500 KIRKHAM STREET PROJECT

CEQA ANALYSIS AND ADDENDUM TO WEST OAKLAND SPECIFIC PLAN EIR

Pursuant to Public Resources Code Sections 21083.3, 21094.5, and 21166
And State CEQA Guidelines Sections 15164, 15183, 15183.3

Date:	March 30, 2016
Project Address:	500 Kirkham Street
Lead Agency Name & Address:	City of Oakland 250 Frank H. Ogawa Plaza, Suite 2114 Oakland, CA 94612
Case Numbers:	PLN15211
Zoning:	S-15 W- Transit Oriented Development
General Plan:	Community Commercial
APNs:	004-0049-00-00 and 004-0049-003-00
Lot Size:	2.85 acres
Plan Area:	West Oakland Specific Plan
Applicant:	**West Oakland Development Group LLC**
Applicant Contact:	**Jabari Herbert** / Tel. # (510) 385-9714
Project Consultant:	**Thomas (Amar) Casey** / Tel. # (510) 689-8094
City Staff Contact:	**Mike Rivera,** City Planner / (510) 238-6417 mrivera@oaklandnet.com

TABLE OF CONTENTS

TABLES

APPENDICES

SUPPLEMENTAL ATTACHMENTS

EXECUTIVE SUMMARY

This document is the City of San Oakland's Addendum (***"Addendum"***) to the West Oakland Specific Plan (***"WOSP"***) Environmental Impact Report (***"EIR"***) with respect to the proposed 500 Kirkham Street Project (the ***"Project"*** or ***"Proposed Project"***). The WOSP EIR was certified by the City of Oakland, as the lead agency, on July 15, 2014 (SCH #20120204047). This Addendum has been prepared pursuant to CEQA Guideline Section 15164 to evaluate the Project pursuant to the WOSP and the WOSP EIR. The purpose of this Addendum is to document that the Project would not result in any new significant environmental impacts or **substantially** more severe environmental impacts than the environmental impacts that were analyzed in the WSOP EIR.

A. PROJECT:

West Oakland Development Group (*"WODG"*) proposes the development of a residential mixed use building on the 2.85 acre property located at 500 Kirkham Street (the "Property"). The proposed building will include up to 426 residential units, up to 34,119 square feet of ground floor retail, the potential for up to 44,918 square feet of space for a charter school or other commercial uses on the 2nd and 3rd floors, a 2 story above ground garage and a ½ acre park.

The building will range from 7 to 12 stories, and from approximately 85 feet to 130 feet in height. The zoning on the Property allows a height of 160 feet, so the proposed building is well below the maximum height. The proposed building would step up from 7 stories along 7th Street to 12 stories along 5th Street. The lower profile facing 7th Street is intended to match up with the buildings in the surrounding area. The entire proposed development would be set back 50' from the Bay Area Rapid Transit (*"BART"*) tracks, which cut through the southern portion of the Property.

The WOSP EIR analyzed the environmental impacts of the adoption and implementation of the WOSP, and where feasible and where the level of detail available was sufficient to adequately analyze the potential environmental effects, provided project-level CEQA review for the foreseeable and anticipated development. This allows the use of the CEQA streamlining and/or tiering provisions for projects proposed within the WOSP.

CEQA CONTEXT FOR THE CITY

Public Resources Code Section 21166 and CEQA Guidelines Section 15164 state that an addendum to a certified EIR is allowed when minor changes or additions are necessary, but none of the conditions described in Section 15162 requiring the preparation of a subsequent EIR or Negative Declaration have occurred.

Under Public Resources Code Section 21666 and CEQA Guideline Section 15162, the lead or responsible agency may only prepare a supplemental or subsequent EIR if:

1. Substantial changes are proposed in the project that require major revisions of the EIR because of the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant environmental effects; or

2. Substantial changes have occurred with respect to the circumstances under which the project would be undertaken, which would require important revisions in the EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant environmental effects; or
3. New information of substantial importance to the project has become available and:
   a. The information was not known and could not have been known with the exercise of reasonable diligence at the time the EIR was certified as complete; and
   b. The new information shows any of the following:
      i. The project would have one or more significant effects not previously discussed in the EIR;
      ii. Significant effects previously examined would be substantially more severe than shown in the EIR;
      iii. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponent declines to adopt the mitigation measure or alternative; or
      iv. Mitigation measures or alternatives which are considerably different from those considered in the EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

A lead or responsible agency may make some changes or additions to a project that was the subject of a previously certified EIR, provided the conditions described above have not occurred. As discussed in greater detail below, the Proposed Project does not meet any of the standards identified in Section 15162 that would require preparation of a supplemental or subsequent EIR. This CEQA Analysis and Addendum therefore determines that no supplemental or subsequent EIR is required for the City to implement the Proposed Project.

Streamlining and Tiering Provisions of CEQA

This CEQA Analysis and Addendum evaluates the potential project-specific environmental effects of the Proposed Project, and analyzes whether such impacts were adequately addressed by the WOSP EIR in accordance with the following three streamlining and/or tiering provisions of CEQA.

1. **Community Plan Exemption.** Public Resources Code Section 21083.3 and CEQA Guidelines Section 15183 allow streamlined environmental review for projects that are "consistent with the development density established by existing zoning, community plan or general plan policies for which an EIR was certified, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site." The WOSP EIR has analyzed and mitigated all impacts resulting from the Proposed Project. Section 15183(c) specifies that "if an impact is not peculiar to the parcel or to the Proposed Project, has been addressed as a significant effect in the prior EIR, or can be substantially mitigated by the imposition of uniformly applied development policies or standards, then an EIR need not be prepared for the project solely on the basis of that impact."

