be required to reduce impacts related to hazardous materials a less than significant level.

HAZ-1 Dewatering Plan

If dewatering is necessary during construction, then a dewatering plan shall be prepared by the applicant. The dewatering plan shall identify the groundwater flow rate, groundwater capture zone, means of discharge of groundwater, and procedures for monitoring discharges. Proper permits for the discharge of the water shall be obtained and approved by the appropriate regulatory oversight agency and included in the dewatering plan. If contaminated groundwater is encountered during dewatering, then contaminated groundwater and its disposal shall be managed in accordance with applicable regulatory requirements and the Soil and Groundwater Management Plan (Appendix C). The dewatering plan shall describe the operation and maintenance tasks to be performed and identify who will be responsible for the operation, maintenance, and permit compliance obligations. Backup systems, if required, shall be included on the plans. A sufficient amount of area near the dewatering system shall be allocated in case filtration of contaminated groundwater is required after groundwater dewatering commences.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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

The project site is not located within two miles of an airport and is not within an airport land use plan area. Therefore, the proposed project would have no impact related to safety hazards or excessive noise from a nearby airport.

NO IMPACT

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The project would provide a centralized parking facility for the vehicle trips that already occur to the SJSU South Campus (refer to Section 17, *Transportation*). Currently, there are insufficient dedicated parking areas on the SJSU South Campus for larger sporting events, such as football games. During these events, attendees park vehicles on athletic fields and other open areas throughout the campus, including the project site. In the event of an emergency, a centralized parking facility may assist evacuation because vehicles could exit the campus in a more orderly manner as opposed to exiting from various locations and directions throughout campus. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

The project site is located on the existing SJSU South Campus, which is located within the central area of the City of San Jose. The campus is developed with athletic fields and facilities, such as the Spartan Stadium and the SJSU running track. The surrounding vicinity is developed with varying land uses, including residential and industrial. Undeveloped wildland areas are not located within proximity to the project site. Additionally, the California Department of Forestry and Fire Protection has mapped the project site and nearly the entire City of San Jose as a “Non-Very High Fire Hazard Severity Zone” (California Department of Forestry and Fire Protection 2008).

Because the project would be located away from wildland areas and wildland fire fuels, and in a Non-Very High Fire Hazard Severity Zone, impacts related to significant loss, injury, or death involving wildland fires would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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10 Hydrology and Water Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	■	☐	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	■	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion or siltation on- or off-site?	☐	☐	■	☐
d. 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 that would substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	☐	☐	■	☐
e. 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 that would 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?	☐	■	☐	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f. 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 that would impede or redirect flood flows?	☐	☐	☐	■
g. In a flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	■
h. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	■	☐

a. *Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?*

e. *Would the project 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 that would 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?*

Project construction would require ground disturbance and excavation. These activities would loosen and expose soil to precipitation and wind, which would increase the potential for soil erosion and sedimentation. Additionally, project construction would require the limited use of heavy machinery and construction equipment, such as dozers, backhoes, and front-end loaders. The operation of this equipment and machinery could result in a spill or accidental release of fuel, engine oil, engine coolant, and lubricants, which could become conveyed to surface waters in stormwater runoff, or infiltrate to groundwater.

As described above for threshold “b” under Geology and Soils, project construction would require coverage under the Construction General Permit, which is administered by the SWRCB. The San Francisco Bay Regional Water Quality Control Board (RWQCB) is responsible for issuing construction stormwater permits on behalf of the SWRCB in Santa Clara County. Compliance with the permitting requirements would include preparation of a construction SWPPP, which would specify BMPs to prevent erosions and sedimentation and to quickly contain and clean up any accidental spills or leaks. Given the relatively flat topography of the site, lack of surface waters, and implementation of the required SWPPP, construction of the proposed project would not violate water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.

Wastewater discharge during project operation would be limited to minimal amounts of stormwater runoff generated during precipitation events. Project operation would not introduce new pollutants to the project site because it currently is used for vehicle parking and as a running track and athletic field, consistent with uses included under the proposed project. Precipitation and surface runoff on the project site would be directed to the City of San Jose's existing storm sewer system. The City of San Jose's existing storm sewer system is operated under an existing NPDES Municipal Regional Permit (MRP). Therefore, the proposed project would be subject to the requirements of the existing NPDES Municipal Regional Permit (MRP). The San Francisco Bay RWQCB issues the MRP to the City of San Jose and 75 other co-permittees that covers stormwater activities for most of the San Francisco Bay Area. The MRP prohibits the discharge of non-stormwater (materials other than stormwater) into the storm drain systems, as well as into watercourses. Discharges may not violate water quality standards of the receiving water. The MRP contains corrective measures that must be implemented in the event of prohibited discharges or violations of water quality standards. Therefore, project operation would not be expected to violate any water quality standards or waste discharge requirements. The stormwater runoff from the proposed project would not exceed the capacity of the City of San Jose's storm sewer system, and any dewatering would not be discharged to the storm drains, pursuant to Mitigation Measure HAZ-1. The proposed project would result in an incremental increase in the amount of impervious surface in the area. Therefore, the proposed project would have less than significant impacts on water quality standards and discharge requirements, including discharge of pollutants.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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

h. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

There is not a Sustainable Groundwater Management Plan applicable to the proposed project site; as discussed in the project description, water service to the proposed project site would be provided via SJSU's existing water supply sources, and water uses on-site would be comparable to existing water uses. In addition, as discussed above under criteria (a) and (e), the project would not obstruct implementation of existing plans and regulations to protect water quality.

The proposed project would not adversely affect groundwater supplies or impede sustainable groundwater management. Although the proposed project would increase the impervious surface on-site, much of the SJSU South Campus is and would remain pervious. Therefore, the project would not substantially interfere with groundwater recharge. The parking garage would not require substantial groundwater use or consumption. A water supply would be required for operation of the project restrooms; however, water use associated with these facilities would be minimal. Therefore, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project 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 that would result in substantial erosion or siltation on- or off-site?

d. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river through the addition of impervious surfaces, in a manner that would substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?

There are no streams or rivers located on or adjacent to the project site. The proposed project would not alter the course of a stream or river.

The project site consists of a paved oval running track with a grass athletic field in the middle of the track, as well as gravel and paved areas used for parking. The running track and paved areas constitute the existing impervious surface on the project site. The project would increase the impervious surface on the site with construction of the parking structure and the semi-pervious synthetic turf sports field. The additional impervious surface would alter drainage patterns by decreasing the amount of precipitation able to infiltrate the ground. Stormwater runoff would be generated and conveyed to the City of San Jose's existing storm sewer system, as described above. Because stormwater from the project would be conveyed and discharged through the existing storm sewer system, substantial siltation would be prevented. The MRP requires storm drain system to be maintained such that inlets and outlets are not blocked or clogged, potentially leading to flooding issues. Therefore, project-related impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

f. Would the project 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 that would impede or redirect flood flows?

As described above, there are no streams or rivers located on or adjacent to the project site. The proposed project would introduce land uses comparable to existing conditions, and would maintain existing drainage patters to the maximum extent feasible. In addition, the proposed project site is not located within a 100-year flood hazard area, as designated by the Federal Emergency Management Agency (FEMA), where the 100-year flood zone is the area of land subject to a one percent annual chance of flooding. The project site is shown on the FEMA Flood Insurance Rate Map for Santa Clara County (Map Panel 253) (FEMA 2009).

The project would not substantially alter the site's existing drainage pattern, and would not alter the course of a stream or river to impede or redirect flood flows.

NO IMPACT

g. In a flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

As discussed under criterion (f), the project site is not within a 100-year flood hazard area. In addition, the SJSU South Campus is not located within a dam inundation area and is not subject to flooding risks from dam failure. According to the Santa Clara County Geologic Hazard Zones Map (County of Santa Clara 2012), the project site is not located within the dike failure hazard zone. The geotechnical evaluation contained in Appendix C evaluated the potential for seismic flood hazard from Anderson Dam, located approximately 18 miles south of the project site. Flooding due to a seismically-induced breach of Anderson Dam is not anticipated (Appendix C). No impacts would occur.

The City of San Jose and Santa Clara County do not have areas of coastline on the Pacific Ocean that would be at risk of inundation from a tsunami. The California Geological Survey (2009) has identified a limited portion of Santa Clara County within close proximity to the San Francisco Bay as a tsunami inundation area. However, the project site is more than nine miles from this area, and it is not located within a tsunami inundation area.

A seiche is a standing wave oscillating in a body of water that is semi-enclosed or fully enclosed, such as bays and lakes. Seiches are typically caused when strong winds and rapid changes in atmospheric pressure, but earthquakes and tsunamis may also cause seiches along ocean shelves and ocean harbors. The severity or magnitude of seiche is limited by the volume of water in the waterbody. Deeper and larger waterbodies contain more water, which in return, can produce taller and more voluminous waves. There are community ponds in Kelley Park, east of the project site. However, these ponds are shallow and small, such that seiche would not be a risk. Based on the inland location of the site and the lack of large enclosed bodies of water nearby, the site is not at risk for damage from tsunamis or seiches (Appendix C).

The proposed project would have no impact related to inundation by tsunami, seiche, or mudflow.

NO IMPACT

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11 Land Use and Planning

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Physically divide an established community?	☐	☐	☐	■
b. Cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	■	☐

a. Would the project physically divide an established community?

The proposed project would be located on the existing SJSU South Campus in an area that is currently developed with a running track and athletic field in the center of the track, as well as gravel and paved areas. The proposed project would provide centralized parking and a recreational sports field, similar to existing conditions, and would not generate additional on-campus growth that would require new roads or other development that could potentially divide established communities. Therefore, the proposed project would not divide an established community and would have no impact.

NO IMPACT

b. Would the project cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect?

The proposed project would be internal to the SJSU South Campus. The project would require a Campus Master Plan Amendment. However, the project aligns with the campus development need to build up and not out, as it would add parking capacity to an existing athletic facility and parking area by constructing a four-story parking structure. The project would not conflict with any land use plans or policies and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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12 Mineral Resources

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

a. Would the project 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. Would the project 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?

The project site is located on the existing SJSU South Campus and is developed with a track and field facility, as well as gravel and paved areas used for parking. The project site is not used or otherwise identified for mineral resource extraction. Therefore, the proposed project would have no impact on mineral resources.

NO IMPACT

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13 Noise

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

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

Sound pressure level is measured on a logarithmic scale with the zero-dBA level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of three dBA, and a sound that is 10 dBA less than the ambient sound level has no effect on ambient noise. Because of the nature of the human ear, a sound must be about 10 dBA greater than the ambient noise level to be judged as twice as loud. In general, a three-dBA change in the ambient noise level is noticeable, while one- to two-dBA changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40 to 50 dBA, while areas adjacent to arterial streets are typically in the 50- to 60-dBA range. Normal conversational levels are usually in the 60- to 65-dBA range and ambient noise levels greater than 65 dBA can interrupt conversations.

Noise levels from point sources, such as those from individual pieces of machinery, typically attenuate (or drop off) at a rate of 6 dBA per doubling of distance from the noise source. Noise levels from lightly traveled roads typically attenuate at a rate of about 4.5 dBA per doubling of distance. Noise levels from heavily traveled roads typically attenuate at about three dBA per doubling of distance. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source can reduces noise levels by about five dBA, while a solid wall or berm can reduce noise levels by five to 10 dBA (Federal Transit Administration [FTA], 2018). The manner in which homes in California are constructed generally provides a reduction of exterior-to-interior noise levels of approximately 20 to 25 dBA with closed windows.

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

The time period in which noise occurs is also important since nighttime noise tends to disturb people more than daytime noise. Community noise is usually measured using the Day-Night Average Level (Ldn), which is the 24-hour average noise level with a 10-dBA penalty for noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours, or Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a five-dBA penalty for noise occurring from 7:00 p.m. to 10:00 p.m. and a 10-dBA penalty for noise occurring from 10:00 p.m. to 7:00 a.m. The Ldn and CNEL typically do not differ by more than one dBA. In practice, CNEL and Ldn are often used interchangeably.

The land use compatibility guidelines for community noise for the City of San Jose are described in the Envision San Jose 2040 General Plan. Table EC-1 within the General Plan explains noise thresholds for schools as 50 to 60 dBA as normally acceptable, 60 to 75 dBA as conditionally acceptable, and 75 to 85 dBA as unacceptable. An ambient noise level survey was completed in 2001 as part of the EIR for the 2001 San Jose State University Campus Master Plan. The levels recorded over a 24-hour period were 66 dBA and 69 dBA. Both measurements fall under the conditionally acceptable ambient noise levels for a school.

Existing Noise Setting

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Noise-sensitive land uses typically include residences, hospitals, schools, guest lodging, libraries, churches and certain types of recreational uses. Industrial uses, the indoor ice rink facility, and parking lots on properties to the south and west of the project site are not considered sensitive receptors. The residences to the north of the project site, along East Humboldt Street are the nearest sensitive receptors. The closest of these residences to the project site is approximately 500 feet from the project site boundary. Kelley Park, which is east of the SJSU South Campus and Senter Road is also considered a sensitive noise-receptor for this analysis. The park is located approximately 800 feet from the project site boundary.

Field noise measurements were performed by Rincon Consultants, Inc. on February 15, 2018, using an ANSI Type II integrating sound level meter. Two 15-minute noise measurements, referred to herein as Noise Measurements 1 and 2, were conducted during the morning peak traffic hour between 7:45 a.m. and 8:45 a.m. Noise Measurement 1 was taken on the sidewalk on the north side of East Humboldt Street, approximately 25 feet from the centerline of the street and 25 feet from the residences along the street. The noise level measured at this location was 63 dBA Leq. Noise Measurement 2 was taken on the sidewalk on the north side of East Alma Avenue, approximately 35 feet from the road centerline and approximately 10 feet from the boundary of the project site. The average noise level measured at this location was 70 dBA Leq. The noise environment at both measurement locations is dominated by traffic along the public streets in the area, including East Humboldt Street, East Alma Avenue, and South 10th Street. The noise measurement field data is provided as Appendix D.

Vibration

Vibration is a unique form of noise because its energy is carried through buildings, structures, and the ground, whereas sound is simply carried through the air. Thus, vibration is generally felt rather than heard. Some vibration effects can be caused by noise (e.g., the rattling of windows from passing trucks). This phenomenon is caused by the coupling of the acoustic energy at frequencies that are close to the resonant frequency of the material being vibrated. Typically, ground-borne vibration generated by manmade activities attenuates rapidly as distance from the source of the vibration increases. The ground motion caused by vibration is measured as particle velocity in inches per second and is measured in vibration decibels (VdB).

The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources inside buildings such as the operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads.

Vibration impacts would be significant if they exceed the following Federal Railroad Administration (FRA) thresholds:

- 65 VdB where low ambient vibration is essential for interior operations, such as hospitals and recording studios
- 72 VdB for residences and buildings where people normally sleep, including hotels
- 75 VdB for institutional land uses with primary daytime use, such as churches and schools
- 95 VdB for physical damage to extremely fragile historic buildings
- 100 VdB for physical damage to buildings

In addition to the groundborne vibration thresholds outlined above, the FRA outlined human response to different levels of groundborne vibration and determined that vibration that is 85 VdB is acceptable only if there are an infrequent number of events per day (FRA, 2012).

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

Construction

Project construction would require the use of various types of heavy equipment and vehicles, such as dozers, excavators, and dump trucks. The use of this equipment would generate engine and mechanical noise temporarily, for the duration of construction. Reference noise levels from the FTA's *Transit Noise and Vibration Impact Assessment* (2018) for typical construction equipment are shown in Table 7. The table also shows the noise level of the equipment at the nearest residential receptor (500 feet) and Kelley Park (800 feet), based on a standard noise attenuation rate of 6 dBA per doubling of distance.

Table 7 Typical Construction Equipment Noise

Equipment	Typical Noise Level (dBA) 50 Feet from Source	Typical Noise Level (dBA) 500 Feet from Source	Typical Noise Level (dBA) 800 Feet from Source
Air Compressor	81	61	61
Backhoe	80	60	57
Compactor (ground)	82	62	58
Concrete Mixer	85	65	61
Generator	82	62	58
Paver	85	65	61
Pneumatic Tools	85	65	61
Roller	85	65	61
Saw	76	56	52
Truck	84	64	60

Source: FTA 2018

As described above, the existing ambient noise level at residences along East Humboldt Street is 63 dBA Leq. As shown in Table 7, construction equipment noise at the nearest residences would attenuate to below 66 dBA. Increases of 3 dBA or less above ambient conditions typically are not perceptible. Also, existing buildings on the SJSU campus between the project site and the residences along East Humboldt Street would result in increased attenuation (a solid row of buildings typically accounts for an approximately 4.5 dBA reduction). Due to the temporary duration of project construction, the additional attenuation that would result from existing buildings surrounding the project site, and the determination that all construction equipment noise would be imperceptible at the nearest residences, temporary increases in ambient noise levels would not be substantial. SJSU does not have existing noise standards or regulations in place. As such, construction of the project would not conflict with noise policies or regulations. Construction-generated noise impacts would be less than significant.

Operation

The site is currently used for the SJSU track and field facility and for vehicle parking during sporting events at the SJSU South Campus. As the project would continue these uses, project operation would not introduce new noise sources to the site. Noise associated with vehicle parking, such as engines cranking, car alarms, opening and closing of car doors, and people's voices would continue, consistent with existing conditions. As the proposed sports field would be lit, it could be used for practices that may go as late as 10:00 p.m., and more noise may be generated during evening hours as a result of the project. However, these practices would not involve spectators, and thus would generate substantially lower noise levels than the existing nighttime football games at Spartan Stadium. Also, due to the distance between the proposed parking and sports facility and the nearest sensitive receptors, it is not anticipated that sports practices or intramural sports associated with operation of the proposed project would result in a significant noise impact.

The project would redistribute existing trips, but it would not generate any new vehicle trips. However, the redistribution of vehicle trips could increase noise for receivers adjacent to the project site and residences northwest of the project site along Keys Street.

Approximately five percent of 4,200 total average daily vehicle trips to the parking structure would be redistributed to Keys Street near single family residences. This equates to approximately 210 trips per day (Appendix E). Keys Street carries approximately 18,000 average daily trips (ADT).[3] A 10 percent increase in traffic volumes would raise traffic noise by approximately 0.4 dBA, a 20 percent increase would raise traffic noise by approximately 0.8 dBA, and a 30 percent increase would result in approximately 1.1 dBA increase in traffic noise. The project would have a significant effect due to traffic noise if it would increase roadway noise levels by more than the 3 dBA threshold of perception, which would occur if traffic on area roadways doubled (FTA 2018). Traffic on Keys Street would increase by 210 trips per day, which is an increase of less than 10 percent over existing traffic and would result in a less than 0.4 dBA increase in noise. Therefore, project traffic noise would not be perceptible at single family residences north of the project site.

The project would redistribute vehicle trips along South 10th Street south of the project site. Existing ADT on South 10th Street between Alma Avenue and Phelan Avenue is approximately 17,000 vehicles.[3] Approximately 210 vehicle trips from the proposed project would be redistributed to South 10th Street south of the project site. Similar to Keys Street, traffic on South 10th Street would increase by less than 10 percent and would result in a less than 0.4 dBA increase in noise. Redistribution of traffic as a result of the proposed project would be below 0.4 dBA and thus imperceptible. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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

Table 8 identifies vibration velocity levels for the types of construction equipment that would operate at the project site during construction.

Table 8 Vibration Levels from Vibration-Generating Construction Equipment

	Approximate VdB	
Equipment	500 feet	800 feet
Loaded Trucks	47	40
Jackhammer	40	34
Bulldozer	48	42

Source: FTA 2018

As illustrated in Table 8, vibration levels could reach approximately 48 vibration decibels (VdB) at the residences located 500 feet from the project site and a maximum of 42 VdB at Kelley Park, 800 feet from the project site. These levels would not exceed the groundborne velocity threshold level

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[3] Keys Street has approximately 1,800 PM peak hour trips. ADT is equal to ten times peak hour trips. Therefore, ADT on Keys Street is approximately 18,000.

of 80 VdB established by the FRA for noise-sensitive buildings, residences, and institutional land uses. Impacts resulting from temporary construction vibration would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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

The project site is not located within two miles of an airport or private airstrip. Therefore, the proposed project would have no impact related to airports and airstrips.

NO IMPACT

14 Population and Housing

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	■
b. Displace substantial amounts of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	■

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

b. Would the project displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere?

The proposed project would not induce population growth in the area or growth in the enrollment numbers for SJSU. The project would serve the existing campus community, and would not impact housing availability or demand. The project site is currently served by roads and other infrastructure because it is located on the existing SJSU South Campus. Therefore, the proposed project would not induce population growth.

The proposed parking garage and sports field would be located in the current location of the SJSU running track and gravel and paved parking areas on the SJSU South Campus. There are no housing units or resident population in this area. Therefore, the proposed project would not displace people or housing. The proposed project would have no impact related to population and housing.

NO IMPACT

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15 Public Services

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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:				
1 Fire protection?	☐	☐	■	☐
2 Police protection?	☐	☐	■	☐
3 Schools?	☐	☐	☐	■
4 Parks?	☐	☐	☐	■
5 Other public facilities?	☐	☐	☐	■

a.1. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, or the 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?

The City of San Jose Fire Department (SJFD) provides emergency response and public safety services on the SJSU South Campus. Response times to the campus are within the four-minute response time called for in the San Jose 2020 General Plan (URS 2001). Emergency access throughout the campus is facilitated by the campus design, incorporation of fire lanes, and access to fire hydrants. The parking structure would be required to comply with applicable building and fire codes and therefore could be served by SJFD in the event of an emergency. The project would not require SJFD to provide new facilities or services that could result in an environmental impact. Impacts would be less than significant.

a.2. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities, or the need for new or physically altered police protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

The SJSU campus has its own on-campus police department. The current response time for the police department is less than three minutes to any emergency call. The department's goal is to respond to all calls for service within 15 minutes. The proposed project would serve as a venue for sports games and the proposed walkway would be open to the public. As discussed in Section 13*, Noise,* and in Section 17, *Transportation*, the project would result in increased trips during sports games; this may result in increased demand for police protection services. However, design features such as blue-light emergency phones and security cameras would be installed to increase safety and police response times throughout the project site and would not result in the need for construction of additional public safety facilities or services. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.3. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered schools, or the need for new or physically altered schools, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

a.4. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered parks, or the need for new or physically altered parks, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

a.5. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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 other public facilities?

The project would allow for intramural sports games and sports practices. Project construction would not involve the construction of housing or other facilities. No population growth would be induced by the project, and therefore would not result in the need for new schools or parks or the physical deterioration of existing schools or parks. No impact would occur.

NO IMPACT

16 Recreation

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

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?*

The project would not construct new housing or other buildings with occupancy, nor does it involve new businesses, and there are no housing units or resident population in this area. Therefore, the proposed project would not directly or indirectly lead to an increase in population that would generate greater demand for regional parks or other recreational facilities. There would be no impacts to recreation from the proposed project, aside from the benefit of a public walking path.

NO IMPACT

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17 Transportation

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

This section is based on the Traffic Study prepared by Hexagon Transportation Consultants, Inc. (see Appendix E).

a. Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Construction

Temporary impacts to the circulation system may occur from worker and truck trips during construction. However, off-site construction trips typically occur during off-peak traffic periods, when intersections and roadways operate well within acceptable levels of service. Typical activities related to the construction of any development could include lane narrowing and/or lane closures and sidewalk closures. In the event of any type of street closure, clear signage (e.g., closure and detour signs) would be provided to ensure vehicles, bicyclists, and pedestrians are able to adequately reach their intended destinations safely. The project would be required to submit a construction management plan for City approval that addresses schedule, closures/detours, staging, parking, and truck routes. Therefore, impacts to the circulation system during the construction would be less than significant.

Operation

The project would be reorienting existing trips and not generating new trips; therefore, the VMT impact would be minimal (Appendix E). However, in order to analyze impacts to nearby intersections, Appendix E used time of arrival estimates supplied by SJSU to quantify impacts to the transportation network. The project is estimated to involve 4,200 daily trips with peak entrances into the parking garage of 400 vehicles per hour and peak exits out of the parking garage of 400 vehicles per hour. Nine intersections were analyzed, all of which operated acceptably before the addition of project traffic. The addition of project traffic did not cause a change in LOS at any of the intersections studied. Therefore, no LOS impacts would occur as a result of the project.

Pedestrian, Bicycle, and Transit Facilities

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. In the project vicinity, sidewalks exist along most nearby streets. However, sidewalks do not exist along portions of Alma Avenue on the south side of the street. Marked crosswalks with pedestrian signal heads and push buttons are provided at all the signalized intersections. There is a pedestrian midblock crosswalk across 10th Street about 700 feet north of Alma Avenue. Overall, the existing network of sidewalks and crosswalks in the immediate vicinity of the project site has good connectivity.

In the vicinity of the project, bike lanes (Class II Bikeway) exist along all nearby streets, other than Alma Avenue. No impacts to bicycle facilities is anticipated with implementation of the proposed project.

Shuttle service to the study area is provided by San Jose State University (SJSU). San Jose Park & Ride Lot Shuttle Service provides service from the San Jose Park & Ride Lot on 7th Street and Alma Avenue to Duncan Hall at SJSU located on 5th Street and San Salvador Street. The Shuttle Service operates during the college semester, Monday through Thursday with approximately 10-minute headways from 6:30 AM to 4:30 PM and with approximately 20-minute headways from 4:30 PM to 10:20 PM. According to the site plan, there is no staging area for shuttle buses. Due to the existing bike lanes, shuttle buses cannot park on 10th Street. This would result in a potential transit impact.

Mitigation Measures

The following mitigation measure would reduce impacts to transit services.

TRA-1 Shuttle Staging Area

The project shall incorporate a staging area sized for 40-foot shuttle buses to transport students and staff between the parking structure and the main campus, and Alma Avenue shall be restriped to provide the necessary space for buses to stop along the curb. The staging area shall be developed to current transit facility design standards and shall optimally accommodate pedestrians and shuttle users through the use of bulb-outs, weather protective shelter structure, and through-vehicle traffic-calming features in the right-of-way.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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

As stated above under *(a)*, the project would be reorienting trips and not generating new trips; therefore, the VMT impact would be minimal (Appendix E). The CSU Transportation Impact Study Manual states that parking facilities that serve the campus demand and do not create “too much parking” would constitute a less than significant impact related to VMT. According to a parking study completed by Watry Design, Inc., the main campus project deficit in 2028 is expected to be 1,741 spaces. Therefore, the proposed parking garage would serve campus demand and not create “too much parking” (Appendix E). The project would not conflict with CEQA Guidelines section 15064.3, subdivision (b) and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. *Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?*

Vehicles would access the site via a full-access driveway on 10th Street approximately 250 north of Alma Avenue, just before the buffered bike lane starts on 10th Street. This location would allow vehicles to enter and exit the garage without encroaching into the buffered bike lane. Site access would also be provided via a full-access driveway on Alma Avenue approximately 325 feet east of 10th Street, at the approximate location of an existing driveway. According to the City of San Jose Department of Transportation (DOT) Geometric Design Guidelines, the typical width for a driveway shall not be less than 10 feet wide for ingress and egress. Therefore, typical width for a two-way driveway is 20 feet. The proposed driveway on 10 Street would be approximately 26 feet wide, and the proposed driveway on Alma Avenue would be approximately 24 feet wide. Both driveways widths meet the city standard (Appendix E).

However, the project has the potential to increase hazards due to congestion from vehicles attempting to enter and exit the project site, especially when driveways would be busiest (Appendix E). Therefore, the following mitigation is required to reduce impacts.

Mitigation Measure

The following mitigation measure would reduce impacts due to transportation hazards.

TRA-2 Management of Ingress/Egress

In order to move traffic efficiently in and out of the proposed garage, at least three lanes for entering and three lanes for exiting shall be provided. Police officers shall be used to direct traffic before and after games taking place in Spartan Stadium to control traffic on 10th Street so that vehicles could enter and exit the garage in a timely manner.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

d. *Would the project result in inadequate emergency access?*

The proposed project would not conflict with emergency access. The project includes an access lane on the east side of the project site, which would ensure emergency access to the site. No impacts would occur.

NO IMPACT

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18 Tribal Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in a Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	■	☐	☐
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Cod Section 2024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significant of the resource to a California Native American tribe.	☐	■	☐	☐

California Assembly Bill 52 of 2014 (AB 52) establishes that "A project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (PRC Section 21084.2). It further states that the lead agency shall establish measures to avoid impacts that would alter the significant characteristics of a tribal cultural resource, when feasible (PRC Section 21084.3).

PRC Section 21074 (a)(1)(A) and (B) defines tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and is:

1. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also establishes a formal consultation process for California tribes regarding those resources. The consultation process must be completed before a CEQA document can be certified. Under AB

52, lead agencies are required to "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project." Native American tribes to be included in the process are those that have requested notice of projects proposed within the jurisdiction of the lead agency.

a. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074 that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?*

b. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074 that is 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 2024.1?*

No tribes have previously requested notification from SJSU. Thus, the California State University Board of Trustees assumes that no known tribal cultural resources are present on the project site. The results of an SLF search, discussed in the Cultural Resources section, were negative. However, excavation of the project site could potentially result in impacts on previously unidentified tribal cultural resources. Impacts from the unanticipated discovery of tribal cultural resources during construction would be less than significant with Mitigation Measures CUL-1 through CUL-3 in Section 5, *Cultural Resources*, and with Mitigation Measure TCR-1 below.

Mitigation Measures

The following mitigation measure, along with Mitigation Measures CUL-1 through CUL-3 in the cultural resources section, would reduce impacts to unanticipated tribal cultural resources to a less than significant level.

TCR-1 Unanticipated Discovery of Tribal Cultural Resources

In the event that cultural resources of Native American origin that may be considered tribal cultural resources are identified during construction, all earth disturbing work within 50 feet of the find must be temporarily suspended or redirected until an archaeologist has evaluated the nature and significance of the find and in consultation with the on-site Native American monitor. If the archaeologist and Native American monitor determine that the resource is a tribal cultural resource and thus significant under CEQA, a mitigation plan shall be prepared and implemented in accordance with state guidelines and in consultation with Native American groups. The plan would include avoidance of the resource or, if avoidance of the resource is infeasible, the plan would outline the appropriate treatment of the resource in coordination with the appropriate Native American tribal representative(s).

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

19 Utilities and Service Systems

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Require or result in the relocation or construction of new or expanded water, 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?	☐	☐	☐	■

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?

As described under Section 10, *Hydrology and Water Quality*, the proposed project would not require new or expanded water supply entitlements or facilities, and existing drainage patterns would be maintained to the maximum extent feasible, such that adverse impacts related to water supply requirements and stormwater drainage would not occur.

The San Francisco Bay RWQCB regulates wastewater treatment for the City of San Jose. Wastewater generated at SJSU is discharged into a campus sewer line and delivered to the San Jose-Santa Clara Regional Wastewater Facility through City wastewater mains that range in size from six inches in diameter to 72 inches in diameter. The San Jose-Santa Clara Regional Wastewater Facility is currently treating an average of 110 million gallons per day, with the capacity to treat 167 million gallons per day (San Jose-Santa Clara Regional Wastewater Facility 2018). Therefore, the San Jose-Santa Clara Regional Wastewater Facility has excess capacity of 57 million gallons per day. The project would include restrooms and drinking fountains, which could incrementally increase water demand. However, this increase would not be substantial, and no wastewater would be generated that could exceed the treatment requirements of the Regional Water Quality Control Board, result in the construction of new water or wastewater treatment facilities or the expansion of existing facilities, or exceed the capacity of any existing wastewater treatment provider.

As discussed under Section 6, Energy, the proposed project would not require new or substantially revised electrical power facilities. In addition, neither construction nor operation and maintenance of the proposed parking structure or sports field would require new or revised natural gas or telecommunications facilities.

NO IMPACT

c. Would the project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

As discussed under Section 9, *Hydrology and Water Quality*, stormwater drainage facilities on the SJSU campus would not be substantially altered as a result of the proposed project. SJSU would be required to comply with all applicable storm water quality policies and regulations set forth by the SWRCB and the San Francisco Bay Area RWQCB. Although there would be ground disturbance during construction and a net increase in impervious surfaces, the proposed project would be engineered to address storm water drainage and flooding standards by storm water runoff to the City of San Jose's existing storm sewer system. The runoff generated from the proposed project would not exceed the capacity of the existing storm sewer system. Therefore, the project would not cause significant environmental effects by adding or expanding storm water drainage facilities. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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

The project would utilize the existing water treatment and distribution system in place at SJSU. In addition, the anticipated amount of water necessary to service the proposed project would be comparable to existing uses on the site. The three new restrooms would introduce a new water demand, but this would be incremental and consistent with supply for the campus water system, which accounts for campus build-out and development. Sufficient water is available for the proposed project, and the project would not generate a need for new or expanded water entitlements. No impact would occur.

NO IMPACT

d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

e. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

The SJSU campus disposes of solid waste through a contract with Republic Services. Solid waste is disposed of at Newby Island Landfill, which has a permitted capacity of 4,000 tons/day. The landfill has a remaining capacity of 37 percent, or approximately 21 million cubic yards as of October 31, 2014 (California Department of Resources Recycling and Recovery 2016). The project would generate a small amount of solid waste during construction from the demolition of the existing structure. Operational waste would be limited to additional waste from athletes, beyond what is currently generated on-site. Because sufficient capacity remains for the minimal additional solid waste from the proposed project, generation of additional solid waste beyond the capacity of the landfill would not be anticipated. Additionally, the campus promotes an effective recycling program, and approximately 83 percent of waste is diverted and recycled (Annual Sustainability Report 2014). The proposed project would be required to comply with all applicable federal, state, and campus statutes and regulations related to solid waste. Therefore, the project would not result in impacts related to solid waste.

NO IMPACT

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20 Wildfire

	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?	☐	☐	☐	■

a. Would the project, if located in or near state responsibility areas or lands classified as very high fire hazard severity zones, substantially impair an adopted emergency response plan or emergency evacuation plan?

The project site is located on the existing SJSU South Campus, which is within the central area of the City of San Jose. Undeveloped wildland areas are not located within proximity to the project site. Additionally, the California Department of Forestry and Fire Protection has mapped the project site and nearly the entirety of the City of San Jose as not within a "Very High Fire Hazard Severity Zone" (California Department of Forestry and Fire Protection 2008). Therefore, the project site is not located near a state responsibility area or classified as having a high fire hazard.

As discussed in Section 15, *Public Services*, the SJFD provides emergency response and public safety services for the project site and SJSU South Campus. According to the Campus Master Plan EIR (2001), emergency access throughout the campus is facilitated by campus design. The project would maintain emergency access and would not interfere with any emergency response plan or evacuation route. No impact would occur.

NO IMPACT

b. *Would the project, if located in or near state responsibility areas or lands classified as very high fire hazard severity zones, 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?*

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?*

San Jose is in the northern portion of the Santa Clara Valley that is bounded by mountains to the east and west, and the San Francisco Bay to the north. Because San Jose lies in the center of the Valley, most of the city, including the project site, is relatively flat. Prevailing winds in the Santa Clara Valley and in San Jose are influenced by terrain, resulting in prevailing wind flows along the Valley's northwest-southeast axis. A northwest sea breeze is common on most days from spring through early fall, with a southeasterly flow at night and in the winter (CARB 1984). The project site and surrounding area is not at risk to high windspeeds or slopes that may exacerbate wildfire risk.

There are no streams or rivers located on or adjacent to the project site, and the project site and surrounding areas are not at high risk of downslope or downstream flooding or landslides. The project site is located in an urbanized area and is not located in a high fire hazard severity zone (California Department of Forestry and Fire Protection 2008). Therefore, wildfire risks would not be exacerbated and risks to people or structures due to runoff, post-fire slope instability, or drainage changes would not occur. Visitors to the project site would not be exposed to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. No impact would occur.

NO IMPACT

c. *Would the project, if located in or near state responsibility areas or lands classified as very high fire hazard severity zones, 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?*

The project site is located in an urbanized area and is not located in or near a state responsibility area or land classified as a very high fire hazard severity zone (California Department of Forestry and Fire Protection 2008). The project would not require the installation or maintenance of associated infrastructure that may exacerbate fire risk. The project site would be adequately served by existing facilities and utilities. Temporary or ongoing impacts to the environment due to facilities that may exacerbate fire risk would not occur.

NO IMPACT

21 Mandatory Findings of Significance

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

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, eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?*

The project is located in an existing developed area that does not contain known historic resources or wildlife habitat. Therefore, the project would not impact fish or wildlife populations, eliminate or reduce the number or restrict the range of a plant or animal community, or eliminate examples of major periods of California history or prehistory. No impacts would occur.

As discussed in this Initial Study, the project has the potential to degrade the quality of the environment in several issue areas without the incorporation of the identified mitigation measures. As discussed in Section 4, *Biological Resources*, Mitigation Measure BIO-1 would be required to reduce impacts to nesting birds a less than significant level. As discussed in Section 5, *Cultural*

Resources, and Section 17, *Tribal Cultural Resources*, the project has the potential to uncover and disturb previously unidentified resources during ground-disturbing activities. Through implementation of Mitigation Measures CUL-1 through CUL-3 and TCR-1, impacts would be less than significant.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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

As discussed in this Initial Study, the project would have no impact, a less than significant impact, or a less than significant impact after mitigation with respect to all environmental issues. As discussed in Section 3, *Air Quality*, and Section 7, *Greenhouse Gas Emissions,* the project would not exceed BAAQMD thresholds. The project would not result in substantial long-term environmental impacts and, therefore, would not contribute to cumulative environmental changes that may occur due to planned and pending development. Potential impacts of the project would not be cumulatively considerable.

NO IMPACT

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

Effects on human beings are generally associated with impacts related to issue areas such as air quality, geology and soils, noise, traffic safety, and hazards. As discussed in this Initial Study, with mitigation incorporated, the project would result in a less than significant impact in each of these resource areas. As discussed in Section 3, *Air Quality,* the project would not generate air quality pollutants above BAAQMD thresholds, and impacts would be less than significant. As discussed in Section 6, *Geology and Soils,* the project would not expose people or structures to potential adverse effects including risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. As discussed in Section 9, *Hazards and Hazardous Materials*, with incorporation of Mitigation Measure HAZ-1, the project would not result in impacts relating to hazardous materials. As discussed in Section 16, *Transportation,* the project would not alter existing transportation infrastructure or have adverse impacts on traffic safety with the incorporation of Mitigation Measure TRA-1 and TRA-2. The project would not cause substantial adverse effects on human beings, either directly or indirectly. Impacts would be less than significant with mitigation.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

References

Bibliography

Association of Bay Area Governments (ABAG). 2017. Plan Bay Area 2040 Draft Plan.

Bay Area Air Quality Management District (BAAQMD). 2012. Risk and Hazard Screening Analysis Process Flow Chart. http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/updated-screening-approach-flow-chart_may-2012.pdf?la=en (accessed August 2018).

____. 2017a. Air Quality Standards and Attainment Status. http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status (accessed August 2018).

____. 2017b. Final 2017 Clean Air Plan. Spare the Air Cool the Climate: A Blueprint for Clean Air and Climate Protection in the Bay Area. Final 2017 Clean Air Plan. April 19, 2017.

____. 2017c. California Environmental Quality Act Air Quality Guidelines. San Francisco, CA. May 2017.

California Air Pollution Control Officers Association (CAPCOA). 2008. CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. January 2008.

____. 2017. California Emissions Estimator Model (CalEEMod) User's Guide. Version 2016.3.2. November 2017.

California Air Resources Board (CARB). 1984. California Surface Wind Climatology. Available at: https://www.arb.ca.gov/research/apr/reports/l013.pdf

____. 2018. *Summary: Diesel Particulate Matter Health Impacts*. October 2018. https://ww2.arb.ca.gov/resources/summary-diesel-particulate-matter-health-impacts (accessed November 2018).

California Climate Action Registry (CCAR). 2009. California Climate Action Registry General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 3.1. January 2009.

California Department of Conservation. 2010. *Fault Activity Map of California (2010)*. http://maps.conservation.ca.gov/cgs/fam/ (accessed November 2018).

California Department of Forestry and Fire Protection. 2008. *Santa Clara County: Very High Fire Hazard Severity Zones in LRA as Recommend by CAL FIRE* [map]. from http://frap.fire.ca.gov/webdata/maps/santa_clara/fhszl_map.43.jpg (accessed March 2018).

California Department of Toxic Substances Control (DTSC). 2018a. *EnviroStor Database* [online database]. http://envirostor.dtsc.ca.gov/public/map/?myaddress=1250+South+10th+Street%2C+San+Jose (accessed March 2018).

California Department of Toxic Substances Control (DTSC). 2018b. *Hazardous Waste and Substances Site List (Cortese)* [online database]. http://www.envirostor.dtsc.ca.gov/public/search?cmd=search&reporttype=CORTESE&site_type=CSITES,OPEN,FUDS,CLOSE&status=ACT,BKLG,COM,COLUR&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+(CORTESE) (accessed March 2018).

California Geological Survey. 2001. *Earthquake Zones of Required Investigation: San Jose East Quadrangle* [map]. California Geological Survey: Sacramento, California.

____. 2002. California Geomorphic Provinces, Note 36. December 2002.

____. 2009. *Tsunami Inundation Map for Emergency Planning, State of California - County of Santa Clara: Milpitas Quadrangle* [map]. California Emergency Management Agency, California Geological Survey, and University of Southern California: Sacramento, California.

California State University. 2016. *CSU Seismic Requirements*. November 1, 2016. http://www.calstate.edu/cpdc/ae/seismic/november_2016_final.pdf (accessed March 2018).

____. 2017. *Sustainability in the California State University*. https://www2.calstate.edu/impact-of-the-csu/sustainability/Documents/2014-17-Sustainability.pdf (accessed January 2019).

Del Rio, Melody. 2018. Speed City Lives on in SJSU Athletics History. http://www.sjsunews.com/spartan_daily/news/article_1852b3f6-d12f-11e8-80b1-4b3de905ca70.html (accessed May 2019).

Dixon, Keith. 1977. Resource Record for P-43-000024: Archaeology on San Jose State's Campus. Confidential record on file with the Northwest Information Center, Sonoma State University.

Evans Ogden, L.J. 1996. Collision course: the hazards of lighted structures and windows to migrating birds. World Wildlife Fund Canada and the Fatal Light Awareness Program, Toronto, Canada.

Edwards, Harry. 2019. Email correspondence with Rachel Myrow at KQED. May 3, 2019.

Federal Emergency Management Agency (FEMA). 2009. *Flood Insurance Rate Map, Santa Clara County, California and Incorporated Areas: Panel 253 of 830* [map]. May 18, 2009.

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment Manual.* FTA Report No. 0123. Prepared by John A. Volpe National Transportation Systems Center. September 2018.

Federal Railroad Administration (FRA). 2012. *High-Speed Ground Transportation Noise and Vibration Impact Assessment*. September 2012.

Hüppop, O., K. Hüppop, J. Dierschke, and R. Hill. 2015. Bird collisions at an offshore platform in the North Sea. Bird Study (63)1: 73-82.

Lynch, Alexandra. 2017. Guide to the San Jose State College "Speed City Collection MSS.2016.04.25. On file with SJSU Special Collections and Archives, San Jose State University.

National Aeronautics and Space Administration. 1998. Science Briefs – Greenhouse Gases: Refining the Role of Carbon Dioxide by Qiancheng Ma. Goddard Institute for Space Studies. March 1998. https://www.giss.nasa.gov/research/briefs/ma_01/ (accessed October 2018).

____. 2018. Global Climate Change: Vital Signs of the Plant. Facts – Causes: A blanket around the Earth. https://climate.nasa.gov/causes/ (accessed October 2018).

National Park Service. 1983. *Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines*. https://www.nps.gov/history/local-law/arch_stnds_0.htm (accessed November 2018).

Natural Resources Conservation Service. 2017. *Web Soil Survey* [online database]. https://websoilsurvey.nrcs.usda.gov/ (accessed March 2018).

The Nature Conservancy. 2015. Reducing Ecological Impacts of Shale Development: Recommended Practices for the Appalachians. www.nature.org/shale-practices (accessed July 2018).

Norris, R.M., and Webb, R.W. 1990. Geology of California. John Wiley & Sons, New York.

Outen, A. 2002. The possible ecological implications of artificial lighting. In: Sherwood, B., D. Cutler, and J Burton (Eds.), 2002. Wildlife and Roads, the Ecological Impact. Imperial College Press, London, 299 pp.

Pioneer Technologies Corporation. 2011. Annual Groundwater Monitoring Report No. 42 (December 1, 2010 through November 30, 2011) for Lorentz Barrel and Drum Site. December 20, 2011. https://www.envirostor.dtsc.ca.gov/public/deliverable_documents/6777343571/2011_GW%20Annual%20Report_43.pdf. San Jose, City of. 2011. *Envision San Jose 2040 General Plan*. Adopted November 1, 2011. http://www.sanjoseca.gov/DocumentCenter/Home/View/474 (accessed March 2018).

San Jose, City of. n.d. *Stormwater*. Retrieved on http://www.sanjoseca.gov/index.aspx?nid=1615 (accessed November 2018).

San Jose State University (SJSU). 2001. Master Plan. San Jose, California. October 2001. [online]: http://www.sjsu.edu/fdo/docs/sjsu_complete_master_plan_hi-res.pdf (accessed January 2019).

Santa Clara, County of. 2012. *Santa Clara County Geologic Hazard Zones*. Retrieved on March 2, 2018, from https://www.sccgov.org/sites/dpd/DocsForms/Documents/GEO_GeohazardATLAS.pdf

Santa Clara, County of, City of San Jose, City of Morgan Hill, City of Gilroy, Santa Clara Valley Water District, & Santa Clara Valley Transportation Authority. 2011. *Final Santa Clara Valley Habitat Plan*. http://scv-habitatagency.org/DocumentCenter/View/136 (accessed November 2018).

Society of Vertebrate Paleontology. 2010. *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources.* Society of Vertebrate Paleontology Impact Mitigation Guidelines Revision Committee.

State Water Resources Control Board (SWRCB). 2015. *GeoTracker* [online database]. https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=1250+South+10th+Street%2C+San+Jose (accessed March 2018).

Strata. 2016. *Exterior Lighting Master Plan and Source Emergency Power, SJSU Campus*. October 7, 2016.

URS. 2001. San Jose State University Master Plan 2001 Update: Final Environmental Impact Report. SCH No. 2001022002. November 5, 2001. [online]: http://www3.sanjoseca.gov/clerk/Agenda/20100420/20100420_0701a1FEIRp1.pdf (accessed January 2019).

United States Environmental Protection Agency (USEPA). 2004. Air Quality Criteria for Particulate Matter (Final Report). Washington, DC. EPA 600/P-99/002aF-bF, 2004. (accessed November 2018).

____. 2015. *Fourth Five-Year Review Report for Lorentz Barrel and Drum Superfund Site.* September 2015. https://www.envirostor.dtsc.ca.gov/public/deliverable_documents/2927052378/Lorentz%20BD%20FYR%20092915_Final.pdf (accessed November 2018).

____. 2018a. *Superfund: Search Superfund Site Information*. https://cumulis.epa.gov/supercpad/CurSites/srchrslt.cfm?start=1 (accessed March 2018).

_____. 2018b. *System Data Searches: SEMS*. https://iaspub.epa.gov/enviro/efsystemquery.sems?fac_search=primary_name&fac_value=&fac_search_type=Beginning&postal_code=&location_address=1250+South+10th+Street&add_search_type=Beginning2&city_name=San+Jose&county_name=&state_code=CA&program_search=multi&report=basic&page_no=1&output_sql_switch=TRUE&database_type=SEMS (accessed March 2018).

United States Fish and Wildlife Service (USFWS). 2018. *National Wetlands Inventory: Wetlands Mappe*r. https://www.fws.gov/wetlands/data/mapper.html (accessed March 2018).

United States Geological Survey (USGS). 1999. *Preliminary Geologic Map of The San Jose 30 X 60-Minute Quadrangle, California* [map]. Wentworth, Blake, McLaughlin, and Graymer. https://pubs.er.usgs.gov/publication/ofr98795 (accessed November 2018).

University of California Museum of Paleontology (UCMP). 2018. Collections [online database]. http://www.ucmp.berkeley.edu/science/collections.php (accessed November 2018).

List of Preparers

Rincon Consultants, Inc. prepared this IS-MND under contract to San Jose State University. Persons involved in data gathering analysis, project management, and quality control are listed below.

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Kari Zajac, Environmental Planner
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Hannah Haas, Archaeologist

Public Review of the Draft IS-MND

The Draft IS-MND prepared for the San Jose State University, South Campus Multi-level Parking Structure and Sports Field Facility Project was circulated for a 30-day public review period that began on June 1, 2019 and concluded on July 1, 2019. No comments were received, and consequently no changes to the Draft IS-MND were deemed necessary.

Appendix A

Photometric Study

San Jose State University Track & Field SJSU

San Jose, CA

Lighting System

Pole / Fixture Summary

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
S1-S6	70'	70'	6	TLC-LED-1150	6.90 kW	A
6			*36*		*41.40 kW*	

Circuit Summary

Circuit	Description	Load	Fixture Qty
A		41.4 kW	36

Fixture Type Summary

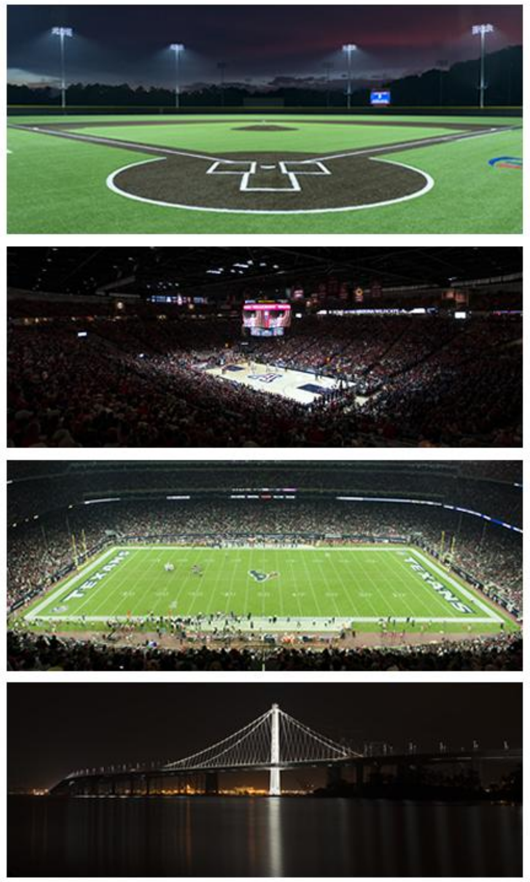
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-1150	LED 5700K - 75 CRI	1150W	121,000	>81,000	>81,000	>81,000	36

Light Level Summary

Calculation Grid Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Soccer	Horizontal Illuminance	36.8	28	46	1.64	1.31	A	36
Walking Track	Horizontal Illuminance	27.6	13	46	3.59	2.12	A	36

From Hometown to Professional



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San Jose State University Track & Field SJSU
San Jose, CA

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
6	S1-S6	70'	-	70'	TLC-LED-1150	6	6	0
6	TOTALS					36	36	0

GRID SUMMARY

Name:	Soccer
Size:	345' x 210'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average:	
Scan Average:	36.77
Maximum:	46
Minimum:	28
Avg / Min:	1.30
Guaranteed Max / Min:	
Max / Min:	1.64
UG (adjacent pts):	1.27
CU:	0.65
No. of Points:	84

LUMINAIRE INFORMATION

Color / CRI:	5700K - 75 CRI
Luminaire Output:	121,000 lumens
No. of Luminaires:	**36**
Total Load:	41.4 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

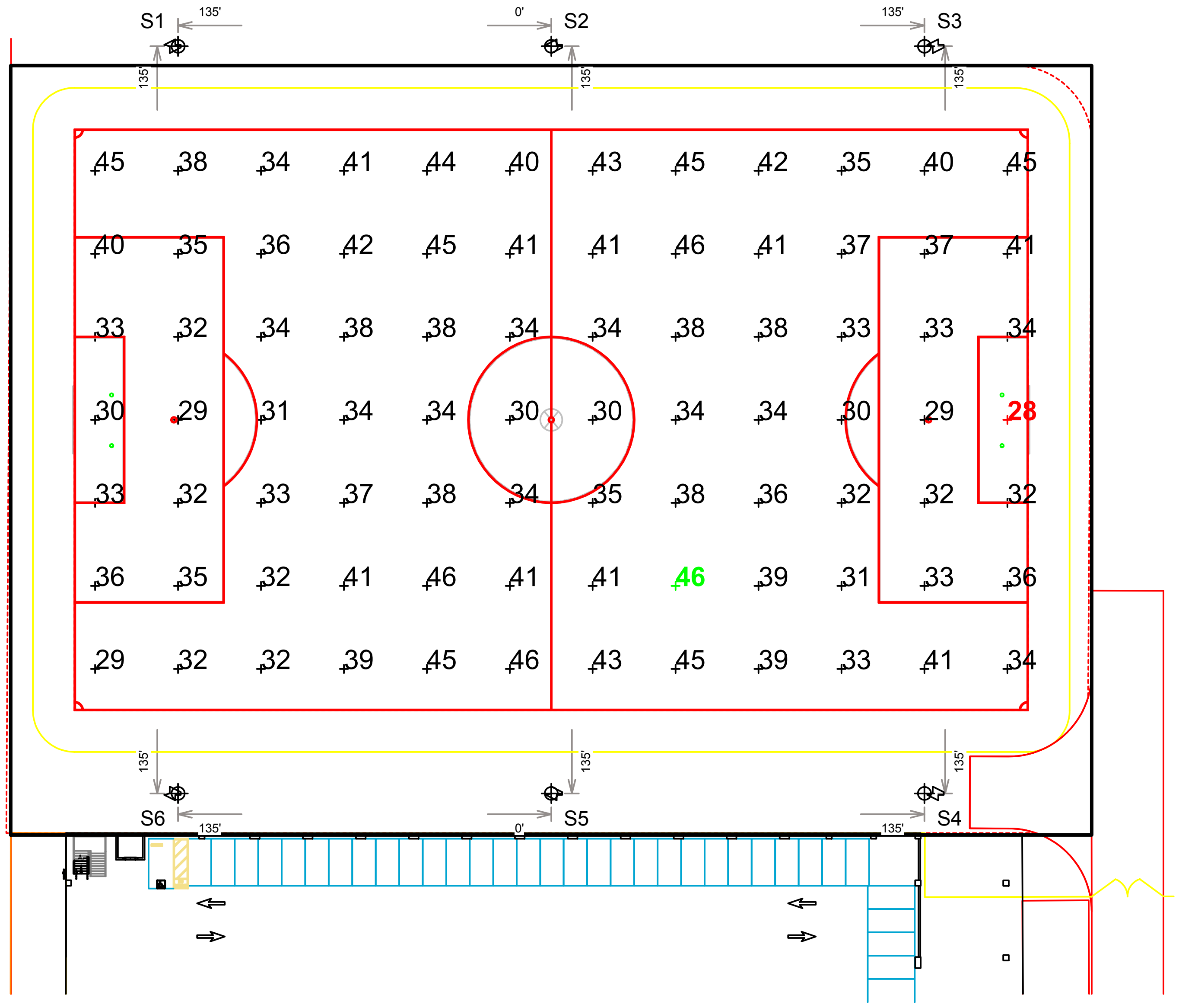
Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



45	38	34	41	44	40	43	45	42	35	40	45
40	35	36	42	45	41	41	46	41	37	37	41
33	32	34	38	38	34	34	38	38	33	33	34
30	29	31	34	34	30	30	34	34	30	29	28
33	32	33	37	38	34	35	38	36	32	32	32
36	35	32	41	46	41	41	46	39	31	33	36
29	32	32	39	45	46	43	45	39	33	41	34

SCALE IN FEET 1 : 60

0' 60' 120'

Pole location(s) ✛ dimensions are relative to 0,0 reference point(s) ⊗

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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
6	S1-S6	70'	-	70'	TLC-LED-1150	6	6	0
6	TOTALS					36	36	0

San Jose State University Track & Field SJSU
San Jose, CA

GRID SUMMARY

Name:	**Walking Track**
Size:	391' x 278'
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	
Maximum:	46
Minimum:	13
Avg / Min:	2.13
Max / Min:	
UG (adjacent pts):	1.79
CU:	0.21
No. of Points:	321

LUMINAIRE INFORMATION

Color / CRI:	5700K - 75 CRI
Luminaire Output:	121,000 lumens
No. of Luminaires:	**36**
Total Load:	41.4 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

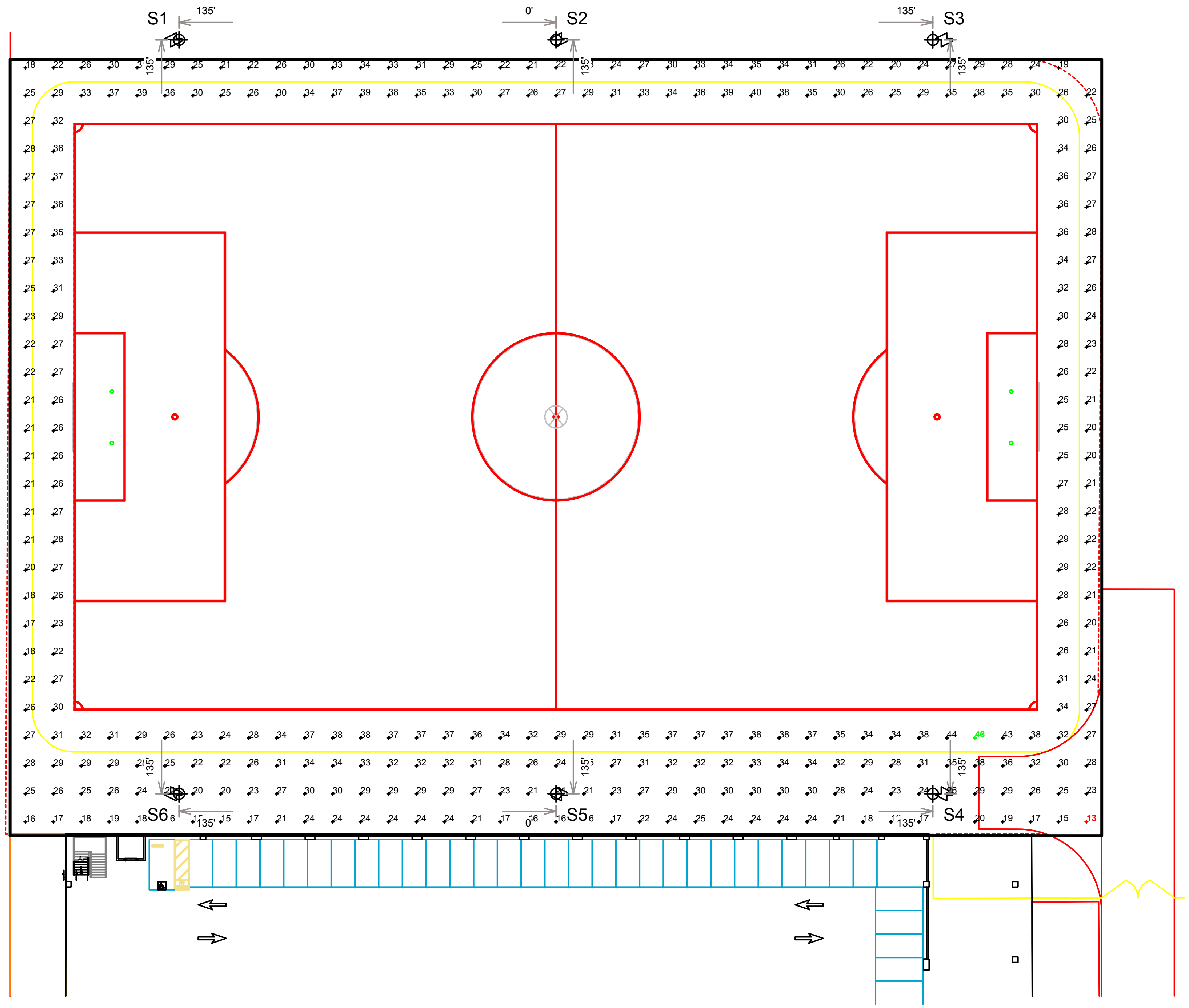
Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



Pole location(s) ✛ dimensions are relative to 0,0 reference point(s) ⊗

SCALE IN FEET 1 : 50

0' 50' 100'

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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
6	S1-S6	70'	-	70'	TLC-LED-1150	6	6	0
6	TOTALS					36	36	0

San Jose State University Track & Field SJSU
San Jose, CA

GRID SUMMARY

Name:	**150' Spill**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES			
	Entire Grid		
Scan Average:			
Maximum:			
Minimum:	0.00		
No. of Points:	69		
LUMINAIRE INFORMATION			
	5700K - 75 CRI 121,000 lumens		
No. of Luminaires:	**36**		
Total Load:	41.4 kW		
			Lumen Maintenance
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

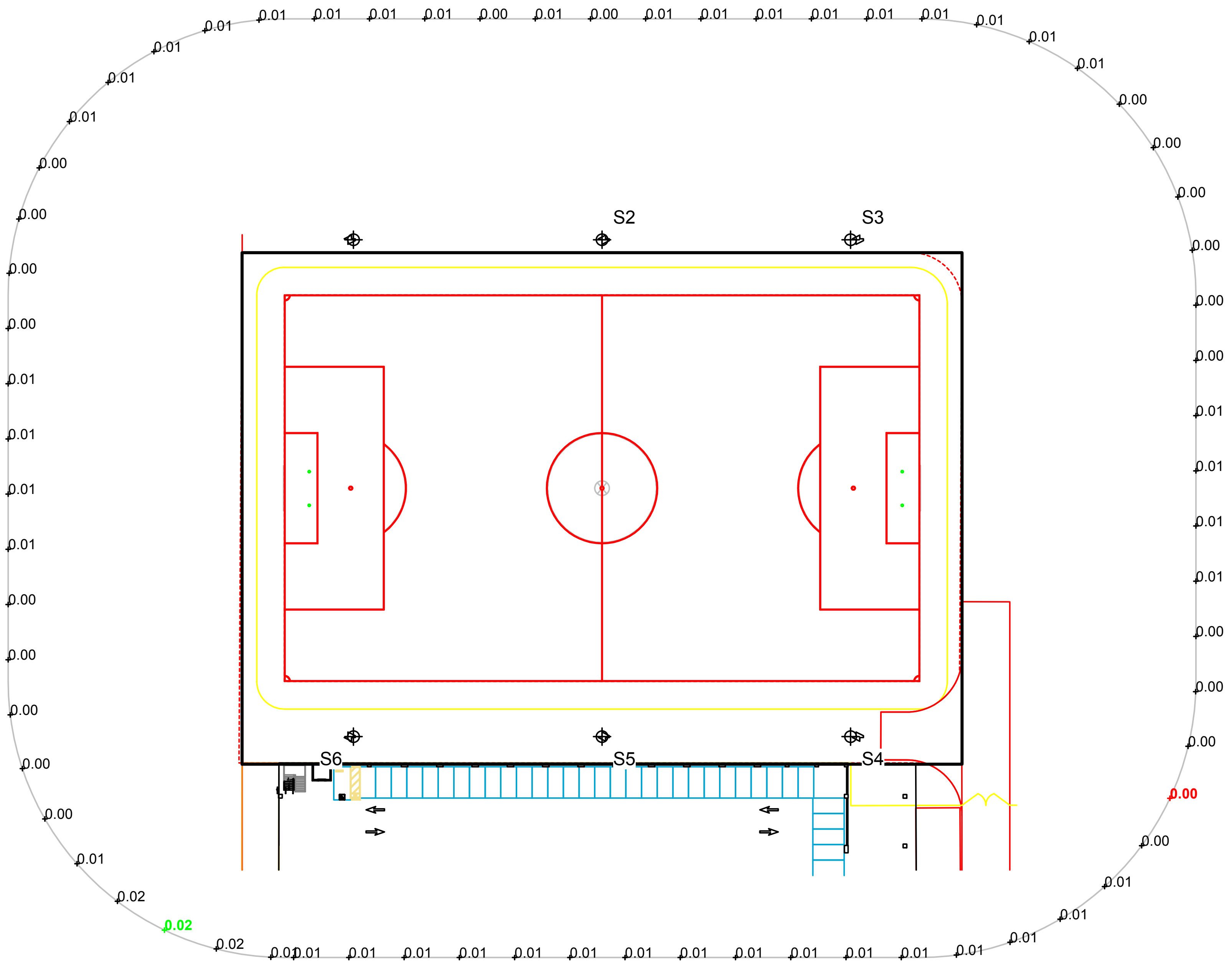
Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⌖ dimensions are relative to 0,0 reference point(s) ⊗

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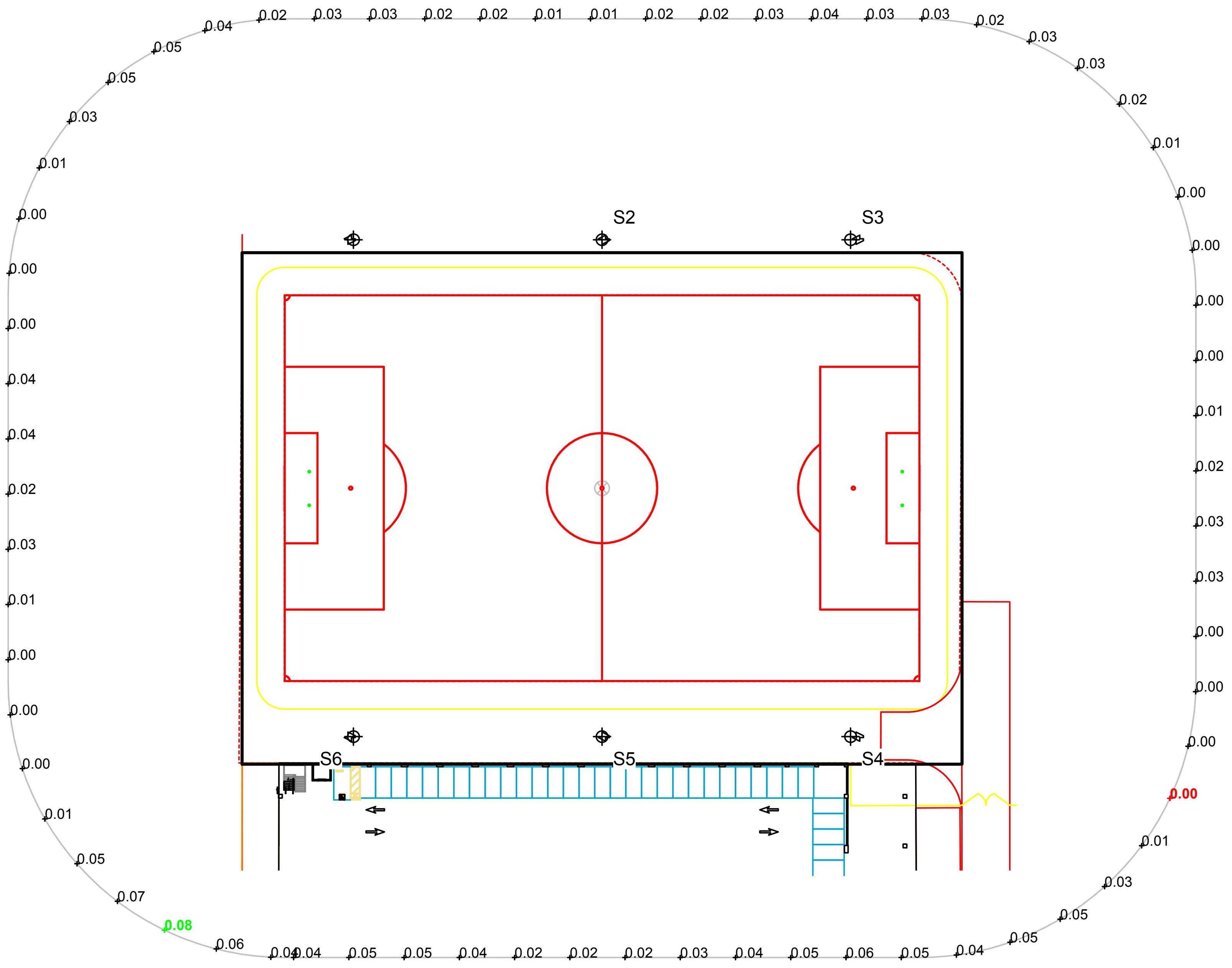
ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
6	S1-S6	70'	-	70'	TLC-LED-1150	6	6	0
6	TOTALS					36	36	0



San Jose State University Track & Field SJSU
San Jose, CA

GRID SUMMARY

Name:	**150' Spill**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED MAX VERTICAL FOOTCANDLES

	Entire Grid
Scan Average:	[redacted]
Maximum:	[redacted]
Minimum:	0.00
No. of Points:	69

LUMINAIRE INFORMATION

	5700K - 75 CRI 121,000 lumens
No. of Luminaires:	**36**
Total Load:	41.4 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
6	S1-S6	70'	-	70'	TLC-LED-1150	6	6	0
6	TOTALS					36	36	0

San Jose State University Track & Field SJSU
San Jose, CA

GRID SUMMARY

Name:	**150' Spill**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED CANDELA (PER FIXTURE)	
	Entire Grid
Scan Average:	
Maximum:	
Minimum:	9.33
No. of Points:	69
LUMINAIRE INFORMATION	
	5700K - 75 CRI
	121,000 lumens
No. of Luminaires:	**36**
Total Load:	41.4 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

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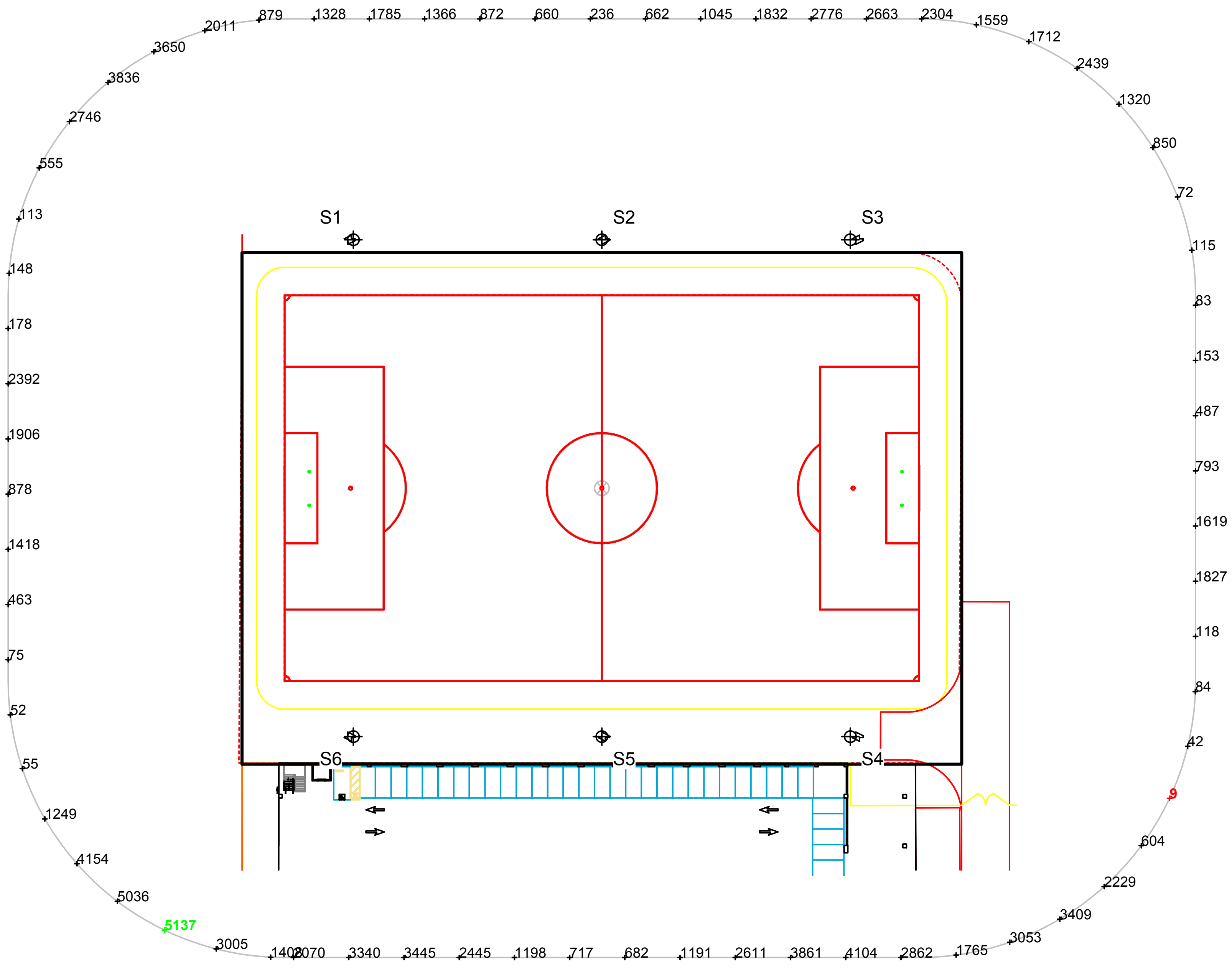

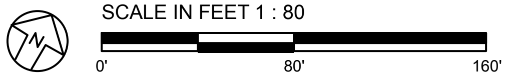

Pole location(s) ⌖ dimensions are relative to 0,0 reference point(s) ⊗

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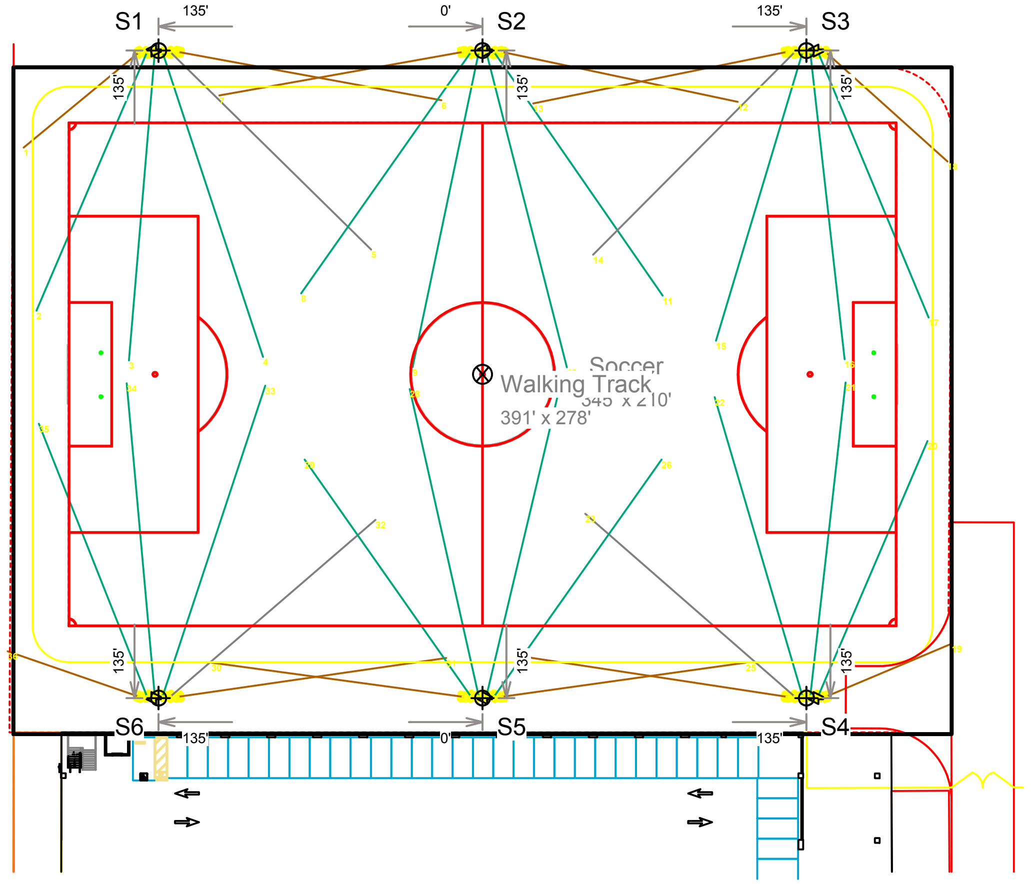

San Jose State University Track & Field SJSU
San Jose, CA

EQUIPMENT LAYOUT

INCLUDES:
- Soccer
- Walking Track

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
6	S1-S6	70'	-	70'	TLC-LED-1150	6
6	TOTALS					36

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Ballast Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1150	6.8	6.5	5.9	5.1	4.1	3.7	3.0

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ✛ dimensions are relative to 0,0 reference point(s) ⊗

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Appendix B

Air Quality Modeling Files

San Jose State University Parking and Sports Field Project

Santa Clara County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	1,503.00	Space	4.90	601,200.00	0
City Park	3.00	Acre	1.80	130,680.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Construction assumed to being in June 3, 2019 and project assumed to be operational in 2020

Land Use - lot acerage based on site plans

Construction Phase - No site preparation. Arch coating assumed to occur half way through building construction

Demolition - Demo amount assumed from google earth, demolish existing track and facilities.

Grading - Project site acerage graded

Vehicle Trips - Conservatively assumed City park trip generation rates

Energy Use -

Energy Mitigation - Project would include LED lighting

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	NumDays	230.00	170.00
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	NumDays	20.00	15.00
tblGrading	AcresOfGrading	7.50	6.70
tblLandUse	LotAcreage	13.53	4.90
tblLandUse	LotAcreage	3.00	1.80

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.2070	37.1383	30.2637	0.0829	6.6190	1.7958	8.0172	3.3941	1.6705	4.6804	0.0000	8,366.8493	8,366.8493	1.0653	0.0000	8,388.7476
2020	7.5571	35.4798	31.9520	0.0895	3.8354	1.3151	5.1506	1.0357	1.2440	2.2797	0.0000	8,966.2758	8,966.2758	0.8774	0.0000	8,988.2096
Maximum	**7.5571**	**37.1383**	**31.9520**	**0.0895**	**6.6190**	**1.7958**	**8.0172**	**3.3941**	**1.6705**	**4.6804**	**0.0000**	**8,966.2758**	**8,966.2758**	**1.0653**	**0.0000**	**8,988.2096**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.2070	37.1383	30.2637	0.0829	6.6190	1.7958	8.0172	3.3941	1.6705	4.6804	0.0000	8,366.8493	8,366.8493	1.0653	0.0000	8,388.7476
2020	7.5571	35.4798	31.9520	0.0895	3.8354	1.3151	5.1506	1.0357	1.2440	2.2797	0.0000	8,966.2758	8,966.2758	0.8774	0.0000	8,988.2096
Maximum	**7.5571**	**37.1383**	**31.9520**	**0.0895**	**6.6190**	**1.7958**	**8.0172**	**3.3941**	**1.6705**	**4.6804**	**0.0000**	**8,966.2758**	**8,966.2758**	**1.0653**	**0.0000**	**8,988.2096**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3030	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0992	0.4146	1.1786	3.4100e-003	0.3082	3.4900e-003	0.3117	0.0823	3.2700e-003	0.0856		343.2971	343.2971	0.0132		343.6257
Total	**0.4021**	**0.4160**	**1.3334**	**3.4200e-003**	**0.3082**	**4.0400e-003**	**0.3123**	**0.0823**	**3.8200e-003**	**0.0861**		**343.6267**	**343.6267**	**0.0140**	**0.0000**	**343.9774**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3030	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0992	0.4146	1.1786	3.4100e-003	0.3082	3.4900e-003	0.3117	0.0823	3.2700e-003	0.0856		343.2971	343.2971	0.0132		343.6257
Total	**0.4021**	**0.4160**	**1.3334**	**3.4200e-003**	**0.3082**	**4.0400e-003**	**0.3123**	**0.0823**	**3.8200e-003**	**0.0861**		**343.6267**	**343.6267**	**0.0140**	**0.0000**	**343.9774**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/3/2019	6/21/2019	5	15	
2	Grading	Grading	6/24/2019	7/12/2019	5	15	
3	Building Construction	Building Construction	7/15/2019	3/6/2020	5	170	
4	Architectural Coating	Architectural Coating	1/6/2020	4/17/2020	5	75	
5	Paving	Paving	3/9/2020	3/27/2020	5	15	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.7

Acres of Paving: 4.9

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 36,072 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	1.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	307.00	120.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	61.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0197	0.0000	0.0197	2.9800e-003	0.0000	2.9800e-003			0.0000			0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697		3,816.8994	3,816.8994	1.0618		3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**0.0197**	**1.7949**	**1.8146**	**2.9800e-003**	**1.6697**	**1.6727**		**3,816.8994**	**3,816.8994**	**1.0618**		**3,843.4451**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.2000e-004	0.0208	4.2900e-003	5.0000e-005	1.1600e-003	8.0000e-005	1.2500e-003	3.2000e-004	8.0000e-005	4.0000e-004		5.6085	5.6085	2.7000e-004		5.6153
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0606	0.0443	0.4276	1.1500e-003	0.1232	7.9000e-004	0.1240	0.0327	7.2000e-004	0.0334		114.6523	114.6523	3.1700e-003		114.7314
Total	**0.0612**	**0.0652**	**0.4319**	**1.2000e-003**	**0.1244**	**8.7000e-004**	**0.1253**	**0.0330**	**8.0000e-004**	**0.0338**		**120.2607**	**120.2607**	**3.4400e-003**		**120.3467**

3.2 Demolition - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0197	0.0000	0.0197	2.9800e-003	0.0000	2.9800e-003			0.0000			0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697	0.0000	3,816.8994	3,816.8994	1.0618		3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**0.0197**	**1.7949**	**1.8146**	**2.9800e-003**	**1.6697**	**1.6727**	**0.0000**	**3,816.8994**	**3,816.8994**	**1.0618**		**3,843.4451**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.2000e-004	0.0208	4.2900e-003	5.0000e-005	1.1600e-003	8.0000e-005	1.2500e-003	3.2000e-004	8.0000e-005	4.0000e-004		5.6085	5.6085	2.7000e-004		5.6153
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0606	0.0443	0.4276	1.1500e-003	0.1232	7.9000e-004	0.1240	0.0327	7.2000e-004	0.0334		114.6523	114.6523	3.1700e-003		114.7314
Total	**0.0612**	**0.0652**	**0.4319**	**1.2000e-003**	**0.1244**	**8.7000e-004**	**0.1253**	**0.0330**	**8.0000e-004**	**0.0338**		**120.2607**	**120.2607**	**3.4400e-003**		**120.3467**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.4958	0.0000	6.4958	3.3614	0.0000	3.3614			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856		2,936.8068	2,936.8068	0.9292		2,960.0361
Total	**2.5805**	**28.3480**	**16.2934**	**0.0297**	**6.4958**	**1.3974**	**7.8931**	**3.3614**	**1.2856**	**4.6469**		**2,936.8068**	**2,936.8068**	**0.9292**		**2,960.0361**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0606	0.0443	0.4276	1.1500e-003	0.1232	7.9000e-004	0.1240	0.0327	7.2000e-004	0.0334		114.6523	114.6523	3.1700e-003		114.7314
Total	**0.0606**	**0.0443**	**0.4276**	**1.1500e-003**	**0.1232**	**7.9000e-004**	**0.1240**	**0.0327**	**7.2000e-004**	**0.0334**		**114.6523**	**114.6523**	**3.1700e-003**		**114.7314**

3.3 Grading - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.4958	0.0000	6.4958	3.3614	0.0000	3.3614			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856	0.0000	2,936.8068	2,936.8068	0.9292		2,960.0361
Total	**2.5805**	**28.3480**	**16.2934**	**0.0297**	**6.4958**	**1.3974**	**7.8931**	**3.3614**	**1.2856**	**4.6469**	**0.0000**	**2,936.8068**	**2,936.8068**	**0.9292**		**2,960.0361**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0606	0.0443	0.4276	1.1500e-003	0.1232	7.9000e-004	0.1240	0.0327	7.2000e-004	0.0334		114.6523	114.6523	3.1700e-003		114.7314
Total	**0.0606**	**0.0443**	**0.4276**	**1.1500e-003**	**0.1232**	**7.9000e-004**	**0.1240**	**0.0327**	**7.2000e-004**	**0.0334**		**114.6523**	**114.6523**	**3.1700e-003**		**114.7314**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**		**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6052	15.1526	4.3484	0.0325	0.8124	0.1098	0.9222	0.2339	0.1051	0.3389		3,428.7191	3,428.7191	0.1798		3,433.2145
Worker	1.2406	0.9070	8.7515	0.0236	2.5219	0.0161	2.5380	0.6689	0.0148	0.6837		2,346.5500	2,346.5500	0.0648		2,348.1696
Total	**1.8458**	**16.0595**	**13.0999**	**0.0560**	**3.3343**	**0.1259**	**3.4602**	**0.9028**	**0.1199**	**1.0227**		**5,775.2691**	**5,775.2691**	**0.2446**		**5,781.3841**

3.4 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**	**0.0000**	**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6052	15.1526	4.3484	0.0325	0.8124	0.1098	0.9222	0.2339	0.1051	0.3389		3,428.7191	3,428.7191	0.1798		3,433.2145
Worker	1.2406	0.9070	8.7515	0.0236	2.5219	0.0161	2.5380	0.6689	0.0148	0.6837		2,346.5500	2,346.5500	0.0648		2,348.1696
Total	**1.8458**	**16.0595**	**13.0999**	**0.0560**	**3.3343**	**0.1259**	**3.4602**	**0.9028**	**0.1199**	**1.0227**		**5,775.2691**	**5,775.2691**	**0.2446**		**5,781.3841**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4906	13.6504	3.8938	0.0322	0.8124	0.0683	0.8807	0.2339	0.0653	0.2992		3,406.8492	3,406.8492	0.1652		3,410.9780
Worker	1.1351	0.8004	7.8237	0.0228	2.5219	0.0157	2.5377	0.6689	0.0145	0.6834		2,273.2311	2,273.2311	0.0564		2,274.6400
Total	**1.6257**	**14.4509**	**11.7176**	**0.0551**	**3.3343**	**0.0840**	**3.4184**	**0.9028**	**0.0798**	**0.9826**		**5,680.0803**	**5,680.0803**	**0.2215**		**5,685.6180**

3.4 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4906	13.6504	3.8938	0.0322	0.8124	0.0683	0.8807	0.2339	0.0653	0.2992		3,406.8492	3,406.8492	0.1652		3,410.9780
Worker	1.1351	0.8004	7.8237	0.0228	2.5219	0.0157	2.5377	0.6689	0.0145	0.6834		2,273.2311	2,273.2311	0.0564		2,274.6400
Total	**1.6257**	**14.4509**	**11.7176**	**0.0551**	**3.3343**	**0.0840**	**3.4184**	**0.9028**	**0.0798**	**0.9826**		**5,680.0803**	**5,680.0803**	**0.2215**		**5,685.6180**

3.5 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.3439					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**3.5861**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2255	0.1590	1.5546	4.5300e-003	0.5011	3.1300e-003	0.5042	0.1329	2.8800e-003	0.1358		451.6844	451.6844	0.0112		451.9643
Total	**0.2255**	**0.1590**	**1.5546**	**4.5300e-003**	**0.5011**	**3.1300e-003**	**0.5042**	**0.1329**	**2.8800e-003**	**0.1358**		**451.6844**	**451.6844**	**0.0112**		**451.9643**

3.5 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.3439					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**3.5861**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2255	0.1590	1.5546	4.5300e-003	0.5011	3.1300e-003	0.5042	0.1329	2.8800e-003	0.1358		451.6844	451.6844	0.0112		451.9643
Total	**0.2255**	**0.1590**	**1.5546**	**4.5300e-003**	**0.5011**	**3.1300e-003**	**0.5042**	**0.1329**	**2.8800e-003**	**0.1358**		**451.6844**	**451.6844**	**0.0112**		**451.9643**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3566**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**		**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0555	0.0391	0.3823	1.1100e-003	0.1232	7.7000e-004	0.1240	0.0327	7.1000e-004	0.0334		111.0699	111.0699	2.7500e-003		111.1388
Total	**0.0555**	**0.0391**	**0.3823**	**1.1100e-003**	**0.1232**	**7.7000e-004**	**0.1240**	**0.0327**	**7.1000e-004**	**0.0334**		**111.0699**	**111.0699**	**2.7500e-003**		**111.1388**

3.6 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3566**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**	**0.0000**	**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0555	0.0391	0.3823	1.1100e-003	0.1232	7.7000e-004	0.1240	0.0327	7.1000e-004	0.0334		111.0699	111.0699	2.7500e-003		111.1388
Total	**0.0555**	**0.0391**	**0.3823**	**1.1100e-003**	**0.1232**	**7.7000e-004**	**0.1240**	**0.0327**	**7.1000e-004**	**0.0334**		**111.0699**	**111.0699**	**2.7500e-003**		**111.1388**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0992	0.4146	1.1786	3.4100e-003	0.3082	3.4900e-003	0.3117	0.0823	3.2700e-003	0.0856		343.2971	343.2971	0.0132		343.6257
Unmitigated	0.0992	0.4146	1.1786	3.4100e-003	0.3082	3.4900e-003	0.3117	0.0823	3.2700e-003	0.0856		343.2971	343.2971	0.0132		343.6257

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	5.67	68.25	50.22	44,777	44,777
Enclosed Parking with Elevator	0.00	0.00	0.00		
Total	5.67	68.25	50.22	44,777	44,777

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.604810	0.038204	0.185149	0.108513	0.015498	0.004981	0.012268	0.020156	0.002083	0.001571	0.005363	0.000620	0.000785
Enclosed Parking with Elevator	0.604810	0.038204	0.185149	0.108513	0.015498	0.004981	0.012268	0.020156	0.002083	0.001571	0.005363	0.000620	0.000785

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3030	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517
Unmitigated	0.3030	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0687					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2197					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0146	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517
Total	**0.3030**	**1.4300e-003**	**0.1548**	**1.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**		**0.3296**	**0.3296**	**8.8000e-004**		**0.3517**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0687					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2197					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0146	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517
Total	**0.3030**	**1.4300e-003**	**0.1548**	**1.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**		**0.3296**	**0.3296**	**8.8000e-004**		**0.3517**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

San Jose State University Parking and Sports Field Project

Santa Clara County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	1,503.00	Space	4.90	601,200.00	0
City Park	3.00	Acre	1.80	130,680.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Construction assumed to being in June 3, 2019 and project assumed to be operational in 2020

Land Use - lot acerage based on site plans

Construction Phase - No site preparation. Arch coating assumed to occur half way through building construction

Demolition - Demo amount assumed from google earth, demolish existing track and facilities.

Grading - Project site acerage graded

Vehicle Trips - Conservatively assumed City park trip generation rates

Energy Use -

Energy Mitigation - Project would include LED lighting

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	NumDays	230.00	170.00
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	NumDays	20.00	15.00
tblGrading	AcresOfGrading	7.50	6.70
tblLandUse	LotAcreage	13.53	4.90
tblLandUse	LotAcreage	3.00	1.80

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.1067	36.7622	30.3857	0.0859	6.6190	1.7958	8.0172	3.3941	1.6705	4.6804	0.0000	8,662.1990	8,662.1990	1.0655	0.0000	8,683.8828
2020	7.4512	35.1500	32.2188	0.0927	3.8354	1.3141	5.1495	1.0357	1.2430	2.2787	0.0000	9,296.2012	9,296.2012	0.8706	0.0000	9,317.9659
Maximum	**7.4512**	**36.7622**	**32.2188**	**0.0927**	**6.6190**	**1.7958**	**8.0172**	**3.3941**	**1.6705**	**4.6804**	**0.0000**	**9,296.2012**	**9,296.2012**	**1.0655**	**0.0000**	**9,317.9659**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.1067	36.7622	30.3857	0.0859	6.6190	1.7958	8.0172	3.3941	1.6705	4.6804	0.0000	8,662.1990	8,662.1990	1.0655	0.0000	8,683.8828
2020	7.4512	35.1500	32.2188	0.0927	3.8354	1.3141	5.1495	1.0357	1.2430	2.2787	0.0000	9,296.2012	9,296.2012	0.8706	0.0000	9,317.9658
Maximum	**7.4512**	**36.7622**	**32.2188**	**0.0927**	**6.6190**	**1.7958**	**8.0172**	**3.3941**	**1.6705**	**4.6804**	**0.0000**	**9,296.2012**	**9,296.2012**	**1.0655**	**0.0000**	**9,317.9658**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3030	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.1141	0.3919	1.1732	3.6600e-003	0.3082	3.4700e-003	0.3117	0.0823	3.2500e-003	0.0855		368.5509	368.5509	0.0130		368.8753
Total	**0.4171**	**0.3934**	**1.3280**	**3.6700e-003**	**0.3082**	**4.0200e-003**	**0.3122**	**0.0823**	**3.8000e-003**	**0.0861**		**368.8805**	**368.8805**	**0.0139**	**0.0000**	**369.2270**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3030	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.1141	0.3919	1.1732	3.6600e-003	0.3082	3.4700e-003	0.3117	0.0823	3.2500e-003	0.0855		368.5509	368.5509	0.0130		368.8753
Total	**0.4171**	**0.3934**	**1.3280**	**3.6700e-003**	**0.3082**	**4.0200e-003**	**0.3122**	**0.0823**	**3.8000e-003**	**0.0861**		**368.8805**	**368.8805**	**0.0139**	**0.0000**	**369.2270**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/3/2019	6/21/2019	5	15	
2	Grading	Grading	6/24/2019	7/12/2019	5	15	
3	Building Construction	Building Construction	7/15/2019	3/6/2020	5	170	
4	Architectural Coating	Architectural Coating	1/6/2020	4/17/2020	5	75	
5	Paving	Paving	3/9/2020	3/27/2020	5	15	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.7

Acres of Paving: 4.9

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 36,072 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	1.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	307.00	120.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	61.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0197	0.0000	0.0197	2.9800e-003	0.0000	2.9800e-003			0.0000			0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697		3,816.8994	3,816.8994	1.0618		3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**0.0197**	**1.7949**	**1.8146**	**2.9800e-003**	**1.6697**	**1.6727**		**3,816.8994**	**3,816.8994**	**1.0618**		**3,843.4451**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.0000e-004	0.0203	3.9600e-003	5.0000e-005	1.1600e-003	8.0000e-005	1.2400e-003	3.2000e-004	8.0000e-005	3.9000e-004		5.7030	5.7030	2.6000e-004		5.7095
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0570	0.0363	0.4590	1.2500e-003	0.1232	7.9000e-004	0.1240	0.0327	7.2000e-004	0.0334		124.7967	124.7967	3.3800e-003		124.8812
Total	**0.0576**	**0.0566**	**0.4629**	**1.3000e-003**	**0.1244**	**8.7000e-004**	**0.1253**	**0.0330**	**8.0000e-004**	**0.0338**		**130.4997**	**130.4997**	**3.6400e-003**		**130.5907**

3.2 Demolition - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0197	0.0000	0.0197	2.9800e-003	0.0000	2.9800e-003			0.0000			0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697	0.0000	3,816.8994	3,816.8994	1.0618		3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**0.0197**	**1.7949**	**1.8146**	**2.9800e-003**	**1.6697**	**1.6727**	**0.0000**	**3,816.8994**	**3,816.8994**	**1.0618**		**3,843.4451**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.0000e-004	0.0203	3.9600e-003	5.0000e-005	1.1600e-003	8.0000e-005	1.2400e-003	3.2000e-004	8.0000e-005	3.9000e-004		5.7030	5.7030	2.6000e-004		5.7095
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0570	0.0363	0.4590	1.2500e-003	0.1232	7.9000e-004	0.1240	0.0327	7.2000e-004	0.0334		124.7967	124.7967	3.3800e-003		124.8812
Total	**0.0576**	**0.0566**	**0.4629**	**1.3000e-003**	**0.1244**	**8.7000e-004**	**0.1253**	**0.0330**	**8.0000e-004**	**0.0338**		**130.4997**	**130.4997**	**3.6400e-003**		**130.5907**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.4958	0.0000	6.4958	3.3614	0.0000	3.3614			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856		2,936.8068	2,936.8068	0.9292		2,960.0361
Total	**2.5805**	**28.3480**	**16.2934**	**0.0297**	**6.4958**	**1.3974**	**7.8931**	**3.3614**	**1.2856**	**4.6469**		**2,936.8068**	**2,936.8068**	**0.9292**		**2,960.0361**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0570	0.0363	0.4590	1.2500e-003	0.1232	7.9000e-004	0.1240	0.0327	7.2000e-004	0.0334		124.7967	124.7967	3.3800e-003		124.8812
Total	**0.0570**	**0.0363**	**0.4590**	**1.2500e-003**	**0.1232**	**7.9000e-004**	**0.1240**	**0.0327**	**7.2000e-004**	**0.0334**		**124.7967**	**124.7967**	**3.3800e-003**		**124.8812**

3.3 Grading - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.4958	0.0000	6.4958	3.3614	0.0000	3.3614			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856	0.0000	2,936.8068	2,936.8068	0.9292		2,960.0361
Total	**2.5805**	**28.3480**	**16.2934**	**0.0297**	**6.4958**	**1.3974**	**7.8931**	**3.3614**	**1.2856**	**4.6469**	**0.0000**	**2,936.8068**	**2,936.8068**	**0.9292**		**2,960.0361**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0570	0.0363	0.4590	1.2500e-003	0.1232	7.9000e-004	0.1240	0.0327	7.2000e-004	0.0334		124.7967	124.7967	3.3800e-003		124.8812
Total	**0.0570**	**0.0363**	**0.4590**	**1.2500e-003**	**0.1232**	**7.9000e-004**	**0.1240**	**0.0327**	**7.2000e-004**	**0.0334**		**124.7967**	**124.7967**	**3.3800e-003**		**124.8812**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**		**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5781	14.9413	3.8284	0.0333	0.8124	0.1082	0.9206	0.2339	0.1035	0.3374		3,516.4460	3,516.4460	0.1669		3,520.6177
Worker	1.1674	0.7421	9.3935	0.0257	2.5219	0.0161	2.5380	0.6689	0.0148	0.6837		2,554.1729	2,554.1729	0.0692		2,555.9016
Total	**1.7455**	**15.6834**	**13.2219**	**0.0589**	**3.3343**	**0.1243**	**3.4586**	**0.9028**	**0.1183**	**1.0211**		**6,070.6189**	**6,070.6189**	**0.2360**		**6,076.5193**

3.4 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**	**0.0000**	**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5781	14.9413	3.8284	0.0333	0.8124	0.1082	0.9206	0.2339	0.1035	0.3374		3,516.4460	3,516.4460	0.1669		3,520.6177
Worker	1.1674	0.7421	9.3935	0.0257	2.5219	0.0161	2.5380	0.6689	0.0148	0.6837		2,554.1729	2,554.1729	0.0692		2,555.9016
Total	**1.7455**	**15.6834**	**13.2219**	**0.0589**	**3.3343**	**0.1243**	**3.4586**	**0.9028**	**0.1183**	**1.0211**		**6,070.6189**	**6,070.6189**	**0.2360**		**6,076.5193**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4662	13.4946	3.4176	0.0331	0.8124	0.0672	0.8796	0.2339	0.0643	0.2982		3,495.5866	3,495.5866	0.1534		3,499.4204
Worker	1.0671	0.6553	8.4435	0.0248	2.5219	0.0157	2.5377	0.6689	0.0145	0.6834		2,474.4396	2,474.4396	0.0606		2,475.9535
Total	**1.5333**	**14.1499**	**11.8612**	**0.0579**	**3.3343**	**0.0830**	**3.4173**	**0.9028**	**0.0788**	**0.9816**		**5,970.0262**	**5,970.0262**	**0.2139**		**5,975.3739**

3.4 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4662	13.4946	3.4176	0.0331	0.8124	0.0672	0.8796	0.2339	0.0643	0.2982		3,495.5866	3,495.5866	0.1534		3,499.4204
Worker	1.0671	0.6553	8.4435	0.0248	2.5219	0.0157	2.5377	0.6689	0.0145	0.6834		2,474.4396	2,474.4396	0.0606		2,475.9535
Total	**1.5333**	**14.1499**	**11.8612**	**0.0579**	**3.3343**	**0.0830**	**3.4173**	**0.9028**	**0.0788**	**0.9816**		**5,970.0262**	**5,970.0262**	**0.2139**		**5,975.3739**

3.5 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.3439					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**3.5861**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2120	0.1302	1.6777	4.9300e-003	0.5011	3.1300e-003	0.5042	0.1329	2.8800e-003	0.1358		491.6639	491.6639	0.0120		491.9647
Total	**0.2120**	**0.1302**	**1.6777**	**4.9300e-003**	**0.5011**	**3.1300e-003**	**0.5042**	**0.1329**	**2.8800e-003**	**0.1358**		**491.6639**	**491.6639**	**0.0120**		**491.9647**

3.5 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.3439					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**3.5861**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2120	0.1302	1.6777	4.9300e-003	0.5011	3.1300e-003	0.5042	0.1329	2.8800e-003	0.1358		491.6639	491.6639	0.0120		491.9647
Total	**0.2120**	**0.1302**	**1.6777**	**4.9300e-003**	**0.5011**	**3.1300e-003**	**0.5042**	**0.1329**	**2.8800e-003**	**0.1358**		**491.6639**	**491.6639**	**0.0120**		**491.9647**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3566**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**		**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0320	0.4126	1.2100e-003	0.1232	7.7000e-004	0.1240	0.0327	7.1000e-004	0.0334		120.9010	120.9010	2.9600e-003		120.9749
Total	**0.0521**	**0.0320**	**0.4126**	**1.2100e-003**	**0.1232**	**7.7000e-004**	**0.1240**	**0.0327**	**7.1000e-004**	**0.0334**		**120.9010**	**120.9010**	**2.9600e-003**		**120.9749**

3.6 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3566**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**	**0.0000**	**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0320	0.4126	1.2100e-003	0.1232	7.7000e-004	0.1240	0.0327	7.1000e-004	0.0334		120.9010	120.9010	2.9600e-003		120.9749
Total	**0.0521**	**0.0320**	**0.4126**	**1.2100e-003**	**0.1232**	**7.7000e-004**	**0.1240**	**0.0327**	**7.1000e-004**	**0.0334**		**120.9010**	**120.9010**	**2.9600e-003**		**120.9749**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1141	0.3919	1.1732	3.6600e-003	0.3082	3.4700e-003	0.3117	0.0823	3.2500e-003	0.0855		368.5509	368.5509	0.0130		368.8753
Unmitigated	0.1141	0.3919	1.1732	3.6600e-003	0.3082	3.4700e-003	0.3117	0.0823	3.2500e-003	0.0855		368.5509	368.5509	0.0130		368.8753

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	5.67	68.25	50.22	44,777	44,777
Enclosed Parking with Elevator	0.00	0.00	0.00		
Total	5.67	68.25	50.22	44,777	44,777

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.604810	0.038204	0.185149	0.108513	0.015498	0.004981	0.012268	0.020156	0.002083	0.001571	0.005363	0.000620	0.000785
Enclosed Parking with Elevator	0.604810	0.038204	0.185149	0.108513	0.015498	0.004981	0.012268	0.020156	0.002083	0.001571	0.005363	0.000620	0.000785

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3030	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517
Unmitigated	0.3030	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0687					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2197					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0146	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517
Total	**0.3030**	**1.4300e-003**	**0.1548**	**1.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**		**0.3296**	**0.3296**	**8.8000e-004**		**0.3517**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0687					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2197					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0146	1.4300e-003	0.1548	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004		0.3296	0.3296	8.8000e-004		0.3517
Total	**0.3030**	**1.4300e-003**	**0.1548**	**1.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**		**0.3296**	**0.3296**	**8.8000e-004**		**0.3517**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

San Jose State University Parking and Sports Field Project

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	1,503.00	Space	4.90	601,200.00	0
City Park	3.00	Acre	1.80	130,680.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Construction assumed to being in June 3, 2019 and project assumed to be operational in 2020

Land Use - lot acerage based on site plans

Construction Phase - No site preparation. Arch coating assumed to occur half way through building construction

Demolition - Demo amount assumed from google earth, demolish existing track and facilities.