   Based on this CEQA Analysis, the Proposed Project qualifies for a community plan exemption. The proposed uses are permitted in the S-15 (Transit Oriented Development) zone district, and the project is consistent with density, building heights, open space, parking, setbacks and other applicable land use development standards as further discussed below. The revised design

proposal meets the Oakland Design Review Criteria in regards to building bulk and mass, articulation, landscaping, lighting, colors and materials that are envisioned in the WOSP EIR. The CEQA Checklist included below concludes that the Proposed Project would not result in significant impacts that (1) are peculiar to the project or project site; (2) were not identified as significant project-level, cumulative, or offsite effects in the WOSP EIR; or (3) were previously identified as significant effects, but are determined to have a more severe adverse impact than discussed in the WOSP EIR. Findings regarding the Proposed Project's consistency with the WOSP are included **Supplemental Attachment 1**.

2. **Qualified Infill Exemption.** Public Resources Code Section 21094.5 and CEQA Guidelines Section 15183.3 allow streamlining for certain qualified infill projects by limiting the topics subject to review at the project level, if the effects of infill development have been addressed in a planning level decision, or by uniformly applicable development policies. Infill projects are eligible if they are located in an urban area on a site that either has been previously developed or that adjoins existing qualified urban uses on at least 75 percent of the site's perimeter; satisfy the performance standards provided in CEQA Guidelines Appendix N; and are consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy. No additional environmental review is required if the infill project would not cause any new specific effects or more significant effects, or if uniformly applicable development policies or standards would substantially mitigate such effects. This Addendum also indicates that the Proposed Project qualifies for a qualified infill exemption. The infill eligibility criteria are evaluated in **Supplemental Attachment 2**, and supported by the CEQA Checklist included below.

3. **Addendum.** Public Resources Code Section 21166 and CEQA Guidelines Section 15164 state that an addendum to an certified EIR is allowed when minor changes or additions are necessary and none of the conditions for preparation of a subsequent EIR or negative declaration, per Section 15162, are satisfied. This Addendum incorporates by reference the information contained in the WOSP EIR. The Proposed Project is required to incorporate and/or comply with the applicable WOSP EIR mitigation measures and the applicable City of Oakland Standard Conditions of Approval (dated July 22, 2015) (SCA's), which are listed in **Appendix D to this Addendum**, and incorporated herein by reference.

Comparison to the WOSP

The WOSP EIR analysis represented the maximum feasible development that can reasonably be expected to occur in the WOSP area over a 25-year planning period, according to the City of Oakland's projections. As shown in **Table 1**, the Proposed Project, as further described in section (1) below would represent a minor change in the Development Program from what was analyzed in the WOSP EIR. The Project's proposed building size is less than that set forth for the Project site in the WOSP; although it would include more dwelling units, it would include substantially fewer commercial uses. The Proposed Project therefore meets the requirements for an addendum.

Table 1.
Comparison of WOSP Development Program for Opportunity Area 2 on 7th Street and Proposed Project at 500 Kirkham Street

Development Characteristics	Development Program	Proposed Project
Height	160 feet	85.5 feet
Residential Units	2,839	426 residential units
Commercial Square Feet (net square feet)	670,000	79,037 Sq. Ft.

The CEQA Checklist provided below evaluates the potential project-specific environmental effects of the Proposed Project as compared to the development program evaluated in the WOSP EIR, and whether the impacts were adequately addressed in the WOSP EIR to allow the abovementioned streamlining and/or tiering provisions of CEQA to apply. Based on the WOSP EIR, the findings, and conclusions of the WOSP EIR, as summarized below, and this CEQA Analysis, the WOSP EIR adequately analyzed the potential environmental impacts associated with the Proposed Project, and the streamlining and/or tiering provisions of CEQA apply to the Proposed Project. Therefore, no further review or analysis under CEQA is required.

(1) PROJECT DESCRIPTION

Project Location

Project Site Setting. The project site is located at 500 Kirkham Street in the City of Oakland, County of Alameda, State of California (the "Caltrans Property" or "Property"). The Property is identified as Assessor's Parcel Numbers: 004-0049-001-00 and 004-0049-003-00. The Property contains approximately 2.85 acres and is bounded by 5th Street to the south, 7th Street to the north, Kirkham Street to the west and Union Street to the east (as shown in Figures 1 and 2).

The Property is located in the West Oakland Redevelopment Project Area, the West Oakland Specific Plan Project Area and the West Oakland Transit Village or the S-15-W Transit Oriented Development Zone area and is identified as an opportunity site in the West Oakland Specific Plan EIR.

Caltrans has offered the Caltrans Property for lease or sale to the City and other public entities under the Surplus Lands Act. The City has entered into an option agreement with Caltrans to acquire the Property, and the City, in turn, has agreed to sell the Property to WODG.

Property Background and Existing Conditions

The Property and surrounding areas originally consisted of bay-margin wetlands that were partially filled in between 1866 and 1890. In 1902, the Property was bisected between 7th and 5th Streets by Poplar Street. The land uses at that time consisted of a mix of residences and commercial/industrial activities. A railroad spur track entered the southwestern portion of the site from 5th Street to serve commercial and industrial operations that were present on the site from 1912 until the mid-1950s. In the mid-1950s, the Property was divided into two pieces, with the majority covered by an elevated section of the Nimitz (Eastshore) Freeway, which ran diagonally across the site from the northwest to the southwest. The remaining southwestern portion of the site remained industrial and was occupied first by the Smilo Chemical Company, a chemical repackaging business, from 1954 to 1984 and then by J&A Truck Repair from 1984 to 1994.

In the mid-1990s, following the 1989 Loma Prieta earthquake, the freeway was removed and relocated about 300 feet south of the site. In 1994, Caltrans acquired the southwestern portion of the site. Since the removal of the freeway, the Property has been largely vacant, used by Caltrans primarily as a construction staging area and a storage yard. The majority of the Property is flat and paved with asphalt. A paved, inclined roadway previously used for truck driver training is present on the northern portion of the site. Portable trailers used as office space by BART are also located on the site. A BART right-of-way easement transects the southwest portion of the Property, leaving a small section of vacant land situated between the BART easement and Kirkham and 5th Streets.

In 1994, Caltrans entered into a Voluntary Cleanup Agreement (***"VCA"***) with the California Department of Toxic Substances Control (***"DTSC"***) for the Cypress Freeway Relocation Project and East Bay Municipal Utility District Sewer Line Realignment in Oakland and neighboring Emeryville. The relocation project covered 34 separate sites, including the 500 Kirkham Street property. The VCA was subsequently amended: twice in 1996, and once each in 1997, 1999, and 2002. The site has been inactive for a number of years. However, according to a Northgate Environmental report dated September 29, 2014, the City of Oakland is now assisting Caltrans in evaluating soil and groundwater quality conditions at the

Property that could potentially impact future redevelopment through covenants and restrictions, and result in remedial excavation and grading.

Project Characteristics

The Project will involve grading of the Property and development of the following uses as shown in Figures 3 and 4:

1. A 7 story building will front on 7th Street and, as proposed, will consist of 3 stories of commercial space, 3 stories of residential units and 1 story of penthouse residential and multi-purpose spaces. All or part of the planned 252 residential units in this portion of the building could be designed as live/work units for artists and arts oriented users that may be attracted to this development. The 10 penthouse units will have 18' ceilings with a mezzanine area. The commercial portion of the building will include up to 34,119 square feet of ground floor retail space and up to 44,918 square feet of space for a charter school or other commercial uses on the 2nd and 3rd floors. If built as a charter school, the 2nd and 3rd floor space will offer a range of classroom sizes as well as an assembly space that could accommodate up to 350 patrons. The total building height along 7th Street will be approximately 85 feet.

2. On the 5th Street side of the building will be two 12 story wings (10 stories over 2 stories of parking) housing up to 174 residential units. The wings will be approximately 130' high, plus the height of elevator and stairwell housings, and will be built in a U-shape to maximize views. The tenth story will have a landscaped deck area surmounted by two-story penthouses. Any units facing the freeway and the BART tracks will have laminated sound railings on the face of the units to provide additional sound protection from the freeway and BART tracks. In addition, the building will be set back 50' from the BART right-of-way which cuts through the southern portion of the property.

3. The parking garage for the project will also be located on the 5th Street side of the building, facing the freeway and BART tracks. The two story, above ground garage will accommodate the parking for both the commercial and residential uses. The garage entrance will be from 5th Street with adequate sight distance provided for motorists exiting the garage. In this portion of the building, the first floor of residential units will be at the equivalent of the 4th story (32'), and thus above the 25' high BART tracks. The parking garage will accommodate a total of 288 parking spaces, allocated as follows: 213 spaces for resident parking (0.5 spaces/unit) and 75 parking spaces for staff, visitors and commercial uses.

4. A ½ acre landscaped park will be located on the portion of the property that lies south of the BART tracks.

The building design allows for some flexibility in the layout and sizes of the residential units. As proposed, unit sizes range from 700 to 900 square feet for 1 bedroom, 1 bath units and approximately 1,300 for 2 bedroom, 2 bath units. Each unit will also have an average of 130 square feet of private exterior deck space. The building will be served by up to five banks of elevators and at least five banks of stairs. As proposed, 1 elevator and stairwell will be located at each end of the building and in the center of building on the 7th Street side, plus there is a double bank of elevators and stairs on the 5th Street side.

The building as proposed will be a Type I Class A fire resistive steel framed building, composed of concrete pan floors and using a light gauge steel framing system, similar to those used in the Broadway

Grand and Orchid 88 projects. The outside walls will be thermal insulated glazed and each unit will have its own energy efficient heating/cooling system. The exterior trim will be an exterior insulation and finishing system (EIFS), largely brick and cement plaster. On the ground floor, the commercial space will have standard storefront floor to ceiling glazing. The building will include an emergency generator.

Proposed Project – Alternative Building Design:
In the event it proves infeasible to construct the 12 story wings, an alternative building design will be implemented for the Proposed Project. The alternative design will reduce the building height to seven stories over the entirety of the site and incorporate the following changes to the building design:

1. A reconfigured ground floor with a smaller retail area (21,961 SF) together with ground floor residential units that wrap around the corner from 7th Street on to Union Street.

2. Elimination of the charter school/commercial space on the 2nd floor. The charter school space would be replaced with parking as well as approximately 14 residential units along the 7th Street and Union Street sides of the building.

3. Reconfiguration of the 3rd floor to reduce the commercial space to 6,140 SF along the 5th Street side of the building, facing the BART tracks. The remainder of the 3rd floor would be devoted to residential units.