Grading - Project site acerage graded

Vehicle Trips - Conservatively assumed City park trip generation rates

Energy Use -

Energy Mitigation - Project would include LED lighting

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	NumDays	230.00	170.00
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	NumDays	20.00	15.00
tblGrading	AcresOfGrading	7.50	6.70
tblLandUse	LotAcreage	13.53	4.90
tblLandUse	LotAcreage	3.00	1.80

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2945	2.7426	2.1122	5.6400e-003	0.2473	0.1103	0.3576	0.0791	0.1034	0.1825	0.0000	515.0163	515.0163	0.0617	0.0000	516.5578
2020	0.2394	0.9803	0.9147	2.4500e-003	0.0964	0.0387	0.1352	0.0261	0.0366	0.0627	0.0000	221.9148	221.9148	0.0242	0.0000	222.5209
Maximum	**0.2945**	**2.7426**	**2.1122**	**5.6400e-003**	**0.2473**	**0.1103**	**0.3576**	**0.0791**	**0.1034**	**0.1825**	**0.0000**	**515.0163**	**515.0163**	**0.0617**	**0.0000**	**516.5578**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2945	2.7426	2.1122	5.6400e-003	0.2473	0.1103	0.3576	0.0791	0.1034	0.1825	0.0000	515.0161	515.0161	0.0617	0.0000	516.5576
2020	0.2394	0.9803	0.9147	2.4500e-003	0.0964	0.0387	0.1352	0.0261	0.0366	0.0627	0.0000	221.9147	221.9147	0.0242	0.0000	222.5208
Maximum	**0.2945**	**2.7426**	**2.1122**	**5.6400e-003**	**0.2473**	**0.1103**	**0.3576**	**0.0791**	**0.1034**	**0.1825**	**0.0000**	**515.0161**	**515.0161**	**0.0617**	**0.0000**	**516.5576**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**6-3-2019**	**9-2-2019**	1.2077	1.2077
2	**9-3-2019**	**12-2-2019**	1.3390	1.3390
3	**12-3-2019**	**3-2-2020**	1.3711	1.3711
4	**3-3-2020**	**6-2-2020**	0.2513	0.2513
		Highest	1.3711	1.3711

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0539	1.3000e-004	0.0139	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0269	0.0269	7.0000e-005	0.0000	0.0287
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1,024.8904	1,024.8904	0.0463	9.5900e-003	1,028.9062
Mobile	5.5700e-003	0.0227	0.0630	1.9000e-004	0.0167	1.9000e-004	0.0169	4.4600e-003	1.8000e-004	4.6400e-003	0.0000	17.6243	17.6243	6.5000e-004	0.0000	17.6406
Waste						0.0000	0.0000		0.0000	0.0000	0.0528	0.0000	0.0528	3.1200e-003	0.0000	0.1308
Water						0.0000	0.0000		0.0000	0.0000	0.0000	3.6395	3.6395	1.6000e-004	3.0000e-005	3.6537
Total	**0.0595**	**0.0228**	**0.0769**	**1.9000e-004**	**0.0167**	**2.4000e-004**	**0.0169**	**4.4600e-003**	**2.3000e-004**	**4.6900e-003**	**0.0528**	**1,046.1811**	**1,046.2338**	**0.0503**	**9.6200e-003**	**1,050.3600**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0539	1.3000e-004	0.0139	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0269	0.0269	7.0000e-005	0.0000	0.0287
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	780.6482	780.6482	0.0353	7.3000e-003	783.7070
Mobile	5.5700e-003	0.0227	0.0630	1.9000e-004	0.0167	1.9000e-004	0.0169	4.4600e-003	1.8000e-004	4.6400e-003	0.0000	17.6243	17.6243	6.5000e-004	0.0000	17.6406
Waste						0.0000	0.0000		0.0000	0.0000	0.0528	0.0000	0.0528	3.1200e-003	0.0000	0.1308
Water						0.0000	0.0000		0.0000	0.0000	0.0000	3.6395	3.6395	1.6000e-004	3.0000e-005	3.6537
Total	**0.0595**	**0.0228**	**0.0769**	**1.9000e-004**	**0.0167**	**2.4000e-004**	**0.0169**	**4.4600e-003**	**2.3000e-004**	**4.6900e-003**	**0.0528**	**801.9388**	**801.9916**	**0.0393**	**7.3300e-003**	**805.1607**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**23.35**	**23.34**	**21.93**	**23.80**	**23.34**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/3/2019	6/21/2019	5	15	
2	Grading	Grading	6/24/2019	7/12/2019	5	15	
3	Building Construction	Building Construction	7/15/2019	3/6/2020	5	170	
4	Architectural Coating	Architectural Coating	1/6/2020	4/17/2020	5	75	
5	Paving	Paving	3/9/2020	3/27/2020	5	15	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.7

Acres of Paving: 4.9

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 36,072 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	1.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	307.00	120.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	61.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.5000e-004	0.0000	1.5000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0264	0.2684	0.1655	2.9000e-004		0.0135	0.0135		0.0125	0.0125	0.0000	25.9698	25.9698	7.2200e-003	0.0000	26.1504
Total	**0.0264**	**0.2684**	**0.1655**	**2.9000e-004**	**1.5000e-004**	**0.0135**	**0.0136**	**2.0000e-005**	**0.0125**	**0.0125**	**0.0000**	**25.9698**	**25.9698**	**7.2200e-003**	**0.0000**	**26.1504**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	1.6000e-004	3.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0385	0.0385	0.0000	0.0000	0.0386
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	3.0000e-004	3.1400e-003	1.0000e-005	8.9000e-004	1.0000e-005	9.0000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.7898	0.7898	2.0000e-005	0.0000	0.7904
Total	**4.1000e-004**	**4.6000e-004**	**3.1700e-003**	**1.0000e-005**	**9.0000e-004**	**1.0000e-005**	**9.1000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.8284**	**0.8284**	**2.0000e-005**	**0.0000**	**0.8290**

3.2 Demolition - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.5000e-004	0.0000	1.5000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0264	0.2684	0.1655	2.9000e-004		0.0135	0.0135		0.0125	0.0125	0.0000	25.9697	25.9697	7.2200e-003	0.0000	26.1503
Total	**0.0264**	**0.2684**	**0.1655**	**2.9000e-004**	**1.5000e-004**	**0.0135**	**0.0136**	**2.0000e-005**	**0.0125**	**0.0125**	**0.0000**	**25.9697**	**25.9697**	**7.2200e-003**	**0.0000**	**26.1503**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	1.6000e-004	3.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0385	0.0385	0.0000	0.0000	0.0386
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	3.0000e-004	3.1400e-003	1.0000e-005	8.9000e-004	1.0000e-005	9.0000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.7898	0.7898	2.0000e-005	0.0000	0.7904
Total	**4.1000e-004**	**4.6000e-004**	**3.1700e-003**	**1.0000e-005**	**9.0000e-004**	**1.0000e-005**	**9.1000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.8284**	**0.8284**	**2.0000e-005**	**0.0000**	**0.8290**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0487	0.0000	0.0487	0.0252	0.0000	0.0252	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2126	0.1222	2.2000e-004		0.0105	0.0105		9.6400e-003	9.6400e-003	0.0000	19.9817	19.9817	6.3200e-003	0.0000	20.1398
Total	**0.0194**	**0.2126**	**0.1222**	**2.2000e-004**	**0.0487**	**0.0105**	**0.0592**	**0.0252**	**9.6400e-003**	**0.0349**	**0.0000**	**19.9817**	**19.9817**	**6.3200e-003**	**0.0000**	**20.1398**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	3.0000e-004	3.1400e-003	1.0000e-005	8.9000e-004	1.0000e-005	9.0000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.7898	0.7898	2.0000e-005	0.0000	0.7904
Total	**4.1000e-004**	**3.0000e-004**	**3.1400e-003**	**1.0000e-005**	**8.9000e-004**	**1.0000e-005**	**9.0000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7898**	**0.7898**	**2.0000e-005**	**0.0000**	**0.7904**

3.3 Grading - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0487	0.0000	0.0487	0.0252	0.0000	0.0252	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2126	0.1222	2.2000e-004		0.0105	0.0105		9.6400e-003	9.6400e-003	0.0000	19.9817	19.9817	6.3200e-003	0.0000	20.1397
Total	**0.0194**	**0.2126**	**0.1222**	**2.2000e-004**	**0.0487**	**0.0105**	**0.0592**	**0.0252**	**9.6400e-003**	**0.0349**	**0.0000**	**19.9817**	**19.9817**	**6.3200e-003**	**0.0000**	**20.1397**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	3.0000e-004	3.1400e-003	1.0000e-005	8.9000e-004	1.0000e-005	9.0000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.7898	0.7898	2.0000e-005	0.0000	0.7904
Total	**4.1000e-004**	**3.0000e-004**	**3.1400e-003**	**1.0000e-005**	**8.9000e-004**	**1.0000e-005**	**9.0000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7898**	**0.7898**	**2.0000e-005**	**0.0000**	**0.7904**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1440	1.2858	1.0470	1.6400e-003		0.0787	0.0787		0.0740	0.0740	0.0000	143.4136	143.4136	0.0349	0.0000	144.2870
Total	**0.1440**	**1.2858**	**1.0470**	**1.6400e-003**		**0.0787**	**0.0787**		**0.0740**	**0.0740**	**0.0000**	**143.4136**	**143.4136**	**0.0349**	**0.0000**	**144.2870**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0359	0.9244	0.2481	2.0100e-003	0.0482	6.6400e-003	0.0548	0.0139	6.3500e-003	0.0203	0.0000	192.5539	192.5539	9.5500e-003	0.0000	192.7927
Worker	0.0680	0.0507	0.5232	1.4600e-003	0.1485	9.8000e-004	0.1495	0.0395	9.0000e-004	0.0404	0.0000	131.4791	131.4791	3.5800e-003	0.0000	131.5686
Total	**0.1039**	**0.9750**	**0.7713**	**3.4700e-003**	**0.1967**	**7.6200e-003**	**0.2043**	**0.0534**	**7.2500e-003**	**0.0607**	**0.0000**	**324.0331**	**324.0331**	**0.0131**	**0.0000**	**324.3614**

3.4 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1440	1.2858	1.0470	1.6400e-003		0.0787	0.0787		0.0740	0.0740	0.0000	143.4134	143.4134	0.0349	0.0000	144.2868
Total	**0.1440**	**1.2858**	**1.0470**	**1.6400e-003**		**0.0787**	**0.0787**		**0.0740**	**0.0740**	**0.0000**	**143.4134**	**143.4134**	**0.0349**	**0.0000**	**144.2868**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0359	0.9244	0.2481	2.0100e-003	0.0482	6.6400e-003	0.0548	0.0139	6.3500e-003	0.0203	0.0000	192.5539	192.5539	9.5500e-003	0.0000	192.7927
Worker	0.0680	0.0507	0.5232	1.4600e-003	0.1485	9.8000e-004	0.1495	0.0395	9.0000e-004	0.0404	0.0000	131.4791	131.4791	3.5800e-003	0.0000	131.5686
Total	**0.1039**	**0.9750**	**0.7713**	**3.4700e-003**	**0.1967**	**7.6200e-003**	**0.2043**	**0.0534**	**7.2500e-003**	**0.0607**	**0.0000**	**324.0331**	**324.0331**	**0.0131**	**0.0000**	**324.3614**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0509	0.4605	0.4044	6.5000e-004		0.0268	0.0268		0.0252	0.0252	0.0000	55.5864	55.5864	0.0136	0.0000	55.9254
Total	**0.0509**	**0.4605**	**0.4044**	**6.5000e-004**		**0.0268**	**0.0268**		**0.0252**	**0.0252**	**0.0000**	**55.5864**	**55.5864**	**0.0136**	**0.0000**	**55.9254**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0114	0.3279	0.0873	7.9000e-004	0.0190	1.6200e-003	0.0206	5.4800e-003	1.5500e-003	7.0300e-003	0.0000	75.2955	75.2955	3.4500e-003	0.0000	75.3819
Worker	0.0245	0.0176	0.1844	5.5000e-004	0.0584	3.8000e-004	0.0588	0.0155	3.5000e-004	0.0159	0.0000	50.1134	50.1134	1.2300e-003	0.0000	50.1441
Total	**0.0359**	**0.3455**	**0.2717**	**1.3400e-003**	**0.0774**	**2.0000e-003**	**0.0794**	**0.0210**	**1.9000e-003**	**0.0229**	**0.0000**	**125.4089**	**125.4089**	**4.6800e-003**	**0.0000**	**125.5260**

3.4 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0509	0.4605	0.4044	6.5000e-004		0.0268	0.0268		0.0252	0.0252	0.0000	55.5863	55.5863	0.0136	0.0000	55.9254
Total	**0.0509**	**0.4605**	**0.4044**	**6.5000e-004**		**0.0268**	**0.0268**		**0.0252**	**0.0252**	**0.0000**	**55.5863**	**55.5863**	**0.0136**	**0.0000**	**55.9254**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0114	0.3279	0.0873	7.9000e-004	0.0190	1.6200e-003	0.0206	5.4800e-003	1.5500e-003	7.0300e-003	0.0000	75.2955	75.2955	3.4500e-003	0.0000	75.3819
Worker	0.0245	0.0176	0.1844	5.5000e-004	0.0584	3.8000e-004	0.0588	0.0155	3.5000e-004	0.0159	0.0000	50.1134	50.1134	1.2300e-003	0.0000	50.1441
Total	**0.0359**	**0.3455**	**0.2717**	**1.3400e-003**	**0.0774**	**2.0000e-003**	**0.0794**	**0.0210**	**1.9000e-003**	**0.0229**	**0.0000**	**125.4089**	**125.4089**	**4.6800e-003**	**0.0000**	**125.5260**

3.5 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1254					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0800e-003	0.0631	0.0687	1.1000e-004		4.1600e-003	4.1600e-003		4.1600e-003	4.1600e-003	0.0000	9.5747	9.5747	7.4000e-004	0.0000	9.5932
Total	**0.1345**	**0.0631**	**0.0687**	**1.1000e-004**		**4.1600e-003**	**4.1600e-003**		**4.1600e-003**	**4.1600e-003**	**0.0000**	**9.5747**	**9.5747**	**7.4000e-004**	**0.0000**	**9.5932**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.6000e-003	5.4600e-003	0.0573	1.7000e-004	0.0181	1.2000e-004	0.0183	4.8300e-003	1.1000e-004	4.9300e-003	0.0000	15.5584	15.5584	3.8000e-004	0.0000	15.5680
Total	**7.6000e-003**	**5.4600e-003**	**0.0573**	**1.7000e-004**	**0.0181**	**1.2000e-004**	**0.0183**	**4.8300e-003**	**1.1000e-004**	**4.9300e-003**	**0.0000**	**15.5584**	**15.5584**	**3.8000e-004**	**0.0000**	**15.5680**

3.5 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1254					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0800e-003	0.0631	0.0687	1.1000e-004		4.1600e-003	4.1600e-003		4.1600e-003	4.1600e-003	0.0000	9.5747	9.5747	7.4000e-004	0.0000	9.5932
Total	**0.1345**	**0.0631**	**0.0687**	**1.1000e-004**		**4.1600e-003**	**4.1600e-003**		**4.1600e-003**	**4.1600e-003**	**0.0000**	**9.5747**	**9.5747**	**7.4000e-004**	**0.0000**	**9.5932**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.6000e-003	5.4600e-003	0.0573	1.7000e-004	0.0181	1.2000e-004	0.0183	4.8300e-003	1.1000e-004	4.9300e-003	0.0000	15.5584	15.5584	3.8000e-004	0.0000	15.5680
Total	**7.6000e-003**	**5.4600e-003**	**0.0573**	**1.7000e-004**	**0.0181**	**1.2000e-004**	**0.0183**	**4.8300e-003**	**1.1000e-004**	**4.9300e-003**	**0.0000**	**15.5584**	**15.5584**	**3.8000e-004**	**0.0000**	**15.5680**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0102	0.1055	0.1099	1.7000e-004		5.6500e-003	5.6500e-003		5.1900e-003	5.1900e-003	0.0000	15.0212	15.0212	4.8600e-003	0.0000	15.1426
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0102**	**0.1055**	**0.1099**	**1.7000e-004**		**5.6500e-003**	**5.6500e-003**		**5.1900e-003**	**5.1900e-003**	**0.0000**	**15.0212**	**15.0212**	**4.8600e-003**	**0.0000**	**15.1426**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	2.7000e-004	2.8200e-003	1.0000e-005	8.9000e-004	1.0000e-005	9.0000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.7652	0.7652	2.0000e-005	0.0000	0.7656
Total	**3.7000e-004**	**2.7000e-004**	**2.8200e-003**	**1.0000e-005**	**8.9000e-004**	**1.0000e-005**	**9.0000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7652**	**0.7652**	**2.0000e-005**	**0.0000**	**0.7656**

3.6 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0102	0.1055	0.1099	1.7000e-004		5.6500e-003	5.6500e-003		5.1900e-003	5.1900e-003	0.0000	15.0212	15.0212	4.8600e-003	0.0000	15.1426
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0102**	**0.1055**	**0.1099**	**1.7000e-004**		**5.6500e-003**	**5.6500e-003**		**5.1900e-003**	**5.1900e-003**	**0.0000**	**15.0212**	**15.0212**	**4.8600e-003**	**0.0000**	**15.1426**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	2.7000e-004	2.8200e-003	1.0000e-005	8.9000e-004	1.0000e-005	9.0000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.7652	0.7652	2.0000e-005	0.0000	0.7656
Total	**3.7000e-004**	**2.7000e-004**	**2.8200e-003**	**1.0000e-005**	**8.9000e-004**	**1.0000e-005**	**9.0000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7652**	**0.7652**	**2.0000e-005**	**0.0000**	**0.7656**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.5700e-003	0.0227	0.0630	1.9000e-004	0.0167	1.9000e-004	0.0169	4.4600e-003	1.8000e-004	4.6400e-003	0.0000	17.6243	17.6243	6.5000e-004	0.0000	17.6406
Unmitigated	5.5700e-003	0.0227	0.0630	1.9000e-004	0.0167	1.9000e-004	0.0169	4.4600e-003	1.8000e-004	4.6400e-003	0.0000	17.6243	17.6243	6.5000e-004	0.0000	17.6406

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	5.67	68.25	50.22	44,777	44,777
Enclosed Parking with Elevator	0.00	0.00	0.00		
Total	5.67	68.25	50.22	44,777	44,777

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.604810	0.038204	0.185149	0.108513	0.015498	0.004981	0.012268	0.020156	0.002083	0.001571	0.005363	0.000620	0.000785
Enclosed Parking with Elevator	0.604810	0.038204	0.185149	0.108513	0.015498	0.004981	0.012268	0.020156	0.002083	0.001571	0.005363	0.000620	0.000785

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	780.6482	780.6482	0.0353	7.3000e-003	783.7070
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,024.8904	1,024.8904	0.0463	9.5900e-003	1,028.9062
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	3.52303e +006	1,024.8904	0.0463	9.5900e-003	1,028.9062
Total		**1,024.8904**	**0.0463**	**9.5900e-003**	**1,028.9062**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	2.68346e +006	780.6482	0.0353	7.3000e-003	783.7070
Total		**780.6482**	**0.0353**	**7.3000e-003**	**783.7070**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0539	1.3000e-004	0.0139	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0269	0.0269	7.0000e-005	0.0000	0.0287
Unmitigated	0.0539	1.3000e-004	0.0139	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0269	0.0269	7.0000e-005	0.0000	0.0287

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0125					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0401					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.3100e-003	1.3000e-004	0.0139	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0269	0.0269	7.0000e-005	0.0000	0.0287
Total	**0.0539**	**1.3000e-004**	**0.0139**	**0.0000**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.0269**	**0.0269**	**7.0000e-005**	**0.0000**	**0.0287**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0125					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0401					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.3100e-003	1.3000e-004	0.0139	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0269	0.0269	7.0000e-005	0.0000	0.0287
Total	**0.0539**	**1.3000e-004**	**0.0139**	**0.0000**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.0269**	**0.0269**	**7.0000e-005**	**0.0000**	**0.0287**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3.6395	1.6000e-004	3.0000e-005	3.6537
Unmitigated	3.6395	1.6000e-004	3.0000e-005	3.6537

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 3.57444	3.6395	1.6000e-004	3.0000e-005	3.6537
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**3.6395**	**1.6000e-004**	**3.0000e-005**	**3.6537**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 3.57444	3.6395	1.6000e-004	3.0000e-005	3.6537
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**3.6395**	**1.6000e-004**	**3.0000e-005**	**3.6537**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0528	3.1200e-003	0.0000	0.1308
Unmitigated	0.0528	3.1200e-003	0.0000	0.1308

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.26	0.0528	3.1200e-003	0.0000	0.1308
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0528**	**3.1200e-003**	**0.0000**	**0.1308**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.26	0.0528	3.1200e-003	0.0000	0.1308
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0528**	**3.1200e-003**	**0.0000**	**0.1308**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Greenhouse Gas Emission Worksheet

N20 Mobile Emissions

SJSU Track and Parking

From CalEEMod Vehicle Fleet Mix Output:

Annual VMT: 44,777

Vehicle Type	**Percent Type**	**CH4 Emission Factor (g/mile)***	**CH4 Emission (g/mile)****	**N2O Emission Factor (g/mile)***	**N2O Emission (g/mile)****
Light Auto	54.7%	0.04	0.0218877	0.04	0.021888
Light Truck < 3750 lbs	4.5%	0.05	0.0022589	0.06	0.002711
Light Truck 3751-5750 lbs	20.3%	0.05	0.0101372	0.06	0.012165
Med Truck 5751-8500 lbs	12.2%	0.12	0.0145812	0.2	0.024302
Lite-Heavy Truck 8501-10,000 lbs	1.6%	0.12	0.0019376	0.2	0.003229
Lite-Heavy Truck 10,001-14,000 lbs	0.6%	0.09	0.0005529	0.125	0.000768
Med-Heavy Truck 14,001-33,000 lbs	2.0%	0.06	0.0011846	0.05	0.000987
Heavy-Heavy Truck 33,001-60,000 lbs	3.0%	0.06	0.0017967	0.05	0.001497
Other Bus	0.2%	0.06	0.0001487	0.05	0.000124
Urban Bus	0.2%	0.06	0.0001362	0.05	0.000114
Motorcycle	0.5%	0.09	0.000457	0.01	5.08E-05
School Bus	0.1%	0.06	4.092E-05	0.05	3.41E-05
Motor Home	0.1%	0.09	8.019E-05	0.125	0.000111
Total	**100.0%**		**0.0551997**		**0.06798**

Total Emissions (metric tons) =
Emission Factor by Vehicle Mix (g/mi) x Annual VMT(mi) x 0.000001 metric tons/g

Conversion to Carbon Dioxide Equivalency (CO2e) Units based on Global Warming Potential (GWP)

CH4	21	GWP
N2O	310	GWP
1 ton (short, US) =	0.90718474	metric ton

Annual Mobile Emissions:

	Total Emissions		**Total CO2e units**	
N20 Emissions:	0.0030	metric tons N2O	**0.94**	metric tons CO2e
		Project Total:	***0.94***	***metric tons CO2e***

References

* from Table C.4: Methane and Nitrous Oxide Emission Factors for Mobile Sources by Vehicle and Fuel Type (g/mile).
in California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.
Assume Model year 2000-present, gasoline fueled.

** Source: California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.

Appendix C

Geotechnical Evaluation and Soil and Groundwater Management Plan

Geotechnical Evaluation

South Campus Multi-Level Parking
Structure & Sports Field Facility
1312 South 10th Street
San Jose, California

San Jose State University

One Washington Square | San Jose, California 95192

March 22, 2019 | Project No. 403335001

Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

Geophysics | Engineering Geology | Laboratory Testing | Industrial Hygiene | Occupational Safety | Air Quality | GIS

Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

Geotechnical Evaluation

South Campus Multi-Level Parking Structure & Sports Field Facility
1312 South 10th Street
San Jose, California

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1 INTRODUCTION

In accordance with your request and authorization, we have performed a geotechnical evaluation for the proposed San Jose State University (SJSU) South Campus Multi-Level Parking Structure & Sports Field Facility project located at 1312 South 10th Street in San Jose, California (Figure 1). The purpose of our study was to evaluate the geotechnical conditions for the proposed improvements and provide recommendations for the design and construction of the proposed facility.

2 SCOPE OF SERVICES

Our scope of services included the following:

- Reviewed readily available geologic and seismic literature pertinent to the project area including geologic maps and reports, regional fault maps, and seismic hazard maps.
- Conducted a site reconnaissance to observe site conditions, including topographic features, drainage, surficial geologic conditions, and to select and mark the subsurface exploration locations for utility clearance.
- Coordinated with Underground Service Alert (USA) to locate underground utilities in the vicinity of the subsurface exploration locations.
- Performed a private utility survey to further check the exploration locations for underground utility conflicts.
- Obtained a boring permit from the Santa Clara Valley Water District.
- Performed eight (8) Cone Penetration Test (CPT) soundings to depths of up to approximately 90 feet below the existing grade to evaluate the subsurface conditions and liquefaction susceptibility. The soundings were backfilled with Portland cement grout in compliance with the Santa Clara Valley Water District drilling permit.
- Drilled six (6) borings to depths of approximately 40 feet below grade, to evaluate the subsurface conditions. The borings were drilled using a truck-mounted drill rig. A representative of Ninyo & Moore logged the subsurface conditions exposed in the borings, and collected bulk and relatively undisturbed samples for laboratory testing. The borings were backfilled with Portland cement grout.
- Laboratory testing on selected soil samples to evaluate soil moisture and dry density, soil gradation, Atterberg limits, consolidation, expansion potential, soil corrosivity, and shear strength as appropriate for the subsurface materials encountered.
- Data compilation and engineering analysis of the information obtained from our background review, subsurface evaluation, and laboratory testing.
- Prepared this geotechnical report presenting our findings and conclusions regarding the subsurface conditions encountered at the project site, and our geotechnical recommendations for the design and construction of the proposed improvements.

3 SITE DESCRIPTION AND BACKGROUND

The proposed Multi-Level Parking Structure and Sports Field Facility site is located on the SJSU South Campus at approximately 37.3213 degrees north latitude and 121.8656 degrees west longitude, north of the intersection between South 10th Street and East Alma Avenue in San Jose, California (Figure 1). The site is bounded to the north by an unpaved parking lot and athletic buildings, to the east by the Spartan Golf Complex, to the south by East Alma Avenue, and to the west by South 10th Street. The site is relatively flat and the elevation ranges from between about 103 and 105 feet above mean sea level (MSL) (Google Earth, 2018). Coyote Creek is located approximately 1,500 feet from the eastern portion of the site. Elevation gradients from the site toward Coyote Creek are relatively flat, approximately 1 percent or less (Google Earth, 2018).

4 PROJECT DESCRIPTION

Based on preliminary design documents (Watry Design, 2019a and 2019b), we understand that the project will consist of construction of a new multi-level parking garage structure with an adjacent, on grade sports field. The parking structure will occupy the southern portion of the site and include four levels of parking, designed to accommodate about 1,500 parking spaces. The bottom level is anticipated to be near the existing ground surface. Associated improvements include field lighting, a walking track, and a fire lane. The site is currently occupied by a track and field which will be demolished.

Preliminary loading information provided indicates columns loads will range from about 362 to 752 kips (Watry Design, 2019c).

5 SUBSURFACE EVALUATION AND LABORATORY TESTING

Our field exploration included a site reconnaissance and subsurface exploration of the project site. The subsurface exploration was conducted on August 21 through August 23, 2018 and consisted of six (6) exploratory borings and eight (8) Cone Penetrometer Test (CPT) soundings. The approximate exploration locations are shown on Figure 2.

The CPT soundings were advanced to depths of up to 90 feet below ground surface using a track-mounted rig with 20-ton reaction capacity. Penetration and pore water pressure data were collected and recorded electronically at intervals of approximately 2 inches while the sounding was being performed. The soil behavior type of the material encountered was assessed using correlations (Robertson, 2009) based on the penetration data. CPT data and the interpreted soil behavior type are presented in Appendix A.

The exploratory borings were advanced with hollow-stem auger drilling methods to depths of approximately 40 feet below the existing grade. A representative of Ninyo & Moore logged the subsurface conditions exposed in the borings and collected bulk and relatively undisturbed soil samples from the borings. The samples were then transported to our geotechnical laboratory for testing. The borings and the soundings were backfilled with grout in accordance with the Santa Clara Valley Water District permit shortly after drilling. Descriptions of the subsurface materials encountered are presented in the following sections. Detailed logs of the borings are presented in Appendix B.

Laboratory testing of soil samples recovered from the borings included tests to evaluate in-situ soil moisture content and dry density, soil gradation, Atterberg limits, expansion index, consolidation characteristics, soil corrosivity, and shear strength. The results of the in-place moisture content and density tests are shown at the corresponding sample depths on the boring logs in Appendix B. The results of the other laboratory tests performed are presented in Appendix C.

6 GEOLOGIC AND SUBSURFACE CONDITIONS

6.1 Regional Geologic Setting

The site is located on the south side of San Francisco Bay in the Coast Ranges geomorphic province of California. The Coast Ranges are comprised of several mountain ranges and structural valleys formed by tectonic processes commonly found around the Circum-Pacific belt. Basement rocks have been sheared, faulted, metamorphosed, and uplifted, and are separated by thick blankets of Cretaceous and Cenozoic sediments that fill structural valleys and line continental margins. The San Francisco Bay Area has several mountain ranges that trend northwest, parallel to major strike-slip faults such as the San Andreas, Hayward, and Calaveras (Figure 3). Major tectonic activity associated with these and other faults within this regional tectonic framework consists primarily of right-lateral, strike-slip movement.

6.2 Site Geology

Published geologic maps (Wentworth et al., 1999; and Helley et al., 1994) indicate that the site is underlain by Holocene levee deposits. Wentworth describes this unit as gray, dense, sandy to silty clay, with occasional lenses of silt and fine gravel. Helley indicates that the clay may contain lenses of silt, sand, and pebbles. A map of regional geology is presented as Figure 4.

6.3 Subsurface Conditions

The following sections provide a generalized description of the geologic units encountered during our subsurface evaluation at the project site. More detailed descriptions are presented on the boring logs in Appendix B. Cross sections depicting our interpretation of the subsurface conditions are presented as Figures 5, 6, and 7.

6.3.1 Aggregate Base

Borings B-1, B-3, B-5, and B-6 and CPT soundings CPT-1, CPT-4, CPT-7, and CPT-8 were advanced through a section of aggregate base. The section encountered consisted of approximately 12 to 18 inches of aggregate base. Variations in the thickness of the aggregate base at the site may be present due to past maintenance, utility work, or other factors.

6.3.2 Fill

Fill was encountered in Borings B-2 and B-4, and CPT soundings CPT-2, CPT-3, CPT-5, and CPT-6 from the ground surface to depths of 1 to 5 feet. The fill, as encountered, generally consisted of brown, moist, stiff, lean clay with sand and gravel.

6.3.3 Alluvium

Alluvium was encountered in the borings and CPT soundings from below the aggregate base or fill to the depths explored. The alluvium generally consisted of brown to gray, moist to wet, firm to very stiff, fat clay, lean clay and sandy lean clay; and gray to brown, moist to wet, loose to medium dense, silt and silty sand.

6.4 Groundwater

Groundwater was encountered during our exploration at depths of approximately 10½ to 14 feet below the existing ground surface in the borings and soundings. The historical high groundwater level for the site is approximately 10 feet below the ground surface (CDMG, 2000).

Fluctuations in the level of groundwater may occur due to variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, groundwater pumping, and other factors which may not have been evident at the time of our field evaluation. In addition, seeps may be encountered at elevations above the groundwater levels encountered due to perched groundwater conditions, leaking pipes, preferential drainage, or other factors not evident at the time of our exploration. Piezometers can be installed to further evaluate the depth to groundwater in the study area and fluctuation in groundwater levels if needed.

7 GEOLOGIC HAZARDS AND GEOTECHNICAL CONSIDERATIONS

This study considered a number of potential issues relevant to the proposed construction on the subject site, including seismic hazards, landsliding, regional ground subsidence, flood hazards, expansive soil, static settlement of compressible soil layers, potential of on-site soil to corrode ferrous metals and promote sulfate attack on concrete, and excavation characteristics. These issues are discussed in the following subsections.

7.1 Seismic Hazards

The seismic hazards considered in this study include the potential for ground rupture due to faulting, seismic ground shaking, liquefaction, dynamic settlement, ground subsidence, seismic slope stability, seismic flood hazard, and tsunamis. These potential hazards are discussed in the following subsections.

7.1.1 Faulting and Ground Surface Rupture

California lies along the boundary between the North American and Pacific tectonic plates. Movement along the plate boundary can generate earthquakes and has created zones of deformation within the Earth’s crust. These zones include various types of complex geologic structures and geomorphic features such as folds, faults, sag ponds, shutter ridges, linear valleys, and scarps. During moderate to large magnitude earthquakes, the ground can rupture along well defined zones of deformation where faults intersect the Earth’s surface.

In response to hazards associated with ground rupture, or surface displacement, the State of California enacted the Alquist-Priolo Earthquake Fault Zoning Act (AP Act) in 1972, which regulates development of structures for human occupancy in areas within active fault zones. The AP Act requires that the State Geologist delineate zones along active faults where evaluation of the potential for ground rupture is required. As defined by the California Geological Survey (CGS, 2018), active faults are faults that have caused surface displacement within Holocene time, or within approximately the last 11,700 years.

The site is not located within an Alquist-Priolo Earthquake Fault Zone established by the State Geologist (CGS, 2018) to delineate regions of potential ground surface rupture adjacent to active faults. The closest known active fault is the southern segment of the Hayward fault (CDMG, 1982; Santa Clara County [SCC], 2012) that is within approximately 4 miles of the site to the northeast. The moment magnitude associated with a rupture of the Southern Segment of Hayward fault is 6.7 (Cao et al., 2003). The moment magnitude associated with a combined rupture of the three component segments of the Hayward – Rodgers Creek fault system is approximately 7.3 (Field et al., 2008). An earthquake with a moment magnitude of 7.0 occurred on the Hayward fault in 1868 (Toppozada and Branum, 2004). The site is approximately 12 miles from the San Andreas Fault. An earthquake with a moment magnitude of 7.8 occurred on the San Andreas Fault in 1906 (Toppozada and Branum, 2004). The Silver Creek fault is located approximately 0.9 miles to the northeast of the site. For the evaluation of fault rupture hazards, this fault is not considered to be active as there is no evidence that surface displacement has occurred along the fault during Holocene time. Studies by Wentworth et al. (2010), however, suggest that two poorly constrained earthquakes in 1903 may have occurred on the Silver Creek. The approximate locations of major faults in the region and their geographic relationship to the project vicinity are shown on Figure 3.

Based on our review of the referenced geologic maps, the project site is not underlain by known active faults (i.e., faults that exhibit evidence of surface displacement in the last 11,700 years). Therefore, the potential for ground surface rupture because of faulting at the site is considered low. Lurching or cracking of the ground surface as a result of nearby seismic events is possible.

7.1.2 Seismic Ground Motion

The 2016 California Building Code (CBC) specifies that the potential for liquefaction and soil strength loss be evaluated, where applicable, for the Maximum Considered Earthquake Geometric Mean peak ground acceleration with adjustment for site class effects in accordance with the American Society of Civil Engineers (ASCE) 7-10 Standard. The peak ground acceleration (PGA) for the site was evaluated using the tabulated value for the Level 2 Basic Service Earthquake (BSE-2) PGA in the CSU Seismic Requirements (2016), which is consistent with the Maximum Considered Earthquake, and a site coefficient of 0.88 to adjust the PGA for Site Class D. The site adjusted PGA was computed as 0.51g from the tabulated value of 0.58g.

7.1.3 Liquefaction and Strain Softening

The strong vibratory motions generated by earthquakes can trigger a rapid loss of shear strength in saturated, loose, granular soils of low plasticity (liquefaction) or in wet, sensitive, cohesive soils (strain softening). Liquefaction and strain softening can result in a loss of foundation bearing capacity or lateral spreading of sloping or unconfined ground. Liquefaction can also generate sand boils leading to subsidence at the ground surface. Liquefaction (or strain softening) is generally not a concern at depths of more than 50 feet below the ground surface. The site is located within a liquefaction hazard zone established by the state geologist (CDMG, 2001) and by Santa Clara County (SCC, 2012). The seismic hazard zones for the site vicinity are presented on Figure 8. Regional studies of liquefaction susceptibility (Witter et al., 2006) indicate that the liquefaction susceptibility at the site is moderate.

We encountered deposits of sand and fine-grained soil of low plasticity below the historic high groundwater level during our subsurface exploration. We evaluated the potential for liquefaction in accordance with the methods presented by Boulanger and Idriss (2014) using the CPT data collected during our subsurface exploration and the computer program CLiq (GeoLogismiki, 2018). Our analysis assumed a design groundwater elevation of 10 feet below the ground surface, and considered a seismic event producing a PGA of 0.51g resulting from a Magnitude 7.3 earthquake. Based on the results of our laboratory testing, soil with a behavior type index (Ic) of 2.6 or less was evaluated for susceptibility to liquefaction and related hazards. The results of our analysis, presented in Appendix D, indicate that thin layers of sandy soil and non-plastic silt below the assumed groundwater level will liquefy under the considered ground motion. Other consequences of liquefaction, including dynamic settlement, sand-boil-induced ground subsidence, and lateral spreading, are addressed in the following sections.

Estimates of undrained and remolded shear strength based on CPT tip resistance and sleeve friction, respectively, indicate that generally the cohesive soils during our subsurface exploration are not particularly sensitive. As such, we do not regard seismically induced strain-softening behavior as a design consideration.

7.1.4 Dynamic Settlement

The strong vibratory motion associated with earthquakes can also dynamically compact loose granular soil leading to surficial settlements. Dynamic settlement is not limited to the near surface environment and may occur in both dry and saturated sand and silt. Cohesive soil is not typically susceptible to dynamic settlement.

We evaluated the potential for dynamic settlement due to liquefaction of saturated soil using the computer program CLiq (GeoLogismiki, 2018) to evaluate the CPT data collected during our field investigation with the methodology of Boulanger and Idriss (2014). Our analysis considered a Magnitude 7.3 earthquake producing a PGA of 0.51g and a design groundwater elevation of 10 feet below the ground surface. The results of our analysis, presented in Appendix D, indicate that the free-field total dynamic settlement following the considered seismic event will be up to approximately 2 inches with negligible dry sand settlement. Differential dynamic settlement is estimated to be about 1 inch over a horizontal distance of approximately 30 feet.

7.1.5 Ground Subsidence

Sand boils that occur when liquefied and near-surface soil escapes to the ground surface can result in ground subsidence due to loss of material that is in addition to dynamic settlement. Based on the assumed PGA, case study data presented by Ishihara (1985), and the relative density, thickness and depth of the saturated, loose granular soil encountered during our subsurface exploration, we do not anticipate that sand boils or resulting ground subsidence will occur following a significant seismic event in the vicinity of the proposed structure.

7.1.6 Lateral Spread

In addition to vertical displacements, seismic ground shaking can induce horizontal displacements as surficial soil deposits spread laterally by floating atop liquefied subsurface layers. Lateral spread can occur on sloping ground or on flat ground adjacent to an exposed face. The nearest exposed face slope is Coyote Creek, located approximately 1,500 feet from the eastern portion of the site. Based on the site topography, site location, and our liquefaction analysis, we do not anticipate that lateral spreading will occur near the proposed structure following a significant seismic event.

7.1.7 Seismic Flood Hazard

Anderson Dam is located approximately 18 miles south of the site. The Dam regulates water flow into Coyote Creek and a failure or breach of the Dam during a seismic event could result in flooding along the Coyote Creek corridor. The Dam is currently in the process of a seismic retrofit which is expected to be completed in the year 2020 (Santa Clara Valley Water District [SCVWD], 2015). Inundation maps prepared by SCVWD (2016) indicate an estimated maximum flood depth at the project site of approximately 22 to 26 feet after a potential failure event. The duration for the maximum flood height to occur at the site is estimated to be about 6 to 8 hours after failure. Based on the nature of proposed improvements for the project, the current operating restrictions and long-term retrofit planned for the Dam, and the distance from the Dam to the site, we do not consider flooding at the site due to a seismically-induced breach of Anderson Dam to be a design consideration.

7.1.8 Tsunamis and Seiches

Tsunamis are long wavelength seismic sea waves (long compared to ocean depth) generated by the sudden movements of the ocean floor during submarine earthquakes, landslides, or volcanic activity. The project location is not within a tsunami inundation area as shown on the Tsunami Inundation Map for Emergency Planning Map (State of California, 2009). Seiches are waves generated in a large enclosed body of water. Based on the inland location of the site and considering that there are no large enclosed bodies of water nearby, the potential for damage due to tsunamis or seiches is not a design consideration.

7.2 Landsliding and Slope Stability

Based on our background review, the site is not within a mapped landslide hazards zone. The site and surrounding areas are relatively flat and the proposed improvements do not include grading significant slopes. As such, we do not regard landsliding or slope stability as a design consideration.

7.3 Regional Ground Subsidence

Ground subsidence due to withdrawal of groundwater for agriculture and water supply was a regional concern in the Santa Clara Valley. The ground surface in downtown San Jose subsided approximately 12 feet between 1910 and 1967 following a drop in the groundwater level of about 235 feet due to sustained groundwater withdrawal (Galloway et al, 1999). Since 1969, management of the groundwater basin incorporating reduced withdrawals, importation of surface water, and groundwater recharge, has effectively halted regional subsidence in the valley (Galloway et al, 1999). Consequently, we do not regard regional ground subsidence due to groundwater withdrawal as a consideration for the project.

7.4 Flood Hazards

Our review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FEMA, 2009) found that the site is outside the 100 and 500-year flood zones in an area described as an area of undetermined flood hazard.

7.5 Expansive Soil

Some clay minerals undergo volume changes upon wetting or drying. Unsaturated soil containing those minerals will shrink/swell with the removal/addition of water. The heaving pressures associated with this expansion can damage structures and flatwork. Laboratory testing was performed on a sample of the near-surface soil to evaluate the expansion index. The tests were performed in general accordance with the American Society of Testing and Materials (ASTM) Standard D 4829 (Expansion Index). The results of our laboratory test indicate that the expansion index of the sample tested was 45. This result is an indicative of a low expansion characteristic.

7.6 Static Settlement

Based on documents provided, the proposed structure will be at or near existing grade and grading at the site will be minor and will not affect site grades. If fill is placed to raise the grades, it will increase the effective stress in the soil resulting in settlement. The geotechnical consultant should be contacted for settlement estimates if fill is placed to raise grades in excess of 2 feet.

Based on the preliminary column loading information provided, the sustained loads for the proposed parking structure are expected to be heavy. Due to the high anticipated column loads, soft ground conditions, and relatively shallow groundwater levels encountered during our subsurface exploration, we anticipate that deep foundations will be needed to support the parking structure.

7.7 Corrosive/Deleterious Soil

An evaluation of the corrosivity of the on-site material was conducted to assess the impact to concrete and metals. The corrosion impact was evaluated using the results of limited laboratory testing on samples obtained during our subsurface study. Laboratory testing to quantify pH, resistivity, chloride, and soluble sulfate contents was performed on a sample of the near-surface soil. The results of the corrosivity tests are presented in Appendix C. The California Department of Transportation (Caltrans) defines a corrosive environment as an area where the soil contains chloride concentration of 500 ppm or greater, soluble sulfate concentration of 1,500 ppm or greater, electrical resistivity of 1,100 ohm-centimeters or less, and a pH of 5.5 or less (Caltrans, 2018). Based on these criteria, the site meets the definition of a corrosive environment. A corrosion engineer should be consulted for recommendations regarding site improvements and potential corrosion. The criteria used to evaluate the deleterious nature of soil on concrete and recommendations from the American Concrete Institute (ACI) for sulfate exposure classes are presented in Table 1. Based on these criteria, the soil on site is defined as Exposure Class S0.

Table 1 Criteria for Deleterious Soil on Concrete

Sulfate Content Percent by Weight	Exposure Class	Maximum Water to Cement Ratio	Minimum 28-day Compressive Strength
0.0 to 0.1	S0	N/A	2,500
0.1 to 0.2	S1	0.50	4,000
0.2 to 2.0	S2	0.45	4,500
> 2.0	S3	0.45	4,500

Reference: American Concrete Institute (ACI) Committee 301 Table 4.2.2.7(a) (ACI, 2016)

7.8 Excavation Characteristics

We anticipate that the proposed project will involve excavations of up to 5 feet in depth for construction of foundations and installation of utilities. The soil encountered during our subsurface exploration over this interval generally consisted of firm to very stiff clay and medium dense, silty sand. Near-vertical cuts in this material up to 4 feet in depth above the groundwater table should remain stable for a limited period of time. However, sloughing of the materials exposed on the excavation sidewall may occur, particularly if the excavation extends below the groundwater level or if the sidewall is disturbed during construction operations or exposed to water. Groundwater was encountered at a depth of about 10½ to 14 feet below existing grade but could rise to shallower depths. The subgrade of excavations extending near to or below groundwater may be unstable without dewatering to depress the water level.

We anticipate that excavations of up to approximately 60 feet, or more, below the existing grade could be needed to install deep foundations. The soil encountered during our subsurface exploration over this interval generally consisted of moist to wet, firm to very stiff, fat clay, lean clay and sandy lean clay; and moist to wet, loose to medium dense, silty sand. Unsupported excavations in these materials below groundwater should not be considered stable. Recommendations for driven piles and auger cast pile foundations, which utilize soil cuttings or the drilling tool to reduce potential for collapse of the foundation excavation during construction, are provided.

8 CONCLUSIONS

Based on our review of the referenced background data, site field reconnaissance, subsurface evaluation, and laboratory testing, it is our opinion that the proposed construction is feasible from a geotechnical standpoint. Geotechnical considerations include the following:

- The subsurface conditions encountered during our exploration generally consisted of brown to gray, moist to wet, firm to very stiff, fat clay, lean clay and sandy lean clay; and gray to brown, moist to wet, loose to medium dense, silt and silty sand.

- Groundwater was encountered at depths of about 10½ to 14 feet below the existing grade during our subsurface exploration. Variations in the groundwater level across the site and over time should be anticipated. Regional mapping indicates that the historic high groundwater level is approximately 10 feet below the existing grade.

- Based on our review of the referenced geologic maps, the project site is not underlain by known active faults (i.e., faults that exhibit evidence of surface displacement in the last 11,700 years). Therefore, the potential for ground surface rupture because of faulting at the site is considered low.

- The site could experience a relatively large degree of ground shaking due to a significant earthquake event resulting in liquefaction and dynamic settlement.

- The site is located within a mapped Liquefaction Hazard Zone. We evaluated the potential for liquefaction and dynamic settlement. The results of our analysis, presented in Appendix D, indicate that layers of soil will liquefy as a result of the considered ground motion. We do not regard the potential for reduction in foundation bearing capacity due to liquefaction as a design consideration for the structure based on the depth and thickness of the liquefiable soil layers encountered.

- The results of our dynamic settlement analysis, presented in Appendix D, indicate that the total dynamic settlement resulting from the considered ground motion will be about 2 inches with a differential dynamic settlement of approximately 1 inch over a lateral distance of about 30 feet. We anticipate that the proposed improvements can be designed to accommodate this level of dynamic settlement without collapse.

- Our laboratory test results indicate that the near-surface clayey soil has a low expansion characteristic.

- Based on the results of our limited soil corrosivity tests during this study and Caltrans corrosion guidelines (2018), the site meets the definition of a corrosive environment.

- We anticipate that the proposed project will involve excavations of up to 5 feet below the existing grade for construction of foundations and installation of utilities. Stability of excavations will be a concern, particularly where excavations extend below groundwater, sidewalls are disturbed by construction operations, or where excavations are exposed to water. Recommendations for excavation stabilization and dewatering are provided.

- We anticipate that excavations of up to approximately 60 feet, or more, below the existing grade could be needed to install deep foundations. The soil encountered during our subsurface exploration over this interval generally consisted of moist to wet, firm to very stiff, fat clay, lean clay and sandy lean clay; and moist to wet, loose to medium dense, silty sand. Unsupported excavations in these materials below groundwater should not be considered stable

9 RECOMMENDATIONS

The following guidelines should be used in the preparation of the construction plans. The project plans and specifications should be reviewed by Ninyo & Moore prior to construction bidding to check for consistency with these recommendations.

9.1 Earthwork

Earthwork should be performed in accordance with the requirements of applicable governing agencies and the recommendations presented below. The geotechnical consultant should observe earthwork operations. Evaluations performed by the geotechnical consultant during the course of operations may result in new recommendations, which could supersede the recommendations in this section.

9.1.1 Pre-Construction Conference

We recommend that a pre-construction conference be held to discuss the grading recommendations presented in the report. Representatives of San Jose State University, the architect, the design engineers, Ninyo & Moore, and the contractor should be in attendance to discuss project schedule and earthwork requirements.

9.1.2 Site Preparation

Site preparation should begin with the removal of vegetation, utility lines, debris and other deleterious materials from areas to be graded. Tree stumps and roots should be removed to such a depth that organic material is generally not present. Clearing and grubbing should extend to the outside of the proposed excavation and fill areas. Rubble and excavated materials that do not meet criteria for use as fill should be disposed of in an appropriate landfill. Existing utilities in the work area should be relocated away from the proposed structures. Existing utilities to be abandoned should be removed, crushed in place, or backfilled with grout.

Excavations resulting from removal of buried utilities, tree stumps, or obstructions should be backfilled with compacted fill in accordance with the recommendations in the following sections.

9.1.3 Observation and Removals

Prior to placement of fill, or the placement of forms or reinforcement for foundations, the client should request an evaluation of the exposed subgrade by Ninyo & Moore. Materials that are considered unsuitable shall be excavated under the observation of Ninyo & Moore in accordance with the recommendations in this section or supplemental recommendations by the geotechnical engineer.

Unsuitable materials include, but may not be limited to dry, loose, soft, wet, expansive, organic, or compressible natural soil; and undocumented or otherwise deleterious fill materials. Unsuitable materials should be removed from trench bottoms and below bearing surfaces to a depth at which suitable foundation subgrade, as evaluated in the field by Ninyo & Moore, is exposed. Based on our subsurface exploration, undocumented fill was generally encountered to depths of 2 feet or less below the ground surface. In Boring B-4, undocumented fill was encountered to a depth of about 5 feet below the ground surface. If shallow footings are used to support the structure, additional borings could be performed in this area to further evaluate the extent and consistency of the undocumented fill or footings should be designed to bear at a depth of 5 feet or more below the ground surface.

9.1.4 Material Recommendations

Materials used during earthwork, grading, and paving operations should comply with the requirements listed in Table 2. Materials should be evaluated by the geotechnical engineer for suitability prior to use. The contractor should notify the geotechnical consultant 72 hours prior to import of materials or use of on-site materials to permit time for sampling, testing, and evaluation of the proposed materials. On-site materials may need to be dried out before re-use as fill. The contractor should be responsible for the uniformity of import material brought to the site.

Table 2 – Recommended Material Requirements

Material and Use	Source	Requirements[1,2]
General Fill: - for uses not otherwise specified	Import	Close-graded with 35 percent or more passing No. 4 sieve and either: Expansion Index of 50 or less, Plasticity Index of 12 or less, or less than 10 percent, by dry weight, passing No. 200 sieve
	On-site borrow	No additional requirements[1]
Aggregate Base	Import	Class II; CSS[4] Section 26-1.02
Controlled Low Strength Material (CLSM)	Import	CSS[4] Section 19-3.02F
Permeable Aggregate - capillary break gravel beneath structures	Import	Open-graded, clean, compactable crushed rock or angular gravel; nominal size ¾ inch or less
Permeable Base - beneath synthetic turf fields	Import	Aggregate Durability of 40 or more; Sand Equivalent of 75 or more; LA Abrasion of 40 or less; see Section 9.6 for gradation criteria
Pipe/Conduit Bedding and Pipe Zone Material -material below pipe invert to 12 inches above pipe	Import	90 to 100 percent (by mass) should pass No. 4 sieve, and 5 percent or less should pass No. 200 sieve
Trench Backfill - above bedding material	Import or on-site borrow	As per general fill and excluding rock/lumps retained on 4-inch sieve or 2-inch sieve in top 12 inches

Notes:

1 In general, fill should be free of rocks or lumps in excess of 6-inches diameter, trash, debris, roots, vegetation or other deleterious material.

2 In general, import fill should be tested or documented to be non-corrosive[3] and free from hazardous materials in concentrations above levels of concern.

3 Non-corrosive as defined by the Corrosion Guidelines (Caltrans, 2018).

4 CSS is California Standard Specifications (Caltrans, 2015).

9.1.5 Subgrade Preparation

Subgrade in trenches and below slabs, footings, flatwork, or fill should be prepared as per the recommendations in Table 3. Prepared subgrade should be maintained in a moist (but not saturated) condition by the periodic sprinkling of water prior to placement of additional overlying fill. Subgrade that has been permitted to dry out and loosen or develop desiccation cracking, should be scarified, moisture-conditioned, and recompacted as per the requirements above.

Table 3 – Subgrade Preparation Recommendations

Subgrade Location	Source
Footings	• After clearing per Section 9.1.2, check for unsuitable materials as per Section 9.1.3. • If unsuitable material is encountered, remove and replace with CLSM or aggregate base placed and compacted per Section 9.1.6. • Scarify and moisture condition exposed subgrade as-needed to achieve a moisture content 2 points or more above the optimum as evaluated by ASTM D1557. Compact exposed subgrade per Section 9.1.6. • Keep in moist condition by sprinkling water.
Below fill, slabs, turf fields, and flatwork	• After clearing per Section 9.1.2, check for unsuitable materials as per Section 9.1.3. • Scarify top 8 inches then moisture-condition and compact as per Section 9.1.6. • Keep in moist condition by sprinkling water.
Utility Trenches	• After clearing per Section 9.1.2, check for unsuitable materials as per Section 9.1.3. • Remove or compact loose/soft material.

9.1.6 Fill Placement and Compaction

Fill and backfill should be compacted in horizontal lifts in conformance with the recommendations presented in Table 4. The allowable uncompacted thickness of each lift of fill depends on the type of compaction equipment utilized, but generally should not exceed 8 inches in loose thickness.

Table 4 – Fill Placement and Compaction Recommendations

Fill Type	Location	Compacted Density[1]	Moisture Content[2]
Subgrade	Footings	95 percent	+ 2 percent or above
	Slabs, flatwork, or fill and in locations not already specified	90 percent	+ 2 percent or above
General Fill	Top 18 inches below finish subgrade for areas subject to vehicular loading	95 percent	+ 2 percent or above
	In locations not already specified	90 percent	+ 2 percent or above
Bedding and Pipe Zone Fill	Material below invert to 12 inches above pipe or conduit	90 percent	Near Optimum
Trench Backfill	Top 18 inches below finish subgrade for areas subject to vehicular loading	95 percent	+ 2 percent or above
	In locations not already specified	90 percent	+ 2 percent or above
Aggregate Base	Below hardscape or footings	95 percent	Near Optimum
Permeable Base	Below synthetic turf fields	90 to 93 percent	Near Optimum

Notes:

1 Expressed as percent relative compaction or ratio of field density to reference density (typically on a dry density basis for soil and aggregate). The reference density of soil and aggregate should be evaluated by ASTM D 1557.

2 Target moisture content at compaction relative to the optimum as evaluated by ASTM D 1557.

Compacted fill should be maintained in a moist (but not saturated) condition by the periodic sprinkling of water prior to placement of additional overlying fill. Fill that has been permitted to dry out and loosen or develop desiccation cracking, should be scarified, moisture-conditioned, and recompacted as per the requirements above.

9.1.7 Temporary Excavations and Shoring

Trench excavations shall be stabilized in accordance with the Excavation Rules and Regulations (29 Code of Federal Regulations [CFR], Part 1926) stipulated by the Occupational Safety and Health Administration (OSHA). Stabilization shall consist of shoring sidewalls or laying slopes back.

Dewatering pits or sumps should be used to depress the groundwater level (if encountered) below the bottom of the excavation. Table 5 lists the OSHA material type classifications and corresponding allowable temporary slope layback inclinations for soil deposits that may be encountered on site. Alternatively, an internally-braced shoring system or trench shield conforming to the OSHA Excavation Rules and Regulations (29 CFR, Part 1926) may be used to stabilize excavation sidewalls during construction. The lateral earth pressures listed in Table 5 may be used to design or select the internally-braced shoring system or trench shield. The recommendations listed in this table are based upon the limited subsurface data provided by our exploratory borings and reflect the influence of the environmental conditions that existed at the time of our exploration. Excavation stability, material classifications, allowable slopes, and shoring pressures should be re-evaluated and revised, as-needed, during construction. Excavations, shoring systems and the surrounding areas should be evaluated daily by a competent person for indications of possible instability or collapse.

Table 5 – OSHA Material Classifications and Allowable Slopes

Formation	OSHA Classification	Allowable Temporary Slope[1,2,3]	Lateral Earth Pressure on Shoring[4] (psf)
Alluvium (above groundwater)	Type C	1½ h:1v (34°)	80×D + 72

Notes:

1 Allowable slope for excavations less than 20 feet deep. Excavation sidewalls in cohesive soil may be benched to meet the allowable slope criteria (measured from the bottom edge of the excavation). The allowable bench height is 4 feet. The bench at the bottom of the excavation may protrude above the allowable slope criteria.
2 In layered soil, layers shall not be sloped steeper than the layer below.
3 Temporary excavations less than 5 feet deep may be made with vertical side slopes and remain unshored if judged to be stable by a competent person (29 CFR, Part 1926.650).
4 'D' is depth of excavation for excavations up to 20 feet deep. Includes a surface surcharge equivalent to two feet of soil.

The shoring system should be designed or selected by a suitably qualified individual or specialty subcontractor. The shoring parameters presented in this report are preliminary design criteria, and the designer should evaluate the adequacy of these parameters and make appropriate modifications for their design. We recommend that the contractor take appropriate measures to protect workers. OSHA requirements pertaining to worker safety should be observed.

Excavations made in close proximity to existing structures may undermine the foundation of those structures and/or cause soil movement related distress to the existing structures. Stabilization techniques for excavations in close proximity to existing structures will need to account for the additional loads imposed on the shoring system and appropriate setback distances for temporary slopes. The geotechnical engineer should be consulted for additional recommendations if the proposed excavations cross below a plane extending down and away from the foundation bearing surfaces of the adjacent structure at an angle of 2:1 (horizontal to vertical).

The excavation bottoms may encounter wet, loose material which may be subject to pumping under heavy equipment loads. The contractor should be prepared to stabilize the bottom of the excavations. In general, unstable bottom conditions may be mitigated by using a stabilizing geogrid, overexcavating the excavation bottom to suitable depths and replacing with compacted fill, or other suitable method. Additionally, aeration of wet soils should be anticipated.

9.1.8 Construction Dewatering

Groundwater was encountered during our subsurface exploration at depths of about 10½ to 14 feet. Regional maps indicate that the historic high groundwater level in the site vicinity is around 10 feet below the ground surface. Variations in groundwater levels across the site and over time should be anticipated. Water intrusion into the excavations may occur as a result of groundwater intrusion or surface runoff. The contractor should be prepared to take appropriate dewatering measures in the event that water intrudes into the excavations. Sump pits, trenches, or similar measures should be used to depress the water level below the bottom of the excavation. Considerations for construction dewatering should include anticipated drawdown, volume of pumping, potential for settlement, and groundwater discharge. Disposal of groundwater should be performed in accordance with the guidelines of the Regional Water Quality Control Board.

9.1.9 Utility Trenches

Trenches constructed for the installation of underground utilities should be stabilized in accordance with our recommendations in Section 9.1.7. Utility trenches should be backfilled with materials that conform to our recommendations in Section 9.1.4. Trench backfill, bedding, and pipe zone fill should be compacted in accordance with Section 9.1.6 of this report. Bedding and pipe zone fill should be shoveled under pipe haunches and compacted by manual or mechanical, hand-held tampers. Trench backfill should be compacted by mechanical means. Densification of trench backfill by flooding or jetting should not be permitted.

To reduce potential for moisture intrusion into a building envelope, we recommend plugging utility trenches at locations where the trench excavations cross under a building perimeter. The trench plug should be constructed of a compacted, fine-grained, cohesive soil that fills the cross-sectional area of the trench for a distance equivalent to the depth of the excavation. Alternatively, the plug may be constructed of concrete or CLSM.

9.1.10 Rainy Weather Considerations

Earthwork and foundation construction should be performed during the period between approximately April 15 and October 15 to avoid the rainy season. In the event that grading is performed during the rainy season, the plans for the project should be supplemented to include a stormwater management plan prepared in accordance with the requirements of the relevant agency having jurisdiction. The plan should include details of measures to protect the subject property and adjoining off-site properties from damage by erosion, flooding or the deposition of mud, debris, or construction-related pollutants, which may originate from the site or result from the grading operation. The protective measures should be installed by the commencement of grading, or prior to the start of the rainy season. The protective measures should be maintained in good working order unless the project drainage system is installed by that date and approval has been granted by the building official to remove the temporary devices.

In addition, construction activities performed during rainy weather may impact the stability of excavation subgrade and exposed ground. Temporary swales should be constructed to divert surface runoff away from excavations and slopes. Steep temporary slopes should be covered with plastic sheeting during significant rains. The geotechnical consultant should be consulted for recommendations to stabilize the site as-needed.

9.2 Seismic Design Criteria

Design of the proposed improvements should be performed in accordance with the requirements of the governing jurisdictions and applicable building codes. Seismic design criteria consistent with the California State University (CSU) Seismic Requirements (2016) were evaluated for the site. The site classification, site coefficients, spectral accelerations, and seismic design category consistent with the CSU criteria are presented in Table 6.

Table 6 – CSU Seismic Design Criteria

Seismic Design Parameter	BSE-2 Value	BSE-1 Value
Site Classification	D	D
Tabulated Spectral Acceleration at 0.2-second Period	1.62 g	1.08 g
Tabulated Spectral Acceleration at 1.0-second Period	0.60 g	0.40 g
Site Coefficient, F_a	0.88	1.07
Site Coefficient, F_v	1.40	1.60
Site-Adjusted Spectral Acceleration at 0.2-second Period	1.23 g	1.16 g
Site-Adjusted Spectral Acceleration at 1.0-second Period	0.84 g	0.64 g
Seismic Design Category	D	D

Seismic design criteria consistent with the California Building Code (2016) guidelines were evaluated for the site. The site classification, site coefficients, and spectral accelerations are presented in Table 7.

Table 7 – California Building Code Seismic Design Criteria

Seismic Design Parameter	Value
Site Classification	D
Site Coefficient, F_a	1.0
Site Coefficient, F_v	1.5
Mapped Spectral Acceleration at 0.2-second Period, S_s	1.500 g
Mapped Spectral Acceleration at 1.0-second Period, S_1	0.600 g
Spectral Acceleration at 0.2-second Period Adjusted for Site Class, S_{MS}	1.500 g
Spectral Acceleration at 1.0-second Period Adjusted for Site Class, S_{M1}	0.900 g
Design Spectral Response Acceleration at 0.2-second Period, S_{DS}	1.000 g
Design Spectral Response Acceleration at 1.0-second Period, S_{D1}	0.600 g
Seismic Design Category	D

9.3 Foundations

Due to the high anticipated column loads, soft ground conditions, and relatively shallow groundwater levels encountered during our subsurface exploration, we anticipate that deep foundations or ground improvement will be needed to support the parking structure. Recommendations for auger cast piles and driven piles are provided in Sections 9.3.1 and 9.3.2. Ground improvement should be designed and constructed by a specialty contractor subject to the review of Ninyo & Moore. Considerations and recommendations for ground improvement are provided in Section 9.3.4.

The foundations should be designed in accordance with structural considerations and the following recommendations. In addition, requirements of the appropriate governing jurisdictions and applicable building codes should be considered in design of the structures.

9.3.1 Auger Cast Pile Foundations

The structure may be supported on auger cast pile foundations. Auger cast piles are cast-in-place foundations that are generally constructed by drilling a shaft in one pass with a hollow-stem auger, injecting cement grout through the hollow stem to fill the shaft as the auger is withdrawn from the excavation, then lowering a cage of reinforcing steel into the grout-filled shaft. Methods for constructing auger cast piles include utilizing continuous flight augers (CFA) and drilled displacement (DD) techniques.

CFA piles are constructed using an auger with continuous flighting and a consistent shaft diameter. The auger is advanced and rotated in a controlled fashion so that the cuttings are not transported up the auger but remain on the flights to stabilize the borehole during auger advancement. Once the tip elevation is achieved, the auger is pulled out of the hole with no rotation to remove the cuttings while the grout is injected into the hole.

DD piles are constructed utilizing an auger with a shaft diameter that increases with distance above the cutting head. The increasing shaft diameter displaces the excavated soil laterally as the auger is advanced to increase the density of the soil around the excavation and reduce the quantity of drill cuttings produced. DD piles that utilize an auger with a shaft diameter that increases to meet the flighting diameter can be considered “full displacement” piles. DD piles may be constructed as full or partial displacement piles with continuous or limited flighting. Augers with limited flighting generally include a section with reversed flights above the displacement body to gather and displace sloughed soil as the auger is rotated out of the hole.

A pre-production indicator pile program should be performed to evaluate achievable bearing depths and resistance to axial loads. The indicator pile program should consist of constructing six or more piles with the proposed equipment to refusal or a target bearing depth at locations distributed around the building footprint. High strain dynamic testing should be performed on the indicator piles in general conformance with ASTM D4945 to evaluate resistance to axial loads. The indicator piles should be instrumented to evaluate tip and shaft resistance. The proposed locations for the indicator piles and the results of the dynamic testing should be reviewed by the geotechnical engineer. The design allowable axial resistance should not exceed 50 percent of the nominal resistance achieved during the testing for downward loading conditions or 33 percent of the nominal resistance achieved due to side friction for upward loading conditions. The design allowable axial resistance may be increased by one third for seismic or wind load combinations.

The allowable axial resistance values listed in Table 8 may be used for preliminary design, presuming that dynamic pile testing is performed during an indicator pile program.

Table 8 – Allowable Axial Resistance For Auger Cast Piles

Pile Type	Embedment Length (feet)	Allowable Downward Axial Resistance (kips)	Allowable Upward Axial Resistance (kips)
18-inch diameter	40	75	65
18-inch diameter	50	100	80
18-inch diameter	60	120	95

A reduction of 10 percent of the allowable capacity should be assumed for seismic analysis in consideration of effects of reduction in strength due to liquefaction. Preliminary estimates of total estimated pile cap settlement due to the applied loads and dynamic settlement are on the order of about ½ inch with a differential settlement of approximately ¼ inch over a lateral distance of about 30 feet. Preliminary estimates for settlement should be revised when actual loading information is available. To mitigate reduction in axial resistance due to pile group effects, the center-to-center spacing between adjacent piles should not be less than three pile diameters.

Over-rotation of the continuous flight auger during drilling can mine soil adjacent to the excavation resulting in future settlement near the completed pile. Interruptions or variations in the rate of auger withdrawal or grout injection can incorporate defects into the pile. To address these concerns, key parameters should be monitored during the drilling and grouting operations. The contractor should furnish equipment to automatically measure auger rotation, auger depth, penetration rate, torque delivered to the auger, crowd force, lifting rate, volume of grout placed, and pressure of the grout near the auger tip. These parameters should be automatically recorded as a function of auger depth at vertical intervals of 2 feet or less and submitted to the geotechnical engineer for review. To reduce the potential for soil mining due to over-rotation, the auger penetration rate should generally exceed the auger pitch in 1½ to 2 rotations for cohesionless soil and in 2 to 3 rotations for clay. The potential for soil mining and an appropriate penetration rate for the site conditions can be evaluated by pre-production indicator piles. The target penetration rate should be selected by the foundation contractor based on the proposed equipment and experience on sites with similar ground conditions or based on a pre-production indicator pile program. To reduce the potential for defects in the pile, the applied grouting pressure and the withdrawal rate should be maintained so that the grout pressure at the discharge point exceeds the overburden pressure. The volume of grout placed should exceed the theoretical volume of the pile, typically by about 15 to 20 percent.

The contractor should select a target grout volume factor based on the proposed equipment and experience on sites with similar ground conditions or based on a pre-production indicator pile program. The observed grout volume factor should be within 7½ percent of the target.

Auger cast piles should be installed within 3 inches of the planned location and within 2 percent of plumb. Where the lateral distance between adjacent piles is less than 6 pile diameters, the second pile should not be drilled until the grout in the first pile has set. Ninyo & Moore should observe the drilling and grouting of the auger cast piles.

9.3.2 Driven Concrete Piles

The parking structure may be constructed on driven concrete pile foundations to mitigate concerns related to static and dynamic settlement under foundation loads. Pre-cast concrete piles should be designed in accordance with American Concrete Institute (ACI) code 543R (ACI, 2012) and the California Building Code (CBSC, 2016) to resist handling, driving, and service loads. Pile foundations should be designed to resist the appropriate load combinations for downward and upward vertical loading, neglecting the potential vertical support provided by pile caps, grade beams or structural mats.

The allowable axial resistance values listed in Table 9 may be used for preliminary design, presuming that dynamic pile testing is performed during an indicator pile program.

Table 9 – Allowable Axial Resistance For Precast Concrete Piles

Pile Type	Embedment Length (feet)	Allowable Downward Axial Resistance (kips)	Allowable Upward Axial Resistance (kips)
14-inch square precast	40	75	60
14-inch square precast	50	100	75
14-inch square precast	60	120	95

A reduction of 10 percent of the allowable capacity should be assumed for seismic analysis in consideration of effects of reduction in strength due to liquefaction. Preliminary estimates of total estimated pile cap settlement due to the applied loads and dynamic settlement are on the order of about ½ inch with a differential settlement of approximately ¼ inch over a lateral distance of about 30 feet. Preliminary estimates for settlement should be revised when actual loading information is available. To mitigate reduction in axial resistance due to pile group effects, the center-to-center spacing between adjacent piles should not be less than three pile diameters.

An indicator pile testing program should be performed prior to production pile fabrication to check that the design resistance can be achieved and to assist in the selection of production pile lengths and driving equipment. The indicator testing program should consist of measuring the strain and acceleration of six piles, distributed across the building footprint, during initial driving and restrike using a pile driving analyzer and evaluating the driving characteristics with wave equation analysis.

The contractor should perform a driveability analysis to select the appropriate hammer and related equipment to drive the piles to the designed embedment depths without overstressing or damaging the piles. The pile hammer should be a diesel or hydraulic impact hammer capable of developing sufficient energy to drive piles at a penetration rate of not less than 1/8-inch per blow. The results of the analysis should be submitted to Ninyo & Moore for review. We recommend that prior to production, an indicator pile testing program, as described above, using equipment recommended by the driveability analysis be performed to further evaluate pile driving conditions, termination criteria, and design assumptions.

Jetting and spudding to facilitate pile driving is not recommended. Locations to receive piles may be pre-drilled to a depth of 10 feet to facilitate driving and reduce potential for vibration and heave of adjacent piles and structures. Locations should be pre-drilled with an auger that will produce a hole with a diameter that is not larger than the pile to be installed. When driving in grouped or closely spaced conditions, sequenced driving should be implemented to minimize lateral or vertical displacement of previously driven piles.

Piles should be checked for alignment and plumbness. Piles should not be out of plumb by more than 2 percent over the length of the pile. The top of the pile should be within 3 inches of the designed location. Pulling piles into position is not recommended.

Ninyo & Moore should observe the pile driving operations for indicator and production piles.

9.3.3 Deep Foundation Lateral Resistance

The parameters listed in Table 10 may be used to evaluate the lateral load resistance of pile foundations for non-seismic conditions. The parameters listed in Table 11 may be used to evaluate the lateral load resistance of the pile foundations for seismic conditions with consideration for select soil layers at residual strength due to liquefaction.

Table 10 – Soil Parameters for Lateral Pile Resistance under Static Conditions

Layer Depth Top Bottom (feet)	γ' (lb/ft^3)	ϕ (degrees)	Su (kip/ft^2)	K (lb/in^3)	e_{50} (%)
0 – 5	115	--	2.00	600	0.65
			--		--
10 – 12	58	30	--	30	--
		--	0.80		
15 – 27	62	--	1.50	400	0.75
27 – 31	62	30	--	30	--
31 – 40	62	--	1.50	400	0.75
40 – 60		--			0.65

Table

0 – 5	115	--	2.00	600	0.65
5 - 10	115	35	--	75	--
10 – 12	58	--	0.05	30	2.00
12 – 15	58	--	0.80	150	1.10
15 – 27	62	--	1.50	400	0.75
27 – 31	62	--	0.05	30	2.00
31 – 40	62	--	1.50	400	0.75
40 – 60	62	--	2.00	600	0.65

The potential for a reduction in the lateral resistance of piles due to the influence of adjacent piles should be considered in design. Piles in a row perpendicular to the direction of lateral loading should be spaced (center to center) at a distance equivalent to three pile diameters (or more) to avoid a reduction in the lateral load resistance due to group effects. A reduction in the lateral resistance due to group effects should be considered for piles in a column parallel to the direction of loading where the center-to-center spacing between adjacent piles in the column is less than eight pile diameters. The reduction in lateral resistance due to group effects for piles in a column parallel to the direction of loading is influenced by the number of piles in the column and the spacing between piles. The efficiency or available lateral resistance per pile are presented in Table 12 for piles in a column parallel to the direction of loading at various spacing. The designer may interpolate between the values in the table for an intermediate spacing or number of piles.

Table 12 – Group Efficiency for Lateral Loading of Pile Groups

Piles in Column [1]	3B Pile Spacing [2]	6B Pile Spacing [2]	8B Pile Spacing [2]
2	60 percent	93 percent	100 percent
3	50 percent	85 percent	100 percent
4	45 percent	81 percent	100 percent
6	40 percent	78 percent	100 percent
10	36 percent	75 percent	100 percent
15	34 percent	73 percent	100 percent
20	33 percent	72 percent	100 percent

[1] Number of piles in column parallel to the direction of the anticipated lateral load.
[2] Center to center pile spacing in direction of the anticipated load where ‘B’ is the pile diameter or width.

A lateral earth pressure on embedded grade beams or pile caps equivalent to 300 pounds per square foot (psf) per foot of depth, up to 3,000 psf, may be considered when evaluating the resistance to lateral loads. The lateral earth pressure within one foot of finish grade should be neglected where the ground adjacent to the foundation is not covered by a pavement or concrete slab. The lateral earth pressure may be increased by one-third for wind or seismic loading conditions.

The lateral deflection needed to develop the recommended earth pressure for resistance to lateral loading on pile caps and grade beams is equivalent to 0.7 percent of the embedment depth for the pile cap or grade beam. This lateral earth pressure should be reduced proportionally where the design lateral deflection, consistent with the assumed head deflection of the pile foundation, is less than 0.7 percent of the embedment depth for the cap or beam. No reduction is needed where the embedment depths are less than 4.5 feet for ⅜-inch of design lateral deflection.

9.3.4 Ground Improvement with Shallow Foundations

Ground improvement can be performed to reduce the dynamic and static settlement and increase the bearing capacity of the subsurface soils. Detailed design of the soil improvement, including construction procedures, equipment, and the size and spacing of the improvement should be prepared by a specialty contractor to meet the project objectives. In general, we anticipate that ground improvement methods, if used, could include deep soil mixing, vibro stone columns, rammed aggregate piers, or drilled displacement columns. As appropriate for the ground improvement method selected, in-situ verification testing of the improved ground should be performed to confirm the design assumptions were achieved. Additional recommendations for in-situ confirmation testing can be provided, if needed, based on the selected ground improvement method.

Deep soil mixing (DSM) is an in-situ ground treatment method that involves blending the in-situ soil with cement or other binding material to improve strength and compressibility of the soil. The DSM can be performed under footing elements or in a grid pattern across the site. DSM design should be performed in accordance with the Federal Highway Administration (FHWA) design manual (FHWA, 2013). A field pre-production test program and report should be conducted which incorporates the proposed mix design, mixing equipment, and mixing procedures proposed for use in production. The field pre-production test and production columns should also include coring from the top to bottom of the column to evaluate the thoroughness of mixing and strength testing of the cores to evaluate the strength of the soil-cement mixture.

Vibro Stone Column (VSC) construction involves the insertion of crushed stone in a grid pattern with a vibratory probe. The strength of the soil mass is increased due to the reinforcement of crushed stone and densification of surrounding soils. In addition, the potential for liquefaction of the subsurface soils is reduced with the improved drainage provided by these stone columns. We anticipate the allowable design bearing pressures of a VSC system will be on the order of 4,000 psf.

Rammed Aggregate Piers (RAP) consist of compacted gravel columns that extend through soft or liquefiable soil layers. Like stone columns, the installation of aggregate piers provides for an increase in soil strength as a result of the compacted gravel columns and increased densification of surrounding soils. In addition, the potential for liquefaction is reduced by the improved drainage of the gravel columns. The difference between aggregate piers and stone columns is in their installation. Aggregate piers are installed by pushing a probe down to the desired depth and then ramming the hole with 12-inch-thick lifts of mechanically compacted gravel. Since the added compaction increases the shear strength between the soils and aggregate piers, a higher bearing capacity can be realized for design of shallow foundations. We anticipate the allowable design bearing pressures of a RAP system will be on the order of 6,000 psf.

Drilled displacement columns consist of a grid of grout columns installed beneath the building footprint. They are constructed with similar methods as drilled displacement auger-cast piles, but typically do not include steel reinforcement and are not structurally connected to the building foundation. An aggregate cushion is typically constructed between the top of the grout columns and the foundation. We anticipate the allowable design bearing pressures of a drilled displacement columns system will be on the order of 4,000 psf.

9.3.5 Drilled Piers for Minor Structures

Drilled piers for minor structures such as fences and light poles, embedded 3 to 20 feet below grade, may be designed using the following criteria.

9.3.5.1 Axial Load Resistance

Drilled piers may be designed for an allowable side friction of 200 psf to evaluate resistance to downward axial loads and 135 psf for upward axial loads. The allowable side friction includes a factor of safety of 2 for downward loading and 3 for upward loading. The allowable side friction may be increased by one-third when considering loads of short duration such as wind or seismic loads. The spacing between adjacent piers should be equivalent to three pier diameters, or more to mitigate reduction due to group effects. Minor structures supported on shallow pier foundations should be designed for a total and differential settlement due to sustained loads of approximately ½ inch and ¼ inch over a horizontal distance of 30 feet.

9.3.5.2 Lateral Load Resistance

A lateral bearing pressure of 100 pounds per square foot (psf) per foot depth up to 1,500 psf may be used to evaluate resistance to lateral loads and overturning moments in accordance with Section 1806 of the 2016 CBC. The allowable lateral bearing pressure may be increased by one-third for wind or seismic load combinations and by an additional factor of two for structures that can accommodate ½ inch of lateral deflection of the top of the pier foundation.

Drilled piers in a row perpendicular to the direction of lateral loading do not need to be reduced for group effects where the center-to-center pier spacing is equivalent to 3 or more pier diameters. A reduction in the lateral resistance due to group effects should be considered for piers in a column parallel to the direction of loading where the center-to-center spacing between adjacent piers in the column is less than eight pier diameters. The reduction in lateral resistance due to group effects for piers in a column parallel to the direction of loading is influenced by the number of piers in the column and the spacing between piers. The efficiency or available lateral resistance per pier are presented in Table 13 for piers in a column parallel to the direction of loading at various spacings.

9.3.5.3 Construction Considerations

Drilled pier excavations should be cleaned of loose material prior to pouring concrete. Drilled pier excavations that encounter groundwater or cohesionless soil may be unstable and may need to be stabilized by temporary casing or use of drilling mud. Standing water should be removed from the pier excavation or the concrete should be delivered to the bottom of the excavation, below the water surface, by tremie pipe. Casing should be removed from the excavation as the concrete is placed. Concrete should be placed in the piers in a manner that reduces the potential for segregation of the components.

Table 13 – Pier Group Efficiency for Lateral Loading Parallel to Load

Piers in Column [1]	3B Pier Spacing [2]	5B Pier Spacing [2]	8B Pier Spacing [2]
2	60 percent	76 percent	100 percent
3	50 percent	70 percent	100 percent
4	45 percent	67 percent	100 percent

Notes:

[1] Number of piers in column parallel to the direction of the anticipated lateral load.

[2] Center to center pier spacing in direction of the anticipated load where ‘B’ is the pile diameter.

9.3.6 Spread Footings for Minor Structures

Minor structures such as equipment pads, auxiliary buildings, and retaining walls may be supported on shallow footings. Footings bearing on alluvium or new engineered fill with subgrade prepared in accordance with the recommendations in Section 9.1.5 may be designed using the criteria listed in Table 8. The geotechnical engineer should observe the footing excavations to evaluate bearing materials and subgrade condition before the exposed subgrade is covered.

Footings bearing at 12 inches below the adjacent grade on firm or medium dense subgrade may be designed for an allowable bearing capacity of 2,000 psf presuming a width of 6 to 36 inches for walls or 6 to 60 inches for columns. Wall footings may be stepped provided that the bearing grade differential between adjacent steps does not exceed 18 inches and the slope of a series of such steps does not exceed 1 unit vertical to 2 units horizontal. The geotechnical engineer should be provided an opportunity to observe the footing excavations to evaluate bearing materials and subgrade condition prior to placement of reinforcing steel or erection of forms. Structures supported on footings consistent with these recommendations should be designed for a total settlement due to sustained loads of 1 inch with a differential of ½ inches over a lateral span of 30 feet. Footing-supported structures should be designed to accommodate an additional 2 inches of total dynamic settlement with a differential dynamic settlement of about 1 inch over a lateral distance of approximately 30 feet.

The allowable bearing capacities recommended above include factor of safety of 3 or more and may be increased by one-third when considering loads of short duration such as wind or seismic forces.

The spread footings should be reinforced with deformed steel bars as detailed by the project structural engineer. Where footings are located adjacent to utility trenches or other excavations, the footing bearing surfaces should bear below an imaginary plane extending upward from the bottom edge of the adjacent trench/excavation at a 2:1 (horizontal to vertical) angle above the bottom edge of the footing. Footings should be deepened or excavation depths reduced as-needed.

A friction coefficient of 0.30 may be assumed for evaluating frictional resistance to lateral loads. A lateral bearing pressure of 300 psf per foot of depth up to 3,000 psf may be used to evaluate the resistance of footings to lateral loads for level ground conditions. The lateral bearing pressure should be neglected to a depth of 1 foot where the ground adjacent to the foundation is not covered by a slab or pavement. The lateral resistance can be taken as the sum of the frictional resistance and passive resistance, provided the passive resistance does not exceed one-half of the total allowable resistance. The friction coefficient and passive lateral bearing pressure should be considered ultimate values. The lateral bearing pressure may be increased by one-third when considering loads of short duration such as wind or seismic forces.

The weight of the material above a plane rising up and away from the bottom edges of the footings at 20 degrees off plumb may be considered, along with the weight of the footing and the material over the footing, when evaluating footing resistance to uplift. A unit weight of 115 pounds per cubic foot (pcf) for soil or aggregate and 150 pcf for normal weight concrete may be assumed for this evaluation.

9.4 Slabs-On-Grade

Slab-on-grade floors for pile-supported buildings will settle differentially relative to the pile supported walls and columns following a significant earthquake due to dynamic settlement. We anticipate that the differential dynamic settlement, following the design earthquake, between the slab-on-grade floor and the pile supported columns may be about 1 inch. Slab-on-grade floors will also settle differentially relative to the pile-supported walls and columns due to static settlement. We estimate that the differential static settlement will be approximately ½ inch. Floor slabs may be designed as structural slabs, where the support provided by the subgrade is neglected, to reduce the potential for differential settlement between the floor slab and the pile-supported walls and columns. Alternatively, floor slabs may be designed as slabs-on-grade and repaired as needed should differential settlement occur.

Slabs-on-grade should be designed by the project structural engineer based on the anticipated loading conditions. The subgrade should be prepared in accordance with Section 9.1.5. Where a vapor retarding system is not used, slabs should be constructed on 6 inches, or more, of aggregate base conforming to Section 9.1.4 and placed in accordance with Section 9.1.6. The slab should be reinforced with deformed steel bars. We recommend that masonry briquettes or plastic chairs be used to aid in the correct placement of slab reinforcement in the upper half of the slab. Refer to Section 9.8 for the recommended concrete cover over reinforcing steel. A vapor retarder is recommended in areas where moisture-sensitive floor coverings or conditioned environments are anticipated. Joints consistent with ACI guidelines (ACI, 2016) may be constructed at periodic intervals to reduce the potential for random cracking of the slab.

9.5 Retaining Walls

Walls retaining up to 15 feet of soil should be designed for an active equivalent fluid earth pressure of 43 pounds per cubic foot (pcf) or an at-rest equivalent fluid earth pressure of 64 pcf for level ground conditions. Retaining walls that yield or deflect may be designed for active earth pressures. Walls that are restrained against deflection should be designed for at rest earth pressures. Yielding walls may also be designed for at-rest earth pressures to reduce the potential wall deflection. Wall deflection equivalent to about 1 percent of wall height may be needed to reduce at-rest earth pressures to active earth pressures.

Walls retaining level ground should be designed to resist construction or live load surcharges on the backfill. The lateral earth pressure due to a backfill surcharge of 240 psf would be 83 psf for unrestrained walls or 128 psf for restrained conditions. An additional backfill surface and lateral earth pressure for adjacent footings should be considered, as applicable, where the adjacent footings bear above an imaginary plane that rises up and away from the bottom edge of the wall at a 2:1 (horizontal to vertical) gradient. An inverted equivalent fluid pressure of 21 pcf may be used to evaluate seismic earth pressures on retaining walls.

A hydrostatic pressure equivalent to 62 psf per foot depth below the historic high groundwater level should be considered for retaining walls that extended below the historic high water level.

Hydrostatic pressures may be neglected for walls above the historic high water level, provided that suitable drainage of the retained soil is provided. The retained soil may be drained by weepholes or a subdrain at the base of the wall stem. Geocomposite drain panels (Miradrain 6000XL, or similar) placed against the back of the wall may be used to supplement a smaller subdrain located near the base of the wall. Measures to reduce the rate of moisture or vapor intrusion through the wall may be advisable for walls where the discoloration resulting from moisture intrusion would be undesirable. Such measures might include use of concrete with a low water-to-cementitious-materials ratio, and/or the placement of an asphalt emulsion or 15-mil thick plastic membrane to the back surface of the wall.

Recommendations for wall foundations and for parameters to evaluate resistance to lateral loads are provided in Section 9.3.6.

9.6 Athletic Field

The synthetic turf athletic field should be designed assuming the subgrade is impermeable. Synthetic turf fields should be constructed over a permeable aggregate base layer that is 6 inches or more in thickness. The permeable aggregate base should meet the criteria presented in Section 9.1.4. Gradation of the drainage material, in percentage by weight, should comply with following criteria presented below in Table 14.

Table 14 – Gradation Criteria for Synthetic Turf Permeable Base

Sieve Size	Percentage Passing
1-inch	100
3/4-inch	80-100
3/8-inch	30-50
No. 4	25-40
No. 8	10-30
No. 30	7-25
No. 40	5-17
No. 50	0-7
No. 200	0-3

After demolition, clearing, and grubbing, the field subgrade should be prepared in accordance with Section 9.1.5**Error! Reference source not found.**. The subgrade should be proof-rolled with a loaded water truck to check for yielding or pumping areas. Yielding or pumping subgrade may be mitigated by excavating the subgrade an additional 8 inches, placing a subgrade enhancement geotextile (such as Mirafi 600X or equivalent) and backfilling the excavation with aggregate base. Appropriate measures to mitigate yielding or pumping subgrade will be influenced by the conditions encountered during grading. The geotechnical engineer should observe the proof-rolling to evaluate the suitability of these mitigation measures.

To facilitate drainage of the fields, the subgrade should be sloped down toward the sidelines at a gradient of 0.5 percent or more. Subdrains should be constructed at the perimeter of the field to collect subsurface water. The subdrain should consist of perforated, 6-inch diameter or larger, schedule 40 plastic pipe in a trench backfilled with the permeable aggregate base material. The pipe should be sloped to drain toward a suitable outlet at a gradient of 0.5 percent or more. Rodent screens should be provided at subdrain outlets as appropriate. Cleanouts should be provided to facilitate periodic maintenance of the system. Measures should be provided to reduce the potential for backflow damage where subdrains are connected to the storm drain system.

Geocomposite strip drains should be placed over the prepared subgrade leading to the perimeter subdrains. The strip drains should be placed at an approximately 15-foot lateral spacing (or as specified by the turf field designer) and aligned at a 45-degree angle to the sideline subdrains. The strip drains should be secured to the subgrade and the ends of the drains should drape over the perforated subdrain pipe. Once the strip drains are secured, the permeable aggregate base can be placed and compacted per Section 9.1.6. The drainage layer material should be placed and compacted in a manner which minimizes segregation and/or degradation, such as minimizing the spreading distance, storing on a hard surface or geotextile prior to placement, keeping the aggregate moist during spreading and to facilitate compaction, and compacting the material with a vibratory smooth roller that does not result in crushing of the aggregate. The permeable aggregate base should be maintained in a moist condition to reduce the potential for dusting of fine aggregate components.

9.7 Exterior Flatwork

Pedestrian sidewalks, walkways, and other flatwork constructed of Portland cement concrete should consist of no less than 4 inches of concrete over 6 inches of aggregate base. The concrete thickness should be increased to 6 inches at driveways. Criteria for aggregate base are presented in Section 9.1.4. Recommendations for subgrade preparation and fill placement are provided in Sections 9.1.5 and 9.1.6, respectively.

Concrete flatwork should be appropriately jointed to reduce the random occurrence of cracks. Joints should be laid out in a square pattern at consistent intervals. Contraction, construction, and isolation joints should be detailed and constructed in accordance with the guidelines of American Concrete Institute (ACI) Committee 301 (ACI, 2016). We recommend a contraction joint spacing of no more than 12 feet for driveways and no more than 8 feet for other flatwork.

Concrete flatwork may be reinforced with deformed steel bars to reduce the potential for differential slab movement, should cracking occur between joints. The reinforcing steel should have a nominal diameter of ⅜-inch or more and should be detailed by the engineer based on the anticipated loading and flatwork usage. Slabs reinforced with distributed steel should be 5 inches thick (or more). Masonry briquettes or plastic chairs should be used to maintain the position of the reinforcement in the upper portion of the slab during concrete placement.

9.8 Concrete

Laboratory testing indicated that the concentration of sulfate and corresponding potential for sulfate attack on concrete is negligible for the soil tested. However, due to the variability in the on-site soil, we recommend that Type II/V or Type V cement be used for concrete structures in contact with soil. In addition, we recommend a water-to-cement ratio of no more than 0.45. A 3-inch thick, or thicker, concrete cover should be maintained over reinforcing steel where concrete is in contact with soil in accordance with ACI Committee 301 (ACI, 2016).

9.9 Moisture Vapor Retarder

The migration of moisture through slabs underlying enclosed spaces or overlain by moisture sensitive floor coverings should be discouraged by providing a moisture vapor retarding system between the subgrade soil and the bottom of slabs. We recommend that the moisture vapor retarding system consist of a 4-inch-thick capillary break, overlain by a 15-mil-thick plastic membrane. The capillary break should be constructed of clean, compacted, open-graded crushed rock or angular gravel of ¾-inch nominal size. To reduce the potential for slab curling and cracking, an appropriate concrete mix with low shrinkage characteristics and a low water-to-cementitious-materials ratio should be specified. In addition, the concrete should be delivered and placed in accordance with ASTM C94 with attention to concrete temperature and elapsed time from batching to placement, and the slab should be cured in accordance with the ACI Manual of Concrete Practice (ACI, 2016), as appropriate. The plastic membrane should conform to the requirements in the latest version of ASTM Standard E 1745 for a Class A membrane. The bottom of the moisture barrier system should be higher in elevation than the exterior grade, if possible. Positive drainage should be established and maintained adjacent to foundations and flatwork.

9.10 Drainage and Site Maintenance

Surface drainage on the site should generally be provided so that water is diverted away from structures and is not permitted to pond. Positive drainage should be established adjacent to structures to divert surface water to an appropriate collector (graded swale, v-ditch, or area drain) with a suitable outlet. Drainage gradients should be 2 percent or more a distance of 5 feet or more from the structure for impervious surfaces and 5 percent or more a distance of 10 feet or more from the structure for pervious surfaces. Slope, pad, and roof drainage (from adjacent structures) should be collected and diverted to suitable discharge areas away from structures or other slopes by non-erodible devices (e.g., gutters, downspouts, concrete swales, etc.). Graded swales, v-ditches, or curb and gutter should be provided at the site perimeter to restrict flow of surface water onto and off of the site. Slopes should be vegetated or otherwise armored to reduce potential for erosion of soil. Drainage structures should be periodically cleaned out and repaired, as-needed, to maintain appropriate site drainage patterns.

Landscaping adjacent to foundations should include vegetation with low-water demands and irrigation should limited to that which is needed to sustain the plants. Trees should be restricted from the areas adjacent to foundations a distance equivalent to the canopy radius of the mature tree. Bioretention areas should not be located within a distance of 20 feet from structure foundations.

Care should be taken by the contractor during grading to preserve any berms, drainage terraces, interceptor swales or other drainage devices on or adjacent to the project area. Drainage patterns established at the time of grading should be maintained for the life of the project.

9.11 Review of Construction Plans

The recommendations provided in this report are based on preliminary design information for the proposed construction. We recommend that a copy of the plans be provided to Ninyo & Moore for review before bidding to check the interpretation of our recommendations and that the designed improvements are consistent with our assumptions. It should be noted that, upon review of these documents, some recommendations presented in this report might be revised or modified to meet the project requirements.

9.12 Construction Observation and Testing

The recommendations provided in this report are based on subsurface conditions encountered in relatively widely spaced exploratory borings and soundings. During construction, the geotechnical engineer or his representative in the field should be allowed to check the exposed subsurface conditions. During construction, the geotechnical engineer or his representative should be allowed to:

- Observe preparation and compaction of subgrade.
- Check and test imported materials prior to use as fill.
- Observe placement and compaction of fill.
- Perform field density tests to evaluate fill and subgrade compaction.
- Observe excavation and foundation construction.

The recommendations provided in this report assume that Ninyo & Moore will be retained as the geotechnical consultant during the construction phase of the project. If another geotechnical consultant is selected, we request that the selected consultant provide a letter to the architect and the owner (with a copy to Ninyo & Moore) indicating that they fully understand Ninyo & Moore's recommendations, and that they are in full agreement with the recommendations contained in this report.

10 LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur because of government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

11 REFERENCES

American Concrete Institute, 2012, Guide to Design, Manufacture, and Installation of Concrete Piles, ACI 543R-12.

American Concrete Institute, 2014, Building Code Requirements for Structural Concrete (ACI 318-14) - Commentary on Building Code Requirements for Structural Concrete (ACI 318R-14).

American Concrete Institute, 2016, ACI Manual of Concrete Practice.

American Society for Testing and Materials (ASTM), 2018, Annual Book of ASTM Standards, West Conshohocken, Pennsylvania.

American Society of Civil Engineer (ASCE), 2010, Minimum Design Loads for Buildings and Other Structures, Standard 7-10.

Boulanger, R.W., and Idriss, I.M., 2014, CPT and SPT Based Liquefaction Triggering Procedures, Center for Geotechnical Modeling, Department of Civil and Environmental Engineering, University of California, Davis, California, Report No. UCD/CGM-14/-1, dated April.

California Building Standards Commission (CBSC), 2016, California Building Code (CBC), Title 24, Part 2, Volumes 1 and 2, based upon the 2015 International Building Code (IBC).

California Department of Transportation (Caltrans), 2018, Corrosion Guidelines, Version 3.0, Division of Engineering Services, Materials Engineering and Testing Services, Corrosion Branch: dated March.

California Department of Transportation (Caltrans), 2015, Standard Specifications.

California Division of Mines and Geology (CDMG), 1982, State of California Special Studies Zones, San Jose East Quadrangle: dated January 1: Scale 1:24,000.

California Division of Mines and Geology (CDMG), 2000, Seismic Hazard Zone Report for the San Jose East 7.5 Minute Quadrangle, Santa Clara County, California, Seismic Hazard Zone Report 044.

California Division of Mines and Geology (CDMG), 2001, Seismic Hazard Zone Map for the San Jose East 7.5 Minute Quadrangle, Santa Clara County, California, Scale: 1:24,000, dated January 17.

California Geological Survey (CGS), 2018, Special Publication 42 – Earthquake Fault Zones, A Guide for Government Agencies, Property Owners / Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California.

California State University (CSU), 2016, CSU Seismic Requirements, Office of the Chancellor: dated November 1.

Cao, T., Bryant, W.A., Rowshandel, B., Branum, D., and Wills, C. J., 2003, The revised 2002 California Probabilistic Seismic Hazard Maps, California, USGS/CGS: dated June.

Dibblee, T.W., and Minch, J.A., 2005, Geologic map of the San Jose East quadrangle, Santa Clara County, California: Dibblee Geological Foundation, Dibblee Foundation Map DF 155, scale 1:24,000

Eslami, A., and Fellenius, B.H., 1997, Pile Capacity by Direct CPT and CPTu Methods Applied to 102 Case Histories, Canadian Geotechnical Journal, Vol. 34, No. 6, pp. 886-904.

Federal Emergency Management Agency (FEMA), 2009, Flood Insurance Rate Map, Santa Clara County, California, Panel 253 of 830, Map Number 06085C0253H, dated May 18.

Federal Highway Administration (FHWA), 2013, Federal Highway Administration Design Manual: Deep Mixing for Embankment and Foundation Support, Rep. No. FHWA-HRT-13-046, FHWA, Washington D.C.

Field, E.H., Dawson, T.E., Felzer, K.R., Frankel, A.D., Gupta, V., Jordan, T.H., Parsons, T., Petersen, M.D., Stein, R.S., Weldon, R.J., II, and Wills, C.J., 2008, The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2), 2007 Working Group on California Earthquake Probabilities, U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203.

Galloway, D., Jones, D.R., and Ingebritsen, S.E., 1999, Land Subsidence in the United States, Circular 1182, United States Geological Survey.

GeoLogismiki, 2018, CLiq v.2.2.0.37 - CPTU Data Presentation & Interpretation Software.

Google Earth, 2018, Version No. 7.3.1.4507.

Helley, E.J., Graymer, R. W., Phelps, G. A.., Showalter, P. K., Wenworth, C. M., 1994, Quaternary Geology Map of the Santa Clara Valley, Santa Clara, Alameda, and San Mateo Counties, California, Scale 1:50000.

Ishihara, K., 1985, Stability of Natural Deposits During Earthquakes, Proceedings of the 11th International Conference on Soil Mechanics and Foundation Engineering, Volume 1, pages 321-376.

Jennings, C.W. and Bryant, William A., 2010, Fault Activity Map of California and Adjacent Areas: California Division of Mines and Geology, California Geologic Data Map Series, Map No. 6, Scale 1:750,000.

Naval Facilities Engineering Command (NAVFAC) Foundations and Earth Structures Design Manual 7.02, September 1986.

Occupational Safety and Health Administration (OSHA), 1989, Occupational Safety and Health Standards – Excavations, Department of Labor, Title 29 Code of Federal Regulations (CFR) part 1926, dated October 31.

Pradel, D. J., 1998, Procedure to Evaluate Earthquake Induced Settlements in Dry Sandy Soils, Journal of Geotechnical and Geoenvironmental Engineering, American Society of Civil Engineers, (ASCE), Volume 124, No. 4.

Robertson, P.K. and Campanella, R.C., 1989, Guidelines for Geotechnical Design using the Cone Penetrometer Test and CPT with Pore Pressure Measurement; Soil Mechanics Series No. 120, Civil Eningeering Department, University of British Colombia, Vancouver, B.C.

Robertson, P.K., 2009, Interpretation of cone penetration tests – a unified approach, Canadian Geotechnical Journal, 46:1337-1355.

Robertson, P.K., and Shao, L., 2010, Estimation of Seismic Compression in Dry Soils Using the CPT, 5th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, California, Dated May 24.

Santa Clara County (SCC), 2012, Geologic Hazard Zones, Sheet 20, Santa Clara County, California, Dated: October 26.

Santa Clara Valley Water District, 2015, Anderson Dam Seismic Retrofit Project, http://www.valleywater.org/scw-C1.aspx, dated October 2015.

Santa Clara Valley Water District, 2016, Leroy Anderson Dam Flood Inundation Maps, Sheet 5, Scale 1 inch = 4,000 feet, dated April.

State of California, 2009, Tsunami Inundation Map for Emergency Planning, San Francisco Bay Area; produced by California Emergency Management Agency, California Geological Survey, and University of Southern California – Tsunami Research Center, Scale 1:150,000, dated December 9.

Tokimatsu, K., and Seed, H.B., 1987, Evaluation of Settlements in Sands Due to Earthquake Shaking, Journal of the Geotechnical Engineering Division, ASCE, Vol. 113, No. 8, pp. 861-878.

Toppozada, T.R., and Branum, D.M., 2004, California Earthquake History, Annals of Geophysics, Vol. 47, No. 2/3, April/June, pp. 509-522.

United States Geological Survey, 2018, United States Seismic Design Maps, World Wide Web, http://geohazards.usgs.gov/designmaps/us/application.php.

Watry Design, Inc., 2019a, San Jose State University South Campus Multi-level Parking Structure & Sports Field Facility, 75% Schematic Design Basis of Design Document, dated February 1.

Watry Design, Inc., 2019b, South Campus Multi-level Parking Structure & Sports Field Facility, Colored Site Plan, dated February 1.

Watry Design, Inc., 2019c, South Campus Multi-level Parking Structure & Sports Field Facility, WDI #17087, dated March 13.

Wentworth, C.M., Williams, R. A., Jachens, R.C., Graymer, R.W., and Stephenson, W.J., 2010, The Quaternary Silver Creek Fault Beneath the Santa Clara Valley, California: U.S. Geological Survey Open-File Report 2010-1010.

Wentworth, Carl M., Blake, M. Clarke., McLaughlin, Robert J., Graymer, Russell W., 1999, Preliminary Geologic Map of the San Jose 30' x 60' Quadrangle, Scale 1:100000.

Witter, R.C., Knudsen, K.L, Sowers, J.M., Wentworth, C.M., Koehler, R.D., Randolph, C.E., Brooks, S.K., and Gans, K.D, 2006, Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California: U.S. Geological Survey Open-File Report 2006-1037, Scale 1:24,000 (http://pubs.usgs.gov/of/2006/1037/).

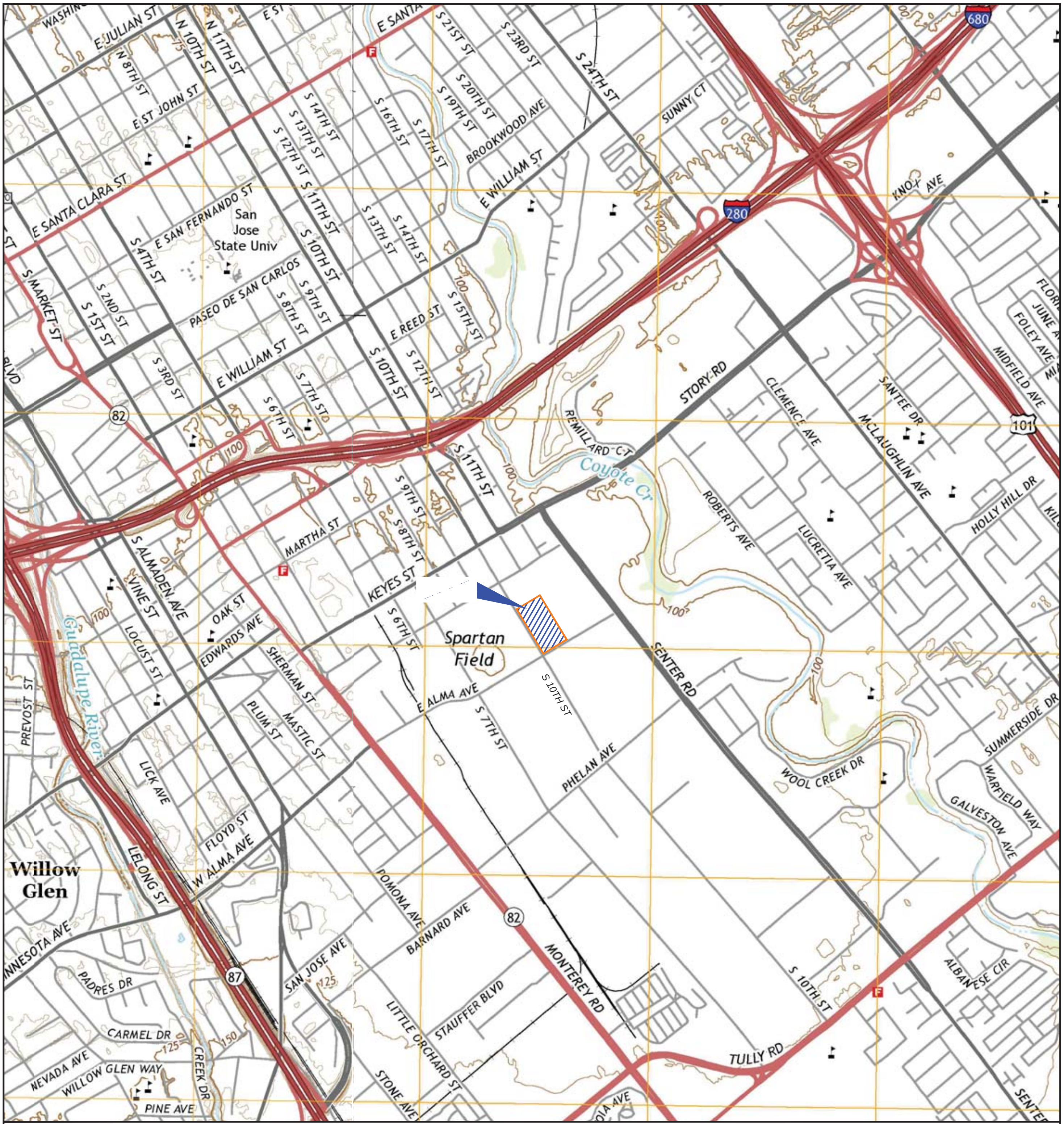
Working Group on California Earthquake Probabilities, 2008, Uniform California Earth-quake Rupture Forecast, Version 2 (UCERF 2): U.S. Geological Survey (USGS) Open-File Report 2007-1437 and California Geological Survey (CGS) Special Report 203: http://pubs.usgs.gov/of/2007/1437/.

Youd, T.L., Idriss, I.M., Andrus, R.D., Arango, I., Castro, G., Christian, J.T., Dobry, R., Finn, W.D., Harder, L.F., Hynes, M.E., Ishihara, K., Koester, J.P., Liao, S.S.C., Marcuson, W.F., Martin, G.R., Mitchell, J.K., Moriwaki, Y., Power, M.S., Robertson, P.K., Seed, R.B., and Stokoe, K.H., II., 2001, Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils, Journal of Geotechnical and Geoenvironmental Engineering: American Society of Civil Engineering 124(10), p. 817-833.

Youd, T.L., Hansen, C.M., and Bartlett, S.F., 2002, Revised Multilinear Regression Equations for Prediction of Lateral Spread Displacement, ASCE Geotechnical Journal, Vol. 128, No. 12.

Zhang, G., Roberston, P.K., and Brachman, R.W.I., 2002, Estimating Liquefaction-Induced Ground Settlements from CPT for Level Ground, Canadian Geotechnical Journal, Volume 39, pp. 1168-1180.

FIGURES



FEET

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NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE I REFERENCE: USGS, 2015

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FIGURE 1

SITE LOCATION

SJSU PARKING GARAGE, TRACK AND FIELD FACILITY
1312 SOUTH TENTH STREET
SAN JOSE, CALIFORNIA
403335001 I 03/19

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

LEGEND

B-1 TD=40.0' ⊕	BORING LOCATION TD=TOTAL DEPTH IN FEET	— - —	SITE BOUNDARY
CPT-1 TD=68.5' △	CPT LOCATION TD=TOTAL DEPTH IN FEET	A ⌊⌋ A'	CROSS SECTION LINE

N

SCALE (FEET)

0 125 250

NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE I REFERENCE: GOOGLE EARTH, 2018

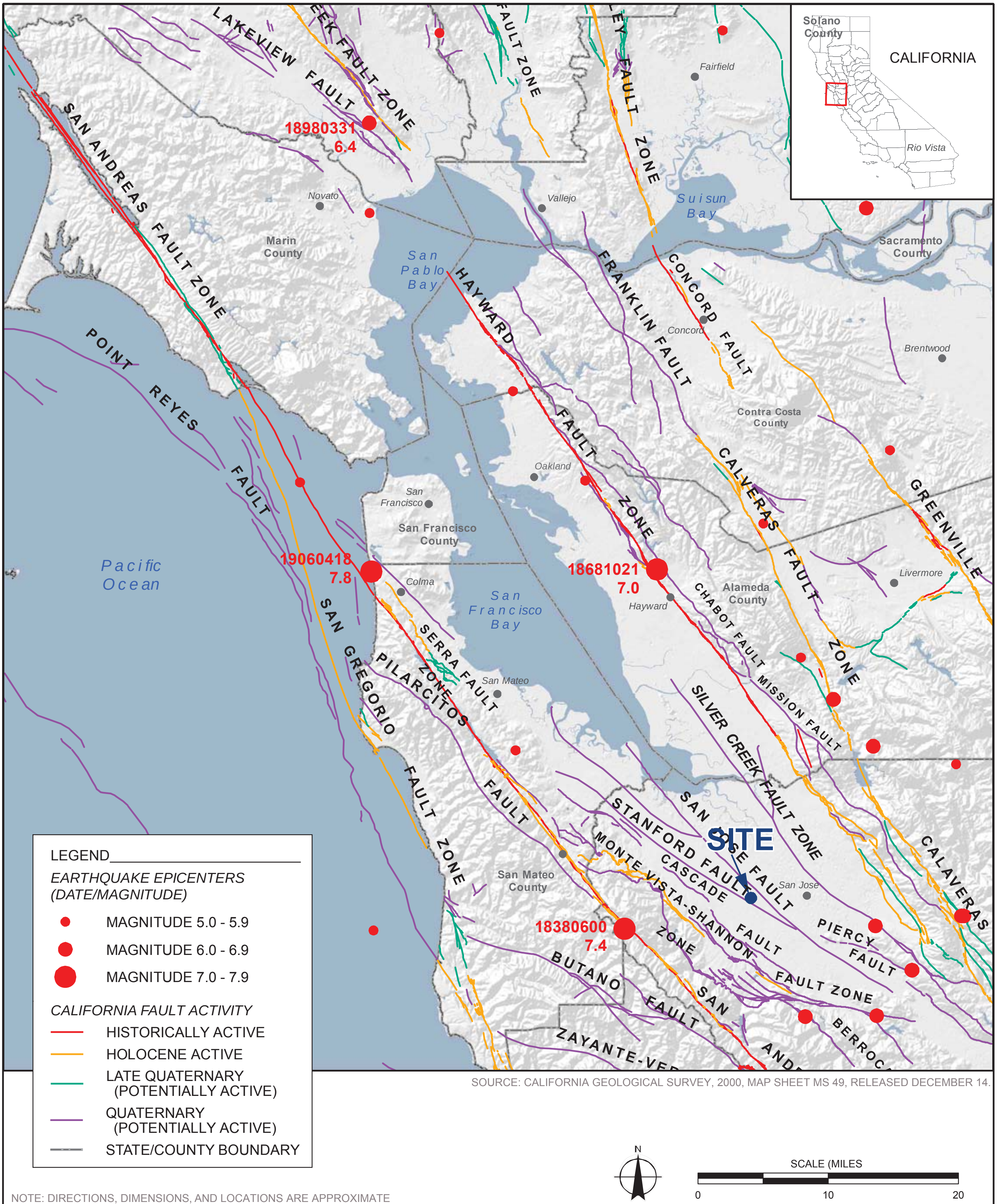
403335001.dwg 03/22/2019 AEK

FIGURE 2

EXPLORATION LOCATIONS

SJSU PARKING STRUCTURE AND TRACK AND FIELD FACILITY
1312 SOUTH TENTH STREET
SAN JOSE, CALIFORNIA
403335001 I 03/19

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants



SOURCE: CALIFORNIA GEOLOGICAL SURVEY, 2000, MAP SHEET MS 49, RELEASED DECEMBER 14.