4. A slight decrease in the number of residential units from 426 to 417. Also the unit mix would be modified to add some studio units, in addition to 1 and 2 bedroom units. Unit sizes would range from 520 SF to approximately 1,100 SF.

5. A reduction in the total number of parking spaces based on the change in the residential unit count and the smaller retail and commercial footprint, although the parking ratios remain the same. There will be 209 spaces for the residential units and 55 spaces for the retail and commercial areas.

6. Modification of the elevator and stairwell layout to provide 2 banks of 2 elevators each, one in the main lobby and another in the center of the building, along with a single elevator on the 5th Street side of the building. Also, 2 stairwells would be added, for a total of 7 spread around the exterior perimeter of the building.

7. The building construction will be change to include a 2 story concrete podium with 5 stories of treated wood construction above.

Circulation Improvements

Regardless of which building design is ultimately adopted, in addition to the on-site development, the Proposed Project will also include improvements to the intersection of 7th Street and Union Street. A separate southbound left turn lane will be added on Union Street and the existing traffic signal will be modified to provide for protected left turns on the eastbound and westbound approaches along with a protected overlap phase for the northbound right turn movement.

The Project also includes a Traffic Management Plan for drop-off and pick-up of students before and after school, as well as a robust Project Transportation Demand Management Plan. The project includes bicycle parking to encourage alternative transportation modes.

Utility Improvements

The Project will provide sewer, water, stormwater drainage and water quality infrastructure in accordance with the City of Oakland's Standard Conditions of Approval as further described under the utilities and services section of this Addendum. Sewer system improvements include mechanisms to control or minimize increases in infiltration/inflow to offset project-related sanitary sewer increases and implementation of best management practices. Adequate water supply would be available to serve the project though a connection to the existing 8" water main in Union Street and the on-site 4" main in Kirkham is proposed to be replaced with an approximately 8" main. Because the Project will not increase impervious area, upgrades to the existing storm drainage system are not expected, although the Project includes a connection to the existing storm drain system in Kirkham.

(2) PROJECT APPROVALS

The Proposed Project would require the following discretionary and ministerial actions and approvals, including without limitation the following:

Actions by the City of Oakland

- Planning Department/Planning Commission: Major Conditional Use Permit, Design Review, CEQA/Environmental Determination, Vesting Tentative Map, Final Map and Condominium Map.
- Building Department: Building permits and other related onsite and offsite work permits, encroachment permits, and curb gutter sidewalk permit.
- City Council: Approval of a Development and Disposition Agreement confirming the transfer of the Property from the City and then to WODG.

Actions by Other Governmental Agencies

- DTSC – Acceptance of remediation work completed pursuant to the VCA.
- Bay Area Air Quality Management District (BAAQMD) – Issuance of permits for installation and operation of an emergency generator (if required).
- Regional Water Quality Control Board – Acceptance of a Notice of Intent to obtain coverage under the General Construction Activity Storm Water Permit, and Notice of Termination after construction is complete. Granting of required clearances to confirm that all applicable standards, regulations, and conditions for all previous contamination at the site have been met.
- East Bay Municipal Utility District (EBMUD) – Approval of new service requests and new water meter installations.

WOSP and EIR

The WOSP provides a framework for future growth and development within the boundaries of the WOSP (the "***WOSP Area***"), which are generally defined as Interstate 580 (MacArthur Freeway) to the

north, Interstate 980 to the east, and the relocated Interstate 880 (Nimitz Freeway) wrapping around the south and west. The WOSP Area also includes a small portion of the East Bay Bridge Shopping Center and the area south of I-880 near Linden Street. The WOSP is a 25 year planning document that provides a vision and planning framework for future growth and development within the WOSP Area.

The WOSP sets forth goals, policies and development regulations to guide future development within the WOSP Area and serves as the mechanism for insuring that future development is coordinated and occurs in an orderly and well planned manner. The WOSP does not propose specific future developments, but for the purposes of environmental review, establishes the West Oakland Development Program, which represents the *maximum feasible development* that the City projected can reasonably be expected to occur in the WOSP Area over a 25 year planning period. In total, the West Oakland Development Program includes the addition of up to 4.7 million square feet of new industrial and commercial space, over 28,000 new jobs throughout the WOSP Area, and 5,000 new residential units accommodating 7,500-11,000 new residents. Concurrent with the adoption of the WOSP and the WOSP EIR, the City of Oakland also adopted General Plan and Planning Code amendments, Zoning Maps, Height Map and Design Guidelines (collectively, the "***Related Actions***").

The WOSP EIR presents an analysis of the environmental impacts of adoption and implementation of the WOSP by evaluating the physical and land use changes resulting from potential development that could occur with adoption and implementation of the WOSP. Pursuant to CEQA Guidelines Sections 15162-15164, 15168, 15183, 15183.5, and/or 15168, future project level environmental analyses may be tiered from the WOSP EIR. Where feasible and where an adequate level of detail is available such that the potential environmental effects may be analyzed for the Proposed Project, the WOSP EIR provides a project level analysis. The Proposed Project relies on the streamlining/tiering provisions of CEQA to the maximum feasible extent in accordance with CEQA Guidelines Section 15152.