NOTE: DIRECTIONS, DIMENSIONS, AND LOCATIONS ARE APPROXIMATE

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FIGURE 3

FAULT LOCATIONS AND EARTHQUAKE EPICENTERS

SJSU PARKING STRUCTURE AND TRACK AND FIELD FACILITY
1312 SOUTH TENTH STREET
SAN JOSE, CALIFORNIA
403335001 I 03/19

Ninyo & Moore
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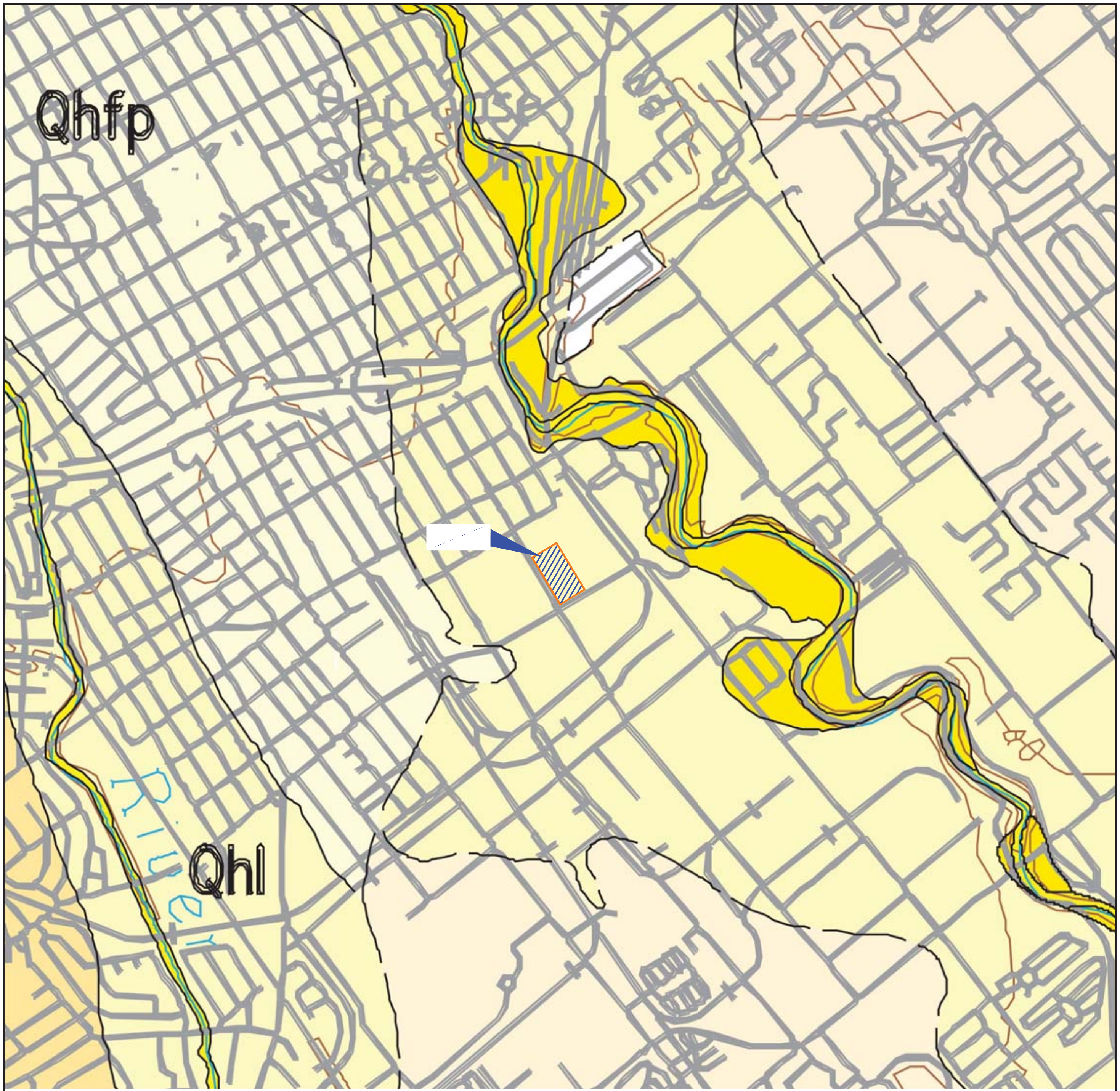

LEGEND

Qhb	BASIN DEPOSITS (HOLOCENE)
Qhfp	FLOOD PLAIN DEPOSITS (HOLOCENE)
Qhl	LEVEE DEPOSITS (HOLOCENE)
Qht	STREAM TERRACE DEPOSITS (HOLOCENE)
Qhf2	ALLUVIAL FAN DEPOSITS, OLDER (HOLOCENE)

THRUST FAULT

FAULT

GEOLOGIC CONTACT

STRIKE AND DIP OF BEDDING

N

SCALE (FEET)

0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE
REFERENCE: USGS, WENTWORTH, ET AL, 1999

403335001.dwg 10/01/2018 AEK

FIGURE 4

REGIONAL GEOLOGY

SJSU PARKING STRUCTURE AND TRACK AND FIELD FACILITY
1312 SOUTH TENTH STREET
SAN JOSE, CALIFORNIA
403335001 I 03/19

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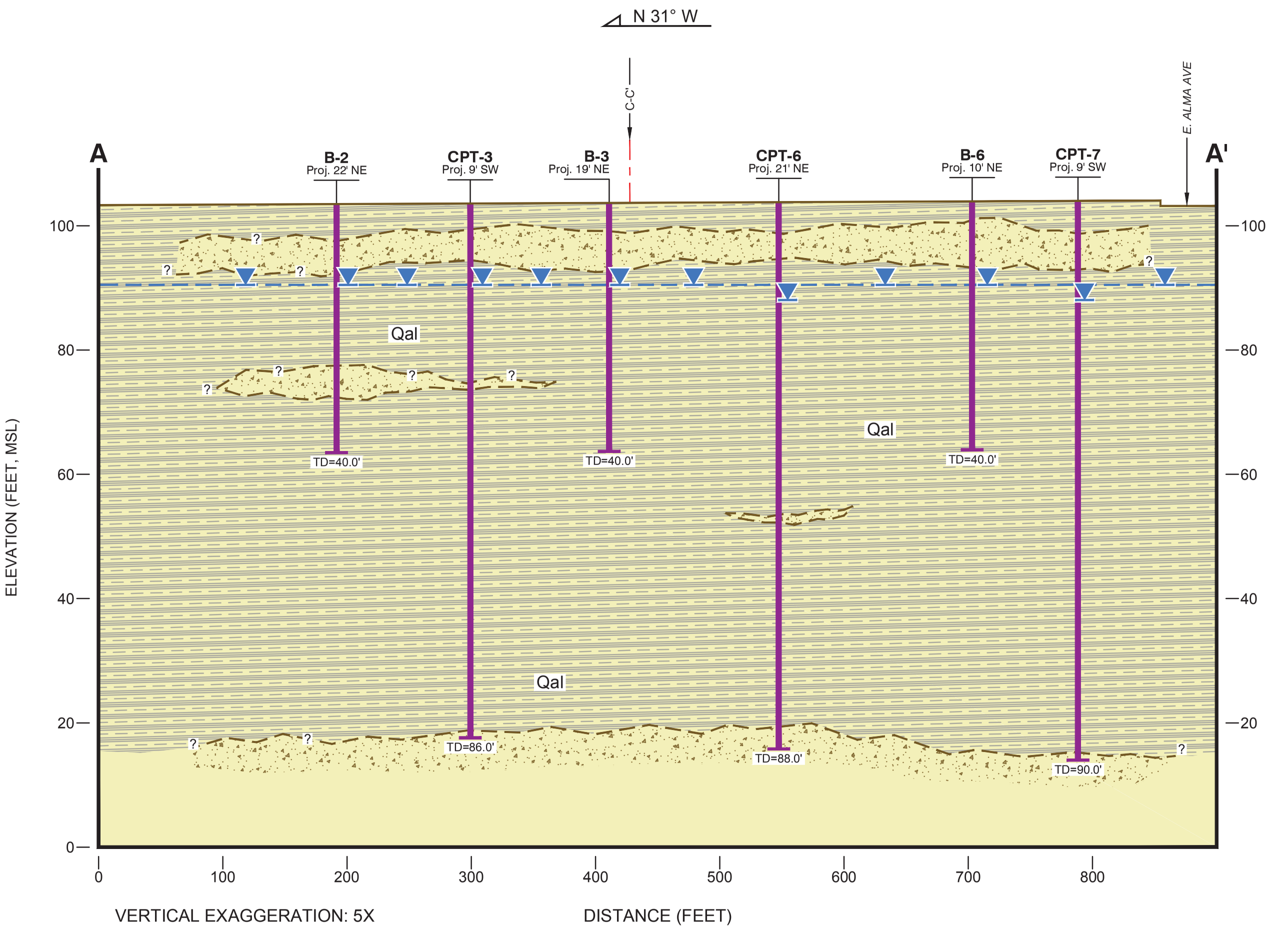

LEGEND

Qal	ALLUVIUM (HOLOCENE)	▨	MOSTLY SAND	— ?—	GEOLOGIC CONTACT: APPROXIMATE, QUERIED WHERE UNCERTAIN	**B-2** TD=40.0'	BORING TD = TOTAL DEPTH IN FEET	**CPT-3** TD=86.3'	CONE PENETRATION TEST TD = TOTAL DEPTH IN FEET
▼	GROUNDWATER LEVEL (AT TIME OF EXPLORATION)	▤	MOSTLY SILT AND CLAY	MSL	MEAN SEA LEVEL				

NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE

403335001.dwg 10/01/2018 AEK

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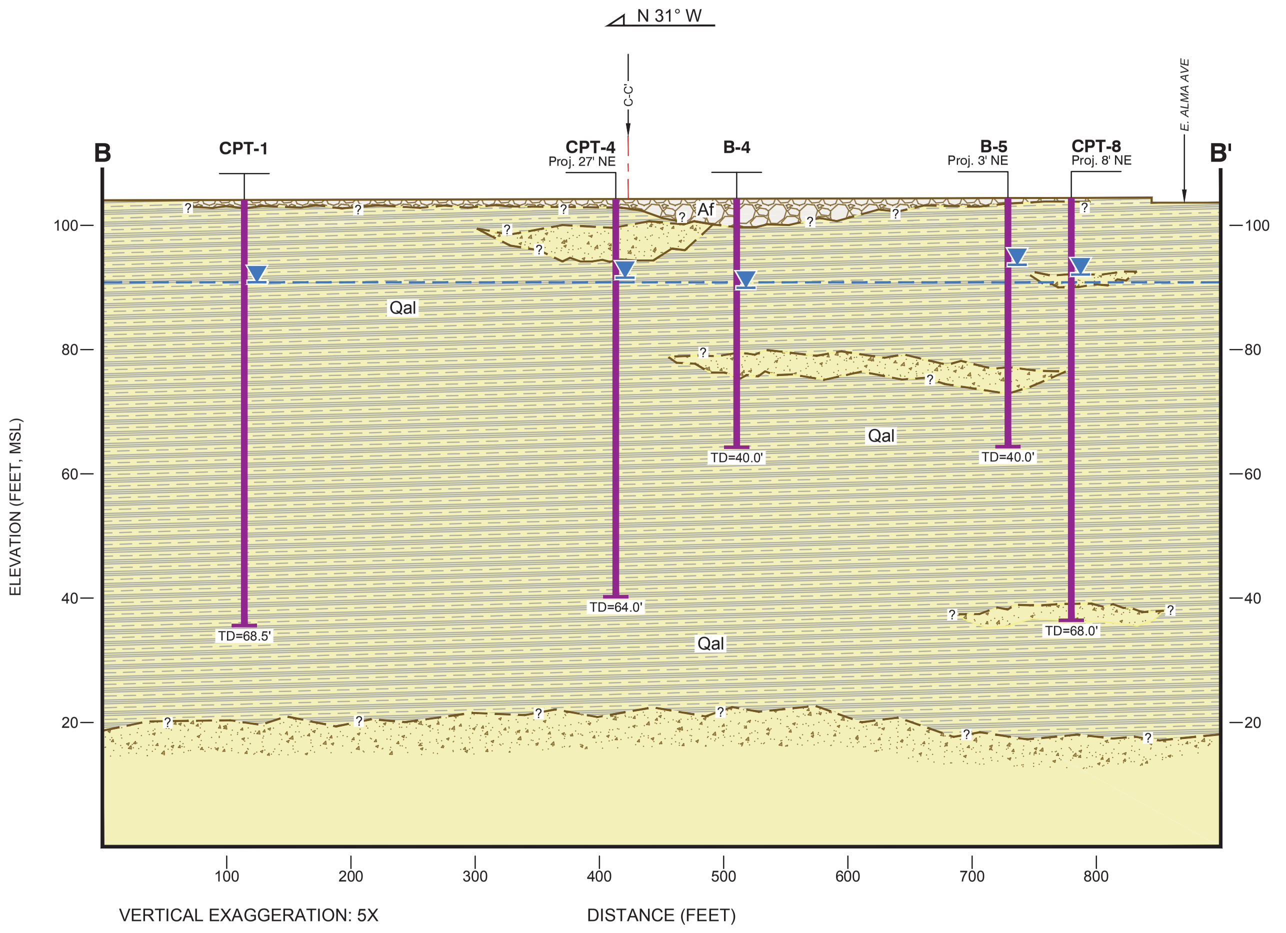
FIGURE 5

GEOLOGIC CROSS SECTION A-A'

SJSU PARKING STRUCTURE AND TRACK AND FIELD FACILITY
1312 SOUTH TENTH STREET
SAN JOSE, CALIFORNIA
403335001 I 03/19



LEGEND

Af	ARTIFICIAL FILL (MODERN)	▨	MOSTLY SAND
Qal	ALLUVIUM (HOLOCENE)	▤	MOSTLY SILT AND CLAY

— ?— GEOLOGIC CONTACT: APPROXIMATE, QUERIED WHERE UNCERTAIN

MSL MEAN SEA LEVEL

▼ GROUNDWATER LEVEL (AT TIME OF EXPLORATION)

B-4 BORING
TD=40.0' TD = TOTAL DEPTH IN FEET

CPT-1 CONE PENETRATION TEST
TD=65.83' TD = TOTAL DEPTH IN FEET

NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE

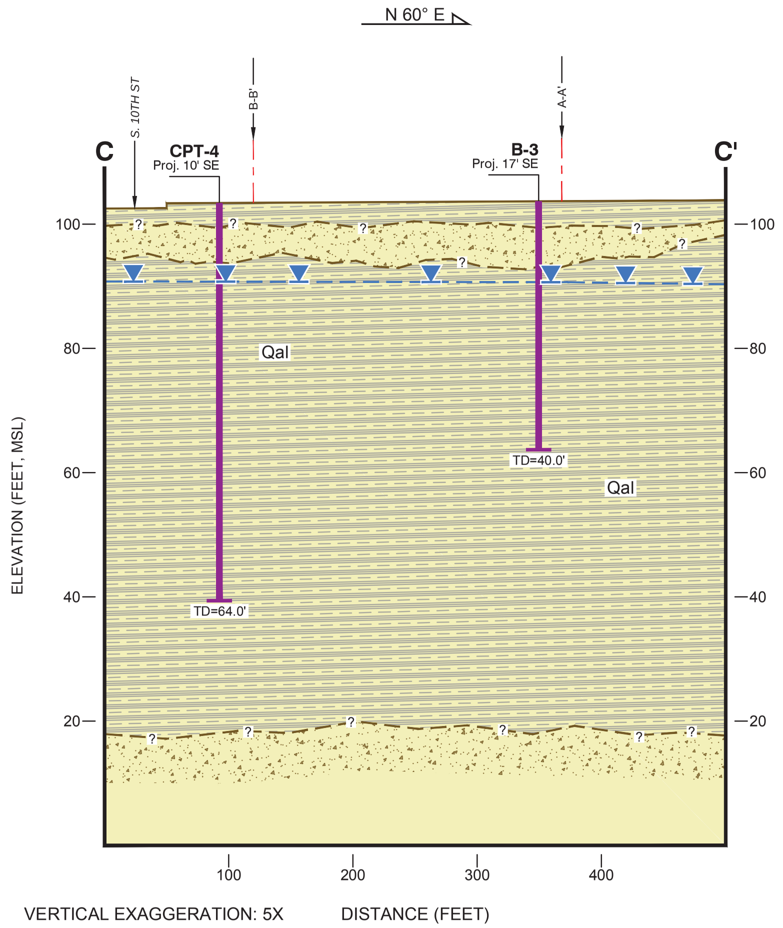
403335001.dwg 10/01/2018 AEK

FIGURE 6

GEOLOGIC CROSS SECTION B-B'

SJSU PARKING STRUCTURE AND TRACK AND FIELD FACILITY
1312 SOUTH TENTH STREET
SAN JOSE, CALIFORNIA
403335001 I 03/19

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants



LEGEND

Qal	ALLUVIUM (HOLOCENE)	▨	MOSTLY SAND
▼	GROUNDWATER LEVEL (AT TIME OF EXPLORATION)	▤	MOSTLY SILT AND CLAY
— ?—	GEOLOGIC CONTACT: APPROXIMATE, QUERIED WHERE UNCERTAIN	MSL	MEAN SEA LEVEL
B-3 TD=40.0'	BORING TD = TOTAL DEPTH IN FEET	**CPT-4** TD=64.0'	CONE PENETRATION TEST TD = TOTAL DEPTH IN FEET

NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE

403335001.dwg 10/01/2018 AEK

Ninyo & Moore
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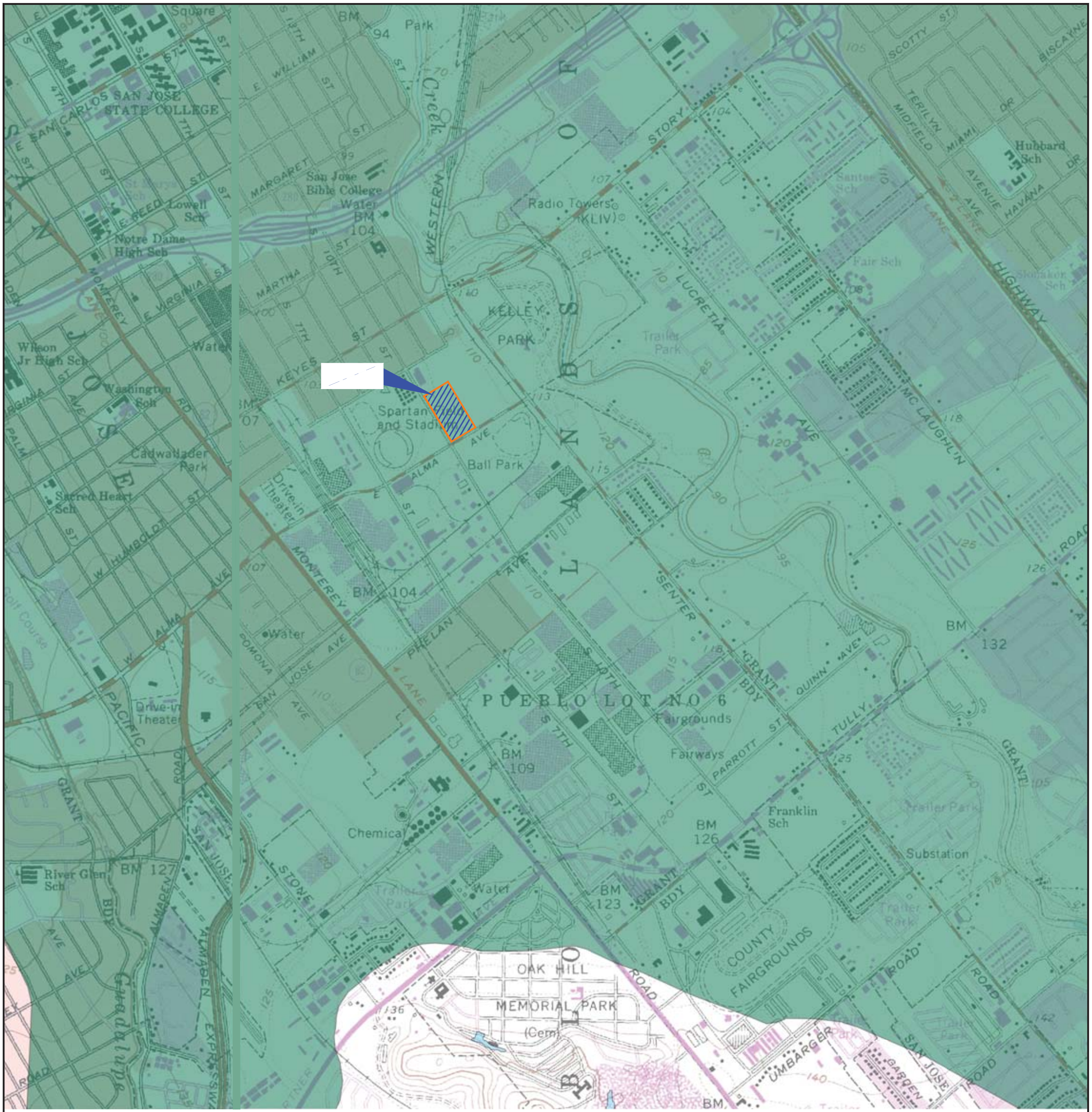
FIGURE 7

GEOLOGIC CROSS SECTION C-C'

SJSU PARKING STRUCTURE AND TRACK AND FIELD FACILITY
1312 SOUTH TENTH STREET
SAN JOSE, CALIFORNIA
403335001 I 03/19



LEGEND

🟩 LIQUEFACTION ZONES:
Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

N

SCALE (FEET)
0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE | REFERENCE: CDMG, 2001

403335001.dwg 10/01/2018 AEK

FIGURE 8

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

SEISMIC HAZARD ZONES

SJSU PARKING STRUCTURE AND TRACK AND FIELD FACILITY
1312 SOUTH TENTH STREET
SAN JOSE, CALIFORNIA
403335001 | 03/19

APPENDIX A

Cone Penetration Testing

APPENDIX A

CONE PENETRATION TESTING

Field Procedure for Cone Penetration Testing

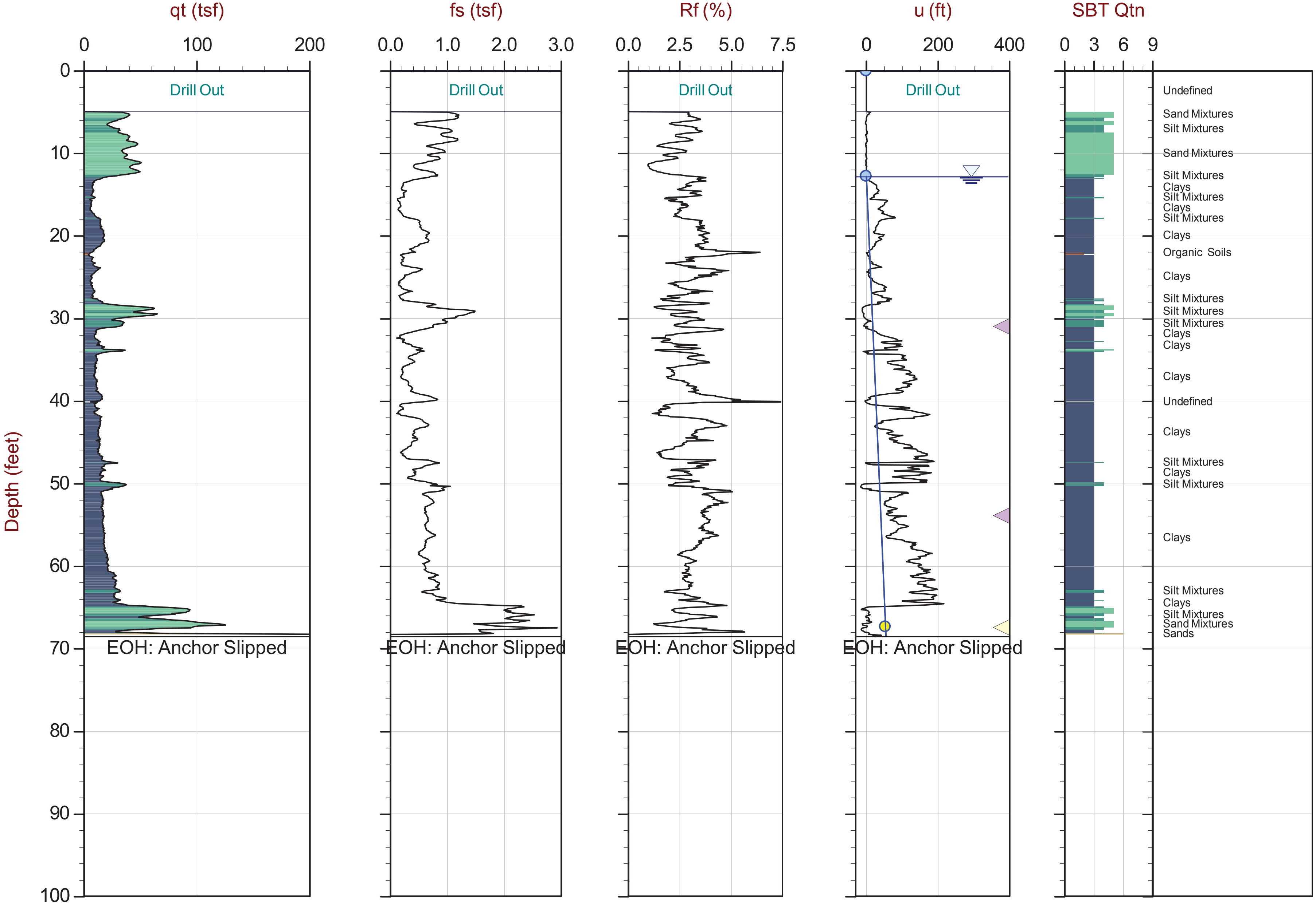
A penetrometer with a conical tip having an apex angle of 60 degrees and a cone base area of 15 square centimeters was hydraulically pushed through the soil using the reaction mass of a 20-ton rig at a constant rate of about 20 millimeters per second in accordance with ASTM D 5778. The penetrometer was instrumented to measure, by electronic methods, the water pressure acting on a transducer near the cone tip, the force on the conical point required to penetrate the soil, and the force on a friction sleeve behind the cone tip as the penetrometer was advanced. Penetration and pore water pressure data (P_w) was collected and recorded electronically at intervals of approximately 1 inch. Cone resistance (Q_t) was calculated by dividing the measured force of penetration by the cone base area. Friction sleeve resistance (F_s) was calculated by dividing the measured force on the friction sleeve by the surface area of the sleeve. The friction ratio (R_f) was calculated as the ratio of the tip resistance to the sleeve friction (Q_t/F_s). A graph of the computed values of cone resistance (Qt), friction ratio (Fs/Qt), and pore water pressure (U) are presented on the logs in the following pages. The tip resistance and friction ratio were used to classify the soil type encountered using the method by Robertson (2009). Equivalent SPT blowcounts at a 60 percent energy ratio with overburden correction ($N_{1(60)}$ values) were calculated from the tip resistance and friction ratio. A graph of the equivalent $N_{1(60)}$ values and the encountered soil types are also presented on the logs in the following pages.

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-23 08:08
Site: SJSU Parking Garage Track Field

Sounding: CPT-01
Cone: 383:T1500F15U500



Max Depth: 20.900 m / 68.57 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N: 4131187m E: 600418m
Sheet No: 1 of 1

● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

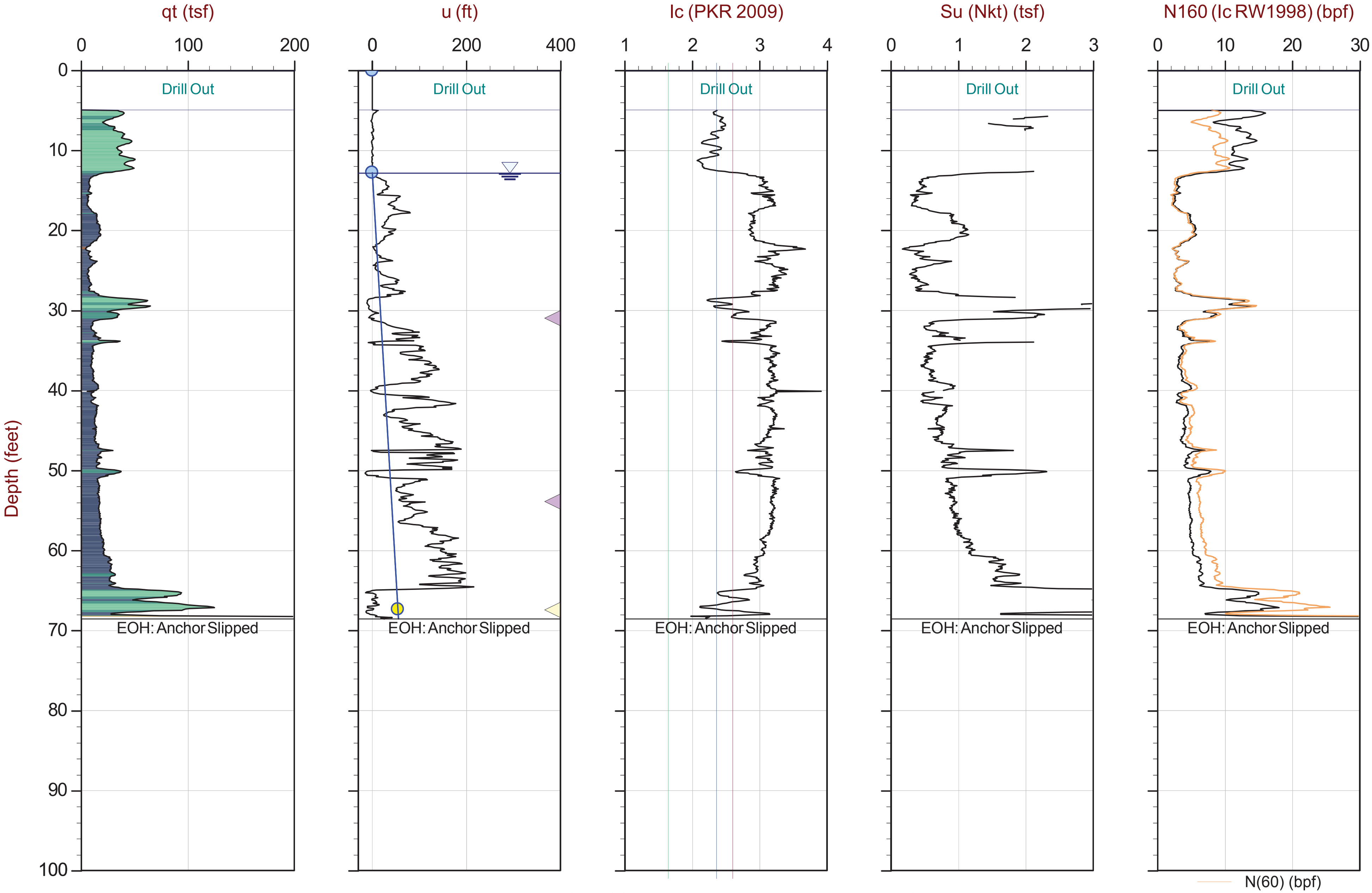
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-23 08:08
Site: SJSU Parking Garage Track Field

Sounding: CPT-01
Cone: 383:T1500F15U500



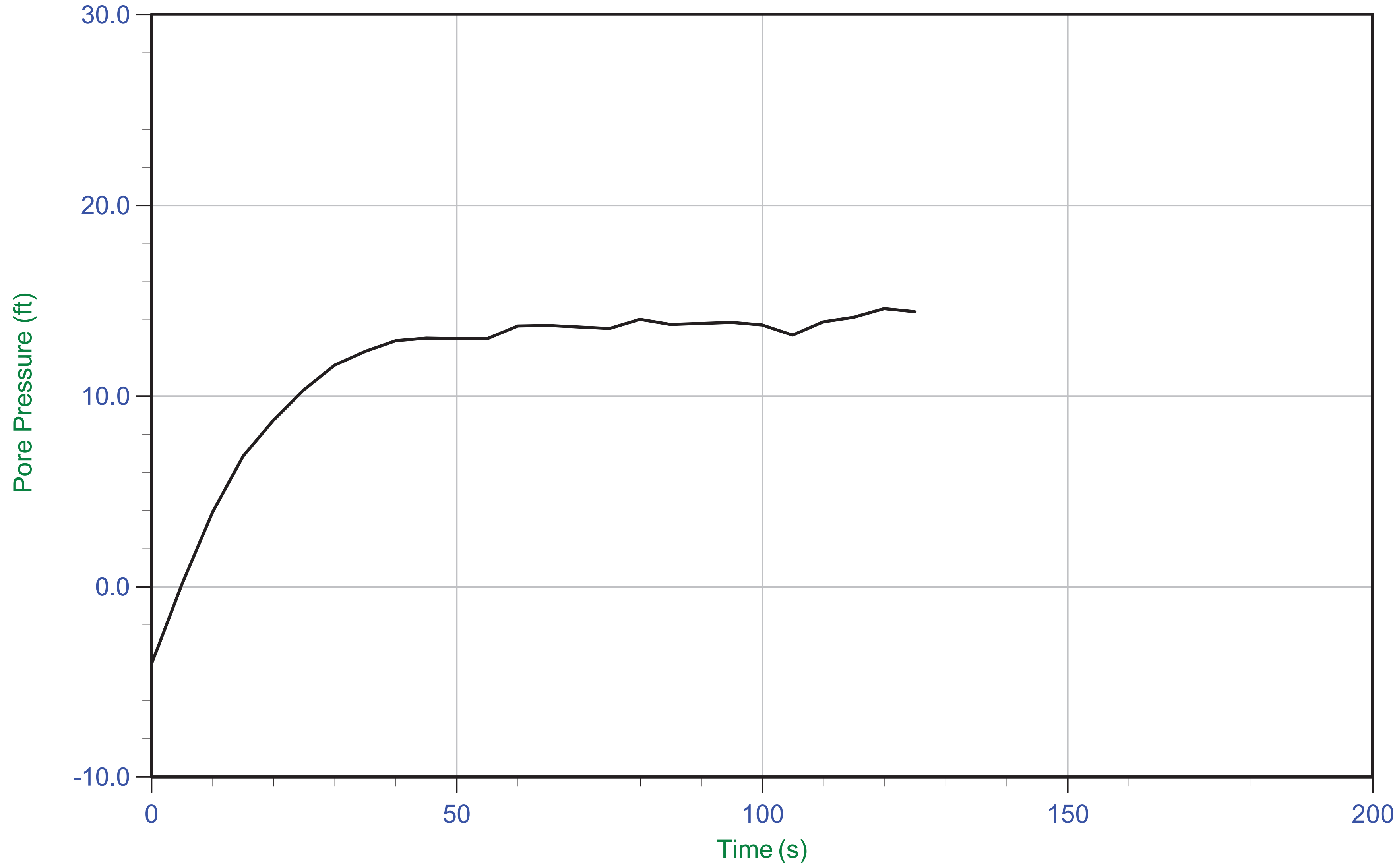
Max Depth: 20.900 m / 68.57 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP01.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N: 4131187m E: 600418m
Page No: 1 of 1

● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◀ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Trace Summary:

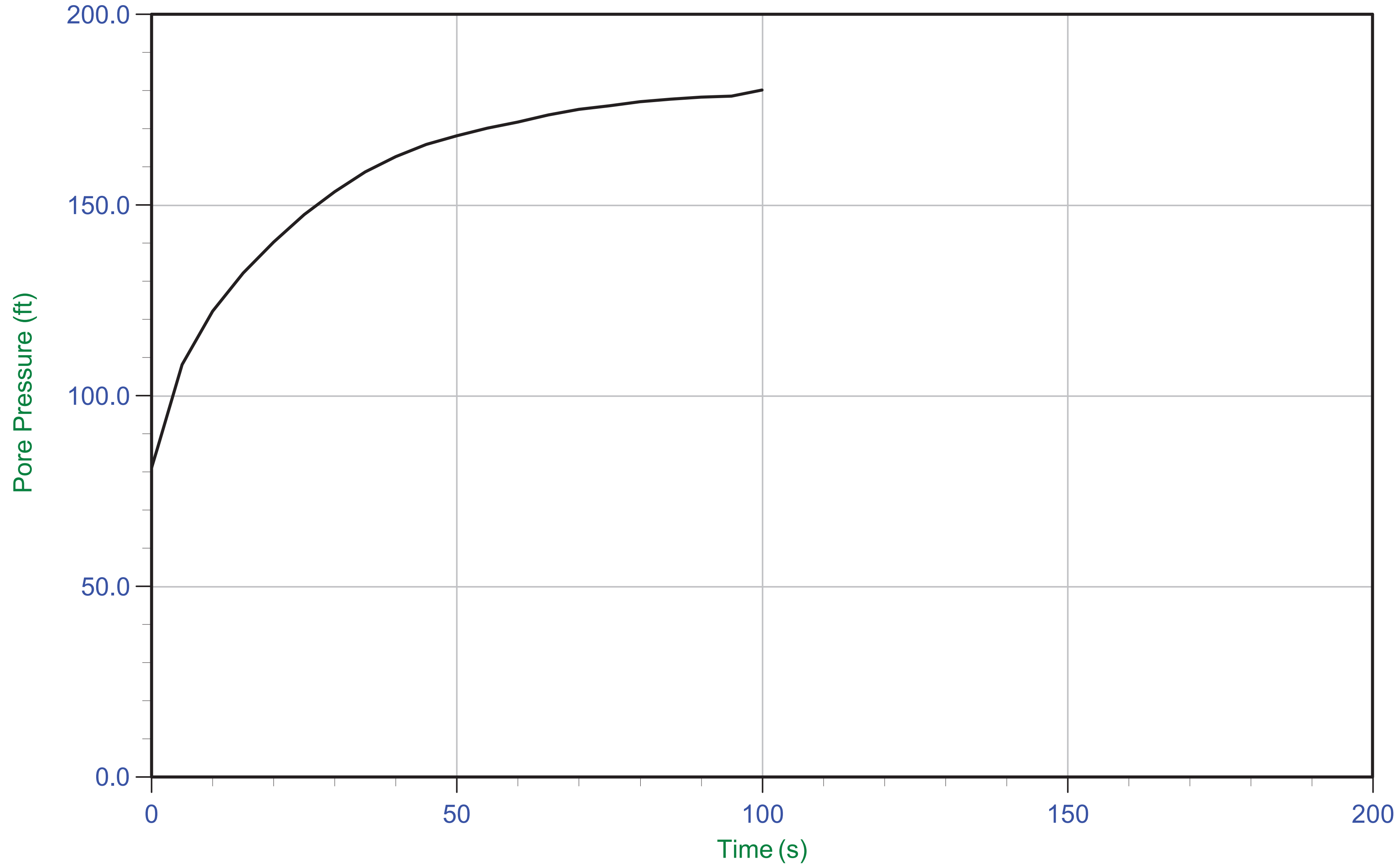
Filename: 18-56133_CP01.PPF
Depth: 9.425 m / 30.922 ft
Duration: 125.0 s

U Min: -4.0 ft
U Max: 14.6 ft

Ninyo & Moore

Job No: 18-56133
Date: 08/23/2018 08:08
Site: SJSU Parking Garage Track Field

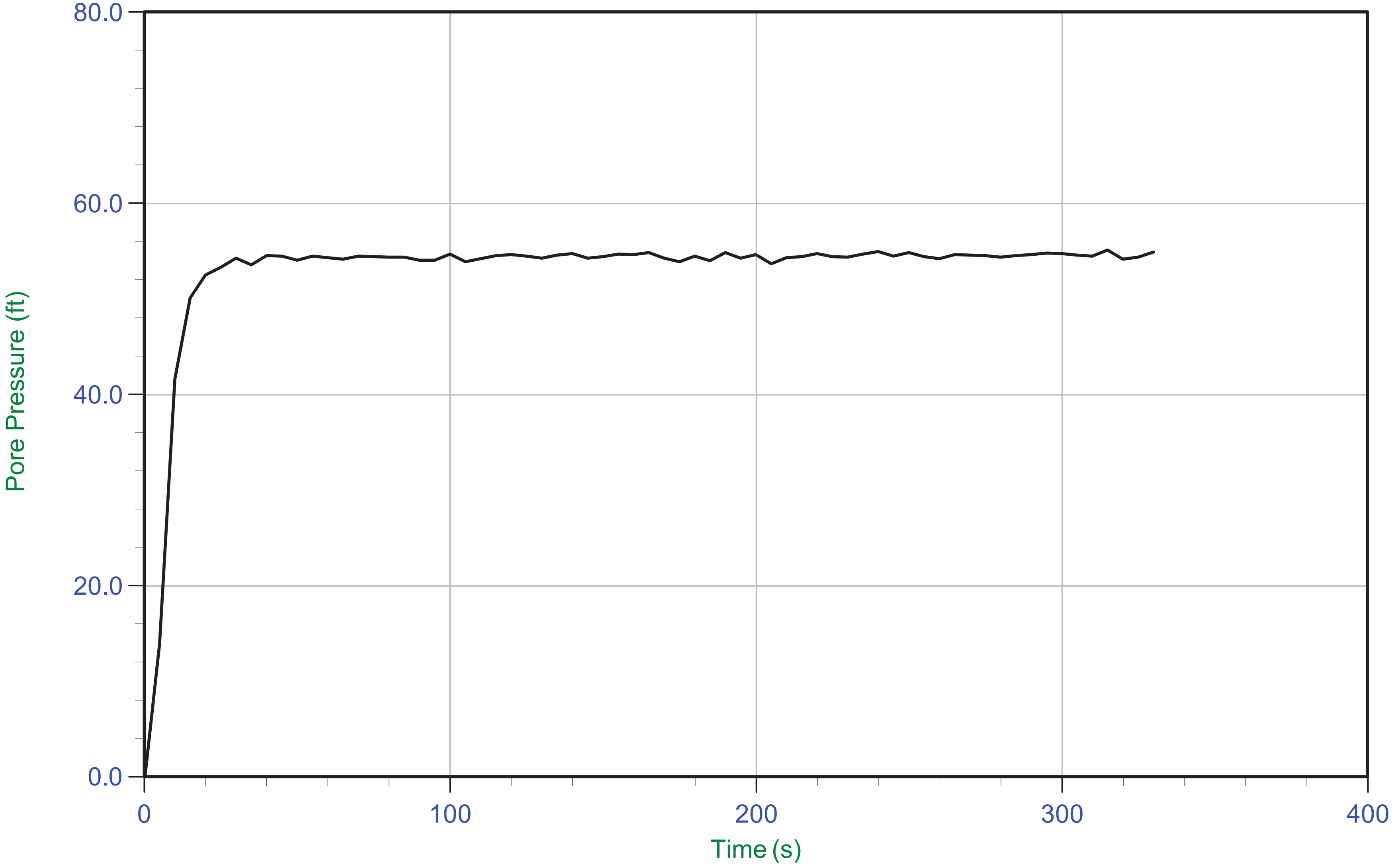
Sounding: CPT-01
Cone: 383:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-56133_CP01.PPF
Depth: 16.425 m / 53.887 ft
Duration: 100.0 s

U Min: 81.1 ft
U Max: 180.1 ft



Trace Summary:

Filename: 18-56133_CP01.PPF
Depth: 20.550 m / 67.420 ft
Duration: 330.0 s

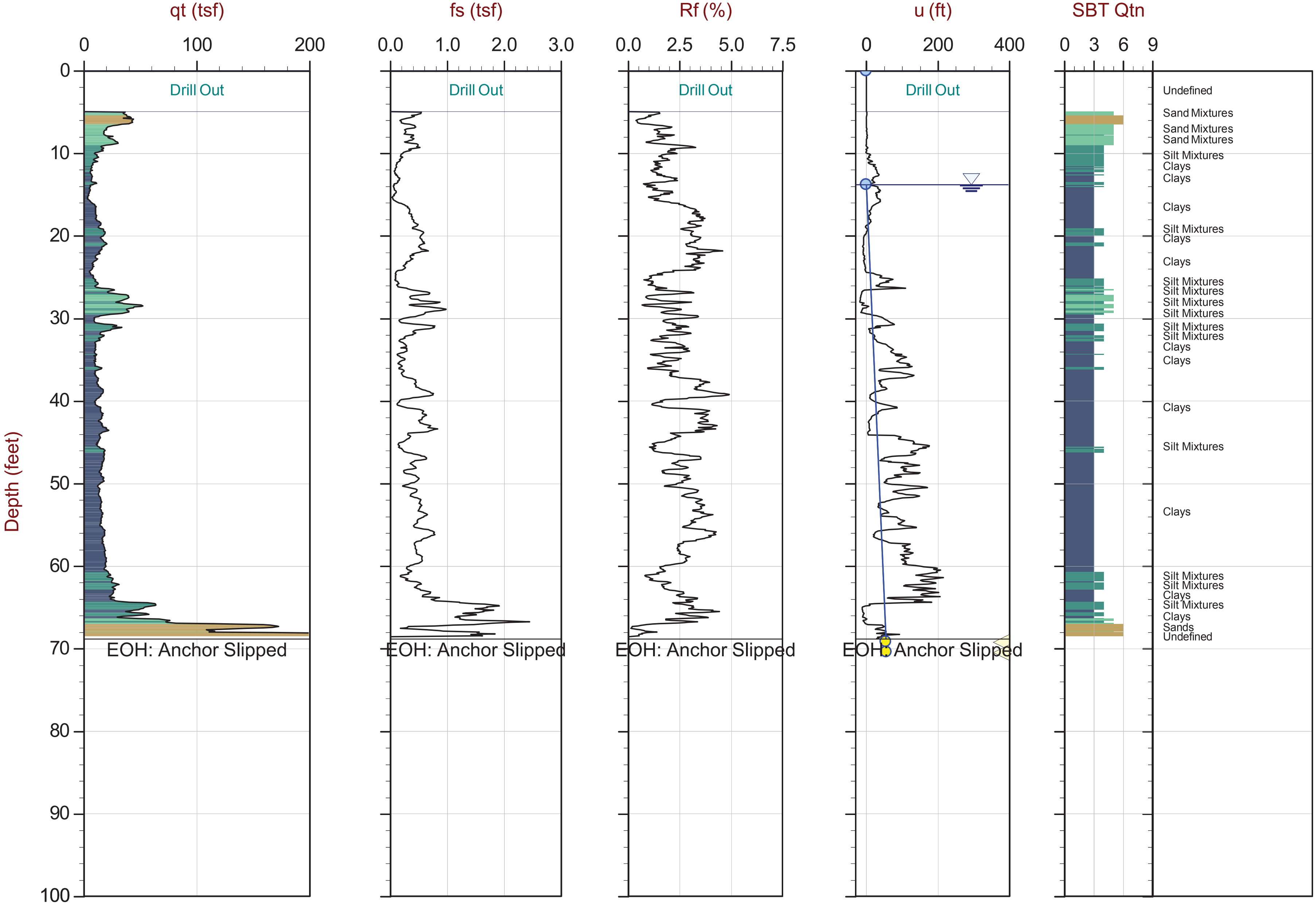
U Min: -0.7 ft
U Max: 55.1 ft

WT: 3.900 m / 12.795 ft
Ueq: 54.6 ft

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-22 08:19
Site: SJSU Parking Garage Track Field

Sounding: CPT-02
Cone: 383:T1500F15U500



Max Depth: 20.975 m / 68.81 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N: 4131154m E: 600483m
Sheet No: 1 of 1

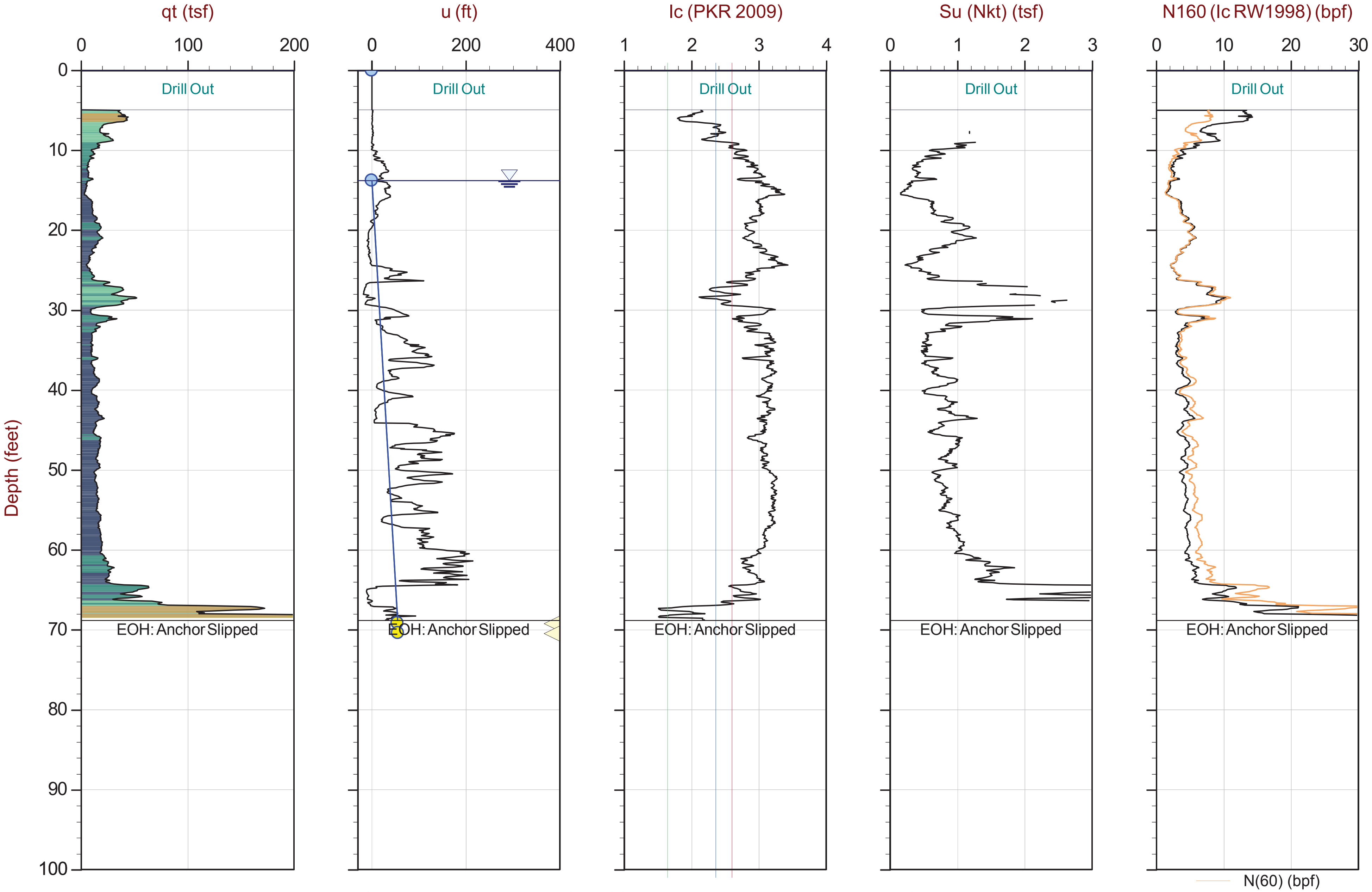
● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-22 08:19
Site: SJSU Parking Garage Track Field

Sounding: CPT-02
Cone: 383:T1500F15U500



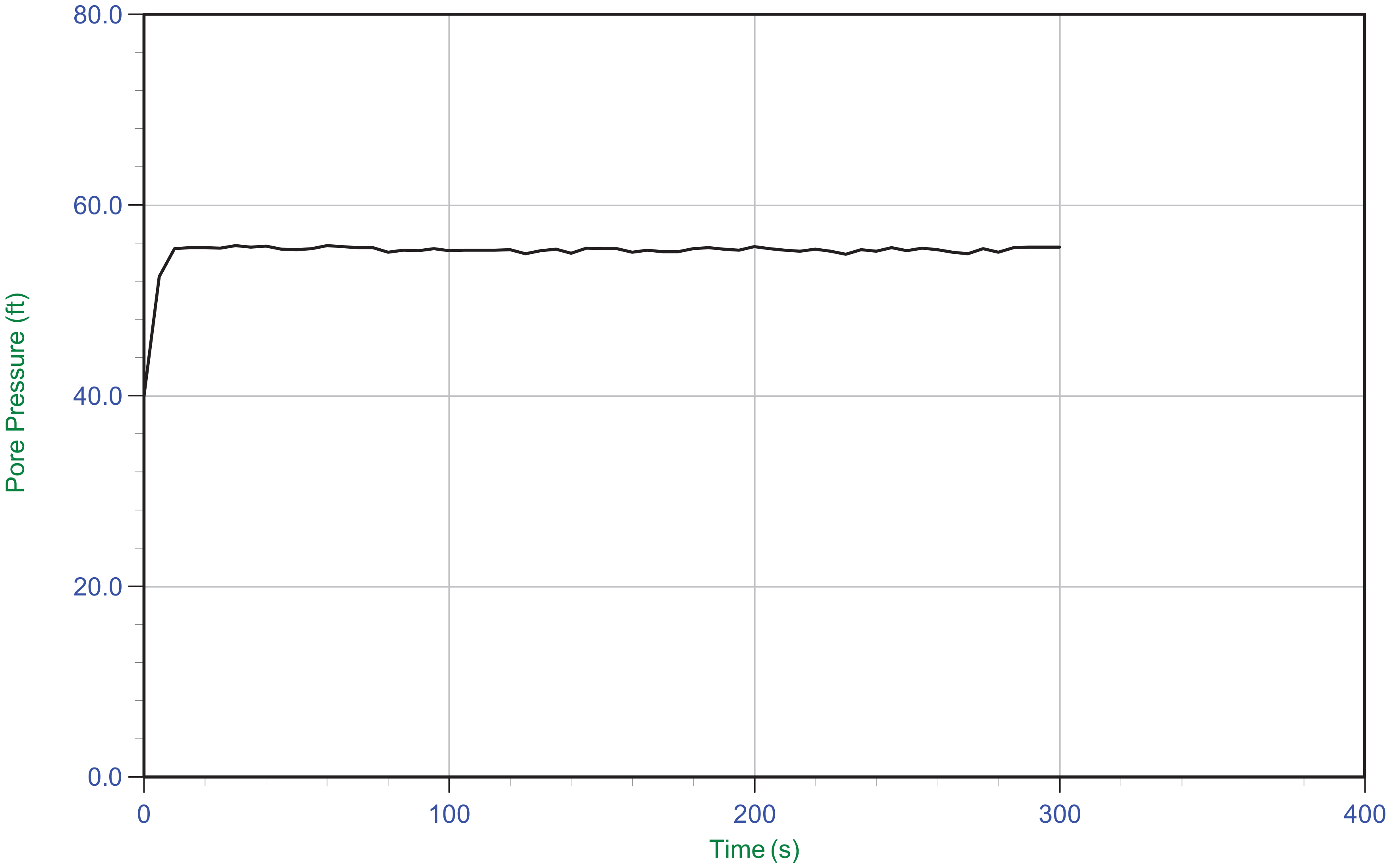
Max Depth: 20.975 m / 68.81 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP02.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N:4131154m E:600483m
Page No: 1 of 1

● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◀ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



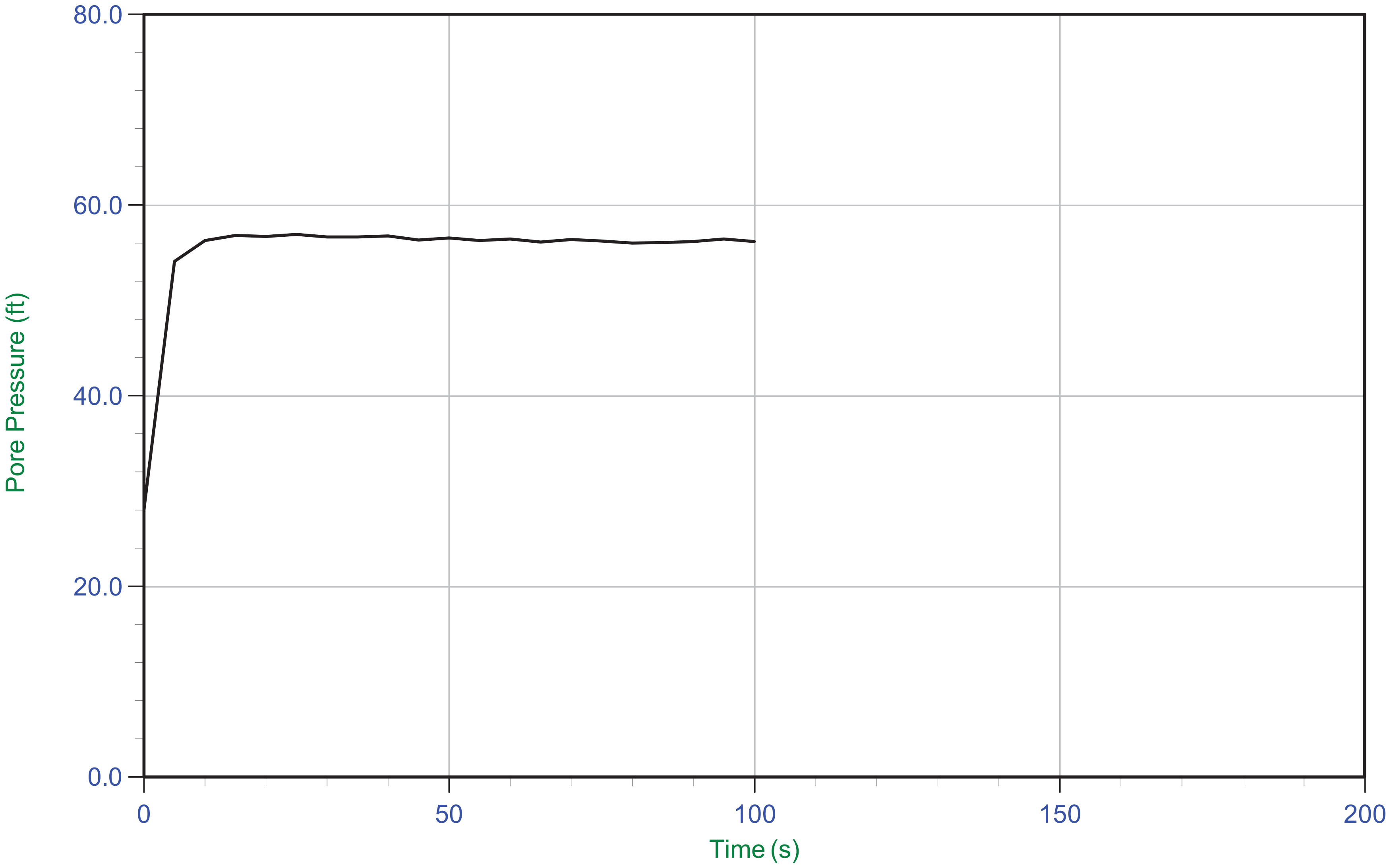
Trace Summary:
Filename: 18-56133_CP02.PPF
Depth: 21.100 m / 69.225 ft
Duration: 300.0 s
U Min: 40.0 ft
U Max: 55.8 ft
WT: 4.204 m / 13.791 ft
Ueq: 55.4 ft

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 08/22/2018 08:19
Site: SJSU Parking Garage Track Field

Sounding: CPT-02
Cone: 383:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-56133_CP02.PPF
Depth: 21.475 m / 70.455 ft
Duration: 100.0 s

U Min: 28.1 ft
U Max: 56.9 ft

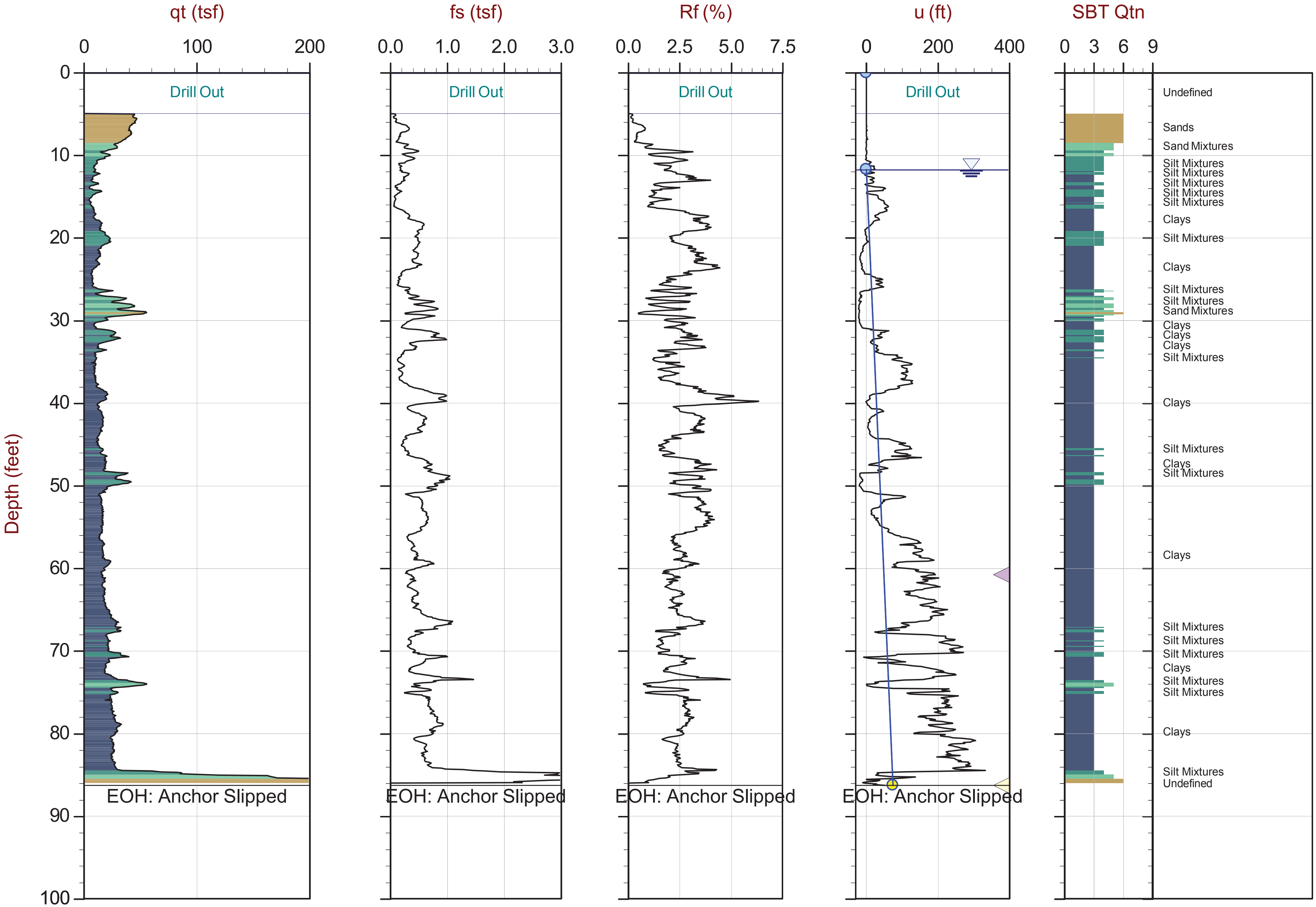
WT: 4.332 m / 14.213 ft
Ueq: 56.2 ft

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-23 12:42
Site: SJSU Parking Garage Track Field

Sounding: CPT-03
Cone: 383:T1500F15U500



Max Depth: 26.300 m / 86.29 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N:4131166m E:600524m
Sheet No: 1 of 1

● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

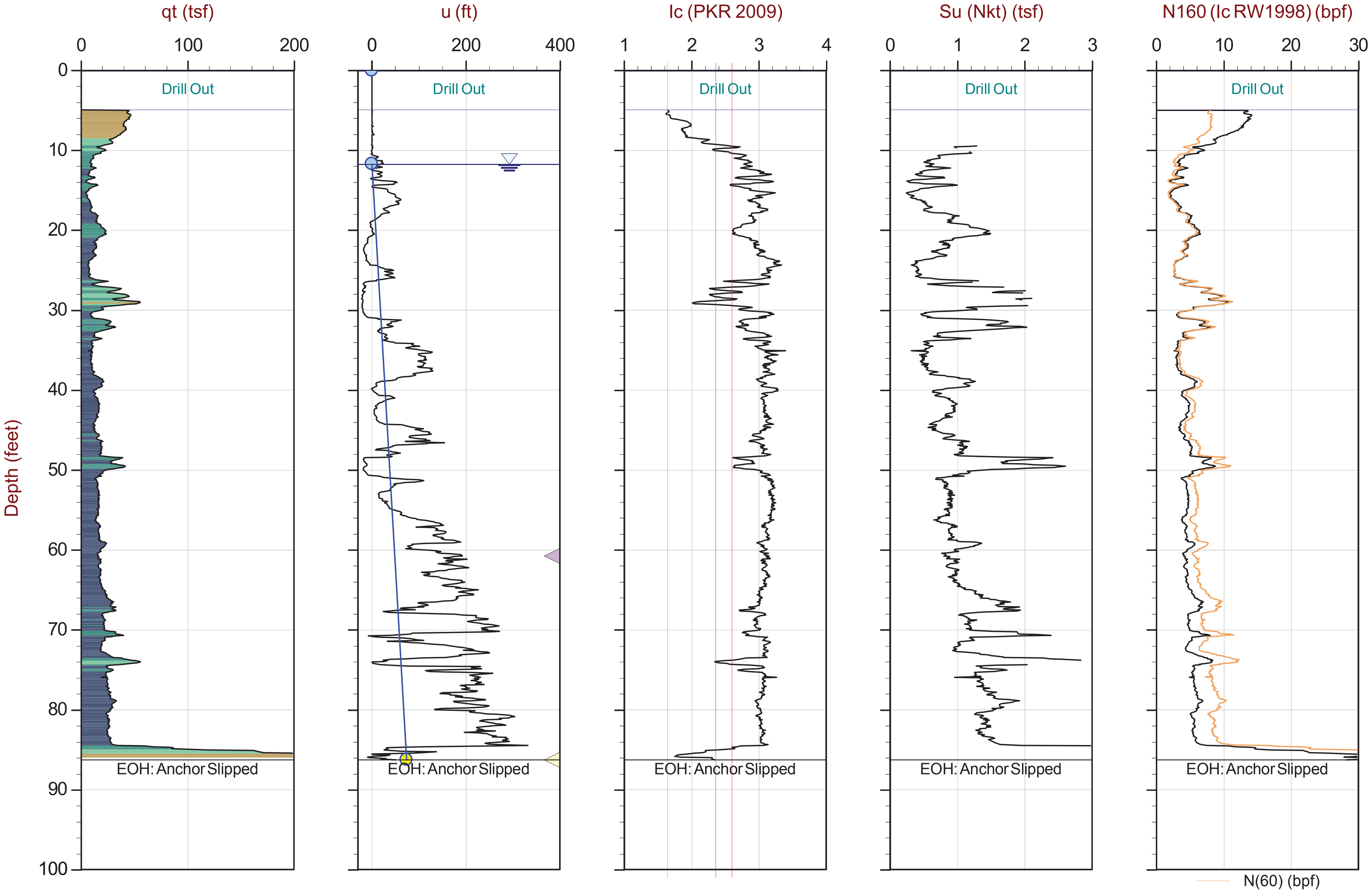
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-23 12:42
Site: SJSU Parking Garage Track Field

Sounding: CPT-03
Cone: 383:T1500F15U500



Max Depth: 26.300 m / 86.29 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP03.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N:4131166m E:600524m
Page No: 1 of 1

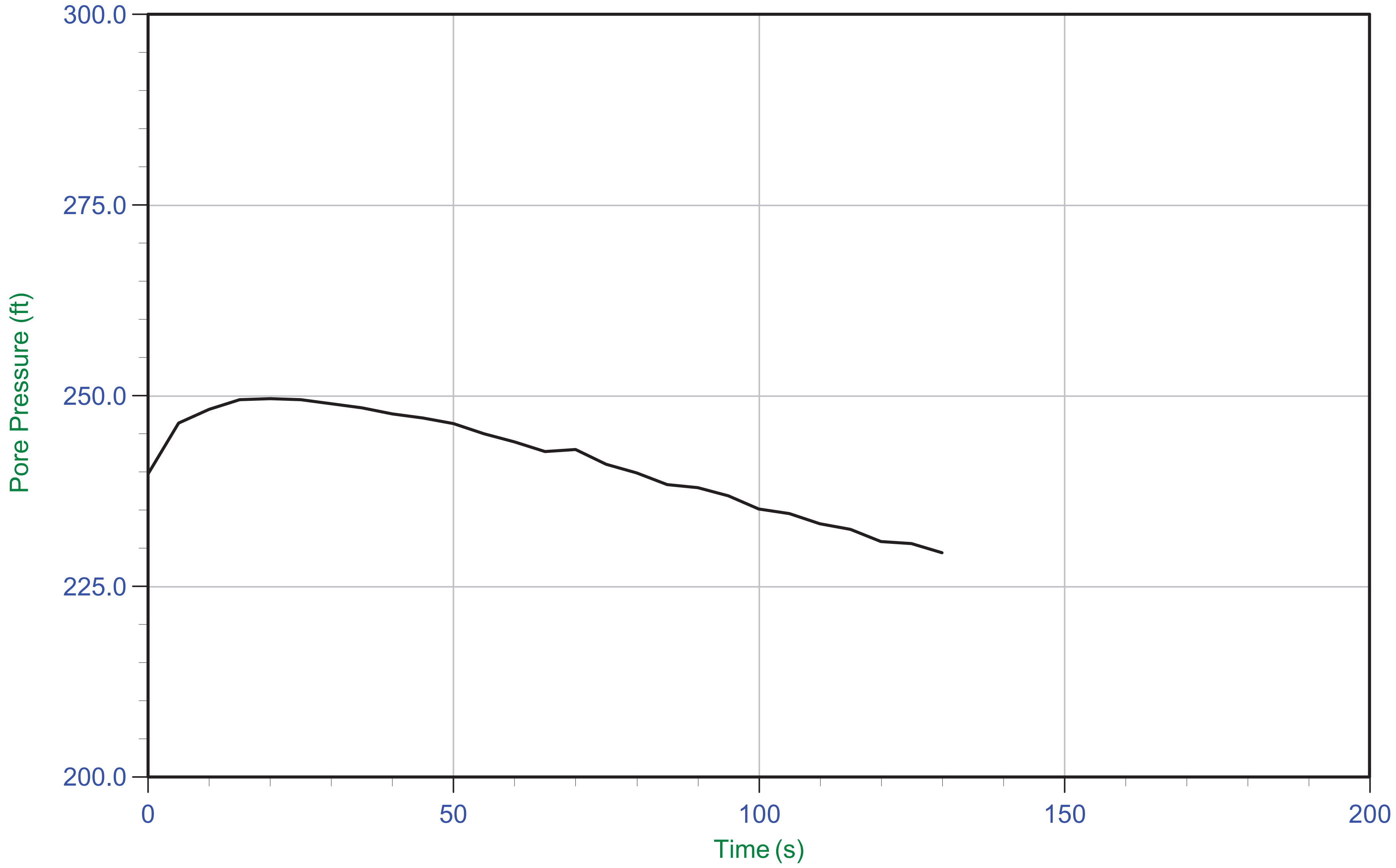
● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Ninyo & Moore

Job No: 18-56133
Date: 08/23/2018 12:42
Site: SJSU Parking Garage Track Field

Sounding: CPT-03
Cone: 383:T1500F15U500 Area=15 cm²



Trace Summary:

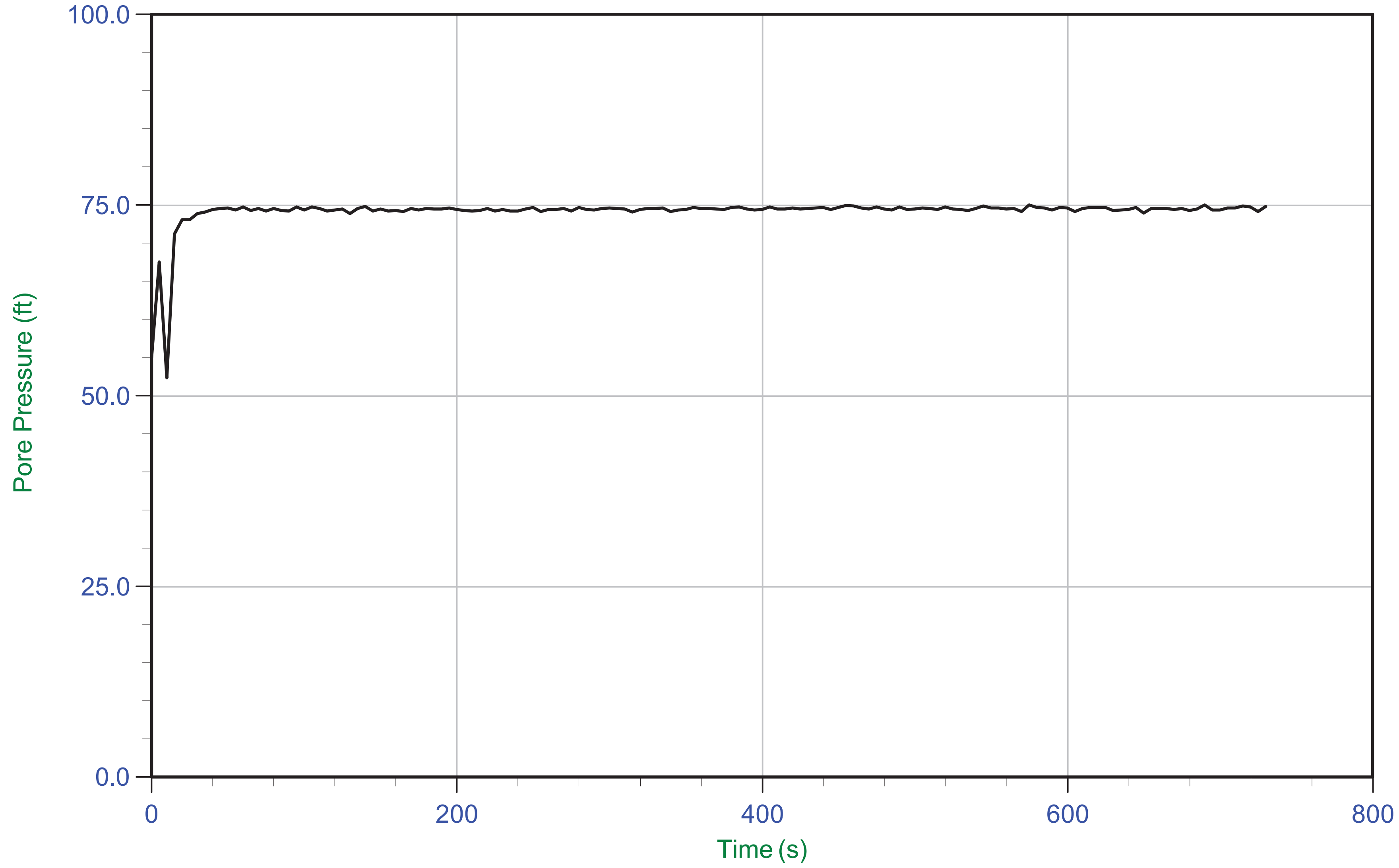
Filename: 18-56133_CP03.PPF
Depth: 18.525 m / 60.777 ft
Duration: 130.0 s

U Min: 229.4 ft
U Max: 249.6 ft

Ninyo & Moore

Job No: 18-56133
Date: 08/23/2018 12:42
Site: SJSU Parking Garage Track Field

Sounding: CPT-03
Cone: 383:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-56133_CP03.PPF
Depth: 26.300 m / 86.285 ft
Duration: 735.0 s

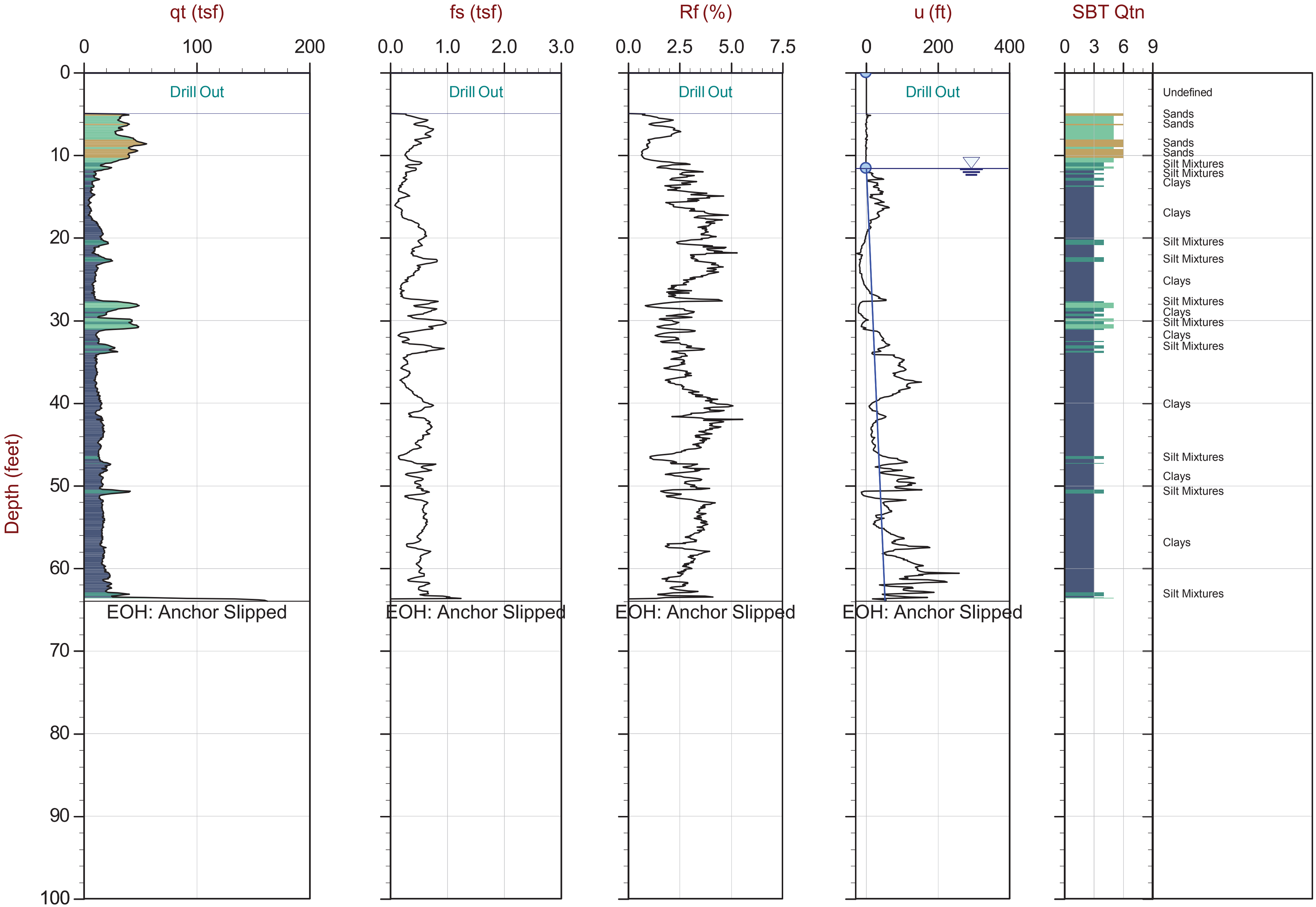
U Min: 0.4 ft
U Max: 75.0 ft

WT: 3.579 m / 11.740 ft
Ueq: 74.5 ft

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-23 15:15
Site: SJSU Parking Garage Track Field

Sounding: CPT-04
Cone: 383:T1500F15U500



Max Depth: 19.500 m / 63.98 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N:4131101m E:600463m
Sheet No: 1 of 1

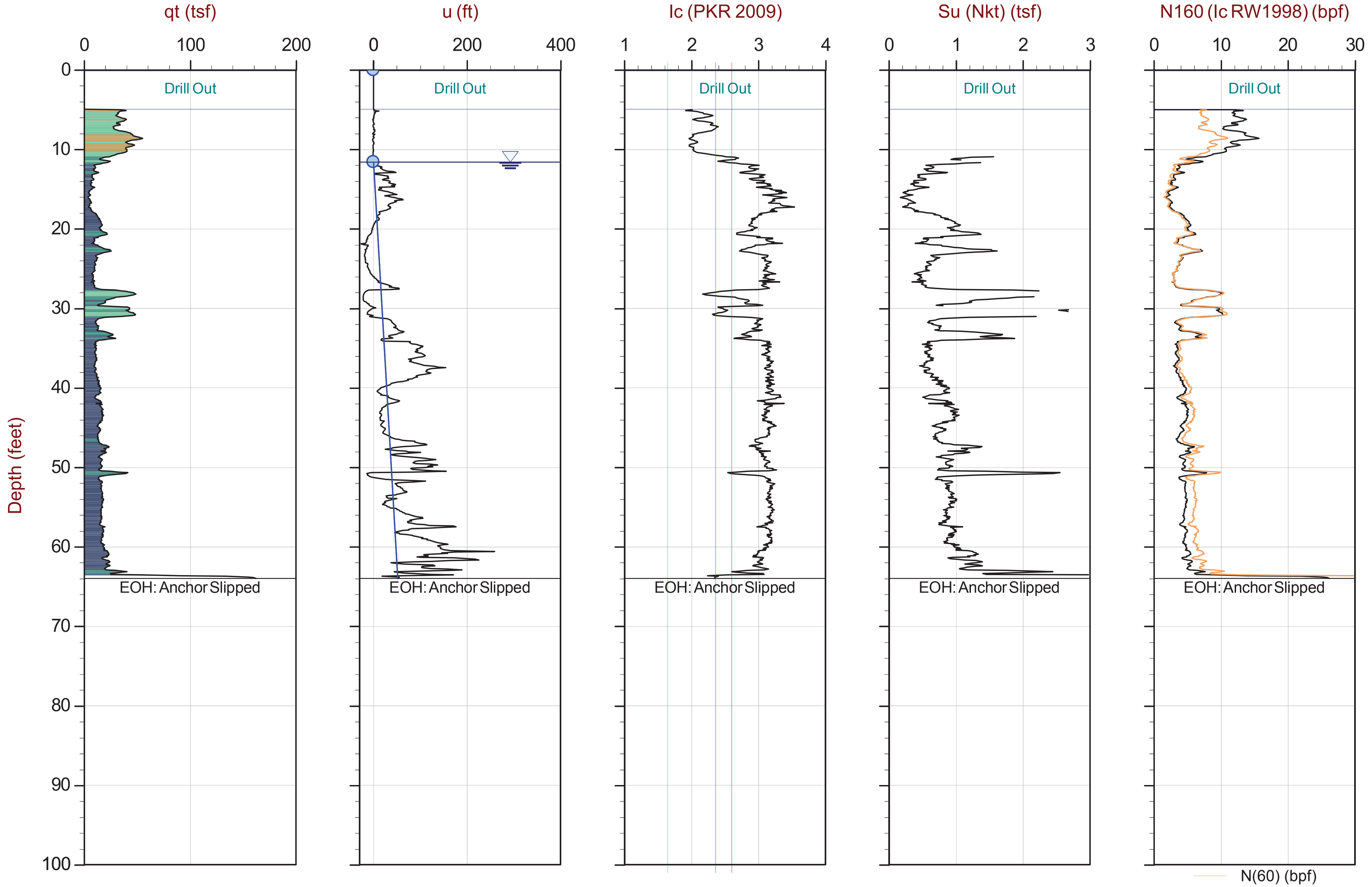
● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-23 15:15
Site: SJSU Parking Garage Track Field

Sounding: CPT-04
Cone: 383:T1500F15U500



Max Depth: 19.500 m / 63.98 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP04.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N:4131101m E:600463m
Page No: 1 of 1

● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

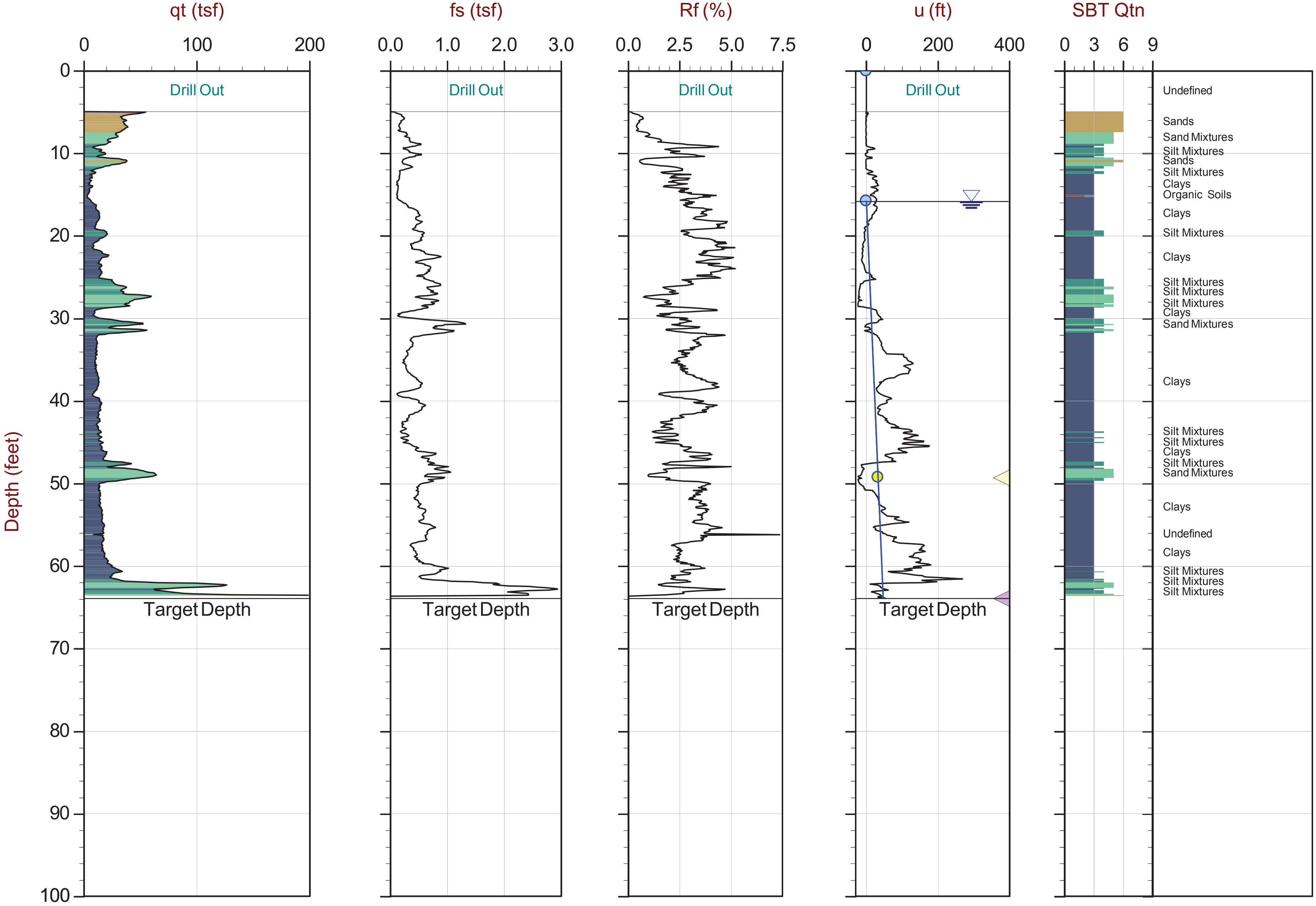
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-22 15:14
Site: SJSU Parking Garage Track Field

Sounding: CPT-05
Cone: 383:T1500F15U500



Max Depth: 19.475 m / 63.89 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP05.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N: 4131072m E: 600530m
Sheet No: 1 of 1

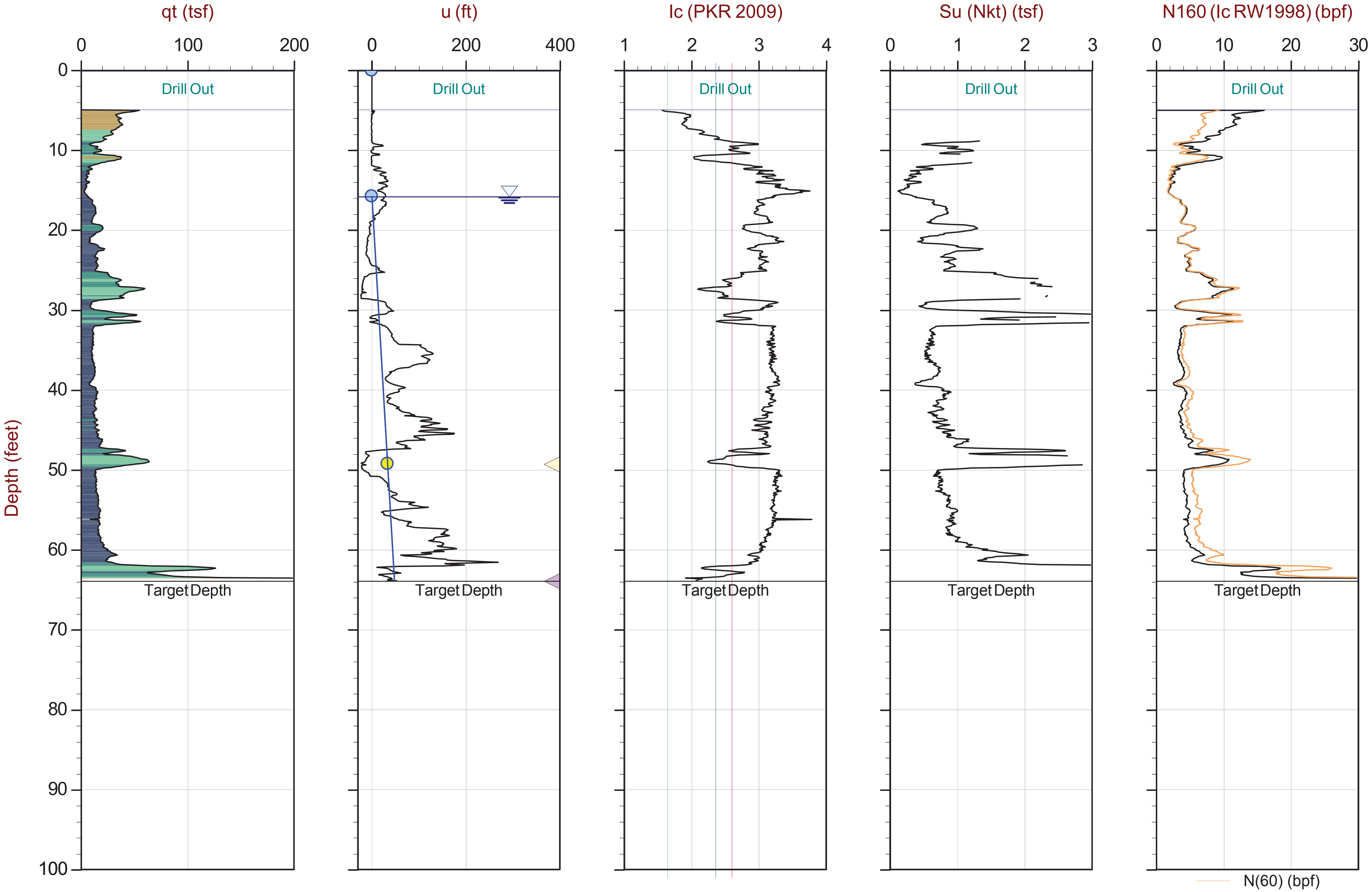
● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-22 15:14
Site: SJSU Parking Garage Track Field

Sounding: CPT-05
Cone: 383:T1500F15U500



Max Depth: 19.475 m / 63.89 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP05.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N:4131072m E:600530m
Page No: 1 of 1

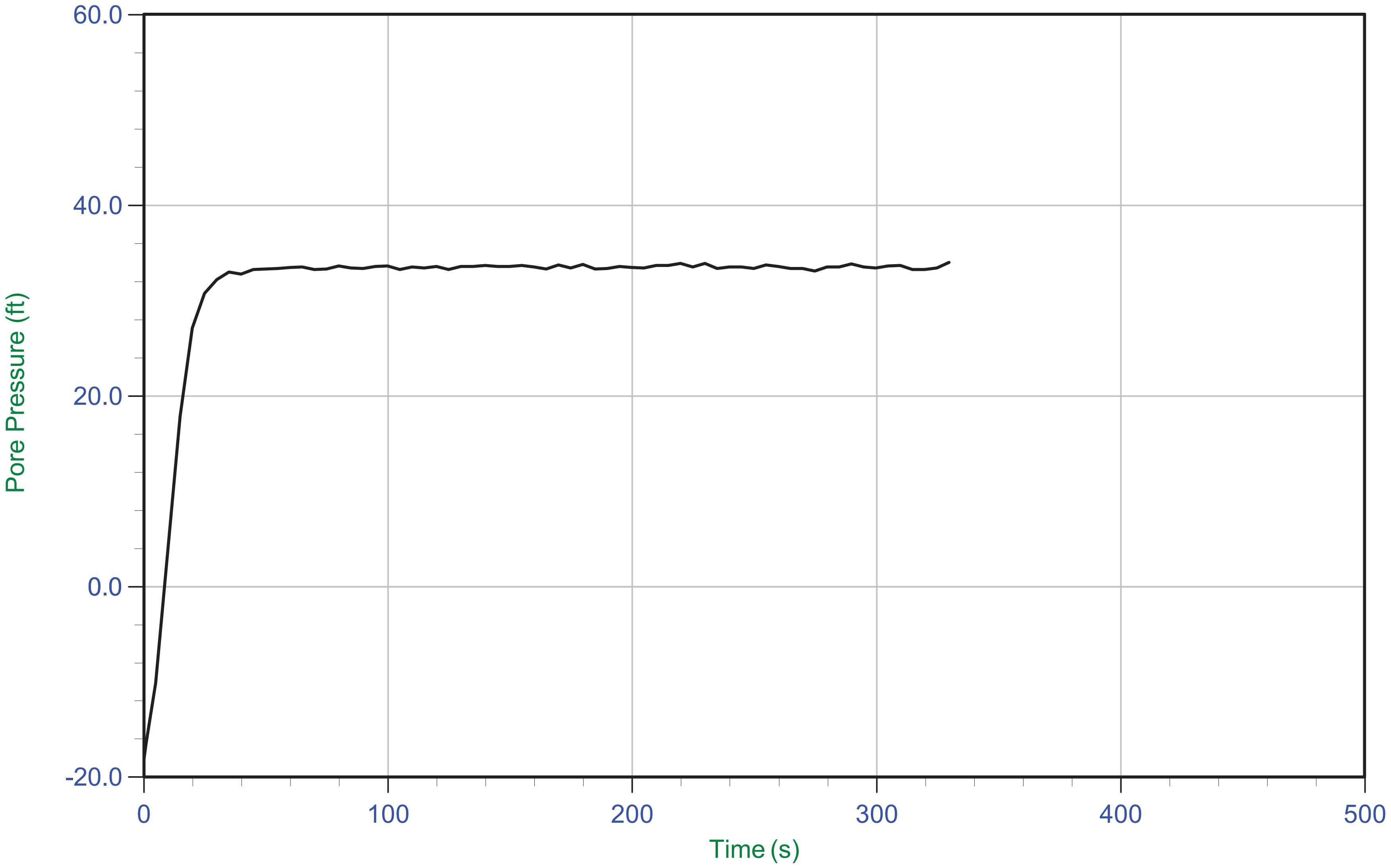
● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Ninyo & Moore

Job No: 18-56133
Date: 08/22/2018 15:14
Site: SJSU Parking Garage Track Field

Sounding: CPT-05
Cone: 383:T1500F15U500 Area=15 cm²



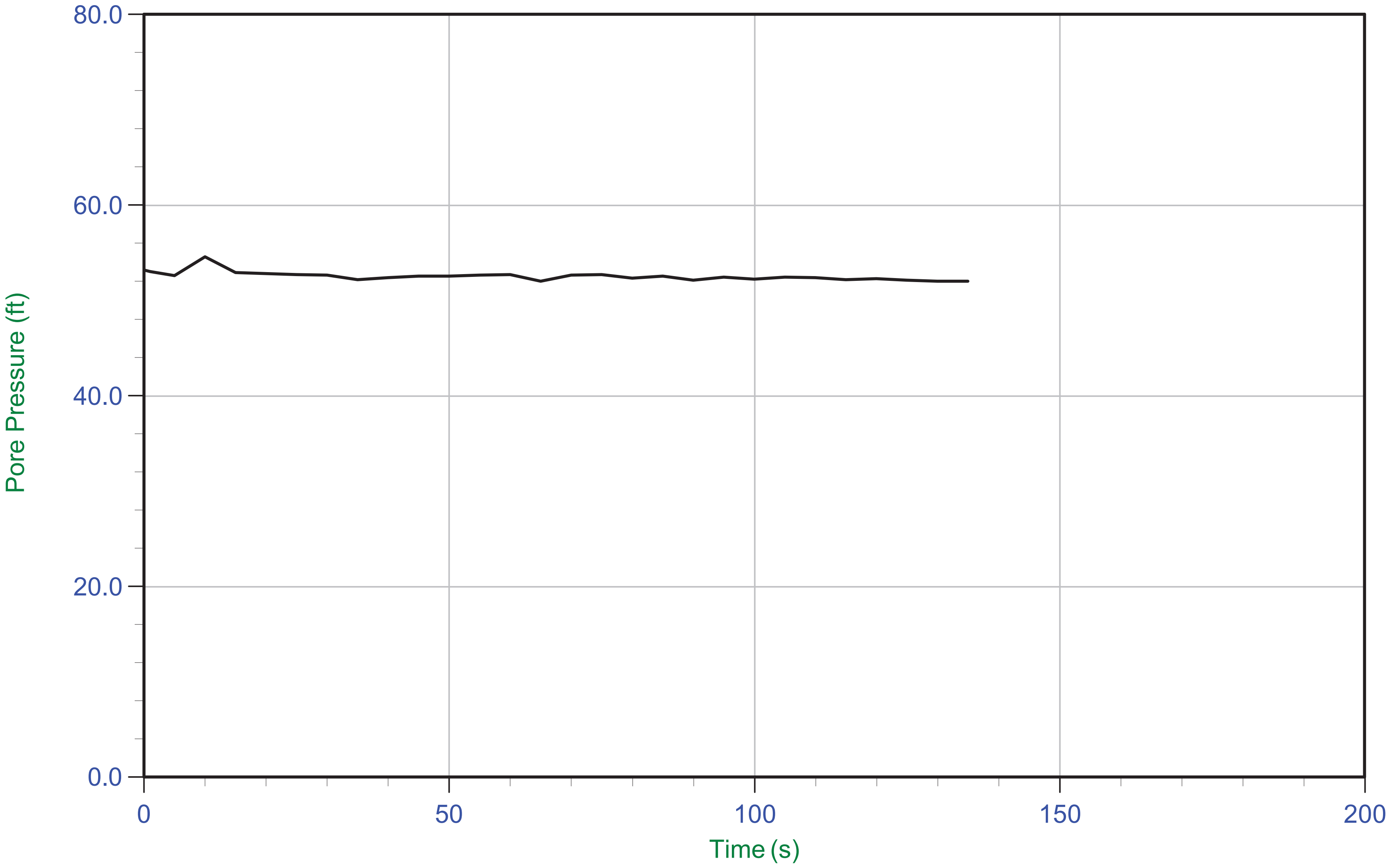
Trace Summary:	Filename: 18-56133_CP05.PPF	U Min: -18.1 ft	WT: 4.816 m / 15.799 ft
	Depth: 15.025 m / 49.294 ft	U Max: 34.0 ft	Ueq: 33.5 ft
	Duration: 330.0 s		

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 08/22/2018 15:14
Site: SJSU Parking Garage Track Field

Sounding: CPT-05
Cone: 383:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-56133_CP05.PPF
Depth: 19.475 m / 63.894 ft
Duration: 135.0 s

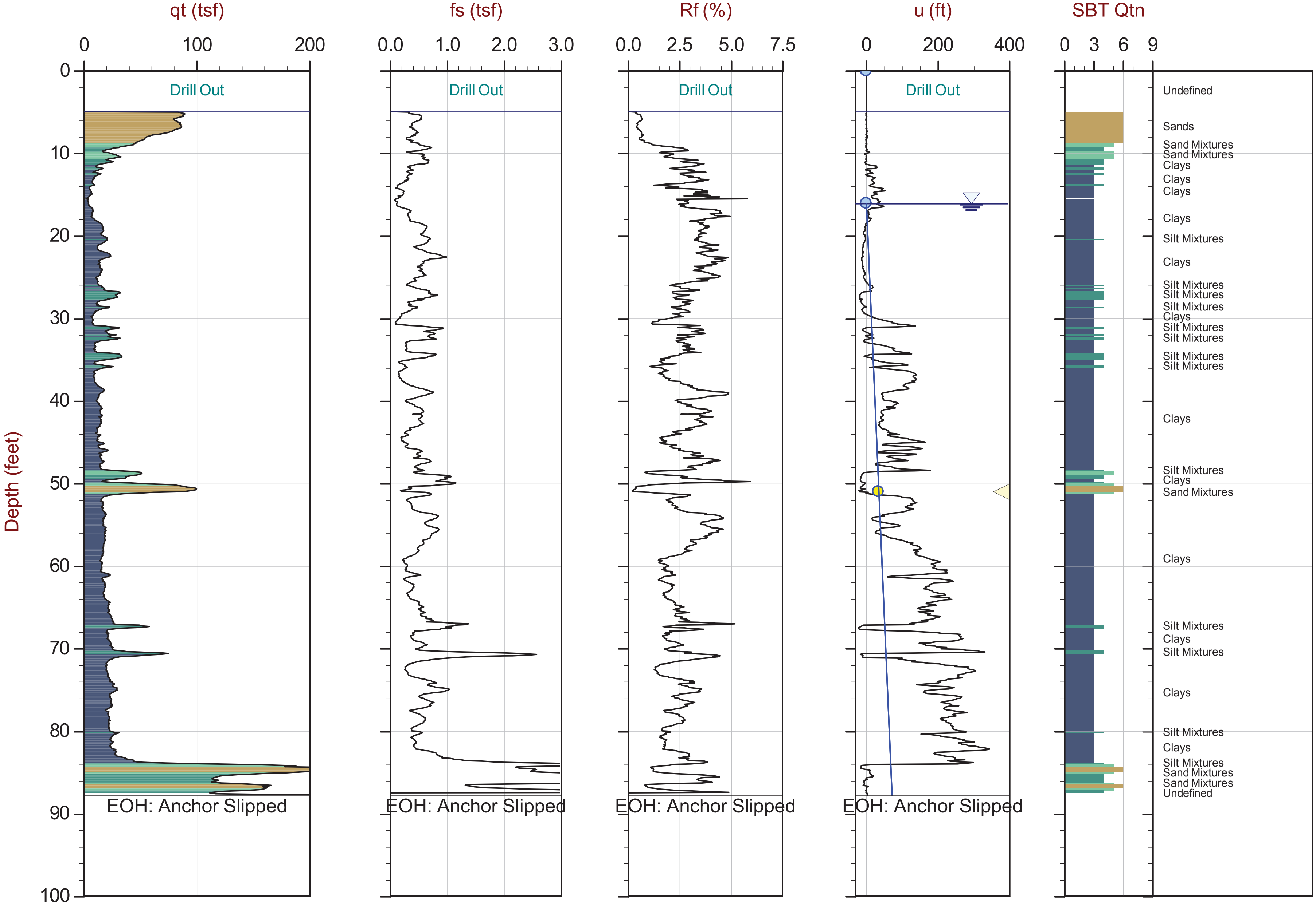
U Min: 52.0 ft
U Max: 54.6 ft

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-22 11:06
Site: SJSU Parking Garage Track Field

Sounding: CPT-06
Cone: 383:T1500F15U500



Max Depth: 26.750 m / 87.76 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP06.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N: 4131108m E: 600549m
Sheet No: 1 of 1

● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

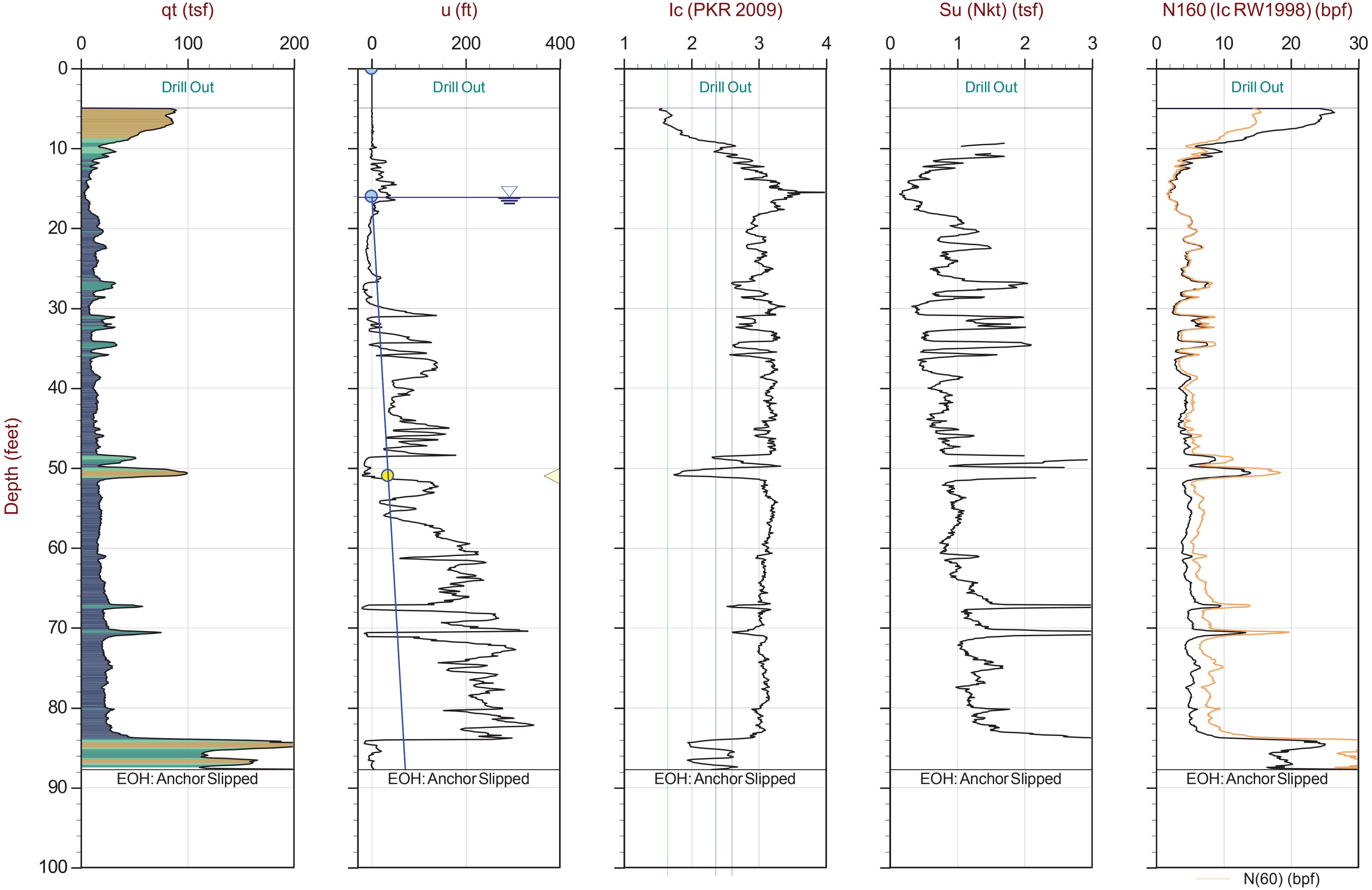
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-22 11:06
Site: SJSU Parking Garage Track Field

Sounding: CPT-06
Cone: 383:T1500F15U500



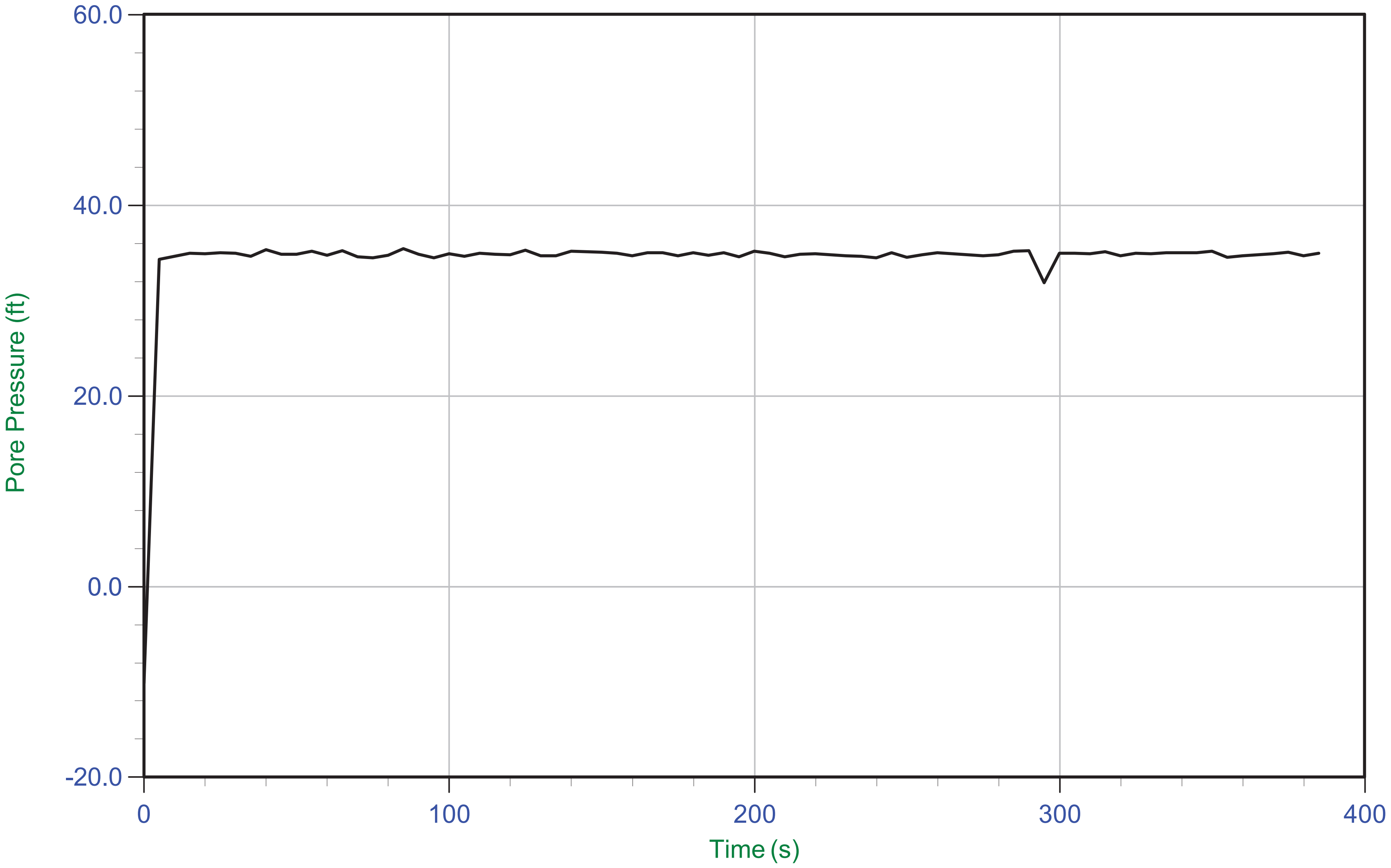
Max Depth: 26.750 m / 87.76 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP06.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N:4131108m E:600549m
Page No: 1 of 1

● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

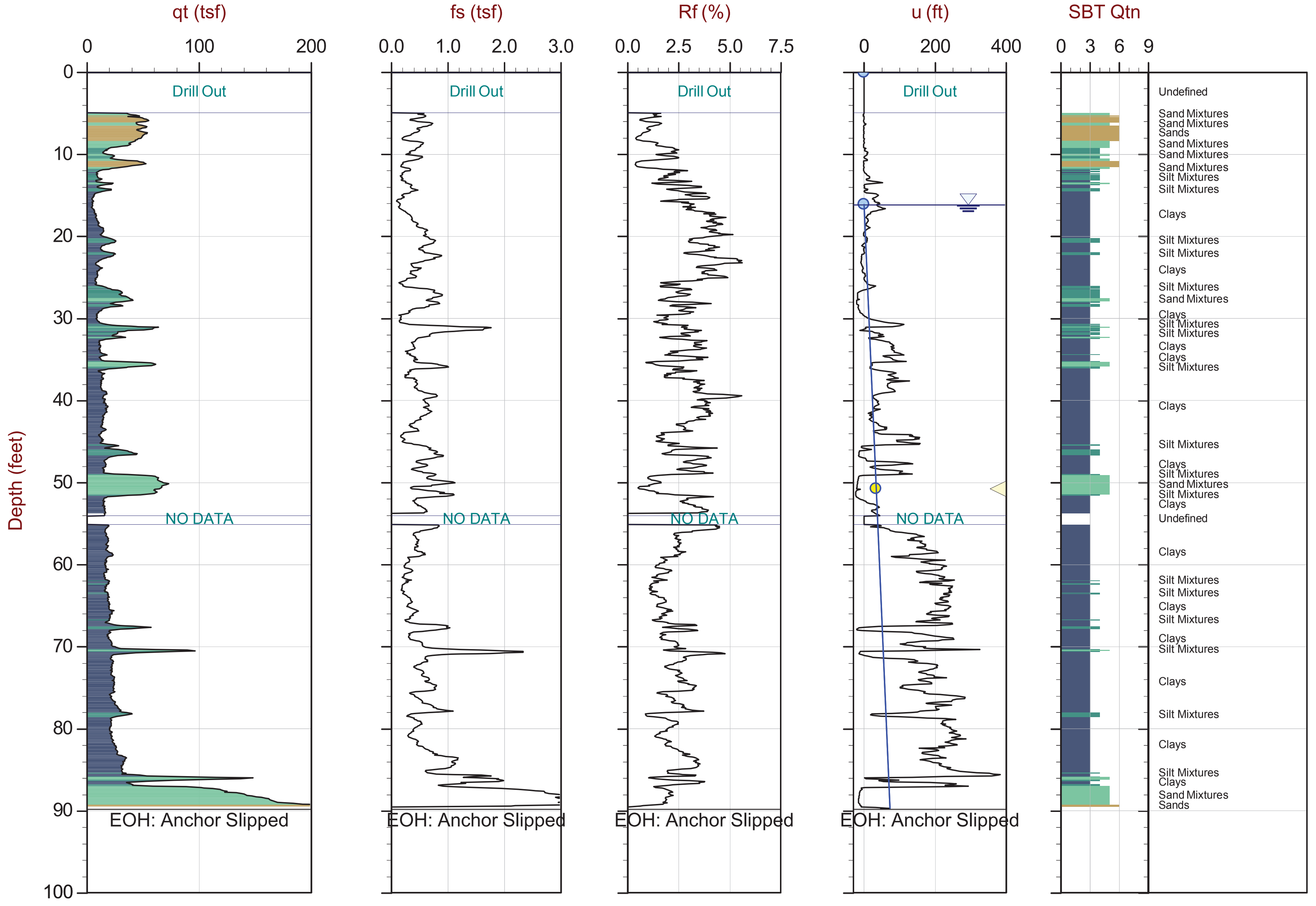


Trace Summary:	Filename: 18-56133_CP06.PPF	U Min: -10.2 ft	WT: 4.897 m / 16.067 ft
	Depth: 15.550 m / 51.016 ft	U Max: 35.5 ft	Ueq: 34.9 ft
	Duration: 385.0 s		

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-22 12:56
Site: SJSU Parking Garage Track Field

Sounding: CPT-07
Cone: 383:T1500F15U500



Max Depth: 27.375 m / 89.81 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP07.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N:4131051m E:600595m
Sheet No: 1 of 1

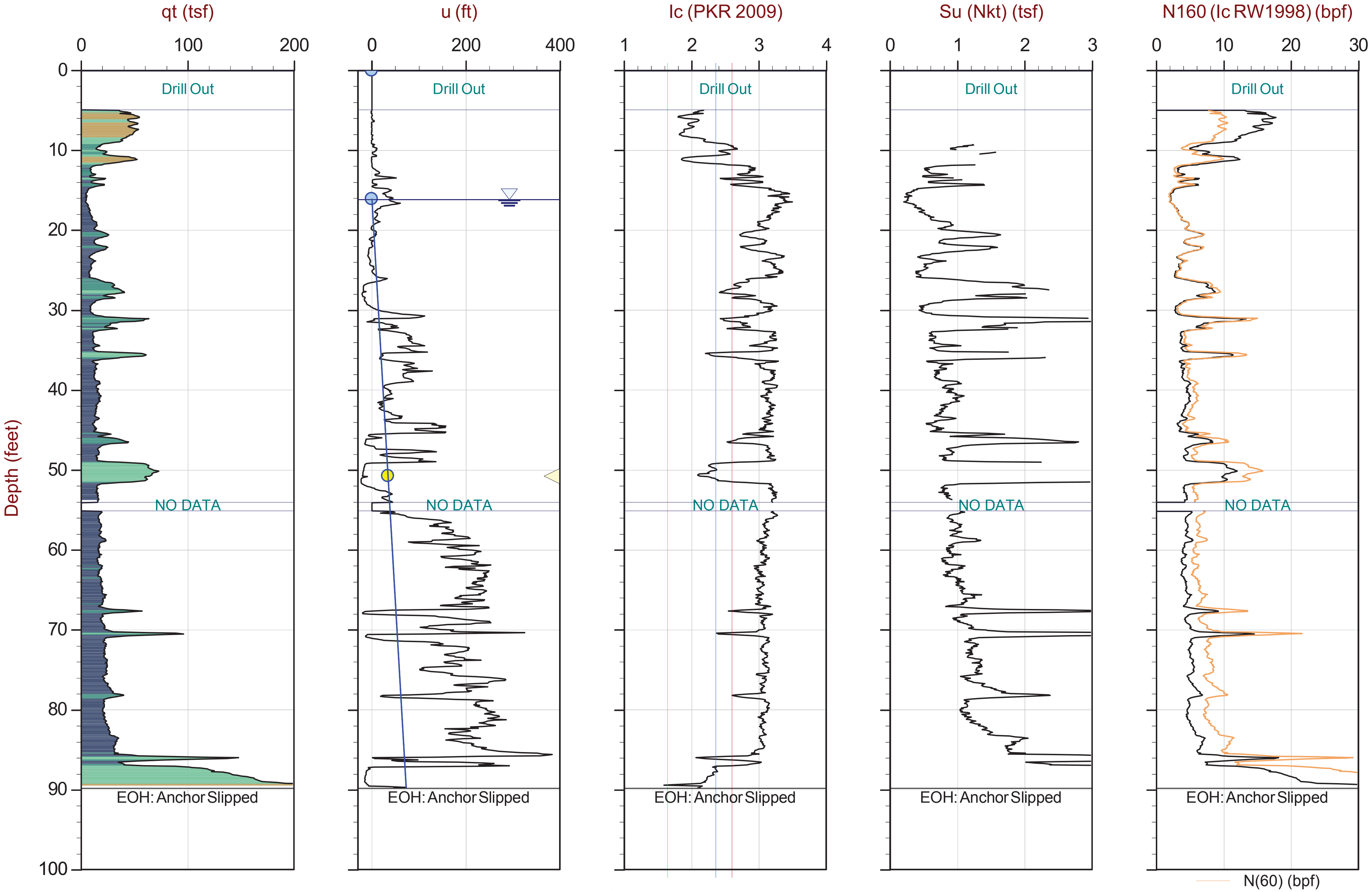
● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-22 12:56
Site: SJSU Parking Garage Track Field

Sounding: CPT-07
Cone: 383:T1500F15U500



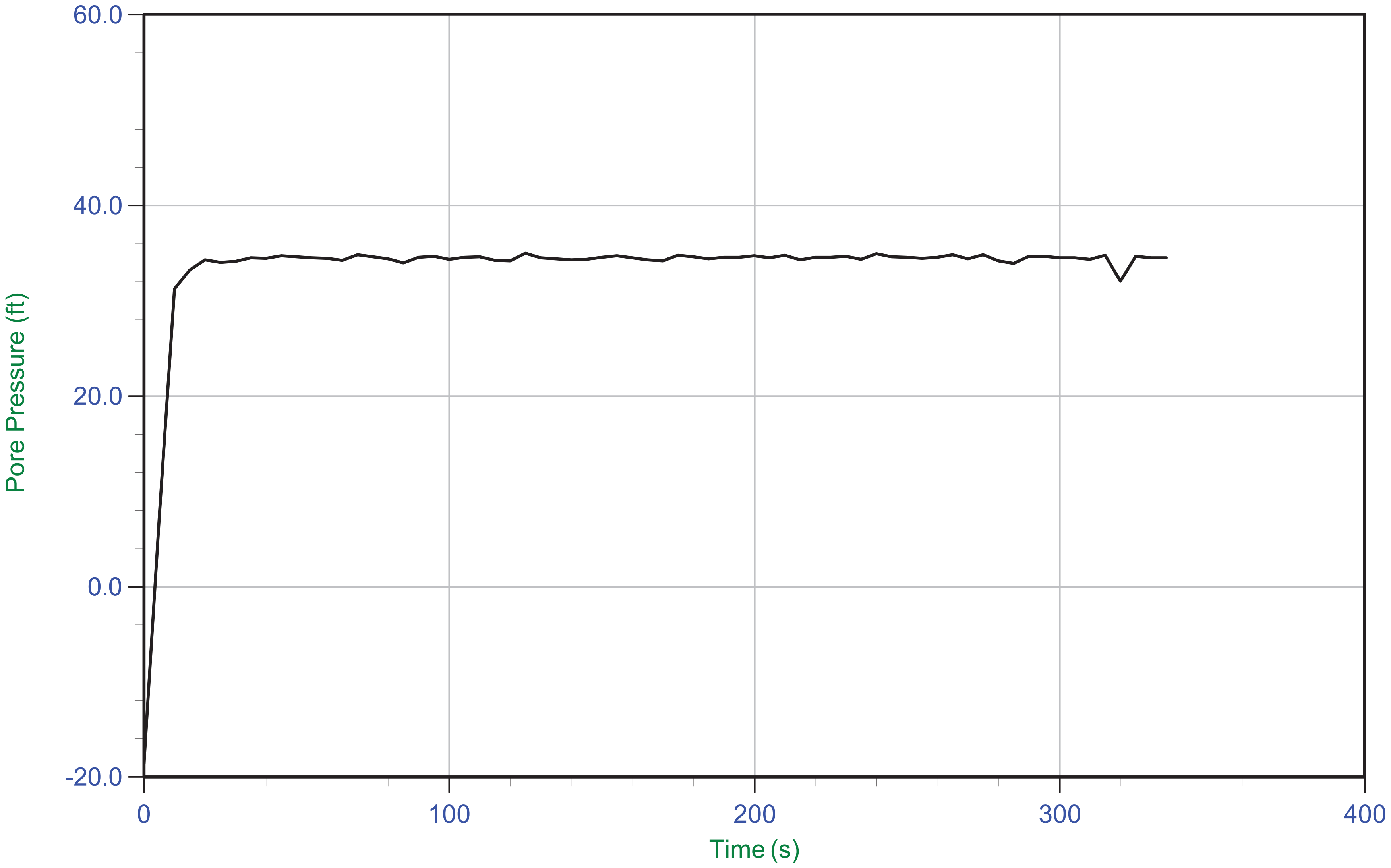
Max Depth: 27.375 m / 89.81 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP07.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N:4131051m E:600595m
Page No: 1 of 1

● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Trace Summary:

Filename: 18-56133_CP07.PPF
Depth: 15.475 m / 50.770 ft
Duration: 335.0 s

U Min: -18.6 ft
U Max: 34.9 ft

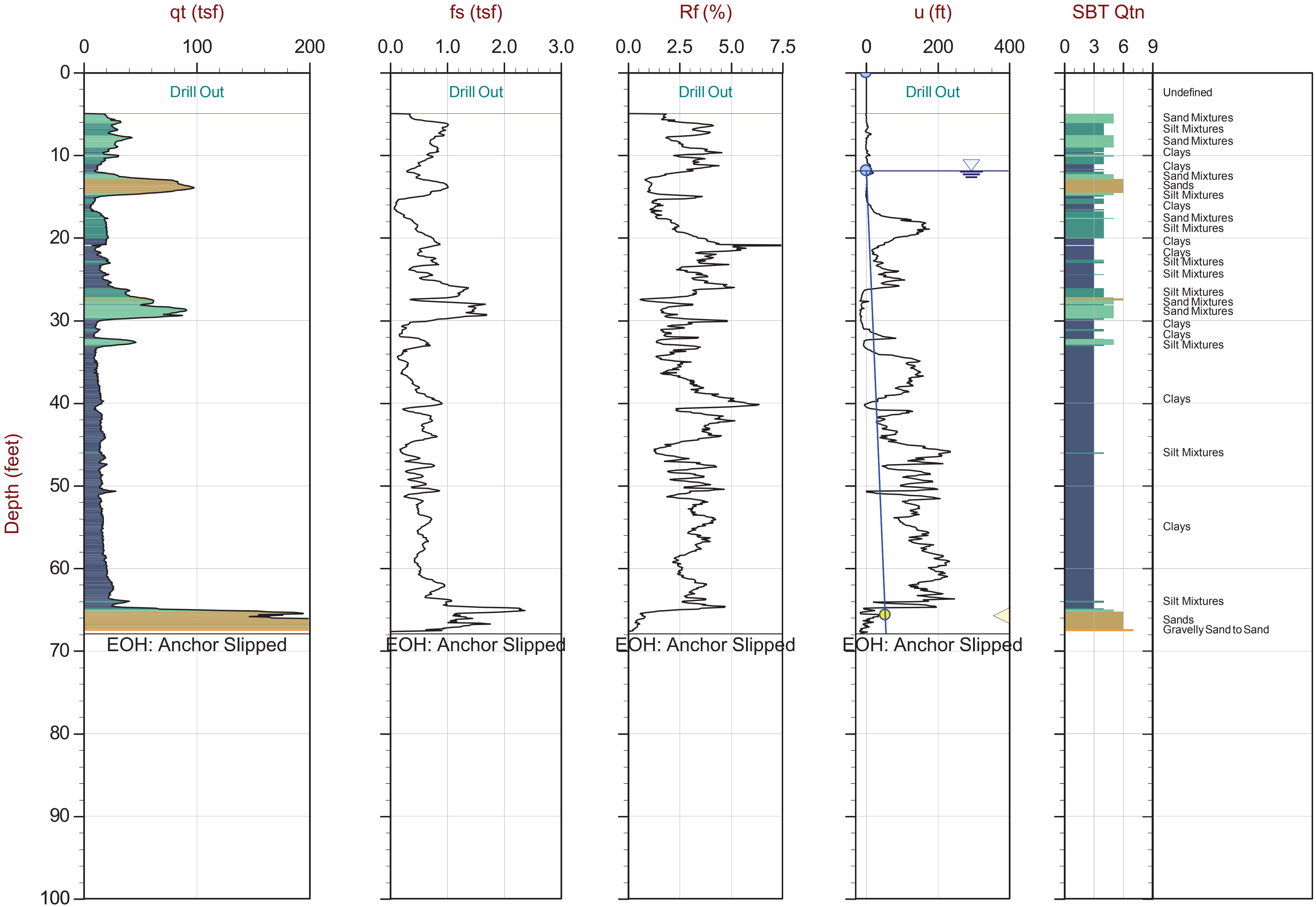
WT: 4.921 m / 16.145 ft
Ueq: 34.6 ft

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-23 10:18
Site: SJSU Parking Garage Track Field

Sounding: CPT-08
Cone: 383:T1500F15U500



Max Depth: 20.700 m / 67.91 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP08.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N: 4131010m E: 600526m
Sheet No: 1 of 1

● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

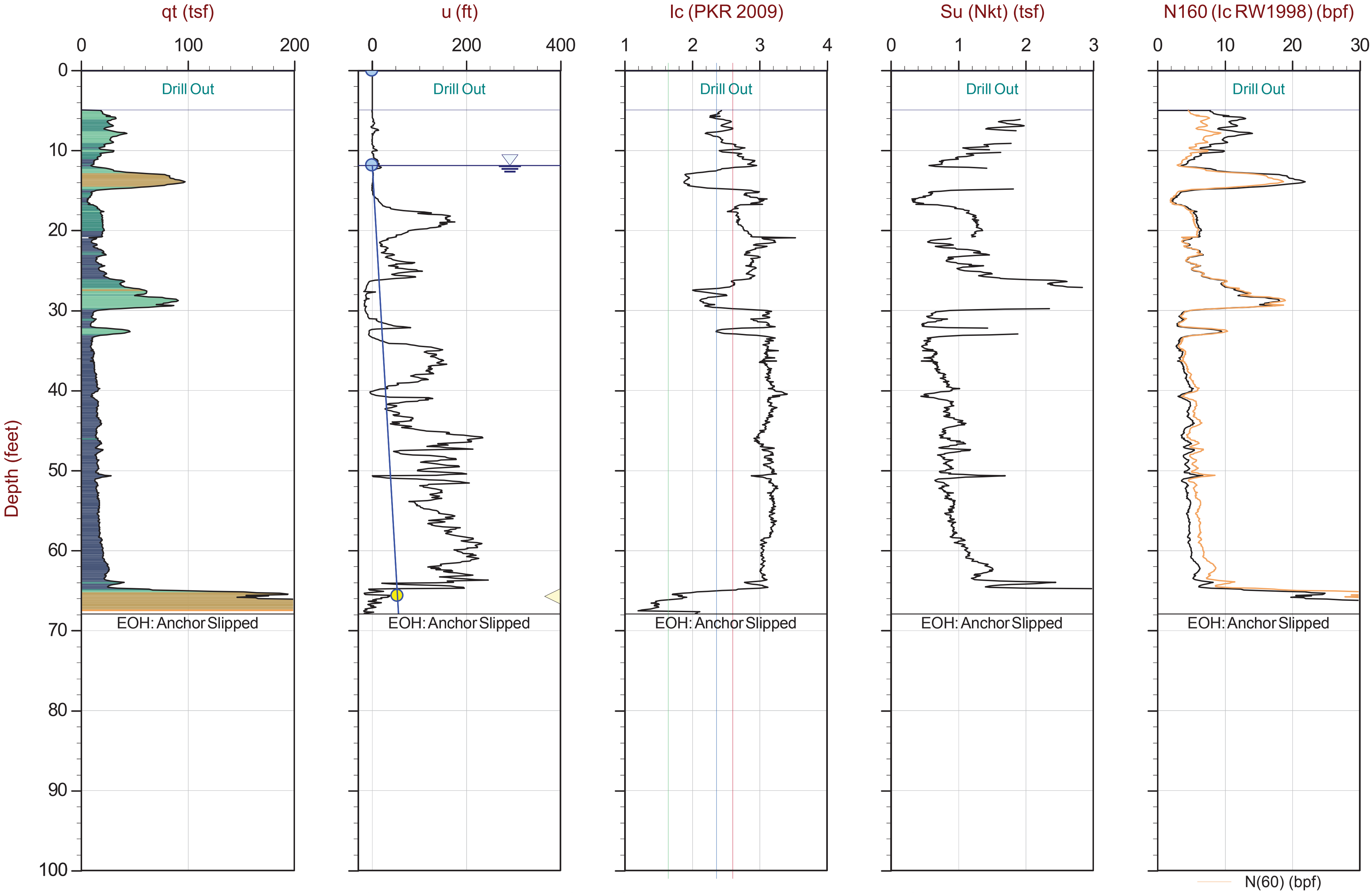
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Ninyo & Moore

Job No: 18-56133
Date: 2018-08-23 10:18
Site: SJSU Parking Garage Track Field

Sounding: CPT-08
Cone: 383:T1500F15U500



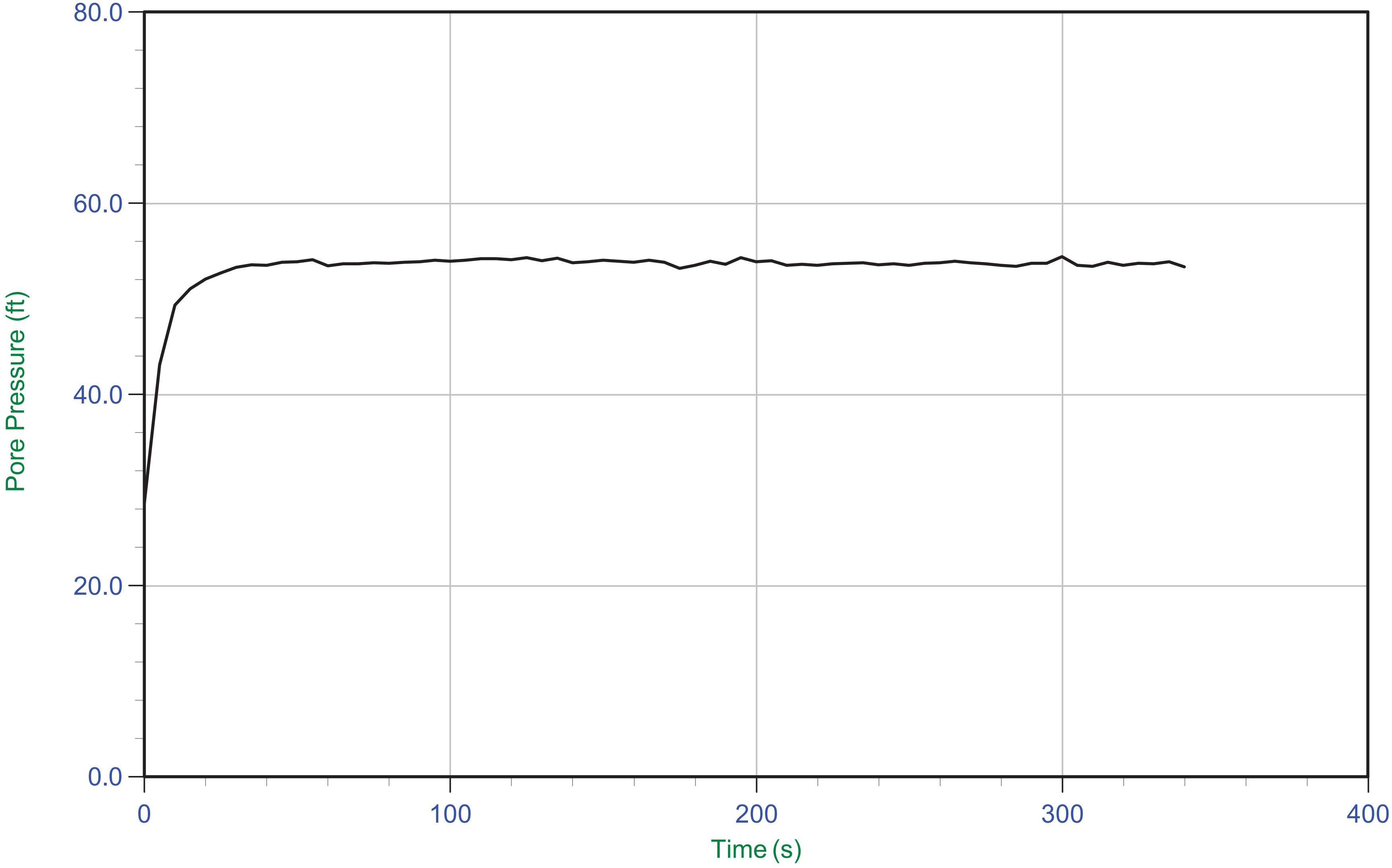
Max Depth: 20.700 m / 67.91 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56133_CP08.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N:4131010m E:600526m
Page No: 1 of 1

● Equilibrium Pore Pressure (Ueq) ● Assumed Ueq ◁ Dissipation, Ueq achieved ◁ Dissipation, Ueq not achieved — Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Trace Summary:

Filename: 18-56133_CP08.PPF
Depth: 20.025 m / 65.698 ft
Duration: 340.0 s

U Min: 28.6 ft
U Max: 54.4 ft

WT: 3.621 m / 11.880 ft
Ueq: 53.8 ft

APPENDIX B

Boring Logs

APPENDIX B

BORING LOGS

Field Procedure for the Collection of Disturbed Samples

Disturbed soil samples were obtained in the field using the following method.

Bulk Samples

Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Sampler

Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. The sampler was driven into the ground 12 to 18 inches with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the sampler, bagged, sealed and transported to the laboratory for testing.

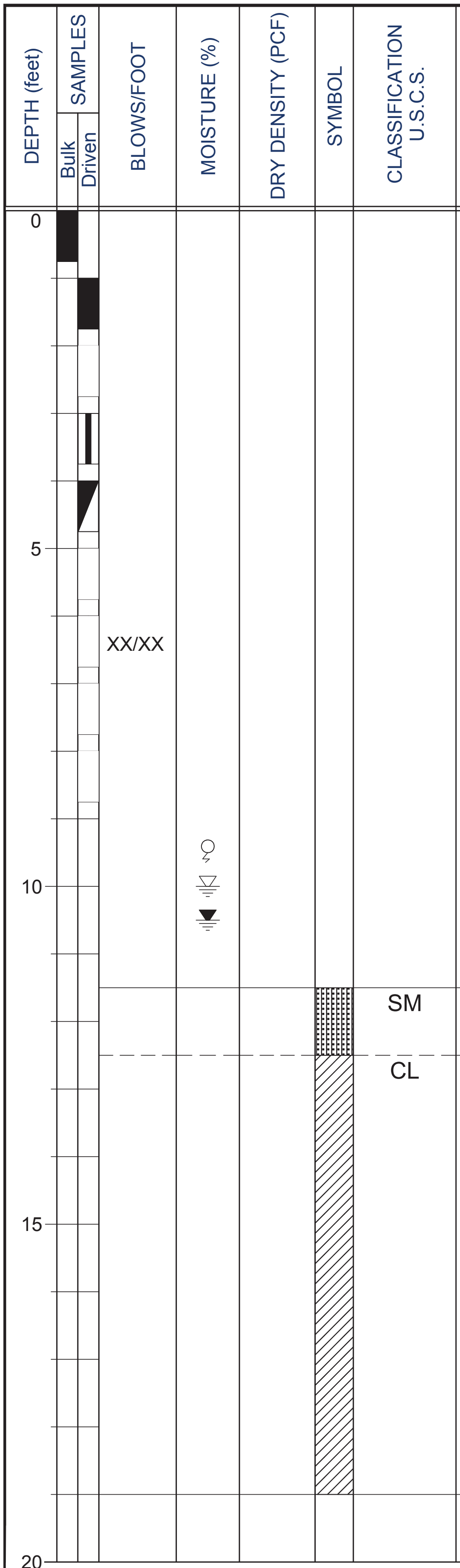
Field Procedure for the Collection of Relatively Undisturbed Samples

Relatively undisturbed soil samples were obtained in the field using the following method.

The Modified Split-Barrel Drive Sampler

The sampler, with an external diameter of 3.0 inches, was lined with 6-inch long, thin brass liners with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer in general accordance with ASTM D 3550. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer, and the number of blows per foot of driving are presented on the boring log as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass liners, sealed, and transported to the laboratory for testing.

BORING LOG EXPLANATION SHEET



Bulk sample.

Modified split-barrel drive sampler.

No recovery with modified split-barrel drive sampler.

Sample retained by others.

Standard Penetration Test (SPT).

No recovery with a SPT.

Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.

No recovery with Shelby tube sampler.

Continuous Push Sample.

Seepage.

Groundwater encountered during drilling.

Groundwater measured after drilling.

MAJOR MATERIAL TYPE (SOIL):

Solid line denotes unit change.

Dashed line denotes material change.

Attitudes: Strike/Dip
b: Bedding
c: Contact
j: Joint
f: Fracture
F: Fault
cs: Clay Seam
s: Shear
bss: Basal Slide Surface
sf: Shear Fracture
sz: Shear Zone
sbs: Shear Bedding Surface

The total depth line is a solid line that is drawn at the bottom of the boring.

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BORING LOG

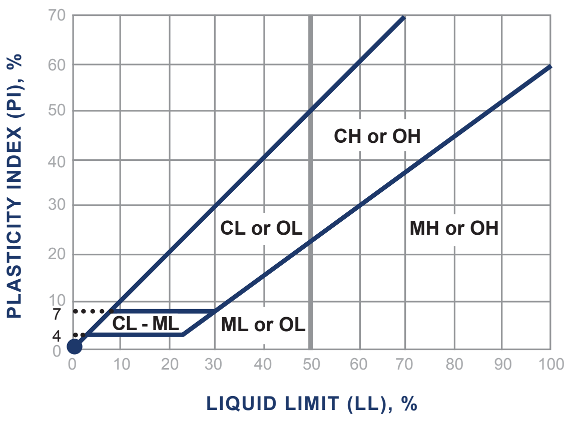
Soil Classification Chart Per ASTM D 2488

Primary Divisions			Secondary Divisions		
			Group Symbol		Group Name
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	**GRAVEL** more than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVEL less than 5% fines	▨	GW	well-graded GRAVEL
			▨	GP	poorly graded GRAVEL
		GRAVEL with DUAL CLASSIFICATIONS 5% to 12% fines	▨	GW-GM	well-graded GRAVEL with silt
			▨	GP-GM	poorly graded GRAVEL with silt
			▨	GW-GC	well-graded GRAVEL with clay
			▨	GP-GC	poorly graded GRAVEL with
		GRAVEL with FINES more than 12% fines	▨	GM	silty GRAVEL
			▨	GC	clayey GRAVEL
			▨	GC-GM	silty, clayey GRAVEL
	SAND 50% or more of coarse fraction passes No. 4 sieve	CLEAN SAND less than 5% fines	▨	SW	well-graded SAND
			▨	SP	poorly graded SAND
		SAND with DUAL CLASSIFICATIONS 5% to 12% fines	▨	SW-SM	well-graded SAND with silt
			▨	SP-SM	poorly graded SAND with silt
			▨	SW-SC	well-graded SAND with clay
			▨	SP-SC	poorly graded SAND with clay
		SAND with FINES more than 12% fines	▨	SM	silty SAND
			▨	SC	clayey SAND
			▨	SC-SM	silty, clayey SAND
FINE-GRAINED SOILS 50% or more passes No. 200 sieve	**SILT and CLAY** liquid limit less than 50%	INORGANIC	▨	CL	lean CLAY
			▨	ML	SILT
			▨	CL-ML	silty CLAY
		ORGANIC	▨	OL (PI > 4)	organic CLAY
			▨	OL (PI < 4)	organic SILT
	SILT and CLAY liquid limit 50% or more	INORGANIC	▨	CH	fat CLAY
			▨	MH	elastic SILT
		ORGANIC	▨	OH (plots on or above “A”-line)	organic CLAY
			▨	OH (plots below “A”-line)	organic SILT
	Highly Organic Soils		▨	PT	Peat

Grain Size

Description		Sieve Size	Grain Size	Approximate Size
Boulders		> 12”	> 12”	Larger than basketball-sized
Cobbles		3 - 12”	3 - 12”	Fist-sized to basketball-sized
Gravel	Coarse	3/4 - 3”	3/4 - 3”	Thumb-sized to fist-sized
	Fine	#4 - 3/4”	0.19 - 0.75”	Pea-sized to thumb-sized
Sand	Coarse	#10 - #4	0.079 - 0.19”	Rock-salt-sized to pea-sized
	Medium	#40 - #10	0.017 - 0.079”	Sugar-sized to rock-salt-sized
	Fine	#200 - #40	0.0029 - 0.017”	Flour-sized to sugar-sized
Fines		Passing #200	< 0.0029”	Flour-sized and smaller

Plasticity Chart



Apparent Density - Coarse-Grained Soil

Apparent Density	Spooling Cable or Cathead		Automatic Trip Hammer	
	SPT (blows/foot)	Modified Split Barrel (blows/foot)	SPT (blows/foot)	Modified Split Barrel (blows/foot)
Very Loose	≤ 4	≤ 8	≤ 3	≤ 5
Loose	5 - 10	9 - 21	4 - 7	6 - 14
Medium Dense	11 - 30	22 - 63	8 - 20	15 - 42
Dense	31 - 50	64 - 105	21 - 33	43 - 70
Very Dense	> 50	> 105	> 33	> 70

Consistency - Fine-Grained Soil

Consis tency	Spooling Cable or Cathead		Automatic Trip Hammer	
	SPT (blows/foot)	Modified Split Barrel (blows/foot)	SPT (blows/foot)	Modified Split Barrel (blows/foot)
Very Soft	< 2	< 3	< 1	< 2
Soft	2 - 4	3 - 5	1 - 3	2 - 3
Firm	5 - 8	6 - 10	4 - 5	4 - 6
Stiff	9 - 15	11 - 20	6 - 10	7 - 13
Very Stiff	16 - 30	21 - 39	11 - 20	14 - 26
Hard	> 30	> 39	> 20	> 26

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USCS METHOD OF SOIL CLASSIFICATION

DATE DRILLED 8/22/2018 BORING NO. B-1

GROUND ELEVATION 104' ± (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'

DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES

SAMPLED BY GL LOGGED BY GL REVIEWED BY RH

DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0					AGGREGATE BASE: Approximately 1.5 feet thick.
				CL	ALLUVIUM: Brown, moist, stiff, lean CLAY.
	26	13.7	97.5		Very stiff. Trace sand.
	23				
10				SM	Brown, moist, medium dense, silty SAND.
				CL	Brown, wet, firm, lean CLAY.
		▽			
	11	31.3	88.6	SM	Brown, wet, loose, silty SAND.
	11			CL	Gray, wet, very stiff, lean CLAY.
		▼			
	42	26.8	92.9		
20					
	24	22.0	105.1		Stiff; trace sand.
				SM	Brown, wet, medium dense, silty SAND.
	43				
30					
				CL	Gray, wet, very stiff, sandy lean CLAY.
	26				
	33				Lean CLAY.
40					

FIGURE B- 1

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PARKING STRUCTURE & SPORTS FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

DATE DRILLED 8/22/2018 BORING NO. B-1

GROUND ELEVATION 104' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'

DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES

SAMPLED BY GL LOGGED BY GL REVIEWED BY RH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40								Total Depth = 40.0 feet. Backfilled the hole with cement grout shortly after drilling. Notes: Groundwater was first encountered at a depth of approximately 13 feet during drilling. It was measured at about 17 feet after drilling. It may rise to a higher level due to variations in seasonal precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

FIGURE B- 2

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PARKING STRUCTURE & SPORTS FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

DATE DRILLED 8/23/2018 BORING NO. B-2

GROUND ELEVATION 104' ± (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'

DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES

SAMPLED BY KCC LOGGED BY KCC REVIEWED BY RH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						▨	CL	FILL: Brown, dry, stiff, sandy lean CLAY; trace gravel.
	■					▨	CL	ALLUVIUM: Brown, moist, stiff, lean CLAY; trace sand.
		■	26			▨		Very stiff.
						▥	SM	Brown, moist, medium dense, silty SAND.
		■	26	11.7	98.9	▥		
10		◤	14			▥		
						▨	CL	Brown, wet, firm, lean CLAY.
				▽		▨		
		■	12	47.6	77.4	▨		
				▼		▨		
		◤	15			▨		Stiff.
20						▨		
		■	21	21.4	104.1	▨		Very stiff. Trace sand.
						▥	SM	Brown, wet, loose, silty SAND.
		■	14			▥		
30						▥		
						▨	CL	Brown to gray, wet, very stiff, lean CLAY.
		◤	24			▨		
		◤	18			▨		
40								

FIGURE B- 3

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PARKING STRUCTURE & SPORTS FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

DATE DRILLED 8/23/2018 BORING NO. B-2

GROUND ELEVATION 104' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'

DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES

SAMPLED BY KCC LOGGED BY KCC REVIEWED BY RH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40								Total Depth = 40.0 feet. Backfilled the hole with cement grout shortly after drilling. Notes: Groundwater was first encountered at a depth of approximately 13 feet during drilling. It was measured at about 16.5 feet after drilling. It may rise to a higher level due to variations in seasonal precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

FIGURE B- 4

PARKING STRUCTURE & SPORTS FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

DATE DRILLED 8/22/2018 BORING NO. B-3

GROUND ELEVATION 104' ± (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'

DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES

SAMPLED BY GL LOGGED BY GL REVIEWED BY RH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						▨	CL	FILL: Brown, dry, stiff, sandy lean CLAY; trace gravel.
	■					▨	CL	ALLUVIUM: Brown, moist, firm, lean CLAY.
		■	23	10.6	104.5	▥	SM	Brown, moist, medium dense, silty SAND.
10		■	24			▥		
		■	14	▽ ▼		▨	CL	Brown, moist, firm, lean CLAY.
20		■	36	24.5	99.5	▨	CH	Gray, wet, very stiff, fat CLAY.
		■	21			▨	CL	Brown, wet, very stiff, lean CLAY; trace sand.
30		■	20	31.0	88.4	▨		Stiff.
		◩	14			▨		
40		■	44			▨		Gray; very stiff.

DATE DRILLED 8/22/2018 BORING NO. B-3

GROUND ELEVATION 104' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'

DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES

SAMPLED BY GL LOGGED BY GL REVIEWED BY RH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40								Total Depth = 40.0 feet. Backfilled the hole with cement grout shortly after drilling. Notes: Groundwater was first encountered at a depth of approximately 13 feet during drilling. It was measured at about 16 feet after drilling. It may rise to a higher level due to variations in seasonal precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

DATE DRILLED 8/22/2018 BORING NO. B-4
GROUND ELEVATION 106' ± (MSL) SHEET 1 OF 2
METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'
DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES
SAMPLED BY GL LOGGED BY GL REVIEWED BY RH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0								AGGREGATE BASE: Approximately 1.5 feet thick.
							CL	FILL: Brown, moist, firm, sandy lean CLAY; trace bricks.
			28				CL	ALLUVIUM: Brown, moist, very stiff, lean CLAY.
			18	11.1	98.1		SM	Brown, moist, medium dense, silty SAND.
10			5				CL	Brown, wet, firm, sandy lean CLAY.
			9	▽				
				▼			CL	Gray, wet, very stiff, lean CLAY.
20			36	23.6	100.1			
			18					Stiff.
			24				SM	Gray, wet, medium dense, silty SAND.
30			17				CL	Brown, wet, stiff, lean CLAY.
			25					Gray.
40			50					Very stiff.

FIGURE B- 7

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PARKING STRUCTURE & SPORTS FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

DATE DRILLED 8/22/2018 BORING NO. B-4

GROUND ELEVATION 106' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'

DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES

SAMPLED BY GL LOGGED BY GL REVIEWED BY RH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40								Total Depth = 40.0 feet. Backfilled the hole with cement grout shortly after drilling. Notes: Groundwater was first encountered at a depth of approximately 14 feet during drilling. It was measured at about 17 feet after drilling. It may rise to a higher level due to variations in seasonal precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

DATE DRILLED 8/23/2018 BORING NO. B-5

GROUND ELEVATION 105' ± (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'

DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES

SAMPLED BY KCC LOGGED BY KCC REVIEWED BY RH

DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0					AGGREGATE BASE: Approximately 1 foot thick.
				CL	ALLUVIUM: Brown, moist, very stiff, lean CLAY.
	11				
	23				
10	5	∇		ML	Brown, moist, loose, SILT.
				CL	Brown, wet, firm, lean CLAY.
	6	27.4			
		▼			
					Grayish brown; very stiff.
	40				
20					
	16				Stiff.
				SM	Brown, wet, medium dense, silty SAND.
	20				
30					
				CL	Grayish brown, wet, stiff, lean CLAY.
	11				
	19				Very stiff.
40					

FIGURE B- 9

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PARKING STRUCTURE & SPORTS FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

DATE DRILLED 8/23/2018 BORING NO. B-5

GROUND ELEVATION 105' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'

DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES

SAMPLED BY KCC LOGGED BY KCC REVIEWED BY RH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40								Total Depth = 40.0 feet. Backfilled the hole with cement grout shortly after drilling. Notes: Groundwater was first encountered at a depth of approximately 10.5 feet during drilling. It was measured at about 17 feet after drilling. It may rise to a higher level due to variations in seasonal precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

DATE DRILLED 8/23/2018 BORING NO. B-6
GROUND ELEVATION 103' ± (MSL) SHEET 1 OF 2
METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'
DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES
SAMPLED BY KCC LOGGED BY KCC REVIEWED BY RH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0								AGGREGATE BASE: Approximately 1 foot thick.
	■						CL	ALLUVIUM: Brown, moist, firm, lean CLAY.
							SM	Brown, moist, medium dense, silty SAND.
		■	32	9.9	108.4			
		■	15	13.5	92.7			
10								
							CL	Brown, wet, firm, lean CLAY.
				▽				
		■	9	30.0	91.0			
							SM	Brown, wet, loose, silty SAND.
				▼			CL	Gray, wet, very stiff, lean CLAY.
		■	36	28.1	90.2			
20								
							CL	Grayish brown, wet, stiff, lean CLAY.
		◩	10					
								Brown.
								Sandy.
		◩	9					
30								
		■	19	31.0	89.0			Gray.
		■	36	28.4	92.5			Very stiff.
40								

FIGURE B- 11

PARKING STRUCTURE & SPORTS FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

DATE DRILLED 8/23/2018 BORING NO. B-6

GROUND ELEVATION 103' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" HSA, B-61 Truck Mounted (Exploration Geo.), 3" HA top 5'

DRIVE WEIGHT 140 LBS (wireline) DROP 30 INCHES

SAMPLED BY KCC LOGGED BY KCC REVIEWED BY RH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40								Total Depth = 40.0 feet. Backfilled the hole with cement grout shortly after drilling. Notes: Groundwater was first encountered at a depth of approximately 13 feet during drilling. It was measured at about 17 feet after drilling. It may rise to a higher level due to variations in seasonal precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

APPENDIX C

Laboratory Testing

APPENDIX C

LABORATORY TESTING

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488-00. Soil classifications are indicated on the logs of the exploratory borings in Appendix B.

Moisture Content

The moisture content of samples obtained from the exploratory boring was evaluated in accordance with ASTM D 2216. The test results are presented on the boring log in Appendix B.

Gradation Analysis

Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422. The grain size distribution curves are shown on Figures C-1 through C-12. The test results were utilized in evaluating the soil classification in accordance with the Unified Soil Classification System (USCS).

Atterberg Limits

Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the USCS. The test results and classifications are shown on Figures C-13 and C-14.

Expansion Index Test

The expansion index of a selected material was evaluated in general accordance with ASTM D 4829. The specimen was molded under a specified compactive energy at approximately 50 percent saturation (plus or minus 1 percent). The prepared 1 inch thick by 4 inch diameter specimen was loaded with a surcharge of 144 pounds per square foot and inundated with tap water. Readings of volumetric swell were made for a period of 24 hours. The test results are presented on Figure C-15.

Consolidation Tests

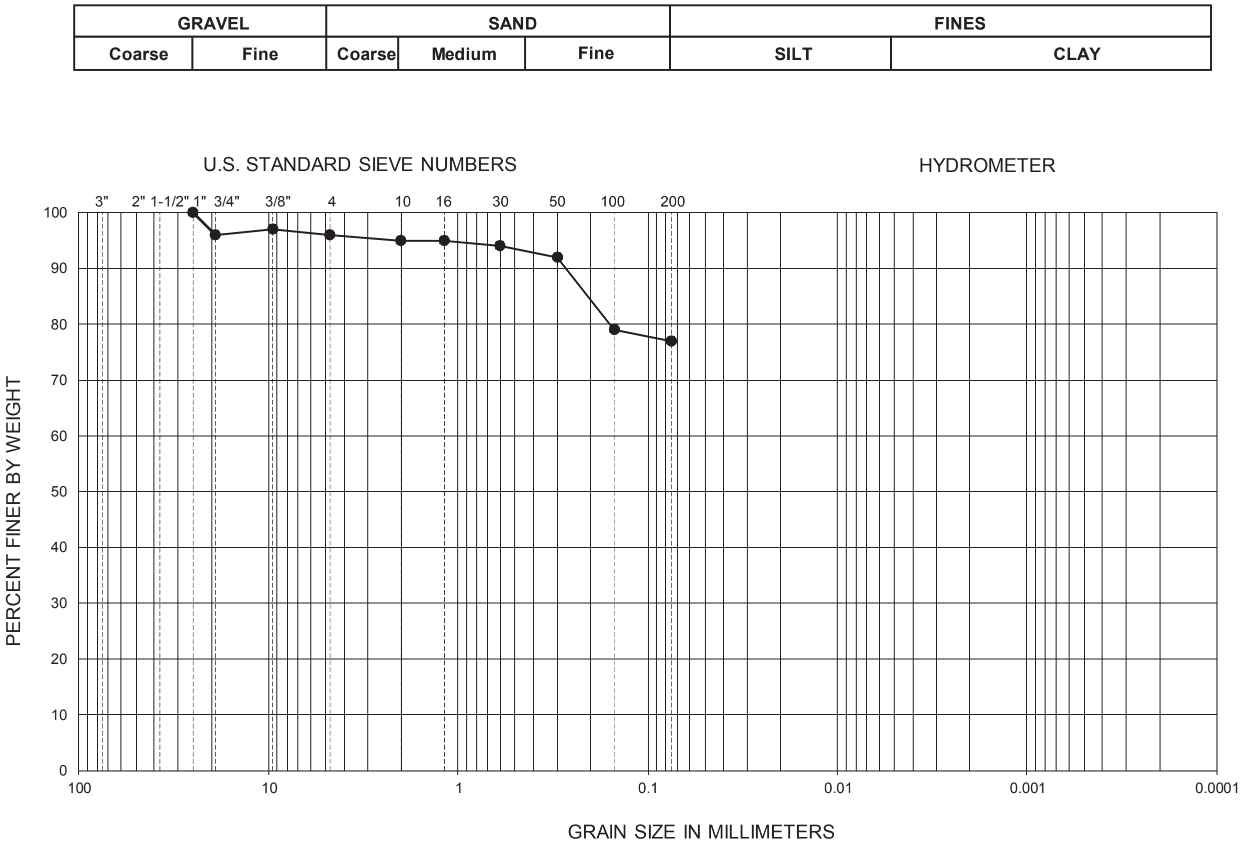
Consolidation tests were performed on selected relatively undisturbed soil samples in general accordance with ASTM D 2435. The samples were inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the tests are summarized on Figures C-16 through C-18.

Unconsolidated Undrained Triaxial Compression Test

Triaxial compression tests were performed on selected relatively undisturbed samples in general accordance with ASTM D 2850. The test results are shown on Figure C-19.

Soil Corrosivity Tests

Soil pH, and resistivity tests were performed on representative samples in general accordance with California Test (CT) 643. The soluble sulfate and chloride content of the selected samples were evaluated in general accordance with CT 417 and CT 422, respectively. The test results are presented on Figure C-20.



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-1	1.0-5.0	--	--	--	--	--	--	--	--	77	CL

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C 1

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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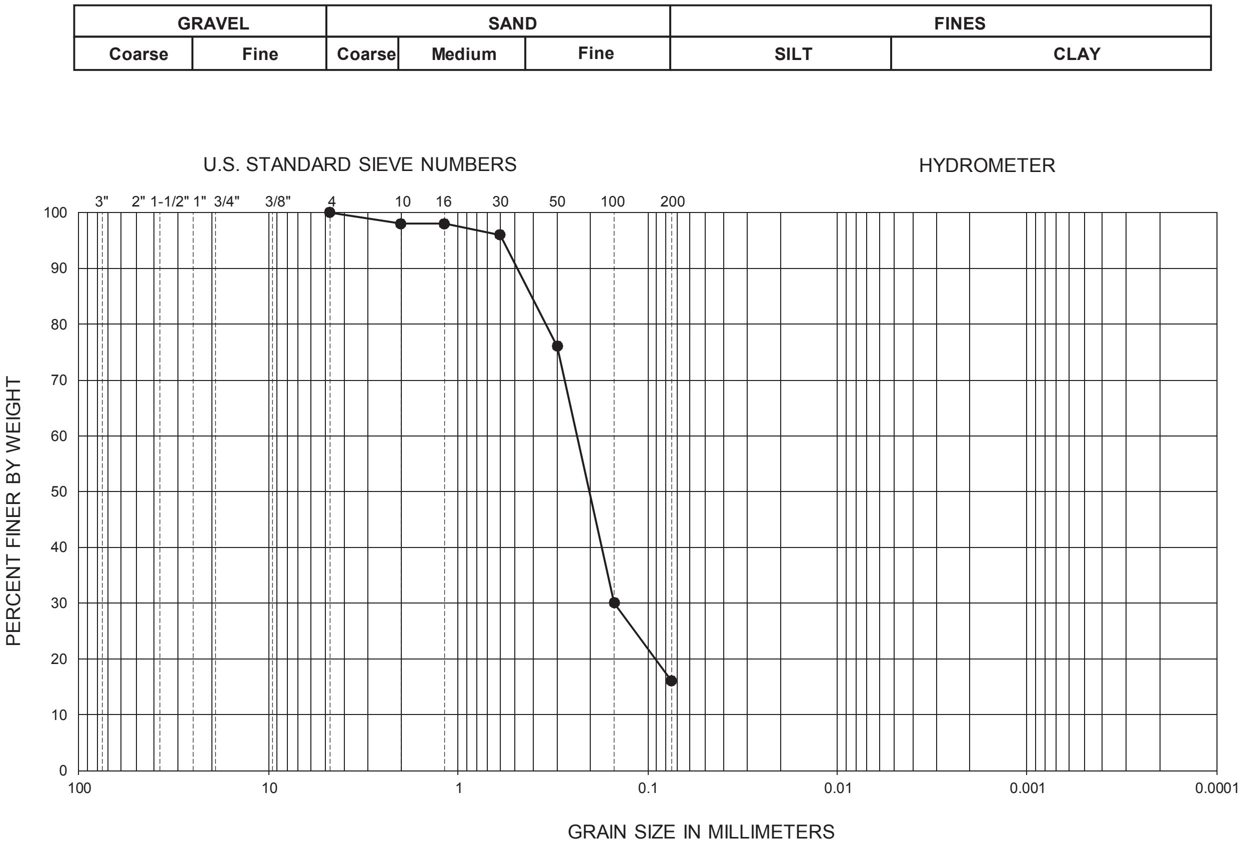

Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-2	10.0-11.5	--	--	--	--	0.67	0.24	--	--	16	SC

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C 2

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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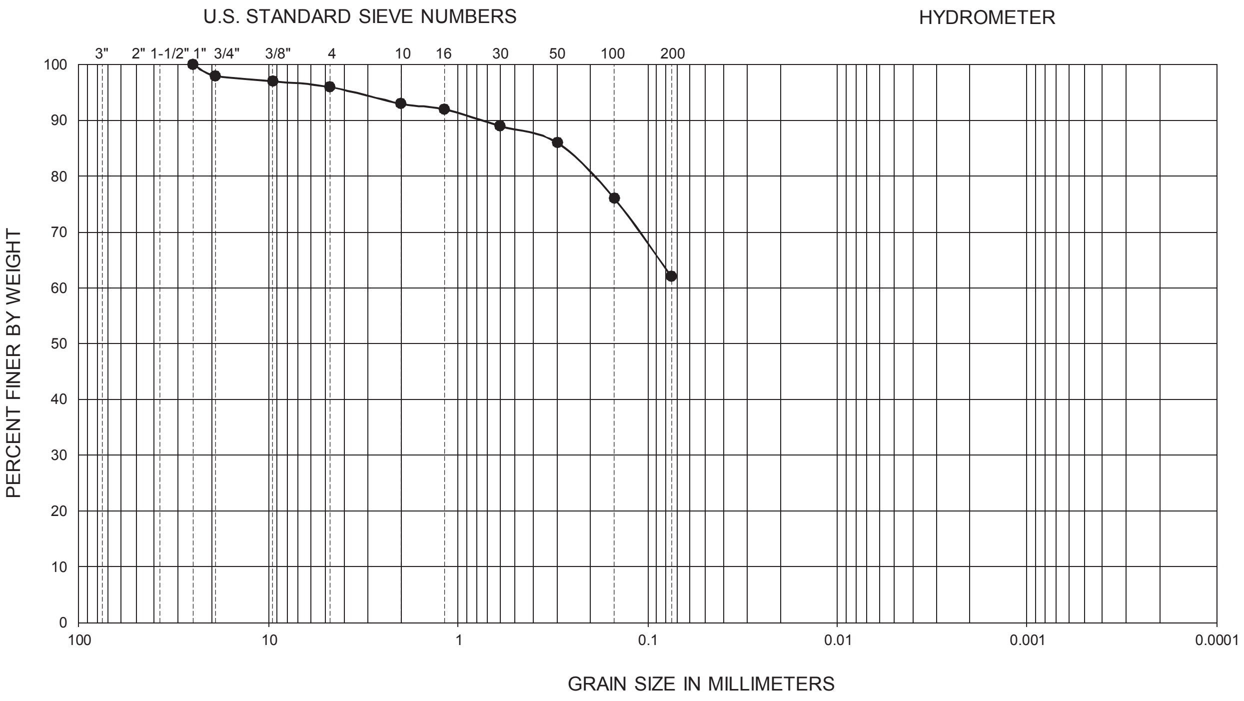
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-4	1.0-5.0	--	--	--	--	--	--	--	--	62	CL

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C 3

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
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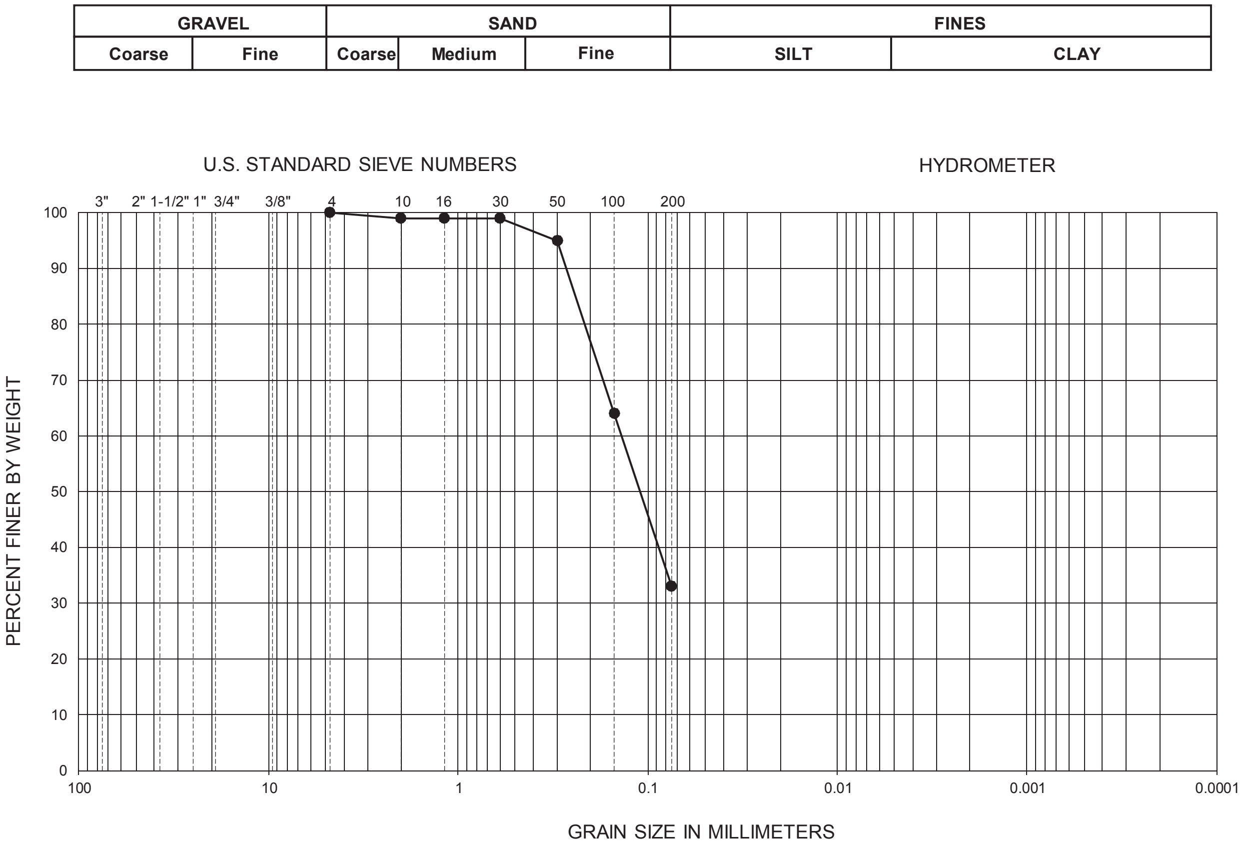


Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-4	9.5-10.0	--	--	--	--	--	--	--	--	33	CL

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

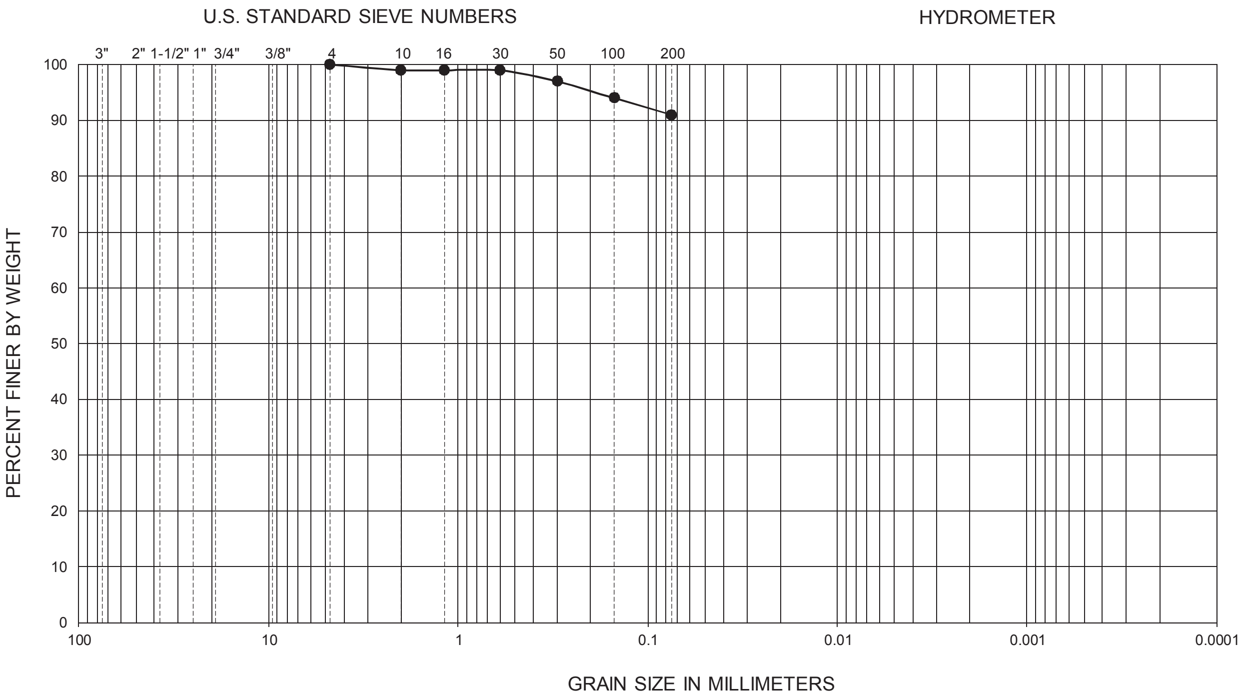
Figure C 4

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

Geotechnical & Environmental Sciences Consultants

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-4	13.5-15.0	--	--	--	--	--	--	--	--	91	CL

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C 5

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
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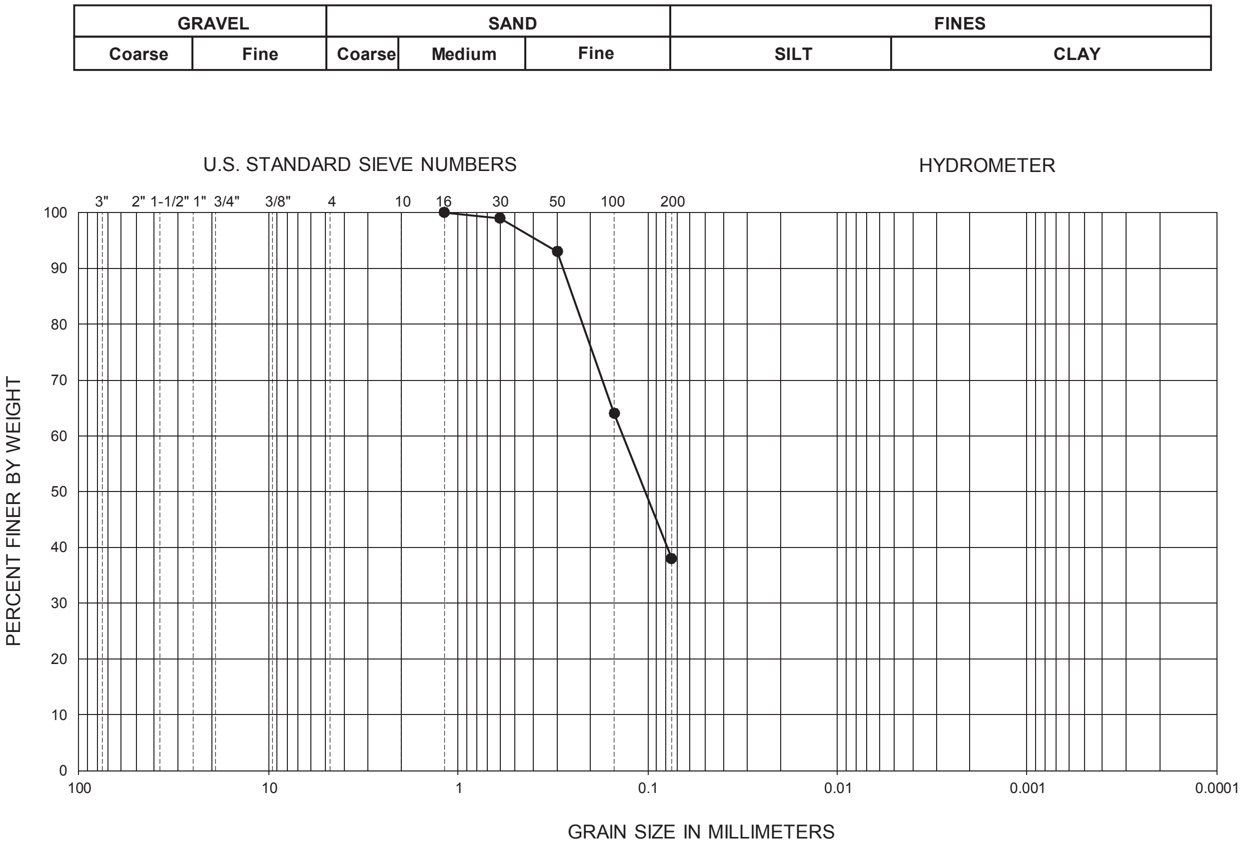

Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-4	25.0-26.5	--	--	--	--	--	0.15	--	--	38	SC

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C 6

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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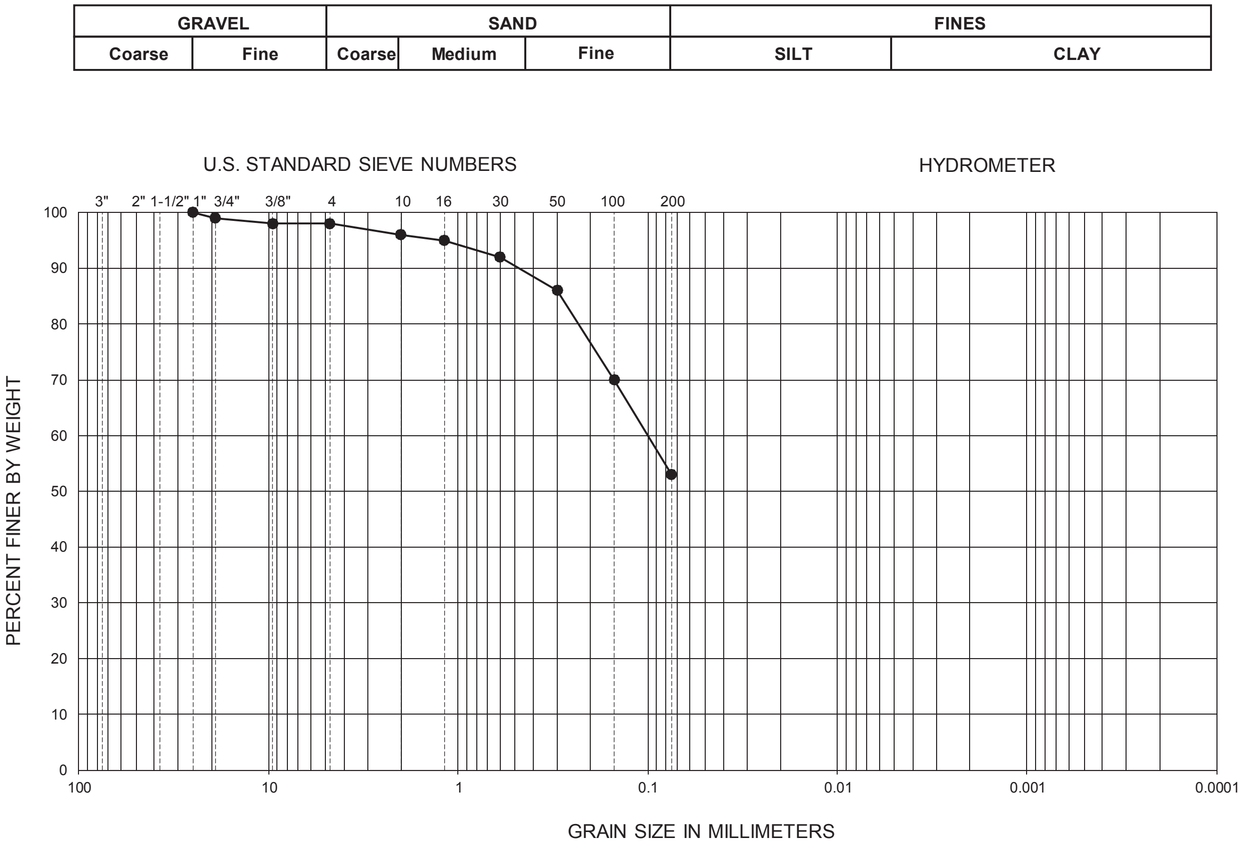

Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-5	1.0-5.0	--	--	--	--	--	0.10	--	--	53	CL

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C-7

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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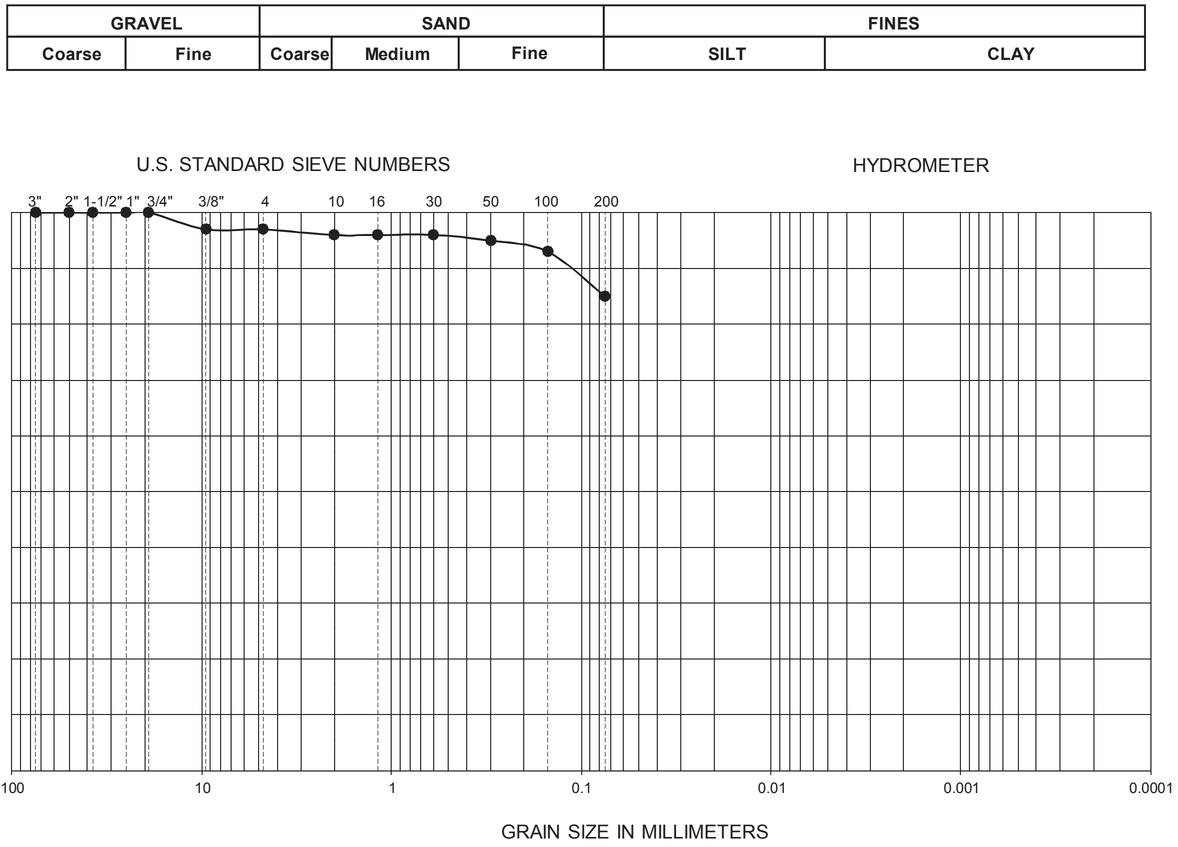

Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-5	10.0-11.5	--	--	--	--	--	--	--	--	85	CH

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C 8

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
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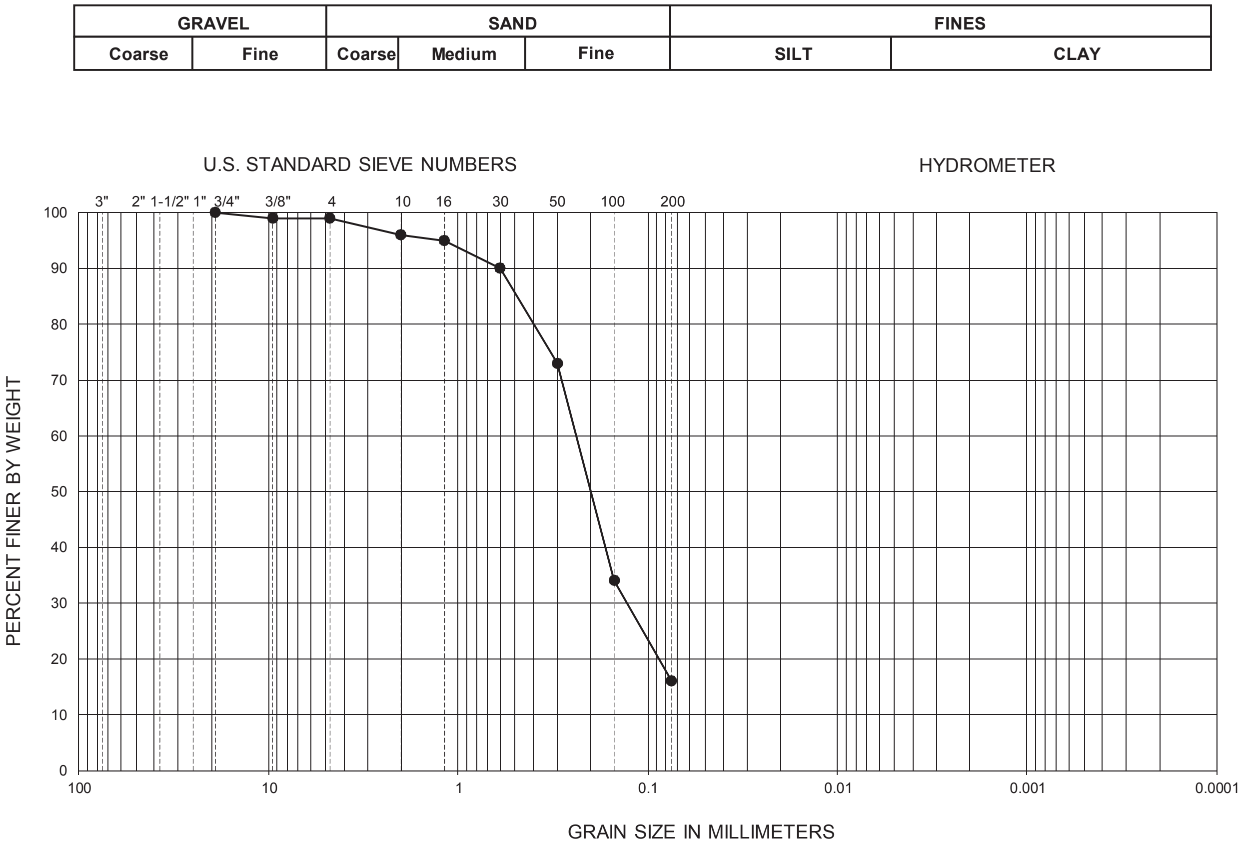

Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-5	28.5-30.0	--	--	--	--	0.70	0.24	--	--	16	SM

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C 9

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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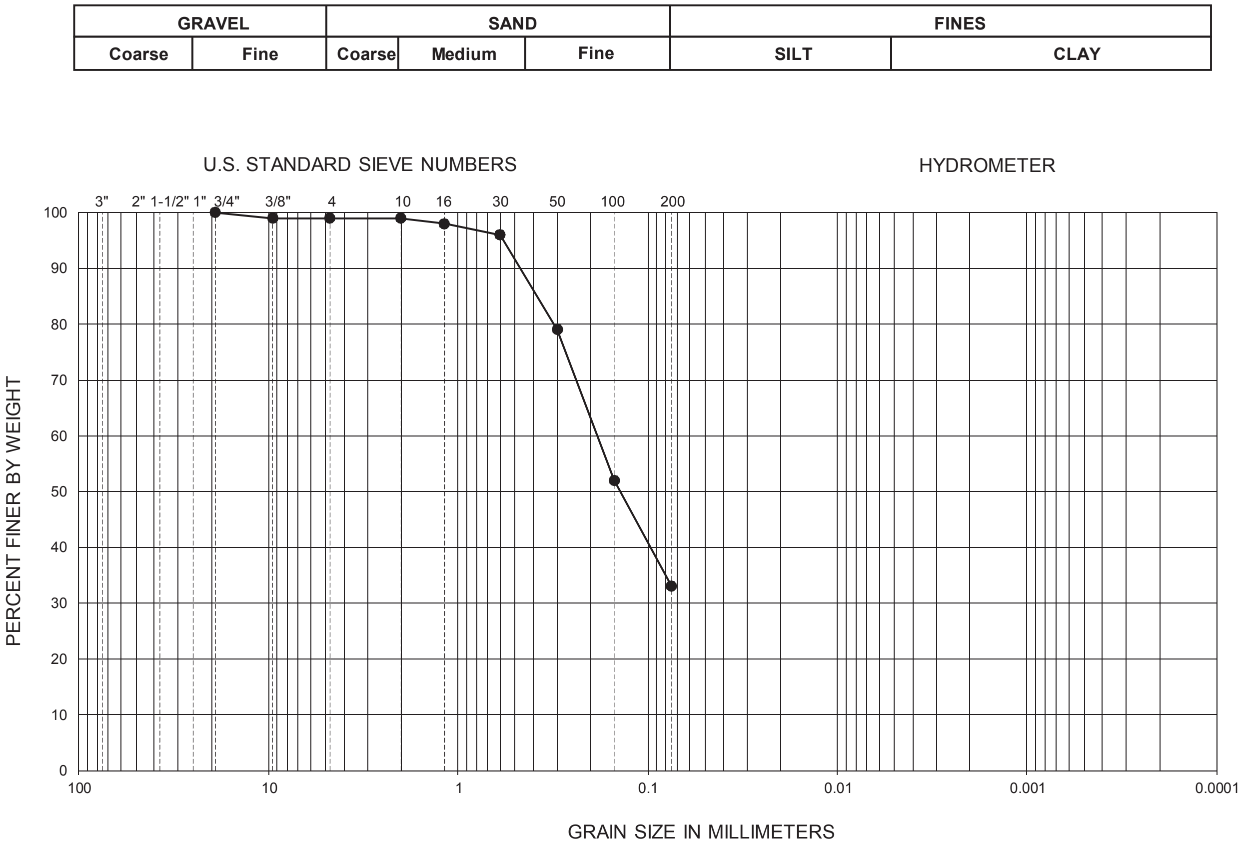

Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-6	6.0-6.5	--	--	--	--	--	0.19	--	--	33	SM

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C 10

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
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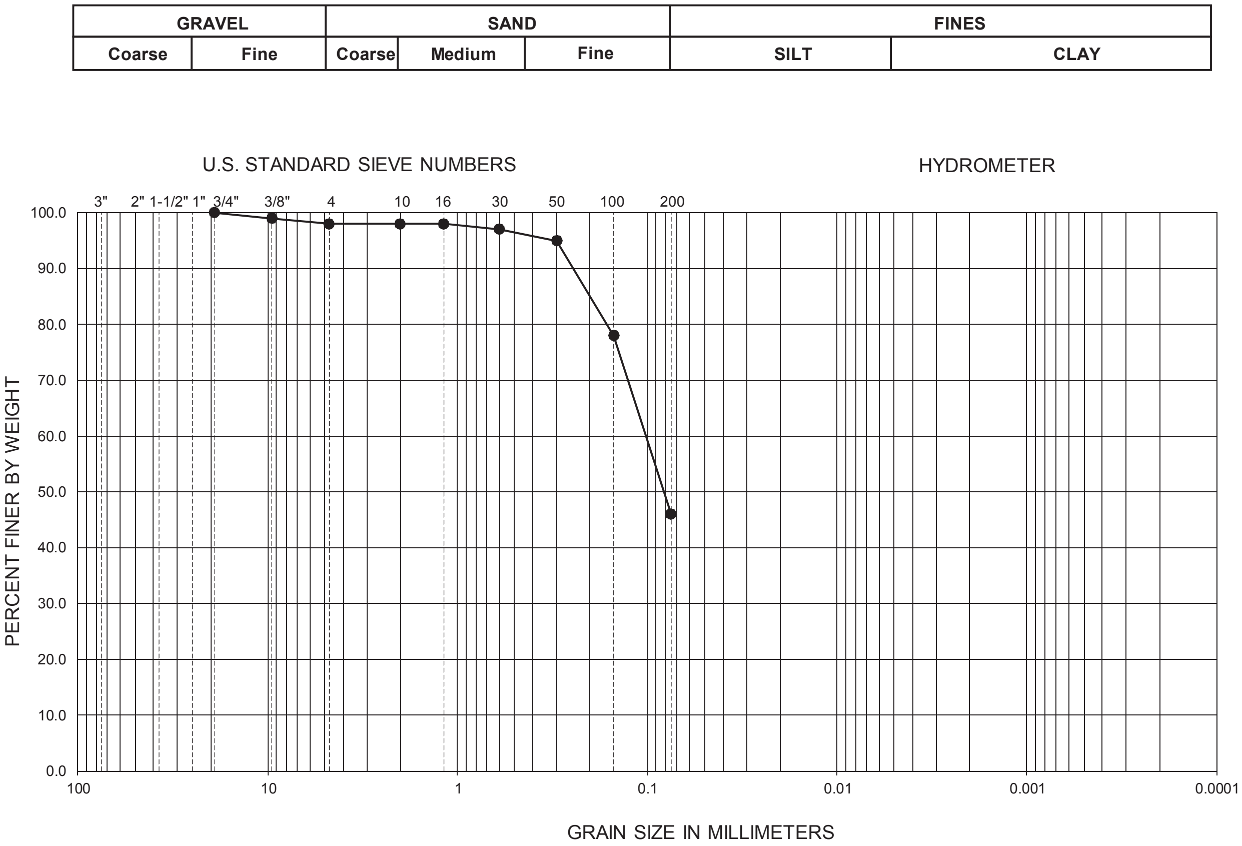

Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-6	9.5-10.0	--	--	--	--	--	0.10	--	--	46	SM

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C 11

GRADATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
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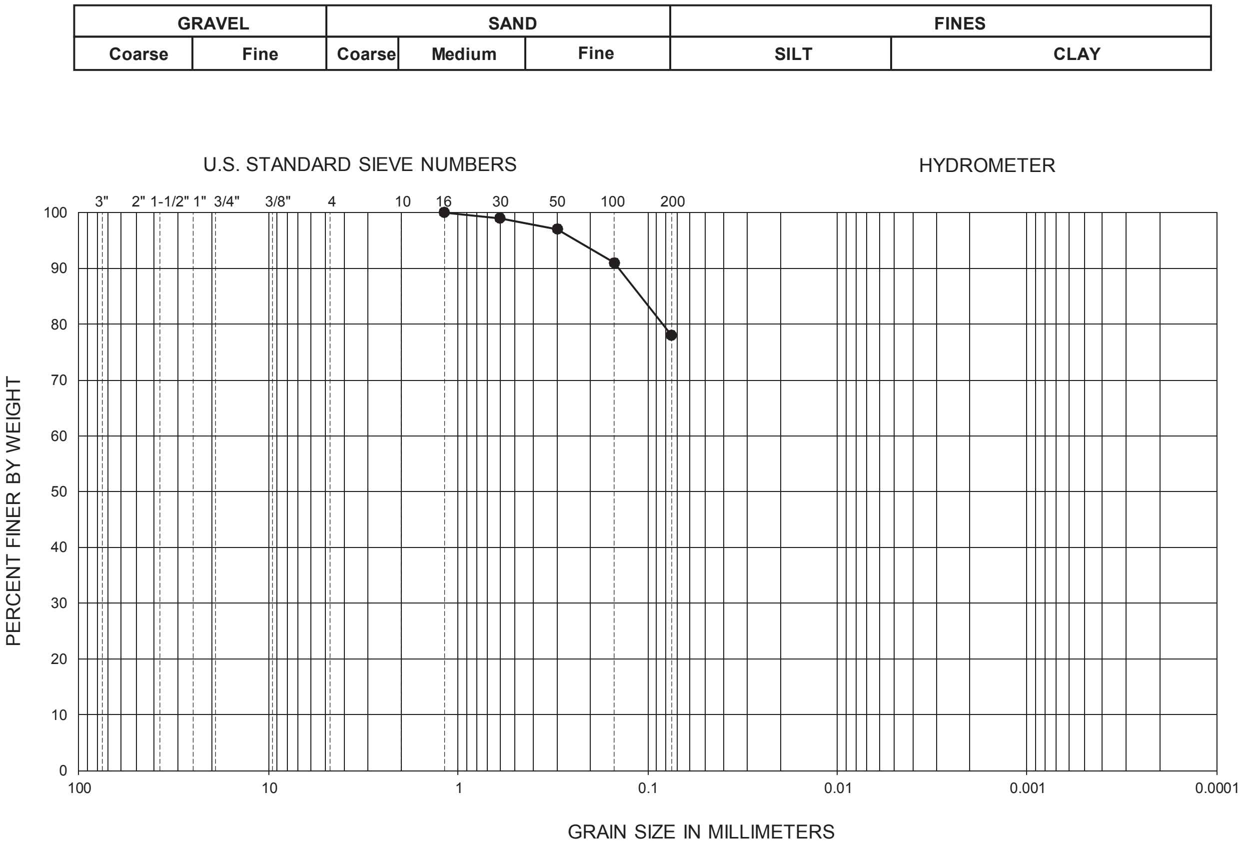

Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-6	28.5-30.0	--	--	--	--	--	--	--	--	78	CL

PERFORMED IN ACCORDANCE WITH ASTM D 422 / D6913

Figure C 12

GRADATION TEST RESULTS

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SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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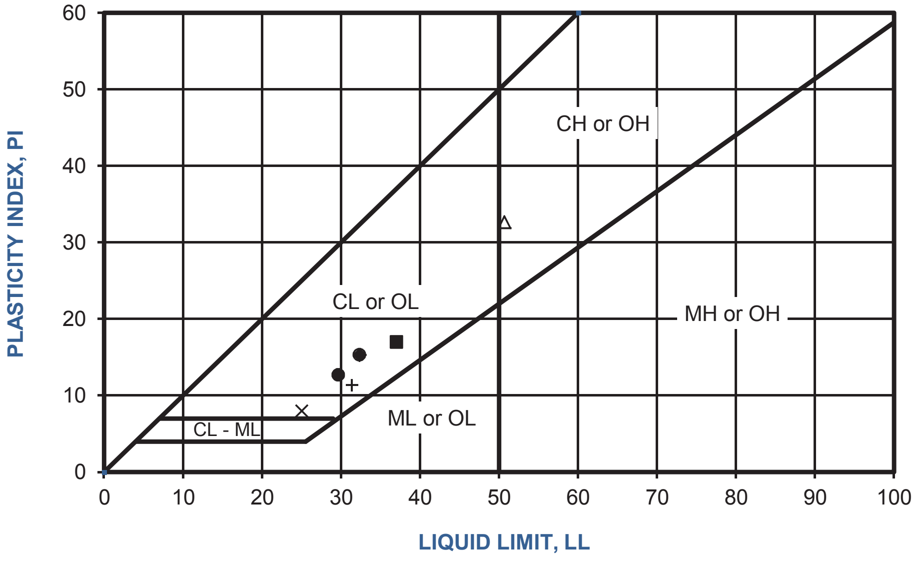
SYMBOL	LOCATION	DEPTH (ft)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS
●	B-1	1.0-5.0	30	17	13	CL	CL
■	B-1	13.5-14.0	37	20	17	CL	CL
◆	B-2	14.5-15.0	32	17	15	CL	CL
○	B-2	24.5-25.0	32	17	15	CL	CL
□	B-3	9.5-10.0	--	--	--	NP	SM
Δ	B-3	19.5-20.0	51	18	33	CH	CH
X	B-3	29.5-30.0	25	17	8	CL	CL
+	B-4	13.5-15.0	31	20	11	CL	CL

NP - INDICATES NON-PLASTIC



PERFORMED IN ACCORDANCE WITH ASTM D 4318

FIGURE C-13

ATTERBERG LIMITS TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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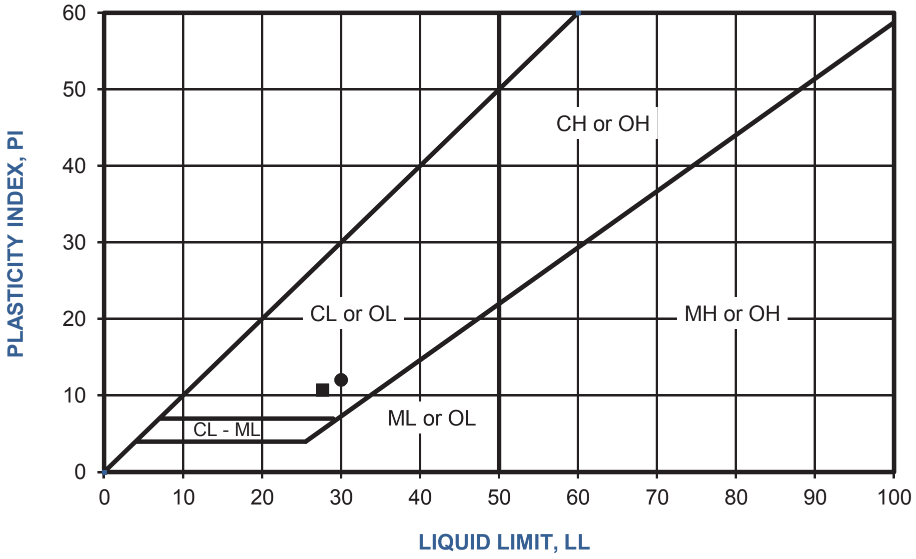
SYMBOL	LOCATION	DEPTH (ft)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS
●	B-5	9.0-9.5	30	18	12	CL	CL
■	B-5	13.5-15.0	28	17	11	CL	CL
◆	B-6	6.0-6.5	--	--	--	NP	NP
○	B-6	14.0-14.5	--	--	--	NP	NP

NP - INDICATES NON-PLASTIC



PERFORMED IN ACCORDANCE WITH ASTM D 4318

FIGURE C-14

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ATTERBERG LIMITS TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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SAMPLE LOCATION	SAMPLE DEPTH (ft)	INITIAL MOISTURE (percent)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (percent)	VOLUMETRIC SWELL (in)	EXPANSION INDEX	POTENTIAL EXPANSION
B-3	1.0-5.0	11.1	106.4	22.4	0.045	45	Low

PERFORMED IN ACCORDANCE WITH ☐ UBC STANDARD 18-2 ☑ ASTM D 4829

FIGURE C-15

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EXPANSION INDEX TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
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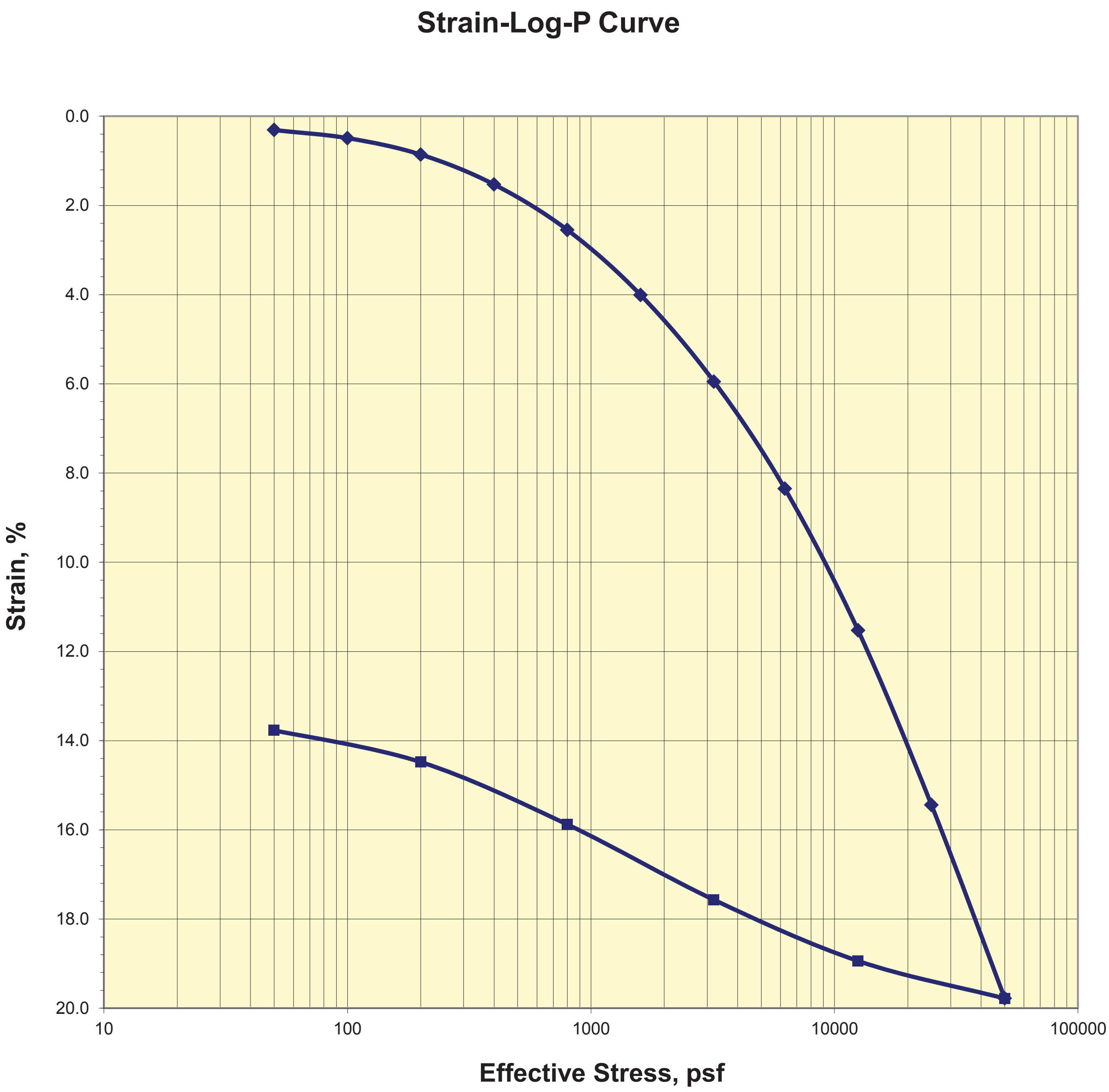

Assumed Gs 2.8	Initial	Final
Moisture %:	33.1	25.5
Dry Density, pcf:	88.5	102.0
Void Ratio:	0.975	0.714
% Saturation:	95.1	100.0

Sample Location	B-3
Depth (ft)	14.5-15.0
Soil Type	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435

FIGURE C-16

CONSOLIDATION TEST RESULTS

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1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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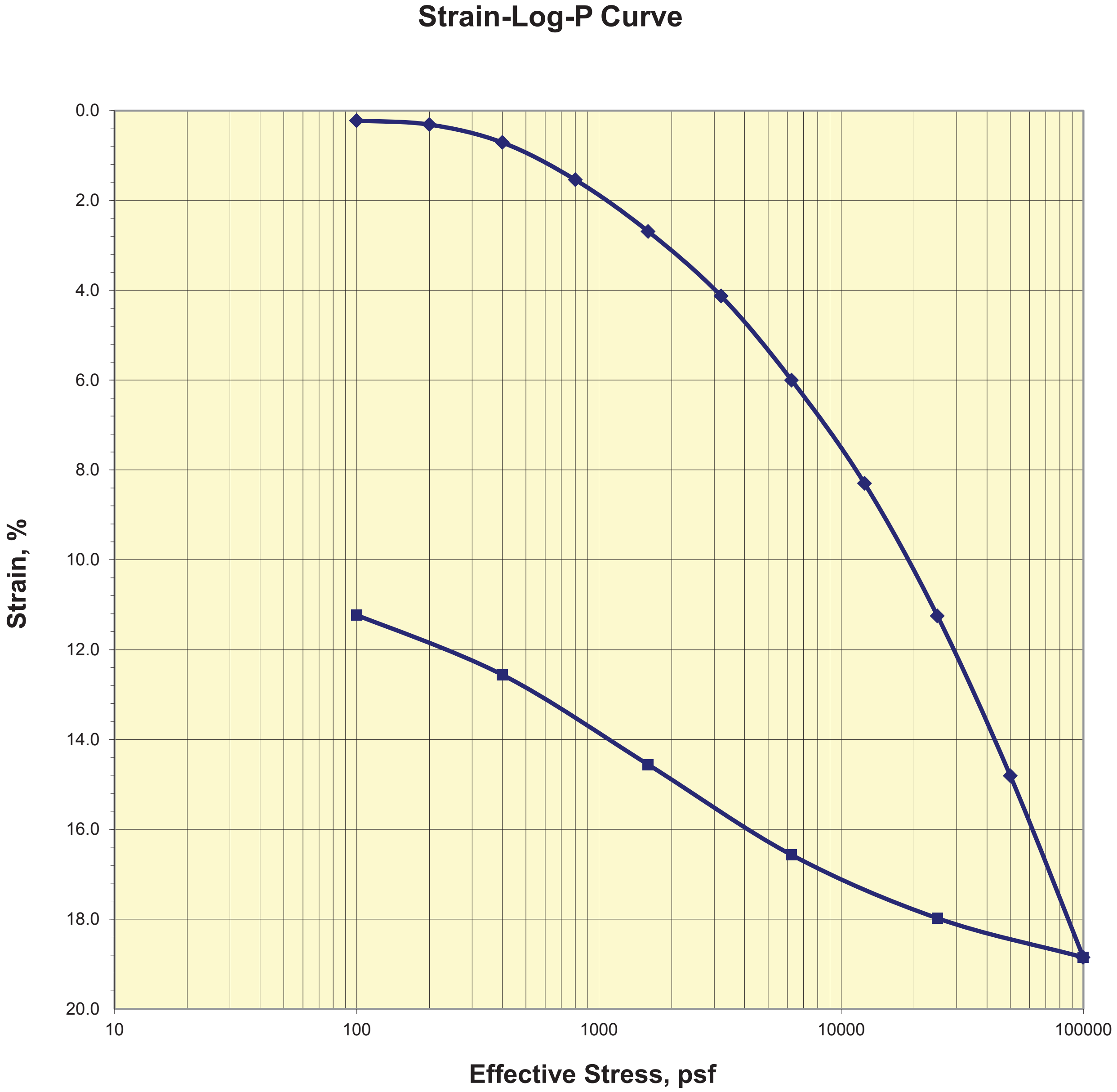

Assumed Gs 2.8	Initial	Final
Moisture %:	26.1	21.6
Dry Density, pcf:	98.9	108.9
Void Ratio:	0.768	0.606
% Saturation:	95.0	100.0

Sample Location	B-5
Depth (ft)	6.0-6.5
Soil Type	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435

FIGURE C-17

CONSOLIDATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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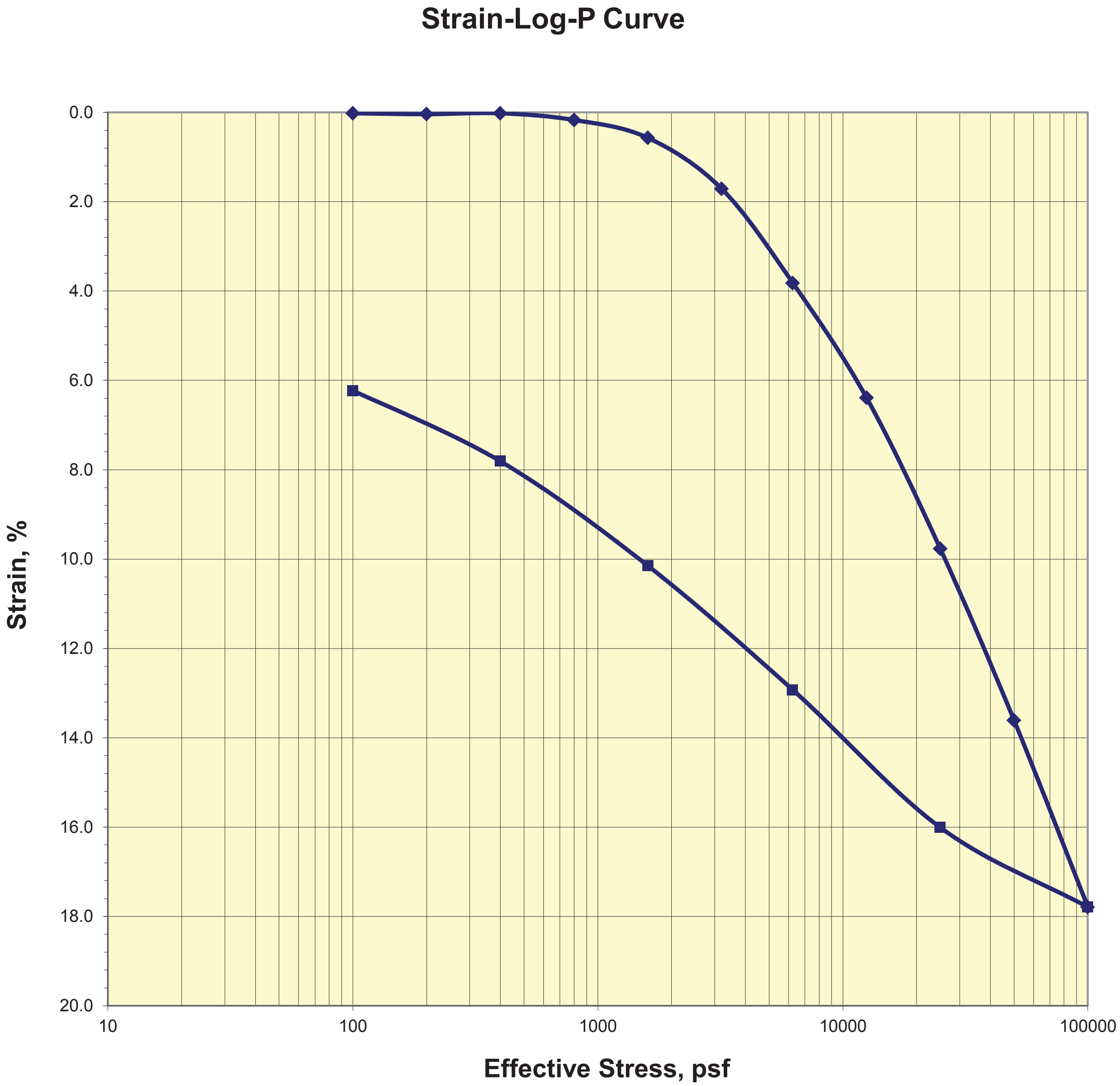

Assumed Gs 2.8	Initial	Final
Moisture %:	25.7	23.4
Dry Density, pcf:	98.6	105.6
Void Ratio:	0.772	0.656
% Saturation:	93.2	100.0

Sample Location B-5
Depth (ft) 19.5-20.0
Soil Type CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435

FIGURE C-18

CONSOLIDATION TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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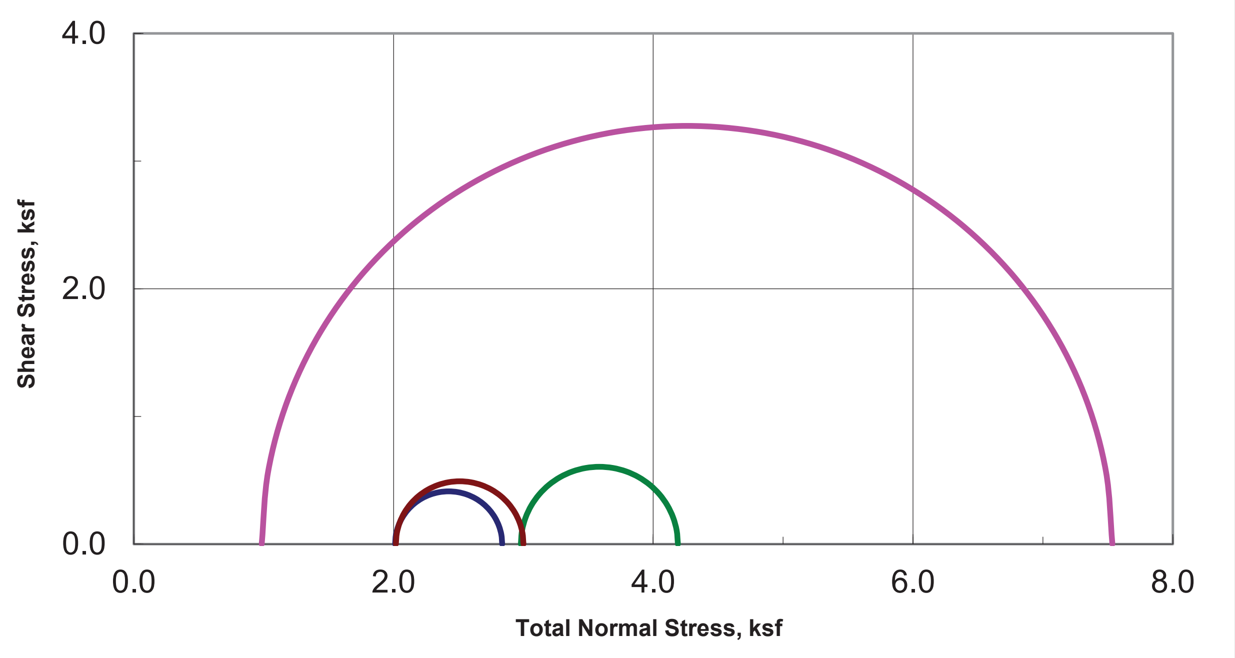
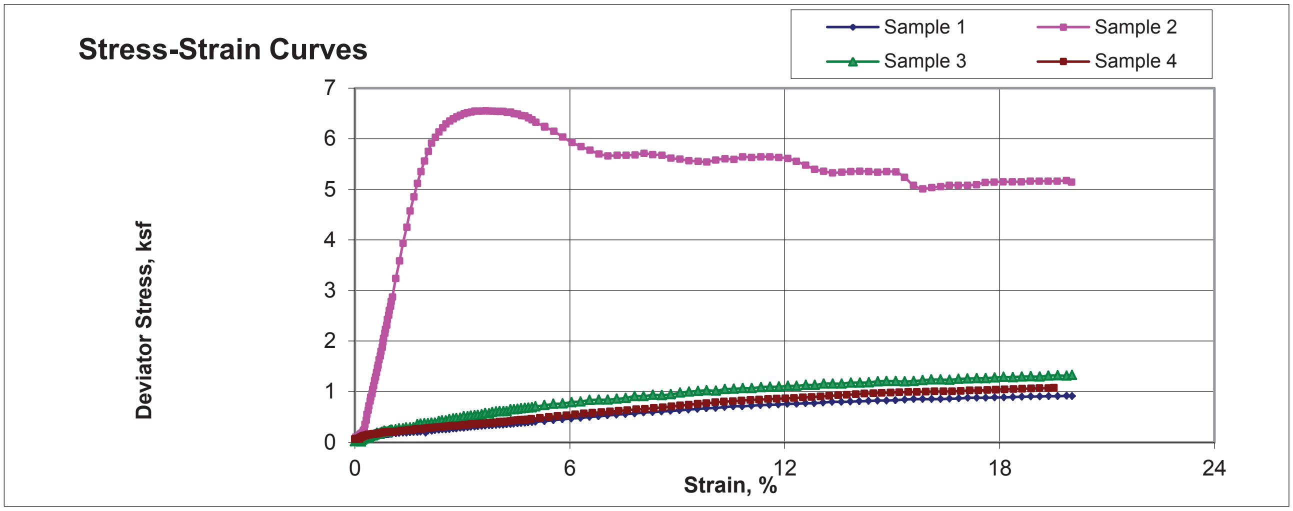
Geotechnical & Environmental Sciences Consultants





SYMBOL	DESCRIPTION	SOIL TYPE	SAMPLE LOCATION	SAMPLE DEPTH (ft.)	MOISTURE CONTENT w, (%)	DRY DENSITY γ_d, (pcf)	CELL PRESSURE (psi)	DEVIATOR (ksf)
◆	Reddish Brown Sandy CLAY	CL	B-2	14.0-14.5	32.9	88.4	14.00	0.83
■	Yellowish Brown Sandy CLAY	CL	B-4	6.0-6.5	11.6	112.2	6.80	6.55
▲	Yellowish Brown Sandy CLAY	CL	B-5	24.5-25.0	20.7	107.9	20.70	1.21
■	Yellowish Brown CLAY w/Sand	CL	B-6	14.5-15	31.8	90.5	31.80	0.98

PERFORMED IN ACCORDANCE WITH ASTM D 2850
STRAIN RATE: 1.0%/MIN

FIGURE C 19

UNCONSOLIDATED-UNDRAINED TRIAXIAL TEST

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

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SAMPLE LOCATION	SAMPLE DEPTH (ft)	pH [1]	RESISTIVITY [1] (ohm-cm)	SULFATE CONTENT [2]		CHLORIDE CONTENT [3] (ppm)
				(ppm)	(%)	
B-4	1.0-5.0	8.1	770	470	0.047	375

[1] PERFORMED IN ACCORDANCE WITH CALIFORNIA TEST METHOD 643
[2] PERFORMED IN ACCORDANCE WITH CALIFORNIA TEST METHOD 417
[3] PERFORMED IN ACCORDANCE WITH CALIFORNIA TEST METHOD 422

FIGURE C-20

CORROSIVITY TEST RESULTS

SJSU PARKING GARAGE, TRACK & FIELD FACILITY
1312 SOUTH TENTH STREET, SAN JOSE, CALIFORNIA

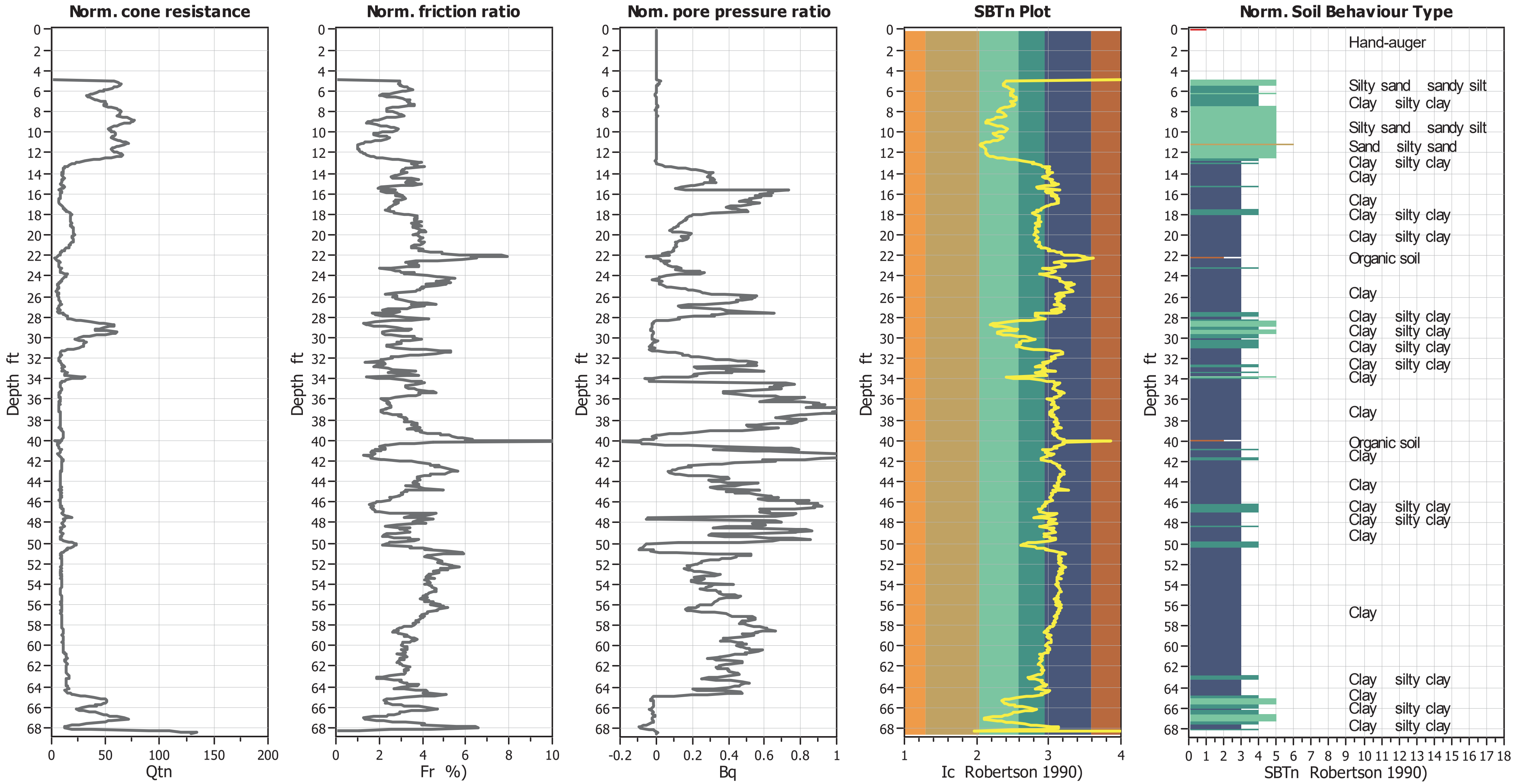
Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

403335001 | 3/19

APPENDIX D

Calculations

CPT basic interpretation plots (normalized)