The Proposed Project is located in the WOSP Area in general and specifically within Area 2 of the 7th Street Opportunity Area. The Vision for 7th Street Opportunity Area includes higher density housing, commercial office and government/ institutional office space around the core of the West Oakland BART Station. It also encourages neighborhood serving retail as well as custom manufacturing/ industrial arts/ artist exhibition space on the ground floor. The 7th Street Opportunity Area is considered a Transit-Oriented Development ("***TOD***") area. TOD is a well-established planning concept generally defined as a mixed-use residential and commercial area designed to maximize access to public transportation, and often incorporates features to encourage the use of transit ridership. In keeping with the uses anticipated by the WOSP for the 7th Street Opportunity Area, the Proposed Project combines commercial and live/work spaces with more typical residential uses and contemplates a .5 to 1 parking ratio to encourage the use of the nearby major transit systems.

Summary of Findings

This Addendum concludes that the Proposed Project is consistent with the development density and land use characteristics established in the WOSP. The Addendum determines that potential environmental impacts associated with the Proposed Project were adequately analyzed and covered in the WOSP EIR. The Proposed Project will be required to comply with the applicable mitigation measures identified in the WOSP EIR, and any applicable SCAs (see **Attachment D**). With implementation of the applicable mitigation measures and SCAs, the Proposed Project would not result in a substantial increase in the severity of significant impacts previously identified in the WOSP EIR, or in any new significant impacts that were not previously identified in the WOSP EIR.

In accordance with California Public Resources Code Sections 21083.3, 21094.5, and 21166; and/or CEQA Guidelines Sections 15183, 15183.3, 15168 15164, and as set forth in the CEQA Checklist below, the Proposed Project qualifies for an addendum because the following findings can be made:

- The Proposed Project would not result in significant impacts that (1) are peculiar to the project or project site; (2) were not previously identified as significant project-level, cumulative, or offsite effects in the WOSP EIR; or (3) were previously identified as significant effects, but which—as a result of substantial new information not known at the time the WOSP EIR was certified—would not increase in severity above that described in the EIR. Therefore, the WOSP EIR evaluated the environmental impacts of the Proposed Project and the Project is exempt from further environmental review in accordance with Public Resources Code Section 21083.3 and CEQA Guidelines Section 15183, 15183.3, and 15168.
- The Proposed Project would not cause any new specific effects on the environment that were not already analyzed in the WOSP EIR or are more significant than previously analyzed in the WOSP EIR. The effects of the Proposed Project have been addressed in the WOSP EIR, and only minor technical revisions and additions are required in order to document that the Proposed Project would not result in additional environmental impacts in accordance with Public Resources Code Section 21094.5 and CEQA Guidelines Section 15164.
- The analyses conducted and the conclusions reached in the WOSP EIR certified by the Planning Commission on June 11, 2014 and confirmed by the City Council on July 15, 2014, remain valid, and no supplemental environmental review is required for the Proposed Project. The Proposed Project would not cause new significant impacts not previously identified in the WOSP EIR, or result in a substantial increase in the severity of previously identified significant impacts. No new mitigation measures would be necessary to reduce significant impacts. No changes have occurred with respect to circumstances surrounding the original project that would cause significant environmental impacts to which the Proposed Project would contribute considerably, and no new information has been put forward that shows that the Proposed Project would cause significant environmental impacts. Therefore, no supplemental environmental review is required in accordance with Public Resources Code Section 21166 and CEQA Guidelines Sections 15164 and 15168.