Input parameters and analysis data

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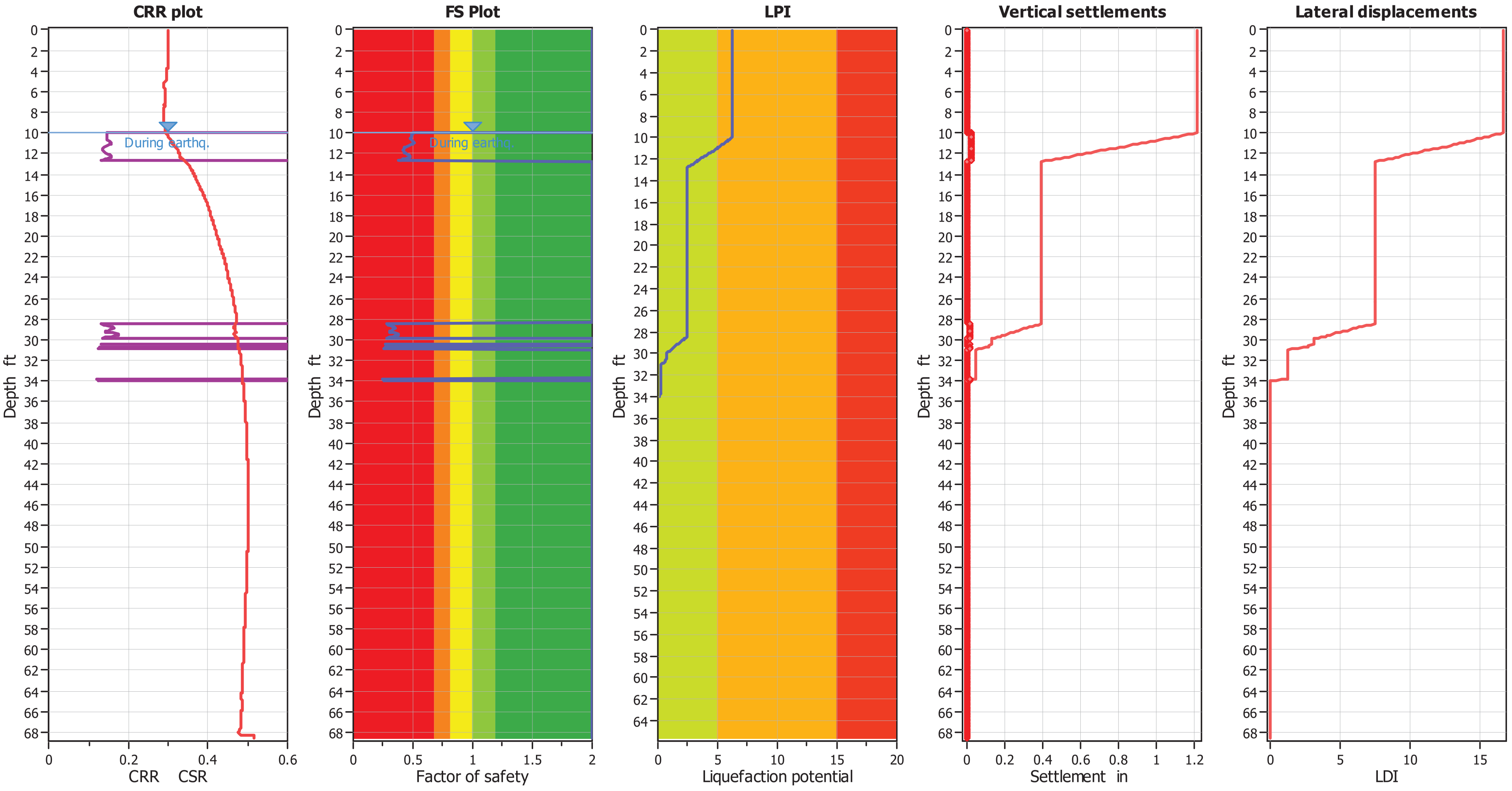
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.51	Use fill:	No	Limit depth applied:	Yes
Depth to water table insitu :	12.80 ft	Fill height:	N/A	Limit depth:	50.00 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



Input parameters and analysis data

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Fines correction method: B&I 2014)
Points to test: Based on Ic value
Earthquake magnitude M_w: 7.30
Peak ground acceleration: 0.51
Depth to water table insitu : 12.80 ft

Depth to GWT (erthq. : 10.00 ft
Average results interval: 1
Ic cut-off value: 2.60
Unit weight calculation: Based on SBT
Use fill: No
Fill height: N/A

Fill weight: N/A
Transition detect. applied: No
K_σ applied: Yes
Clay like behavior applied: Sands only
Limit depth applied: Yes
Limit depth: 50.00 ft

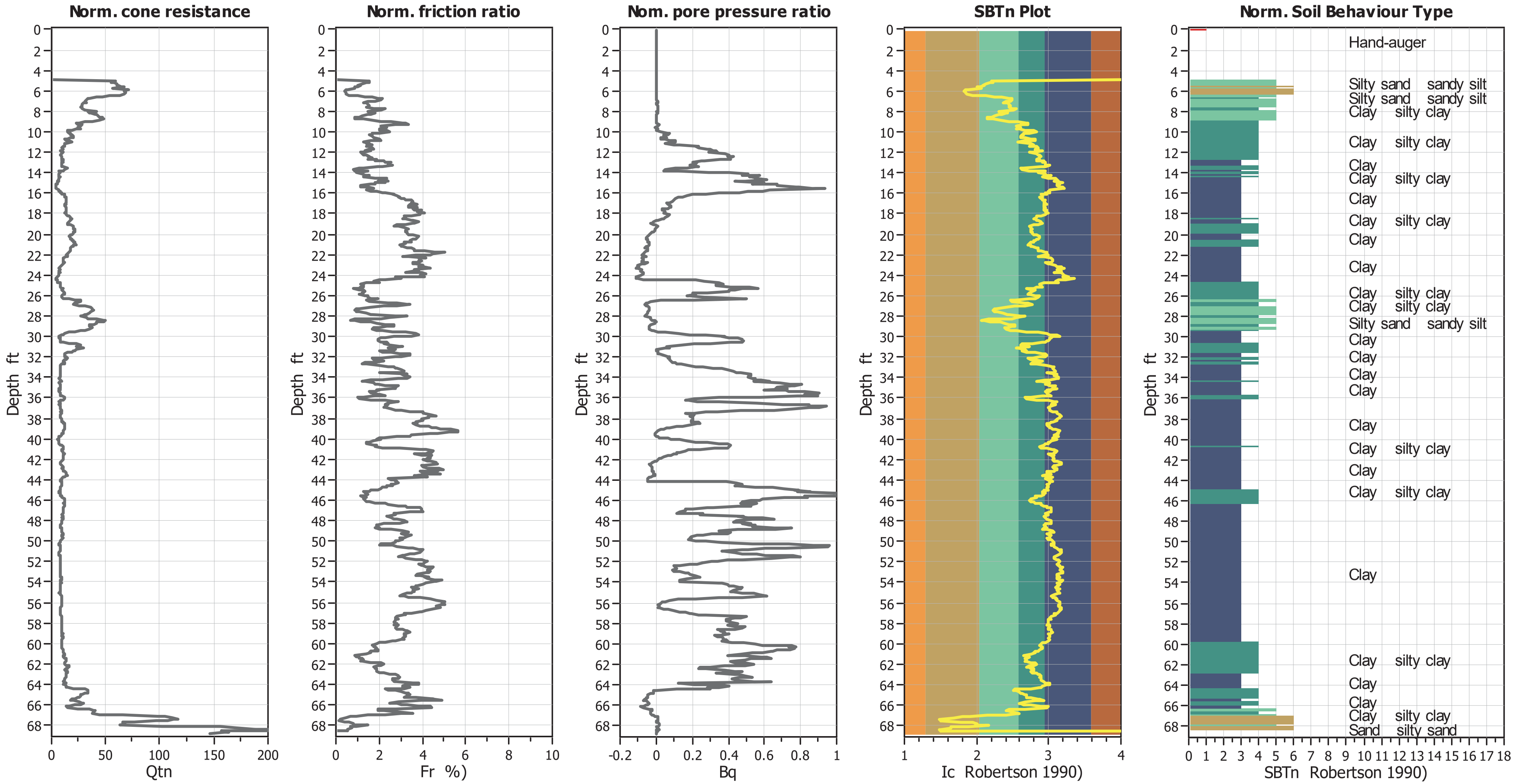
F.S. color scheme

- 🟥 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

CPT basic interpretation plots (normalized)



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Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.51	Use fill:	No	Limit depth applied:	Yes
Depth to water table insitu :	13.80 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

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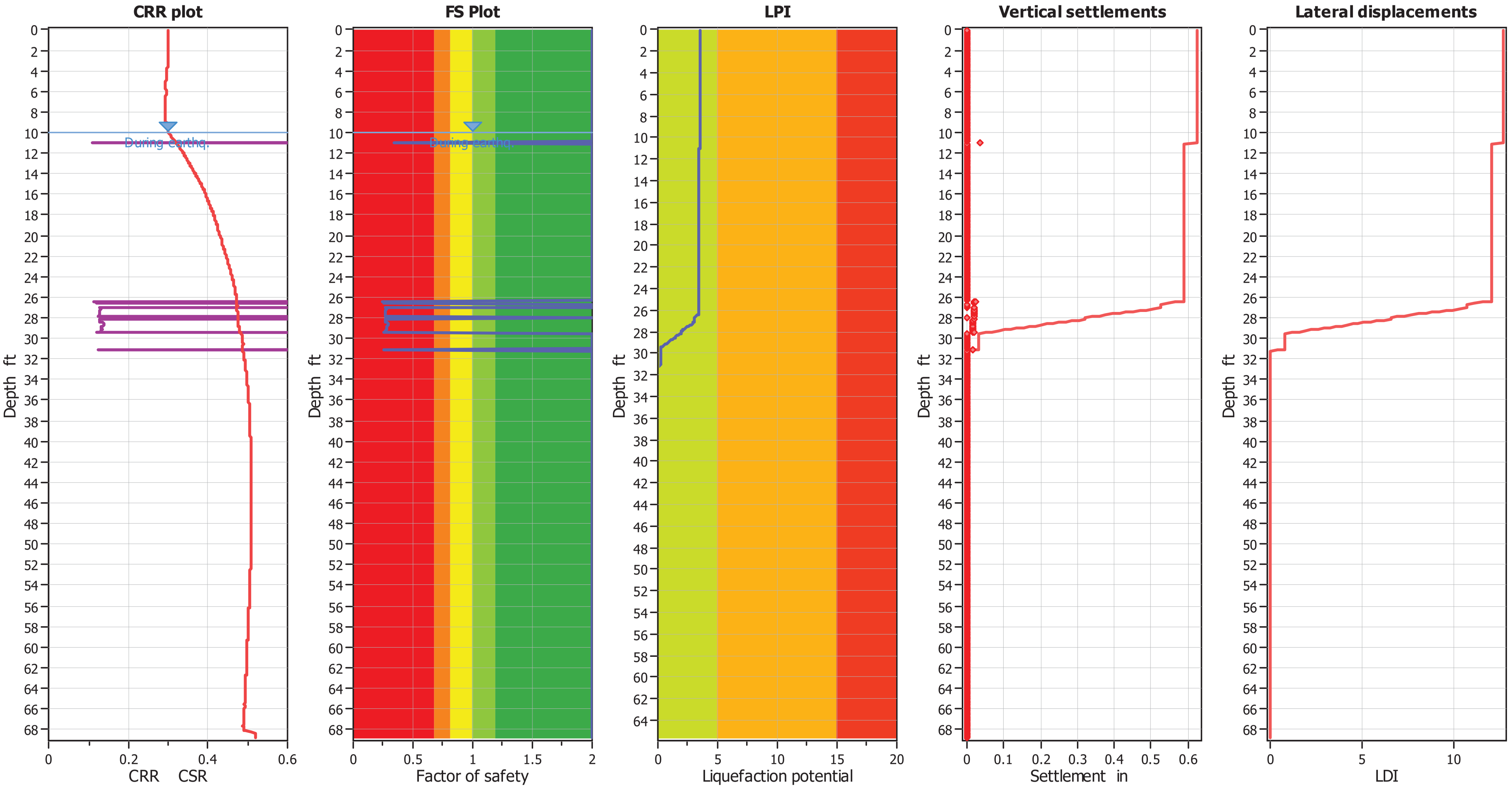
- ⬛ 8. Very stiff sand to
- ⬜ 9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

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Fines correction method: B&I 2014)
Points to test: Based on Ic value
Earthquake magnitude M_w: 7.30
Peak ground acceleration: 0.51
Depth to water table insitu : 13.80 ft

Depth to GWT (erthq. : 10.00 ft
Average results interval: 1
Ic cut-off value: 2.60
Unit weight calculation: Based on SBT
Use fill: No
Fill height: N/A

Fill weight: N/A
Transition detect. applied: No
K_σ applied: Yes
Clay like behavior applied: Sands only
Limit depth applied: Yes
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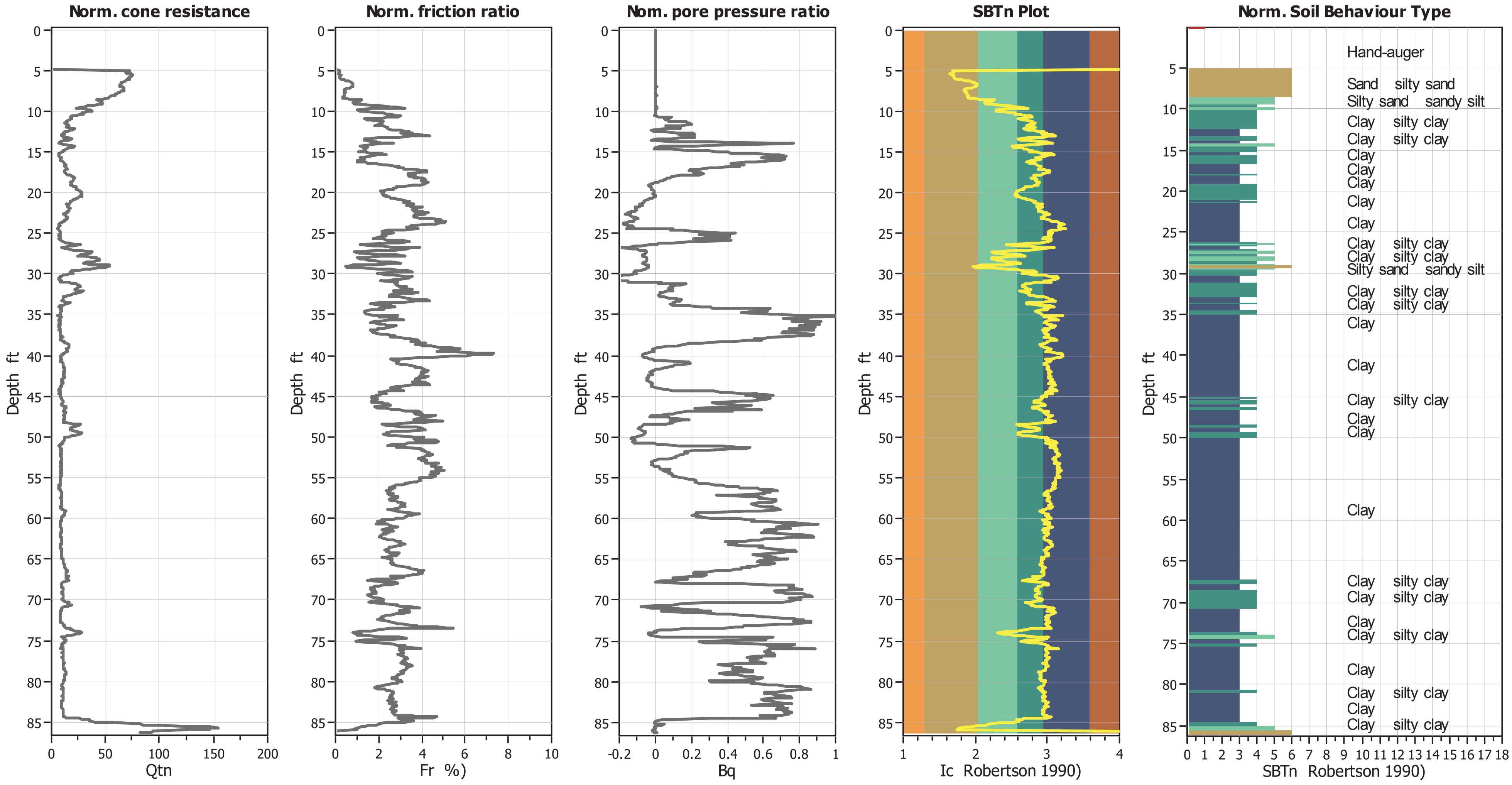

Input parameters and analysis data

Analysis method:	B&I 2014)	Depth to GWT (erthq. :	10.00 ft	Fill weight:	N/A
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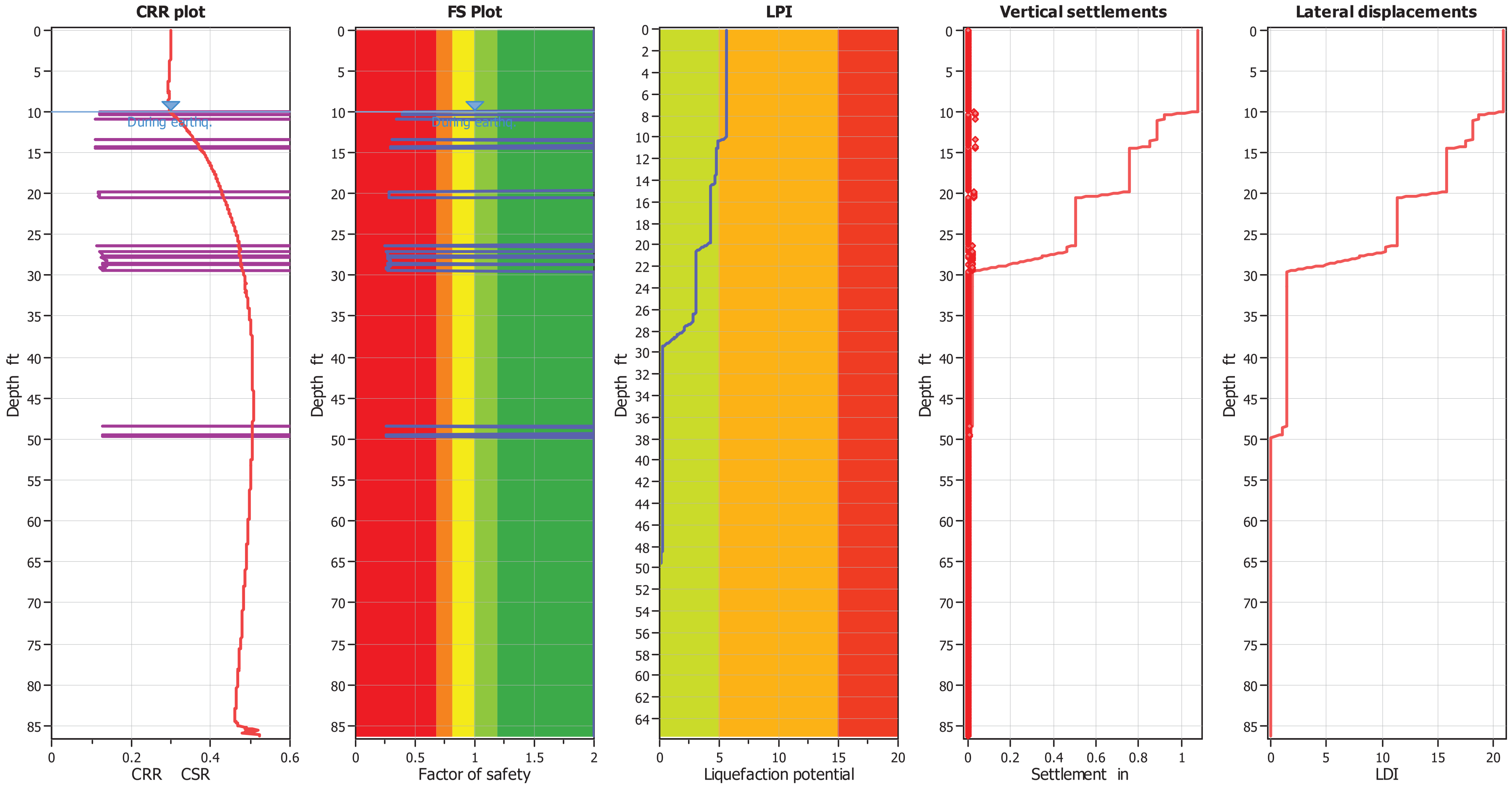
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.51	Use fill:	No	Limit depth applied:	Yes
Depth to water table insitu :	11.70 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

🟥 1. Sensitive fine grained	🟩 4. Clayey silt to silty	🟧 7. Gravely sand to sand
🟫 2. Organic material	🟩 5. Silty sand to sandy silt	⬜ 8. Very stiff sand to
🟦 3. Clay to silty clay	🟨 6. Clean sand to silty sand	⬜ 9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

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Fines correction method:	B&I 2014)	Average results interval:	1	Transition detect. applied:	No
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Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.51	Use fill:	No	Limit depth applied:	Yes
Depth to water table insitu :	11.70 ft	Fill height:	N/A	Limit depth:	50.00 ft

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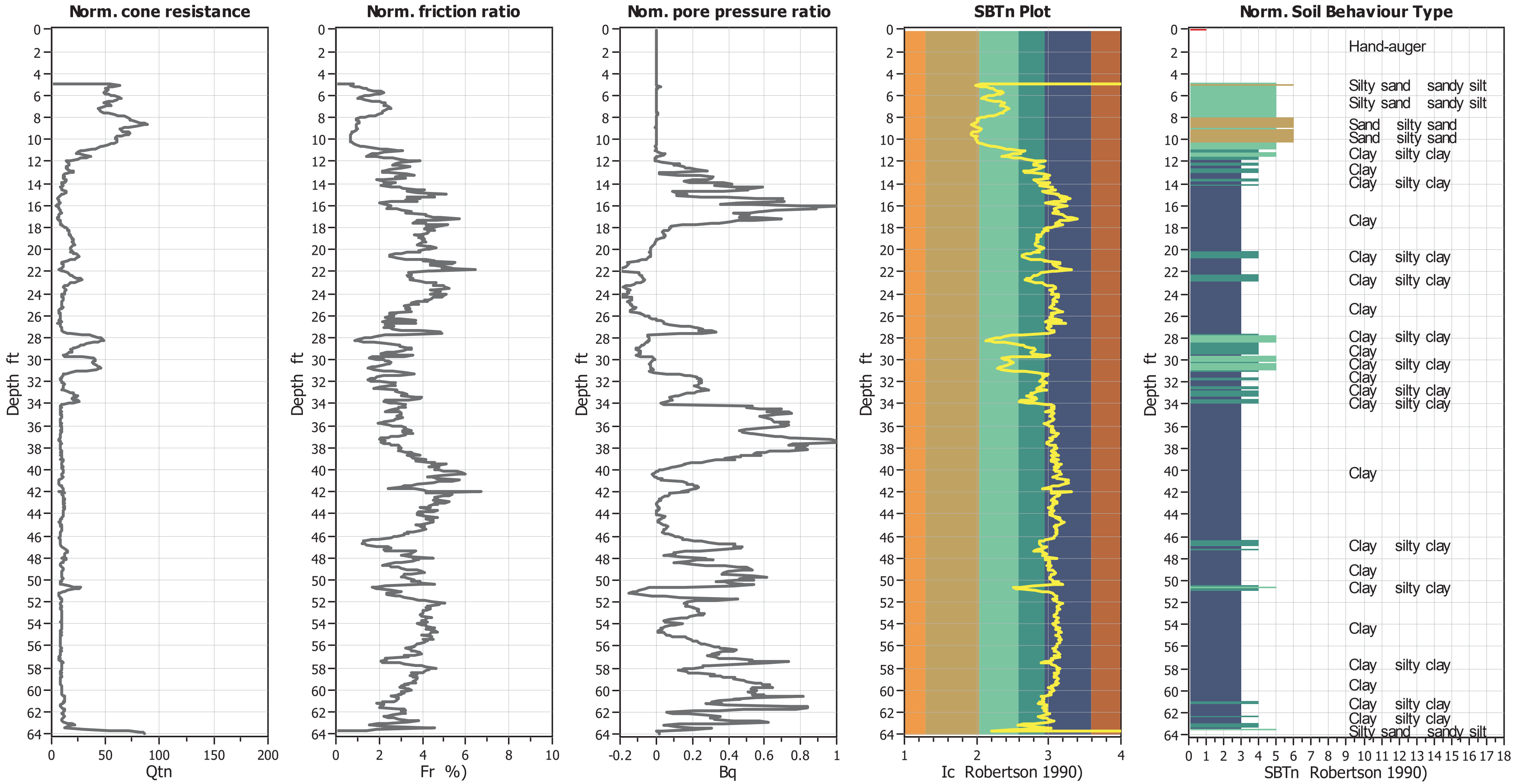

Input parameters and analysis data

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Fines correction method:	B&I 2014)	Average results interval:	1	Transition detect. applied:	No
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Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.51	Use fill:	No	Limit depth applied:	Yes
Depth to water table insitu :	11.60 ft	Fill height:	N/A	Limit depth:	50.00 ft

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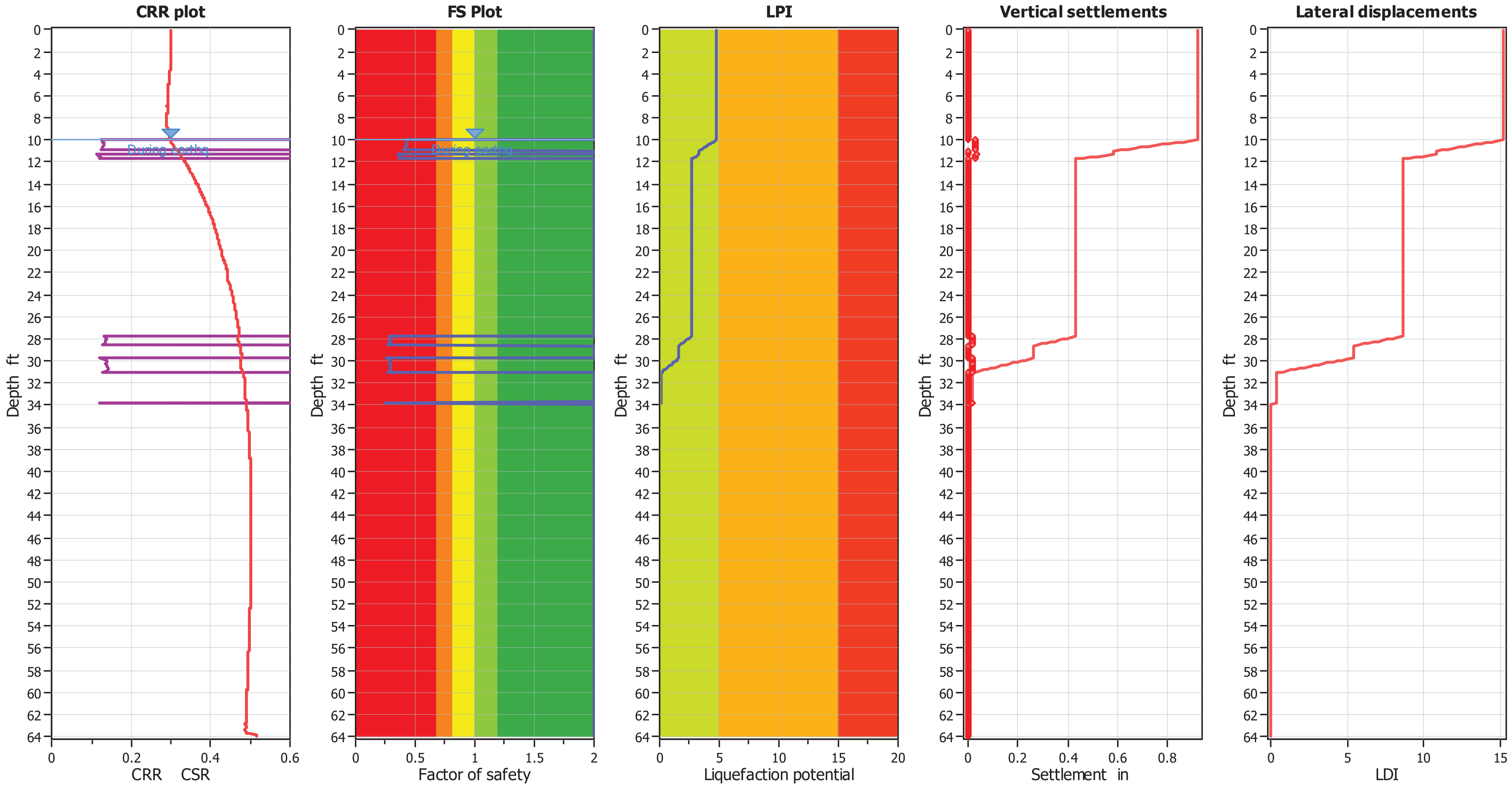
- ⬛ 8. Very stiff sand to
- ⬜ 9. Very stiff fine grained

Liquefaction analysis overall plots


CRR plot

FS Plot

LPI

Vertical settlements

Lateral displacements

Input parameters and analysis data

Analysis method: B&I 2014)
Fines correction method: B&I 2014)
Points to test: Based on Ic value
Earthquake magnitude M_w: 7.30
Peak ground acceleration: 0.51
Depth to water table insitu : 11.60 ft

Depth to GWT (erthq. : 10.00 ft
Average results interval: 1
Ic cut-off value: 2.60
Unit weight calculation: Based on SBT
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Fill height: N/A

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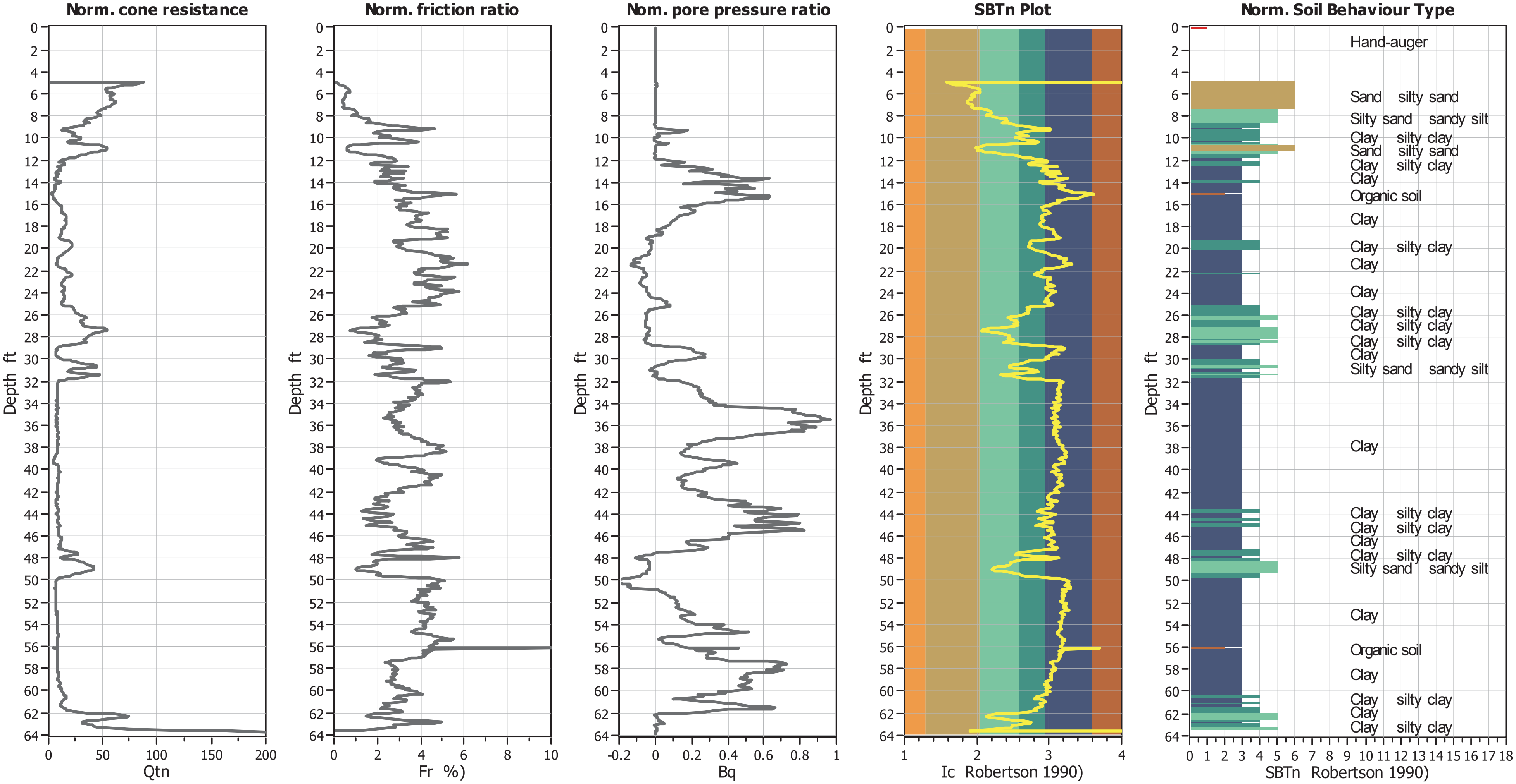

Input parameters and analysis data

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Fines correction method:	B&I 2014)	Average results interval:	1	Transition detect. applied:	No
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Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.51	Use fill:	No	Limit depth applied:	Yes
Depth to water table insitu :	15.80 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

🟥 1. Sensitive fine grained	🟩 4. Clayey silt to silty	🟧 7. Gravely sand to sand
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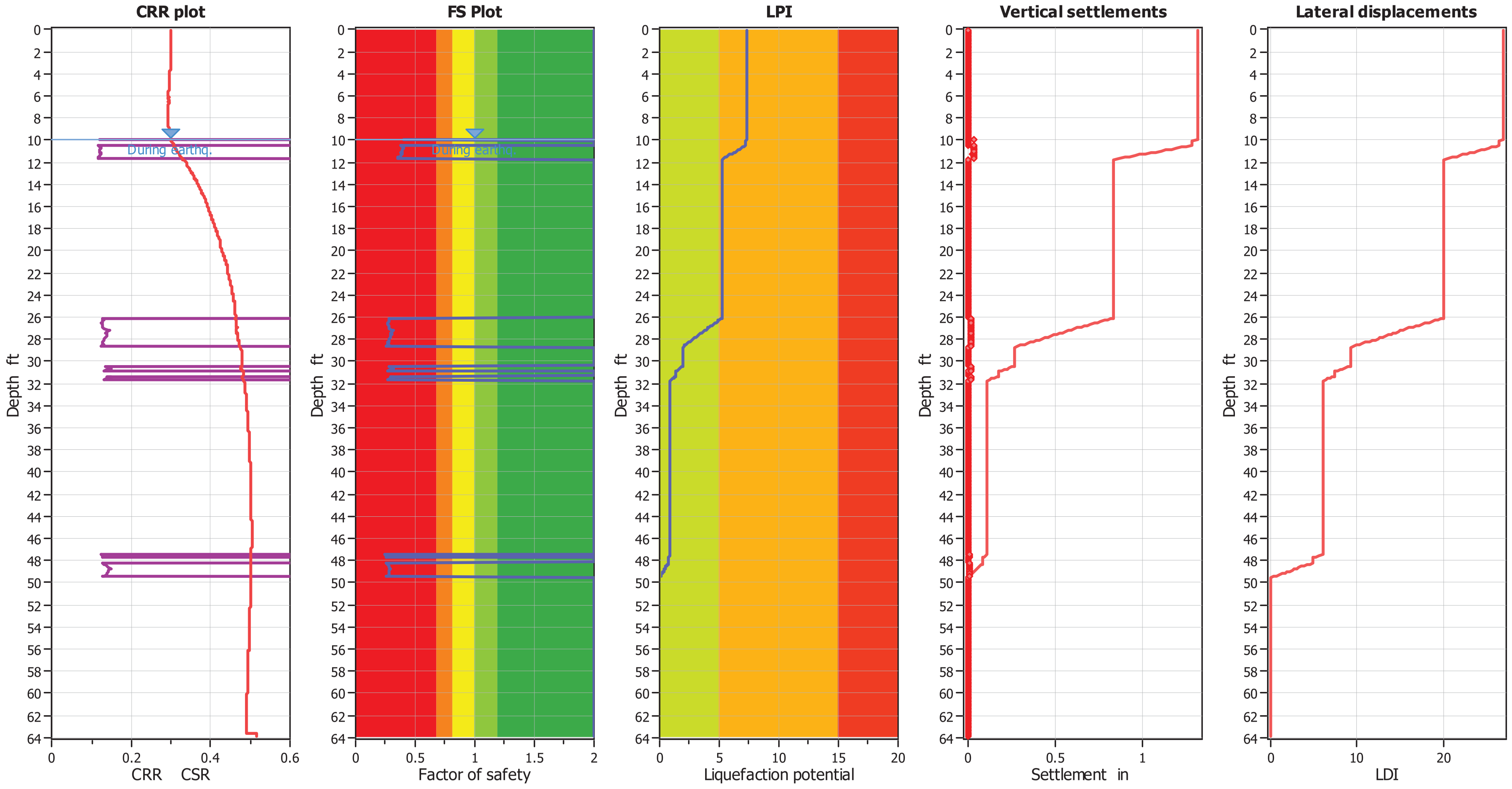
🟦 3. Clay to silty clay	🟨 6. Clean sand to silty sand	⬜ 9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

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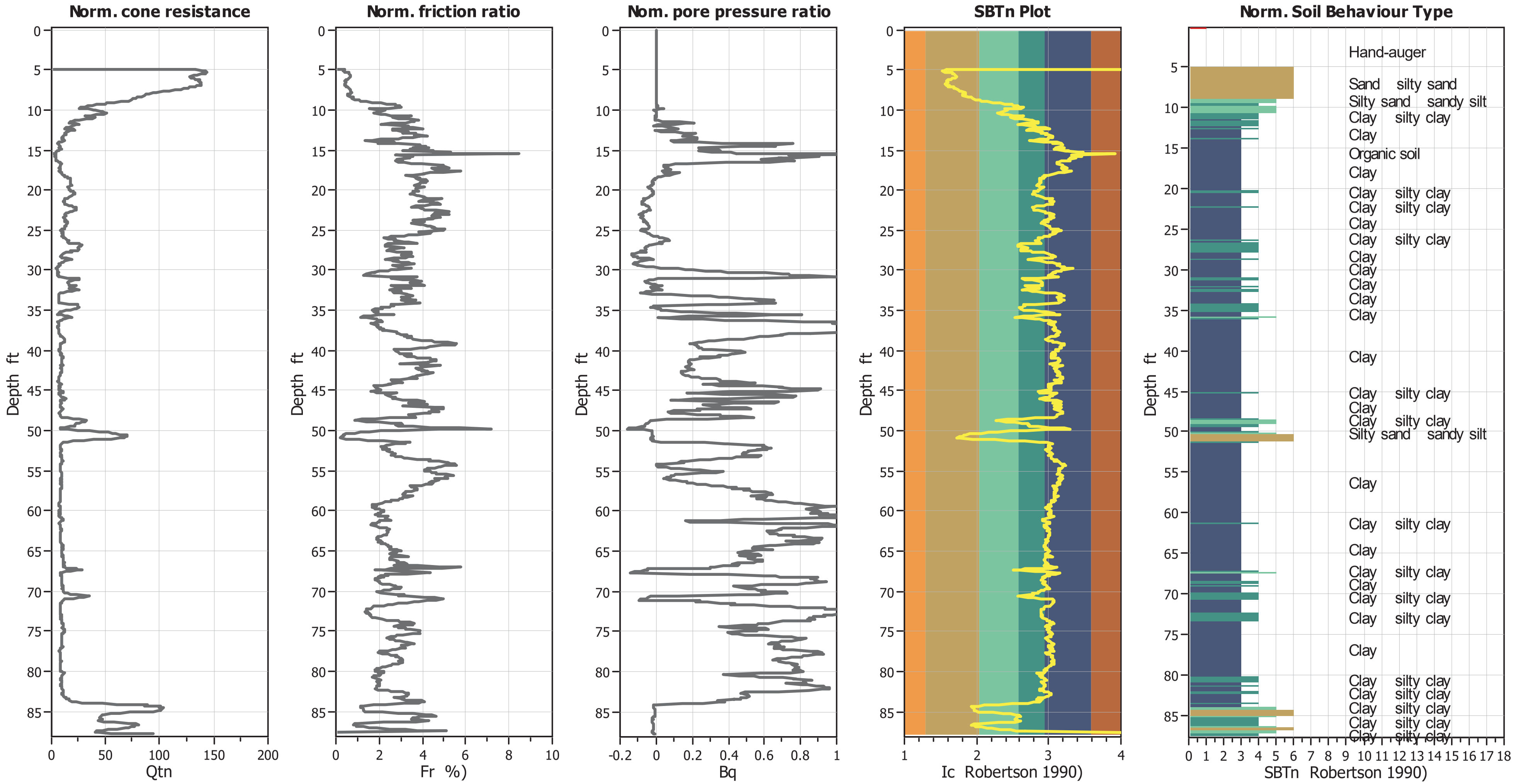
Project file: \\GC-OAK\Documents$\tsneddon\My Documents\Work\0_Projects\403335001_SJSU_South Campus Parking Garage\GEOTECHNICAL ANALYSIS\403335001 - Liquefaction Analysis.clq

CPT basic interpretation plots (normalized)



Input parameters and analysis data

Analysis method: B&I 2014)
Fines correction method: B&I 2014)
Points to test: Based on Ic value
Earthquake magnitude M_w: 7.30
Peak ground acceleration: 0.51
Depth to water table insitu : 16.10 ft

Depth to GWT (erthq. : 10.00 ft
Average results interval: 1
Ic cut-off value: 2.60
Unit weight calculation: Based on SBT
Use fill: No
Fill height: N/A

Fill weight: N/A
Transition detect. applied: No
K_σ applied: Yes
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Limit depth: 50.00 ft

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- ⬛ 8. Very stiff sand to
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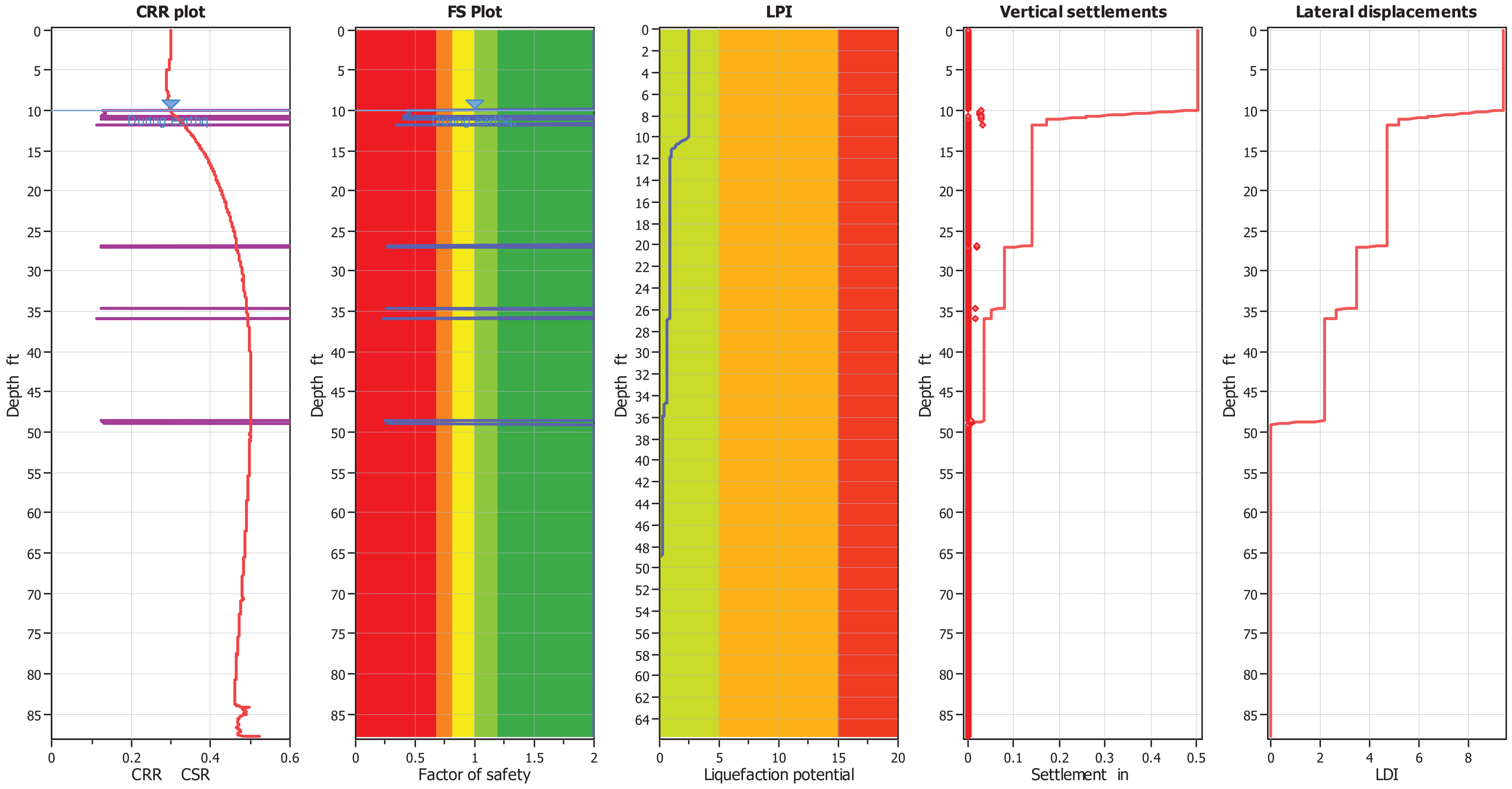
Liquefaction analysis overall plots



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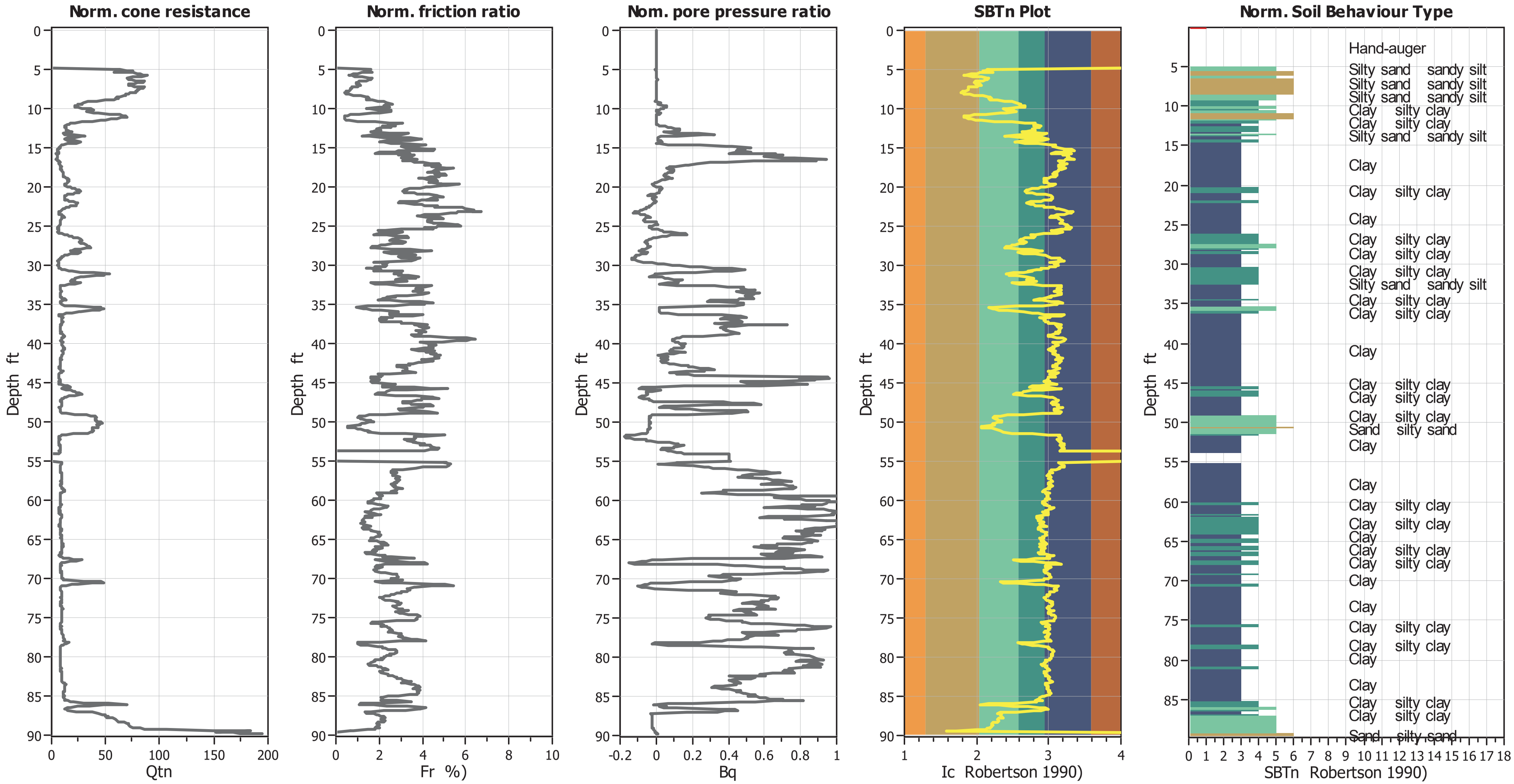
CPT basic interpretation plots (normalized)



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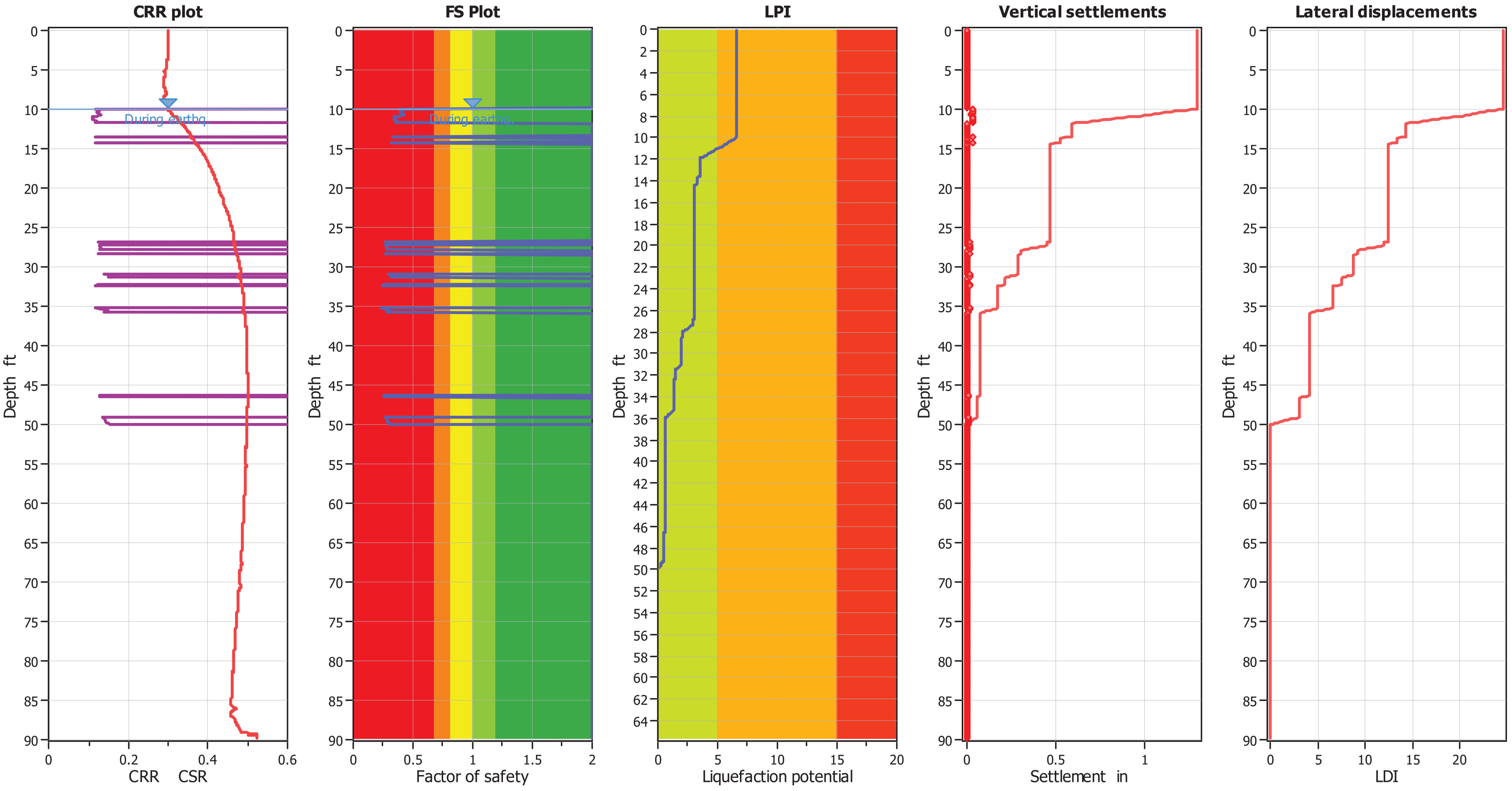
Liquefaction analysis overall plots



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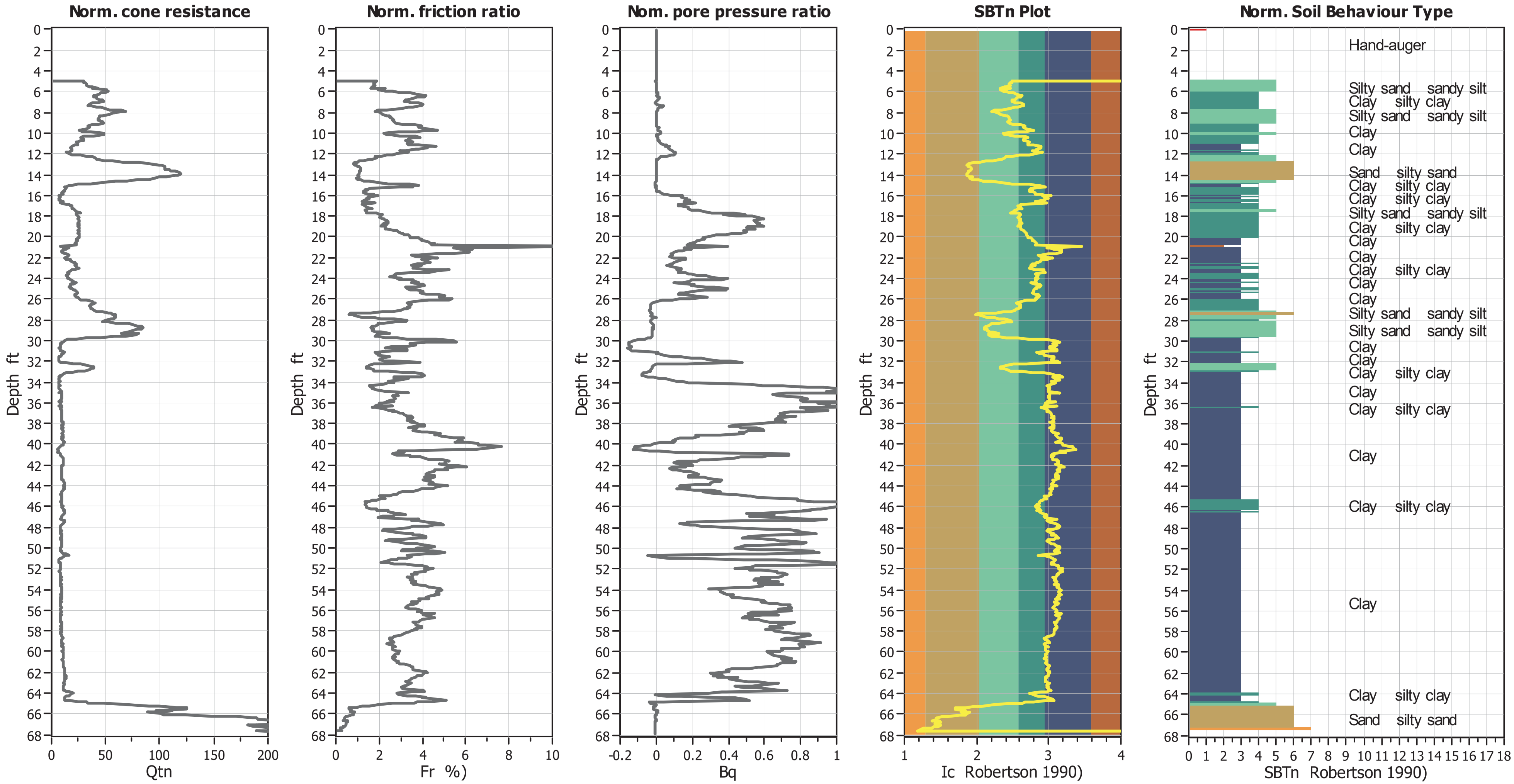

Input parameters and analysis data

Analysis method: B&I 2014)
Fines correction method: B&I 2014)
Points to test: Based on Ic value
Earthquake magnitude M_w: 7.30
Peak ground acceleration: 0.51
Depth to water table insitu : 11.90 ft

Depth to GWT (erthq. : 10.00 ft
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Unit weight calculation: Based on SBT
Use fill: No
Fill height: N/A

Fill weight: N/A
Transition detect. applied: No
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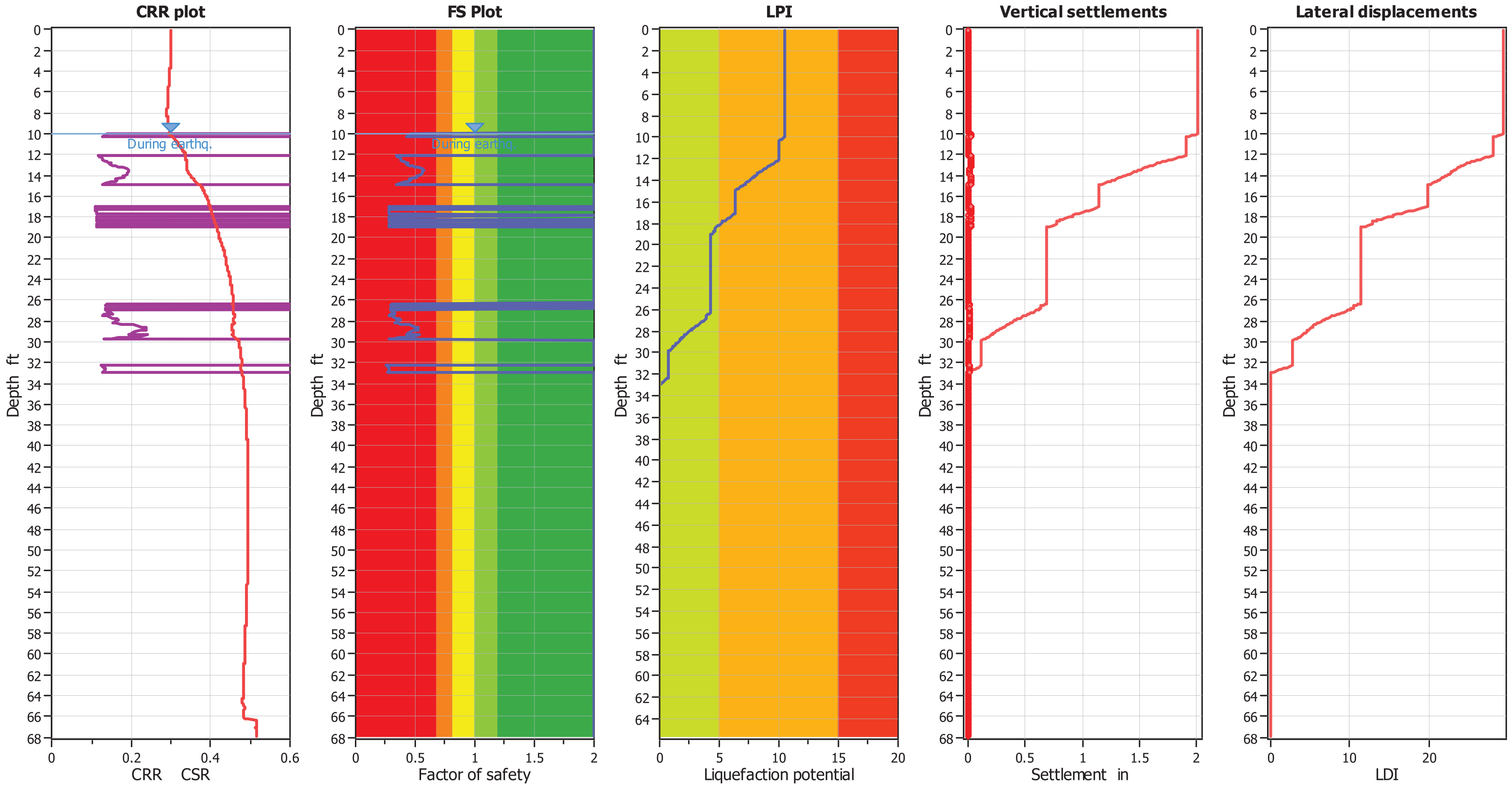
Liquefaction analysis overall plots



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Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

South Campus Athletic Track Soil and Groundwater Management Plan

San José State University
San José, California

San José State University
1 Washington Square | San José, California 95192

May 2, 2019 | Project No. 402335031

Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

Geophysics | Engineering Geology | Laboratory Testing | Industrial Hygiene | Occupational Safety | Air Quality | GIS

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

May 2, 2019
Project No. 402335031

Mr. Ashraf Fouad
Senior Director
Planning Design and Construction
San José State University
San José, California 95192

Subject: South Campus Athletic Track Soil and Groundwater Management Plan
San José State University
San José, California

Dear Mr. Fouad:

In accordance with your request, Ninyo & Moore has prepared this South Campus Athletic Track Soil and Groundwater Management Plan (SGMP) for the property located at the northeast corner of the intersection of East Alma Avenue and South 10th Street in San José, California (site). This SGMP was prepared in accordance with our *Preliminary Soil Investigation Report*, dated January 10, 2019.

This SGMP provides soil and groundwater handling requirements based on the findings of previous environmental investigations. This SGMP is intended for implementation during upcoming redevelopment activities at the site.

We appreciate the opportunity to be of continued service to you on this project.

Respectfully Submitted,
NINYO & MOORE

Kristopher M. Larson
No. 8059

Helen Hild
Senior Staff Geologist

Kris M. Larson, PG 8059
Principal Environmental Geologist

HEH/KML/vmn

Distribution: (1) Addressee

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FIGURES

1 – Site Location
2 – Site Plan

APPENDICES

A – Assessor’s Parcel Map
B – DTSC Information Advisory Clean Imported Fill Material Guidelines

1 INTRODUCTION

Ninyo & Moore Geotechnical & Environmental Sciences Consultants (Ninyo & Moore) has prepared this Soil and Groundwater Management Plan (SGMP) on behalf of San José State University (SJSU) for the South Campus Athletic Track (site) located at the northeast corner of the intersection of East Alma Avenue and South 10th Street in San José, California (Figure 1). This SGMP was prepared based on our recommendation in our *Preliminary Soil Investigation Report*, dated January 10, 2019. Report findings included concentrations of select metals, including arsenic, hexavalent chromium and nickel detected above their respective 2019 San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels (ESLs). Concentrations of metals identified in site soils (with the exception of lead) are within background metals concentrations in the Bay Area where ultramafic Franciscan complex outcrops are located. The Kearny Foundation published a report titled *Background Concentrations of Trace and Major Elements in California Soils*, which indicates Northern California has higher background concentrations of chromium and nickel than Southern California and adjacent areas (Kearny, 1996). In the case of arsenic, the concentrations from site soils were reported below the established background arsenic concentration of 11 milligrams per kilogram in Bay Area soils as noted by Duverge (Duverge, 2011).

Redevelopment activities at the site will include the removal of the track, and the installation of a soccer field and parking structure. This SGMP has been prepared to discuss soil management protocols to be implemented during redevelopment construction activities based on our knowledge of future site construction activities. The SGMP is designed to be a useful document for soil management during earthwork construction activities including, but not limited to, drilling, grading, excavation, utility trenching and installation, and any other subsurface activities associated with the site improvements.

This SGMP also addresses worker health and safety controls, personnel assignments and responsibilities, soil excavation, management of contaminated and potentially contaminated soils, procedures for off-site disposal, and, if required, reuse of excess soil. The SGMP also provides requirements to reduce potential exposure of workers and the public to contaminants in soil and groundwater. Work performed under this plan shall be in compliance with site development or redevelopment specifications, a site-specific health and safety plan, and applicable local, state, and federal statutes and regulations.

2 PROJECT TEAM ROLES AND RESPONSIBILITIES

This section describes the general project team relevant to the excavation, handling, transportation, off-site disposal of contaminated materials and, as applicable, soil reuse and groundwater disposal if encountered at the site.

2.1 Project Manager

SJSU or another designated party (Project Manager) will oversee future construction activities at the site. The Project Manager will serve as the point of contact and will coordinate with the involved parties.

2.2 General Contractor

Because future planned construction activities include the potential to encounter impacted materials, the General Contractor (Contractor) responsible for site construction will be required to implement this SGMP addressing excavation and management, direct-loading, temporary stockpiling, possible off-site disposal, and measures to protect worker/public health and the environment from impacts caused by the Contractor's activities. The Contractor shall be responsible for assigning qualified personnel to execute the work, and for selecting and supervising the work of other subcontractors assigned to the project.

The Contractor shall provide a site Superintendent, who will be responsible for site activities. The site Superintendent's responsibilities will include oversight of equipment, labor, materials, and resources needed to complete the project as it involves the impacted materials.

2.3 Subcontractors

The Contractor may utilize subcontractors to execute subtasks of this project, subject to approval by the Project Manager. The supervision, inspection, and approval of such subcontractor work will be the responsibility of the Contractor.

2.4 Health and Safety Manager

The Contractor or Project Manager shall retain a Health and Safety Manager (HSM), who is a Certified Industrial Hygienist (CIH), or who is under the direct supervision of a CIH, with the appropriate training, certificates, and experience. The HSM will be responsible for preparing and overseeing implementation of Site-specific Health and Safety Plan (SSHSP). The SSHSP shall list the various safety-related Contractor personnel and their duties and responsibilities. The SSHSP is discussed in further detail in Section 7.

2.5 Environmental Consultant

The Project Manager will retain a qualified environmental consulting firm (Environmental Consultant) to provide environmental oversight services for site construction activities involving impacted soil and/or groundwater. The Environmental Consultant will monitor soil excavation activities, provide guidance to the Contractor on segregation of materials as necessary, and document any on-site reuse of excavated materials. As applicable, they will assist in characterizing and profiling previously unknown impacted materials if such materials are proposed to be transported and disposed of offsite.

2.6 Geotechnical Consultant

The Project Manager will retain or assign a qualified geotechnical consultant to serve as the Project Geotechnical Consultant. The Geotechnical Consultant will perform compaction testing and oversee backfilling of excavations as-needed.

3 SITE DESCRIPTION AND ENVIRONMENTAL BACKGROUND

The site is an approximately 8-acre rectangular lot with an oval track and gravel parking area, bounded by South 10th Street to the west, East Alma Avenue to the southeast, SJSU facilities to the north and east, and the former Lorentz Barrel & Drum Company (LBDC) approximately 100 feet to the southwest. The surrounding properties' land use is mixed commercial and residential. The site consists of a turf track underlain by concrete, and a grassy field with sprint tracks in the middle. Compacted gravel surrounds the northern and western boundaries of the lot.

The site is north of and adjacent to the former Lorentz Barrel & Drum Company (LBDC), a former drum reconditioning business that operated from 1947 to 1987 where drums containing solvents, pesticides, and other materials were cleaned, recoated, and sold for reuse. Improper waste handling practices during the drum recycling operations resulted in chemical contamination of soil, soil vapor and groundwater at the LBDC property. These impacts to groundwater from the LBDC property extend onto the SJSU site. Investigations at the LBDC facility are further described in Section 3.2.

3.1 Site Investigations

Ninyo & Moore collected 57 soil samples and one track material sample for a *Preliminary Soil Investigation Report* in November 2018, which compared concentrations to the 2016 ESLs. A figure showing sample locations is provided as Figure 2. Four soil samples were collected from 14 boring locations at 1 foot below ground surface (bgs), 2 feet bgs, 3 feet bgs, and at 4 feet bgs. The top two samples, collected at 1 foot bgs and 2 feet bgs, were submitted for analysis, and the bottom two samples, collected at 3 and 4 feet bgs, were placed on hold pending the analytical results of the shallow samples. Of these deeper samples collected, five samples below were taken off hold and analyzed because the shallower samples from the same boring exceeded their respective Tier 1 ESLs. The samples were analyzed for several potential site constituents of concern, including Title 22 Metals, total petroleum hydrocarbons (TPH) as gasoline (TPHg), as diesel (TPHd) and as motor oil (TPHmo), organochlorine pesticides (OCPs) and volatile organic compounds (VOCs). One additional surface sample was collected from the center of the grassy field to determine the background concentrations of lead at the site.

Several constituents were reported above Tier 1 ESLs and concentrations of arsenic, hexavalent chromium and nickel were reported above the Construction Worker ESLs. Concentrations of these metals identified in site soils are within background metals concentrations in the Bay Area, where ultramafic Franciscan complex outcrops are located. The soil sample analytical data indicates that site soils should be classified as Class II non-hazardous waste for disposal purposes.

Ninyo & Moore recommended this SGMP to summarize protocol to be implemented during future site improvement activities to protect future site workers as well as to assist contractors with soil handling, removal and disposal procedures for the site soils and groundwater.

Ninyo & Moore has included an update to the tables, provided as Table 1 through Table 3, to compare these concentrations to the current January 2019 ESLs.

3.2 Off-Site Investigations

The former LBDC property is located approximately 100 feet southwest of the site and is currently an open United States Environmental Protection Agency (USEPA) Superfund site. Based on the most recent *Five-Year Review Report*, a volatile organic compound (VOC) groundwater plume and 1,4-dioxane groundwater plume extends from the LBDC property, beneath South 10th Street and the entirety of the SJSU athletic track to approximately 2,000 feet and 4,500 feet (the VOC plume and the 1,4-dioxane plume, respectively) northeast of the LBDC property (USEPA, 2015). Six groundwater wells (EX-8, P-12, P-17, P-20, P-22 and P-23) in the LBDC monitoring well network are currently located at the site. Historical groundwater monitoring data is available on the State Water Resources Control Board's (SWRCB) Geotracker website, Global ID SL0608546934. The contaminants of concern from the LBDC property include VOCs in soil and groundwater and polychlorinated biphenyls (PCBs) in soil.

Soil vapor samples were collected in 2014 at the adjacent SJSU soccer field, approximately 100 feet to the west across South 10th Street (Environmental Cost Management, 2015). Results from the soil vapor sampling indicated concentrations of trichloroethene, tetrachloroethene, 1,1-

dichloroethene, above their respective Commercial/Industrial ESLs at depths of approximately 10 feet below ground surface (bgs).

4 PHYSICAL SETTINGS

4.1 Geology

The site is located within the Santa Clara Sub-basin of the Santa Clara Valley Groundwater Basin, which is bounded by the Diablo Range to the east, and the Santa Cruz Mountains to the west. Based on the review of the Geologic Map of the San Francisco Bay Region, Franciscan outcrops occur northeast of the San Andreas Fault and east of the Calaveras Fault from San Jose to Gilroy. These outcrops could be the source of the metals concentrations observed in the soils at the site. Continental deposits from the Pliocene and Holocene of unconsolidated to semi-consolidated sediments, including gravel, sand, silt, and clay, exist to an approximate depth of 1,500 feet bgs (DWR, 2004).

Shallow soil observations included coarse-grained aggregate base materials existing immediately below the concrete track, underlain by fine-grained native soils to the total explored depth of 4 feet bgs during Ninyo & Moore's investigation (Ninyo & Moore, 2018).

4.2 Hydrology

Ninyo & Moore did not encounter any groundwater during the Preliminary Soil Investigation. An investigation conducted at the adjacent LBDC property during a groundwater monitoring event in 2017 indicated depths to water were encountered at approximately 14 to 15 feet bgs (Pioneer, 2017).

Based on AMEC/Pioneer's 2011, *Focused Feasibility Study Work Plan* for the LBDC site, there are four groundwater-bearing zones in the vicinity of the site, and are discussed as follows:

- The A-zone aquifer is approximately 10 feet thick and is composed of a sand layer, and overlies a clay aquitard that is reportedly 10 feet thick in some areas.
- The B-zone aquifer is a sandy saturated unit, between 25 to 45 feet bgs.
- The C-zone stratigraphy is composed of saturated sands and is present between 70 to 90 feet bgs.
- The D-zone aquifer is also composed of a saturated sandy unit ranging between 230 to 1,000 feet thick and is the source of regional groundwater.

4.3 Surface Water

Surface waters, including ponds, streams, creeks, lagoons and other naturally-occurring bodies of water have not been observed on the site. Ninyo & Moore used the United States Fish and Wildlife Service National Wetlands Inventory to identify surface waters within a 1-mile radius of the site. The closest surface waters to the Site are several small (ranging from 0.10 acre to 0.45 acre) man-made ponds in the Japanese Friendship Garden approximately 0.20 mile east of the site. The next closest surface body of water is Coyote Creek, which is located approximately 0.29 mile east of the site.

5 PLANNED FUTURE SITE DEVELOPMENT

The planned use of the site includes a new parking structure in the southern portion of the site and a soccer field in the northern portion of the site. The parking structure will extend to approximately 5 feet bgs. Approximately 22,000 cubic yards (cy) are estimated to be removed during this construction activity. Some earthwork activities may extend to approximately 15 feet bgs and potentially encounter groundwater.

6 NOTIFICATION

Prior to and during earthwork construction activities related to redevelopment of a site, applicable permits and notifications shall be the responsibility of the Contractor. If contaminated or potentially contaminated soil and/or groundwater are found on site, the Project Manager and Environmental Consultant will be immediately informed.

7 SITE SPECIFIC HEALTH AND SAFETY PLAN

The Contractor or any Subcontractors with workers who may directly contact native site soils or groundwater (e.g., during site preparation, grading, and foundation construction) shall prepare its own SSHSP, as deemed necessary by its corporate policies, applicable to the activities being performed and in compliance with Federal and State requirements. Considerations should include the development of engineering controls, administrative controls and the use of personal protective equipment (PPE) as a last line of defense for construction workers who may be working with and/or coming into physical contact with contaminated soils, or exposed to dust generation during excavation and subsequent construction at the site. The Contractor and its Subcontractors are responsible for the health and safety of their own personnel and the general public.

The SSHSP shall include procedures for earthwork construction personnel to manage encountered/disturbed soil that is obviously impacted, as identified by visual observation of staining, odors or elevated organic vapor readings, and to handle encountered abandoned subsurface structures such as tanks, sumps, and pipes.

Field personnel shall be required to review the SSHSP and provide written acknowledgement of their review and understanding of the SSHSP and willingness to abide by its requirements. In addition, the Contractor's site superintendent will perform a daily tailgate safety meeting held at the beginning of each workday to discuss relevant task-specific safety issues. Additionally, daily site visitors will be required to review the SSHSP and sign the acknowledgement sheet.

8 SOIL MANAGEMENT PLAN PROTOCOL

The following SGMP protocols should be followed during earthwork and dewatering activities.

8.1 Soil Excavation and Monitoring

Overall, soil handling may include segregating soils into temporary stockpiles, on site soil reuse, and/or soil direct-loading for off-site disposal in accordance with project specifications discussed in this SGMP. In addition, general construction mitigation measures will need to be implemented, including control of dust generation at the site, decontamination of equipment, and prevention of sediment from leaving the site as storm water runoff. All activities will be conducted in compliance with the SSHSP, this SGMP, and all applicable local, state, and federal statutes, regulations, and guidelines. Excavation and handling of impacted soils will be conducted in a manner that will prevent the potential release of contamination, if present, to other on-site and off-site areas.

8.2 Soil Profile

The Contractor shall be responsible for construction activities associated with the site improvement activities. With the results of the previous investigation, further analytical testing will be required to characterize the soil and obtain the soil profile required for the removal of the 22,000 cy of soil at the site. Due to the volume of soils to be profiled, it is anticipated one 4-point composite sample will characterize approximately 1,000 cy of soil. The frequency and type of analyses will be dependent upon the receiving facilities requirements and is further discussed in Section 8.5.1. If soils are not pre-characterized before the start of off-hauling activities, soils will need to be stockpiled on site, and characterization samples will need to be collected by the Environmental Consultant prior to their removal from the site. Once the soil is characterized and a profile is obtained, soils will be able to be excavated and loaded into trucks and transported to an approved landfill.

If the soil is pre-characterized by the Environmental Consultant before the start of excavation activities, a profile should be obtained from a landfill, and soils may be direct-loaded into transporter trucks and transported to the approved landfill.

In the event of unexpected contamination is encountered in the excavated soils, soil segregation, stockpiling, and additional sampling and analysis may be required and is described below.

8.3 Soil Segregation and Stockpiling

The Contractor shall be responsible for construction activities associated with subsurface excavation, trenching, handling, on site reuse, direct-loading for off-site disposal, and temporary stockpiling of soil in accordance with project specifications; general construction impact mitigation measures, including control of dust generation at the site, decontamination of equipment, prevention of sediment from leaving the site in storm water runoff, and management of groundwater, if any; the SSHSP, this SGMP, and all applicable local, state, and federal statutes, regulations, and guidelines. Excavation and handling of impacted soils will be conducted in a manner that prevents the release of contamination, if present, to other on-site and off-site areas.

The Environmental Consultant shall observe, monitor and document intrusive work activities associated with known or suspected areas of impacted soils. If evidence of potentially impacted soils (e.g., distinctive discoloration and odor and/or suspected contaminated materials such as wastes) is encountered by the Contractor, the Project Manager shall be notified and the Environmental Consultant will monitor and document intrusive work activities. The Environmental Consultant will use a combination of field screening procedures and indicators, such as distinctive soil discoloration, odor, photoionization detector (PID) readings, and visual observations, as well as experience to assist in the identification and management of excavated soils and to guide the Contractor in segregating excavated impacted soil, as-needed. These activities will assist with reducing the likelihood of construction delays.

The Contractor shall coordinate with the Environmental Consultant to segregate soil into either separate stockpiles for disposal or for reuse as evaluated by the Environmental Consultant. Alternatively, soil may be direct loaded for disposal, pending further analytical testing.

- **Disposal Soils Stockpile:** If excavated impacted soil to be transported off-site for disposal is not directly loaded on to trucks, the Contractor shall transport the soil to a pre-determined temporary stockpile staging area. Additional analytical testing may be necessary to evaluate the segregated stockpile for off-site disposal to meet the accepting facility requirements. This procedure is further discussed in Section 8.5.1.

- **Reuse Soils Stockpile:** Soil that is not suspected to be contaminated based on the location, previous sampling data, lack of visual or field screening indicators of contamination, and/or has been evaluated as suitable for on-site reuse by the Environmental Consultant, the Geotechnical Consultant, and the Santa Clara County Department of Environmental Health (DEH) may be placed by the Contractor into a "reuse" stockpile. Soil stockpiles designated for reuse will need to be analytically tested prior to being reused, and is discussed further in Section 8.5.1.

Should any potential impacts be encountered during earthwork construction activities, these soils will be considered impacted unless analytical testing confirms it is not. The Contractor will excavate, load, and transport potentially contaminated soil and contaminated soils to a pre-determined, on site stockpile staging area (Figure 2). If any soil is encountered that is subsequently classified as hazardous waste, it will be either be temporarily stockpiled separately from non-hazardous soils in accordance with hazardous waste regulations, or direct-loaded on to trucks for off-site hazardous waste disposal.

8.4 Track Material

The track material has high concentrations of lead and mercury. Abatement specifications should be provided in a separate document to this SGMP by an environmental consultant prior to removal.

8.5 Stockpile Management

In the event contaminated soils exceed non-hazardous waste disposal requirements, the staging area and the stockpiles shall be managed by the Contractor in accordance with project specifications, this document, the SSHSP, and a project Storm Water Pollution Prevention Plan (SWPPP), which will follow SWRCB Construction General Permit guidelines. The soil stockpiles shall be constructed and managed to minimize the threat of release of contaminants or soil from the stockpile, as applicable. Contaminated substances, hazardous substances, and/or hazardous waste stockpiles shall be removed from the site in less than 90 days from the date in which the waste started accruing.

It is required that any excavated and stockpiled soils associated with construction activities at the site be managed as follows:

- Hazardous or potentially hazardous stockpiles should be placed onto a relatively impervious surface, such as asphalt, concrete, or on a 30-millimeter (mil) or thicker high density polyethylene (HDPE) liner.

- Spray or mist with water to minimize dust emissions during stockpiling, if necessary.

- Securely cover stockpiles with an 8-mil or thicker HDPE liner to minimize vapor emissions and prevent runoff from rain during periods of inactivity.

- Configure stockpiles in such a manner that surface water runoff, if present, from the stockpile does not carry stockpiled material and/or leachate beyond the stockpile perimeter berm.

If excavated soils are designated for potential on-site reuse, and are evaluated as suitable for on-site reuse by the Environmental Consultant, the Geotechnical Consultant and the DEH, it will be placed by the Contractor into a “Reuse” stockpile. The “Reuse” and/or clean stockpiled soils shall not be in direct contact with any impacted or potentially impacted materials or stockpiled soil for off-site disposal. Stockpiles will be sampled as outlined below in Section 8.5.1.

The Environmental Consultant will assist the Project Manager with removing stockpiles from the site in a timely manner to avoid nuisance complaints.

8.5.1 Stockpile Sampling

If unexpected soil contamination is discovered during excavation, soils are not pre-characterized before the state of excavation activities, or soils are designated for potential on-site reuse, additional soil sampling may be necessary and is described below.

The number of samples required is based on the volume of the stockpile and the analysis listed below. The actual number of samples to be analyzed will be dependent on the accepting facility requirements. In general, 4-point composite soil samples shall be collected from the stockpiles for laboratory analyses:

- California Title 22 Metals (Environmental Protection Agency Method [EPA] 6010B/7471A);
- VOCs (EPA Method 8260B);
- TPHg, TPHd and TPHmo (EPA Method 8260B/8015B); and
- OCPs (EPA Method 8081A).
- A California Waste Extraction Test (WET) method to profile soils impacted by metals exceeding 10 times their respective STLCs in order to classify the soil as either non-hazardous or hazardous waste. If STLCs are exceeded after the WET, or if specific metals in soils exceed 20 times their toxicity characteristics leaching procedure (TCLP) or exceed their total threshold limit concentration (TTLC), a TCLP WET will be conducted to evaluate the hazardous waste classification (RCRA or non-RCRA) for the soil.

Other analytical tests, pending the accepting facility(s) requirements, may be required.

8.5.2 Best Management Practices

The Contractor shall implement best management practices (BMPs) to protect the temporary stockpiles from erosion and storm water run-on and runoff. The BMPs should be included in the site SWPPP and would include, but are not limited to, the following:

- erosion control,
- storm water drainage control,
- secondary containment (as applicable),
- fugitive emission control of dust and/or vapors,
- spill prevention, and
- tracking control.

Additional BMPs, as specified in a site-specific SWPPP, may be required by the California General Permit (CGP).

8.6 Odor and Vapor Control

If there is a potential to generate odors or chemical vapors during earthwork construction activities, including during excavation and management of direct-loaded or temporarily stockpiled contaminated materials, the Contractor shall employ odor/vapor suppression techniques or covering of stockpiles and open excavations or trenches, to mitigate impacts to site workers, visitors and nearby sensitive receptors (e.g., businesses, residential communities, general public).

There is a potential for soil vapor impacts at the site due to the proximity of the LBDC property. Based the off-site LBDC investigation conducted in 2014, VOCs are anticipated to be present at depths of approximately 10 feet bgs. Air monitoring will occur in the exclusion zone with a photoionization detector (PID) to determine if any odor/vapor suppression techniques are warranted, which will be discussed further in the SSHSP. In addition, the Contractor shall implement appropriate means and methods to mitigate any chemical vapors and/or odors of stockpiles, and open excavations or trenches, prior to leaving the site at the end of each workday.

8.7 Dust Control

The Contractor shall mitigate dust with water, either with a hand held sprayer or by water trucks, as-needed, on the surface of active work areas. Groundwater will not be used for dust control measures. Care will be exercised to minimize the overuse of water so as not to create surface water runoff or excessively saturated conditions. Dust control will also be conducted at the site entrance during construction activities. Air monitoring as described in Section 8.7.1 will be conducted during active soil excavation and transport in order to assure and document the safe removal of contaminated soils from the site in compliance with state and federal regulations.

Water spraying for dust suppression shall be controlled in a manner consistent with the SWPPP by the Contractor.

8.7.1 Air Monitoring

This section details the air monitoring strategy and methodologies that will be used during the soil excavation and grading. The air monitoring program may be modified as warranted in the field. The strategy and methodologies are designed to achieve several goals:

- Identify and monitor the air contaminants generated during the soil removal and decontamination activities to assign the appropriate PPE and safety systems specified for those activities.
- Provide feedback to site operations personnel regarding potential hazards from exposure to hazardous air contaminants generated through site activities.
- Identify and monitor total dust at points outside of the soil removal and decontamination exclusion zones. Air monitoring will be conducted during work activities to measure potential exposure of sensitive receptors to site chemical constituents, as a result of removal activities.

The Environmental Consultant, will monitor dust levels within the exclusion zone and at the work area boundary nearest to downwind receptor locations. Due to the fact that site soils to be excavated are primarily impacted with metals, the Contractor or Environmental Consultant will focus on the implementation of mitigation measures and real-time monitoring of airborne dust levels generated by removal activities.

Air monitoring will be performed during all site activities in which impacted or potentially impacted materials are being disturbed or handled. The Environmental Consultant will staff the site with an air monitoring/health and safety professional whose responsibilities will include:

- Monitoring total dust levels at the property boundaries. The site air monitoring professional will have the authority to stop work in the event that on-site activities generate dust levels (particulate matter PM10) that exceed the Bay Area Air Quality Management District (BAAQMD) community action level (fence line) of 50 micrograms per meters cubed over a 24 hour period (BAAQMD, 2017). The air-monitoring professional will monitor on-site wind direction and speed to identify conditions that require cessation of work, for example, wind speeds high enough to result in visible dust emissions from the point-of-origin or crossing the property line, despite the application of dust mitigation measures.

- Assuring that all real-time air samplers are properly calibrated and in good working condition. Real-time, data-logging aerosol monitors (such as personal data real-time aerosol monitors) will be used to measure total dust levels. Real-time information will be posted daily and discussed with site workers.
- Coordinating general site safety activities including all daily hazard communication, safety practices and procedure briefings.
- Overseeing personal decontamination practices.
- General site safety leadership, support and recordkeeping.

Actual locations will be determined in the field. Air monitoring will be performed over an approximate 8-hour period each day that soil excavation or grading activities are conducted. The air-monitoring professional will check the equipment every 30 minutes during operation. This frequency is subject to change based on site conditions and newly available data.

8.8 Decontamination

Construction equipment and transportation vehicles that contact impacted or potentially impacted soil (fill or native) will be decontaminated prior to leaving the site to minimize the possibility that this equipment will track site soil onto public roadways. To minimize the possibility of cross-contamination, construction equipment and transportation vehicles will also be decontaminated prior to moving from on-site areas known or newly found to contain contaminated soils or wastes to other areas or paved areas that are not expected to contain impacted materials.

Decontamination methods will include scraping, brushing, and/or vacuuming to remove dirt on vehicle exteriors and wheels. In the event that these dry decontamination methods are not adequate, methods such as steam cleaning, high-pressure washing, and cleaning solutions will be used, as necessary, to thoroughly remove accumulated dirt and other materials. Wash water resulting from decontamination activities will be collected and managed in accordance with all applicable laws and regulations.

8.9 Imported Material

If the Contractor requires the importation of material for use as backfill on site, this imported material shall be tested and characterized prior to importing following the DTSC *Information Advisory Clean Imported Fill Material* guidelines as provided in in Appendix B. The Environmental Consultant and DEH shall be provided the analytical sampling results to confirm that this material is acceptable for import. Additional geotechnical evaluation will also be required for any imported material.

8.10 Unknown Contamination

If hazardous substances or conditions are encountered which present an immediate threat of injury to human health or water quality, the Contractor shall secure the area and shall notify the Project Manager, Environmental Consultant and DEH immediately. The Contractor shall call "911" to summon the emergency services, as necessary. Any site cleanup activities will need to be approved by the Environmental Consultant and DEH under all applicable laws.

If previously unknown hazardous substances or conditions are encountered that do not present an immediate threat to human health or water quality, the Contractor shall immediately notify the Environmental Consultant and the Project Manager. As necessary, the area surrounding the discovery of unknown contamination will be isolated and secured by the Contractor with markings, fencing, or a suitable barrier so that construction activities can be excluded from the zone of impact. The Environmental Consultant and the Project Manager will then decide whether immediate excavation, segregation, stockpiling, containerization, and/or other activities are warranted as well as notification of the appropriate regulatory authority.

Any encountered, abandoned subsurface structures that may contain liquids, e.g., sumps, storage tanks, and pipelines, will be treated as possible contaminated materials or potential sources of contaminants to soil and groundwater, particularly if they were not emptied prior to abandonment. The following steps and procedures should be followed after the discovery of these subsurface structures:

- Any obvious leakage or drainage will be collected, contained and stopped as rapidly as can be safely accomplished by the contractor;
- DEH staff will be notified and applicable paperwork, such as an Underground Tank Closure Plan will be initiated;
- Residual liquids in the sump(s), tank(s), and/or pipe(s) will be removed, contained, tested as required for disposal, and appropriately disposed;
- Sumps and tanks will be cleaned and closed in place or excavated and appropriately disposed;
- If it is not necessary to remove all of a discovered pipe to complete construction, then the pipe will be cut, the portion of the pipe required to be removed to complete construction will be removed and appropriately disposed, and the ends of the pipe remaining in place will be capped; and;
- Visibly contaminated or odorous soil, whether or not it is associated with encountered subsurface sumps, tanks, or pipes, will be subject to the soil management procedures discussed above;
- If residual liquids are determined to contain hazardous compounds other than petroleum hydrocarbon constituents at significant concentrations or quantities, the DEH will be

contacted, and additional environmental assessments will be conducted in accordance with the DEH guidance and in accordance with all laws and regulations.

8.11 Transport and Disposal

If impacted soils or other materials are transported off-site for disposal, the selected transporters and disposal facilities must be appropriately licensed and/or permitted, properly insured, and be pre-approved by the Project Manager. The Contractor, with assistance from the Environmental Consultant, will manage the transportation and disposal of wastes to the appropriate treatment and disposal or recycling facilities. The Contractor shall prepare waste profiles and manifests for review by the Environmental Consultant and for signature by the Project Manager. Manifests and waste profiles will be forwarded to the appropriate disposal/recycling facility for acceptance. The Contractor shall be responsible for the scheduling of shipments of wastes after notice of acceptance.

Coordinating vehicles entering the site for loading and off-site disposal of site materials shall be tracked through documentation by the Contractor with assistance from the Environmental Consultant. Vehicles shall be decontaminated, as necessary, prior to their departure from the site. Care shall be taken to avoid spillage of contaminated materials and/or tracking such materials off-site. The Contractor shall maintain a daily log of contaminated substances, hazardous substances, or hazardous wastes removed from the site for disposal. Upon project completion, the logs shall be accompanied by copies of waste manifests and load tickets that document receipt of the waste at the permitted facility and the weight of the load.

Any hazardous wastes transported off-site for disposal or recycling shall be performed in accordance with Department of Transportation (DOT) Hazardous Material Transportation regulations 49 CFR Parts 171 and 180, 40 CFR Part 262, Subpart B, and Title 22 CCR Section 66262, which involve packaging, placarding, labeling, and manifesting requirements. Hazardous wastes being transported shall also have appropriate certification notices per 40 CFR Par 268 and Title 22 CCR Section 66268. Personnel having the required DOT-training shall perform DOT-related functions, if required.

Contaminated materials characterized as non-hazardous that do not exhibit the DOT hazard class characteristics (i.e., explosives, gases, flammable/combustible liquids, flammable solids/spontaneously combustible materials/dangerous when wet materials, oxidizers and organic peroxides, toxic materials and infectious substances, radioactive materials, and corrosive materials) are not regulated under DOT rules for hazardous materials transportation. If a material is suspected to be hazardous, it shall be shipped under the appropriate hazard class.

Trucks carrying contaminated substances, hazardous substances, or hazardous wastes shall be enclosed such that there is no odor or dust generated during transportation along the haul route identified in the project specifications. Open trucks shall not be permitted to transport waste from the site that may produce odor or dust during transportation.

8.12 Groundwater Management

Some earthwork activities may extend to approximately 15 feet bgs and potentially encounter groundwater. Should the Contractor encounter groundwater, the Environmental Consultant should be notified as impacts to soil vapor are present at these depths at the site. A PID should be used to monitor concentrations of worker breathing zone should any excavations deeper than 10 feet bgs occur. When excavation to groundwater is conducted, dewatering may be necessary. Any groundwater pumped from the excavation will need to be temporarily stored and sampled to evaluate disposal options. This may include discharge to sanitary sewer or storm drain, pending regulatory approval. If groundwater management is required, the Contractor will be responsible for providing equipment (vacuum truck or a pump, holding tanks, filtration systems) to contain groundwater and to conduct any permit-required sampling and analytical testing until it can be discharged to either sanitary or storm sewer systems. Prior to any discharge, the Environmental Consultant must be provided the analytical sampling results to confirm discharging is acceptable. The Contractor will be responsible to comply with all conditions of any discharge permit. Should off-site disposal be required, the groundwater will be stored, sampled and analyzed by the Contractor in accordance with the accepting facilities requirements.

8.13 Documentation

The Environmental Consultant shall prepare a comprehensive completion report summarizing the activities involving soil removal, and compliance with this SGMP. The report will include information relating to excavation for construction, volume of soils either excavated or reused on site (and any placement locations of on-site reused materials), disposed off-site, or reused off-site. If soils are transported off-site, information will be provided regarding the characterization, handling, and disposal of these soils. The report will be signed by the Environmental Consultant’s registered professional (e.g., Professional Geologist, Professional Engineer).

The report will include the following information:

- Site map showing the lateral extent and depths of the soils excavated at the site,
- Placement location(s), of any excavated soils reused on site,

- As applicable, identification of each stockpile type, a plot plan detailing the stockpile locations, and corresponding estimates of the volumes of materials in each stockpile,
- As applicable (e.g., off-site disposal or reuse), description of the sampling methodologies and sample location/selection process, and sample locations, a copy of the sample analytical results, chain-of-custody documents, and quality assurance/quality control supporting data, summary tables of the laboratory analytical results of the stockpile sampling,
- If soils are transported off-site, an accounting of the materials transported and either disposed of or reused off-site, including location of reused soils, weight tickets and waste manifests, and
- Health and safety monitoring records, including air monitoring analytical data during excavation activities (if conducted) and procedures used to mitigate odors and dust.

9 LIMITATIONS

This SGMP has been prepared in general accordance with current regulatory guidelines and the standard-of-care exercised in preparing similar plans in the project area. No warranty, expressed or implied, is made regarding the professional opinions presented in this plan. Variations in site conditions may exist and conditions not observed or described in this plan may be encountered during subsequent activities. Please also note that this plan did not include an evaluation of geotechnical conditions or potential geologic hazards.

Ninyo & Moore's opinions and recommendations regarding environmental conditions, as presented in this plan, are based on limited subsurface assessments. Further assessment of potential adverse environmental impacts from past on-site and/or nearby use of hazardous materials may be accomplished by a more comprehensive assessment. The samples collected and used for testing, and the observations made, are believed to be representative of the area(s) evaluated; however, conditions can vary significantly between sampling locations. Variations in soil and/or groundwater conditions will exist beyond the points explored.

The environmental interpretations and opinions contained in this plan are based on the results of laboratory tests and analyses intended to detect the presence and concentration of specific chemical or physical constituents in samples collected from the subject site, and on work performed by others. The testing and analyses have been conducted by independent laboratories, which are certified by the State of California to conduct such tests. Ninyo & Moore has no involvement in, or control over, such testing and analysis of work performed by others. Ninyo & Moore, therefore, disclaims responsibility for any inaccuracy in such laboratory results and work performed by others.

Our conclusions and opinions are based on an analysis of the observed site conditions and work performed by others. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby facilities. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this plan may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires any additional information, or has questions regarding content, interpretations presented, or completeness of this document.

This plan is intended exclusively for use by SJSU. Any use or reuse of the findings, conclusions, and/or recommendations of this plan by parties other than the client is undertaken at said parties' sole risk.

10 REFERENCES

AMEC/Pioneer, 2011. *Focused Feasibility Study Work Plan, Lorentz Barrel and Drum Superfund Site, San Jose, California.* December.

Bay Area Air Quality Management District, 2017. Air Quality Standards and Attainment Status. Updated January 5.

DWR, 2005. California Department of Water Resources Bulletin 118, Santa Clara Valley Groundwater Basin, Santa Clara Subbasin. February 27.

Duverge, 2011. Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region, dated December.

Environmental Cost Management, 2015. *Final Site Inspection Report, Data Gap Assessment, Lorentz Barrel and Drum Superfund Site, San Jose, California*. July.

Graymer, R.W. et al, 2006. Geologic Map of the San Francisco Bay Region.

Kearny, 1996. Background Concentrations of Trace and Major Elements in California Soils, dated March.

Ninyo & Moore, 2019. San Jose State University, South Campus Athletic Track Preliminary Soil Investigation. Dated January 10.

Pioneer, 2017. *Annual Groundwater Monitoring Report No. 49, Lorentz Barrel & Drum Site, 1515 South 10th Street, San Jose, California*. December 22.

San Francisco Bay Regional Water Quality Control Board, 2019, Environmental Screening Levels, January.

San Francisco Bay Regional Water Quality Control Board, 2016, Environmental Screening Levels, February.

United States Environmental Protection Agency, 2015. *Fourth Five-Year Review Report for Lorentz Barrel and Drum Superfund Site, San Jose, California*. September.

United States Fish and Wildlife Service National Wetlands Inventory Wetlands Mapper.

Table 1 – Soil Analytical Results - TPH, OCPs and VOCs

Sample ID	Depth (feet bgs)	Date Collected	TPHd	TPHmo	TPHg	Other VOCs and OCPs
			(mg/kg)		(µg/kg)	
B1-1	1.0	11/15/18	2.1	ND < 49	--	--
B1-2	2.0	11/15/18	ND < 2.0	ND < 49	--	--
B2-1	1.0	11/15/18	3.2	ND < 49	--	--
B2-2	2.0	11/15/18	2.7	ND < 48	ND < 250	ND
B3-1	1.0	11/15/18	17	57	--	--
B3-2	2.0	11/15/18	8.4	ND < 48	--	--
B4-1	1.0	11/15/18	13	ND < 49	--	--
B4-2	2.0	11/15/18	5.4	ND < 49	--	--
B5-1	1.0	11/15/18	6.4	ND < 49	--	--
B5-2	2.0	11/15/18	2.6	ND < 47	--	--
B6-1	1.0	11/15/18	4.8	ND < 50	ND < 250	ND
B6-2	2.0	11/15/18	ND < 2.0	ND < 49	--	--
B7-1	1.0	11/15/18	4.9	ND < 49	--	--
B7-2	2.0	11/15/18	2.0	ND < 48	--	--
B8-1	1.0	11/15/18	6.4	ND < 49	--	--
B8-2	2.0	11/15/18	2.5	ND < 48	--	--
B9-1	1.0	11/15/18	5.5	ND < 49	--	--
B9-2	2.0	11/15/18	2.9	ND < 49	--	--
B10-1	1.0	11/15/18	13	65	--	--
B10-2	2.0	11/15/18	3.1	ND < 48	--	--
B11-1	1.0	11/15/18	5.6	ND < 49	--	--
B11-2	2.0	11/15/18	2.9	ND < 47	--	--
B12-1	1.0	11/15/18	5.4	ND < 48	--	--
B12-2	2.0	11/15/18	5.4	ND < 49	ND < 250	ND
B13-1	1.0	11/15/18	53	**150**	--	--
B13-2	2.0	11/15/18	4.9	ND < 48	--	--
B14-1	1.0	11/15/18	4.4	ND < 49	--	--
B14-2	2.0	11/15/18	4.7	ND < 49	--	--
Screening Levels						
Tier 1 ESLs[1]			260	100	100,000	Various
Construction Worker ESLs[2]			1,100	54,000	1,800,000	Various

Notes:

TPH - total petroleum hydrocarbons

TPHd - TPH as diesel, analyzed by United States Environmental Protection Agency (EPA) Method 8015B

TPHmo - TPH as motor oil, analyzed by EPA Method 8015B

TPHg - TPH as gasoline, analyzed by EPA Method 8260B

OCPs - organochlorine pesticides, analyzed by EPA Method 8081A

VOCs- volatile organic compounds, analyzed by EPA Method 8260B

bgs – below ground surface

mg/kg – milligrams per kilogram

µg/kg - micrograms per kilogram

ND - not detected

ND < X – analyte not detected at or above laboratory reporting limit X

-- - not analyzed

1. San Francisco Bay Regional Water Qualty Control Board (RWQCB) Tier 1 Environmental Screening Levels (ESLs), Soil, dated January 2019
2. RWQCB Construction Worker ESLs, Soil, dated January 2019. Most conservative ESL tabulated

Table 2 – Soil Analytical Results - Title 22 Metals

Sample ID	Depth (feet bgs)	Date Collected	Arsenic	Barium	Beryllium	Total Chromium	Chromium STLC	Hexavalent Chromium	Cobalt	Copper	Lead	Lead STLC	Mercury	Mercury STLC	Mercury TCLP	Nickel	Vanadium	Zinc	Other Metals
			(mg/kg)				(mg/l)	(mg/kg)				(mg/l)	(mg/kg)	(mg/l)		(mg/kg)			
B1-1	1.0	11/15/18	--	--	--	--	--	ND < 0.29	--	--	7.2	--	0.043	--	--	--	--	--	ND
B1-2	2.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	7.1	--	0.044	--	--	--	--	--	ND
B2-1	1.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	7.6	--	0.054	--	--	**87**	--	--	ND
B2-2	2.0	11/15/18	7.3	160	0.44	**54**	0.15	ND < 0.29	13	31	7.2	--	0.040	--	--	85	**38**	61	ND
B2-3	3.0	11/15/18	--	--	--	--	--	--	--	--	--	--	--	--	--	**100**	--	--	--
B2-4	4.0	11/15/18	--	--	--	--	--	--	--	--	--	--	--	--	--	69	--	--	--
B3-1	1.0	11/15/18	--	--	--	--	--	ND < 0.29	--	--	21	--	1.6	--	--	--	--	--	ND
B3-2	2.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	11	--	0.48	--	--	--	--	--	ND
B4-1	1.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	30	--	**2.3**	ND < 0.0020 H	--	--	--	--	ND
B4-2	2.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	11	--	0.43	--	--	--	--	--	ND
B5-1	1.0	11/15/18	--	--	--	--	--	**0.35**	--	--	7.3	--	0.069	--	--	--	--	--	ND
B5-2	2.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	6.6	--	0.066	--	--	--	--	--	ND
B6-1	1.0	11/15/18	8.0	190	0.52	**57**	0.19	ND < 0.30	15	35	8.8	--	0.065	--	--	85	**39**	65	ND
B6-2	2.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	10	--	0.041	--	--	**94**	--	--	ND
B6-3	3.0	11/15/18	--	--	--	--	--	--	--	--	--	--	--	--	--	65	--	--	--
B7-1	1.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	11	--	0.055	--	--	--	--	--	ND
B7-2	2.0	11/15/18	--	--	--	--	--	ND < 0.29	--	--	9.8	--	0.055	--	--	--	--	--	ND
B8-1	1.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	11	--	0.071	--	--	--	--	--	ND
B8-2	2.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	9.4	--	0.033	--	--	--	--	--	ND
B9-1	1.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	18	--	0.31	--	--	--	--	--	ND
B9-2	2.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	10	--	0.054	--	--	--	--	--	ND
B10-1	1.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	19	--	0.17	--	--	--	--	--	ND
B10-2	2.0	11/15/18	--	--	--	--	--	ND < 0.29	--	--	11	--	0.08	--	--	--	--	--	ND
B11-1	1.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	13	--	0.15	--	--	--	--	--	ND
B11-2	2.0	11/15/18	--	--	--	--	--	**0.49**	--	--	10	--	0.04	--	--	--	--	--	ND
B11-3	3.0	11/15/18	--	--	--	--	--	**0.44**	--	--	--	--	--	--	--	--	--	--	--
B11-4	4.0	11/15/18	--	--	--	--	--	ND < 0.29 H	--	--	--	--	--	--	--	--	--	--	--
B12-1	1.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	21	--	0.16	--	--	--	--	--	ND
B12-2	2.0	11/15/18	5.2	120	0.40	41	--	ND < 0.30	11	23	13	--	0.18	--	--	61	**29**	50	ND
B13-1	1.0	11/15/18	--	--	--	--	--	ND < 0.29	--	--	**50**	0.98	**5.2**	ND < 0.0020 H	ND < 0.0020 H	--	--	--	ND
B13-2	2.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	13	--	1.5	--	--	--	--	--	ND
B14-1	1.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	11	--	0.096	--	--	--	--	--	ND
B14-2	2.0	11/15/18	--	--	--	--	--	ND < 0.30	--	--	16	--	0.096	--	--	--	--	--	ND
Background	1.0	11/15/18	--	--	--	--	--	--	--	--	17	--	--	--	--	--	--	--	--
Screening Levels																			
Tier 1 ESLs^1			11 ^{2}	390	5.0	160	--	0.30	23	180	32	--	13	--	--	86	18	340	Various
Construction Worker ESLs^3			11 ^{2}	3,000	27	NE	--	2.8	28	14,000	160	--	44	--	--	86	470	110,000	Various
STLC x 10^4			50	1,000	7.5	50	5^5	--	800	250	50	5^5	2.0	0.2^5	--	200	240	2,500	Various
TCLP x 20^6			100	2,000	--	100	--	--	--	--	100	--	4.0	--	0.2	--	--	--	Various

Notes:

Metals analyzed by Environmental Protection Agency (EPA) Method 6010B; hexavalent chromium analyzed by EPA Method 7199; mercury analyzed by EPA Method 7471A

mg/kg – milligrams per kilogram

mg/l - miilligrams per liter

bgs – below ground surface

H - Sample was prepped or analyzed beyond the specified holding time

ND < X – analyte not detected at or above laboratory reporting limit X.

-- - not analyzed/not applicable

1. San Francisco Bay Regional Water Qualty Control Board (RWQCB) Tier 1 Environmental Screening Levels (ESLs), Soil, dated January 2019
2. Duverge, 2011. Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region, dated December
3. RWQCB Construction Worker ESLs, Soil, dated January 2019. Most conservative ESL tabulated
4. SLTC - soluble threshold limit concentration, California Code of Regulations, Title 22 Division 4.5, Chapter 11, Article 3, Section 66261.24
5. STLC/TCLP concentrations. Exceedence of STLC prompts analysis of TCLP
6. TCLP - toxicity characteristic leaching procedure, Code of Federal Regulations, Part 40, Title 261

Bold indicates concentration exceeds associated screening criteria

Table 3 – Soil Analytical Results - Track Sample Analytical Results

Sample ID	Depth (feet bgs)	Date Collected	TPHd		Metals								TPHg, Other Metals, VOCs, PCBs and Asbestos
			TPHd	TPHmo	Barium	Total Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	
			(mg/kg)										
TS-1	1.0	11/15/18	**600**	**830**	5.1	**500**	62	**4,700**	**17**	3.3	14	9.5	ND
Screening Levels													
Tier 1 ESLs^1			260	100	390	160	180	32	13	86	18	340	Various
Construction Worker ESLs^2			1,100	54,000	3,000	NE	14,000	160	44	86	470	110,000	Various
STLC x 10^3			--	--	1,000	50	250	50	2.0	200	240	2,500	Various
TCLP x 20^4			--	--	2,000	100	--	100	4.0	--	--	--	Various
TTLC^5			--	--	10,000	2,500	2,500	1,000	20	2,000	2,400	5,000	Various

Notes:

TPH - total petroleum hydrocarbons analyzed by Environmental Protection Agency (EPA) Method 8015.

Metals analyzed by EPA Method 6010B; mercury analyzed by EPA Method 7471A

VOCs - volatile organic compounds, analyzed by EPA Method 8260B

PCBs - polychlorinated biphenyls, analyzed by EPA Method 8082

Asbestos analyzed by California Air Resources Board 435

mg/kg – milligrams per kilogram

bgs – below ground surface

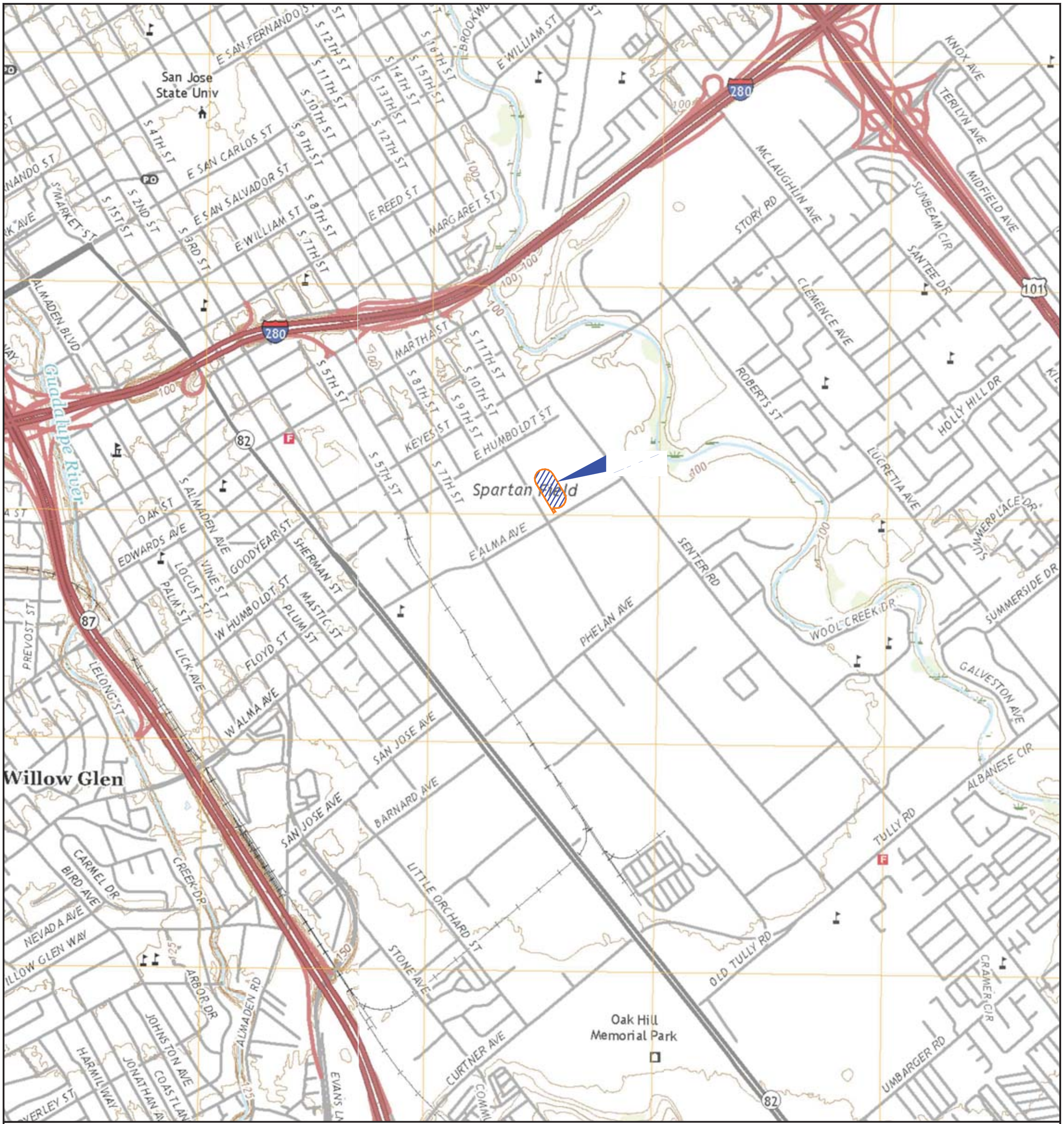
ND<X – analyte not detected at or above laboratory reporting limit X.

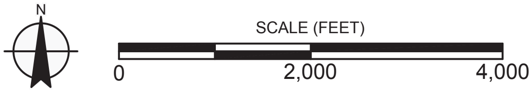
-- - not analyzed/not applicable

1. San Francisco Bay Regional Water Qualty Control Board (RWQCB) Tier 1 Environmental Screening Levels (ESLs), Soil, dated January 2019
2. RWQCB Construction Worker ESLs, Soil, dated January 2019. Most conservative ESL tabulated
3. SLTC - soluble threshold limit concentration, California Code of Regulations, Title 22 Division 4.5, Chapter 11, Article 3, Section 66261.24
4. TCLP - toxicity characteristic leaching procedure, Code of Federal Regulations, Part 40, Title 261
5. TTLC - total threshold limit concentration, Code of Federal Regulations, Part 40, Title 261

Bold indicates concentration exceeds associated screening criteria

FIGURES





NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE I REFERENCE: USGS, 2018

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FIGURE 1

SITE LOCATION

SJSU TRACK
461-475 EAST ALMA AVENUE
SAN JOSE, CALIFORNIA
402335031 I 12/18

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

LEGEND

B-1 ⊕ BORING LOCATION **TS-1** ● TRACK SAMPLE

NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE I REFERENCE: GOOGLE EARTH, 2019

FIGURE 2

SITE PLAN

SJSU TRACK
461-475 EAST ALMA AVENUE
SAN JOSE, CALIFORNIA
402335031 I 04/19

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

402335031.dwg 04/25/2019 AEK

APPENDIX A

Assessor’s Parcel Map

OFFICE OF COUNTY ASSESSOR — SANTA CLARA COUNTY, CALIFORNIA

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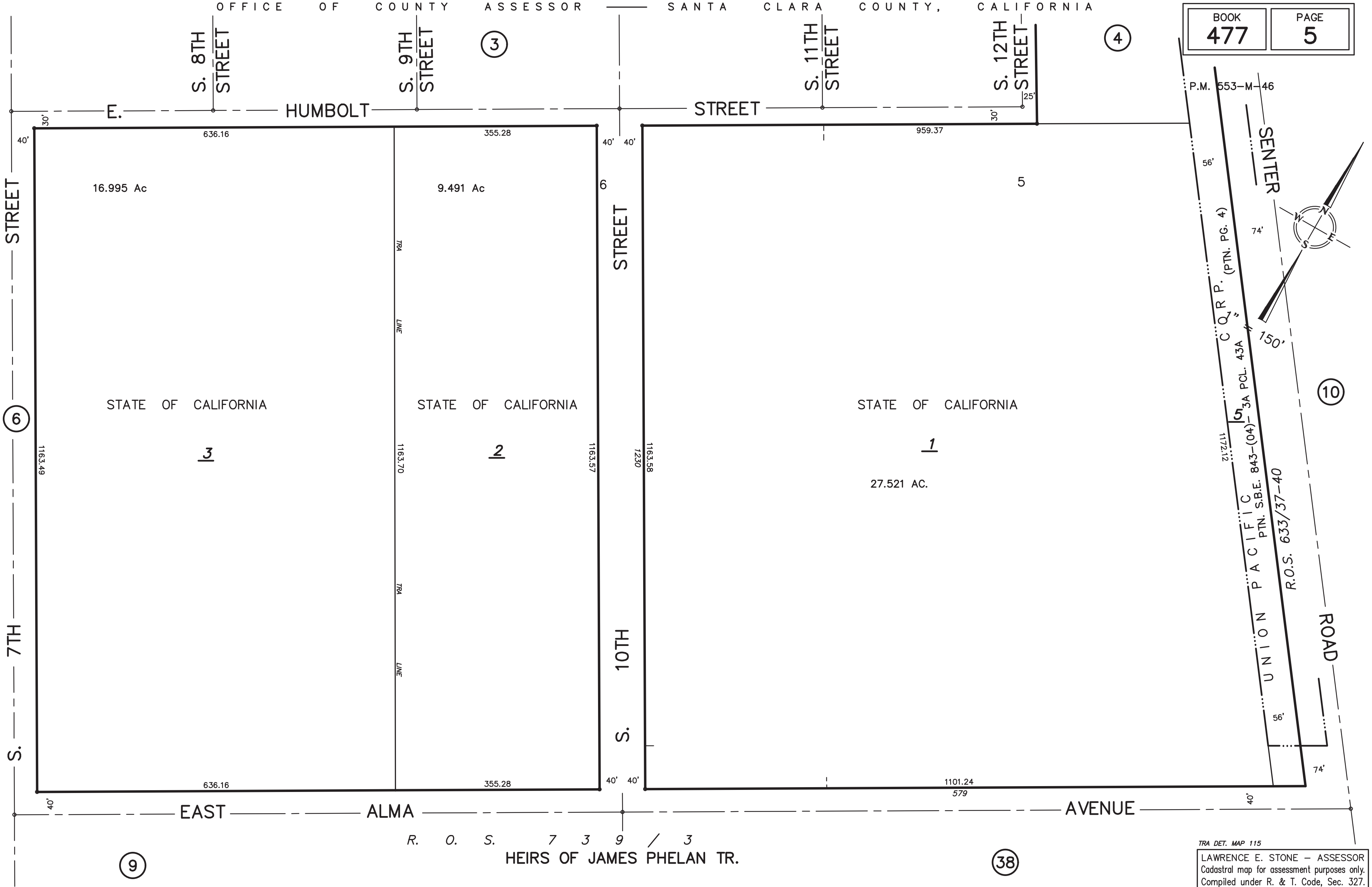

TRA DET. MAP 115

LAWRENCE E. STONE – ASSESSOR
Cadastral map for assessment purposes only.
Compiled under R. & T. Code, Sec. 327.
Effective Roll Year 2018–2019

APPENDIX B

DTSC Information Advisory Clean Imported Fill Material Guidelines

Information Advisory
Clean Imported Fill Material

October 2001

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

It is DTSC's mission to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California

California Environmental Protection Agency

Executive Summary

This fact sheet has been prepared to ensure that inappropriate fill material is not introduced onto sensitive land use properties under the oversight of the DTSC or applicable regulatory authorities. Sensitive land use properties include those that contain facilities such as hospitals, homes, day care centers, and schools. This document only focuses on human health concerns and ecological issues are not addressed. It identifies those types of land use activities that may be appropriate when determining whether a site may be used as a fill material source area. It also provides guidelines for the appropriate types of analyses that should be performed relative to the former land use, and for the number of samples that should be collected and analyzed based on the estimated volume of fill material that will need to be used. The information provided in this fact sheet is not regulatory in nature, rather is to be used as a guide, and in most situations the final decision as to the acceptability of fill material for a sensitive land use property is made on a case-by-case basis by the appropriate regulatory agency.

Introduction

The use of imported fill material has recently come under scrutiny because of the instances where contaminated soil has been brought onto an otherwise clean site. However, there are currently no established standards in the statutes or regulations that address environmental requirements for imported fill material. Therefore, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) has prepared this fact sheet to identify procedures that can be used to minimize the possibility of introducing contaminated soil onto a site that requires imported fill material. Such sites include those that are undergoing site remediation, corrective action, and closure activities overseen by DTSC or the appropriate regulatory agency. These procedures may also apply to construction projects that will result in sensitive land uses. The intent of this fact sheet is to protect people who live on or otherwise use a sensitive land use property. By using this fact sheet as a guide, the reader will minimize the chance of introducing fill material that may result in potential risk to human health or the environment at some future time.

Overview

Both natural and manmade fill materials are used for a variety of purposes. Fill material properties are commonly controlled to meet the necessary site specific engineering specifications. Because most sites requiring fill material are located in or near urban areas, the fill materials are often obtained from construction projects that generate an excess of soil, and from demolition debris (asphalt, broken concrete, etc.). However, materials from those types of sites may or may not be appropriate, depending on the proposed use of the fill, and the quality of the assessment and/or mitigation measures, if necessary. Therefore, unless material from construction projects can be demonstrated to be free of contamination and/or appropriate for the proposed use, the use of that material as fill should be avoided.

Selecting Fill Material

In general, the fill source area should be located in nonindustrial areas, and not from sites undergoing an environmental cleanup. Nonindustrial sites include those that were previously undeveloped, or used solely for residential or agricultural purposes. If the source is from an agricultural area, care should be taken to insure that the fill does not include former agricultural waste process byproducts such as manure or other decomposed organic material. Undesirable sources of fill material include industrial and/or commercial sites where hazardous ma-

Potential Contaminants Based on the Fill Source Area

Fill Source:	**Target Compounds**
Land near to an existing freeway	Lead (EPA methods 6010B or 7471A), PAHs (EPA method 8310)
Land near a mining area or rock quarry	Heavy Metals (EPA methods 6010B and 7471A), asbestos (polarized light microscopy), pH
Agricultural land	Pesticides (Organochlorine Pesticides: EPA method 8081A or 8080A; Organophosphorus Pesticides: EPA method 8141A; Chlorinated Herbicides: EPA method 8151A), heavy metals (EPA methods 6010B and 7471A)
Residential/acceptable commercial land	VOCs (EPA method 8021 or 8260B, as appropriate and combined with collection by EPA Method 5035), semi-VOCs (EPA method 8270C), TPH (modified EPA method 8015), PCBs (EPA method 8082 or 8080A), heavy metals including lead (EPA methods 6010B and 7471A), asbestos (OSHA Method ID-191)

**The recommended analyses should be performed in accordance with USEPA SW-846 methods (1996). Other possible analyses include Hexavalent Chromium: EPA method 7199*

Recommended Fill Material Sampling Schedule

Area of Individual Borrow Area	**Sampling Requirements**
2 acres or less	Minimum of 4 samples
2 to 4 acres	Minimum of 1 sample every 1/2 acre
4 to 10 acres	Minimum of 8 samples
Greater than 10 acres	Minimum of 8 locations with 4 subsamples per location

Volume of Borrow Area Stockpile	**Samples per Volume**
Up to 1,000 cubic yards	1 sample per 250 cubic yards
1,000 to 5,000 cubic yards	4 samples for first 1000cubic yards +1 sample per each additional 500 cubic yards
Greater than 5,000 cubic yards	12 samples for first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

terials were used, handled or stored as part of the business operations, or unpaved parking areas where petroleum hydrocarbons could have been spilled or leaked into the soil. Undesirable commercial sites include former gasoline service stations, retail strip malls that contained dry cleaners or photographic processing facilities, paint stores, auto repair and/or painting facilities. Undesirable industrial facilities include metal processing shops, manufacturing facilities, aerospace facilities, oil refineries, waste treatment plants, etc. Alternatives to using fill from construction sites include the use of fill material obtained from a commercial supplier of fill material or from soil pits in rural or suburban areas. However, care should be taken to ensure that those materials are also uncontaminated.

Documentation and Analysis

In order to minimize the potential of introducing contaminated fill material onto a site, it is necessary to verify through documentation that the fill source is appropriate and/or to have the fill material analyzed for potential contaminants based on the location and history of the source area. Fill documentation should include detailed information on the previous use of the land from where the fill is taken, whether an environmental site assessment was performed and its findings, and the results of any testing performed. It is recommended that any such documentation should be signed by an appropriately licensed (CA-registered) individual. If such documentation is not available or is inadequate, samples of the fill material should be chemically analyzed. Analysis of the fill material should be based on the source of the fill and knowledge of the prior land use.

Detectable amounts of compounds of concern within the fill material should be evaluated for risk in accordance with the DTSC Preliminary Endangerment Assessment (PEA) Guidance Manual. If metal analyses are performed, only those metals (CAM 17 / Title 22) to which risk levels have been assigned need to be evaluated. At present, the DTSC is working to establish California Screening Levels (CSL) to determine whether some compounds of concern pose a risk. Until such time as these CSL values are established, DTSC recommends that the DTSC PEA Guidance Manual or an equivalent process be referenced. This guidance may include the Regional Water Quality Control Board's (RWQCB) guidelines for reuse of non-hazardous petroleum hydrocarbon contaminated soil as applied to Total Petroleum Hydrocarbons (TPH) only. The RWQCB guidelines should not be used for volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCS). In addition, a standard laboratory data package, including a summary of the QA/QC (Quality Assurance/Quality Control) sample results should also accompany all analytical reports.

When possible, representative samples should be collected at the borrow area while the potential fill material is still in place, and analyzed prior to removal from the borrow area. In addition to performing the appropriate analyses of the fill material, an appropriate number of samples should also be determined based on the approximate volume or area of soil to be used as fill material. The table above can be used as a guide to determine the number of samples needed to adequately characterize the fill material when sampled at the borrow site.

Alternative Sampling

A Phase I or PEA may be conducted prior to sampling to determine whether the borrow area may have been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with DTSC or appropriate regulatory agency. However, if it is not possible to analyze the fill material at the borrow area or determine that it is appropriate for use via a Phase I or PEA, it is recommended that one (1) sample per truckload be collected and analyzed for all compounds of concern to ensure that the imported soil is uncontaminated and acceptable. (See chart on Potential Contaminants Based on the Fill Source Area for appropriate analyses). This sampling frequency may be modified upon consultation with the DTSC or appropriate regulatory agency if all of the fill material is derived from a common borrow area. However, fill material that is not characterized at the borrow area will need to be stockpiled either on or off-site until the analyseshave been completed. In addition, should contaminants exceeding acceptance criteria be identified in the stockpiled fill material, that material will be deemed unacceptable and new fill material will need to be obtained, sampled and analyzed. Therefore, the DTSC recommends that all sampling and analyses should be completed prior to delivery to the site to ensure the soil is free of contamination, and to eliminate unnecessary transportation charges for unacceptable fill material.

Composite sampling for fill material characterization may or may not be appropriate, depending on quality and homogeneity of source/borrow area, and compounds of concern. Compositing samples for volatile and semivolatile constituents is not acceptable. Composite sampling for heavy metals, pesticides, herbicides or PAH's from unanalyzed stockpiled soil is also unacceptable, unless it is stockpiled at the borrow area and originates from the same source area. In addition, if samples are composited, they should be from the same soil layer, and not from different soil layers.

When very large volumes of fill material are anticipated, or when larger areas are being considered as borrow areas, the DTSC recommends that a Phase I or PEA be conducted on the area to ensure that the borrow area has not been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with the DTSC.

For further information, call Richard Coffman, Ph.D., R.G., at (818) 551-2175.

Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

Appendix D

Noise Measurement Data

```
-         Freq Weight : A
-         Time Weight : FAST
-         Level Range : 40-100
-         Max dB : 78.1 - 2018/02/15 08:53:29
-         Level Range : 40-100
-         SEL : 92.7
-         Leq : 63.2
-
          No.s            Date Time     (dB)
         ----------------------------------------------------------------------
             1  2018/02/15 08:43:10     53.0      54.2      59.2      61.0      65.8
             6  2018/02/15 08:43:15     66.2      64.8      65.9      65.5      61.3
            11  2018/02/15 08:43:20     58.1      60.4      64.0      64.2      67.0
            16  2018/02/15 08:43:25     68.6      71.7      74.2      73.6      72.4
            21  2018/02/15 08:43:30     69.1      64.5      60.7      59.9      59.5
            26  2018/02/15 08:43:35     60.8      59.2      57.5      55.2      54.7
            31  2018/02/15 08:43:40     55.5      56.2      56.7      58.4      58.4
            36  2018/02/15 08:43:45     57.3      58.3      58.1      61.4      60.7
            41  2018/02/15 08:43:50     60.6      59.6      58.9      58.5      58.3
            46  2018/02/15 08:43:55     60.0      61.3      64.2      64.4      64.1
            51  2018/02/15 08:44:00     63.1      58.9      58.2      59.4      59.7
            56  2018/02/15 08:44:05     61.1      63.6      64.4      65.2      64.9
            61  2018/02/15 08:44:10     65.3      64.8      65.7      66.5      65.8
            66  2018/02/15 08:44:15     66.0      65.5      65.9      66.5      65.3
            71  2018/02/15 08:44:20     65.6      65.2      65.6      64.9      64.4
            76  2018/02/15 08:44:25     63.9      64.1      61.7      63.9      68.5
            81  2018/02/15 08:44:30     70.1      72.1      73.2      73.5      71.4
            86  2018/02/15 08:44:35     68.6      65.2      65.1      64.3      64.0
            91  2018/02/15 08:44:40     63.9      65.1      65.6      66.2      62.7
            96  2018/02/15 08:44:45     61.0      58.3      56.3      55.1      54.7
           101  2018/02/15 08:44:50     56.3      58.6      59.5      62.0      62.2
           106  2018/02/15 08:44:55     63.9      61.7      60.4      60.4      62.5
           111  2018/02/15 08:45:00     63.8      64.0      64.1      63.4      61.9
           116  2018/02/15 08:45:05     59.2      57.3      55.8      55.0      55.8
           121  2018/02/15 08:45:10     57.0      60.6      62.9      62.6      64.6
           126  2018/02/15 08:45:15     67.2      65.0      68.8      67.5      65.7
           131  2018/02/15 08:45:20     62.1      59.8      58.1      55.7      54.2
           136  2018/02/15 08:45:25     53.8      53.6      54.1      53.8      53.2
           141  2018/02/15 08:45:30     52.9      52.7      53.8      52.4      52.6
           146  2018/02/15 08:45:35     53.0      53.5      55.0      58.0      57.5
           151  2018/02/15 08:45:40     57.0      57.4      56.6      58.2      64.7
           156  2018/02/15 08:45:45     65.2      68.4      68.7      71.1      70.2
           161  2018/02/15 08:45:50     67.9      65.9      65.9      66.6      68.8
           166  2018/02/15 08:45:55     71.5      70.5      73.4      75.2      74.6
           171  2018/02/15 08:46:00     68.8      67.6      67.8      67.5      67.5
           176  2018/02/15 08:46:05     66.3      65.9      66.2      68.1      70.4
           181  2018/02/15 08:46:10     67.8      67.2      64.9      64.3      65.4
           186  2018/02/15 08:46:15     65.1      63.6      62.5      60.1      57.4
           191  2018/02/15 08:46:20     57.1      56.0      58.0      59.9      61.7
           196  2018/02/15 08:46:25     63.4      64.6      62.0      58.3      55.9
           201  2018/02/15 08:46:30     54.5      55.7      56.6      55.5      56.9
           206  2018/02/15 08:46:35     58.5      60.3      61.6      61.4      61.7
           211  2018/02/15 08:46:40     61.5      57.3      55.0      54.5      53.3
           216  2018/02/15 08:46:45     53.2      53.4      55.5      52.5      52.6
           221  2018/02/15 08:46:50     52.6      52.6      52.3      53.9      54.7
           226  2018/02/15 08:46:55     54.7      56.0      57.3      58.4      61.0
           231  2018/02/15 08:47:00     62.4      62.4      62.6      59.3      58.5
           236  2018/02/15 08:47:05     60.0      60.7      60.2      60.8      57.4
           241  2018/02/15 08:47:10     55.2      54.2      53.9      53.7      52.6
           246  2018/02/15 08:47:15     52.8      53.0      53.4      53.4      53.4
           251  2018/02/15 08:47:20     53.0      52.9      52.7      53.2      55.1
           256  2018/02/15 08:47:25     53.7      52.5      53.7      54.4      53.4
           261  2018/02/15 08:47:30     53.7      53.9      57.0      55.2      55.3
           266  2018/02/15 08:47:35     55.4      54.3      54.1      55.2      55.6
           271  2018/02/15 08:47:40     58.2      59.1      59.7      61.1      62.1
           276  2018/02/15 08:47:45     64.2      65.7      67.7      65.3      62.5
           281  2018/02/15 08:47:50     60.6      60.7      61.1      60.8      63.8
           286  2018/02/15 08:47:55     60.3      58.4      60.5      62.0      57.1
           291  2018/02/15 08:48:00     59.5      59.1      61.9      63.2      63.8
           296  2018/02/15 08:48:05     65.9      66.3      66.2      66.1      64.5
           301  2018/02/15 08:48:10     63.9      62.0      59.3      59.8      58.4
           306  2018/02/15 08:48:15     57.7      58.6      57.4      58.4      59.4
           311  2018/02/15 08:48:20     60.3      62.5      63.2      59.6      58.1
           316  2018/02/15 08:48:25     58.0      56.7      55.3      56.2      55.5
           321  2018/02/15 08:48:30     57.3      56.9      59.9      59.3      56.7
           326  2018/02/15 08:48:35     57.6      57.6      56.9      57.2      55.4
           331  2018/02/15 08:48:40     55.5      55.7      55.0      54.8      56.7
           336  2018/02/15 08:48:45     58.5      61.1      65.0      66.4      65.9
           341  2018/02/15 08:48:50     64.9      65.5      66.3      68.2      67.2
           346  2018/02/15 08:48:55     67.1      67.5      68.1      65.6      61.6
           351  2018/02/15 08:49:00     60.7      63.1      61.9      61.9      65.0
           356  2018/02/15 08:49:05     67.2      67.3      66.7      71.4      75.2
           361  2018/02/15 08:49:10     69.3      67.6      65.6      64.8      63.0
           366  2018/02/15 08:49:15     63.4      62.9      64.4      66.1      67.5
           371  2018/02/15 08:49:20     67.2      63.3      59.4      57.0      55.5
           376  2018/02/15 08:49:25     54.4      53.9      53.7      53.4      53.2
           381  2018/02/15 08:49:30     54.9      56.9      58.3      59.2      60.8
           386  2018/02/15 08:49:35     60.9      58.1      55.5      54.9      54.5
           391  2018/02/15 08:49:40     55.6      56.7      59.8      62.4      65.1
           396  2018/02/15 08:49:45     66.9      65.7      66.2      65.7      64.2
           401  2018/02/15 08:49:50     63.2      61.1      59.0      57.8      54.5
           406  2018/02/15 08:49:55     54.1      54.3      54.3      55.2      53.5
           411  2018/02/15 08:50:00     54.6      52.9      53.0      57.5      56.3
           416  2018/02/15 08:50:05     58.4      58.0      61.4      65.6      71.7
           421  2018/02/15 08:50:10     67.1      63.5      61.7      59.8      58.7
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426  2018/02/15 08:50:15     58.9     61.9     61.5     61.7     65.8
431  2018/02/15 08:50:20     70.8     67.6     66.0     63.4     64.9
436  2018/02/15 08:50:25     67.1     67.7     68.3     66.4     65.9
441  2018/02/15 08:50:30     65.5     63.9     63.9     61.1     61.2
446  2018/02/15 08:50:35     61.9     61.6     63.5     66.2     65.4
451  2018/02/15 08:50:40     65.7     65.2     64.7     63.1     62.8
456  2018/02/15 08:50:45     63.5     64.1     65.3     64.3     62.2
461  2018/02/15 08:50:50     59.7     57.5     55.9     55.4     55.5
466  2018/02/15 08:50:55     57.4     56.0     56.1     55.8     56.1
471  2018/02/15 08:51:00     55.6     57.2     55.6     54.9     56.3
476  2018/02/15 08:51:05     55.1     55.4     55.7     54.8     55.3
481  2018/02/15 08:51:10     55.1     54.7     56.2     58.0     60.0
486  2018/02/15 08:51:15     62.3     65.6     64.5     64.4     66.5
491  2018/02/15 08:51:20     66.8     66.1     66.0     65.7     63.8
496  2018/02/15 08:51:25     64.3     62.9     61.5     61.2     59.2
501  2018/02/15 08:51:30     57.5     56.2     56.1     56.0     55.1
506  2018/02/15 08:51:35     55.3     55.0     55.0     54.9     54.7
511  2018/02/15 08:51:40     54.3     53.8     54.7     53.7     53.8
516  2018/02/15 08:51:45     53.7     53.2     53.1     53.2     53.3
521  2018/02/15 08:51:50     53.7     53.7     54.8     54.8     55.8
526  2018/02/15 08:51:55     58.3     60.9     64.0     64.7     65.3
531  2018/02/15 08:52:00     65.0     61.8     61.9     62.4     63.8
536  2018/02/15 08:52:05     61.4     60.5     62.1     63.0     62.8
541  2018/02/15 08:52:10     58.2     55.9     54.8     56.2     54.6
546  2018/02/15 08:52:15     54.4     55.3     56.3     57.7     56.5
551  2018/02/15 08:52:20     56.2     58.7     59.8     59.1     58.3
556  2018/02/15 08:52:25     59.7     59.6     61.6     61.3     63.8
561  2018/02/15 08:52:30     64.7     65.3     67.0     64.1     63.3
566  2018/02/15 08:52:35     64.2     65.3     63.5     63.2     60.5
571  2018/02/15 08:52:40     60.0     63.7     62.0     62.3     63.9
576  2018/02/15 08:52:45     59.2     60.8     59.2     59.5     59.3
581  2018/02/15 08:52:50     59.9     63.9     68.9     62.3     60.3
586  2018/02/15 08:52:55     62.8     60.0     59.3     58.3     57.5
591  2018/02/15 08:53:00     55.9     57.4     56.5     55.0     54.6
596  2018/02/15 08:53:05     54.8     56.3     58.4     54.9     54.9
601  2018/02/15 08:53:10     54.3     55.5     53.4     53.2     54.1
606  2018/02/15 08:53:15     55.6     58.5     58.9     59.7     60.4
611  2018/02/15 08:53:20     61.3     61.0     61.2     66.7     70.6
616  2018/02/15 08:53:25     69.4     70.8     74.2     74.6     77.9
621  2018/02/15 08:53:30     69.9     65.5     61.7     60.4     60.7
626  2018/02/15 08:53:35     61.6     58.5     59.2     61.9     59.4
631  2018/02/15 08:53:40     59.0     58.3     55.3     54.4     53.3
636  2018/02/15 08:53:45     53.2     52.5     52.3     52.8     53.3
641  2018/02/15 08:53:50     52.6     53.1     52.6     51.5     51.9
646  2018/02/15 08:53:55     52.4     52.5     52.5     53.0     51.7
651  2018/02/15 08:54:00     53.2     54.4     54.6     56.5     58.6
656  2018/02/15 08:54:05     60.7     65.0     66.9     67.0     67.2
661  2018/02/15 08:54:10     65.2     64.4     63.8     64.1     62.7
666  2018/02/15 08:54:15     62.4     60.3     59.3     57.9     57.8
671  2018/02/15 08:54:20     58.0     61.0     62.0     63.3     61.4
676  2018/02/15 08:54:25     60.5     59.2     57.3     56.4     61.0
681  2018/02/15 08:54:30     59.5     60.8     57.8     57.6     56.5
686  2018/02/15 08:54:35     59.4     58.9     56.2     54.6     58.1
691  2018/02/15 08:54:40     55.5     58.1     55.4     57.5     57.2
696  2018/02/15 08:54:45     59.9     59.7     61.5     64.0     65.8
701  2018/02/15 08:54:50     66.2     62.2     60.9     58.4     61.1
706  2018/02/15 08:54:55     62.1     63.6     65.0     62.0     61.6
711  2018/02/15 08:55:00     61.1     59.4     59.3     59.7     57.2
716  2018/02/15 08:55:05     54.6     54.7     53.7     54.2     55.8
721  2018/02/15 08:55:10     52.3     51.2     51.2     50.7     50.7
726  2018/02/15 08:55:15     50.3     51.1     52.7     54.3     53.0
731  2018/02/15 08:55:20     53.0     52.6     53.1     51.7     52.5
736  2018/02/15 08:55:25     52.9     53.0     54.1     55.1     55.1
741  2018/02/15 08:55:30     57.8     60.0     59.8     61.5     62.4
746  2018/02/15 08:55:35     62.6     62.0     60.8     63.6     66.1
751  2018/02/15 08:55:40     69.0     69.3     67.9     70.7     73.6
756  2018/02/15 08:55:45     70.6     67.7     63.9     61.0     58.2
761  2018/02/15 08:55:50     55.9     57.1     56.8     55.3     54.8
766  2018/02/15 08:55:55     53.0     54.4     55.6     57.5     59.9
771  2018/02/15 08:56:00     61.8     64.6     63.2     61.8     57.1
776  2018/02/15 08:56:05     55.0     53.7     56.7     57.6     59.9
781  2018/02/15 08:56:10     62.3     64.0     63.7     58.7     56.2
786  2018/02/15 08:56:15     53.7     52.6     52.9     52.5     52.3
791  2018/02/15 08:56:20     51.1     51.2     52.2     50.7     52.0
796  2018/02/15 08:56:25     50.8     51.9     51.4     51.0     52.2
801  2018/02/15 08:56:30     53.0     51.8     51.1     52.3     51.7
806  2018/02/15 08:56:35     54.8     52.5     54.1     56.7     55.2
811  2018/02/15 08:56:40     56.6     54.3     57.9     56.8     56.5
816  2018/02/15 08:56:45     55.8     56.1     58.6     57.7     57.6
821  2018/02/15 08:56:50     57.8     57.2     58.4     56.1     56.6
826  2018/02/15 08:56:55     59.1     64.0     63.9     59.5     57.5
831  2018/02/15 08:57:00     58.2     59.1     59.0     59.9     58.4
836  2018/02/15 08:57:05     58.9     61.9     64.2     65.0     66.9
841  2018/02/15 08:57:10     66.8     65.3     64.0     66.4     69.1
846  2018/02/15 08:57:15     66.8     63.9     64.5     64.4     64.9
851  2018/02/15 08:57:20     65.0     65.9     64.4     61.2     57.7
856  2018/02/15 08:57:25     55.3     57.0     55.6     54.9     56.4
861  2018/02/15 08:57:30     58.5     60.9     64.6     65.7     66.4
866  2018/02/15 08:57:35     66.6     66.6     64.9     62.7     62.4
871  2018/02/15 08:57:40     62.8     63.3     60.6     59.4     58.1
876  2018/02/15 08:57:45     53.9     53.2     52.0     53.1     51.8
881  2018/02/15 08:57:50     52.2     52.0     51.4     51.9     51.7
886  2018/02/15 08:57:55     54.4     52.4     52.1     54.3     54.4
891  2018/02/15 08:58:00     53.2     53.4     52.2     53.1     52.9
896  2018/02/15 08:58:05     56.4     57.3     56.5     63.5     65.8
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```
-          Freq Weight : A
-          Time Weight : FAST
-          Level Range : 40-100
-          Max dB : 91.5 - 2018/02/15 09:21:54
-          Level Range : 40-100
-          SEL : 99.5
-          Leq : 70.0
-
           No.s            Date Time     (dB)
          ----------------------------------------------------------------------
              1  2018/02/15 09:11:52     60.9      61.3      60.4      62.0      66.1
              6  2018/02/15 09:11:57     70.9      72.3      68.7      67.3      68.4
             11  2018/02/15 09:12:02     71.8      71.7      68.5      66.8      66.5
             16  2018/02/15 09:12:07     68.9      72.3      70.1      65.4      66.4
             21  2018/02/15 09:12:12     63.4      62.5      62.8      65.7      70.2
             26  2018/02/15 09:12:17     72.7      75.2      73.6      69.8      65.2
             31  2018/02/15 09:12:22     64.9      61.3      62.4      60.2      61.0
             36  2018/02/15 09:12:27     62.1      62.0      65.2      66.6      68.3
             41  2018/02/15 09:12:32     66.5      66.4      68.6      71.5      74.9
             46  2018/02/15 09:12:37     78.5      74.8      75.5      73.1      67.3
             51  2018/02/15 09:12:42     65.4      63.2      63.0      65.1      62.9
             56  2018/02/15 09:12:47     60.8      61.3      61.3      62.0      61.2
             61  2018/02/15 09:12:52     60.5      59.7      59.9      61.0      60.1
             66  2018/02/15 09:12:57     59.7      59.6      58.6      59.8      58.7
             71  2018/02/15 09:13:02     58.9      58.9      58.8      58.4      59.4
             76  2018/02/15 09:13:07     58.7      58.7      58.8      61.0      62.4
             81  2018/02/15 09:13:12     63.9      63.5      63.5      62.4      60.9
             86  2018/02/15 09:13:17     60.3      62.3      59.9      60.1      64.8
             91  2018/02/15 09:13:22     60.8      60.9      62.9      66.8      68.3
             96  2018/02/15 09:13:27     69.4      73.6      76.5      76.0      74.0
            101  2018/02/15 09:13:32     75.1      74.0      70.5      65.3      63.9
            106  2018/02/15 09:13:37     62.0      61.0      60.4      59.8      60.9
            111  2018/02/15 09:13:42     61.1      62.2      66.8      73.6      75.4
            116  2018/02/15 09:13:47     73.0      68.3      67.9      69.0      69.0
            121  2018/02/15 09:13:52     66.9      63.5      61.5      62.0      62.6
            126  2018/02/15 09:13:57     67.0      76.9      74.5      64.6      60.3
            131  2018/02/15 09:14:02     58.9      58.0      58.2      59.9      60.1
            136  2018/02/15 09:14:07     64.7      71.0      73.9      67.4      63.6
            141  2018/02/15 09:14:12     67.1      69.2      69.4      71.1      70.9
            146  2018/02/15 09:14:17     65.7      62.1      59.9      59.8      59.4
            151  2018/02/15 09:14:22     59.0      58.7      58.3      57.4      58.5
            156  2018/02/15 09:14:27     58.5      58.4      58.5      57.6      56.9
            161  2018/02/15 09:14:32     57.7      57.2      57.3      58.8      58.1
            166  2018/02/15 09:14:37     57.2      56.9      56.9      57.5      57.5
            171  2018/02/15 09:14:42     58.1      58.2      57.6      57.7      57.3
            176  2018/02/15 09:14:47     57.7      57.9      57.7      57.9      59.1
            181  2018/02/15 09:14:52     58.0      57.9      58.9      58.0      58.7
            186  2018/02/15 09:14:57     58.5      59.6      60.9      61.9      67.9
            191  2018/02/15 09:15:02     75.6      73.3      74.5      68.4      66.4
            196  2018/02/15 09:15:07     67.0      69.9      69.1      67.8      64.3
            201  2018/02/15 09:15:12     65.6      68.4      70.0      71.4      72.8
            206  2018/02/15 09:15:17     74.4      75.8      70.4      66.4      64.4
            211  2018/02/15 09:15:22     63.0      60.2      59.0      57.8      58.1
            216  2018/02/15 09:15:27     57.3      56.6      57.1      56.7      57.4
            221  2018/02/15 09:15:32     58.0      58.8      59.9      62.3      65.3
            226  2018/02/15 09:15:37     66.3      67.7      67.9      67.5      66.2
            231  2018/02/15 09:15:42     65.5      64.1      65.2      68.5      74.2
            236  2018/02/15 09:15:47     70.8      64.2      66.4      69.9      70.6
            241  2018/02/15 09:15:52     65.6      62.2      61.7      62.6      66.0
            246  2018/02/15 09:15:57     69.7      69.0      64.6      61.6      60.3
            251  2018/02/15 09:16:02     59.6      59.4      59.9      58.3      59.6
            256  2018/02/15 09:16:07     58.9      57.3      58.3      58.0      59.6
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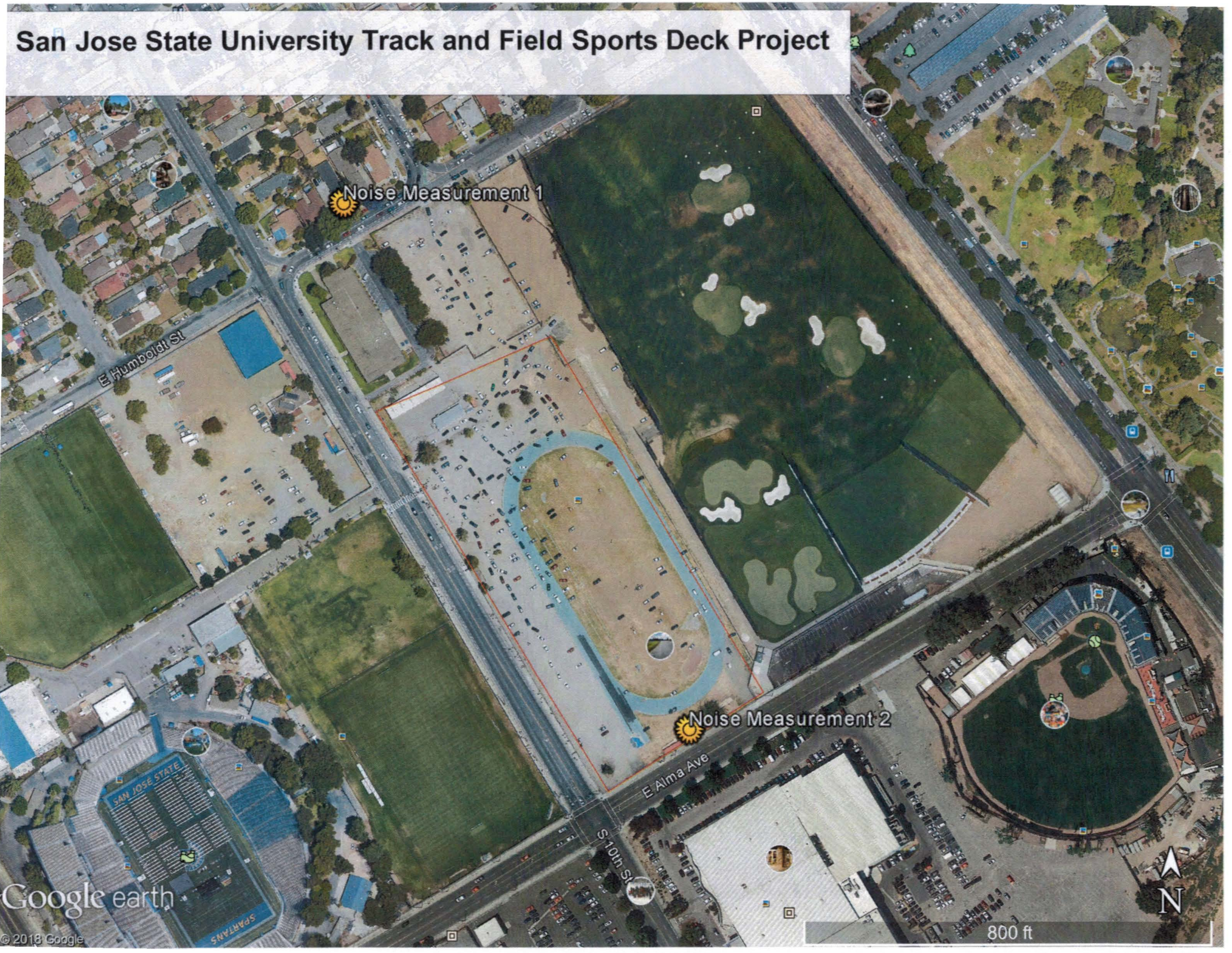
            266  2018/02/15 09:16:17     61.7      62.7      64.9      67.6      70.9
            271  2018/02/15 09:16:22     79.3      77.1      71.7      72.8      73.9
            276  2018/02/15 09:16:27     72.0      74.1      78.3      71.1      68.5
            281  2018/02/15 09:16:32     68.8      70.2      75.1      73.5      72.1
            286  2018/02/15 09:16:37     71.0      69.2      67.5      65.4      63.9
            291  2018/02/15 09:16:42     65.4      65.9      63.1      65.6      65.3
            296  2018/02/15 09:16:47     62.6      61.6      60.6      61.3      59.3
            301  2018/02/15 09:16:52     60.7      59.2      59.9      59.9      59.2
            306  2018/02/15 09:16:57     59.2      59.9      59.8      60.1      59.8
            311  2018/02/15 09:17:02     60.6      59.7      59.7      59.6      59.2
            316  2018/02/15 09:17:07     59.5      60.2      60.3      60.8      61.8
            321  2018/02/15 09:17:12     60.8      60.9      61.5      61.0      60.8
            326  2018/02/15 09:17:17     60.6      61.1      61.5      60.2      64.1
            331  2018/02/15 09:17:22     63.4      63.3      62.2      62.1      61.4
            336  2018/02/15 09:17:27     62.7      63.1      62.4      61.4      61.7
            341  2018/02/15 09:17:32     61.5      61.1      63.6      62.5      64.3
            346  2018/02/15 09:17:37     69.6      72.7      74.5      68.4      66.7
            351  2018/02/15 09:17:42     73.5      73.8      66.0      69.5      72.4
            356  2018/02/15 09:17:47     68.0      62.6      60.2      57.4      58.1
            361  2018/02/15 09:17:52     57.1      57.8      57.6      59.0      61.4
            366  2018/02/15 09:17:57     62.4      64.9      71.3      76.7      70.9
            371  2018/02/15 09:18:02     63.8      61.8      65.3      72.3      72.1
            376  2018/02/15 09:18:07     63.3      58.5      57.8      57.1      59.4
            381  2018/02/15 09:18:12     57.7      58.2      58.2      58.0      57.8
            386  2018/02/15 09:18:17     57.9      58.7      57.5      58.3      59.0
            391  2018/02/15 09:18:22     58.7      58.1      57.4      58.2      57.6
            396  2018/02/15 09:18:27     57.5      57.2      57.6      57.3      58.3
            401  2018/02/15 09:18:32     57.9      58.6      58.9      59.0      60.2
            406  2018/02/15 09:18:37     61.6      63.3      64.5      67.7      70.0
            411  2018/02/15 09:18:42     68.7      65.8      63.8      61.8      61.1
            416  2018/02/15 09:18:47     60.9      60.2      59.3      61.2      60.9
            421  2018/02/15 09:18:52     59.4      59.5      59.2      58.5      58.2
```

```
426  2018/02/15 09:18:57     58.3      58.7      60.0      58.4      59.1
431  2018/02/15 09:19:02     58.4      61.2      58.2      58.1      58.6
436  2018/02/15 09:19:07     58.7      58.4      58.1      57.0      58.4
441  2018/02/15 09:19:12     57.7      57.0      57.8      58.4      59.2
446  2018/02/15 09:19:17     58.3      57.6      57.4      57.4      56.9
451  2018/02/15 09:19:22     56.7      57.0      57.4      57.2      57.9
456  2018/02/15 09:19:27     57.1      56.1      55.6      57.0      55.5
461  2018/02/15 09:19:32     55.0      55.8      56.3      57.0      56.6
466  2018/02/15 09:19:37     56.5      56.5      56.7      56.0      56.9
471  2018/02/15 09:19:42     57.9      58.9      57.8      61.0      67.1
476  2018/02/15 09:19:47     71.8      69.4      72.3      74.6      68.5
481  2018/02/15 09:19:52     65.1      63.1      64.3      66.2      66.7
486  2018/02/15 09:19:57     69.2      71.0      70.6      69.3      66.0
491  2018/02/15 09:20:02     62.9      61.7      61.0      61.1      60.6
496  2018/02/15 09:20:07     58.5      58.9      60.4      61.2      59.9
501  2018/02/15 09:20:12     63.7      62.6      65.9      68.2      72.0
506  2018/02/15 09:20:17     71.8      69.8      70.3      75.2      73.3
511  2018/02/15 09:20:22     66.4      64.0      61.5      63.5      68.3
516  2018/02/15 09:20:27     72.5      72.1      75.4      74.5      73.3
521  2018/02/15 09:20:32     71.8      70.0      75.3      75.5      72.2
526  2018/02/15 09:20:37     74.3      66.2      62.1      60.2      60.7
531  2018/02/15 09:20:42     60.4      62.2      60.2      60.8      62.7
536  2018/02/15 09:20:47     60.5      60.8      64.9      62.4      62.5
541  2018/02/15 09:20:52     61.6      61.8      62.1      62.8      62.7
546  2018/02/15 09:20:57     61.7      60.5      61.2      63.4      62.3
551  2018/02/15 09:21:02     64.2      67.1      70.9      68.2      64.6
556  2018/02/15 09:21:07     62.0      60.7      59.3      58.8      58.7
561  2018/02/15 09:21:12     60.0      63.8      66.1      68.0      68.6
566  2018/02/15 09:21:17     63.8      61.4      58.5      58.9      58.0
571  2018/02/15 09:21:22     58.6      57.4      57.6      57.6      57.9
576  2018/02/15 09:21:27     58.3      60.1      62.2      64.2      68.3
581  2018/02/15 09:21:32     68.4      65.4      63.0      61.9      60.0
586  2018/02/15 09:21:37     60.5      58.7      59.2      59.5      60.8
591  2018/02/15 09:21:42     60.8      61.4      62.2      62.8      64.0
596  2018/02/15 09:21:47     66.1      71.2      73.6      76.5      76.9
601  2018/02/15 09:21:52     81.6      87.7      90.5      88.6      75.3
606  2018/02/15 09:21:57     73.4      70.6      67.8      63.4      62.9
611  2018/02/15 09:22:02     62.7      61.4      65.3      67.2      68.8
616  2018/02/15 09:22:07     68.0      65.0      62.6      59.8      59.8
621  2018/02/15 09:22:12     58.9      59.3      61.6      62.5      64.3
626  2018/02/15 09:22:17     66.0      67.7      66.2      66.5      68.9
631  2018/02/15 09:22:22     72.2      72.3      67.9      62.6      61.3
636  2018/02/15 09:22:27     59.9      59.7      60.0      63.2      67.4
641  2018/02/15 09:22:32     67.5      72.2      67.7      62.6      59.9
646  2018/02/15 09:22:37     57.8      57.4      57.6      57.2      57.0
651  2018/02/15 09:22:42     57.1      56.5      57.1      57.2      57.4
656  2018/02/15 09:22:47     56.9      57.1      56.3      56.9      57.6
661  2018/02/15 09:22:52     58.1      57.8      58.2      58.4      58.9
666  2018/02/15 09:22:57     59.0      58.9      60.0      60.4      63.8
671  2018/02/15 09:23:02     67.8      71.6      74.1      69.4      71.0
676  2018/02/15 09:23:07     75.5      68.6      70.5      73.6      72.5
681  2018/02/15 09:23:12     72.1      71.6      70.4      68.1      68.0
686  2018/02/15 09:23:17     70.6      73.8      69.2      67.4      67.2
691  2018/02/15 09:23:22     66.0      67.2      66.7      68.2      72.0
696  2018/02/15 09:23:27     77.9      69.7      65.2      64.4      64.1
701  2018/02/15 09:23:32     66.0      69.5      65.8      63.8      61.7
706  2018/02/15 09:23:37     65.9      60.9      59.6      59.4      58.1
711  2018/02/15 09:23:42     59.8      58.6      59.3      58.4      59.0
716  2018/02/15 09:23:47     58.8      60.3      60.5      60.7      59.7
721  2018/02/15 09:23:52     59.4      60.3      62.4      62.8      60.8
726  2018/02/15 09:23:57     60.0      60.0      59.3      60.5      60.4
731  2018/02/15 09:24:02     60.1      60.4      60.1      60.3      59.6
736  2018/02/15 09:24:07     59.4      60.2      59.9      59.2      61.5
741  2018/02/15 09:24:12     60.3      59.0      58.3      58.8      58.5
746  2018/02/15 09:24:17     57.9      57.3      58.6      59.2      59.4
751  2018/02/15 09:24:22     61.2      65.5      69.5      73.5      76.2
756  2018/02/15 09:24:27     73.6      70.7      64.5      61.0      59.8
761  2018/02/15 09:24:32     59.2      57.9      58.1      57.2      57.4
766  2018/02/15 09:24:37     57.0      58.2      59.7      60.8      67.9
771  2018/02/15 09:24:42     70.8      73.2      71.2      71.5      71.5
776  2018/02/15 09:24:47     72.1      70.2      69.0      71.0      69.1
781  2018/02/15 09:24:52     65.6      63.4      64.2      67.4      70.3
786  2018/02/15 09:24:57     70.5      75.7      72.7      65.2      62.8
791  2018/02/15 09:25:02     61.5      62.4      60.2      61.3      60.4
796  2018/02/15 09:25:07     60.3      61.6      63.0      62.3      63.7
801  2018/02/15 09:25:12     65.9      67.8      66.7      64.8      62.3
806  2018/02/15 09:25:17     60.8      61.1      59.8      59.4      58.7
811  2018/02/15 09:25:22     58.8      59.4      58.8      58.1      58.4
816  2018/02/15 09:25:27     58.1      57.6      58.0      58.2      58.8
821  2018/02/15 09:25:32     57.9      59.1      59.2      58.7      59.3
826  2018/02/15 09:25:37     61.4      60.0      59.8      60.8      61.1
831  2018/02/15 09:25:42     61.7      65.8      69.9      74.9      70.4
836  2018/02/15 09:25:47     64.9      62.7      61.5      64.9      69.7
841  2018/02/15 09:25:52     66.4      60.3      58.9      56.6      56.0
846  2018/02/15 09:25:57     56.2      55.7      56.6      55.7      55.3
851  2018/02/15 09:26:02     55.8      55.2      55.0      55.3      55.3
856  2018/02/15 09:26:07     56.2      56.0      56.0      56.5      56.1
861  2018/02/15 09:26:12     55.9      56.2      57.2      56.3      56.3
866  2018/02/15 09:26:17     56.9      56.8      55.9      56.1      55.9
871  2018/02/15 09:26:22     56.2      56.2      56.2      56.7      58.4
876  2018/02/15 09:26:27     58.1      59.2      59.7      60.5      61.0
881  2018/02/15 09:26:32     63.0      65.0      66.8      69.0      66.4
886  2018/02/15 09:26:37     62.5      59.9      57.9      58.5      58.6
891  2018/02/15 09:26:42     60.5      63.5      64.9      68.6      70.1
896  2018/02/15 09:26:47     67.2      67.1      63.4      61.4      61.2
```

San Jose State University Track and Field Sports Deck Project



Rincon Consultants, Inc.
Environmental Scientists Planners Engineers
www.rinconconsultants.com

Ambient Noise Survey Data Sheet

Instructions: Document noise measurement locations with a photo of the site, including the noise meter. Additionally, take notes on general and secondary noise sources, including the instantaneous noise level if possible. As a reminder, A/C weighting should be set to "A" and generally response time should be set to "fast." For additional information, please review the *Noise Measurement Protocol* in the pelican case.

Project Name: SJSU Track & Field Deck **Job Number:** 17-05299
Date: 2/15/18 **Operator Name:** Ben

Measurement #1

Location: 1 **Begin time:** 7:48 am **Finish time:** 8:03 am
Measurement No.: 46 **Wind (mph):** 3 **Direction:** W
Cloud Cover Class: Overcast (>80%) ☐ Light (20-80%) ☐ Sunny (<20%) ☑
Calibration (dB): Start: 94.0 End: 94.0
Primary Noise Sources: E. Humboldt St. **Distance:** 25 Ft
Secondary Noise Sources:
Notes:

Traffic Count: Passenger Cars: Too many to count
Medium to Heavy Duty Trucks (3 axles): Yes Heavy Duty Trucks (4+ axles): No
Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): No
Leq: 63.2 **SEL:** 92.7 **Lmax:** 78.1 **Lmin:** 50.1 **PK:** 92.1
L(05): 67.7 **L(10):** 66.2 **L(50):** 59.3 **L(90):** 53.1 **L(95):** 52.3
Response: Slow ☐ Fast ☑ Peak ☐ Impulse ☐

Measurement #2

Location: 2 **Begin time:** 8:17 am **Finish time:** 8:32 am
Measurement No.: 47 **Wind (mph):** 4 **Direction:** NW
Cloud Cover Class: Overcast (>80%) ☐ Light (20-80%) ☐ Sunny (<20%) ☑
Calibration (dB): Start: 94.0 End: 94.0
Primary Noise Sources: E. Alma Ave. **Distance:** 35 Ft.
Secondary Noise Sources:
Notes:

Traffic Count: Passenger Cars: 𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸|| = 97
Medium to Heavy Duty Trucks (3 axles): || Heavy Duty Trucks (4+ axles): |
Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): 1 Airplane
Leq: 70.0 **SEL:** 99.5 **Lmax:** 91.5 **Lmin:** 54.3 **PK:** 104.0
L(05): 73.6 **L(10):** 71.5 **L(50):** 61.4 **L(90):** 57.4 **L(95):** 56.6
Response: Slow ☐ Fast ☑ Peak ☐ Impulse ☐

Form Updated: 10/2/2017

Appendix E

Traffic Study

HEXAGON TRANSPORTATION CONSULTANTS, INC.

SJSU
Parking Structure

Transportation Impact Analysis

Prepared for:

Rincon Consultants, Inc.

May 2, 2019

Hexagon Transportation Consultants, Inc.
Hexagon Office: 4 North Second Street, Suite 400
San Jose, CA 95113
Hexagon Job Number: 18GB59
Phone: 408.971.6100
Client Name: Rincon Consultants, Inc.

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Executive Summary

This report presents the results of the transportation analysis conducted for the proposed new San Jose State University (SJSU) parking garage on 10th Street. The garage would provide a total of 1,500 parking spaces: 368 spaces on the ground level, 374 spaces on the second level, 374 spaces on the third level, and 384 spaces on the fourth level. The project site is at the location of an existing practice track on S. 10th Street at Alma Avenue. The entrances to the parking garage would be on S. 10th Street, approximately 250 feet north of Alma Avenue, and on Alma Avenue, 325 feet east of S. 10th Street.

During the weekend, the garage would be used for parking for events at CEFCU Stadium. Parking currently uses the area of the practice track and formerly used the soccer field adjacent to CEFCU Stadium. Together these existing parking areas comprised about 1,500 parking spaces. Recently an improved soccer field was built adjacent to the stadium, so that field is no longer used for parking. Therefore, the new parking garage would replace all the parking that formerly used the fields adjacent to the stadium.

The parking structure would be used daily for parking for students, staff, and the general public. Currently, students and staff park close to main campus on the street. The proposed parking garage will generate no new net trips. It will reorient trips from areas where people are currently parking to the proposed parking garage. For the purposes of analyses, the traffic study is based on the new trips to this area and the daily usage of the parking structure. The typical daily usage would be a maximum of about 700 vehicles parked at any one time, but with two turnovers per day.

This study was conducted for the purpose of identifying the potential transportation impacts related to the proposed development. The transportation impacts of the project were evaluated following the typical standards and methodologies used in the City of San Jose.

Project-Level VMT Analysis

Since the project would be reorienting trips and not generating new trips, the VMT impact would be minimal. The CSU Transportation Impact Study Manual states that parking facilities that serve the campus demand and do not create “too much parking” would constitute a less than significant impact related to VMT. According to a parking study completed by Watry Design, Inc., the main campus project deficit in 2028 is expected to be 1,741 spaces. Therefore, the proposed parking garage would serve campus demand and not create “too much parking”.

Trip Generation

The magnitude of traffic that is being generated by the proposed parking garage on the site was estimated based on time of arrival estimates supplied by San Jose State University (SJSU). The traffic study focused on typical daily operations of the garage. The traffic during special events, which typically happen on weekends, was not analyzed because the existing trips for special events already park in the immediate vicinity of the project site. The proposed development is estimated generate 4,200 daily trips with peak entrances into the parking garage to be 400 vehicles per hour and peak exits out of the parking garage to be 400 vehicles per hour.

Intersection Level of Service Analysis

The results of the intersection level of service analysis show that measured against the City of San Jose level of service impact criteria, none of the study intersections would be significantly impacted by the project.

Other Transportation Issues

These other transportation issues were evaluated to determine if any deficiencies would exist under project conditions that may not be specifically linked to environmental impact reporting. These are not considered environmental issues under CEQA, but have been included in the traffic study to meet the requirements of the local jurisdiction.

Vehicle Queuing Analysis

The results show that the estimated 95th percentile queues would exceed the left-turn storage capacity on 10th Street at the 10th Street/I-280 Northbound On-Ramp intersection and 11th Street at the 11th Street/I-280 Northbound Off-Ramp intersection under all existing AM and PM peak hour conditions.

10th Street and I-280 Northbound On-Ramp

The queuing analysis indicates that the 95th percentile vehicle queue for the westbound left-turn lane at the 10th Street/I-280 Northbound On-Ramp intersection currently exceeds the existing vehicle storage capacity during the AM and PM peak hour of traffic and would continue to do so under the existing plus project conditions. The left-turn lane provides 150 feet of vehicle storage and currently requires 350 feet based on the queuing analysis. However, no operational issues were observed during the AM and PM peak hours. Field observations showed that the westbound left-turn lane had enough cycle time to make the left turn. The project would increase the 95th percentile vehicle queue during the AM peak hour by 3 vehicles and would not increase the 95th percentile vehicle queue during the PM peak hour.

11th Street and I-280 Northbound Off-Ramp

The queuing analysis indicates that the 95th percentile vehicle queue for the northbound left-turn lane at the 11th Street/I-280 Northbound Off-Ramp intersection currently exceeds the existing vehicle storage capacity during the AM and PM peak hour of traffic and would continue to do so under the existing plus project conditions. The left-turn lane provides 250 feet of vehicle storage and currently requires 550 feet based on the queuing analysis. This was confirmed by field observations. The project would not increase the 95th percentile vehicle queue during the AM peak hour and would increase the 95th percentile vehicle queue during the PM peak hour by 3 vehicles.

The site plan shows adequate site access and on-site circulation, and no significant traffic operational issues are expected to occur as a result of the project. The existing transit and bicycle facilities in the study area are sufficient to serve the project.

Hexagon has the following recommendations resulting from the site access and circulation analysis.

- During special events, police officers should be used to direct traffic on 10th Street and Alma Avenue so that vehicles could efficiently get in and out of the garage.
- The plan for shuttle buses is that they would pick up passengers along the curb on Alma Avenue adjacent to the parking structure. It will be necessary to restripe Alma Avenue to provide enough space along the curb for buses to stop.
- The existing midblock crosswalk across 10th Street should be relocated about 200 feet south to provide a direct connection from the parking structure to the stadium. The crosswalk should be redesigned to meet current City Standards.
- Depending on the current passenger load in the shuttle buses, it may be necessary to add additional buses to the route.

Table ES 1
Intersection Level of Service Summary

				Existing Conditions			
				No Project		with Project	
#	Intersection	Peak Hour	Count Date	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
1	10th Street and Keyes Street	AM	3/13/19	24.6	C	25.2	C
		PM	3/12/19	24.6	C	24.5	C
2	11th Street and Keyes Street	AM	3/13/19	25.2	C	25.9	C
		PM	3/12/19	25.6	C	27.8	C
3	7th Street and Alma Avenue	AM	3/13/19	29.1	C	28.9	C
		PM	3/12/19	26.0	C	27.9	C
4	10th Street and Alma Avenue	AM	3/13/19	24.2	C	24.8	C
		PM	3/12/19	24.8	C	25.1	C
5	Senter Road and Alma Avenue	AM	3/13/19	12.6	B	12.8	B
		PM	3/12/19	13.8	B	14.2	B
6	11th Street and I-280 Northbound Off-Ramp*	AM	3/13/19	10.7	B	11.7	B
		PM	10/20/16	15.2	B	15.8	B
7	11th Street and I-280 Southbound On-Ramp*	AM	3/13/19	12.1	B	12.0	B
		PM	10/20/16	13.2	B	13.0	B
8	10th Street and I-280 Northbound On-Ramp*	AM	3/13/19	15.8	B	16.4	B
		PM	12/14/16	16.2	B	17.5	B
9	10th Street and I-280 Southbound Off-Ramp*	AM	3/13/19	14.6	B	15.3	B
		PM	12/13/16	16.5	B	17.1	B

Note:

* Denotes the CMP designated Intersection

Bold indicates a substandard level of service.

Bold indicates an adverse effect on intersection operations caused by the project.

1. Introduction

This report presents the results of the transportation analysis conducted for the proposed new San Jose State University (SJSU) parking garage on 10th Street (see Figure 1). The garage would provide a total of 1,500 parking spaces: 368 spaces on the ground level, 374 spaces on the second level, 374 spaces on the third level, and 384 spaces on the fourth level (see Figure 2). The project site is at the location of an existing practice track on S. 10th Street at Alma Avenue. The entrances to the parking garage would be on S. 10th Street, approximately 250 feet north of Alma Avenue, and on Alma Avenue, 325 feet east of S. 10th Street.

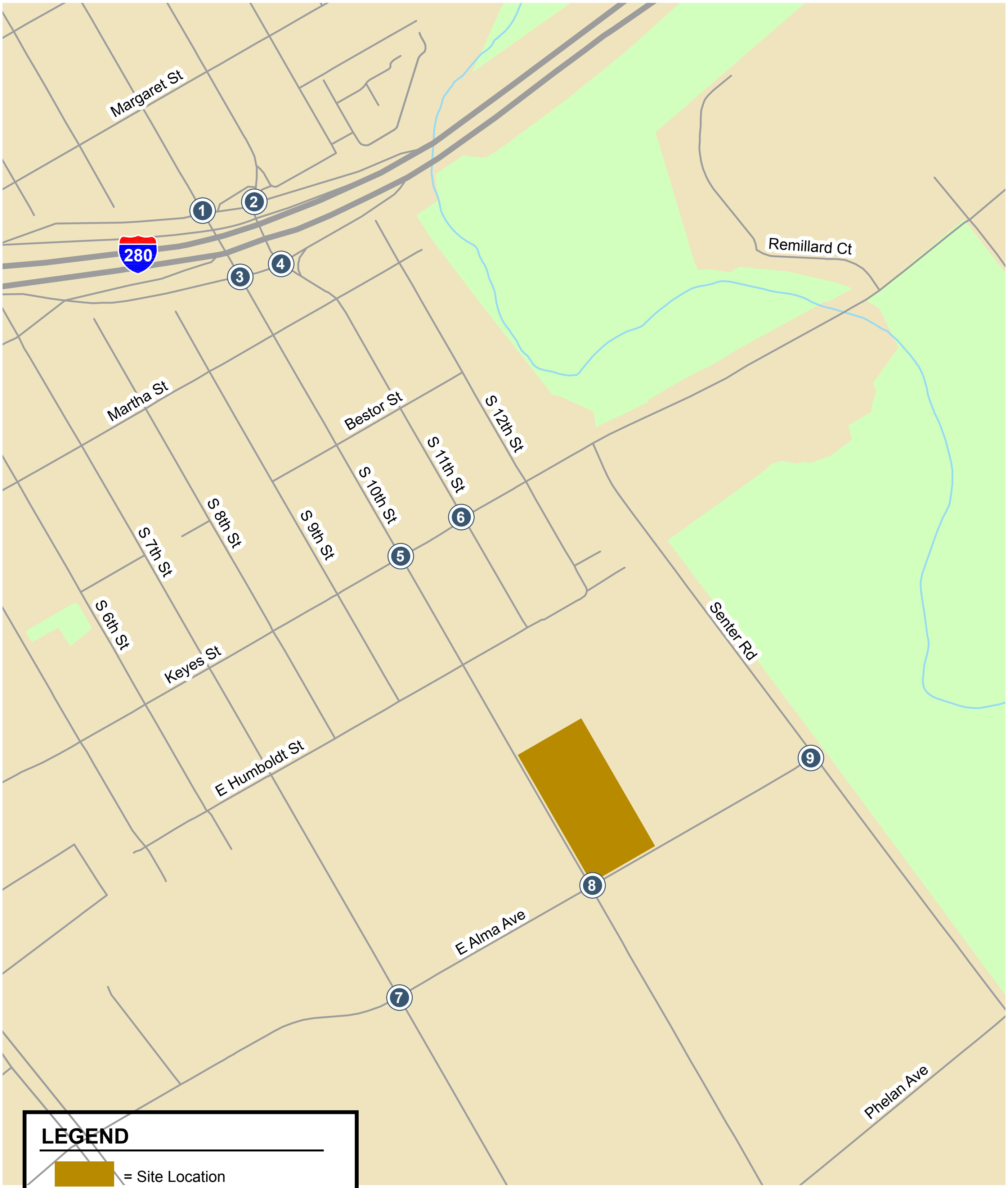
During the weekend, the garage would be used for parking for events at CEFCU Stadium. Parking currently uses the area of the practice track and formerly used the soccer field adjacent to CEFCU Stadium. Together these existing parking areas comprised about 1,500 parking spaces. Recently an improved soccer field was built adjacent to the stadium, so that field is no longer used for parking. Therefore, the new parking garage would replace all the parking that formerly used the fields adjacent to the stadium.

The parking structure would be used daily for parking for students, staff, and the general public. Currently, students and staff park close to campus on the street. Therefore, no new trips to the campus are expected, but there would be new trips to this area. The traffic study is based on daily usage of the parking structure. The typical daily usage would be a maximum of about 1400 vehicles parked at any one time. However, there would be two turnovers per day.

Scope of Study

This study was conducted for the purpose of identifying the potential transportation impacts related to the proposed development. The potential impacts of the project were evaluated in accordance with typical standards used in the City of San Jose and used by the Santa Clara Valley Transportation Authority CMP. The traffic analysis includes an analysis of weekday AM and PM peak-hour traffic conditions and determines the traffic impacts of the proposed development on key intersections in the vicinity of the site. The key intersections are identified below.

1. 10th Street & I-280 Northbound On-Ramp
2. 11th Street & I-280 Northbound Off-Ramp
3. 10th Street & I-280 Southbound Off-Ramp
4. 11th Street & I-280 Northbound On-Ramp
5. 10th Street & Keyes Street
6. 11th Street & Keyes Street
7. 7th Street & Alma Avenue
8. 10th Street & Alma Avenue
9. Senter Road & Alma Avenue



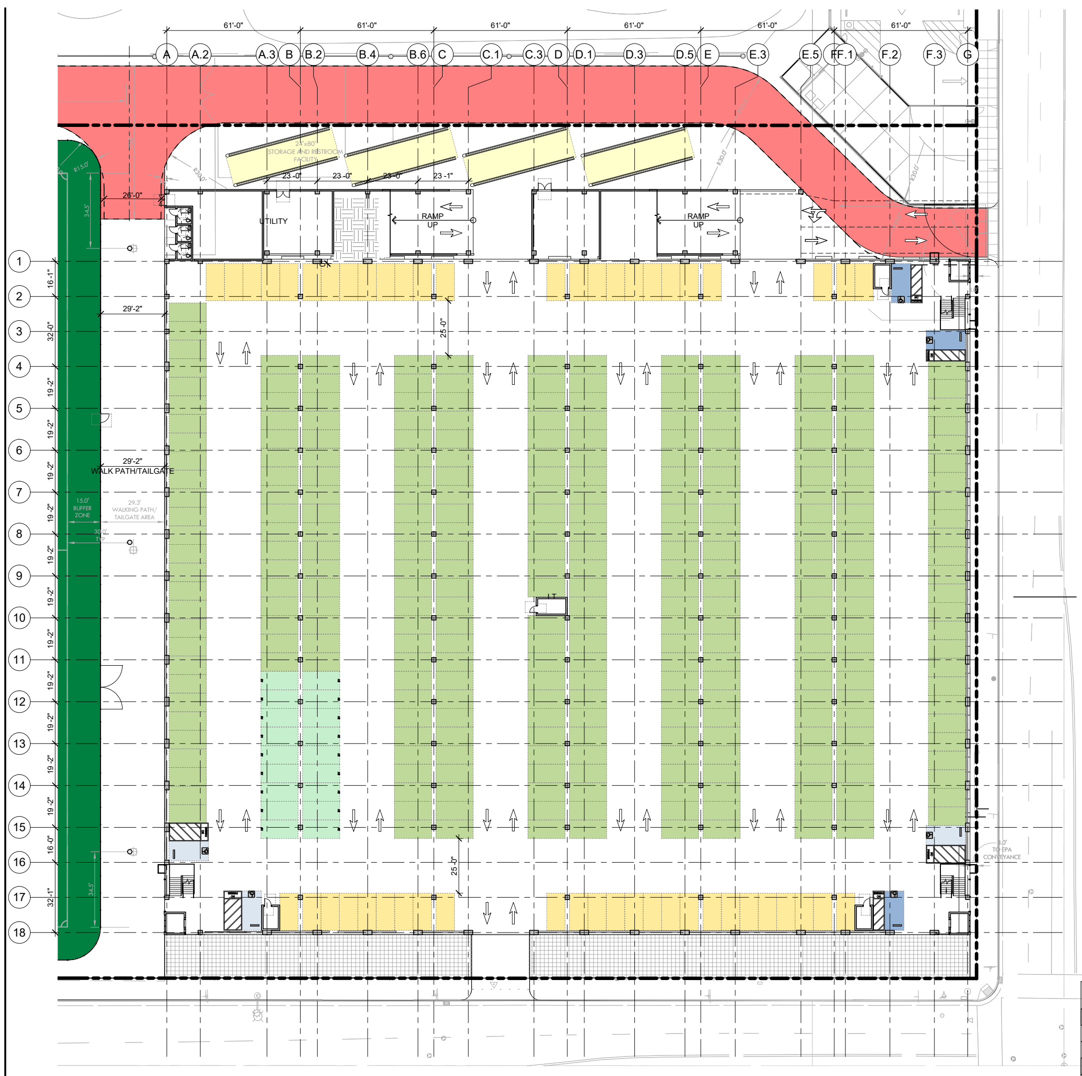
LEGEND

🟫 = Site Location

Ⓧ = Study Intersection

Figure 1
Site Location and Study Intersections

NORTH
Not to Scale



- 🟩 STANDARD
- 🟩 UNISTALL
- ACCESSIBLE
- VAN ACCESSIBLE
- CARPOOL
- CLEAN AIR/CARPOOL/EV
- EV
- COMPACT
- ACCESSIBLE EV
- VAN ACCESSIBLE EV
- AM AMBULATORY EV

PARKING STALL SUMMATION

LEVEL	UNISTALL (8'-6"x18'-0")	ACCESSIBLE 9'-0"x18'-0")	VAN/ACCESSIBLE (9'-0"x18'-0")	ELECTRIC VEHICLE / EV ADA	TOTAL	SQ. FOOTAGE	SQ. FT./STALL
FOURTH	356	4	2	22	384	118,937	310
THIRD	346	4	2	22	374	122,030	326
SECOND	346	4	2	22	374	122,030	326
GROUND	344	3	3	18	368	117,706	320
TOTAL	1,392	15	9	84	1,500	480,702	320

20' 0 40' 80'

SCALE: 1" 20'-0"

SJSU SAN JOSÉ STATE UNIVERSITY

Architects • Engineers • Parking Planners

WATRY DESIGN, INC.

San Jose, California
Irvine, California
Dallas, Texas

watrydesign.com

MCCARTHY

VERDE DESIGN
LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
SPORT PLANNING & DESIGN

NOT FOR CONSTRUCTION

LEVEL 01 PARKING PLAN

SJSU SOUTH CAMPUS PARKING STRUCTURE

SAN JOSE, CA

REVISIONS

NO.	DATE	BY

75% SCHEMATIC DESIGN

JOB NO.: 17087
DATE : 01/23/2018
DESIGN: Michelle
DRAWN: Devon
CHK. BY: Francisco
SCALE : As indicated

SHEET:

PK2.1

Figure 2
Site Plan

HEXAGON

NORTH
Not to Scale

Traffic conditions at the study intersections were analyzed for both the weekday AM and PM peak hours of adjacent street traffic. The AM peak hour is expected to occur between 7:00 AM and 9:00 AM and the PM peak hour is expected to occur between 4:00 PM and 6:00 PM on a regular weekday. These are the peak commute hours during which most traffic congestion occurs on the roadways.

Intersection operations conditions were evaluated for the following scenarios:

- ***Existing Conditions.*** Existing traffic volumes at the study intersections were obtained from new traffic counts conducted in March 2019.
- ***Existing Plus Project Conditions.*** Existing plus project conditions relfect projected traffic volumes on the planned roadway network with completion of the project. Existing plus traffic volumes the additional traffic generated by the project.

The TIA also includes a vehicle queuing analysis, an evaluation of potential project impacts on bicycle, pedestrian, and transit facilities, and a review of site access and on-site circulation.

Methodology

This section presents the methods used to determine the traffic conditions for each scenario described above and the traffic impacts of the project. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

Data Requirements

The data required for the analysis were obtained from new traffic counts and field observations. The following data were collected from these sources:

- Intersection traffic volumes,
- Intersection lane configurations, and
- Intersection signal timing and phasing.

Analysis Methodologies

Signalized Intersection Level of Service

Traffic conditions at the study intersections were evaluated using level of service (LOS). Level of service is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays.

The City of San Jose evaluates intersection levels of service using TRAFFIX software, which is based on the Highway Capacity Manual (HCM) 2000 method for signalized intersections. This HCM method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. This average delay can then be correlated to a level of service. Table 1 presents the level of service definitions for signalized intersections.

The City of San Jose level of service standard for signalized intersections is LOS D or better. Four of the study intersections are CMP intersections.

Table 1
Signalized Intersection Level of Service Definitions Based on Delay

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Signal progression is extremely favorable. Most vehicles arrive during the green phase and do not stop at all. Short cycle lengths may also contribute to the very low vehicle delay.	10.0 or less
B+ B B-	Operations characterized by good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average vehicle delay.	10.1 to 12.0 12.1 to 18.0 18.1 to 20.0
C+ C C-	Higher delays may result from fair signal progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though may still pass through the intersection without stopping.	20.1 to 23.0 23.1 to 32.0 32.1 to 35.0
D+ D D-	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable signal progression, long cycle lenghts, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 39.0 39.1 to 51.0 51.1 to 55.0
E+ E E-	This is considered to be the limit of acceptable delay. These high delay values generally indicate poor signal progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Individual cycle failures occur frequently.	55.1 to 60.0 60.1 to 75.0 75.1 to 80.0
F	This level of delay is considered unacceptable by most drivers. This condition often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes of such delay levels.	greater than 80.0

Source: Transportation Research Board, *2000 Highway Capacity Manual* (Washington, D.C., 2000) p10-16.
VTA Traffic Level of Service Analysis Guidelines (June 2003), Table 2.

Vehicle Queuing

The queuing analysis is used to determine the appropriate storage lengths for the high demand turn lanes where the project would add a substantial number of trips. Vehicle queues were estimated using a Poisson probability distribution, which estimates the probability of “n” vehicles for a vehicle movement using the following formula:

$$\text{Probability (X=n)} = \frac{\lambda^n e^{-(\lambda)}}{n!}$$

Where:

Probability (X=n) = probability of “n” vehicles in queue per lane
n = number of vehicles in the queue per lane
λ = Average number of vehicles in queue per lane (vehicles per hour per lane/signal cycles per hour)

The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95th percentile maximum number of queued vehicles per signal cycle for a particular movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the movement. This analysis thus provides a basis for estimating future storage requirements at intersections.

Significant Impact Criteria

Significance criteria are used to establish what constitutes an impact. For this analysis, the criteria used to determine significant impacts on signalized intersections are based on City of San Jose Level of Service standards. Impacts to pedestrian and bicycle facilities and transit services were evaluated based on the VTA Transportation Impact Analysis (TIA) Guidelines (October 2014) and professional judgment. Additionally, transportation-related impacts were evaluated against criteria in the California State University Transportation Impact Study Manual.

City of San Jose Signalized Intersections

According to City of San Jose level of service standard, a development is said to create a significant adverse impact on traffic conditions at a signalized intersection if for either peak hour, either of the following conditions occurs:

1. The level of service at the intersection drops below its respective level of service standard (LOS D or better for local intersections) when project traffic is added, or
2. An intersection that operates below its level of service standard under no-project conditions experiences an increase in critical-movement delay of four (4) or more seconds, and the volume-to-capacity ratio (v/c) is increased by one percent (0.01) or more when project traffic is added.

A significant impact at a signalized intersection is said to be satisfactorily mitigated when measures are implemented that would restore intersection operations back to background (without the project) conditions or better.

Pedestrians, Bicycles, and Transit Services

According to the VTA TIA Guidelines, a traffic study should qualitatively address the project effects on existing bicyclists and pedestrians as well as the effects and benefits of site development and associated roadway improvements on bicycle/pedestrian infrastructure, circulation, and conformance to existing plans and policies.

For transit services, a traffic study should estimate the increase in transit vehicle delay as a result of the project development and qualitatively address the project effects on transit access and facilities.

California State University Impact Criteria

The CSU Transportation Study Impact Manual lists the significance criteria as follows:

1. Plan Conflict-The project would conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities.
2. VMT Impacts-The project would result in a VMT-related impact.
3. Hazard Impact-The project would substantially increase hazards due to a geometric design feature.
4. Emergency Access Impact-The project would result in inadequate emergency access.

Report Organization

The remainder of this report is divided into four chapters. Chapter 2 describes the existing roadway network, transit services, and pedestrian facilities. Chapter 3 describes the methods used to estimate project traffic, intersection operations under existing plus project conditions, and the project's impacts on the existing transportation system. Chapter 4 presents the project's impacts on other transportation issues including transit, bicycle and pedestrian facilities, and vehicle queuing. Chapter 5 includes a summary of project impacts and recommended improvements.

2.

Existing Conditions

This chapter describes the existing conditions for transportation facilities in the vicinity of the site, including the roadway network, transit service, pedestrian and bicycle facilities, and the existing levels of service of the key intersections in the study area.

Existing Roadway Network

Regional access to the project site is provided by Interstate 280 (I-280). Local roadways in the vicinity of the site include 7th Street, 10th Street, 11th Street, Keyes Street, Alma Avenue, and Senter Road. These roadways are described below.

I-280 is an east-west freeway in the vicinity of the project that extends through the Bay Area, connecting San Francisco to San Jose. I-280 is eight lanes wide with three mixed-flow lanes and one high occupancy vehicle (HOV) lane in each direction in the vicinity of the project site. I-280 provides site access via partial interchanges at 10th Street and 11th Street.

7th Street is a north-south local roadway that extends from East San Salvador Street to Old Tully Road. 7th Street has a posted speed limit of 30 mph and is two lanes wide. 7th Street has sidewalks on both sides and has bike lanes along the street. On-street parking is allowed along the west side of 7th Street south of Alma Avenue within the project vicinity.

10th Street is a north-south local roadway that extends from Old Bayshore Highway to Tully Road. 10th Street has bike lanes along 10th Street and has sidewalks on both sides. 10th Street is a one-way, 2-lane southbound street from East Hedding Street to East Humboldt Street and a two-way, 4-lane (two lanes in each direction) street from East Humboldt Street to Tully Road. Within the vicinity of the project site, the posted speed limit is 35 mph and on-street parking is prohibited on both sides of the street near the project area.

11th Street is a north-south local roadway that extends from East Hedding Street to East Humboldt Street. 11th Street has a posted speed limit of 30 mph and is two lanes wide. 11th Street is a one-way northbound street from East Hedding Street to East Humboldt Street. Within the vicinity of the project site, 11th Street has bike lanes along the street. On-street parking is allowed on both sides of the street.

Keyes Street is an east-west local roadway that extends from 1st Street to Senter Road. Keyes Street has a posted speed limit of 35 mph and is four to six lanes wide (two to three lanes in each direction). Keyes Street has sidewalks on both sides of the street and has bike lanes throughout the street. On-street parking is permitted between 2nd Street and 10th Street in the vicinity of the project site.

Alma Avenue is an east-west local roadway that extends from Minnesota Avenue to Senter Road. Alma Avenue has a posted speed limit of 35 mph and is four lanes wide (two lanes in each direction). Within the vicinity of the project site, Alma Avenue has sidewalks on both sides of the street and has on-street parking between 10th Street and Senter Road.

Senter Road is a north-south local roadway that extends from Keyes Street/Story Road to Coyote Road and then bends east-west from Coyote Road to Monterey Road. Senter Road has a posted speed limit of 40 mph from Keyes Street to Capitol Expressway. Senter Road is six lanes wide (three lanes in each direction) and has bike lanes throughout the entire segment. Within the vicinity of the project site, Senter Road has sidewalks on the eastern side of the street between Keyes Street/Story Road to Alma Avenue.

Existing Pedestrian and Bicycle Facilities

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. In the project vicinity, sidewalks exist along most nearby streets. However, sidewalks do not exist along portions of Alma Avenue on the south side of the street. Marked crosswalks with pedestrian signal heads and push buttons are provided at all the signalized intersections. There is a pedestrian midblock crosswalk across 10th Street about 700 feet north of Alma Avenue. Overall, the existing network of sidewalks and crosswalks in the immediate vicinity of the project site has good connectivity.

In the vicinity of the project, bike lanes (Class II Bikeway) exist along all nearby streets, other than Alma Avenue (Figure 3).

Existing Shuttle Service

Shuttle service to the study area is provided by San Jose State University (SJSU). This is described below.

San Jose Park & Ride Lot Shuttle Service provides service from the San Jose Park & Ride Lot on 7th Street and Alma Avenue to Duncan Hall at SJSU located on 5th Street and San Salvador Street. The Shuttle Service operates during the college semester, Monday through Thursday with approximately 10-minute headways from 6:30 AM to 9:00 AM, 5-minute headways from 9:00 AM to 4:10 PM, 10-minute headways from 4:10 PM to 8:00 PM, and 20-minute headways from 8:00 PM to 10:30 PM.

Existing Intersection Lane Configurations

The existing lane configurations at the study intersections were determined by observations in the field and are shown on Figure 4.

Existing Traffic Volumes

Existing AM and PM peak hour traffic volumes for the nine study intersections were obtained from new manual turning-movement counts conducted in March 2019. As required by the VTA CMP, PM peak hour traffic volumes at CMP intersections were obtained directly from the latest version of the CMP Monitoring and Conformance Report. The existing peak-hour intersection volumes are shown in Figure 5. Intersection turning-movement counts conducted for this analysis are presented in Appendix B.

Existing Intersection Traffic Operations

Intersection traffic operations were evaluated against City of San Jose standards. The results of the intersection level of service analysis under existing conditions are summarized in Table 2.

The results of the analysis show that all signalized intersections operate at an acceptable level of service (LOS D or better) during the AM and PM peak hour.

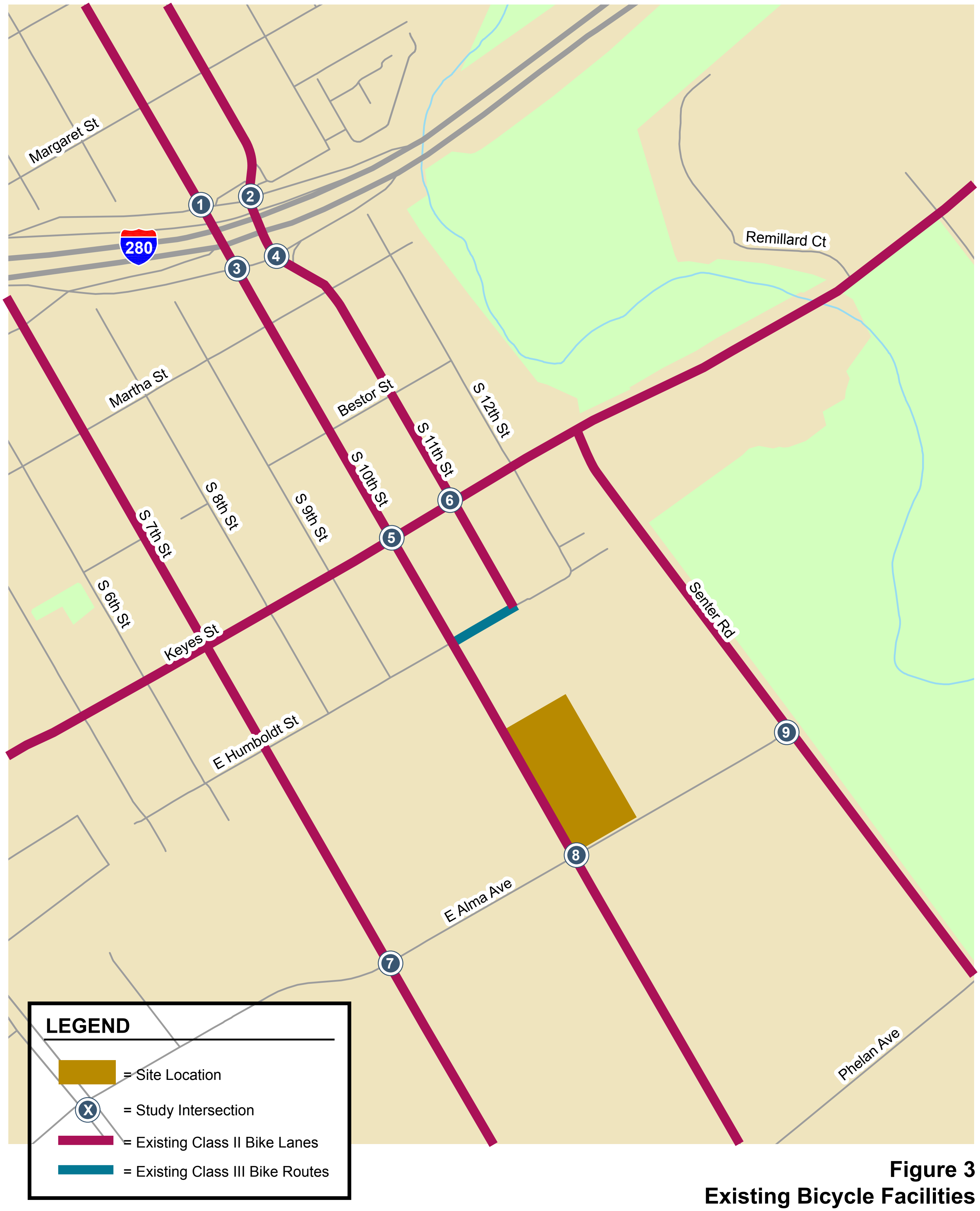


Figure 3
Existing Bicycle Facilities

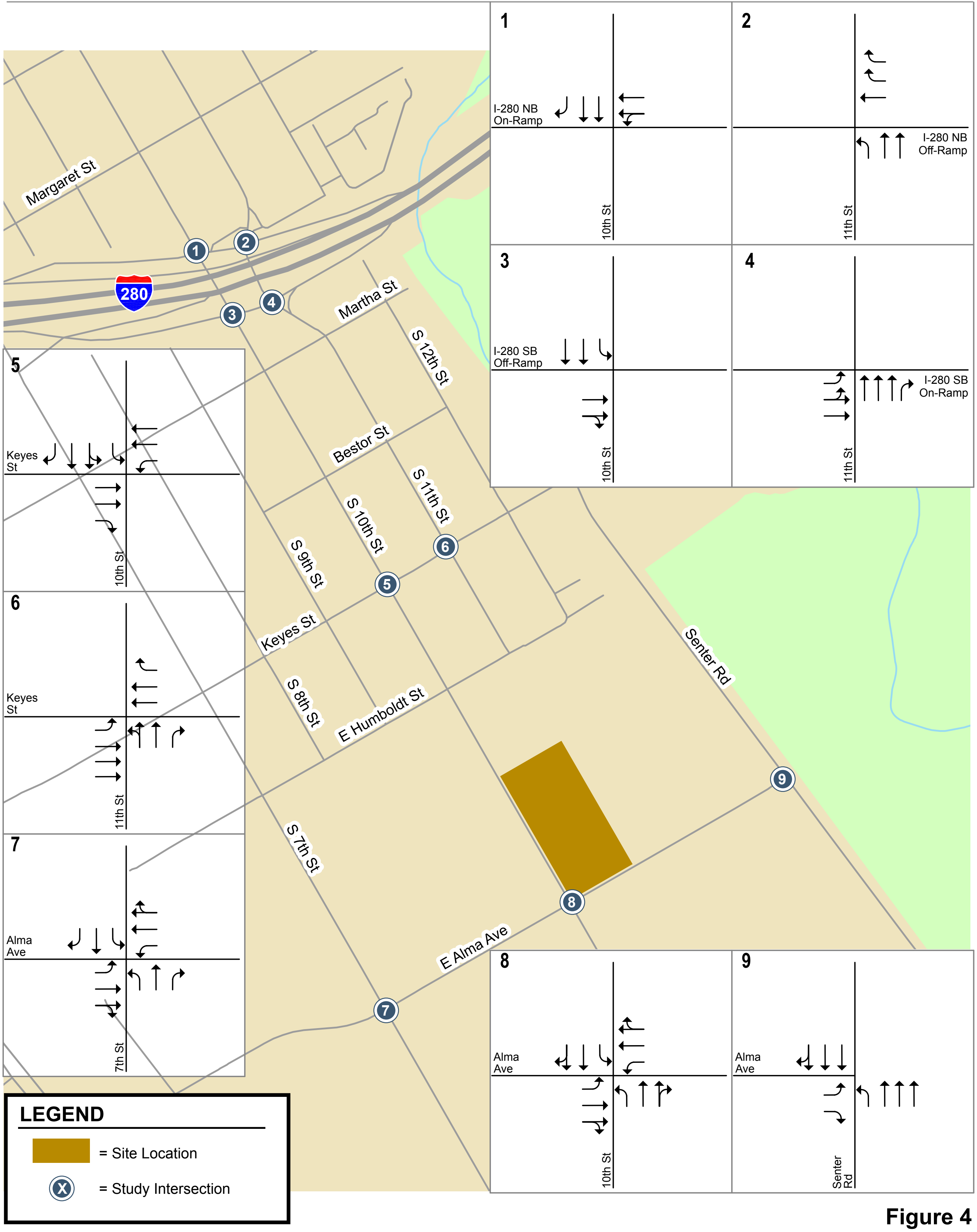


Figure 4
Existing Lane Configurations

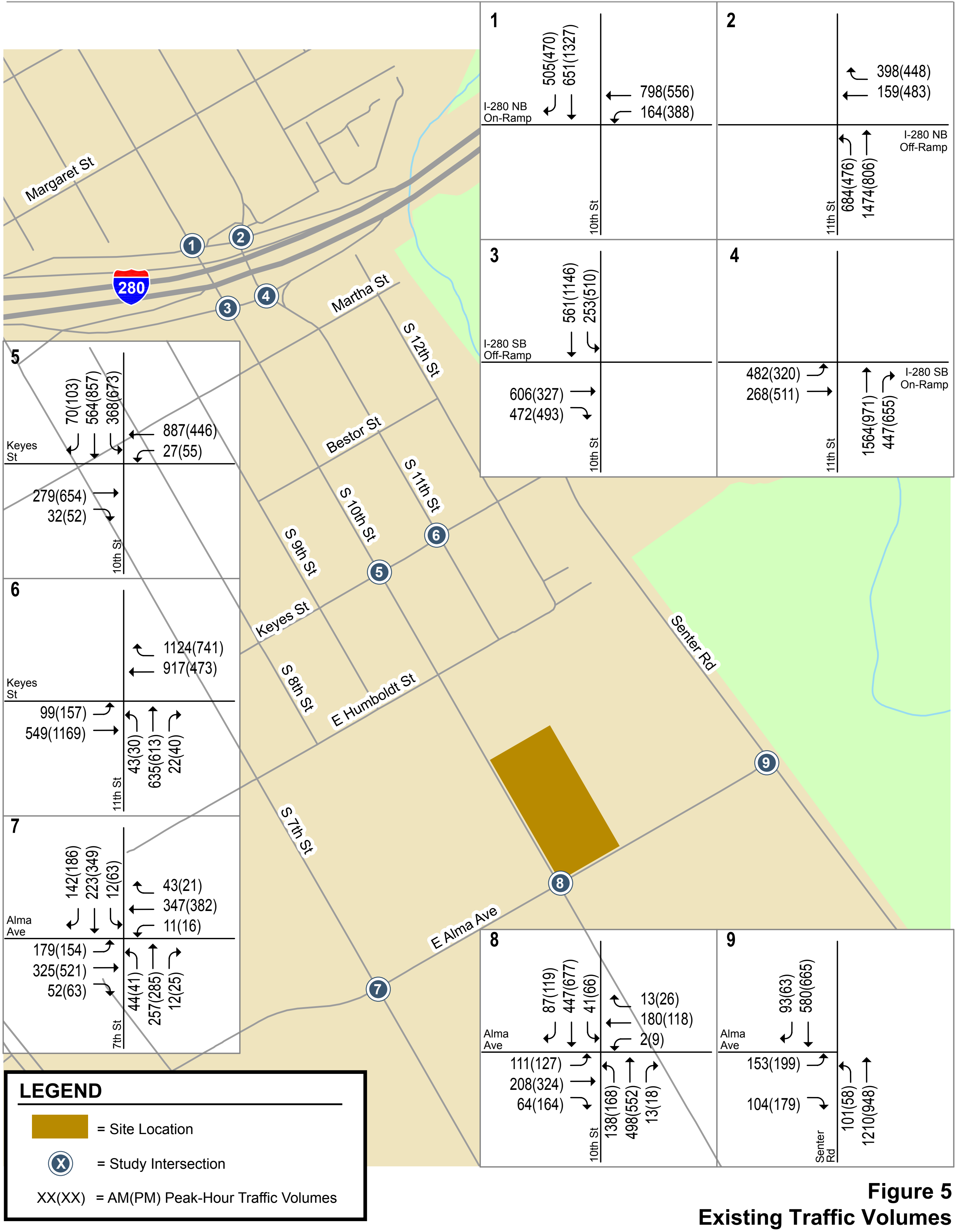


Figure 5
Existing Traffic Volumes

NORTH
Not to Scale

Table 2
Existing Intersection Levels of Service

Study Number	Intersection	Peak Hour	Count Date	Existing Conditions Avg. Delay (sec)	Existing Conditions LOS
1	10th Street and Keyes Street	AM	03/13/19	24.6	C
		PM	03/12/19	24.6	C
2	11th Street and Keyes Street	AM	03/13/19	25.2	C
		PM	03/12/19	25.6	C
3	7th Street and Alma Avenue	AM	03/13/19	29.1	C
		PM	03/12/19	26.0	C
4	10th Street and Alma Avenue	AM	03/13/19	24.2	C
		PM	03/12/19	24.8	C
5	Senter Road and Alma Avenue	AM	03/13/19	12.6	B
		PM	03/12/19	13.8	B
6	11th Street and I-280 Northbound Off-Ramp*	AM	03/13/19	10.7	B
		PM	10/20/16	15.2	B
7	11th Street and I-280 Southbound On-Ramp*	AM	03/13/19	12.1	B
		PM	10/20/16	13.2	B
8	10th Street and I-280 Northbound On-Ramp*	AM	03/13/19	15.8	B
		PM	12/14/16	16.2	B
9	10th Street and I-280 Southbound Off-Ramp*	AM	03/13/19	14.6	B
		PM	12/13/16	16.5	B

Note:
* Denotes the CMP designated Intersection

Observed Existing Traffic Conditions

Traffic conditions were observed in the field to identify existing operational deficiencies and to confirm the accuracy of calculated levels of service. The purpose of this effort was (1) to identify any existing traffic problems that may not be directly related to level of service, and (2) to identify any locations where the level of service analysis does not accurately reflect actual existing traffic conditions. AM and PM field observations conducted in March 2019 revealed that overall the study intersections operate well, and the level of service calculations accurately reflect existing conditions. However, operational issues were observed during the commute peak hours as described below.

Senter Road & Alma Avenue

During the PM peak hour, long queues were observed on Alma Avenue. Generally, the queues would clear with each green cycle but occasionally 4 to 5 vehicles would fail to clear. However, this occurs infrequently. Senter Road generally provides enough green time for vehicles to pass through the intersection.

11th Street & Keyes Street

During the PM peak hour, long queues were observed in the eastbound left-turn lane on Keyes Street. Generally, the queues would clear with each green cycle, but occasionally 1 to 2 vehicles would fail to clear.

11th Street & I-280 Northbound Off-Ramp

During the AM peak hour, long queues were observed in the northbound left-turn lane on 11th Street. The queue spills over to the 11th Street/I-280 Northbound On-Ramp intersection and beyond Martha Street. Generally, the queues would clear with each green cycle, but occasionally 1 to 2 vehicles would fail to clear. The northbound through lane on 11th Street has moderate queue lengths with enough cycle time to pass through the intersection.

11th Street & I-280 Southbound On-Ramp

During the AM peak hour, long queues were observed in the northbound left-most through lane on 11th Street. The queue spills over beyond Martha Street. The vehicles are queuing into the left-most lane to get onto the I-280 Northbound On-Ramp. Generally, these queues have to wait through multiple cycle lengths to cross the intersection. The other northbound through lanes on 11th Street have moderate queue lengths with enough cycle time to pass through the intersection.

10th Street & I-280 Southbound Off-Ramp

No operational issues were observed during the AM and PM peak hour.

10th Street & I-280 Northbound On-Ramp

No significant issues were observed during the AM peak hour. During the PM peak hour, long queues were observed in the southbound left-turn lane on 10th Street. Generally, the southbound through lane traffic can clear through the intersection, but occasionally about 2 to 3 vehicles would fail to clear.

The westbound shared left-turn/through lane heading south onto 10th Street backs up to the 11th Street/I-280 Northbound Off-Ramp intersection and occasionally spills over with the northbound left-turn. However, there is enough green time to clear to the westbound left-turn lane.

3.
Existing Plus Project Conditions

This chapter describes existing traffic conditions with the addition of the traffic that would be generated by the proposed project. Existing plus project traffic conditions could potentially occur if the project were to be occupied prior to the other approved projects in the area.

Project-Level VMT Analysis

The project would be reorienting existing trips and not creating new trips; therefore, the VMT impact would be minimal. The CSU Transportation Impact Study Manual states that parking facilities that serve the campus demand and do not create “too much parking” would constitute a less than significant impact related to VMT. According to a parking study completed by Watry Design, Inc., the main campus project deficit in 2028 is expected to be 1,741 spaces. Therefore, the proposed parking garage would serve campus demand and not create “too much parking”.

California State University Transportation Impact

Plan Conflict

The proposed project does not conflict with the master plan of the university. The university has several Transportation Demand Management programs. Some features include transit incentives (such as discounted transit options), carpool programs, bicycle campaigns, bicycle sharing discounts, and managing parking (via apps and adjusting number of parking permits issued).

The project is not required to comply with local plans, policies, or regulations. For informational purposes, however, the project is shown to comply with the 2040 San Jose General Plan parking policy, as described below:

- Goal TR-8.2 Balance business viability and land resources by maintaining an adequate supply of parking to serve demand while avoiding excessive parking supply that encourages automobile use.

VMT Impacts

As previously mentioned, the project is screened from a VMT assessment because it is a parking facility that serves campus demand.

Hazard Impacts

As described in the Vehicular Access and Circulation section, the project site plan shows no geometric design features that would increase hazards to vehicles.

Emergency Access Impacts

The proposed parking garage would not result in any inadequate emergency access. The project would not alter the existing roadways of 10th Street and Alma Avenue.

Roadway Network

The roadway network under existing plus project conditions would be the same as the existing roadway network because the project would not alter the existing intersection lane configurations.

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear are estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM and PM peak hours. As part of the project trip distribution, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment, the project trips are assigned to specific streets and intersections. These procedures are described below.

Trip Generation

The magnitude of traffic that would be generated by the proposed parking garage on the site was estimated based on time of arrival estimates supplied by San Jose State University (SJSU). The traffic study focused on typical daily operations of the garage. The traffic during special events, which typically happen on weekends, was not analyzed because the existing trips for special events already park in the immediate vicinity of the project site.

Table 3 shows the project trip generation estimates, broken down by the hour. The proposed development is estimated generate 4,200 daily trips with peak entrances into the parking garage to be 400 vehicles per hour and peak exits out of the parking garage to be 400 vehicles per hour.

Trip Distribution and Assignment

The trip distribution pattern for the proposed development was estimated based on existing travel patterns on the surrounding roadway system and the locations of complementary land uses (see Figure 6).

The peak-hour trips generated by the existing and proposed uses were assigned to the roadway system based on the directions of approach and departure, the roadway network connections, and the locations of project driveways (see Figure 7).

Intersection Traffic Volumes

Project trips, as represented in the above project trip assignment, were added to existing traffic volumes to obtain existing plus project traffic volumes (see Figure 8).

Table 3
Project Trip Generation Estimates

Hour	Entrances	Exits
6 AM - 7 AM	350	0
7 AM - 8 AM	350	50
8 AM - 9 AM	400	100
9 AM - 10 AM	300	150
10 AM - 11 AM	200	200
11 AM - 12 PM	200	200
12 PM - 1 PM	200	300
1 PM - 2 PM	200	200
2 PM - 3 PM	200	350
3 PM - 4 PM	200	350
4 PM - 5 PM	100	400
5 PM - 6 PM	100	300
6 PM - 7 PM	0	200
Total	2800	2800

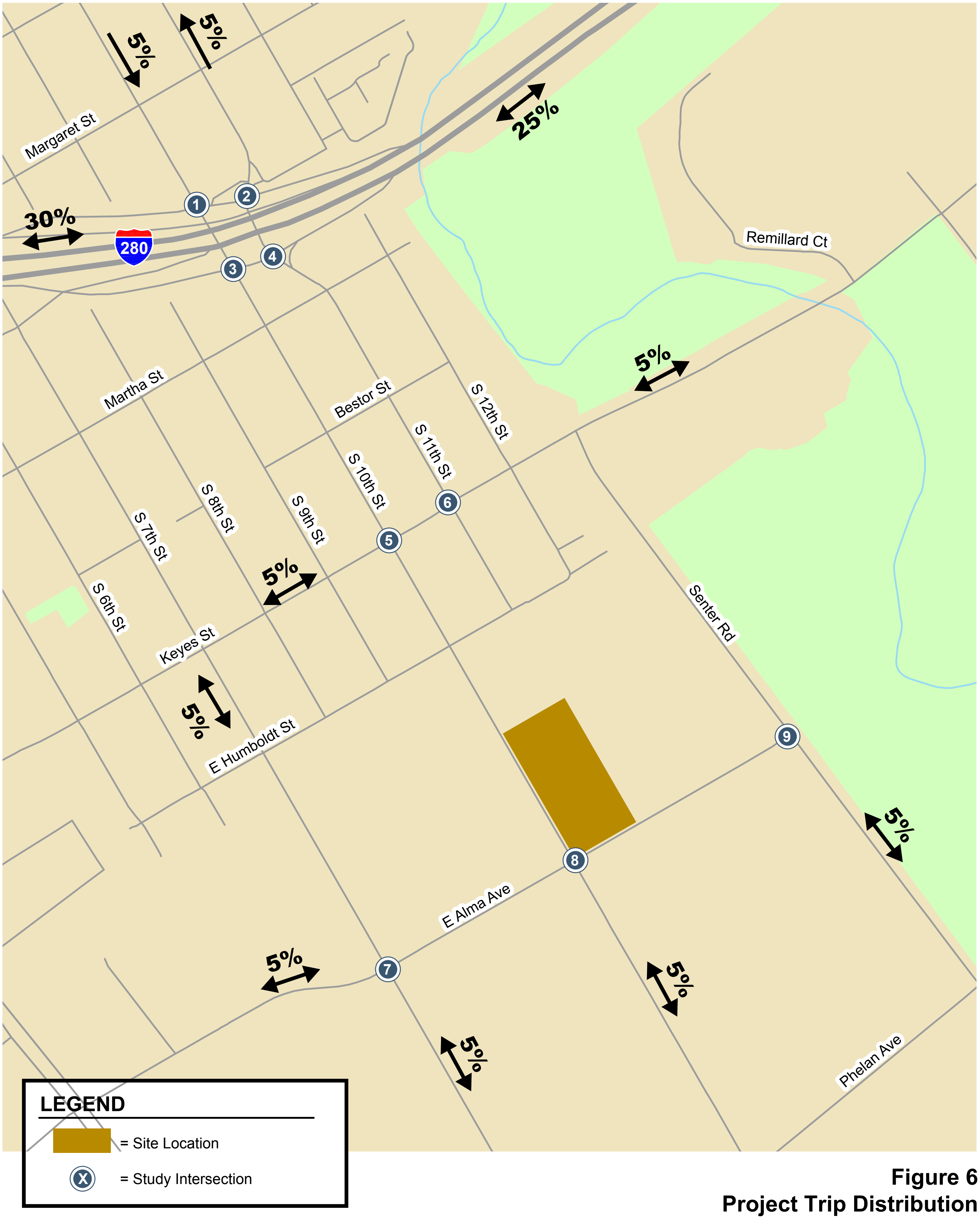


Figure 6
Project Trip Distribution

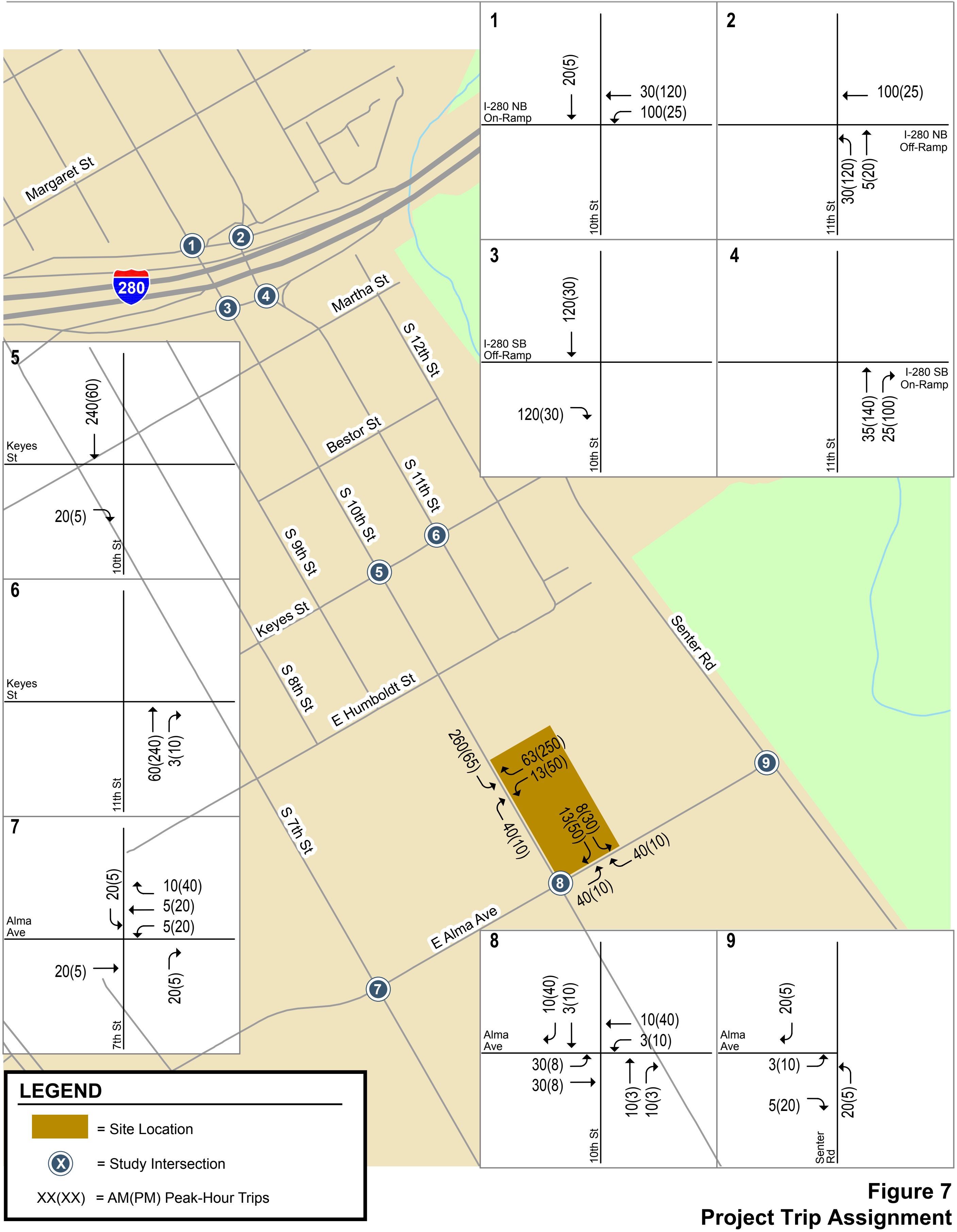


Figure 7
Project Trip Assignment

NORTH
Not to Scale

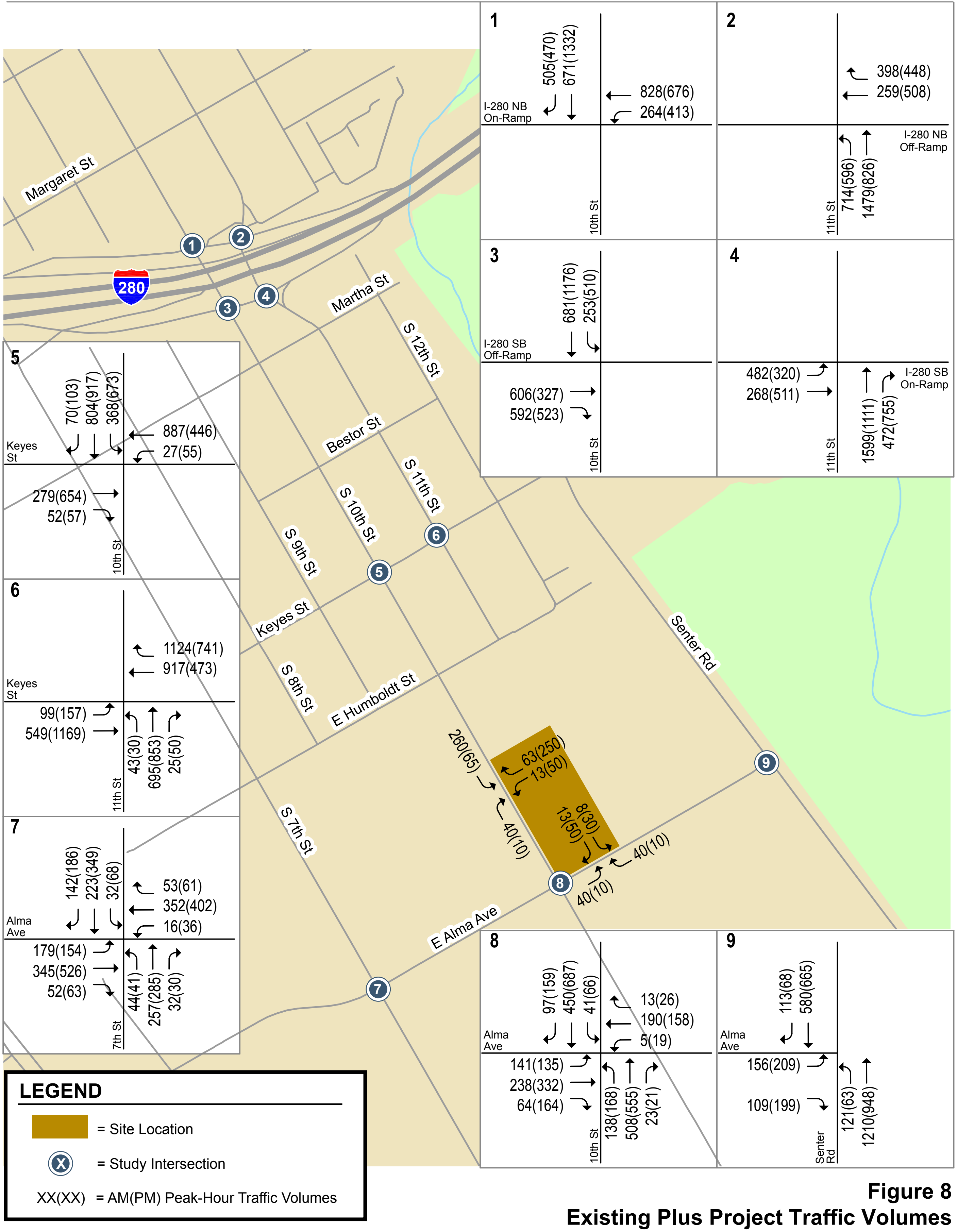


Figure 8
Existing Plus Project Traffic Volumes

NORTH
Not to Scale

Intersection Levels of Service

The intersection level of service analysis results show that all study intersections would operate at acceptable levels of service during both AM and PM peak hours under existing plus project conditions (see Table 4). The intersection level of service calculation sheets are included in Appendix B.