for

Environmental Review Officer: Darin Ranelletti

March 31, 2016

Date

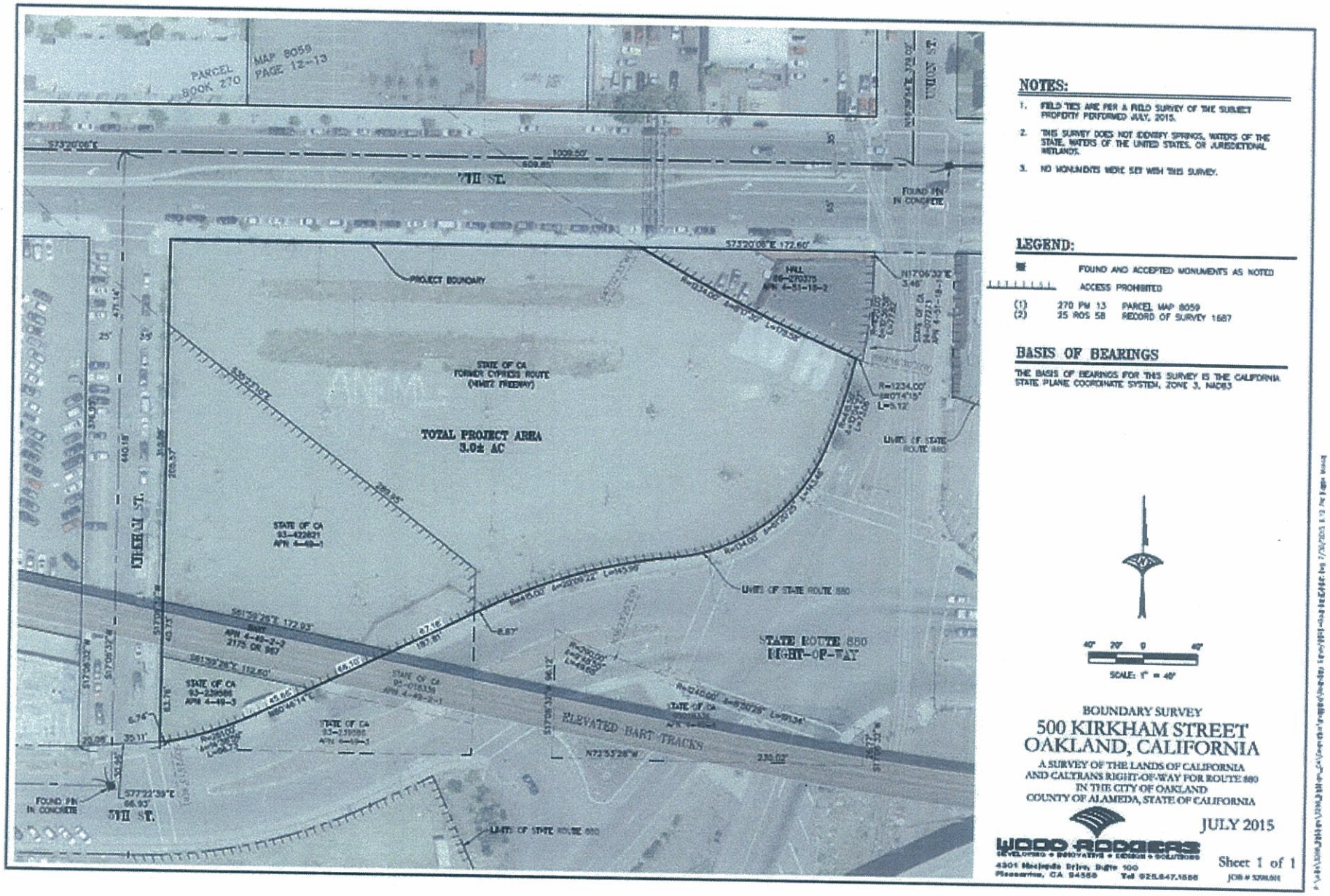


Figure 1 – Location Map

VICINITY MAP

Figure 2 – Vicinity Map

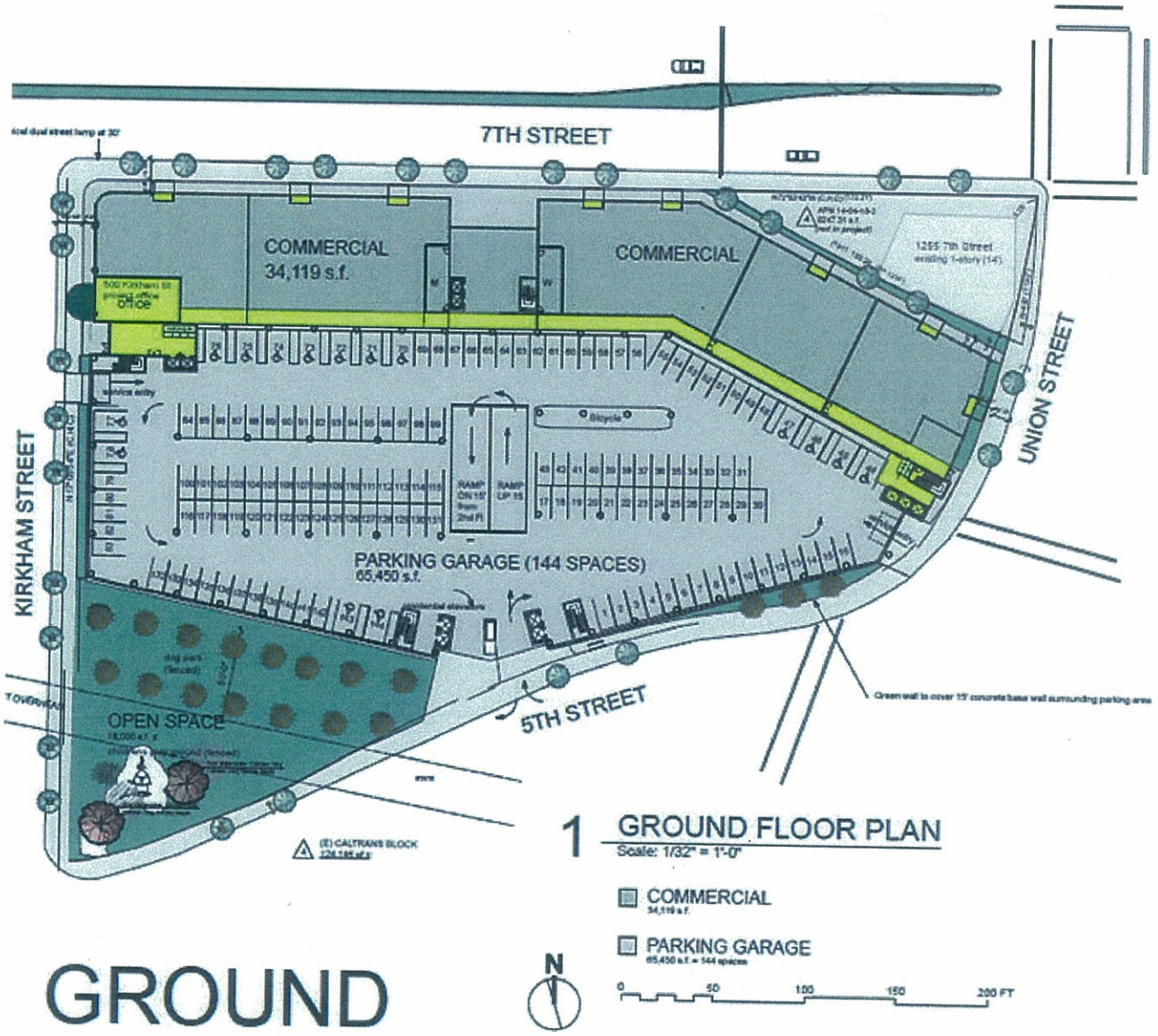


Figure 3 – Site Plan

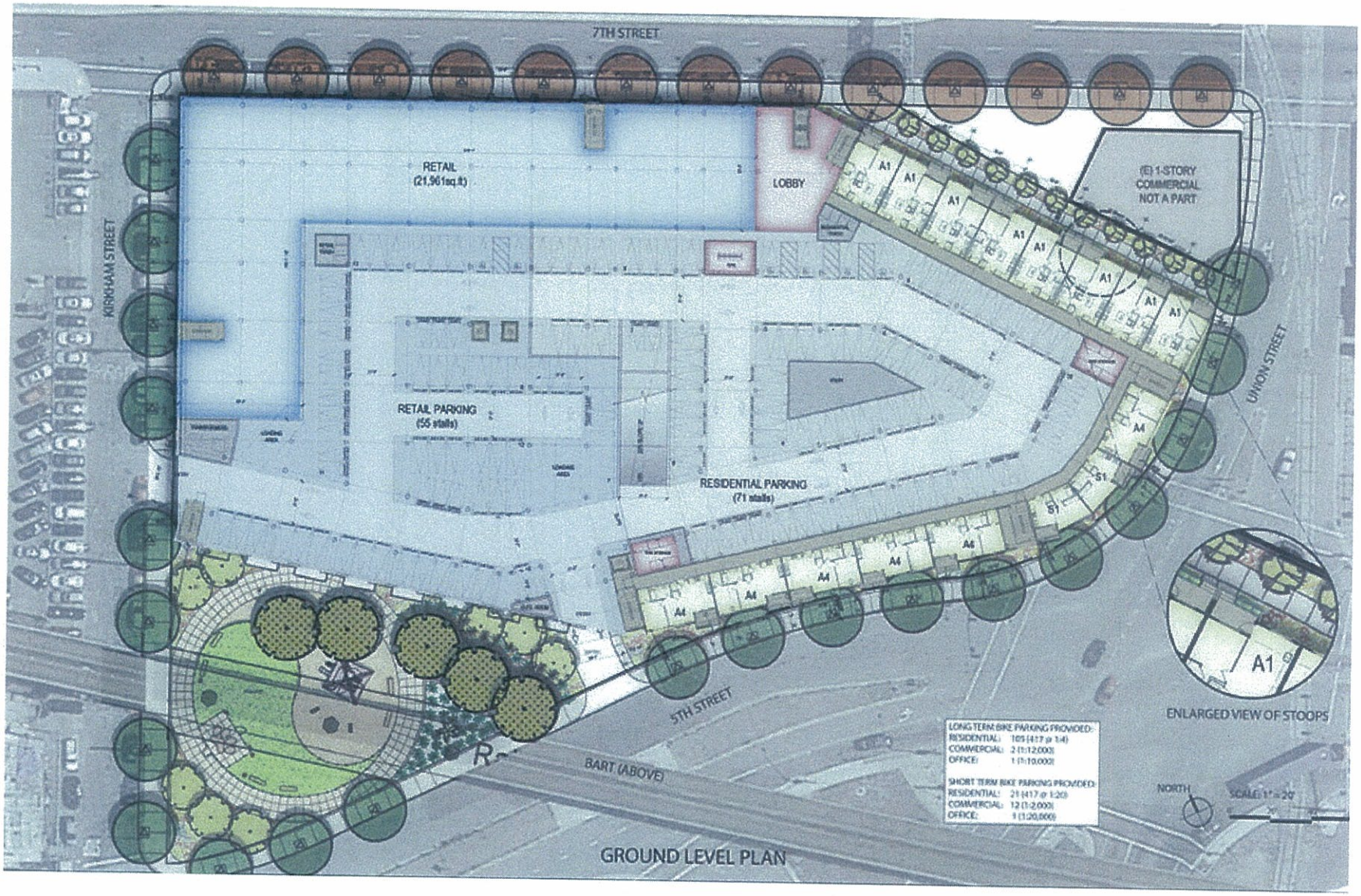


Figure 4 – Ground Level Plan

(3) CEQA CHECKLIST

Overview

This CEQA Checklist provides a summary of the potential environmental impacts that may result from adoption and implementation of the Project, as evaluated in the WOSP EIR and this Addendum. The WOSP EIR evaluated potential environmental impacts of development under the WOSP. This Addendum incorporates by reference the WOSP EIR discussion and analysis of potential environmental impacts and identifies applicable project-level environmental impacts associated with the Proposed Project.

This Addendum provides a determination of whether the Proposed Project would result in:

- Equal or less severe impacts compared to those impacts previously identified in the WOSP EIR;
- A substantial increase in the severity of a previously identified significant impact in the WOSP EIR; or
- A new significant impact.