Table 4
Existing Plus Project Intersection Levels of Service

			Existing Conditions			
			No Project		With Project	
Study Number	Intersection	Peak Hour	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
1	10th Street and Keyes Street	AM	24.6	C	25.2	C
		PM	24.6	C	24.5	C
2	11th Street and Keyes Street	AM	25.2	C	25.9	C
		PM	25.6	C	27.8	C
3	7th Street and Alma Avenue	AM	29.1	C	28.9	C
		PM	26.0	C	27.9	C
4	10th Street and Alma Avenue	AM	24.2	C	24.8	C
		PM	24.8	C	25.1	C
5	Senter Road and Alma Avenue	AM	12.6	B	12.8	B
		PM	13.8	B	14.2	B
6	11th Street and I-280 Northbound Off-Ramp*	AM	10.7	B	11.7	B
		PM	15.2	B	15.8	B
7	11th Street and I-280 Southbound On-Ramp*	AM	12.1	B	12.0	B
		PM	13.2	B	13.0	B
8	10th Street and I-280 Northbound On-Ramp*	AM	15.8	B	16.4	B
		PM	16.2	B	17.5	B
9	10th Street and I-280 Southbound Off-Ramp*	AM	14.6	B	15.3	B
		PM	16.5	B	17.1	B

Note:
* Denotes the CMP designated Intersection

4.
Other Transportation Issues

This chapter presents other transportation issues associated with the project. These include an analysis of:

- Vehicle queuing
- Site access and on-site circulation
- Potential impacts to pedestrians, bicycles, and transit services

These other transportation issues were evaluated to determine if any deficiencies would exist under project conditions that may not be specifically linked to environmental impact reporting. These are not considered environmental issues under CEQA, but have been included in the traffic study to meet the requirements of the local jurisdiction. The analyses in this chapter are based on professional judgment in accordance with the standards and methods employed by the traffic engineering community.

Vehicle Queuing Analysis

The analysis of intersection levels of service was supplemented with a vehicle queuing analysis for left-turn lanes and stop-controlled approaches at intersections where the project would add left-turn movements. This analysis provides a basis for estimating future storage requirements at the intersections under existing plus project conditions. Vehicle queues were estimated using a Poisson probability distribution, described in Chapter 1. The following movements were selected for evaluation:

- 10th Street and Alma Avenue – Eastbound left turn lane
- 10th Street and Alma Avenue – Westbound left turn lane
- Senter Road and Alma Avenue – Northbound left turn lane
- 10th Street and I-280 Northbound On-Ramp – Westbound shared left-turn/through lane heading south on 10th Street
- 11th Street and I-280 Northbound Off- Ramp – Northbound left turn lane

Table 5 shows that the estimated 95th percentile queues would exceed the left-turn storage capacity on 10th Street at the 10th Street/I-280 Northbound On-Ramp intersection and 11th Street at the 11th Street/I-280 Northbound Off-Ramp intersection under AM and PM peak hour conditions.

Table 5
Intersection Vehicle Queuing Analysis Results

	10th Street and Alma Avenue				Senter Road and Alma Avenue				10th Street and I-280 Northbound On-Ramp		11th Street and I-280 Northbound Off-Ramp	
	EBL		WBL		EBL		NBL		WBL		NBL	
Measurement	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Existing												
Cycle/Delay [1] (sec)	80	80	80	80	75	75	75	75	80	80	80	80
Volume (vphpl)	111	127	2	9	153	199	101	58	164	388	684	476
Total 95th %. Queue (veh.)	5	6	1	1	6	8	5	3	7	14	22	16
Total 95th %. Queue (ft.) [2]	125	150	25	25	150	200	125	75	175	350	550	400
Total Storage	275	275	175	175	200	200	200	200	150	150	250	250
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	**N**	**N**	**N**	**N**
Existing Plus Project												
Cycle/Delay [1] (sec)	80	80	80	80	75	75	75	75	80	80	80	80
Volume (vphpl)	141	135	5	19	156	209	121	63	264	413	714	596
Total 95th %. Queue (veh.)	6	6	1	2	6	8	5	3	10	14	23	19
Total 95th %. Queue (ft.) [2]	150	150	25	50	150	200	125	75	250	350	575	475
Total Storage	275	275	175	175	200	200	200	200	150	150	250	250
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	**N**	**N**	**N**	**N**

Notes:
WBL = westbound left movement; NBL = northbound left movement; SBL = southbound left movement; EBL = eastbound left movement

[1] Vehicle queue calculations based on cycle length for signalized intersections.

[2] Assumes 25 Feet Per Vehicle Queued.

10th Street and I-280 Northbound On-Ramp

The queuing analysis indicates that the 95th percentile vehicle queue for the westbound left-turn lane at the 10th Street/I-280 Northbound On-Ramp intersection currently exceeds the existing vehicle storage capacity during the AM and PM peak hour of traffic and would continue to do so under the existing plus project conditions. The left-turn lane provides 150 feet of vehicle storage and currently require 350 feet based on the queuing analysis. However, no operational issues were observed during the AM and PM peak hour. Field observations showed that the westbound left-turn lane had enough cycle time to make the left turn. The project would increase the 95th percentile vehicle queue during the AM peak hour by 3 vehicles and would not increase the 95th percentile vehicle queue during the PM peak hour.

11th Street and I-280 Northbound Off-Ramp

The queuing analysis indicates that the 95th percentile vehicle queue for the northbound left-turn lane at the 11th Street/I-280 Northbound Off-Ramp intersection currently exceeds the existing vehicle storage capacity during the AM and PM peak hour of traffic and would continue to do so under the existing plus project conditions. The left-turn lane provides 250 feet of vehicle storage and currently require 575 feet based on the queuing analysis. This was confirmed by field observations. The project would not increase the 95th percentile vehicle queue during the AM peak hour and would increase the 95th percentile vehicle queue during the PM peak hour by 3 vehicles.

Vehicular Access and Circulation

The site access and circulation evaluation is based on the January 23, 2018 site plan prepared by Watry Design, Inc. (see Figure 2). Site access and on-site vehicular circulation were reviewed in accordance with generally accepted traffic engineering standards.

Site Access

The project generated traffic would access the site via a full-access driveway on 10th Street approximately 250 north of Alma Avenue. It would be located just before the buffered bike lane starts on 10th Street. The location would allow vehicles to enter and exit the garage without encroaching into the buffered bike lane. Site access would also be provided via a full-access driveway on Alma Avenue approximately 325 feet east of 10th Street. It would be located about where an existing driveway is.

According to the City of San Jose Department of Transportation (DOT) Geometric Design Guidelines, the typical width for a driveway shall not be less than 10 feet wide for ingress and egress. Therefore, typical width for a two-way driveway is 20 feet. The full-access driveway on 10th Street is shown to be approximately 26 feet wide, which meets the City Standard. The proposed full-access driveway on Alma Avenue is shown to be approximately 24 feet wide, which meets the City Standard.

10th Street Driveway Operations

The operations analysis shows that the driveway would operate with a delay of 19.8 seconds (LOS C) during the AM peak hour and 35.3 seconds (LOS E) during the PM peak hour. The traffic signal at the 10th Street/Alma Avenue intersection would create sufficient gaps in traffic on 10th Street to allow traffic to enter and exit this project driveway.

Alma Avenue Driveway Operations

The operations analysis shows that the driveway would operate with a delay of 10.1 seconds (LOS B) during the AM peak hour and 9.9 seconds (LOS A) during the PM peak hour. The traffic signal at the 10th Street/Alma Avenue intersection would create sufficient gaps in traffic on Alma Avenue to allow traffic to enter and exit this project driveway.

Driveway Operations During Special Events

The driveways along 10th Street and Alma Avenue would be busiest during special events. To move traffic efficiently in and out of the garage, at least four lanes should be provided for entering and four lanes for exiting. Police officers are typically directing traffic before and after games to get cars efficiently in and out of parking lots. Therefore, officers should be used to direct traffic on 10th Street and Alma Avenue so that vehicles could get in and out of the garage in a timely manner during the peak hours of traffic. If necessary, road and lane closures should be implemented to help direct traffic into the garage more efficiently.

Sight Distance

The proposed project driveways should be free and clear of any obstructions to optimize sight distance. Providing the appropriate sight distance reduces the likelihood of a collision at the driveway and provides drivers with the ability to locate sufficient gaps in traffic and exit the site. There are no landscaping features shown on the site plan along 10th Street and Alma Avenue. Sight distance requirements vary depending on the roadway speeds.

For 10th Street, which has a posted speed limit of 35 mph, the Caltrans recommend stopping sight distance is 250 feet. This means that a drive must be able to see 250 feet down 10th Street in order to stop and avoid a collision with a vehicle or pedestrian. Adequate sight distance would be provided at the project driveway on 10th Street.

For Alma Avenue, which has a posted speed limit of 35 mph, the Caltrans recommend stopping sight distance is 250 feet. This means that a drive must be able to see 250 feet down 10th Street in order to stop and avoid a collision with a vehicle or pedestrian. Adequate sight distance would be provided at the project driveway on Alma Avenue.

On-Site Circulation

On-site vehicular circulation was reviewed in accordance with generally accepted traffic engineering standards. The project would have a full-access driveway on 10th Street and a full-access driveway on Alma Avenue. In the parking garage, there would be a drive aisle that leads to the parking spaces and to ramps to the second floor, third floor, and fourth floor of the parking structure. The perimeter drive aisle would have 90-degree perpendicular parking spaces. The drive aisle width (25 feet) would provide sufficient space for vehicles to back out of the of the parking stalls. There would be two speed ramps provided on the east side of the parking garage. The ramp width (26 feet) would provide sufficient space for vehicles to travel up and down the ramps. Some drivers with larger vehicles may have difficulty navigating the sharp right turn necessary to access the speed ramps and would encroach into the opposing lane. The garage design should be sufficiently open to allow vehicles making turning movements to see each other. Generally, the proposed plan would provide vehicle traffic with adequate connectivity through the parking areas.

The plan for shuttle buses is that they would pick up passengers along the curb on Alma Avenue adjacent to the parking structure. It will be necessary to restripe Alma Avenue to provide enough space along the curb for buses to stop.

Pedestrian, Bicycle and Transit Facilities

All new development projects in San Jose should encourage multi-modal travel, consistent with the goals of the City’s General Plan. It is the goal of the General Plan that all development projects accommodate and encourage the use of non-automobile transportation modes to achieve San Jose’s mobility goals and reduce vehicle trip generation and vehicle miles traveled. In addition, the adopted City Bike Master Plan establishes goals, policies and actions to make bicycling a daily part of life in San Jose. The Master Plan includes designated bike lanes along all City streets, as well as on designated bike corridors. In order to further the goals of the City, pedestrian and bicycle facilities should be encouraged with new development projects.

Pedestrian Facilities

The existing network of sidewalks and crosswalks in the immediate vicinity of the project site has good connectivity and provides pedestrians with safe routes to nearby destinations. Alma Avenue and 10th Street have sidewalks on both sides of the street in the project vicinity. Crosswalks with pedestrian signal heads are located at all signalized intersections in the study area.

There is an existing midblock crosswalk across 10th Street about 700 feet north of Alma Avenue. This crosswalk should be relocated about 200 feet south to provide a direct connection from the edge of the parking structure to the stadium. In this way, pedestrians exiting the parking structure would have a shorter walk to cross 10th Street. In addition, the crosswalk should be redesigned to meet current City Standards.

Bicycle Facilities

There are bike lanes within the project vicinity on 10th Street, 11th Street, Keyes Street and Senter Road. The existing bike lanes provide bicyclists with safe routes to various points of interest in the study area, including the nearby bus stop on Senter Road and Alma Avenue. The project does not propose to provide on-site bicycle parking.

Bicyclists heading to the campus from the parking structure can utilize the bike lanes rather than taking the shuttle bus. Bicyclists would use the bike lanes on 10th Street that connect to bike lanes on 11th Street via bike lanes on Humboldt Street. From 11th Street, bicyclists would use the shared bike lane on San Salvador Street to get to the campus. To return to the parking structure, bicyclists would use the bike lanes on 10th Street.

Transit Service

San Jose State University provides shuttle service from the San Jose Park & Ride Lot on 7th Street and Alma Avenue to Duncan Hall at SJSU located on 5th Street and San Salvador Street. The Shuttle Service operates during the college semester, Monday through Thursday with approximately 10-minute headways from 6:30 AM to 9:00 AM, 5-minute headways from 9:00 AM to 4:10 PM, 10-minute headways from 4:10 PM to 8:00 PM, and 20-minute headways from 8:00 PM to 10:30 PM. This service would be slightly rerouted to serve the proposed new parking structure. Depending on the current passenger load in the shuttle buses, it may be necessary to add additional buses to the route.

Construction Activities

Typical activities related to the construction of any development could include lane narrowing and/or lane closures and sidewalk closures. In the event of any type of street closure, clear signage (e.g., closure and detour signs) must be provided to ensure vehicles, bicyclists, and pedestrians are able to adequately reach their intended destinations safely. The project would be required to submit a construction management plan for City approval that addresses schedule, closures/detours, staging, parking, and truck routes.

5.
Conclusions

This study was conducted for the purpose of identifying the potential transportation impacts related to the proposed development. The transportation impacts of the project were evaluated following the standards and methodologies established in the City of San Jose's *Transportation Analysis Handbook.*

Project-Level VMT Analysis

Since the project is reorienting existing trips and not generating new trips, the VMT impact would be minimal. The CSU Transportation Impact Study Manual states that parking facilities that serve the campus demand and do not create "too much parking" would constitute a less than significant impact related to VMT. According to a parking study completed by Watry Design, Inc., the main campus project deficit in 2028 is expected to be 1,741 spaces. Therefore, the proposed parking garage would serve campus demand and not create "too much parking".

Trip Generation

The magnitude of traffic that is being generated by the proposed parking garage on the site was estimated based on time of arrival estimates supplied by San Jose State University (SJSU). The traffic study focused on typical daily operations of the garage. The traffic during special events, which typically happen on weekends, was not analyzed. The proposed development is estimated generate 4,200 daily trips with peak entrances into the parking garage to be 400 vehicles per hour and peak exits out of the parking garage to be 400 vehicles per hour.

Intersection Level of Service Analysis

The results of the intersection level of service analysis show that measured against the City of San Jose level of service impact criteria, none of the study intersections would be significantly impacted by the project.

Other Transportation Issues

These other transportation issues were evaluated to determine if any deficiencies would exist under project conditions that may not be specifically linked to environmental impact reporting. These are not considered environmental issues under CEQA, but have been included in the traffic study to meet the requirements of the local jurisdiction.

Vehicle Queuing Analysis

The results show that the estimated 95th percentile queues would exceed the left-turn storage capacity on 10th Street at the 10th Street/I-280 Northbound On-Ramp intersection and 11th Street at the 11th Street/I-280 Northbound Off-Ramp intersection under all existing AM and PM peak hour conditions.

10th Street and I-280 Northbound On-Ramp

The queuing analysis indicates that the 95th percentile vehicle queue for the westbound left-turn lane at the 10th Street/I-280 Northbound On-Ramp intersection currently exceeds the existing vehicle storage capacity during the AM and PM peak hour of traffic and would continue to do so under the existing plus project conditions. The left-turn lane provides 150 feet of vehicle storage and currently requires 350 feet based on the queuing analysis. However, no operational issues were observed during the AM and PM peak hours. Field observations showed that the westbound left-turn lane had enough cycle time to make the left turn. The project would increase the 95th percentile vehicle queue during the AM peak hour by 3 vehicles and would not increase the 95th percentile vehicle queue during the PM peak hour.

11th Street and I-280 Northbound Off-Ramp

The queuing analysis indicates that the 95th percentile vehicle queue for the northbound left-turn lane at the 11th Street/I-280 Northbound Off-Ramp intersection currently exceeds the existing vehicle storage capacity during the AM and PM peak hour of traffic and would continue to do so under the existing plus project conditions. The left-turn lane provides 250 feet of vehicle storage and currently requires 550 feet based on the queuing analysis. This was confirmed by field observations. The project would not increase the 95th percentile vehicle queue during the AM peak hour and would increase the 95th percentile vehicle queue during the PM peak hour by 3 vehicles.

The site plan shows adequate site access and on-site circulation, and no significant traffic operational issues are expected to occur as a result of the project. The existing transit and bicycle facilities in the study area are sufficient to serve the project.

Hexagon has the following recommendations resulting from the site access and circulation analysis.

- During special events, police officers should be used to direct traffic on 10th Street and Alma Avenue so that vehicles could efficiently get in and out of the garage.
- The plan for shuttle buses is that they would pick up passengers along the curb on Alma Avenue adjacent to the parking structure. It will be necessary to restripe Alma Avenue to provide enough space along the curb for buses to stop.
- The existing midblock crosswalk across 10th Street should be relocated about 200 feet south to provide a direct connection from the parking structure to the stadium. The crosswalk should be redesigned to meet current City Standards.
- Depending on the current passenger load in the shuttle buses, it may be necessary to add additional buses to the route.

SJSU Parking Structure

Technical Appendices

May 2, 2019

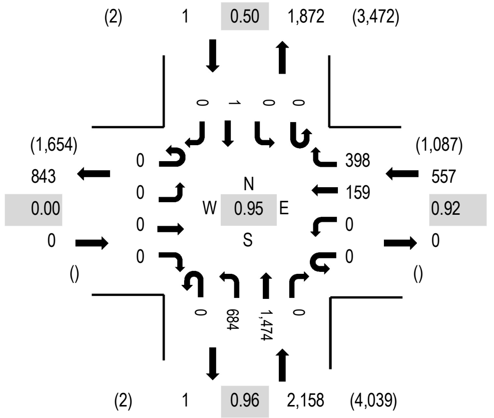
Appendix A

Traffic Counts

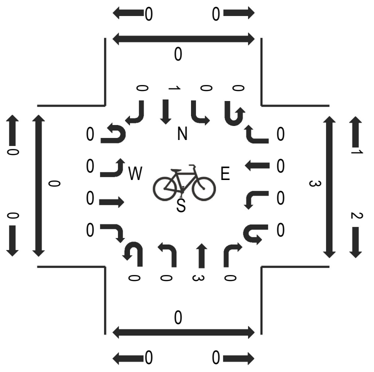
All Traffic Data
Services Inc.
(303) 216-2439
www.alltrafficdata.net

Location: 1 11TH ST & I-280 NB OFF RAMP AM
Date: Wednesday, March 13, 2019
Peak Hour: 07:45 AM - 08:45 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

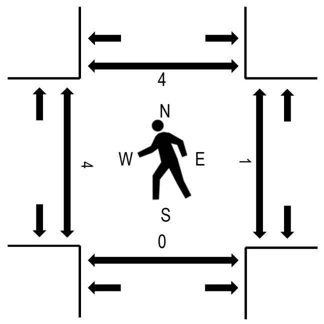
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	I-280 NB OFF RAMP Eastbound				I-280 NB OFF RAMP Westbound				11TH ST Northbound				11TH ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	0	39	117	0	170	232	0	0	0	1	0	559	2,418	1	2	0	0
7:15 AM	0	0	0	0	0	0	35	86	0	196	269	0	0	0	0	0	586	2,571	0	0	0	0
7:30 AM	0	0	0	0	0	0	35	91	0	186	329	0	0	0	0	0	641	2,666	1	2	0	0
7:45 AM	0	0	0	0	0	0	46	84	0	169	332	0	0	0	1	0	632	2,716	1	0	0	1
8:00 AM	0	0	0	0	0	0	43	109	0	183	377	0	0	0	0	0	712	2,710	0	1	0	0
8:15 AM	0	0	0	0	0	0	41	100	0	160	380	0	0	0	0	0	681		3	0	0	3
8:30 AM	0	0	0	0	0	0	29	105	0	172	385	0	0	0	0	0	691		0	0	0	0
8:45 AM	0	0	0	0	0	0	28	99	0	122	377	0	0	0	0	0	626		2	0	0	0

Peak Rolling Hour Flow Rates

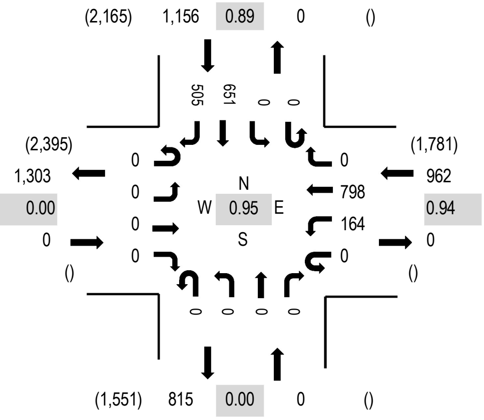
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	6	1	0	4	3	0	0	0	0	0	14
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	4
Lights	0	0	0	0	0	0	147	394	0	653	1,451	0	0	0	0	0	2,645
Mediums	0	0	0	0	0	0	6	3	0	27	17	0	0	0	0	0	53
Total	0	0	0	0	0	0	159	398	0	684	1,474	0	0	0	1	0	2,716

All Traffic Data
Services Inc.

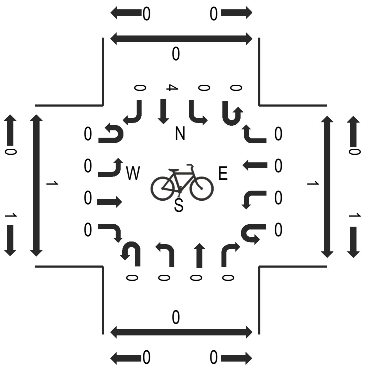
(303) 216-2439
www.alltrafficdata.net

Location: 2 10TH ST & I-280 NB ON RAMP AM
Date: Wednesday, March 13, 2019
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

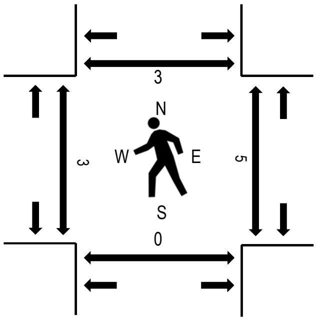
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	I-280 NB ON RAMP Eastbound				I-280 NB ON RAMP Westbound				10TH ST Northbound				10TH ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	47	170	0	0	0	0	0	0	0	117	112	446	2,083	1	1	0	0
7:15 AM	0	0	0	0	0	37	210	0	0	0	0	0	0	0	167	116	530	2,118	2	0	0	1
7:30 AM	0	0	0	0	0	40	215	0	0	0	0	0	0	0	158	147	560	2,097	1	0	0	0
7:45 AM	0	0	0	0	0	45	178	0	0	0	0	0	0	0	190	134	547	1,987	0	0	0	0
8:00 AM	0	0	0	0	0	42	195	0	0	0	0	0	0	0	136	108	481	1,863	0	5	0	2
8:15 AM	0	0	0	0	0	48	179	0	0	0	0	0	0	0	152	130	509		4	2	0	5
8:30 AM	0	0	0	0	0	30	183	0	0	0	0	0	0	0	142	95	450		3	0	0	1
8:45 AM	0	0	0	0	0	34	128	0	0	0	0	0	0	0	166	95	423		0	0	0	0

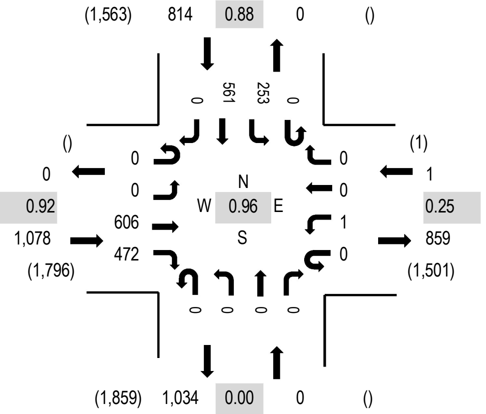
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	4	4	0	0	0	0	0	0	0	2	2	12
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
Lights	0	0	0	0	0	156	739	0	0	0	0	0	0	0	627	488	2,010
Mediums	0	0	0	0	0	4	55	0	0	0	0	0	0	0	18	15	92
Total	0	0	0	0	0	164	798	0	0	0	0	0	0	0	651	505	2,118

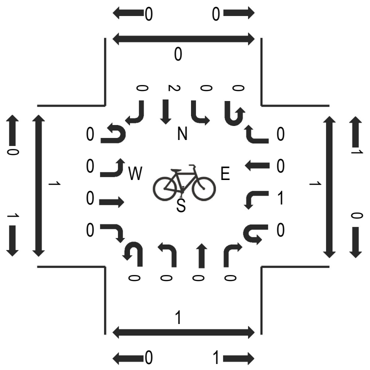
(303) 216-2439
www.alltrafficdata.net

Location: 3 10TH ST & I-280 SB OFF RAMP AM
Date: Wednesday, March 13, 2019
Peak Hour: 07:45 AM - 08:45 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

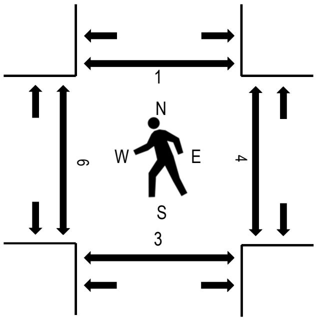
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

	I-280 SB OFF RAMP Eastbound				I-280 SB OFF RAMP Westbound				10TH ST Northbound				10TH ST Southbound						Pedestrian Crossings			
Interval Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	Rolling Hour	West	East	South	North
7:00 AM	0	0	63	54	0	0	0	0	0	0	0	0	0	62	95	0	274	1,531	1	0	0	0
7:15 AM	0	0	73	92	0	0	0	0	0	0	0	0	0	73	123	0	361	1,737	2	0	0	0
7:30 AM	0	0	91	108	0	0	0	0	0	0	0	0	0	79	124	0	402	1,849	0	1	1	0
7:45 AM	0	0	132	123	0	0	0	0	0	0	0	0	0	74	165	0	494	1,893	0	0	1	0
8:00 AM	0	0	164	129	0	0	0	0	0	0	0	0	0	54	133	0	480	1,829	0	3	1	0
8:15 AM	0	0	151	110	0	1	0	0	0	0	0	0	0	65	146	0	473		3	0	0	1
8:30 AM	0	0	159	110	0	0	0	0	0	0	0	0	0	60	117	0	446		3	1	1	0
8:45 AM	0	0	126	111	0	0	0	0	0	0	0	0	0	75	118	0	430		1	0	0	0

Peak Rolling Hour Flow Rates

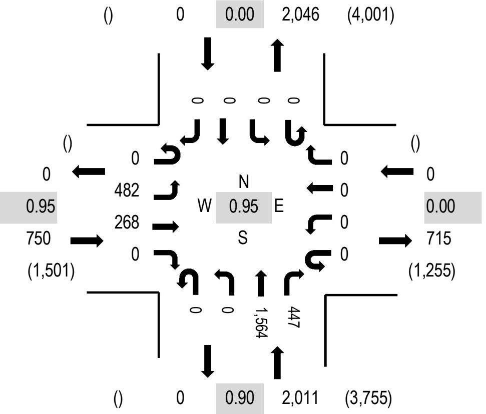
	Eastbound				Westbound				Northbound				Southbound				
Vehicle Type	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total
Articulated Trucks	0	0	1	5	0	0	0	0	0	0	0	0	0	2	4	0	12
Bicycles on Road	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	3
Lights	0	0	600	444	0	0	0	0	0	0	0	0	0	248	526	0	1,818
Mediums	0	0	5	23	0	0	0	0	0	0	0	0	0	3	29	0	60
Total	0	0	606	472	0	1	0	0	0	0	0	0	0	253	561	0	1,893

All Traffic Data
1010110
Services Inc.

(303) 216-2439
www.alltrafficdata.net

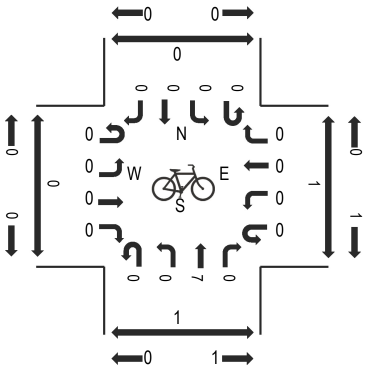
Location: 4 11TH ST & I-280 SB ON RAMP AM
Date: Wednesday, March 13, 2019
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles

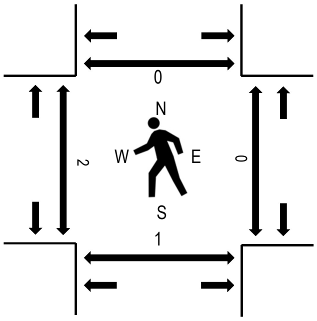


Note: Total study counts contained in parentheses.

Peak Hour - Bicycles



Peak Hour - Pedestrians



Traffic Counts

	I-280 SB ON RAMP				I-280 SB ON RAMP				11TH ST				11TH ST									
Interval Start Time	Eastbound				Westbound				Northbound				Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	69	59	0	0	0	0	0	0	0	343	85	0	0	0	0	556	2,634	1	2	0	0
7:15 AM	0	77	73	0	0	0	0	0	0	0	393	122	0	0	0	0	665	2,761	0	0	0	0
7:30 AM	0	93	77	0	0	0	0	0	0	0	428	130	0	0	0	0	728	2,754	1	0	0	0
7:45 AM	0	138	70	0	0	0	0	0	0	0	376	101	0	0	0	0	685	2,702	0	0	1	0
8:00 AM	0	174	48	0	0	0	0	0	0	0	367	94	0	0	0	0	683	2,622	1	0	0	0
8:15 AM	0	153	58	0	0	0	0	0	0	0	370	77	0	0	0	0	658		0	0	0	0
8:30 AM	0	153	53	0	0	0	0	0	0	0	399	71	0	0	0	0	676		1	0	1	0
8:45 AM	0	128	78	0	0	0	0	0	0	0	340	59	0	0	0	0	605		2	0	0	0

Peak Rolling Hour Flow Rates

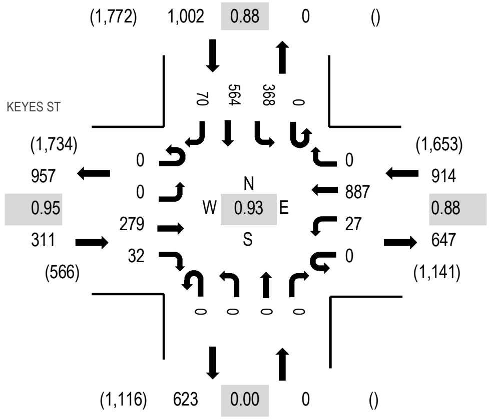
	Eastbound				Westbound				Northbound				Southbound				
Vehicle Type	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total
Articulated Trucks	0	2	1	0	0	0	0	0	0	0	9	7	0	0	0	0	19
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7
Lights	0	478	266	0	0	0	0	0	0	0	1,475	411	0	0	0	0	2,630
Mediums	0	2	1	0	0	0	0	0	0	0	73	29	0	0	0	0	105
Total	0	482	268	0	0	0	0	0	0	0	1,564	447	0	0	0	0	2,761

All Traffic Data
Services Inc.

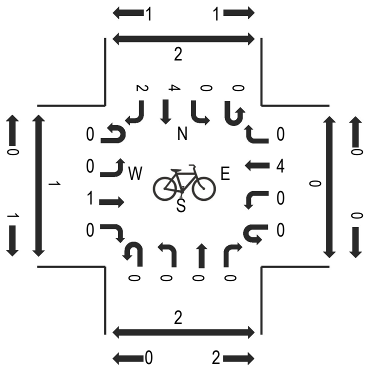
(303) 216-2439
www.alltrafficdata.net

Location: 5 10TH ST & KEYES ST AM
Date: Wednesday, March 13, 2019
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

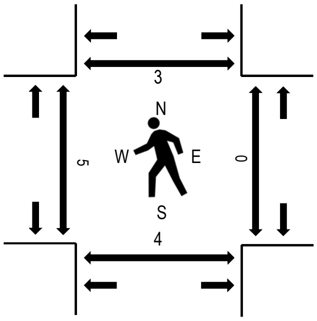
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	KEYES ST Eastbound U-Turn	Left	Thru	Right	KEYES ST Westbound U-Turn	Left	Thru	Right	10TH ST Northbound U-Turn	Left	Thru	Right	10TH ST Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour	Pedestrian Crossings West	East	South	North
7:00 AM	0	0	42	4	0	3	137	0	0	0	0	0	0	51	90	10	337	1,931	1	0	0	2
7:15 AM	0	0	65	4	0	6	179	0	0	0	0	0	0	68	125	15	462	2,181	2	0	6	3
7:30 AM	0	0	70	6	0	4	222	0	0	0	0	0	0	79	131	20	532	2,227	0	0	0	0
7:45 AM	0	0	73	8	0	5	258	0	0	0	0	0	0	87	159	10	600	2,192	2	0	1	1
8:00 AM	0	0	73	9	0	10	211	0	0	0	0	0	0	121	141	22	587	2,060	0	0	2	1
8:15 AM	0	0	63	9	0	8	196	0	0	0	0	0	0	81	133	18	508		3	0	1	1
8:30 AM	0	0	55	3	0	4	231	0	0	0	0	0	0	69	123	12	497		1	0	1	5
8:45 AM	0	0	74	8	0	7	172	0	0	0	0	0	0	70	116	21	468		0	0	4	1

Peak Rolling Hour Flow Rates

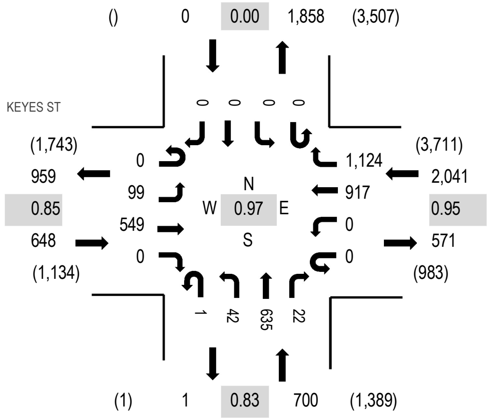
Vehicle Type	Eastbound U-Turn	Left	Thru	Right	Westbound U-Turn	Left	Thru	Right	Northbound U-Turn	Left	Thru	Right	Southbound U-Turn	Left	Thru	Right	Total
Articulated Trucks	0	0	3	1	0	0	3	0	0	0	0	0	0	2	4	0	13
Bicycles on Road	0	0	1	0	0	0	4	0	0	0	0	0	0	0	4	2	11
Lights	0	0	258	30	0	27	862	0	0	0	0	0	0	354	529	64	2,124
Mediums	0	0	17	1	0	0	18	0	0	0	0	0	0	12	27	4	79
Total	0	0	279	32	0	27	887	0	0	0	0	0	0	368	564	70	2,227

All Traffic Data
Services Inc.

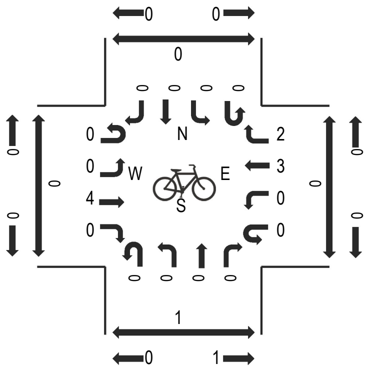
(303) 216-2439
www.alltrafficdata.net

Location: 6 11TH ST & KEYES ST AM
Date: Wednesday, March 13, 2019
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

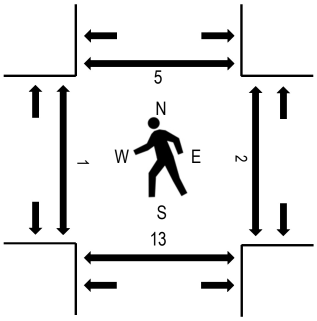
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	KEYES ST Eastbound				KEYES ST Westbound				11TH ST Northbound				11TH ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	20	71	0	0	0	134	233	0	5	148	3	0	0	0	0	614	3,098	1	3	1	0
7:15 AM	0	30	102	0	0	0	173	269	0	13	147	8	0	0	0	0	742	3,301	3	1	5	0
7:30 AM	0	29	116	0	0	0	231	287	1	9	191	10	0	0	0	0	874	3,389	0	0	2	0
7:45 AM	0	20	147	0	0	0	249	287	0	10	148	7	0	0	0	0	868	3,281	0	2	4	2
8:00 AM	0	28	163	0	0	0	215	256	0	11	142	2	0	0	0	0	817	3,136	1	0	4	2
8:15 AM	0	22	123	0	0	0	222	294	0	12	154	3	0	0	0	0	830		0	0	3	1
8:30 AM	0	18	104	0	0	0	250	237	0	12	140	5	0	0	0	0	766		0	1	4	2
8:45 AM	0	28	113	0	0	0	186	188	0	11	191	6	0	0	0	0	723		1	1	4	4

Peak Rolling Hour Flow Rates

	Eastbound				Westbound				Northbound				Southbound				
Vehicle Type	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total
Articulated Trucks	0	1	3	0	0	0	1	5	0	0	8	1	0	0	0	0	19
Bicycles on Road	0	0	4	0	0	0	3	2	0	0	0	0	0	0	0	0	9
Lights	0	89	520	0	0	0	889	1,096	1	42	583	16	0	0	0	0	3,236
Mediums	0	9	22	0	0	0	24	21	0	0	44	5	0	0	0	0	125
Total	0	99	549	0	0	0	917	1,124	1	42	635	22	0	0	0	0	3,389

All Traffic Data
Services Inc.

(303) 216-2439
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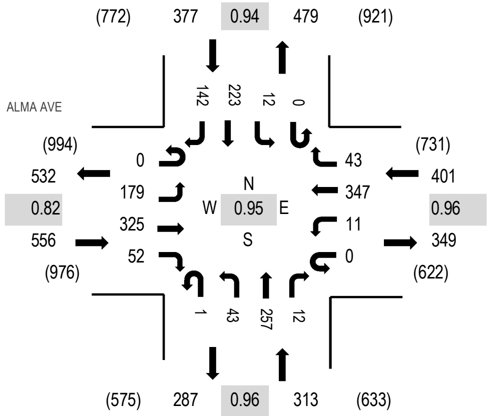
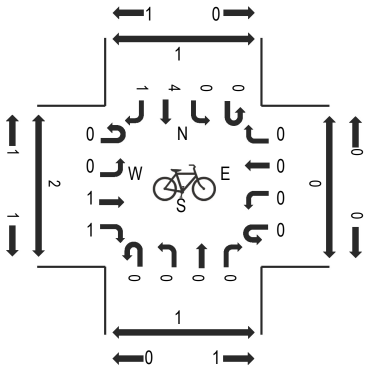
Location: 7 7TH ST & ALMA AVE AM
Date: Wednesday, March 13, 2019
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

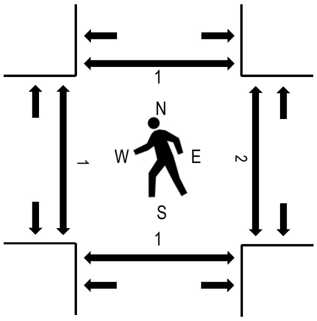
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	ALMA AVE Eastbound				ALMA AVE Westbound				7TH ST Northbound				7TH ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	17	50	8	0	3	54	10	0	9	69	1	0	2	53	36	312	1,565	1	0	0	0
7:15 AM	0	39	85	15	0	4	91	9	1	15	68	1	0	4	38	35	405	1,647	1	0	1	0
7:30 AM	0	59	95	16	0	1	97	5	0	10	72	4	0	2	36	37	434	1,613	0	1	0	0
7:45 AM	0	44	75	9	0	1	86	10	0	13	63	5	0	3	78	27	414	1,593	0	1	0	1
8:00 AM	0	37	70	12	0	5	73	19	0	5	54	2	0	3	71	43	394	1,547	0	0	0	0
8:15 AM	0	34	84	10	0	1	79	14	0	6	38	7	0	2	58	38	371		2	0	0	3
8:30 AM	0	37	59	11	0	2	78	14	0	14	78	6	0	3	72	40	414		1	0	1	1
8:45 AM	0	45	55	10	0	3	59	13	0	17	73	2	0	2	57	32	368		0	0	0	0

Peak Rolling Hour Flow Rates

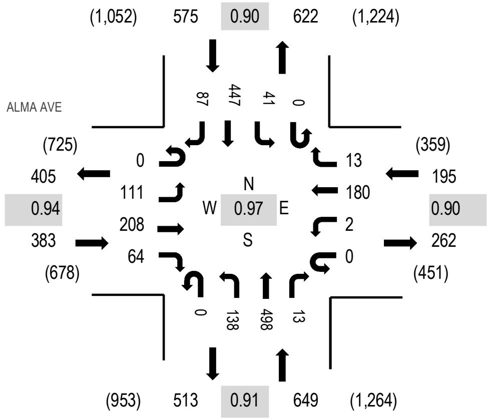
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	3	1	0	0	0	3	0	0	1	15	0	0	0	16	1	40
Bicycles on Road	0	0	1	1	0	0	0	0	0	0	0	0	0	0	4	1	7
Lights	0	169	315	48	0	10	338	40	1	37	185	7	0	12	171	131	1,464
Mediums	0	7	8	3	0	1	6	3	0	5	57	5	0	0	32	9	136
Total	0	179	325	52	0	11	347	43	1	43	257	12	0	12	223	142	1,647

All Traffic Data Services Inc.

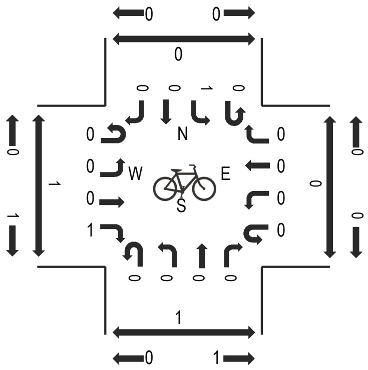
(303) 216-2439
www.alltrafficdata.net

Location: 8 10TH ST & ALMA AVE AM
Date: Wednesday, March 13, 2019
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:15 AM - 07:30 AM

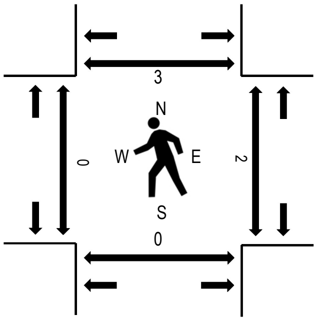
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	ALMA AVE Eastbound				ALMA AVE Westbound				10TH ST Northbound				10TH ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	14	28	10	0	0	26	3	0	24	117	1	0	4	72	18	317	1,668	0	0	0	0
7:15 AM	0	34	44	22	0	1	48	5	0	29	139	3	0	7	104	29	465	1,802	0	0	0	0
7:30 AM	0	24	63	15	0	0	46	1	0	39	139	1	0	8	98	17	451	1,777	0	1	0	2
7:45 AM	0	17	51	17	0	1	47	5	0	34	110	5	0	10	121	17	435	1,719	0	0	0	0
8:00 AM	0	36	50	10	0	0	39	2	0	36	110	4	0	16	124	24	451	1,685	0	1	0	1
8:15 AM	0	26	52	17	0	3	40	8	0	30	110	1	0	11	118	24	440		0	0	0	2
8:30 AM	0	32	36	16	0	2	38	6	0	36	108	2	0	16	91	10	393		1	3	0	0
8:45 AM	0	18	35	11	0	2	27	9	0	33	151	2	0	1	98	14	401		0	3	0	0

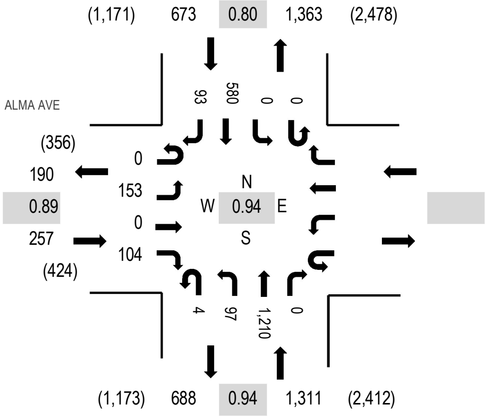
Peak Rolling Hour Flow Rates

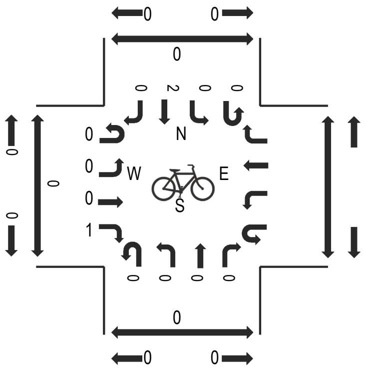
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	1	0	0	0	3	0	0	1	6	0	0	0	5	1	17
Bicycles on Road	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	2
Lights	0	106	198	62	0	2	174	13	0	134	439	12	0	40	420	84	1,684
Mediums	0	5	9	1	0	0	3	0	0	3	53	1	0	0	22	2	99
Total	0	111	208	64	0	2	180	13	0	138	498	13	0	41	447	87	1,802

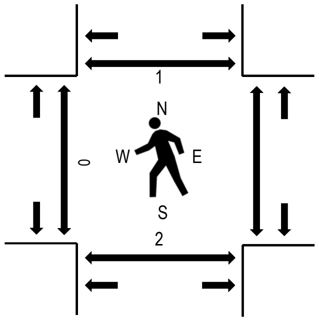
All Traffic Data
Services Inc.

(303) 216-2439
www.alltrafficdata.net

Location: 9 SENTER RD & ALMA AVE AM
Date: Wednesday, March 13, 2019
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM


Peak Hour - All Vehicles


Peak Hour - Bicycles


Peak Hour - Pedestrians

Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	ALMA AVE Eastbound				Westbound				SENTER RD Northbound				SENTER RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	17	0	14					2	20	234	0	0	0	65	9	361	1,987	0		0	0
7:15 AM	0	32	0	20					0	25	291	0	0	0	100	33	501	2,173	0		0	0
7:30 AM	0	43	0	29					0	23	304	0	0	0	103	24	526	2,241	0		0	1
7:45 AM	0	37	0	27					0	25	292	0	0	0	189	29	599	2,173	0		0	0
8:00 AM	0	34	0	30					3	23	294	0	0	0	143	20	547	2,020	0		1	0
8:15 AM	0	39	0	18					1	26	320	0	0	0	145	20	569		0		1	0
8:30 AM	0	25	0	20					1	23	237	0	0	0	127	25	458		1		0	0
8:45 AM	0	26	0	13					1	14	253	0	0	0	122	17	446		0		1	0

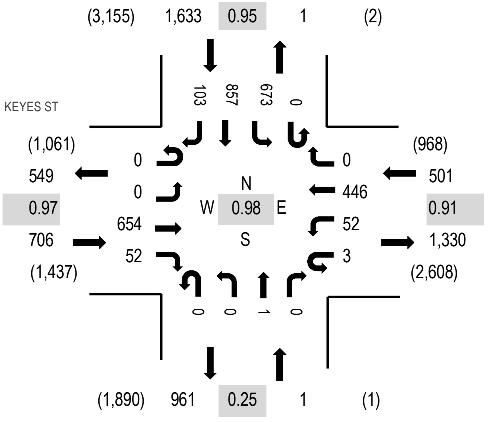
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	1					0	1	5	0	0	0	3	1	11
Bicycles on Road	0	0	0	1					0	0	0	0	0	0	2	0	3
Lights	0	147	0	98					3	96	1,174	0	0	0	562	91	2,171
Mediums	0	6	0	4					1	0	31	0	0	0	13	1	56
Total	0	153	0	104					4	97	1,210	0	0	0	580	93	2,241

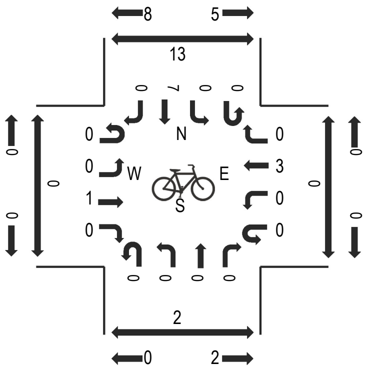
All Traffic Data
Services Inc.
(303) 216-2439
www.alltrafficdata.net

Location: 5 10TH ST & KEYES ST PM
Date: Tuesday, March 12, 2019
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:00 PM - 04:15 PM

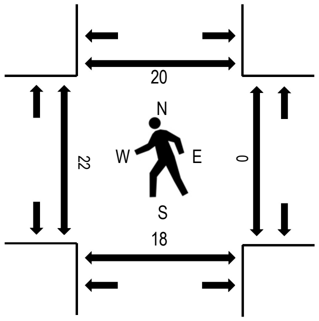
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	KEYES ST Eastbound				KEYES ST Westbound				10TH ST Northbound				10TH ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	146	12	2	17	118	0	0	0	1	0	0	186	217	25	724	2,841	6	0	5	8
4:15 PM	0	0	165	9	1	12	112	0	0	0	0	0	0	165	208	34	706	2,802	3	0	2	0
4:30 PM	0	0	166	14	0	13	104	0	0	0	0	0	0	161	210	27	695	2,774	6	0	5	6
4:45 PM	0	0	177	17	0	10	112	0	0	0	0	0	0	161	222	17	716	2,745	7	0	6	6
5:00 PM	0	1	174	7	1	7	128	0	0	0	0	0	0	132	221	14	685	2,720	0	0	1	7
5:15 PM	0	0	181	12	5	3	112	0	0	0	0	0	0	147	203	15	678		6	0	4	5
5:30 PM	0	0	166	13	0	4	104	0	0	0	0	0	0	151	206	22	666		1	0	2	2
5:45 PM	0	0	164	13	1	11	91	0	0	0	0	0	0	156	229	26	691		4	0	5	7

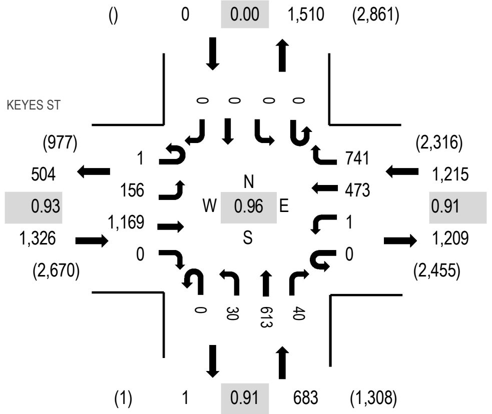
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	1	0	0	0	0	0	0	1	4	0	6
Bicycles on Road	0	0	1	0	0	0	3	0	0	0	0	0	0	0	7	0	11
Lights	0	0	643	52	3	52	434	0	0	0	1	0	0	647	811	97	2,740
Mediums	0	0	10	0	0	0	8	0	0	0	0	0	0	25	35	6	84
Total	0	0	654	52	3	52	446	0	0	0	1	0	0	673	857	103	2,841

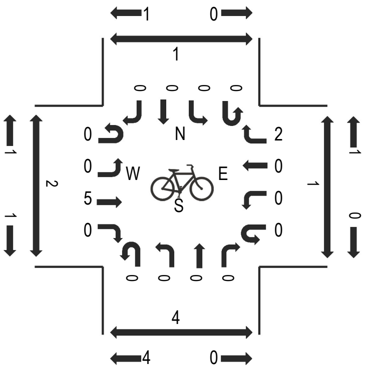
All Traffic Data
Services Inc.
(303) 216-2439
www.alltrafficdata.net

Location: 6 11TH ST & KEYES ST PM
Date: Tuesday, March 12, 2019
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

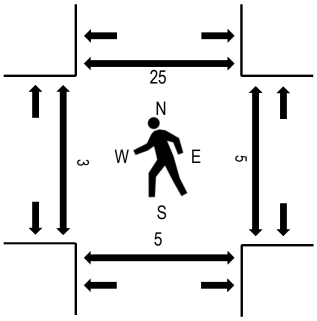
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	KEYES ST Eastbound				KEYES ST Westbound				11TH ST Northbound				11TH ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	36	294	0	0	0	132	194	0	7	153	17	0	0	0	0	833	3,186	0	6	4	6
4:15 PM	0	44	322	0	0	0	106	185	0	10	109	10	0	0	0	0	786	3,193	2	0	5	8
4:30 PM	0	50	303	0	0	0	111	184	0	8	154	9	0	0	0	0	819	3,224	1	1	2	5
4:45 PM	1	32	286	0	0	0	121	182	0	4	111	11	0	0	0	0	748	3,138	1	0	0	4
5:00 PM	0	37	273	0	0	0	123	213	0	14	171	9	0	0	0	0	840	3,108	1	2	2	13
5:15 PM	0	37	307	0	0	1	118	162	0	4	177	11	0	0	0	0	817		0	2	1	3
5:30 PM	0	32	282	0	0	0	103	145	0	8	159	4	0	0	0	0	733		2	0	4	0
5:45 PM	0	29	305	0	0	0	99	137	0	8	128	12	0	0	0	0	718		1	2	5	3

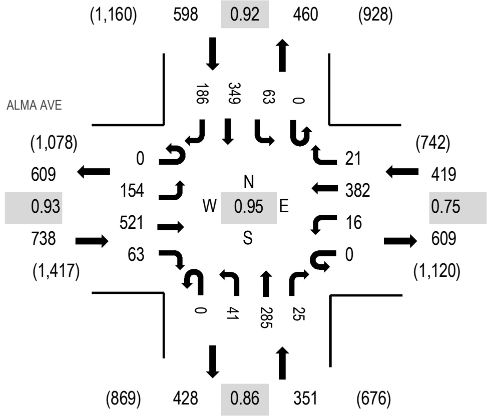
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Bicycles on Road	0	0	5	0	0	0	0	2	0	0	0	0	0	0	0	0	7
Lights	1	154	1,131	0	0	1	462	727	0	30	595	39	0	0	0	0	3,140
Mediums	0	2	32	0	0	0	11	12	0	0	18	1	0	0	0	0	76
Total	1	156	1,169	0	0	1	473	741	0	30	613	40	0	0	0	0	3,224

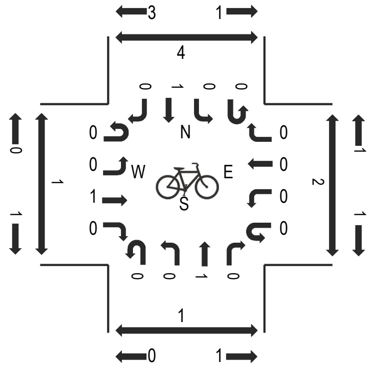
All Traffic Data
Services Inc.
(303) 216-2439
www.alltrafficdata.net

Location: 7 7TH ST & ALMA AVE PM
Date: Tuesday, March 12, 2019
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 04:30 PM - 04:45 PM

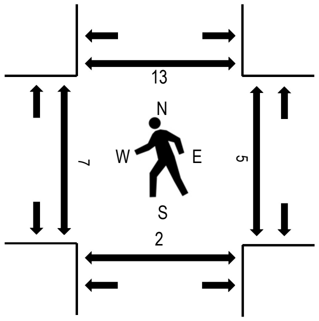
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	ALMA AVE Eastbound				ALMA AVE Westbound				7TH ST Northbound				7TH ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	28	117	13	0	4	86	12	0	18	83	5	0	12	109	36	523	2,093	1	8	11	15
4:15 PM	0	42	104	11	0	4	71	9	0	6	75	7	0	8	103	53	493	2,104	5	5	2	8
4:30 PM	0	47	130	21	0	5	80	9	0	13	63	12	0	14	110	53	557	2,106	0	0	1	3
4:45 PM	0	30	144	12	0	1	93	2	0	13	67	2	0	22	92	42	520	1,982	1	1	0	0
5:00 PM	0	40	129	14	0	8	125	6	0	11	83	3	0	7	67	41	534	1,902	0	3	0	5
5:15 PM	0	37	118	16	0	2	84	4	0	4	72	8	0	20	80	50	495		6	1	1	5
5:30 PM	0	50	116	16	0	3	54	8	0	9	56	3	0	14	75	29	433		8	2	2	24
5:45 PM	0	43	118	21	0	2	61	9	0	9	53	1	0	6	80	37	440		0	0	0	0

Peak Rolling Hour Flow Rates

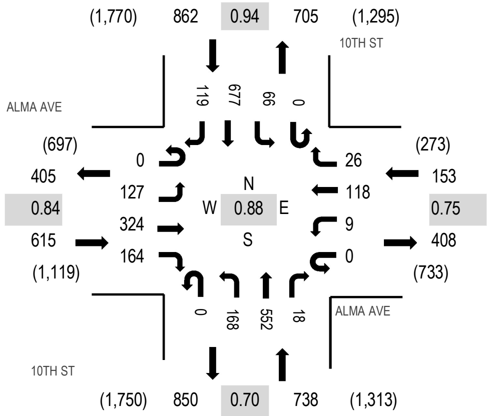
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	2	0	0	0	0	0	0	3	0	0	0	3	1	9
Bicycles on Road	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	3
Lights	0	151	510	56	0	15	371	19	0	39	273	24	0	62	312	180	2,012
Mediums	0	3	10	5	0	1	11	2	0	2	8	1	0	1	33	5	82
Total	0	154	521	63	0	16	382	21	0	41	285	25	0	63	349	186	2,106

All Traffic Data
Services Inc.

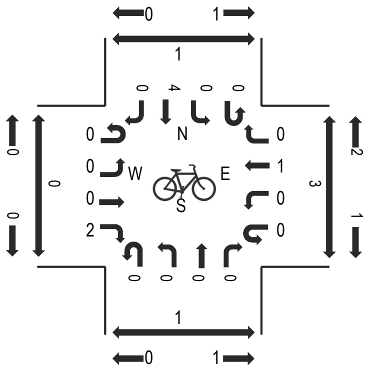
(303) 216-2439
www.alltrafficdata.net

Location: 8 10TH ST & ALMA AVE PM
Date: Tuesday, March 12, 2019
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

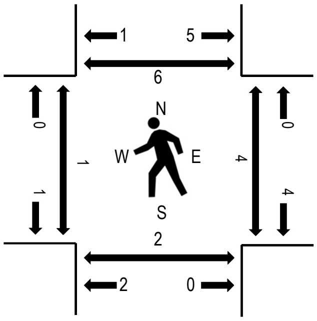
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	ALMA AVE Eastbound				ALMA AVE Westbound				10TH ST Northbound				10TH ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	31	61	29	0	2	28	1	0	35	129	8	0	10	196	33	563	2,200	2	2	1	12
4:15 PM	0	34	73	26	0	5	28	4	0	24	90	7	0	18	176	31	516	2,312	2	2	2	4
4:30 PM	0	32	79	37	0	3	28	4	0	36	126	6	0	15	152	35	553	2,368	0	4	1	2
4:45 PM	0	38	97	48	0	1	25	1	0	30	88	3	0	21	184	32	568	2,314	0	0	0	2
5:00 PM	0	25	72	40	0	2	38	11	0	61	198	5	0	24	168	31	675	2,275	0	0	1	2
5:15 PM	0	32	76	39	0	3	27	10	0	41	140	4	0	6	173	21	572		1	0	0	0
5:30 PM	0	23	66	39	0	2	19	6	0	24	102	1	0	14	186	17	499		1	1	0	0
5:45 PM	0	29	55	38	0	0	20	5	0	19	136	0	0	12	201	14	529		1	1	0	0

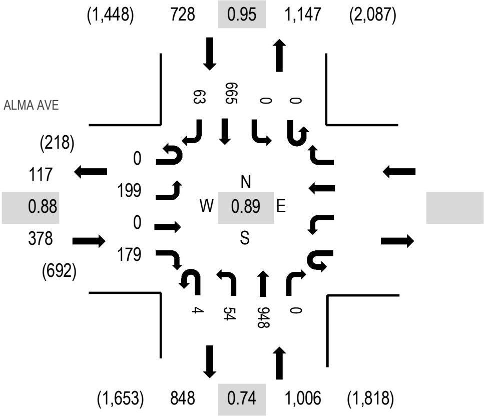
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	2	0	0	0	0	0	0	0	0	0	0	1	4	0	7
Bicycles on Road	0	0	0	2	0	0	1	0	0	0	0	0	0	0	4	0	7
Lights	0	126	320	157	0	9	117	26	0	157	532	18	0	65	647	118	2,292
Mediums	0	1	2	5	0	0	0	0	0	11	20	0	0	0	22	1	62
Total	0	127	324	164	0	9	118	26	0	168	552	18	0	66	677	119	2,368

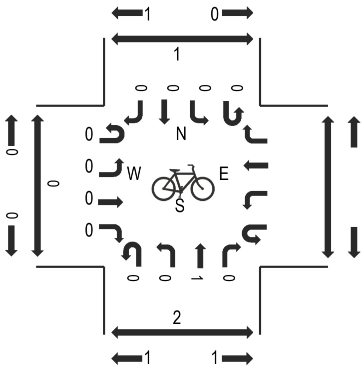
All Traffic Data
Services Inc.
(303) 216-2439
www.alltrafficdata.net

Location: 9 SENTER RD & ALMA AVE PM
Date: Tuesday, March 12, 2019
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

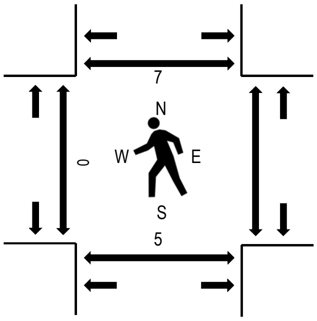
Peak Hour - All Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	ALMA AVE Eastbound U-Turn	Left	Thru	Right	Westbound U-Turn	Left	Thru	Right	SENTER RD Northbound U-Turn	Left	Thru	Right	SENTER RD Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour	Pedestrian Crossings West	East	South	North
4:00 PM	0	45	0	32					0	18	220	0	0	0	191	17	523	2,002	0		1	2
4:15 PM	0	50	0	42					0	7	173	0	0	0	189	21	482	2,071	0		0	1
4:30 PM	0	51	0	39					1	15	202	0	0	0	180	17	505	2,112	0		3	1
4:45 PM	0	51	0	56					1	7	197	0	0	0	162	18	492	2,045	0		1	2
5:00 PM	0	40	0	47					0	23	319	0	0	0	147	16	592	1,956	0		0	4
5:15 PM	0	57	0	37					2	9	230	0	0	0	176	12	523		0		1	0
5:30 PM	0	44	0	39					3	9	196	0	0	0	138	9	438		0		4	0
5:45 PM	0	34	0	28					0	8	178	0	0	0	143	12	403		1		1	2

Peak Rolling Hour Flow Rates

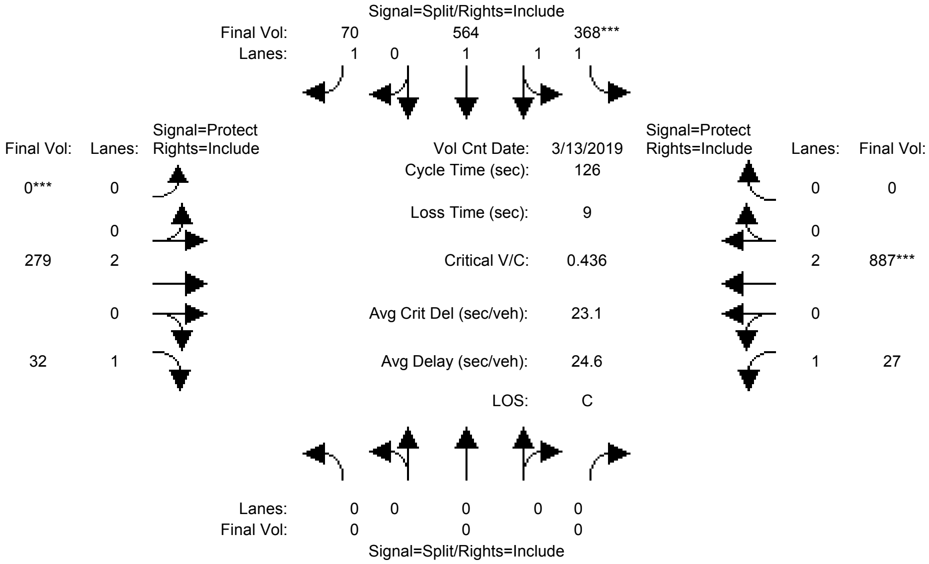
Vehicle Type	Eastbound U-Turn	Left	Thru	Right	Westbound U-Turn	Left	Thru	Right	Northbound U-Turn	Left	Thru	Right	Southbound U-Turn	Left	Thru	Right	Total
Articulated Trucks	0	0	0	1					0	0	0	0	0	0	1	0	2
Bicycles on Road	0	0	0	0					0	0	1	0	0	0	0	0	1
Lights	0	198	0	177					4	54	935	0	0	0	651	63	2,082
Mediums	0	1	0	1					0	0	12	0	0	0	13	0	27
Total	0	199	0	179					4	54	948	0	0	0	665	63	2,112

Appendix B

Level of Service Calculations

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #5: 10th Street/Keyes Street [CSJ 3619]



```
                         Signal=Split/Rights=Include
          Final Vol:      70         564          368***
            Lanes:         1    0      1       1    1

           Signal=Protect                                       Signal=Protect
Final Vol:  Lanes:  Rights=Include      Vol Cnt Date:  3/13/2019  Rights=Include   Lanes:  Final Vol:
                                    Cycle Time (sec):     126
   0***       0                                                                        0        0
                                     Loss Time (sec):      9
              0                                                                        0
   279        2                          Critical V/C:   0.436                         2      887***

              0                Avg Crit Del (sec/veh):    23.1                         0

   32         1                    Avg Delay (sec/veh):    24.6                         1       27

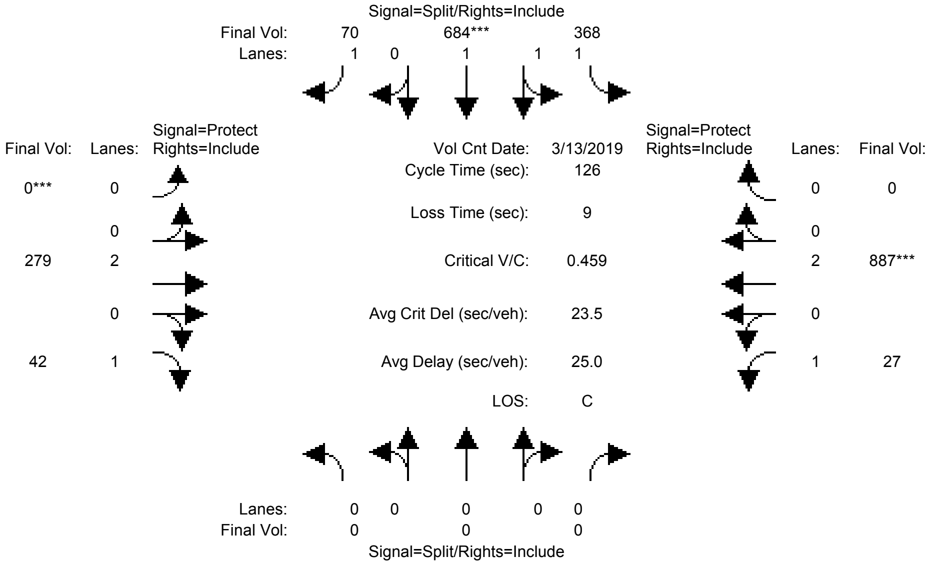
                                                 LOS:       C

            Lanes:         0    0      0       0    0
          Final Vol:       0           0            0
                         Signal=Split/Rights=Include
```

```
Street Name:           10th Street                        Keyes Street
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0    10   10    10     0   10    10     7   10     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:30 AM - 8:30 AM
Base Vol:       0    0     0   368  564    70     0  279    32    27  887     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   368  564    70     0  279    32    27  887     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0   368  564    70     0  279    32    27  887     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   368  564    70     0  279    32    27  887     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0   368  564    70     0  279    32    27  887     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0   368  564    70     0  279    32    27  887     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.93 0.98  0.92  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:       0.00 0.00  0.00  1.22 1.78  1.00  0.00 2.00  1.00  1.00 2.00  0.00
Final Sat.:     0    0     0  2150 3296  1750     0 3800  1750  1750 3800     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.17 0.17  0.04  0.00 0.07  0.02  0.02 0.23  0.00
Crit Moves:                   ****             ****                   ****
Green Time:   0.0  0.0   0.0  49.5 49.5  49.5   0.0 39.7  39.7  27.8 67.5   0.0
Volume/Cap:  0.00 0.00  0.00  0.44 0.44  0.10  0.00 0.23  0.06  0.07 0.44  0.00
Uniform Del:  0.0  0.0   0.0  28.0 28.0  24.2   0.0 31.9  30.1  38.9 17.7   0.0
IncremntDel:  0.0  0.0   0.0   0.1  0.1   0.1   0.0  0.1   0.0   0.1  0.2   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00  1.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  0.00
Delay/Veh:    0.0  0.0   0.0  28.2 28.2  24.3   0.0 32.0  30.1  38.9 17.9   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  28.2 28.2  24.3   0.0 32.0  30.1  38.9 17.9   0.0
LOS by Move:    A    A     A     C    C     C     A    C     C     D    B     A
HCM2k95thQ:     0    0     0    16   16     4     0    8     2     2   18     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project AM

Intersection #5: 10th Street/Keyes Street [CSJ 3619]

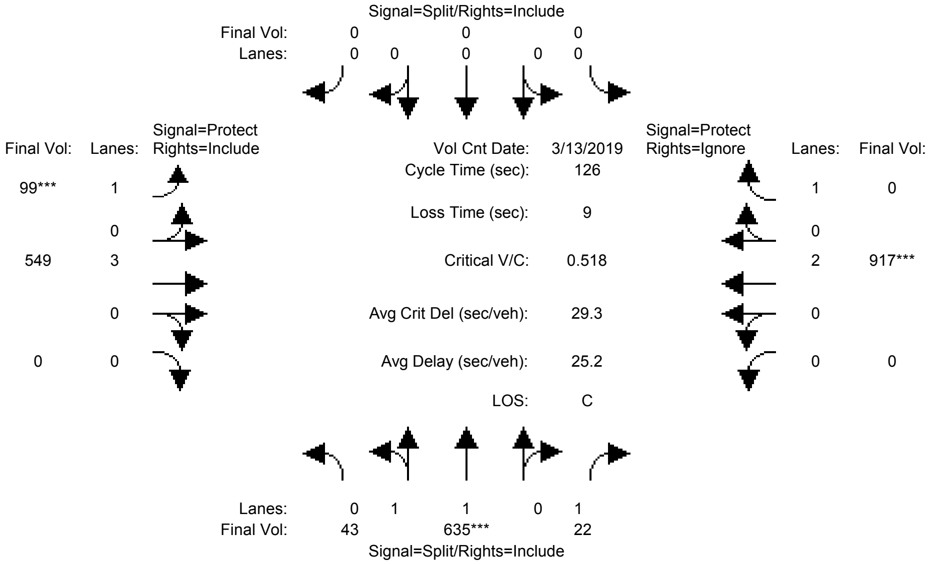


Vol Cnt Date: 3/13/2019
Cycle Time (sec): 126
Loss Time (sec): 9
Critical V/C: 0.459
Avg Crit Del (sec/veh): 23.5
Avg Delay (sec/veh): 25.0
LOS: C

```
Street Name:           10th Street                          Keyes Street
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0    10   10    10     0   10    10     7   10     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:30 AM - 8:30 AM
Base Vol:       0    0     0   368  564    70     0  279    32    27  887     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   368  564    70     0  279    32    27  887     0
Added Vol:      0    0     0     0  120     0     0    0    10     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0   368  684    70     0  279    42    27  887     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   368  684    70     0  279    42    27  887     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0   368  684    70     0  279    42    27  887     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0   368  684    70     0  279    42    27  887     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 0.97  0.92  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:       0.00 0.00  0.00  1.09 1.91  1.00  0.00 2.00  1.00  1.00 2.00  0.00
Final Sat.:     0    0     0  1905 3541  1750     0 3800  1750  1750 3800     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.19 0.19  0.04  0.00 0.07  0.02  0.02 0.23  0.00
Crit Moves:                        ****        ****                   ****
Green Time:   0.0  0.0   0.0  53.0 53.0  53.0   0.0 37.7  37.7  26.4 64.0   0.0
Volume/Cap:  0.00 0.00  0.00  0.46 0.46  0.10  0.00 0.25  0.08  0.07 0.46  0.00
Uniform Del:  0.0  0.0   0.0  26.2 26.2  22.0   0.0 33.4  31.7  40.0 19.9   0.0
IncremntDel:  0.0  0.0   0.0   0.1  0.1   0.1   0.0  0.1   0.1   0.1  0.2   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00  1.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  0.00
Delay/Veh:    0.0  0.0   0.0  26.4 26.4  22.1   0.0 33.5  31.8  40.1 20.1   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  26.4 26.4  22.1   0.0 33.5  31.8  40.1 20.1   0.0
LOS by Move:    A    A     A     C    C     C     A    C     C     D    C     A
HCM2k95thQ:     0    0     0    18   18     3     0    8     3     2   19     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

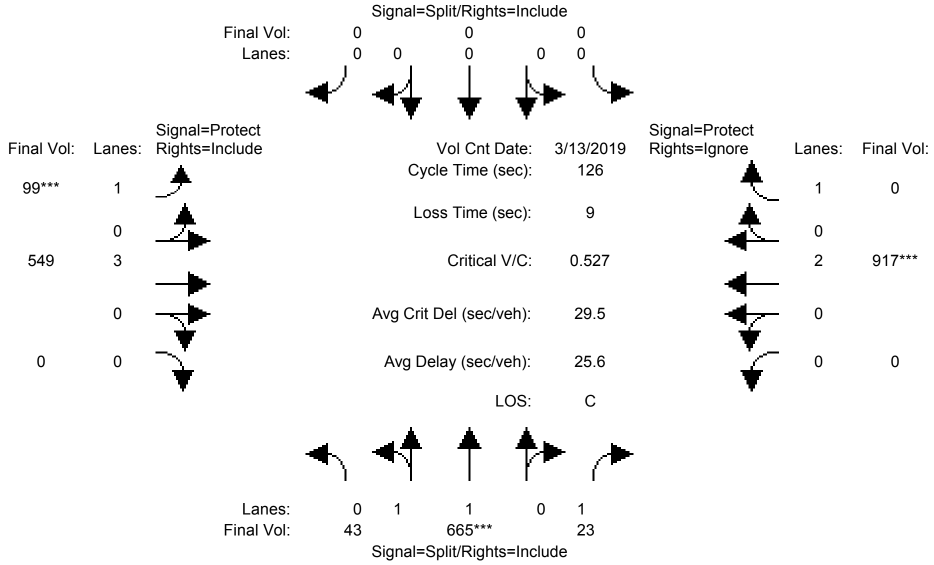
Intersection #6: 11th Street/Keyes Street [CSJ 3472]



```
Street Name:           11th Street                     Keyes Street
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10    10     0    0     0     7   10     0     0   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:30 - 8:30 AM
Base Vol:      43  635    22     0    0     0    99  549     0     0  917  1124
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   43  635    22     0    0     0    99  549     0     0  917  1124
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   43  635    22     0    0     0    99  549     0     0  917  1124
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
PHF Volume:    43  635    22     0    0     0    99  549     0     0  917     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   43  635    22     0    0     0    99  549     0     0  917     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
FinalVolume:   43  635    22     0    0     0    99  549     0     0  917     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.98  0.92  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:       0.13 1.87  1.00  0.00 0.00  0.00  1.00 3.00  0.00  0.00 2.00  1.00
Final Sat.:   235 3465  1750     0    0     0  1750 5700     0     0 3800  1750
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.18  0.01  0.00 0.00  0.00  0.06 0.10  0.00  0.00 0.24  0.00
Crit Moves:       ****                         ****                   ****
Green Time:  44.6 44.6  44.6   0.0  0.0   0.0  13.8 72.4   0.0   0.0 58.7   0.0
Volume/Cap:  0.52 0.52  0.04  0.00 0.00  0.00  0.52 0.17  0.00  0.00 0.52  0.00
Uniform Del: 32.2 32.2  26.7   0.0  0.0   0.0  53.0 12.6   0.0   0.0 23.7   0.0
IncremntDel:  0.4  0.4   0.0   0.0  0.0   0.0   2.5  0.0   0.0   0.0  0.3   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   1.00 1.00  1.00  0.00 0.00  0.00  1.00 1.00  0.00  0.00 1.00  0.00
Delay/Veh:   32.6 32.6  26.7   0.0  0.0   0.0  55.5 12.6   0.0   0.0 24.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  32.6 32.6  26.7   0.0  0.0   0.0  55.5 12.6   0.0   0.0 24.0   0.0
LOS by Move:    C    C     C     A    A     A     E    B     A     A    C     A
HCM2k95thQ:    20   20     1     0    0     0     8    6     0     0   22     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project AM

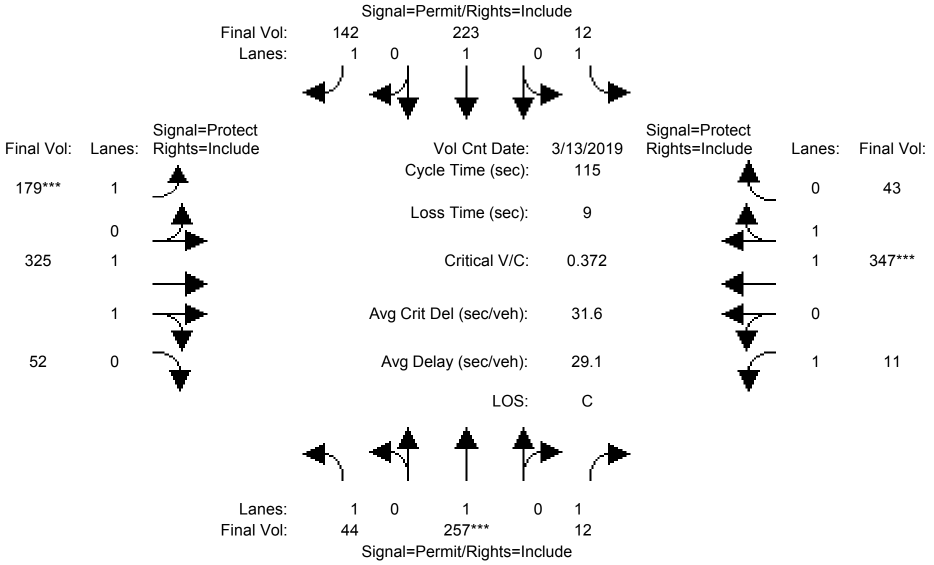
Intersection #6: 11th Street/Keyes Street [CSJ 3472]



```
Street Name:           11th Street                       Keyes Street
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10    10     0    0     0     7   10     0     0   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:30 - 8:30 AM
Base Vol:      43  635    22     0    0     0    99  549     0     0  917  1124
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   43  635    22     0    0     0    99  549     0     0  917  1124
Added Vol:      0   30     1     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   43  665    23     0    0     0    99  549     0     0  917  1124
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
PHF Volume:    43  665    23     0    0     0    99  549     0     0  917     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   43  665    23     0    0     0    99  549     0     0  917     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
FinalVolume:   43  665    23     0    0     0    99  549     0     0  917     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.98  0.92  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:       0.12 1.88  1.00  0.00 0.00  0.00  1.00 3.00  0.00  0.00 2.00  1.00
Final Sat.:   225 3475  1750     0    0     0  1750 5700     0     0 3800  1750
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.19  0.01  0.00 0.00  0.00  0.06 0.10  0.00  0.00 0.24  0.00
Crit Moves:       ****                         ****                  ****
Green Time:  45.8 45.8  45.8   0.0  0.0   0.0  13.5 71.2   0.0   0.0 57.7   0.0
Volume/Cap:  0.53 0.53  0.04  0.00 0.00  0.00  0.53 0.17  0.00  0.00 0.53  0.00
Uniform Del: 31.6 31.6  25.9   0.0  0.0   0.0  53.2 13.2   0.0   0.0 24.4   0.0
IncremntDel:  0.4  0.4   0.0   0.0  0.0   0.0   2.8  0.0   0.0   0.0  0.3   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   1.00 1.00  1.00  0.00 0.00  0.00  1.00 1.00  0.00  0.00 1.00  0.00
Delay/Veh:   32.0 32.0  25.9   0.0  0.0   0.0  56.0 13.2   0.0   0.0 24.7   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  32.0 32.0  25.9   0.0  0.0   0.0  56.0 13.2   0.0   0.0 24.7   0.0
LOS by Move:    C    C     C     A    A     A     E    B     A     A    C     A
HCM2k95thQ:    20   20     1     0    0     0     8    7     0     0   23     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

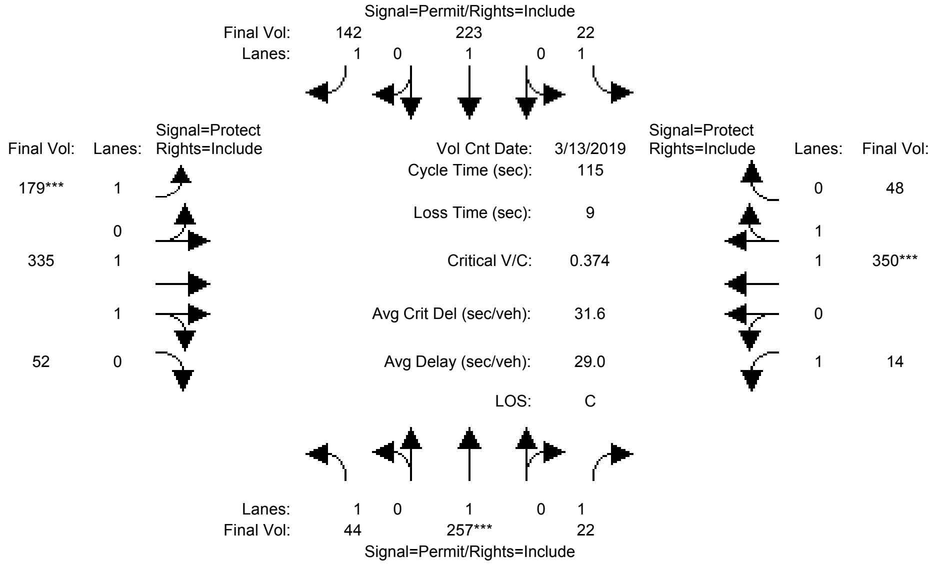
Intersection #7: 7th Street/Alma Avenue [CSJ 3238]



```
Street Name:            7th Street                       Alma Avenue
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10    10    10   10    10     7   10    10     7   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:15 - 8:15 AM
Base Vol:      44  257    12    12  223   142   179  325    52    11  347    43
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   44  257    12    12  223   142   179  325    52    11  347    43
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   44  257    12    12  223   142   179  325    52    11  347    43
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    44  257    12    12  223   142   179  325    52    11  347    43
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   44  257    12    12  223   142   179  325    52    11  347    43
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   44  257    12    12  223   142   179  325    52    11  347    43
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 0.98  0.95  0.92 0.98  0.95
Lanes:       1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.72  0.28  1.00 1.77  0.23
Final Sat.:  1750 1900  1750  1750 1900  1750  1750 3189   510  1750 3292   408
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.14  0.01  0.01 0.12  0.08  0.10 0.10  0.10  0.01 0.11  0.11
Crit Moves:       ****                         ****                   ****
Green Time:  41.8 41.8  41.8  41.8 41.8  41.8  31.6 40.2  40.2  24.0 32.6  32.6
Volume/Cap:  0.07 0.37  0.02  0.02 0.32  0.22  0.37 0.29  0.29  0.03 0.37  0.37
Uniform Del: 23.9 26.9  23.5  23.5 26.4  25.3  33.7 27.1  27.1  36.2 33.0  33.0
IncremntDel:  0.0  0.3   0.0   0.0  0.3   0.2   0.5  0.1   0.1   0.0  0.2   0.2
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay 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
Delay/Veh:   23.9 27.3  23.5  23.5 26.7  25.5  34.2 27.2  27.2  36.3 33.2  33.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  23.9 27.3  23.5  23.5 26.7  25.5  34.2 27.2  27.2  36.3 33.2  33.2
LOS by Move:    C    C     C     C    C     C     C    C     C     D    C     C
HCM2k95thQ:     2   13     1     1   11     7    11   10    10     1   11    11
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project AM

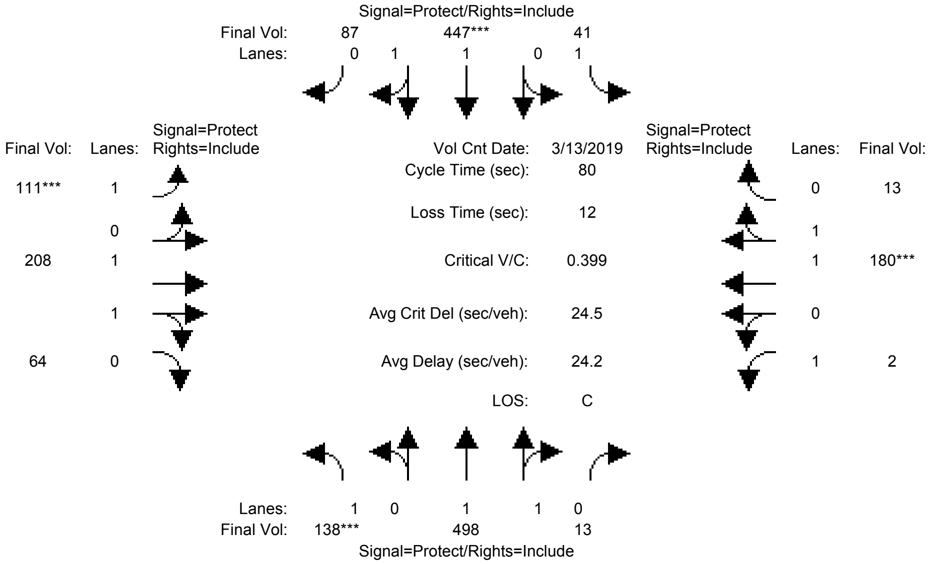
Intersection #7: 7th Street/Alma Avenue [CSJ 3238]



```
Street Name:              7th Street                          Alma Avenue
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10    10    10   10    10     7   10    10     7   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:15 - 8:15 AM
Base Vol:      44  257    12    12  223   142   179  325    52    11  347    43
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   44  257    12    12  223   142   179  325    52    11  347    43
Added Vol:      0    0    10    10    0     0     0   10     0     3    3     5
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   44  257    22    22  223   142   179  335    52    14  350    48
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    44  257    22    22  223   142   179  335    52    14  350    48
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   44  257    22    22  223   142   179  335    52    14  350    48
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   44  257    22    22  223   142   179  335    52    14  350    48
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 0.98  0.95  0.92 0.98  0.95
Lanes:       1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.72  0.28  1.00 1.75  0.25
Final Sat.:  1750 1900  1750  1750 1900  1750  1750 3202   497  1750 3253   446
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.14  0.01  0.01 0.12  0.08  0.10 0.10  0.10  0.01 0.11  0.11
Crit Moves:       ****                         ****                   ****
Green Time:  41.5 41.5  41.5  41.5 41.5  41.5  31.4 40.7  40.7  23.7 33.0  33.0
Volume/Cap:  0.07 0.37  0.03  0.03 0.32  0.22  0.37 0.30  0.30  0.04 0.37  0.37
Uniform Del: 24.1 27.1  23.8  23.8 26.6  25.5  33.8 26.8  26.8  36.5 32.7  32.7
IncremntDel:  0.0  0.3   0.0   0.0  0.3   0.2   0.5  0.1   0.1   0.0  0.2   0.2
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay 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
Delay/Veh:   24.1 27.5  23.8  23.8 26.9  25.7  34.3 26.9  26.9  36.6 32.9  32.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  24.1 27.5  23.8  23.8 26.9  25.7  34.3 26.9  26.9  36.6 32.9  32.9
LOS by Move:    C    C     C     C    C     C     C    C     C     D    C     C
HCM2k95thQ:     2   13     1     1   11     7    11   10    10     1   11    11
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #8: 10th Street/Alma Avenue [CSJ 3239]

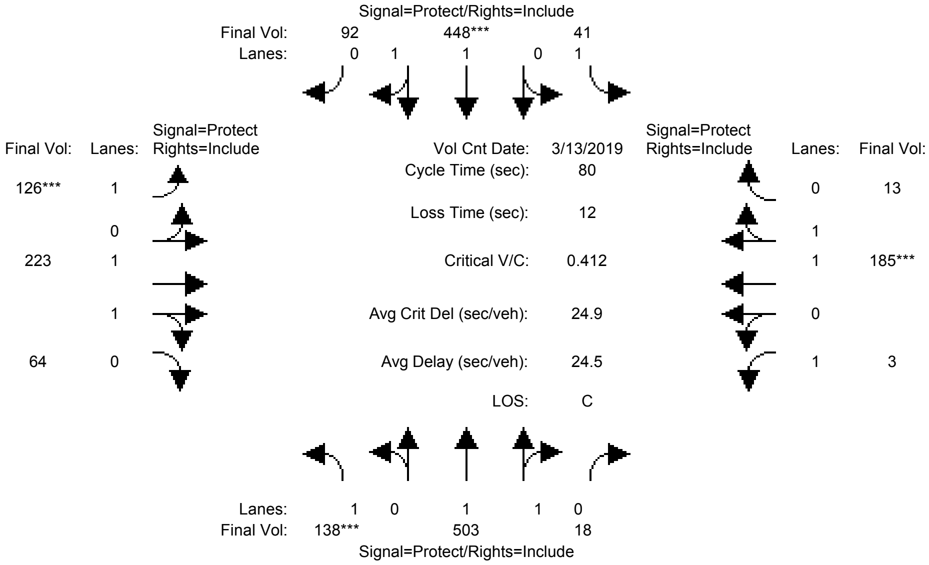


Vol Cnt Date: 3/13/2019
Cycle Time (sec): 80
Loss Time (sec): 12
Critical V/C: 0.399
Avg Crit Del (sec/veh): 24.5
Avg Delay (sec/veh): 24.2
LOS: C

```
Street Name:           10th Street                        Alma Avenue
Approach:      North Bound      South Bound        East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     7   10    10     7   10    10     7   10    10     7   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:15 - 8:15 AM
Base Vol:     138  498    13    41  447    87   111  208    64     2  180    13
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  138  498    13    41  447    87   111  208    64     2  180    13
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  138  498    13    41  447    87   111  208    64     2  180    13
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   138  498    13    41  447    87   111  208    64     2  180    13
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  138  498    13    41  447    87   111  208    64     2  180    13
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  138  498    13    41  447    87   111  208    64     2  180    13
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 0.97  0.95  0.92 0.98  0.95  0.92 0.98  0.95  0.92 0.98  0.95
Lanes:       1.00 1.95  0.05  1.00 1.67  0.33  1.00 1.52  0.48  1.00 1.86  0.14
Final Sat.:  1750 3606    94  1750 3097   603  1750 2829   870  1750 3451   249
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.14  0.14  0.02 0.14  0.14  0.06 0.07  0.07  0.00 0.05  0.05
Crit Moves:  ****                  ****        ****                  ****
Green Time:  15.8 27.4  27.4  17.4 29.0  29.0  12.7 13.6  13.6   9.6 10.5  10.5
Volume/Cap:  0.40 0.40  0.40  0.11 0.40  0.40  0.40 0.43  0.43  0.01 0.40  0.40
Uniform Del: 27.9 20.0  20.0  25.1 19.0  19.0  30.2 29.7  29.7  31.1 31.9  31.9
IncremntDel:  0.8  0.2   0.2   0.1  0.2   0.2   0.9  0.5   0.5   0.0  0.5   0.5
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay 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
Delay/Veh:   28.7 20.3  20.3  25.2 19.2  19.2  31.1 30.2  30.2  31.1 32.4  32.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  28.7 20.3  20.3  25.2 19.2  19.2  31.1 30.2  30.2  31.1 32.4  32.4
LOS by Move:    C    C     C     C    B     B     C    C     C     C    C     C
HCM2k95thQ:     7   10    10     2   10    10     5    6     6     0    5     5
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project AM

Intersection #8: 10th Street/Alma Avenue [CSJ 3239]

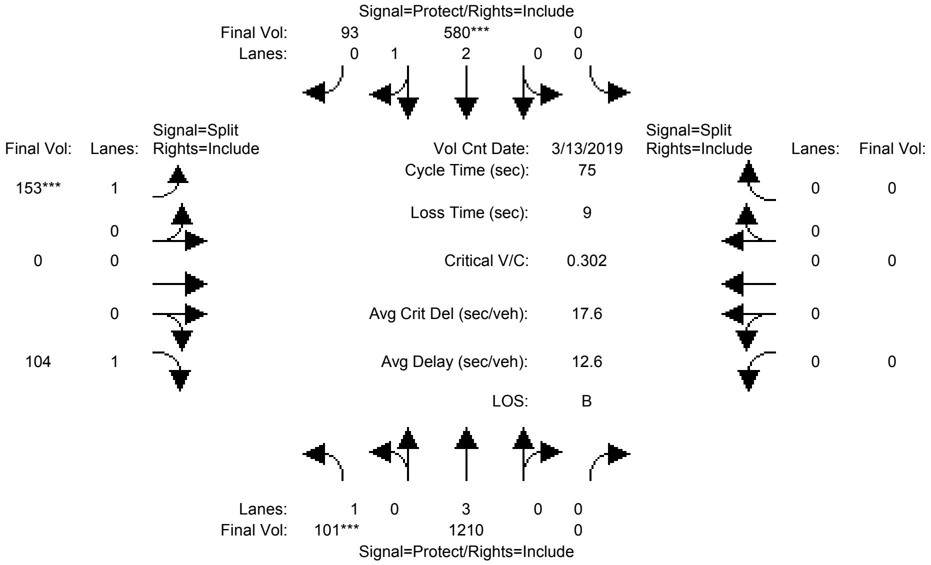


Vol Cnt Date: 3/13/2019
Cycle Time (sec): 80
Loss Time (sec): 12
Critical V/C: 0.412
Avg Crit Del (sec/veh): 24.9
Avg Delay (sec/veh): 24.5
LOS: C

```
Street Name:           10th Street                         Alma Avenue
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    7   10    10     7   10    10     7   10    10     7   10    10
Y+R:         4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:15 - 8:15 AM
Base Vol:     138  498    13    41  447    87   111  208    64     2  180    13
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  138  498    13    41  447    87   111  208    64     2  180    13
Added Vol:      0    5     5     0    1     5    15   15     0     1    5     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  138  503    18    41  448    92   126  223    64     3  185    13
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   138  503    18    41  448    92   126  223    64     3  185    13
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  138  503    18    41  448    92   126  223    64     3  185    13
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  138  503    18    41  448    92   126  223    64     3  185    13
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 0.97  0.95  0.92 0.98  0.95  0.92 0.98  0.95  0.92 0.98  0.95
Lanes:       1.00 1.93  0.07  1.00 1.65  0.35  1.00 1.54  0.46  1.00 1.87  0.13
Final Sat.:  1750 3572   128  1750 3069   630  1750 2874   825  1750 3457   243
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.14  0.14  0.02 0.15  0.15  0.07 0.08  0.08  0.00 0.05  0.05
Crit Moves:  ****                  ****        ****                   ****
Green Time:  15.3 26.9  26.9  16.7 28.3  28.3  14.0 14.3  14.3  10.0 10.4  10.4
Volume/Cap:  0.41 0.42  0.42  0.11 0.41  0.41  0.41 0.43  0.43  0.01 0.41  0.41
Uniform Del: 28.4 20.5  20.5  25.6 19.5  19.5  29.4 29.2  29.2  30.6 32.0  32.0
IncremntDel:  0.8  0.2   0.2   0.1  0.2   0.2   0.9  0.5   0.5   0.0  0.6   0.6
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay 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
Delay/Veh:   29.2 20.7  20.7  25.8 19.7  19.7  30.3 29.7  29.7  30.7 32.6  32.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  29.2 20.7  20.7  25.8 19.7  19.7  30.3 29.7  29.7  30.7 32.6  32.6
LOS by Move:    C    C     C     C    B     B     C    C     C     C    C     C
HCM2k95thQ:     7   10    10     2   10    10     6    6     6     0    6     6
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

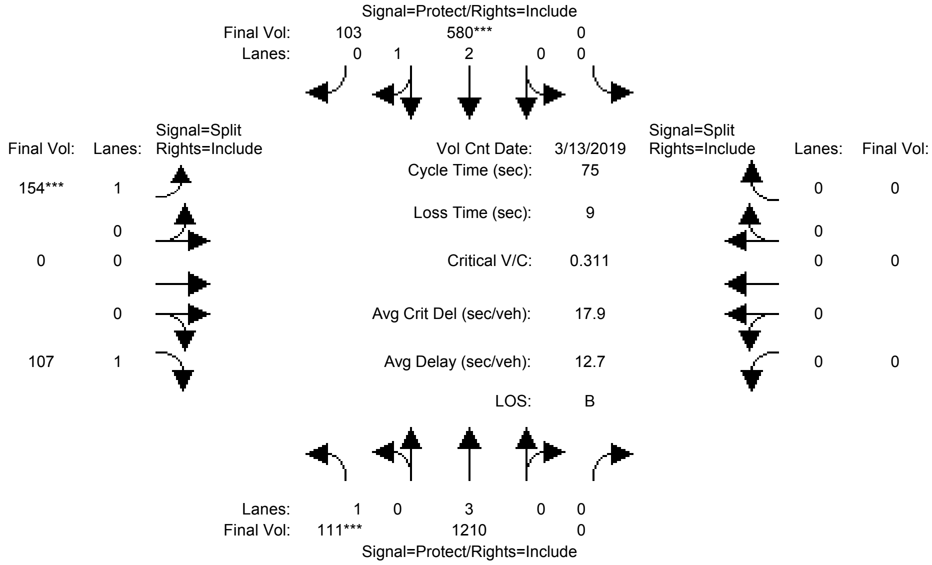
Intersection #9: Senter Road/Alma Avenue [CSJ 3237]



```
Street Name:           Senter Road                       Alma Avenue
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     7   10      0      0   10     10     10      0     10      0      0      0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:30 - 8:30 AM
Base Vol:     101 1210     0     0  580    93   153    0   104     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  101 1210     0     0  580    93   153    0   104     0    0     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  101 1210     0     0  580    93   153    0   104     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   101 1210     0     0  580    93   153    0   104     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  101 1210     0     0  580    93   153    0   104     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  101 1210     0     0  580    93   153    0   104     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 0.99  0.95  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:       1.00 3.00  0.00  0.00 2.57  0.43  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:  1750 5700     0     0 4825   774  1750    0  1750     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.21  0.00  0.00 0.12  0.12  0.09 0.00  0.06  0.00 0.00  0.00
Crit Moves:  ****                  ****        ****
Green Time:  14.4 44.3   0.0   0.0 29.9  29.9  21.7  0.0  21.7   0.0  0.0   0.0
Volume/Cap:  0.30 0.36  0.00  0.00 0.30  0.30  0.30 0.00  0.20  0.00 0.00  0.00
Uniform Del: 26.0  8.0   0.0   0.0 15.4  15.4  20.7  0.0  20.1   0.0  0.0   0.0
IncremntDel:  0.5  0.1   0.0   0.0  0.1   0.1   0.3  0.0   0.2   0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   1.00 1.00  0.00  0.00 1.00  1.00  1.00 0.00  1.00  0.00 0.00  0.00
Delay/Veh:   26.5  8.1   0.0   0.0 15.5  15.5  21.1  0.0  20.3   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  26.5  8.1   0.0   0.0 15.5  15.5  21.1  0.0  20.3   0.0  0.0   0.0
LOS by Move:    C    A     A     A    B     B     C    A     C     A    A     A
HCM2k95thQ:     5   10     0     0    7     7     6    0     4     0    0     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project AM

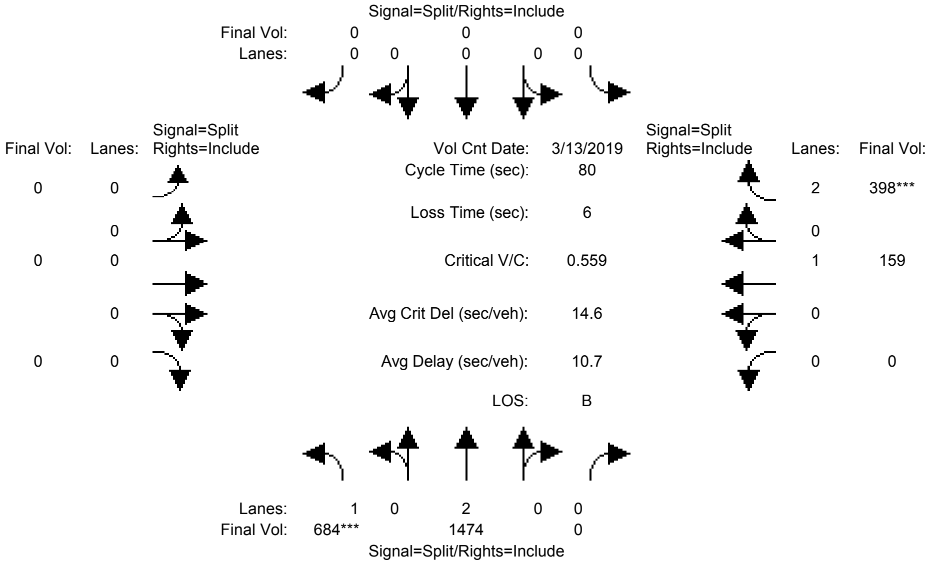
Intersection #9: Senter Road/Alma Avenue [CSJ 3237]



```
Street Name:           Senter Road                          Alma Avenue
Approach:      North Bound     South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     7   10      0      0   10     10     10    0     10      0    0      0
Y+R:          4.0  4.0    4.0    4.0  4.0    4.0    4.0  4.0    4.0    4.0  4.0    4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:30 - 8:30 AM
Base Vol:     101 1210      0      0  580     93    153    0    104      0    0      0
Growth Adj:  1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00
Initial Bse:  101 1210      0      0  580     93    153    0    104      0    0      0
Added Vol:     10    0      0      0    0     10      1    0      3      0    0      0
PasserByVol:    0    0      0      0    0      0      0    0      0      0    0      0
Initial Fut:  111 1210      0      0  580    103    154    0    107      0    0      0
User Adj:    1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00
PHF Adj:     1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00
PHF Volume:   111 1210      0      0  580    103    154    0    107      0    0      0
Reduct Vol:     0    0      0      0    0      0      0    0      0      0    0      0
Reduced Vol:  111 1210      0      0  580    103    154    0    107      0    0      0
PCE Adj:     1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00
MLF Adj:     1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00
FinalVolume:  111 1210      0      0  580    103    154    0    107      0    0      0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900   1900   1900 1900   1900   1900 1900   1900   1900 1900   1900
Adjustment:  0.92 1.00   0.92   0.92 0.99   0.95   0.92 1.00   0.92   0.92 1.00   0.92
Lanes:       1.00 3.00   0.00   0.00 2.53   0.47   1.00 0.00   1.00   0.00 0.00   0.00
Final Sat.:  1750 5700      0      0 4754    844   1750    0   1750      0    0      0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.21   0.00   0.00 0.12   0.12   0.09 0.00   0.06   0.00 0.00   0.00
Crit Moves:  ****                  ****        ****
Green Time:  15.3 44.8    0.0    0.0 29.4   29.4   21.2  0.0   21.2    0.0  0.0    0.0
Volume/Cap:  0.31 0.36   0.00   0.00 0.31   0.31   0.31 0.00   0.22   0.00 0.00   0.00
Uniform Del: 25.4  7.7    0.0    0.0 15.8   15.8   21.1  0.0   20.5    0.0  0.0    0.0
IncremntDel:  0.5  0.1    0.0    0.0  0.1    0.1    0.4  0.0    0.2    0.0  0.0    0.0
InitQueuDel:  0.0  0.0    0.0    0.0  0.0    0.0    0.0  0.0    0.0    0.0  0.0    0.0
Delay Adj:   1.00 1.00   0.00   0.00 1.00   1.00   1.00 0.00   1.00   0.00 0.00   0.00
Delay/Veh:   25.9  7.8    0.0    0.0 15.8   15.8   21.5  0.0   20.7    0.0  0.0    0.0
User DelAdj: 1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00   1.00 1.00   1.00
AdjDel/Veh:  25.9  7.8    0.0    0.0 15.8   15.8   21.5  0.0   20.7    0.0  0.0    0.0
LOS by Move:    C    A      A      A    B      B      C    A      C      A    A      A
HCM2k95thQ:     5    9      0      0    8      8      6    0      4      0    0      0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #3034: 11th Street/I-280 Northbound Off-Ramp

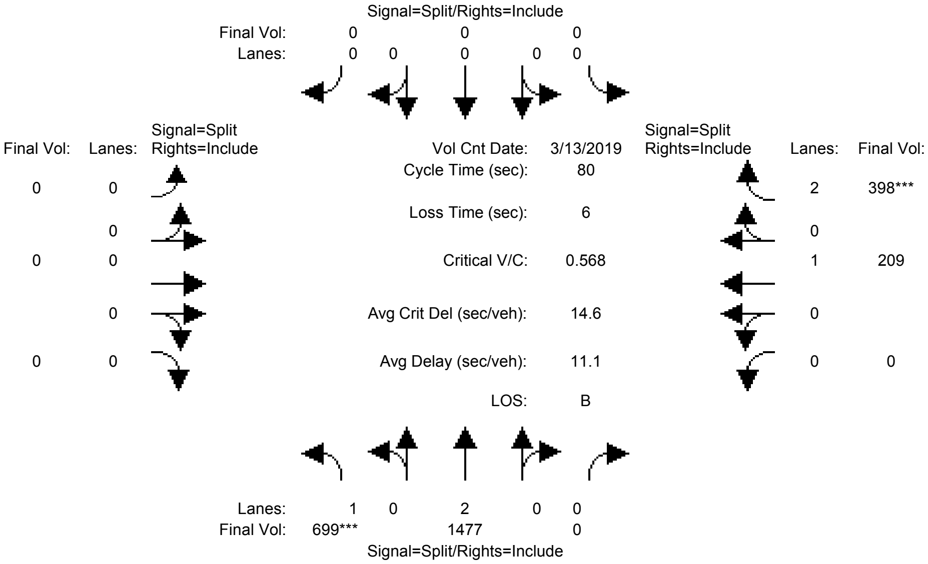


Vol Cnt Date: 3/13/2019
Cycle Time (sec): 80
Loss Time (sec): 6
Critical V/C: 0.559
Avg Crit Del (sec/veh): 14.6
Avg Delay (sec/veh): 10.7
LOS: B

```
Street Name:           11th Street              I-280 Northbound Off-Ramp
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10     0    0    0     0    0    0     0    0   10    10
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:45 - 8:45 AM
Base Vol:     684 1474     0    0    0     0    0    0     0    0  159   398
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  684 1474     0    0    0     0    0    0     0    0  159   398
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  684 1474     0    0    0     0    0    0     0    0  159   398
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   684 1474     0    0    0     0    0    0     0    0  159   398
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  684 1474     0    0    0     0    0    0     0    0  159   398
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  684 1474     0    0    0     0    0    0     0    0  159   398
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.92 1.00  0.92 0.92 1.00  0.92 0.92 1.00  0.92 0.92 1.00  0.83
Lanes:       1.00 2.00  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 1.00  2.00
Final Sat.:  1750 3800     0    0    0     0    0    0     0    0 1900  3150
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.39 0.39  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.08  0.13
Crit Moves:  ****                                                       ****
Green Time:  55.9 55.9   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0 18.1  18.1
Volume/Cap:  0.56 0.55  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.37  0.56
Uniform Del:  5.9  5.9   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0 26.2  27.4
IncremntDel:  0.6  0.3   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.5   1.0
InitQueuDel:  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0
Delay Adj:   1.00 1.00  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 1.00  1.00
Delay/Veh:    6.5  6.2   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0 26.7  28.4
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   6.5  6.2   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0 26.7  28.4
LOS by Move:    A    A     A    A    A     A    A    A     A    A    C     C
HCM2k95thQ:    17   17     0    0    0     0    0    0     0    0    7    11
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project AM

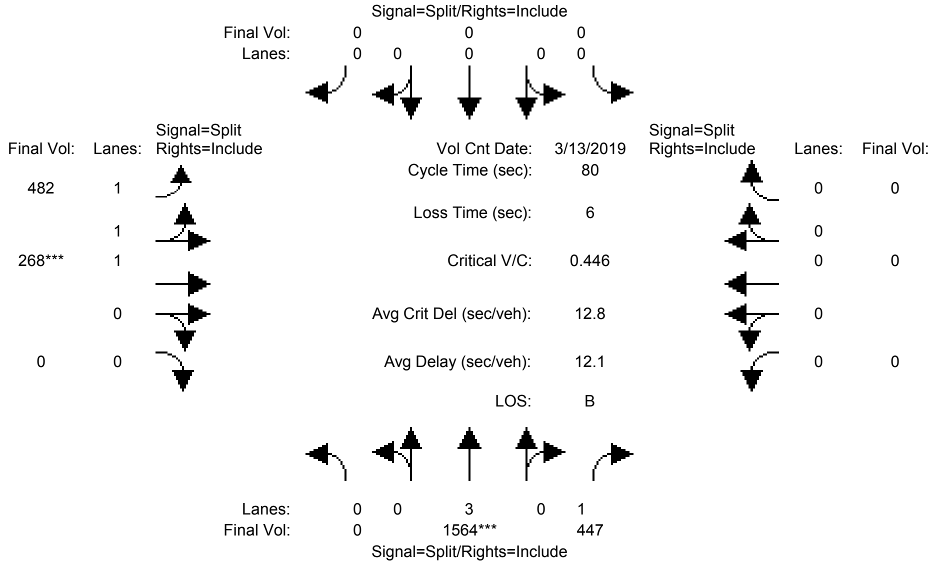
Intersection #3034: 11th Street/I-280 Northbound Off-Ramp



```
Street Name:           11th Street              I-280 Northbound Off-Ramp
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10     0    0    0     0    0    0     0    0   10    10
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:45 - 8:45 AM
Base Vol:     684 1474     0    0    0     0    0    0     0    0  159   398
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  684 1474     0    0    0     0    0    0     0    0  159   398
Added Vol:     15    3     0    0    0     0    0    0     0    0   50     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  699 1477     0    0    0     0    0    0     0    0  209   398
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   699 1477     0    0    0     0    0    0     0    0  209   398
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  699 1477     0    0    0     0    0    0     0    0  209   398
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  699 1477     0    0    0     0    0    0     0    0  209   398
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.92 1.00  0.92 0.92 1.00  0.92 0.92 1.00  0.92 0.92 1.00  0.83
Lanes:       1.00 2.00  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 1.00  2.00
Final Sat.:  1750 3800     0    0    0     0    0    0     0    0 1900  3150
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.40 0.39  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.11  0.13
Crit Moves:  ****                                                         ****
Green Time:  56.2 56.2   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0 17.8  17.8
Volume/Cap:  0.57 0.55  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.49  0.57
Uniform Del:  5.9  5.8   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0 27.2  27.7
IncremntDel:  0.6  0.3   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.9   1.1
InitQueuDel:  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0
Delay Adj:   1.00 1.00  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 1.00  1.00
Delay/Veh:    6.5  6.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0 28.1  28.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   6.5  6.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0 28.1  28.8
LOS by Move:    A    A     A    A    A     A    A    A     A    A    C     C
HCM2k95thQ:    17   16     0    0    0     0    0    0     0    0   10    12
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

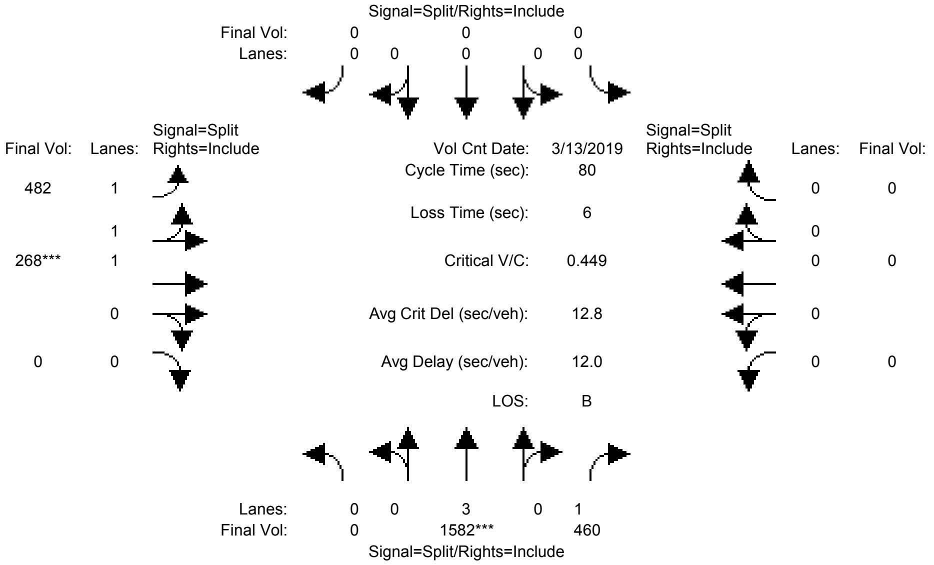
Intersection #3035: 11th Street/I-280 Southbound On-Ramp



```
Street Name:           11th Street                 I-280 Soutbound On-Ramp
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0   10    10     0    0     0    10   10     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:15 - 8:15 AM
Base Vol:       0 1564   447     0    0     0   482  268     0     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1564   447     0    0     0   482  268     0     0    0     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1564   447     0    0     0   482  268     0     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1564   447     0    0     0   482  268     0     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1564   447     0    0     0   482  268     0     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1564   447     0    0     0   482  268     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.93 1.00  0.92  0.92 1.00  0.92
Lanes:       0.00 3.00  1.00  0.00 0.00  0.00  1.97 1.03  0.00  0.00 0.00  0.00
Final Sat.:     0 5700  1750     0    0     0  3499 1946     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.27  0.26  0.00 0.00  0.00  0.14 0.14  0.00  0.00 0.00  0.00
Crit Moves:       ****                              ****
Green Time:   0.0 49.3  49.3   0.0  0.0   0.0  24.7 24.7   0.0   0.0  0.0   0.0
Volume/Cap:  0.00 0.45  0.41  0.00 0.00  0.00  0.45 0.45  0.00  0.00 0.00  0.00
Uniform Del:  0.0  8.1   7.9   0.0  0.0   0.0  22.1 22.1   0.0   0.0  0.0   0.0
IncremntDel:  0.0  0.1   0.3   0.0  0.0   0.0   0.2  0.2   0.0   0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 1.00  1.00  0.00 0.00  0.00  1.00 1.00  0.00  0.00 0.00  0.00
Delay/Veh:    0.0  8.2   8.2   0.0  0.0   0.0  22.3 22.3   0.0   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  8.2   8.2   0.0  0.0   0.0  22.3 22.3   0.0   0.0  0.0   0.0
LOS by Move:    A    A     A     A    A     A     C    C     A     A    A     A
HCM2k95thQ:     0   13    12     0    0     0    11   11     0     0    0     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project AM

Intersection #3035: 11th Street/I-280 Southbound On-Ramp



```
                        Signal=Split/Rights=Include
           Final Vol:     0           0           0
              Lanes:      0     0     0      0    0

            Signal=Split                                  Signal=Split
Final Vol: Lanes: Rights=Include   Vol Cnt Date:  3/13/2019  Rights=Include  Lanes:  Final Vol:
                                Cycle Time (sec):    80
   482       1                                                                0         0
                                 Loss Time (sec):     6
             1                                                                0
  268***     1                     Critical V/C:    0.449                     0         0

             0              Avg Crit Del (sec/veh):  12.8                     0

    0        0                 Avg Delay (sec/veh):  12.0                     0         0

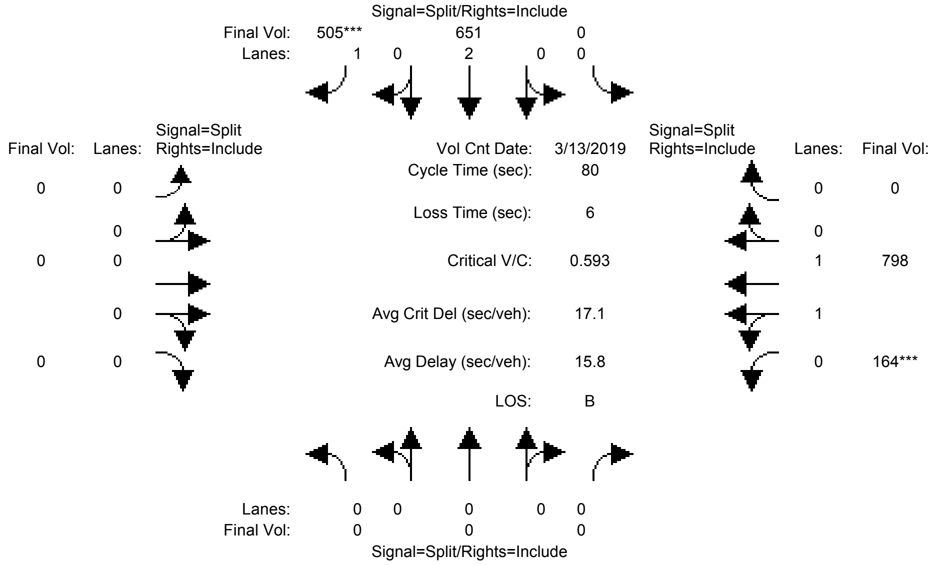
                                              LOS:     B

              Lanes:      0     0     3      0    1
           Final Vol:     0        1582***        460
                        Signal=Split/Rights=Include
```

```
Street Name:           11th Street                 I-280 Soutbound On-Ramp
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0   10    10     0    0     0    10   10     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:15 - 8:15 AM
Base Vol:       0 1564   447     0    0     0   482  268     0     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1564   447     0    0     0   482  268     0     0    0     0
Added Vol:      0   18    13     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1582   460     0    0     0   482  268     0     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1582   460     0    0     0   482  268     0     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1582   460     0    0     0   482  268     0     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1582   460     0    0     0   482  268     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.93 1.00  0.92  0.92 1.00  0.92
Lanes:       0.00 3.00  1.00  0.00 0.00  0.00  1.97 1.03  0.00  0.00 0.00  0.00
Final Sat.:     0 5700  1750     0    0     0  3499 1946     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.28  0.26  0.00 0.00  0.00  0.14 0.14  0.00  0.00 0.00  0.00
Crit Moves:       ****                              ****
Green Time:   0.0 49.5  49.5   0.0  0.0   0.0  24.5 24.5   0.0   0.0  0.0   0.0
Volume/Cap:  0.00 0.45  0.43  0.00 0.00  0.00  0.45 0.45  0.00  0.00 0.00  0.00
Uniform Del:  0.0  8.1   7.9   0.0  0.0   0.0  22.3 22.3   0.0   0.0  0.0   0.0
IncremntDel:  0.0  0.1   0.3   0.0  0.0   0.0   0.2  0.2   0.0   0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 1.00  1.00  0.00 0.00  0.00  1.00 1.00  0.00  0.00 0.00  0.00
Delay/Veh:    0.0  8.2   8.2   0.0  0.0   0.0  22.5 22.5   0.0   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  8.2   8.2   0.0  0.0   0.0  22.5 22.5   0.0   0.0  0.0   0.0
LOS by Move:    A    A     A     A    A     A     C    C     A     A    A     A
HCM2k95thQ:     0   13    12     0    0     0    11   11     0     0    0     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

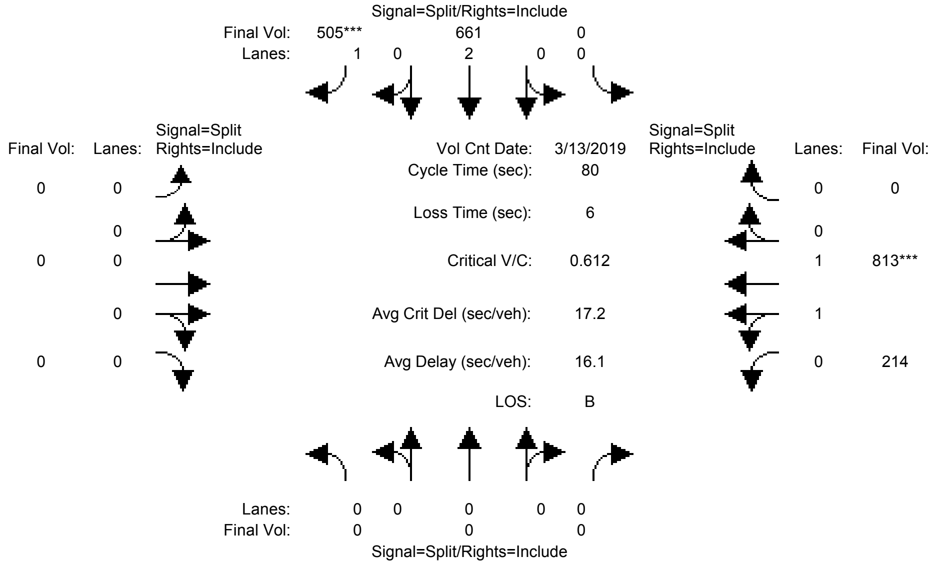
Intersection #3040: 10th Street/I-280 Northbound On-Ramp



```
Street Name:           10th Street                I-280 Northbound On-Ramp
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0     0   10    10     0    0     0    10   10     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:15 - 8:15 AM
Base Vol:       0    0     0     0  651   505     0    0     0   164  798     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     0  651   505     0    0     0   164  798     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0     0  651   505     0    0     0   164  798     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0     0  651   505     0    0     0   164  798     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0     0  651   505     0    0     0   164  798     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0     0  651   505     0    0     0   164  798     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.92  0.95 0.98  0.92
Lanes:       0.00 0.00  0.00  0.00 2.00  1.00  0.00 0.00  0.00  0.35 1.65  0.00
Final Sat.:     0    0     0     0 3800  1750     0    0     0   631 3069     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.00 0.17  0.29  0.00 0.00  0.00  0.26 0.26  0.00
Crit Moves:                              ****                ****
Green Time:   0.0  0.0   0.0   0.0 38.9  38.9   0.0  0.0   0.0  35.1 35.1   0.0
Volume/Cap:  0.00 0.00  0.00  0.00 0.35  0.59  0.00 0.00  0.00  0.59 0.59  0.00
Uniform Del:  0.0  0.0   0.0   0.0 12.7  14.8   0.0  0.0   0.0  17.0 17.0   0.0
IncremntDel:  0.0  0.0   0.0   0.0  0.1   1.1   0.0  0.0   0.0   0.6  0.6   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00  0.00 1.00  1.00  0.00 0.00  0.00  1.00 1.00  0.00
Delay/Veh:    0.0  0.0   0.0   0.0 12.8  16.0   0.0  0.0   0.0  17.6 17.6   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0   0.0 12.8  16.0   0.0  0.0   0.0  17.6 17.6   0.0
LOS by Move:    A    A     A     A    B     B     A    A     A     B    B     A
HCM2k95thQ:     0    0     0     0   10    19     0    0     0    18   18     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project AM

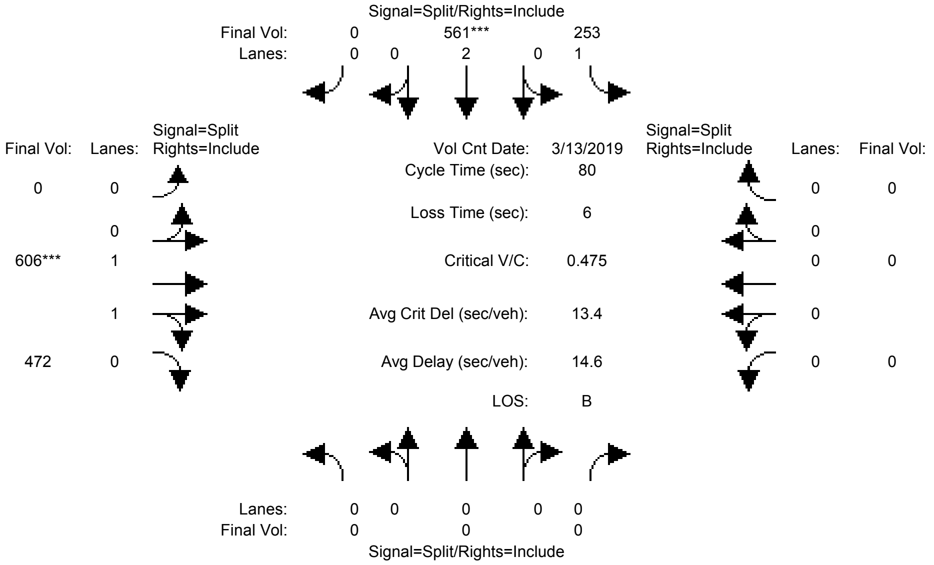
Intersection #3040: 10th Street/I-280 Northbound On-Ramp



```
Street Name:           10th Street              I-280 Northbound On-Ramp
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0    0   10    10    0    0     0   10   10     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:15 - 8:15 AM
Base Vol:       0    0     0    0  651   505    0    0     0  164  798     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0    0  651   505    0    0     0  164  798     0
Added Vol:      0    0     0    0   10     0    0    0     0   50   15     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0    0  661   505    0    0     0  214  813     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0    0  661   505    0    0     0  214  813     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0    0  661   505    0    0     0  214  813     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0    0  661   505    0    0     0  214  813     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.92 1.00  0.92 0.92 1.00  0.92 0.92 1.00  0.92 0.95 0.98  0.92
Lanes:       0.00 0.00  0.00 0.00 2.00  1.00 0.00 0.00  0.00 0.43 1.57  0.00
Final Sat.:     0    0     0    0 3800  1750    0    0     0  771 2928     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.00 0.17  0.29 0.00 0.00  0.00 0.28 0.28  0.00
Crit Moves:                             ****                      ****
Green Time:   0.0  0.0   0.0  0.0 37.7  37.7  0.0  0.0   0.0 36.3 36.3   0.0
Volume/Cap:  0.00 0.00  0.00 0.00 0.37  0.61 0.00 0.00  0.00 0.61 0.61  0.00
Uniform Del:  0.0  0.0   0.0  0.0 13.5  15.7  0.0  0.0   0.0 16.5 16.5   0.0
IncremntDel:  0.0  0.0   0.0  0.0  0.1   1.4  0.0  0.0   0.0  0.7  0.7   0.0
InitQueuDel:  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00 0.00 1.00  1.00 0.00 0.00  0.00 1.00 1.00  0.00
Delay/Veh:    0.0  0.0   0.0  0.0 13.7  17.1  0.0  0.0   0.0 17.2 17.2   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  0.0 13.7  17.1  0.0  0.0   0.0 17.2 17.2   0.0
LOS by Move:    A    A     A    A    B     B    A    A     A    B    B     A
HCM2k95thQ:     0    0     0    0   10    19    0    0     0   19   19     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #3041: 10th Street/I-280 Southbound Off-Ramp

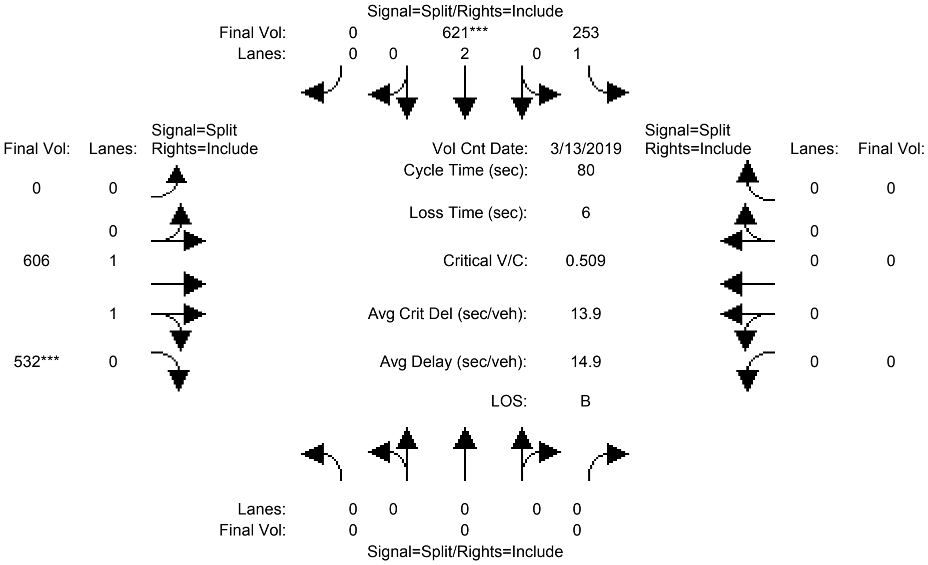


Vol Cnt Date: 3/13/2019
Cycle Time (sec): 80
Loss Time (sec): 6
Critical V/C: 0.475
Avg Crit Del (sec/veh): 13.4
Avg Delay (sec/veh): 14.6
LOS: B

```
Street Name:            10th Street                  I-280 Southbound Off-Ramp
Approach:       North Bound      South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0    10   10     0     0   10    10     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:45 - 8:45 AM
Base Vol:       0    0     0   253  561     0     0  606   472     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   253  561     0     0  606   472     0    0     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0   253  561     0     0  606   472     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   253  561     0     0  606   472     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0   253  561     0     0  606   472     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0   253  561     0     0  606   472     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 0.99  0.95  0.92 1.00  0.92
Lanes:       0.00 0.00  0.00  1.00 2.00  0.00  0.00 1.10  0.90  0.00 0.00  0.00
Final Sat.:     0    0     0  1750 3800     0     0 2079  1619     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.14 0.15  0.00  0.00 0.29  0.29  0.00 0.00  0.00
Crit Moves:                        ****              ****
Green Time:   0.0  0.0   0.0  24.9 24.9   0.0   0.0 49.1  49.1   0.0  0.0   0.0
Volume/Cap:  0.00 0.00  0.00  0.46 0.47  0.00  0.00 0.47  0.47  0.00 0.00  0.00
Uniform Del:  0.0  0.0   0.0  22.2 22.3   0.0   0.0  8.4   8.4   0.0  0.0   0.0
IncremntDel:  0.0  0.0   0.0   0.6  0.3   0.0   0.0  0.2   0.2   0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00  1.00 1.00  0.00  0.00 1.00  1.00  0.00 0.00  0.00
Delay/Veh:    0.0  0.0   0.0  22.8 22.6   0.0   0.0  8.6   8.6   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  22.8 22.6   0.0   0.0  8.6   8.6   0.0  0.0   0.0
LOS by Move:    A    A     A     C    C     A     A    A     A     A    A     A
HCM2k95thQ:     0    0     0    10   11     0     0   14    14     0    0     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project AM

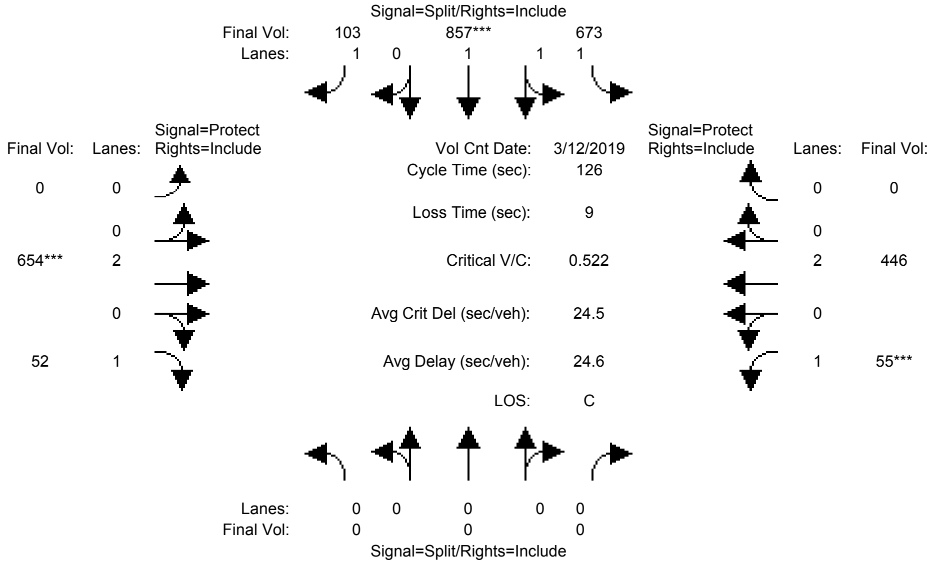
Intersection #3041: 10th Street/I-280 Southbound Off-Ramp



```
Street Name:           10th Street              I-280 Southbound Off-Ramp
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0    10   10     0     0   10    10     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Mar 2019 << 7:45 - 8:45 AM
Base Vol:       0    0     0   253  561     0     0  606   472     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   253  561     0     0  606   472     0    0     0
Added Vol:      0    0     0     0   60     0     0    0    60     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0   253  621     0     0  606   532     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   253  621     0     0  606   532     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0   253  621     0     0  606   532     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0   253  621     0     0  606   532     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.95  0.92 1.00  0.92
Lanes:       0.00 0.00  0.00  1.00 2.00  0.00  0.00 1.04  0.96  0.00 0.00  0.00
Final Sat.:     0    0     0  1750 3800     0     0 1969  1729     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.14 0.16  0.00  0.00 0.31  0.31  0.00 0.00  0.00
Crit Moves:                        ****                     ****
Green Time:   0.0  0.0   0.0  25.7 25.7   0.0   0.0 48.3  48.3   0.0  0.0   0.0
Volume/Cap:  0.00 0.00  0.00  0.45 0.51  0.00  0.00 0.51  0.51  0.00 0.00  0.00
Uniform Del:  0.0  0.0   0.0  21.6 22.1   0.0   0.0  9.1   9.1   0.0  0.0   0.0
IncremntDel:  0.0  0.0   0.0   0.6  0.4   0.0   0.0  0.2   0.2   0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00  1.00 1.00  0.00  0.00 1.00  1.00  0.00 0.00  0.00
Delay/Veh:    0.0  0.0   0.0  22.1 22.4   0.0   0.0  9.2   9.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  22.1 22.4   0.0   0.0  9.2   9.2   0.0  0.0   0.0
LOS by Move:    A    A     A     C    C     A     A    A     A     A    A     A
HCM2k95thQ:     0    0     0    10   12     0     0   16    16     0    0     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #5: 10th Street/Keyes Street [CSJ 3619]



Signal=Split/Rights=Include
Final Vol: 103 857*** 673
Lanes: 1 0 1 1 1

Signal=Protect
Rights=Include
Final Vol: 0 654*** 52
Lanes: 0 0 2 0 1

Vol Cnt Date: 3/12/2019
Cycle Time (sec): 126
Loss Time (sec): 9
Critical V/C: 0.522
Avg Crit Del (sec/veh): 24.5
Avg Delay (sec/veh): 24.6
LOS: C

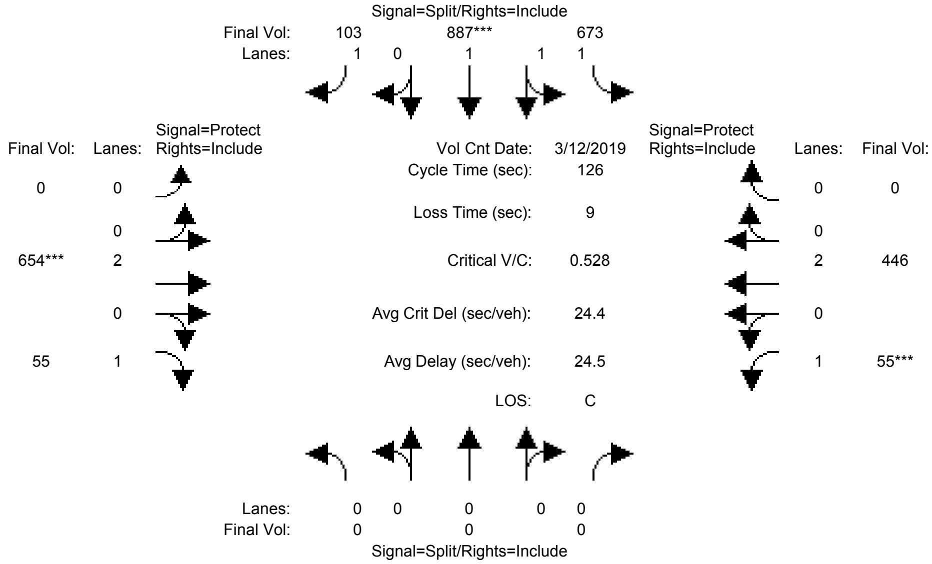
Signal=Protect
Rights=Include
Lanes: 0 0 2 0 1
Final Vol: 0 446 55***

Lanes: 0 0 0 0 0
Final Vol: 0 0 0
Signal=Split/Rights=Include

```
Street Name:           10th Street                        Keyes Street
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0   10   10    10     0   10    10     7   10     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Mar 2019 << 4:00 - 5:00 PM
Base Vol:       0    0     0  673  857   103     0  654    52    55  446     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0  673  857   103     0  654    52    55  446     0
Added Vol:      0    0     0    0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0    0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0  673  857   103     0  654    52    55  446     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0  673  857   103     0  654    52    55  446     0
Reduct Vol:     0    0     0    0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0  673  857   103     0  654    52    55  446     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0  673  857   103     0  654    52    55  446     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92 0.93 0.98  0.92  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:       0.00 0.00  0.00 1.36 1.64  1.00  0.00 2.00  1.00  1.00 2.00  0.00
Final Sat.:     0    0     0 2396 3051  1750     0 3800  1750  1750 3800     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.28 0.28  0.06  0.00 0.17  0.03  0.03 0.12  0.00
Crit Moves:                       ****              ****        ****
Green Time:   0.0  0.0   0.0 67.8 67.8  67.8   0.0 41.6  41.6   7.6 49.2   0.0
Volume/Cap:  0.00 0.00  0.00 0.52 0.52  0.11  0.00 0.52  0.09  0.52 0.30  0.00
Uniform Del:  0.0  0.0   0.0 18.7 18.7  14.3   0.0 34.2  29.2  57.4 26.5   0.0
IncremntDel:  0.0  0.0   0.0  0.2  0.2   0.1   0.0  0.4   0.1   4.6  0.1   0.0
InitQueuDel:  0.0  0.0   0.0  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00 1.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  0.00
Delay/Veh:    0.0  0.0   0.0 18.8 18.8  14.3   0.0 34.6  29.2  62.1 26.7   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 18.8 18.8  14.3   0.0 34.6  29.2  62.1 26.7   0.0
LOS by Move:    A    A     A    B    B     B     A    C     C     E    C     A
HCM2k95thQ:     0    0     0   23   23     4     0   19     3     5   11     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project PM

Intersection #5: 10th Street/Keyes Street [CSJ 3619]



Signal=Split/Rights=Include
Final Vol: 103 887*** 673
Lanes: 1 0 1 1 1

Signal=Protect
Rights=Include
Final Vol: 0, 654***, 55
Lanes: 0, 0, 2, 0, 1

Vol Cnt Date: 3/12/2019
Cycle Time (sec): 126
Loss Time (sec): 9
Critical V/C: 0.528
Avg Crit Del (sec/veh): 24.4
Avg Delay (sec/veh): 24.5
LOS: C

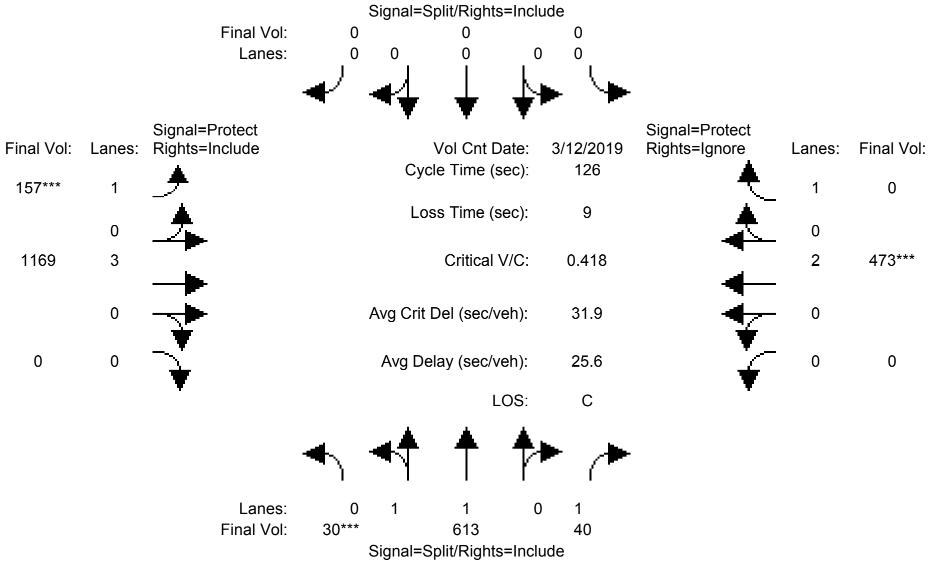
Signal=Protect
Rights=Include
Lanes: 0, 0, 2, 0, 1
Final Vol: 0, 446, 55***

Lanes: 0 0 0 0 0
Final Vol: 0 0 0
Signal=Split/Rights=Include

```
Street Name:           10th Street                         Keyes Street
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    0    0     0    10   10    10     0   10    10     7   10     0
Y+R:         4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Mar 2019 << 4:00 - 5:00 PM
Base Vol:      0    0     0   673  857   103     0  654    52    55  446     0
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0     0   673  857   103     0  654    52    55  446     0
Added Vol:     0    0     0     0   30     0     0    0     3     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0    0     0   673  887   103     0  654    55    55  446     0
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0     0   673  887   103     0  654    55    55  446     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0    0     0   673  887   103     0  654    55    55  446     0
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0    0     0   673  887   103     0  654    55    55  446     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.92 1.00  0.92  0.93 0.98  0.92  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:      0.00 0.00  0.00  1.33 1.67  1.00  0.00 2.00  1.00  1.00 2.00  0.00
Final Sat.:    0    0     0  2350 3097  1750     0 3800  1750  1750 3800     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.00  0.00  0.29 0.29  0.06  0.00 0.17  0.03  0.03 0.12  0.00
Crit Moves:                       ****              ****        ****
Green Time:  0.0  0.0   0.0  68.4 68.4  68.4   0.0 41.1  41.1   7.5 48.6   0.0
Volume/Cap: 0.00 0.00  0.00  0.53 0.53  0.11  0.00 0.53  0.10  0.53 0.30  0.00
Uniform Del: 0.0  0.0   0.0  18.5 18.5  14.0   0.0 34.6  29.5  57.5 26.9   0.0
IncremntDel: 0.0  0.0   0.0   0.2  0.2   0.1   0.0  0.4   0.1   5.0  0.1   0.0
InitQueuDel: 0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:  0.00 0.00  0.00  1.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  0.00
Delay/Veh:   0.0  0.0   0.0  18.6 18.6  14.0   0.0 35.0  29.6  62.5 27.1   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  0.0  0.0   0.0  18.6 18.6  14.0   0.0 35.0  29.6  62.5 27.1   0.0
LOS by Move:   A    A     A     B    B     B     A    C     C     E    C     A
HCM2k95thQ:    0    0     0    23   23     4     0   19     3     5   11     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #6: 11th Street/Keyes Street [CSJ 3472]

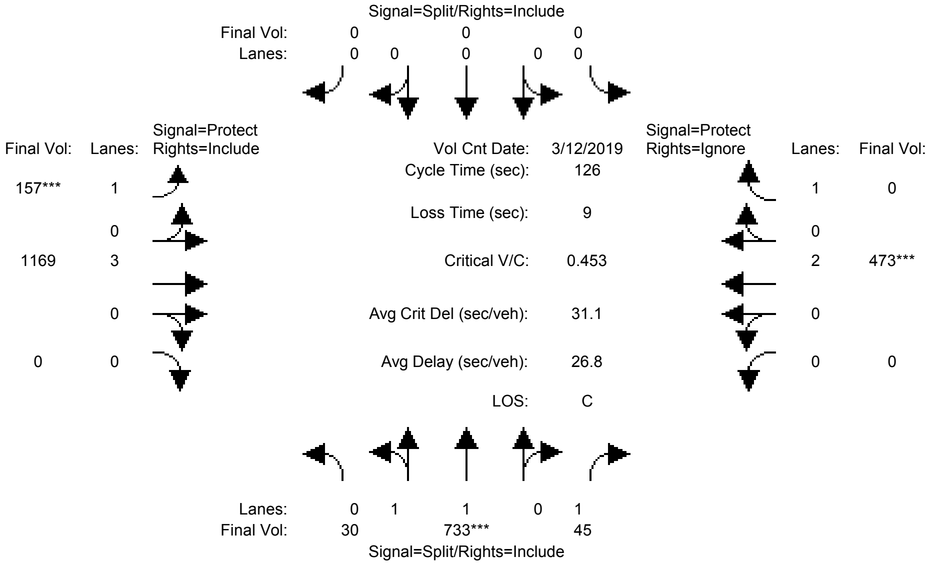


Vol Cnt Date: 3/12/2019
Cycle Time (sec): 126
Loss Time (sec): 9
Critical V/C: 0.418
Avg Crit Del (sec/veh): 31.9
Avg Delay (sec/veh): 25.6
LOS: C

```
Street Name:           11th Street                        Keyes Street
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10     10     0    0      0     7   10      0      0   10     10
Y+R:          4.0  4.0    4.0   4.0  4.0    4.0   4.0  4.0    4.0   4.0  4.0    4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Mar 2019 << 4:30 - 5:30 PM
Base Vol:      30  613     40     0    0      0   157 1169      0      0  473    741
Growth Adj:  1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   1.00
Initial Bse:   30  613     40     0    0      0   157 1169      0      0  473    741
Added Vol:      0    0      0     0    0      0     0    0      0      0    0      0
PasserByVol:    0    0      0     0    0      0     0    0      0      0    0      0
Initial Fut:   30  613     40     0    0      0   157 1169      0      0  473    741
User Adj:    1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   0.00
PHF Adj:     1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   0.00
PHF Volume:    30  613     40     0    0      0   157 1169      0      0  473      0
Reduct Vol:     0    0      0     0    0      0     0    0      0      0    0      0
Reduced Vol:   30  613     40     0    0      0   157 1169      0      0  473      0
PCE Adj:     1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   0.00
MLF Adj:     1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   0.00
FinalVolume:   30  613     40     0    0      0   157 1169      0      0  473      0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900   1900  1900 1900   1900  1900 1900   1900  1900 1900   1900
Adjustment:  0.95 0.97   0.92  0.92 1.00   0.92  0.92 1.00   0.92  0.92 1.00   0.92
Lanes:       0.10 1.90   1.00  0.00 0.00   0.00  1.00 3.00   0.00  0.00 2.00   1.00
Final Sat.:   173 3527   1750     0    0      0  1750 5700      0      0 3800   1750
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.17 0.17   0.02  0.00 0.00   0.00  0.09 0.21   0.00  0.00 0.12   0.00
Crit Moves:  ****                                ****                     ****
Green Time:  52.4 52.4   52.4   0.0  0.0    0.0  27.1 64.6    0.0    0.0 37.5    0.0
Volume/Cap:  0.42 0.42   0.05  0.00 0.00   0.00  0.42 0.40   0.00  0.00 0.42   0.00
Uniform Del: 26.0 26.0   22.0   0.0  0.0    0.0  42.7 18.8    0.0    0.0 35.5    0.0
IncremntDel:  0.2  0.2    0.0   0.0  0.0    0.0   0.8  0.1    0.0    0.0  0.3    0.0
InitQueuDel:  0.0  0.0    0.0   0.0  0.0    0.0   0.0  0.0    0.0    0.0  0.0    0.0
Delay Adj:   1.00 1.00   1.00  0.00 0.00   0.00  1.00 1.00   0.00  0.00 1.00   0.00
Delay/Veh:   26.2 26.2   22.0   0.0  0.0    0.0  43.4 18.9    0.0    0.0 35.7    0.0
User DelAdj: 1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   1.00  1.00 1.00   1.00
AdjDel/Veh:  26.2 26.2   22.0   0.0  0.0    0.0  43.4 18.9    0.0    0.0 35.7    0.0
LOS by Move:    C    C      C     A    A      A     D    B      A      A    D      A
HCM2k95thQ:    17   17      2     0    0      0    11   16      0      0   14      0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project PM

Intersection #6: 11th Street/Keyes Street [CSJ 3472]

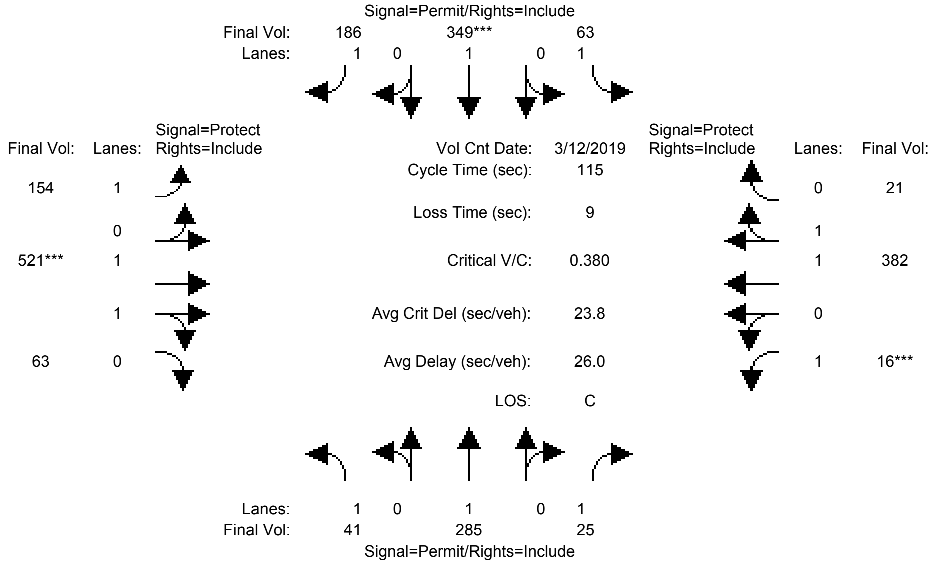


Vol Cnt Date: 3/12/2019
Cycle Time (sec): 126
Loss Time (sec): 9
Critical V/C: 0.453
Avg Crit Del (sec/veh): 31.1
Avg Delay (sec/veh): 26.8
LOS: C

```
Street Name:           11th Street                        Keyes Street
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10    10     0    0     0     7   10     0     0   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Mar 2019 << 4:30 - 5:30 PM
Base Vol:      30  613    40     0    0     0   157 1169     0     0  473   741
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   30  613    40     0    0     0   157 1169     0     0  473   741
Added Vol:      0  120     5     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   30  733    45     0    0     0   157 1169     0     0  473   741
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
PHF Volume:    30  733    45     0    0     0   157 1169     0     0  473     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   30  733    45     0    0     0   157 1169     0     0  473     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
FinalVolume:   30  733    45     0    0     0   157 1169     0     0  473     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.97  0.92  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:       0.08 1.92  1.00  0.00 0.00  0.00  1.00 3.00  0.00  0.00 2.00  1.00
Final Sat.:   145 3554  1750     0    0     0  1750 5700     0     0 3800  1750
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.21 0.21  0.03  0.00 0.00  0.00  0.09 0.21  0.00  0.00 0.12  0.00
Crit Moves:       ****                         ****                   ****
Green Time:  57.4 57.4  57.4   0.0  0.0   0.0  25.0 59.6   0.0   0.0 34.6   0.0
Volume/Cap:  0.45 0.45  0.06  0.00 0.00  0.00  0.45 0.43  0.00  0.00 0.45  0.00
Uniform Del: 23.5 23.5  19.2   0.0  0.0   0.0  44.5 22.0   0.0   0.0 37.8   0.0
IncremntDel:  0.2  0.2   0.0   0.0  0.0   0.0   0.9  0.1   0.0   0.0  0.3   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   1.00 1.00  1.00  0.00 0.00  0.00  1.00 1.00  0.00  0.00 1.00  0.00
Delay/Veh:   23.7 23.7  19.2   0.0  0.0   0.0  45.4 22.1   0.0   0.0 38.1   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  23.7 23.7  19.2   0.0  0.0   0.0  45.4 22.1   0.0   0.0 38.1   0.0
LOS by Move:    C    C     B     A    A     A     D    C     A     A    D     A
HCM2k95thQ:    19   19     2     0    0     0    11   18     0     0   15     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

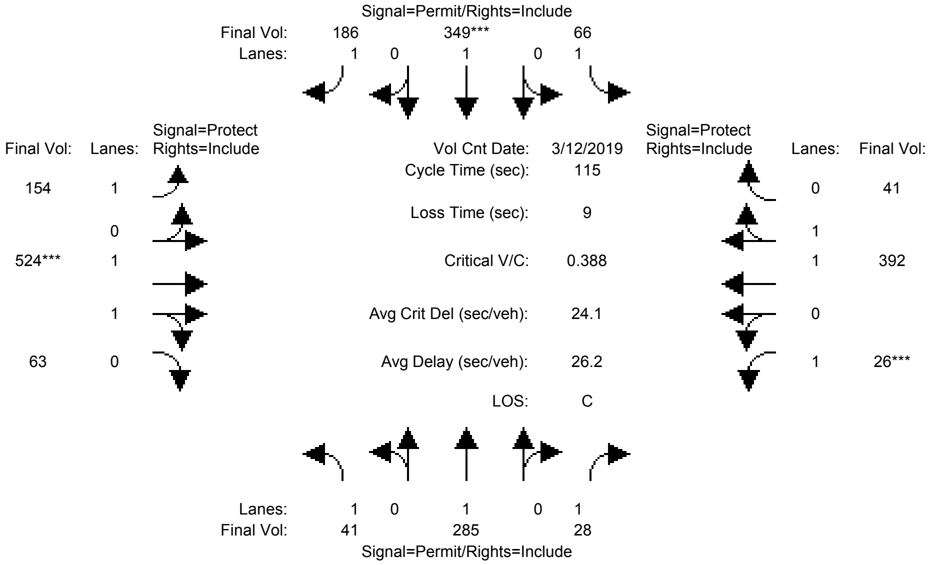
Intersection #7: 7th Street/Alma Avenue [CSJ 3238]



```
Street Name:            7th Street                      Alma Avenue
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10    10    10   10    10     7   10    10     7   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Mar 2019 << 4:30 - 5:30 PM
Base Vol:      41  285    25    63  349   186   154  521    63    16  382    21
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   41  285    25    63  349   186   154  521    63    16  382    21
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   41  285    25    63  349   186   154  521    63    16  382    21
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    41  285    25    63  349   186   154  521    63    16  382    21
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   41  285    25    63  349   186   154  521    63    16  382    21
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   41  285    25    63  349   186   154  521    63    16  382    21
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 0.98  0.95  0.92 0.98  0.95
Lanes:       1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.78  0.22  1.00 1.89  0.11
Final Sat.:  1750 1900  1750  1750 1900  1750  1750 3301   399  1750 3507   193
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.15  0.01  0.04 0.18  0.11  0.09 0.16  0.16  0.01 0.11  0.11
Crit Moves:                        ****              ****        ****
Green Time:  53.2 53.2  53.2  53.2 53.2  53.2  23.6 45.8  45.8   7.0 29.2  29.2
Volume/Cap:  0.05 0.32  0.03  0.08 0.40  0.23  0.43 0.40  0.40  0.15 0.43  0.43
Uniform Del: 17.0 19.5  16.8  17.2 20.3  18.6  39.8 24.8  24.8  51.2 35.9  35.9
IncremntDel:  0.0  0.2   0.0   0.0  0.3   0.1   0.8  0.2   0.2   0.7  0.3   0.3
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay 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
Delay/Veh:   17.0 19.7  16.8  17.2 20.6  18.7  40.7 24.9  24.9  51.8 36.3  36.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  17.0 19.7  16.8  17.2 20.6  18.7  40.7 24.9  24.9  51.8 36.3  36.3
LOS by Move:    B    B     B     B    C     B     D    C     C     D    D     D
HCM2k95thQ:     2   12     1     3   15     8    10   14    14     1   11    11
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project PM

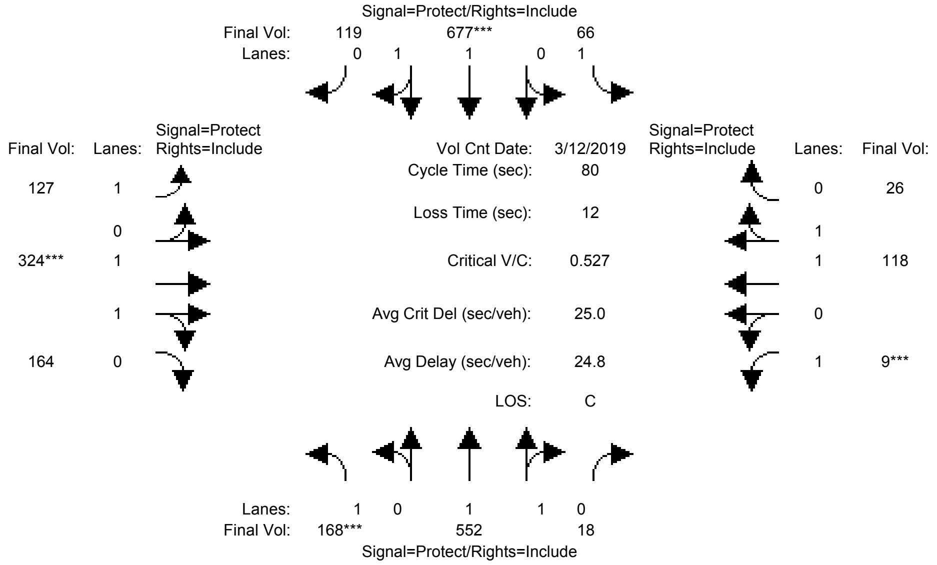
Intersection #7: 7th Street/Alma Avenue [CSJ 3238]



```
Street Name:                7th Street                            Alma Avenue
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:   10   10    10    10   10    10     7   10    10     7   10    10
Y+R:         4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Mar 2019 << 4:30 - 5:30 PM
Base Vol:     41  285    25    63  349   186   154  521    63    16  382    21
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  41  285    25    63  349   186   154  521    63    16  382    21
Added Vol:     0    0     3     3    0     0     0    3     0    10   10    20
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  41  285    28    66  349   186   154  524    63    26  392    41
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   41  285    28    66  349   186   154  524    63    26  392    41
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  41  285    28    66  349   186   154  524    63    26  392    41
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  41  285    28    66  349   186   154  524    63    26  392    41
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.92 1.00  0.92  0.92 1.00  0.92  0.92 0.98  0.95  0.92 0.98  0.95
Lanes:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.78  0.22  1.00 1.81  0.19
Final Sat.: 1750 1900  1750  1750 1900  1750  1750 3303   397  1750 3349   350
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.02 0.15  0.02  0.04 0.18  0.11  0.09 0.16  0.16  0.01 0.12  0.12
Crit Moves:                        ****             ****        ****
Green Time: 53.1 53.1  53.1  53.1 53.1  53.1  22.7 45.9  45.9   7.0 30.2  30.2
Volume/Cap: 0.05 0.32  0.03  0.08 0.40  0.23  0.45 0.40  0.40  0.24 0.45  0.45
Uniform Del:17.0 19.6  16.9  17.3 20.4  18.6  40.6 24.7  24.7  51.5 35.4  35.4
IncremntDel: 0.0  0.2   0.0   0.0  0.3   0.1   0.9  0.2   0.2   1.2  0.3   0.3
InitQueuDel: 0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay 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
Delay/Veh:  17.1 19.8  16.9  17.3 20.7  18.8  41.5 24.9  24.9  52.7 35.7  35.7
User DelAdj:1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 17.1 19.8  16.9  17.3 20.7  18.8  41.5 24.9  24.9  52.7 35.7  35.7
LOS by Move:   B    B     B     B    C     B     D    C     C     D    D     D
HCM2k95thQ:    2   12     1     3   15     8    11   14    14     2   12    12
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #8: 10th Street/Alma Avenue [CSJ 3239]

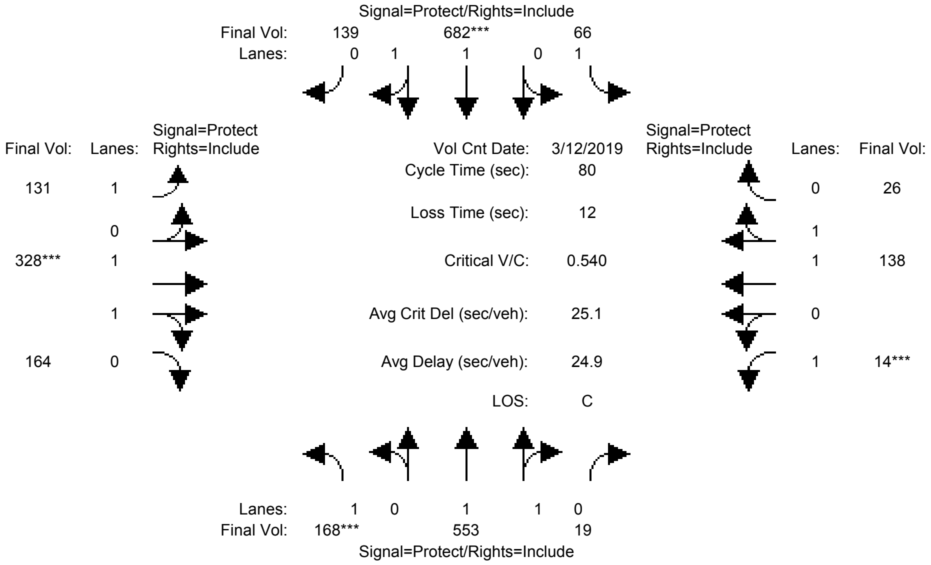


Vol Cnt Date: 3/12/2019
Cycle Time (sec): 80
Loss Time (sec): 12
Critical V/C: 0.527
Avg Crit Del (sec/veh): 25.0
Avg Delay (sec/veh): 24.8
LOS: C

```
Street Name:           10th Street                         Alma Avenue
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     7   10    10     7   10    10     7   10    10     7   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Mar 2019 << 4:30 - 5:30 PM
Base Vol:     168  552    18    66  677   119   127  324   164     9  118    26
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  168  552    18    66  677   119   127  324   164     9  118    26
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  168  552    18    66  677   119   127  324   164     9  118    26
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   168  552    18    66  677   119   127  324   164     9  118    26
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  168  552    18    66  677   119   127  324   164     9  118    26
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  168  552    18    66  677   119   127  324   164     9  118    26
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 0.97  0.95  0.92 0.98  0.95  0.92 0.99  0.95  0.92 0.98  0.95
Lanes:       1.00 1.94  0.06  1.00 1.69  0.31  1.00 1.31  0.69  1.00 1.63  0.37
Final Sat.:  1750 3583   117  1750 3146   553  1750 2456  1243  1750 3031   668
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.15  0.15  0.04 0.22  0.22  0.07 0.13  0.13  0.01 0.04  0.04
Crit Moves:  ****                  ****              ****        ****
Green Time:  13.2 27.3  27.3  15.5 29.6  29.6  10.4 18.2  18.2   7.0 14.8  14.8
Volume/Cap:  0.58 0.45  0.45  0.19 0.58  0.58  0.56 0.58  0.58  0.06 0.21  0.21
Uniform Del: 30.8 20.5  20.5  27.0 20.2  20.2  32.7 27.5  27.5  33.5 27.6  27.6
IncremntDel:  3.0  0.3   0.3   0.3  0.6   0.6   3.2  1.0   1.0   0.2  0.2   0.2
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay 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
Delay/Veh:   33.8 20.8  20.8  27.3 20.8  20.8  35.8 28.6  28.6  33.6 27.8  27.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  33.8 20.8  20.8  27.3 20.8  20.8  35.8 28.6  28.6  33.6 27.8  27.8
LOS by Move:    C    C     C     C    C     C     D    C     C     C    C     C
HCM2k95thQ:    10   11    11     3   16    16     6   11    11     1    3     3
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project PM

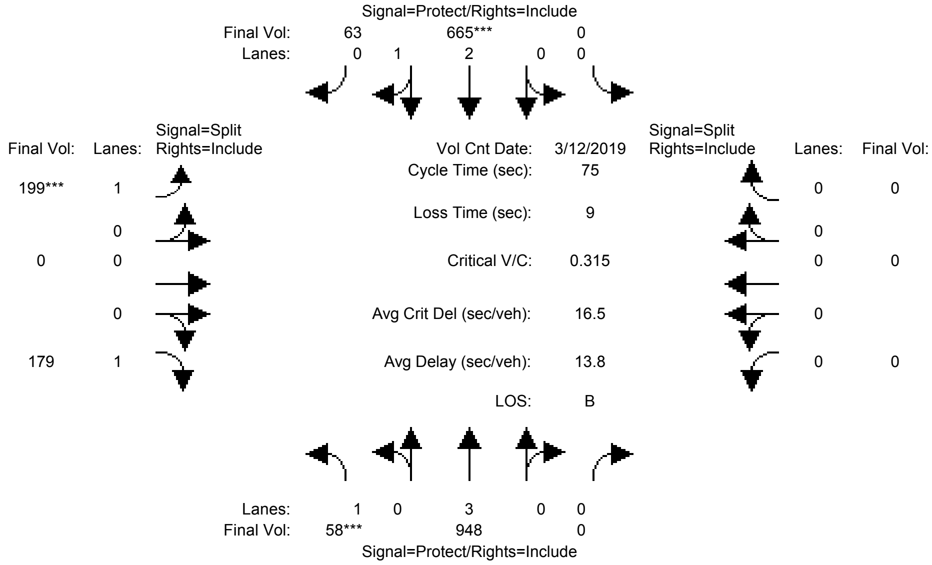
Intersection #8: 10th Street/Alma Avenue [CSJ 3239]



```
Street Name:           10th Street                       Alma Avenue
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     7   10    10     7   10    10     7   10    10     7   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Mar 2019 << 4:30 - 5:30 PM
Base Vol:     168  552    18    66  677   119   127  324   164     9  118    26
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  168  552    18    66  677   119   127  324   164     9  118    26
Added Vol:      0    1     1     0    5    20     4    4     0     5   20     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  168  553    19    66  682   139   131  328   164    14  138    26
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   168  553    19    66  682   139   131  328   164    14  138    26
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  168  553    19    66  682   139   131  328   164    14  138    26
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  168  553    19    66  682   139   131  328   164    14  138    26
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 0.97  0.95  0.92 0.98  0.95  0.92 0.99  0.95  0.92 0.98  0.95
Lanes:       1.00 1.93  0.07  1.00 1.65  0.35  1.00 1.32  0.68  1.00 1.67  0.33
Final Sat.:  1750 3577   123  1750 3073   626  1750 2466  1233  1750 3113   587
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.15  0.15  0.04 0.22  0.22  0.07 0.13  0.13  0.01 0.04  0.04
Crit Moves:  ****                  ****             ****        ****
Green Time:  13.0 27.5  27.5  15.5 30.0  30.0  10.3 18.0  18.0   7.0 14.7  14.7
Volume/Cap:  0.59 0.45  0.45  0.19 0.59  0.59  0.58 0.59  0.59  0.09 0.24  0.24
Uniform Del: 31.0 20.4  20.4  27.0 20.1  20.1  32.8 27.7  27.7  33.6 27.9  27.9
IncremntDel:  3.3  0.3   0.3   0.3  0.7   0.7   3.8  1.1   1.1   0.3  0.2   0.2
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay 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
Delay/Veh:   34.3 20.7  20.7  27.3 20.8  20.8  36.7 28.9  28.9  33.8 28.1  28.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  34.3 20.7  20.7  27.3 20.8  20.8  36.7 28.9  28.9  33.8 28.1  28.1
LOS by Move:    C    C     C     C    C     C     D    C     C     C    C     C
HCM2k95thQ:    10   11    11     3   17    17     7   11    11     1    4     4
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #9: Senter Road/Alma Avenue [CSJ 3237]



Signal=Protect/Rights=Include
Final Vol: 63 665*** 0
Lanes: 0 1 2 0 0

Final Vol: Lanes: Signal=Split Rights=Include
199*** 1
0
0 0
0
179 1

Vol Cnt Date: 3/12/2019
Cycle Time (sec): 75
Loss Time (sec): 9
Critical V/C: 0.315
Avg Crit Del (sec/veh): 16.5
Avg Delay (sec/veh): 13.8
LOS: B

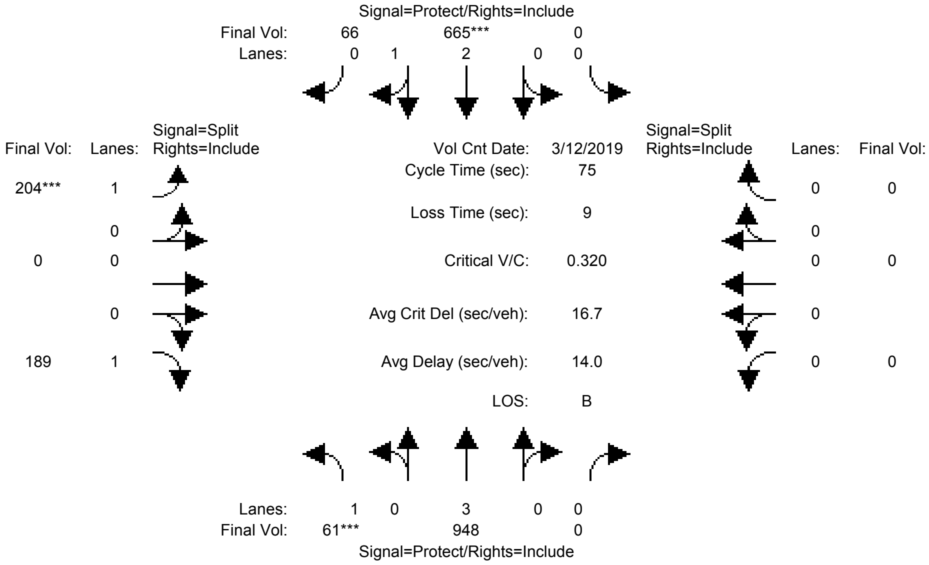
Signal=Split Rights=Include Lanes: Final Vol:
0 0
0
0 0
0
0 0

Lanes: 1 0 3 0 0
Final Vol: 58*** 948 0
Signal=Protect/Rights=Include

```
Street Name:          Senter Road                       Alma Avenue
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     7   10     0     0   10    10    10    0    10     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Mar 2019 << 4:30 - 5:30 PM
Base Vol:      58  948     0     0  665    63   199    0   179     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   58  948     0     0  665    63   199    0   179     0    0     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   58  948     0     0  665    63   199    0   179     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    58  948     0     0  665    63   199    0   179     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   58  948     0     0  665    63   199    0   179     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   58  948     0     0  665    63   199    0   179     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 0.99  0.95  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:       1.00 3.00  0.00  0.00 2.73  0.27  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:  1750 5700     0     0 5115   485  1750    0  1750     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.17  0.00  0.00 0.13  0.13  0.11 0.00  0.10  0.00 0.00  0.00
Crit Moves:  ****                  ****        ****
Green Time:   7.9 38.9   0.0   0.0 31.0  31.0  27.1  0.0  27.1   0.0  0.0   0.0
Volume/Cap:  0.31 0.32  0.00  0.00 0.31  0.31  0.31 0.00  0.28  0.00 0.00  0.00
Uniform Del: 31.0 10.4   0.0   0.0 14.8  14.8  17.3  0.0  17.0   0.0  0.0   0.0
IncremntDel:  1.0  0.1   0.0   0.0  0.1   0.1   0.3  0.0   0.2   0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   1.00 1.00  0.00  0.00 1.00  1.00  1.00 0.00  1.00  0.00 0.00  0.00
Delay/Veh:   32.0 10.5   0.0   0.0 14.9  14.9  17.5  0.0  17.3   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  32.0 10.5   0.0   0.0 14.9  14.9  17.5  0.0  17.3   0.0  0.0   0.0
LOS by Move:    C    B     A     A    B     B     B    A     B     A    A     A
HCM2k95thQ:     3    8     0     0    8     8     7    0     7     0    0     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project PM

Intersection #9: Senter Road/Alma Avenue [CSJ 3237]

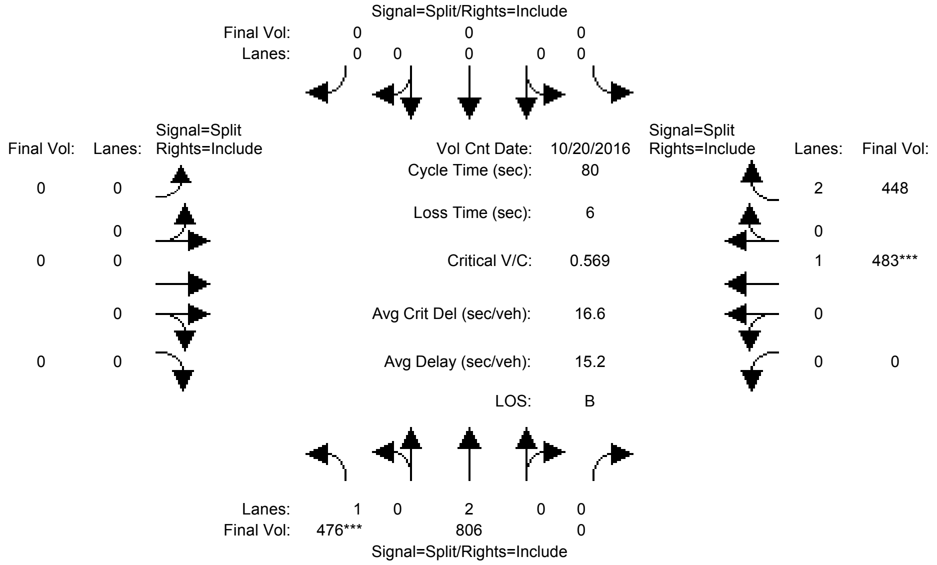


Vol Cnt Date: 3/12/2019
Cycle Time (sec): 75
Loss Time (sec): 9
Critical V/C: 0.320
Avg Crit Del (sec/veh): 16.7
Avg Delay (sec/veh): 14.0
LOS: B

```
Street Name:           Senter Road                        Alma Avenue
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     7   10     0     0   10    10    10    0    10     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Mar 2019 << 4:30 - 5:30 PM
Base Vol:      58  948     0     0  665    63   199    0   179     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   58  948     0     0  665    63   199    0   179     0    0     0
Added Vol:      3    0     0     0    0     3     5    0    10     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   61  948     0     0  665    66   204    0   189     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    61  948     0     0  665    66   204    0   189     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   61  948     0     0  665    66   204    0   189     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   61  948     0     0  665    66   204    0   189     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 0.99  0.95  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:       1.00 3.00  0.00  0.00 2.72  0.28  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:  1750 5700     0     0 5094   506  1750    0  1750     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.17  0.00  0.00 0.13  0.13  0.12 0.00  0.11  0.00 0.00  0.00
Crit Moves:  ****                  ****        ****
Green Time:   8.2 38.7   0.0   0.0 30.6  30.6  27.3  0.0  27.3   0.0  0.0   0.0
Volume/Cap:  0.32 0.32  0.00  0.00 0.32  0.32  0.32 0.00  0.30  0.00 0.00  0.00
Uniform Del: 30.9 10.5   0.0   0.0 15.1  15.1  17.2  0.0  17.0   0.0  0.0   0.0
IncremntDel:  1.0  0.1   0.0   0.0  0.1   0.1   0.3  0.0   0.3   0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   1.00 1.00  0.00  0.00 1.00  1.00  1.00 0.00  1.00  0.00 0.00  0.00
Delay/Veh:   31.8 10.6   0.0   0.0 15.2  15.2  17.5  0.0  17.3   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  31.8 10.6   0.0   0.0 15.2  15.2  17.5  0.0  17.3   0.0  0.0   0.0
LOS by Move:    C    B     A     A    B     B     B    A     B     A    A     A
HCM2k95thQ:     4    8     0     0    8     8     8    0     7     0    0     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #3034: 11th Street/I-280 Northbound Off-Ramp



```
                               Signal=Split/Rights=Include
                  Final Vol:    0          0          0
                      Lanes:    0    0     0     0    0

                Signal=Split                                    Signal=Split
Final Vol: Lanes: Rights=Include      Vol Cnt Date: 10/20/2016  Rights=Include  Lanes: Final Vol:
                                  Cycle Time (sec):     80
    0        0                                                                    2      448

             0                     Loss Time (sec):      6                        0

    0        0                        Critical V/C:  0.569                        1      483***

             0               Avg Crit Del (sec/veh):  16.6                        0

    0        0                    Avg Delay (sec/veh):  15.2                      0        0

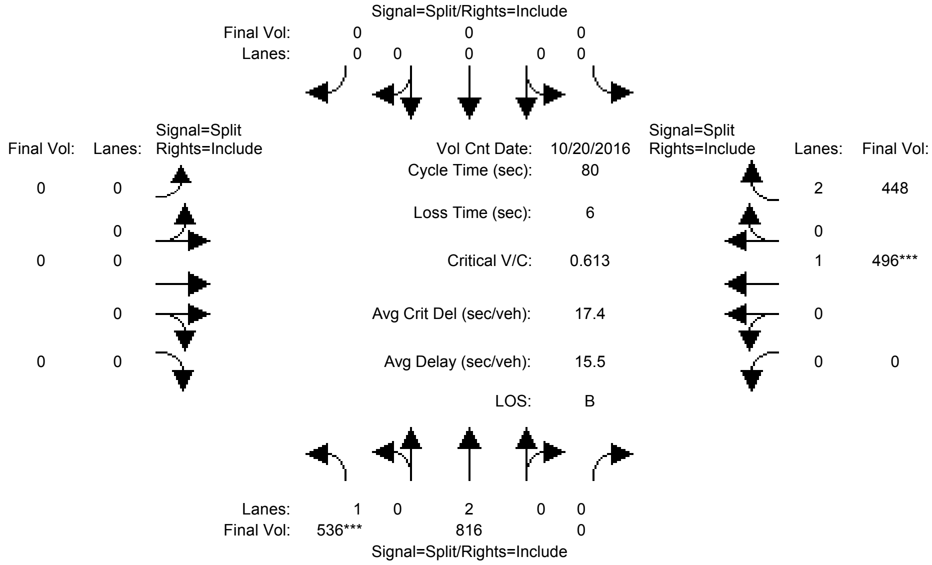
                                               LOS:      B

                      Lanes:    1    0     2     0    0
                  Final Vol: 476***       806         0
                               Signal=Split/Rights=Include
```

```
Street Name:            11th Street              I-280 Northbound Off-Ramp
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10     0     0    0     0     0    0     0     0   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Oct 2016 << 4:00 - 5:00 PM
Base Vol:     476  806     0     0    0     0     0    0     0     0  483   448
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  476  806     0     0    0     0     0    0     0     0  483   448
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  476  806     0     0    0     0     0    0     0     0  483   448
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   476  806     0     0    0     0     0    0     0     0  483   448
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  476  806     0     0    0     0     0    0     0     0  483   448
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  476  806     0     0    0     0     0    0     0     0  483   448
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.83
Lanes:       1.00 2.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 1.00  2.00
Final Sat.:  1750 3800     0     0    0     0     0    0     0     0 1900  3150
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.27 0.21  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.25  0.14
Crit Moves:  ****                                                     ****
Green Time:  38.3 38.3   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 35.7  35.7
Volume/Cap:  0.57 0.44  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.57  0.32
Uniform Del: 15.0 13.8   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 16.4  14.3
IncremntDel:  0.9  0.2   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.9   0.1
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   1.00 1.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 1.00  1.00
Delay/Veh:   15.9 14.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 17.3  14.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  15.9 14.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 17.3  14.4
LOS by Move:    B    B     A     A    A     A     A    A     A     A    B     B
HCM2k95thQ:    17   12     0     0    0     0     0    0     0     0   17     9
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project PM

Intersection #3034: 11th Street/I-280 Northbound Off-Ramp

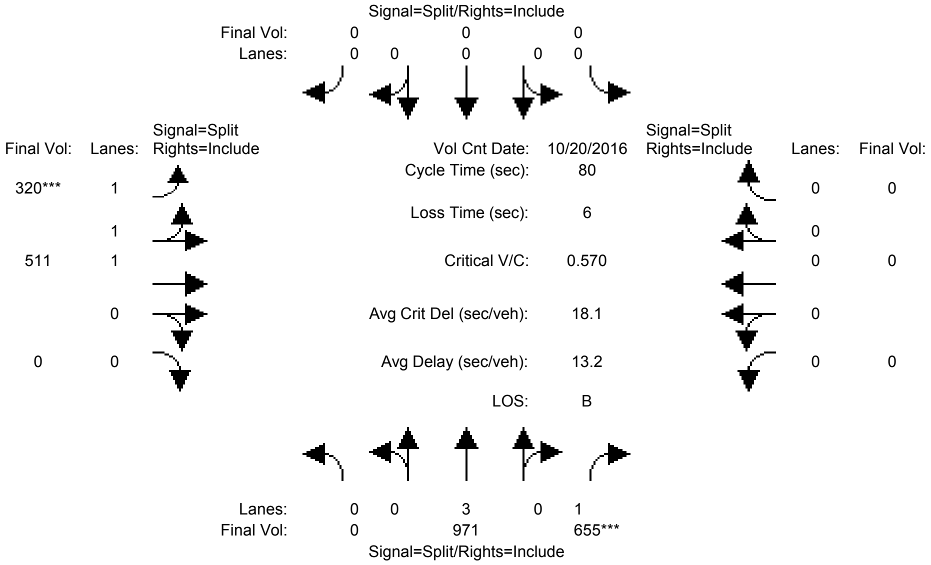


Vol Cnt Date: 10/20/2016
Cycle Time (sec): 80
Loss Time (sec): 6
Critical V/C: 0.613
Avg Crit Del (sec/veh): 17.4
Avg Delay (sec/veh): 15.5
LOS: B

```
Street Name:           11th Street               I-280 Northbound Off-Ramp
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    10   10     0     0    0     0     0    0     0     0   10    10
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Oct 2016 << 4:00 - 5:00 PM
Base Vol:     476  806     0     0    0     0     0    0     0     0  483   448
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  476  806     0     0    0     0     0    0     0     0  483   448
Added Vol:     60   10     0     0    0     0     0    0     0     0   13     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  536  816     0     0    0     0     0    0     0     0  496   448
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   536  816     0     0    0     0     0    0     0     0  496   448
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  536  816     0     0    0     0     0    0     0     0  496   448
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  536  816     0     0    0     0     0    0     0     0  496   448
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.83
Lanes:       1.00 2.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 1.00  2.00
Final Sat.:  1750 3800     0     0    0     0     0    0     0     0 1900  3150
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.31 0.21  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.26  0.14
Crit Moves:  ****                                                   ****
Green Time:  39.9 39.9   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 34.1  34.1
Volume/Cap:  0.61 0.43  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.61  0.33
Uniform Del: 14.5 12.8   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 17.9  15.4
IncremntDel:  1.3  0.2   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  1.4   0.1
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   1.00 1.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 1.00  1.00
Delay/Veh:   15.8 12.9   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 19.3  15.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  15.8 12.9   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 19.3  15.5
LOS by Move:    B    B     A     A    A     A     A    A     A     A    B     B
HCM2k95thQ:    19   12     0     0    0     0     0    0     0     0   19     9
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #3035: 11th Street/I-280 Southbound On-Ramp

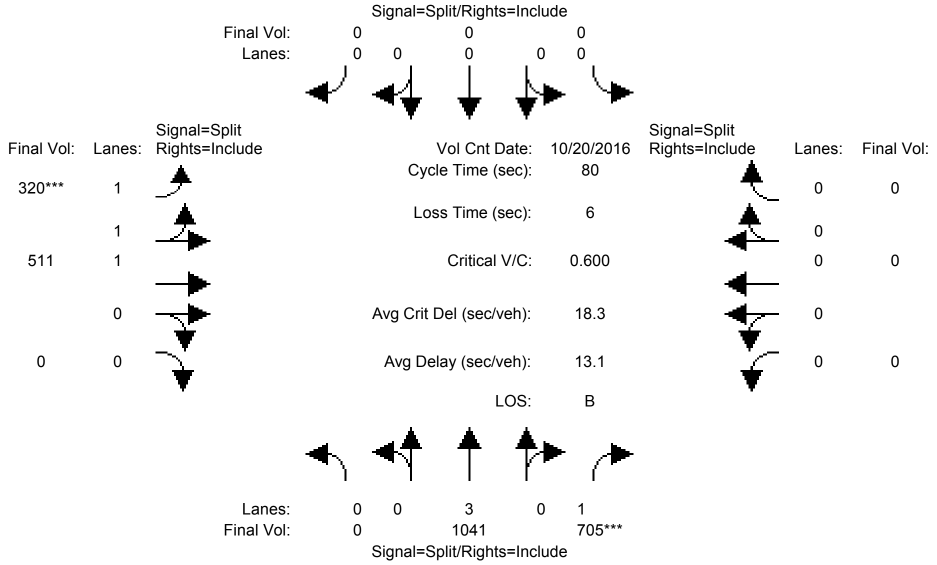


Vol Cnt Date: 10/20/2016
Cycle Time (sec): 80
Loss Time (sec): 6
Critical V/C: 0.570
Avg Crit Del (sec/veh): 18.1
Avg Delay (sec/veh): 13.2
LOS: B

```
Street Name:           11th Street                  I-280 Soutbound On-Ramp
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0   10    10      0    0     0     10   10     0      0    0     0
Y+R:          4.0  4.0   4.0    4.0  4.0   4.0    4.0  4.0   4.0    4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Oct 2016 << 4:45 - 5:45 PM
Base Vol:       0  971   655      0    0     0    320  511     0      0    0     0
Growth Adj:  1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
Initial Bse:    0  971   655      0    0     0    320  511     0      0    0     0
Added Vol:      0    0     0      0    0     0      0    0     0      0    0     0
PasserByVol:    0    0     0      0    0     0      0    0     0      0    0     0
Initial Fut:    0  971   655      0    0     0    320  511     0      0    0     0
User Adj:    1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
PHF Volume:     0  971   655      0    0     0    320  511     0      0    0     0
Reduct Vol:     0    0     0      0    0     0      0    0     0      0    0     0
Reduced Vol:    0  971   655      0    0     0    320  511     0      0    0     0
PCE Adj:     1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
FinalVolume:    0  971   655      0    0     0    320  511     0      0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900   1900 1900  1900   1900 1900  1900   1900 1900  1900
Adjustment:  0.92 1.00  0.92   0.92 1.00  0.92   0.92 0.98  0.92   0.92 1.00  0.92
Lanes:       0.00 3.00  1.00   0.00 0.00  0.00   1.19 1.81  0.00   0.00 0.00  0.00
Final Sat.:     0 5700  1750      0    0     0   2097 3349     0      0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.17  0.37   0.00 0.00  0.00   0.15 0.15  0.00   0.00 0.00  0.00
Crit Moves:             ****                     ****
Green Time:   0.0 52.6  52.6    0.0  0.0   0.0   21.4 21.4   0.0    0.0  0.0   0.0
Volume/Cap:  0.00 0.26  0.57   0.00 0.00  0.00   0.57 0.57  0.00   0.00 0.00  0.00
Uniform Del:  0.0  5.7   7.5    0.0  0.0   0.0   25.3 25.3   0.0    0.0  0.0   0.0
IncremntDel:  0.0  0.0   0.7    0.0  0.0   0.0    0.5  0.5   0.0    0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0    0.0  0.0   0.0    0.0  0.0   0.0    0.0  0.0   0.0
Delay Adj:   0.00 1.00  1.00   0.00 0.00  0.00   1.00 1.00  0.00   0.00 0.00  0.00
Delay/Veh:    0.0  5.7   8.2    0.0  0.0   0.0   25.8 25.8   0.0    0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
AdjDel/Veh:   0.0  5.7   8.2    0.0  0.0   0.0   25.8 25.8   0.0    0.0  0.0   0.0
LOS by Move:    A    A     A      A    A     A      C    C     A      A    A     A
HCM2k95thQ:     0    6    18      0    0     0     13   13     0      0    0     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project PM

Intersection #3035: 11th Street/I-280 Southbound On-Ramp

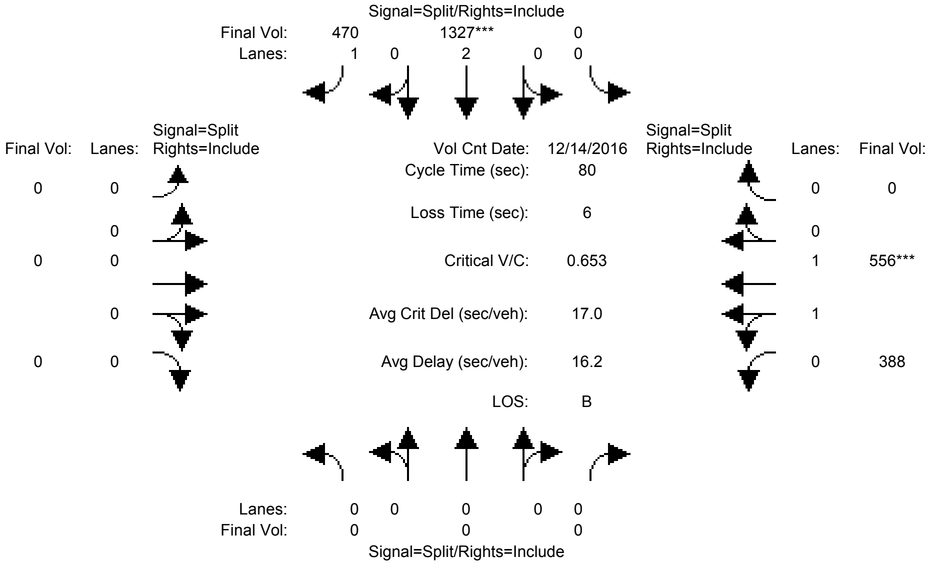


Vol Cnt Date: 10/20/2016
Cycle Time (sec): 80
Loss Time (sec): 6
Critical V/C: 0.600
Avg Crit Del (sec/veh): 18.3
Avg Delay (sec/veh): 13.1
LOS: B

```
Street Name:           11th Street              I-280 Soutbound On-Ramp
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    0   10    10     0    0     0    10   10     0     0    0     0
Y+R:         4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Oct 2016 << 4:45 - 5:45 PM
Base Vol:      0  971   655     0    0     0   320  511     0     0    0     0
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  971   655     0    0     0   320  511     0     0    0     0
Added Vol:     0   70    50     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0 1041   705     0    0     0   320  511     0     0    0     0
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0 1041   705     0    0     0   320  511     0     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0 1041   705     0    0     0   320  511     0     0    0     0
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0 1041   705     0    0     0   320  511     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.92 1.00  0.92  0.92 1.00  0.92  0.92 0.98  0.92  0.92 1.00  0.92
Lanes:      0.00 3.00  1.00  0.00 0.00  0.00  1.19 1.81  0.00  0.00 0.00  0.00
Final Sat.:    0 5700  1750     0    0     0  2097 3349     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.18  0.40  0.00 0.00  0.00  0.15 0.15  0.00  0.00 0.00  0.00
Crit Moves:            ****                   ****
Green Time:  0.0 53.7  53.7   0.0  0.0   0.0  20.3 20.3   0.0   0.0  0.0   0.0
Volume/Cap: 0.00 0.27  0.60  0.00 0.00  0.00  0.60 0.60  0.00  0.00 0.00  0.00
Uniform Del: 0.0  5.3   7.3   0.0  0.0   0.0  26.3 26.3   0.0   0.0  0.0   0.0
IncremntDel: 0.0  0.0   0.9   0.0  0.0   0.0   0.7  0.7   0.0   0.0  0.0   0.0
InitQueuDel: 0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:  0.00 1.00  1.00  0.00 0.00  0.00  1.00 1.00  0.00  0.00 0.00  0.00
Delay/Veh:   0.0  5.3   8.1   0.0  0.0   0.0  27.0 27.0   0.0   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  0.0  5.3   8.1   0.0  0.0   0.0  27.0 27.0   0.0   0.0  0.0   0.0
LOS by Move:   A    A     A     A    A     A     C    C     A     A    A     A
HCM2k95thQ:    0    7    19     0    0     0    14   14     0     0    0     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #3040: 10th Street/I-280 Northbound On-Ramp



Signal=Split/Rights=Include
Final Vol: 470 1327*** 0
Lanes: 1 0 2 0 0

Final Vol: Lanes: Signal=Split Rights=Include
0 0
0
0 0
0
0 0

Vol Cnt Date: 12/14/2016
Cycle Time (sec): 80
Loss Time (sec): 6
Critical V/C: 0.653
Avg Crit Del (sec/veh): 17.0
Avg Delay (sec/veh): 16.2
LOS: B

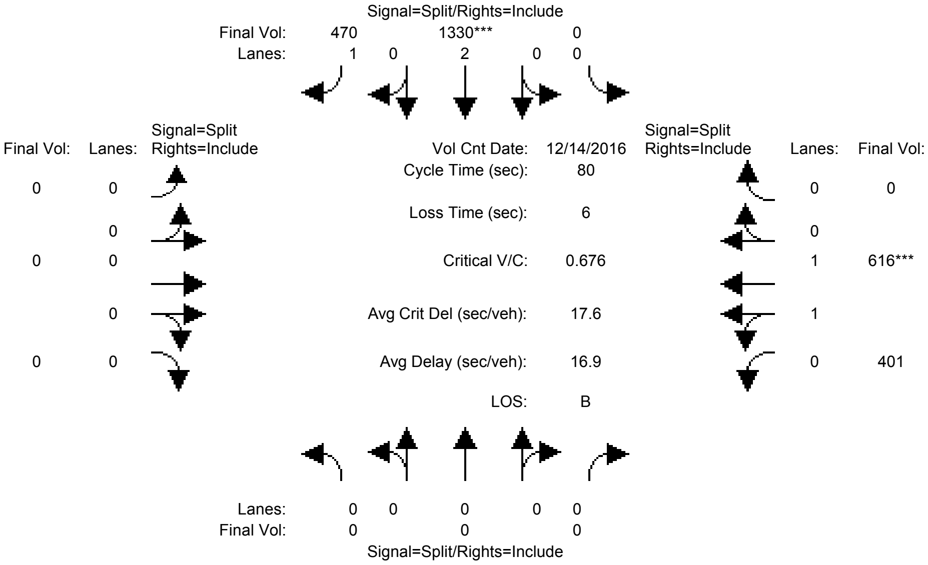
Signal=Split Rights=Include Lanes: Final Vol:
0 0
0
1 556***
1
0 388

Lanes: 0 0 0 0 0
Final Vol: 0 0 0
Signal=Split/Rights=Include

```
Street Name:           10th Street              I-280 Northbound On-Ramp
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0     0   10    10     0    0     0    10   10     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Dec 2016 << 4:45 - 5:45 PM
Base Vol:       0    0     0     0 1327   470     0    0     0   388  556     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     0 1327   470     0    0     0   388  556     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0     0 1327   470     0    0     0   388  556     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0     0 1327   470     0    0     0   388  556     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0     0 1327   470     0    0     0   388  556     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0     0 1327   470     0    0     0   388  556     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.92  0.95 0.99  0.92
Lanes:       0.00 0.00  0.00  0.00 2.00  1.00  0.00 0.00  0.00  0.84 1.16  0.00
Final Sat.:     0    0     0     0 3800  1750     0    0     0  1520 2178     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.00 0.35  0.27  0.00 0.00  0.00  0.26 0.26  0.00
Crit Moves:                        ****                              ****
Green Time:   0.0  0.0   0.0   0.0 42.8  42.8   0.0  0.0   0.0  31.2 31.2   0.0
Volume/Cap:  0.00 0.00  0.00  0.00 0.65  0.50  0.00 0.00  0.00  0.65 0.65  0.00
Uniform Del:  0.0  0.0   0.0   0.0 13.3  11.9   0.0  0.0   0.0  19.9 19.9   0.0
IncremntDel:  0.0  0.0   0.0   0.0  0.8   0.4   0.0  0.0   0.0   1.1  1.1   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00  0.00 1.00  1.00  0.00 0.00  0.00  1.00 1.00  0.00
Delay/Veh:    0.0  0.0   0.0   0.0 14.1  12.3   0.0  0.0   0.0  21.0 21.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0   0.0 14.1  12.3   0.0  0.0   0.0  21.0 21.0   0.0
LOS by Move:    A    A     A     A    B     B     A    A     A     C    C     A
HCM2k95thQ:     0    0     0     0   22    15     0    0     0    19   19     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project PM

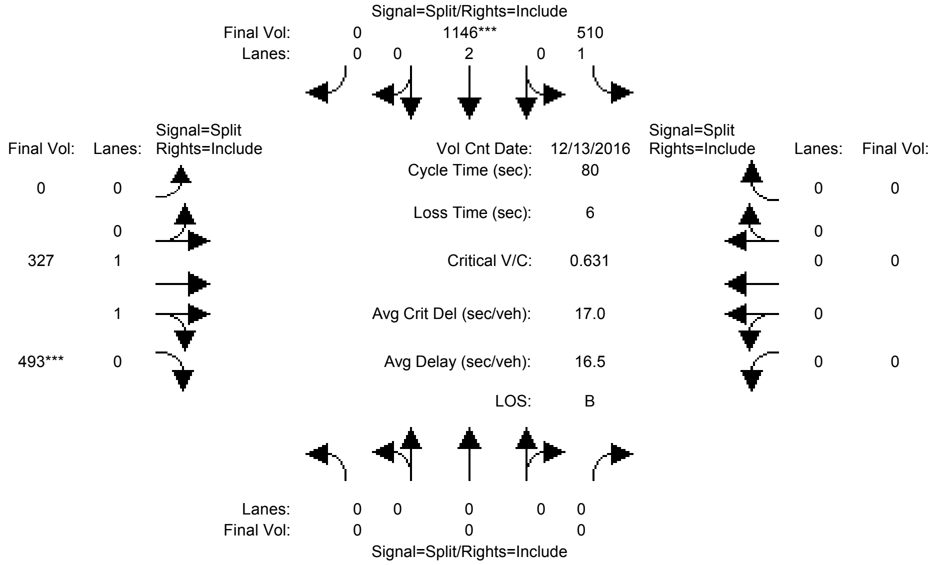
Intersection #3040: 10th Street/I-280 Northbound On-Ramp



```
Street Name:           10th Street              I-280 Northbound On-Ramp
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0     0   10    10     0    0     0    10   10     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Dec 2016 << 4:45 - 5:45 PM
Base Vol:       0    0     0     0 1327   470     0    0     0   388  556     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     0 1327   470     0    0     0   388  556     0
Added Vol:      0    0     0     0    3     0     0    0     0    13   60     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0     0 1330   470     0    0     0   401  616     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0     0 1330   470     0    0     0   401  616     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0     0 1330   470     0    0     0   401  616     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0     0 1330   470     0    0     0   401  616     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.92  0.95 0.99  0.92
Lanes:       0.00 0.00  0.00  0.00 2.00  1.00  0.00 0.00  0.00  0.81 1.19  0.00
Final Sat.:     0    0     0     0 3800  1750     0    0     0  1458 2240     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.00 0.35  0.27  0.00 0.00  0.00  0.27 0.27  0.00
Crit Moves:                        ****                              ****
Green Time:   0.0  0.0   0.0   0.0 41.4  41.4   0.0  0.0   0.0  32.6 32.6   0.0
Volume/Cap:  0.00 0.00  0.00  0.00 0.68  0.52  0.00 0.00  0.00  0.68 0.68  0.00
Uniform Del:  0.0  0.0   0.0   0.0 14.3  12.7   0.0  0.0   0.0  19.4 19.4   0.0
IncremntDel:  0.0  0.0   0.0   0.0  0.9   0.5   0.0  0.0   0.0   1.2  1.2   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00  0.00 1.00  1.00  0.00 0.00  0.00  1.00 1.00  0.00
Delay/Veh:    0.0  0.0   0.0   0.0 15.2  13.2   0.0  0.0   0.0  20.6 20.6   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0   0.0 15.2  13.2   0.0  0.0   0.0  20.6 20.6   0.0
LOS by Move:    A    A     A     A    B     B     A    A     A     C    C     A
HCM2k95thQ:     0    0     0     0   23    16     0    0     0    21   21     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #3041: 10th Street/I-280 Southbound Off-Ramp

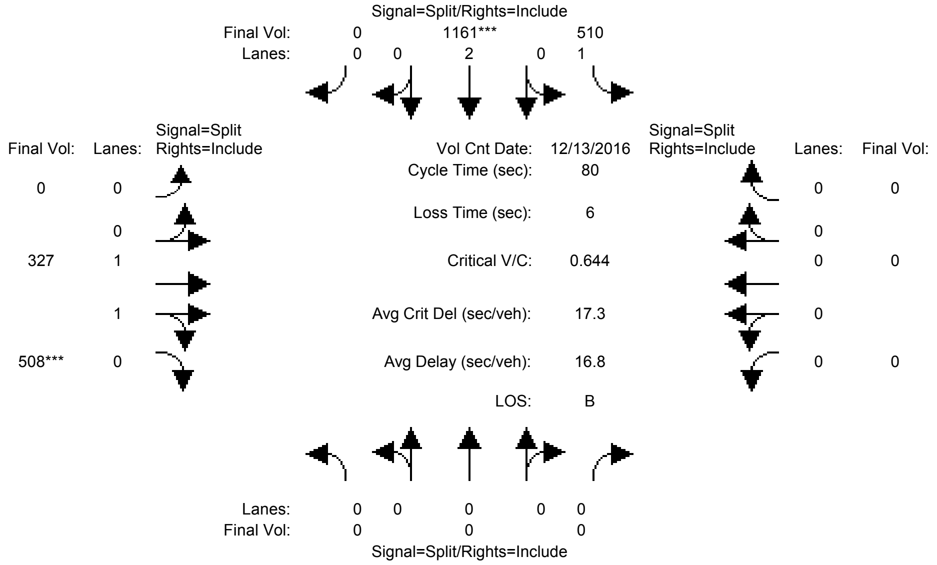


Vol Cnt Date: 12/13/2016
Cycle Time (sec): 80
Loss Time (sec): 6
Critical V/C: 0.631
Avg Crit Del (sec/veh): 17.0
Avg Delay (sec/veh): 16.5
LOS: B

```
Street Name:           10th Street             I-280 Southbound Off-Ramp
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0   10   10     0    0   10    10    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Dec 2016 << 4:15 - 5:15 PM
Base Vol:       0    0     0  510 1146     0    0  327   493    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0  510 1146     0    0  327   493    0    0     0
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0  510 1146     0    0  327   493    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0  510 1146     0    0  327   493    0    0     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  510 1146     0    0  327   493    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0  510 1146     0    0  327   493    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.92 1.00  0.92 0.92 1.00  0.92 0.92 1.00  0.92 0.92 1.00  0.92
Lanes:       0.00 0.00  0.00 1.00 2.00  0.00 0.00 1.00  1.00 0.00 0.00  0.00
Final Sat.:     0    0     0 1750 3800     0    0 1900  1750    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.29 0.30  0.00 0.00 0.17  0.28 0.00 0.00  0.00
Crit Moves:                       ****                  ****
Green Time:   0.0  0.0   0.0 38.3 38.3   0.0  0.0 35.7  35.7  0.0  0.0   0.0
Volume/Cap:  0.00 0.00  0.00 0.61 0.63  0.00 0.00 0.39  0.63 0.00 0.00  0.00
Uniform Del:  0.0  0.0   0.0 15.4 15.6   0.0  0.0 14.8  17.0  0.0  0.0   0.0
IncremntDel:  0.0  0.0   0.0  1.3  0.7   0.0  0.0  0.1   1.0  0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00 1.00 1.00  0.00 0.00 1.00  1.00 0.00 0.00  0.00
Delay/Veh:    0.0  0.0   0.0 16.7 16.3   0.0  0.0 14.9  18.1  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 16.7 16.3   0.0  0.0 14.9  18.1  0.0  0.0   0.0
LOS by Move:    A    A     A    B    B     A    A    B     B    A    A     A
HCM2k95thQ:     0    0     0   18   19     0    0   11    20    0    0     0
Note: Queue reported is the number of cars per lane.
```

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Exist+Project PM

Intersection #3041: 10th Street/I-280 Southbound Off-Ramp



Signal=Split/Rights=Include
Final Vol: 0 1161*** 510
Lanes: 0 0 2 0 1

Signal=Split
Rights=Include
Final Vol: Lanes:
0 0
0
327 1
1
508*** 0

Vol Cnt Date: 12/13/2016
Cycle Time (sec): 80
Loss Time (sec): 6
Critical V/C: 0.644
Avg Crit Del (sec/veh): 17.3
Avg Delay (sec/veh): 16.8
LOS: B

Signal=Split
Rights=Include
Lanes: Final Vol:
0 0
0
0 0
0
0 0

Lanes: 0 0 0 0 0
Final Vol: 0 0 0
Signal=Split/Rights=Include

```
Street Name:           10th Street                I-280 Southbound Off-Ramp
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0    10   10     0     0   10    10     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Dec 2016 << 4:15 - 5:15 PM
Base Vol:       0    0     0   510 1146     0     0  327   493     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   510 1146     0     0  327   493     0    0     0
Added Vol:      0    0     0     0   15     0     0    0    15     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0   510 1161     0     0  327   508     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   510 1161     0     0  327   508     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0   510 1161     0     0  327   508     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0   510 1161     0     0  327   508     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  0.92
Lanes:       0.00 0.00  0.00  1.00 2.00  0.00  0.00 1.00  1.00  0.00 0.00  0.00
Final Sat.:     0    0     0  1750 3800     0     0 1900  1750     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.29 0.31  0.00  0.00 0.17  0.29  0.00 0.00  0.00
Crit Moves:                        ****                   ****
Green Time:   0.0  0.0   0.0  37.9 37.9   0.0   0.0 36.1  36.1   0.0  0.0   0.0
Volume/Cap:  0.00 0.00  0.00  0.61 0.64  0.00  0.00 0.38  0.64  0.00 0.00  0.00
Uniform Del:  0.0  0.0   0.0  15.6 15.9   0.0   0.0 14.6  17.0   0.0  0.0   0.0
IncremntDel:  0.0  0.0   0.0   1.4  0.8   0.0   0.0  0.1   1.1   0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 0.00  0.00  1.00 1.00  0.00  0.00 1.00  1.00  0.00 0.00  0.00
Delay/Veh:    0.0  0.0   0.0  17.0 16.7   0.0   0.0 14.7  18.1   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  17.0 16.7   0.0   0.0 14.7  18.1   0.0  0.0   0.0
LOS by Move:    A    A     A     B    B     A     A    B     B     A    A     A
HCM2k95thQ:     0    0     0    18   19     0     0   11    20     0    0     0
Note: Queue reported is the number of cars per lane.
```

Appendix F

Energy Calculation Files

SJSU Parking Structure and Sports Field Project

Last Updated: January 16, 2019

Assumed Brake-Specific Fuel Consumption for Diesel Fuel (US gallons of diesel fuel per horsepower)	0.0653

CONSTRUCTION EQUIPMENT

Construction Equipment	**#**	**Operation per Day**	**Horsepowe**	**Construction Phase**	**Fuel Used (gallons)**
Rubber Tired Dozer	2	8	247	Demo Phase	5,161.312
Concrete/Industrial Saws	1	8	81	Demo Phase	846.288
Excavators	3	8	158	Demo Phase	4,952.352
Graders	1	8	187	Grading Phase	1,953.776
Excavators	1	8	158	Grading Phase	1,650.784
Rubber Tired Dozer	1	8	247	Grading Phase	2,580.656
Tractors/Loaders/Backhoes	3	8	97	Grading Phase	3,040.368
Cranes	1	7	231	Building Phase	24,285.723
Forklifts	3	8	89	Building Phase	32,080.584
Generator Sets	1	8	84	Building Phase	10,092.768
Tractors/Loaders/Backhoes	3	7	97	Building Phase	30,593.703
Welders	1	8	46	Building Phase	5,526.992
Air Compressors	1	6	78	Architectural Phase	4,584.060
Pavers	2	8	130	Paving Phase	2,716.480
Paving Equipment	2	8	132	Paving Phase	2,758.272
Rollers	2	8	80	Paving Phase	1,671.680
				Total Fuel Used	**134,495.80**

Construction Phase	**Days of Op.**
Demo Phase	20
Grading Phase	20
Building Phase	230
Paving Phase	20
Architectural Coating Phase	150

Source: Barrington Diesel Club (BDC). 2017. *Diesel engine power to Fuel Consumption table - Naturally aspirated Engines* . October 2017. Available at: https://barringtondieselclub.co.za/technical/fuel/diesel-fuel-consumption-nat-aspirated.pdf.

Note: Table based on fuel consumed at 240 grams/kWh

WORKER TRIPS

Constuction Phase	MPG	Trips	Trip Length (miles)		Fuel Used (gallons)
Demo Phase	17.9	15	10.8		9.050
Grading Phase	17.9	15	10.8		9.050
Building Phase	17.9	307	10.8		185.229
Paving Phase	17.9	61	10.8		36.804
Architectural Coating Phase	17.9	15	10.8		9.050
				Total Fuel Used	**249.18**

HAULING AND VENDOR TRIPS

Trip Class	MPG	Trips	Trip Length (miles)		Fuel Used (gallons)
Vendor Trips	6.4	120	20		375.000
Hauling Trips	6.4	1	7.3		1.141
				Total Fuel Used	**376.14**

GRAND TOTALS

Diesel

134,871.94 Gallons

Gasoline

249.18 Gallons

Appendix G

Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Program

CEQA requires that a reporting or monitoring program be adopted for the conditions of project approval that are necessary to mitigate or avoid significant effects on the environment (Public Resources Code 21081.6). The mitigation monitoring and reporting program is designed to ensure compliance with adopted mitigation measures during project implementation. For each mitigation measure recommended in the Initial Study-Mitigated Negative Declaration (IS-MND), specifications are made herein that identify the action required and the monitoring that must occur. In addition, a responsible agency is identified for verifying compliance with individual conditions of approval contained in the Mitigation Monitoring and Reporting Program (MMRP).

In order to implement this MMRP, the Board of Trustees of the California State University will designate a campus representative (or designee). The campus representative will be responsible for ensuring that the mitigation measures incorporated into the project are complied with during project implementation. The campus representative will also distribute copies of the MMRP to the responsible agency identified in the MMRP, which has partial or full responsibility for implementing the mitigation measure. Failure of a responsible agency to implement a mitigation measure will not in any way prevent the lead agency from implementing the proposed project.

The following table will be used as the campus representative's checklist to determine compliance with each required mitigation measure.

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Agency	Compliance Verification		
					Initial	Date	Comments
Biological Resources							
BIO-1: Native/Breeding Native Bird Protection							
To avoid impacts to nesting birds, including birds protected under the Migratory Bird Treaty Act, all tree removal shall be limited to the period between September 1 and January 31 (i.e., outside the nesting season) if feasible. If tree removal cannot be conducted during this period, a pre-construction survey for active nests within the project site shall be conducted by a qualified biologist at the site no more than two weeks prior to removal of the trees. If an active bird nest is located, the nest site shall be fenced at a distance commensurate with the particular species and in consultation with the California Department of Fish and Wildlife (CDFW) until juveniles have fledged and when there is no evidence of a second attempt at nesting. Limits of construction to avoid a nest should be established in the field with flagging and stakes or construction fencing. Construction personnel shall be instructed on the sensitivity of the area. The project proponent shall record the results of the recommended protective measures described above to document compliance with applicable state and federal laws pertaining to protection of native birds.	Limit all initial ground disturbing activities, including tree removal, to the time period between September 1 and January 31. A qualified biologist shall prepare a pre-construction survey if initial site disturbance cannot be conducted during the time specified above. The project proponent shall record the results of protective measures to document compliance with applicable state and federal laws and CDFW requirements pertaining to protection of native birds.	Within 30 days prior to construction	Once	San Jose State University Facilities Development & Operations			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Agency	Compliance Verification		
					Initial	Date	Comments
Cultural Resources							
CUL-1: Worker's Environmental Awareness Program							
A qualified archaeologist shall be retained who meets the Secretary of the Interior's Professional Qualifications Standards for archaeology to conduct a WEAP training for archaeological sensitivity for all construction personnel prior to the commencement of any ground disturbing activities. Archaeological sensitivity training shall include a description of the types of cultural material that may be encountered, cultural sensitivity issues, regulatory issues, and the proper protocol for treatment of the materials in the event of a find. If construction stops for more than one month, a WEAP training must be conducted before construction commences again.	A qualified archaeologist shall conduct a WEAP training for archaeological sensitivity for all construction personnel prior to the commencement of any ground disturbing activities or after a month halt in construction.	Within 15 days prior to construction	Once or periodically if construction halts.	San Jose State University Facilities Development & Operations			
CUL-2: Archaeological and Native Monitoring							
If archaeological resources are encountered during ground-disturbing activities, work in the immediate area must halt and the find evaluated for significance under CEQA. Monitoring may be reduced or halted at the discretion of the monitors as warranted by conditions such as encountering bedrock, sediments being excavated are fill, soils occur within formations unlikely to yield cultural resources (e.g., soils formations predating human occupation of the region), or negative findings during the first 60 percent of rough grading. If monitoring is reduced to spot-checking, spot-checking shall occur when ground-disturbance moves to a new location within the project site and when ground disturbance will extend to depths not previously reached (unless those depths are within bedrock). Upon completion of monitoring, a monitoring report and accompanying monitoring logs shall be submitted to SJSU and NWIC.	Initial project-related ground-disturbing activities shall be observed by a qualified archaeological monitor under the direction of an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology (NPS 1983). Initial ground disturbance is defined as activities within previously undisturbed native soils. A Native American monitor shall be retained for the duration of project ground disturbance	Ongoing during ground disturbance construction activities, such as grading	As needed during ground disturbance activity	San Jose State University Facilities Development & Operations			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Agency	Compliance Verification		
					Initial	Date	Comments
CUL-3: Unanticipated Discovery of Cultural Resources							
If cultural resources are encountered during ground disturbing activities, work within 50 feet of the find shall be halted, SJSU shall be informed, and an archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for archaeology (NPS 1983) shall be contacted immediately to evaluate the find. If necessary, the evaluation may require preparation of a treatment plan and testing for the California Register of Historical Resources (CRHR) eligibility. If the discovery proves to be significant under CEQA and cannot be avoided by the project, additional work, such as data recovery excavation, shall be required to mitigate any significant impacts to historical and/or archaeological resources. All documentation, including any Department of Parks and Recreation Series 523 form(s), excavation report(s), and accompanying field forms, shall be submitted to SJSU and to NWIC, as appropriate.	The lead agency will suspend all work if cultural resources or any artifact or an unusual amount of bone, or shell is encountered during construction until the find can be evaluated by a qualified archaeologist. If the resources are found to be significant, they will be avoided or mitigated.	Once, if warranted	Immediately upon triggering activity construction	San Jose State University Facilities Development & Operations			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Agency	Compliance Verification		
					Initial	Date	Comments
Hazards and Hazardous Materials							
HAZ-1: Dewatering Plan							
If dewatering is necessary during construction, then a dewatering plan shall be prepared by the applicant. The dewatering plan shall identify the groundwater flow rate, groundwater capture zone, means of discharge of groundwater, and procedures for monitoring discharges. Proper permits for the discharge of the water shall be obtained and approved by the appropriate regulatory oversight agency and included in the dewatering plan. If contaminated groundwater is encountered during dewatering, then contaminated groundwater and its disposal shall be managed in accordance with applicable regulatory requirements and the Soil and Groundwater Management Plan (Appendix C). The dewatering plan shall describe the operation and maintenance tasks to be performed and identify who will be responsible for the operation, maintenance, and permit compliance obligations. Backup systems, if required, shall be included on the plans. A sufficient amount of area near the dewatering system shall be allocated in case filtration of contaminated groundwater is required after groundwater dewatering commences.	If dewatering is necessary during construction, then a dewatering plan shall be prepared by the applicant. If contaminated groundwater is encountered during dewatering, then contaminated groundwater and its disposal shall be managed in accordance with applicable regulatory requirements and the Soil and Groundwater Management Plan (Appendix C). A sufficient amount of area near the dewatering system shall be allocated in case filtration of contaminated groundwater is required after groundwater dewatering commences.	Prior to construction	Once	San Jose State University Facilities Development & Operations			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Agency	Compliance Verification		
					Initial	Date	Comments
Transportation							
TRA-1: Shuttle Staging Area							
The project shall incorporate a staging area sized for 40-foot shuttle buses to transport students and staff between the parking structure and the main campus, and Alma Avenue shall be restriped to provide the necessary space for buses to stop along the curb. The staging area shall be developed to current transit facility design standards and shall optimally accommodate pedestrians and shuttle users through the use of bulb-outs, weather protective shelter structure, and through-vehicle traffic-calming features in the right-of-way.	Incorporate a staging area for shuttle bus transportation that is developed to current transit facility design standards.	Prior to construction and final plan check approval	Once	San Jose State University Facilities Development & Operations			
TRA-2: Management of Ingress/Egress							
In order to move traffic efficiently in and out of the proposed garage, at least three lanes for entering and three lanes for exiting shall be provided. Police officers shall be used to direct traffic before and after games taking place in Spartan Stadium to control traffic on 10th Street so that vehicles could enter and exit the garage in a timely manner.	Incorporate three lanes for ingress/egress to proposed garage. Police officers shall be used to direct traffic before and after events that are anticipated to draw 20,000 or more spectators.	Incorporate into construction plans and specifications. Event management operations during Spartans football games.	During operation	San Jose State University Facilities Development & Operations San Jose State University Athletics Department			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Agency	Compliance Verification		
					Initial	Date	Comments
Tribal Cultural Resources							
TRC-1: Unanticipated Discovery of Tribal Cultural Resources							
In the event that cultural resources of Native American origin that may be considered tribal cultural resources are identified during construction, all earth disturbing work within 50 feet of the find must be temporarily suspended or redirected until an archaeologist has evaluated the nature and significance of the find and in consultation with the on-site Native American monitor. If the archaeologist and Native American monitor determine that the resource is a tribal cultural resource and thus significant under CEQA, a mitigation plan shall be prepared and implemented in accordance with state guidelines and in consultation with Native American groups. The plan would include avoidance of the resource or, if avoidance of the resource is infeasible, the plan would outline the appropriate treatment of the resource in coordination with the appropriate Native American tribal representative(s).	An archaeologist will evaluate the nature of any potential findings of cultural resources of Native American origin during construction in consultation with the on-site Native American monitor.	Ongoing during ground-disturbing construction activities	As warranted dependent on discoveries during construction period	San Jose State University Facilities Development & Operations			