Where the severity of the impacts of the Proposed Project would be the same as or less than the severity of the impacts described in the WOSP EIR, that fact is reflected in the "Resulting Level of Significance" column. Where the "Resulting Level of Significance" column indicates a Substantial Increase in Severity of Previously Identified Significant Impact in WOSP EIR or where a New Significant Impact is checked, there are significant impacts that are:

- Peculiar to project or project site (per CEQA Guidelines Sections 15183 or 15183.3);
- Not identified in the previous EIR (WOSP EIR) (per CEQA Guidelines Sections 15183 or 15183.3), including offsite and cumulative impacts (per CEQA Guidelines Section 15183);
- Due to substantial changes in the project (per CEQA Guidelines Section 15162);
- Due to substantial changes in circumstances under which the project will be undertaken (per CEQA Guidelines Sections 15162); or
- Due to substantial new information not known at the time the WOSP EIR was certified (per CEQA Guidelines Sections 15162, 15183, or 15183.3).

The Proposed Project will comply with the applicable mitigation measures identified in the WOSP EIR, and with all applicable SCAs. This CEQA Checklist includes references to the applicable mitigation measures and SCAs, and a list of the mitigation measures and SCAs is included in **Appendix D**, which is incorporated by reference into the Addendum. The SCA numbers referenced in the WOSP EIR have been updated to reflect the SCA numbers referenced in the City of Oakland Standard Conditions of Approval adopted by the City Council on 11/03/08 (Ordinance No. 12899 C.M.S.) Revised July 22, 2015. A table is included in the appendices at the end of the Addendum to identifying the original SCA references contained in the EIR as compared to the current 2015 SCAs. The Addendum refers to the current 2015 SCAs unless otherwise noted.

Summary of Project Impacts, Standard Conditions of Approval, Mitigation Measures and Residual Impacts: 500 Kirkham Street

AESTHETICS, SHADOW AND WIND

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
1. Aesthetics, Shadow, and Wind • Would the project:			
a) Have a substantial adverse effect on a public scenic vista; substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, located within a state or locally designated scenic highway; substantially degrade the existing visual character or quality of the site and its surroundings; or create a new source of substantial light or glare which would substantially and adversely affect day or nighttime views in the area.	I	☐	☐
b) Introduce landscape that would now or in the future cast substantial shadows on existing solar collectors (in conflict with Public Resource Code sections 25980-25986); or cast shadow that substantially impairs the function of a building using passive solar heat collection, solar collectors for hot water heating, or photovoltaic solar collectors.	I	☐	☐
c) Cast shadow that substantially impairs the beneficial use of a public or quasi-public park, lawn, garden, or open space; or, cast shadow on an historical resource, as defined by CEQA Guidelines Section 15064.5(a), such that shadows would materially impair a resource's historic significance;	I	☐	☐
d) Require an exception (variance) to the policies and regulations in the General Plan, Planning Code, or Uniform Building Code, and the exception causes a fundamental conflict with policies and regulations in the General Plan, Planning Code, and Uniform Building Code addressing the provision of adequate light related to	I	☐	☐

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
appropriate uses; or			
e) Create winds that exceed 36 mph for more than one hour during daylight hours during the year. The wind analysis only needs to be done if the project's height is 100 feet or greater (measured to the roof) and one of the following conditions exist: (a) the project is located adjacent to a substantial water body (i.e., Oakland Estuary, Lake Merritt or San Francisco Bay); or (b) the project is located in Downtown.		☐	☐

Scenic Vistas, Scenic Resources, and Visual Character (Criterion 1a)

The WOSP EIR determined that potential impacts to scenic vistas and resources, visual character, and lighting and glare from development under the WOSP would be less than significant with implementation of SCAs, and that no mitigation measures were necessary.

Impact Aest-1 concluded that there are no officially designated public scenic vistas within or near the Planning Area. No scenic vistas or view corridors would be substantially obstructed or degraded by development in accordance with the WOSP. Impact Aesth-3 determined that development and public realm improvements would not substantially degrade the existing visual character or quality of any sites and their surroundings, but would substantially improve the existing visual character and quality of the Planning Area. Infill development and redevelopment would repair the existing inconsistent urban fabric where such inconsistencies exist, and result in a more unified and coherent development character. The proposed land use patterns and development types, and focusing change in the Opportunity Areas while preserving established residential neighborhoods, would provide sensitive transitions to existing development, reinforce the character of residential and non-residential areas, and harmonize existing incompatibilities. Gateway and streetscape improvements, and development of new activity nodes, would improve visual quality and reinforce community identity. Impact Aesth-2 found that development and public realm improvements in accordance with the WOSP would not substantially damage scenic resources, including trees or historic buildings, but rather would improve the quality of views of the Planning Area from the I-580 scenic highway. Impact Aesth-4 concluded that development facilitated by the WOSP would create new sources of light and glare, but these new sources would be consistent with typical light and glare conditions. Subsequent individual projects would not substantially and adversely affect day or nighttime views in the area. Impact Aesth-6 also concluded that he WOSP does not propose changes to any of those existing General Plan policies or zoning or building regulations, and would not cause a fundamental conflict with those policies and regulations in the General Plan, Planning Code and Uniform Building Code, that address the provision of adequate light related to appropriate uses.

The Physical Height Model analyzed in the WOSP EIR represents the conceptual massing for projects to be developed under the WOSP, and served as the basis for massing, view corridor, shadow, and wind analysis performed for this Addendum. The Physical Height Model allowed for 160 foot building heights in the vicinity of the Property. The WOSP EIR determined that new structures would partially obstruct views of the sky, but that such changes would not represent a substantial adverse effect on views, because no views considered scenic or unique (as defined by CEQA) and no visual access to protected scenic resources (as defined by the General Plan) would be obstructed. Changes anticipated under the WOSP would generally create a more pedestrian-oriented aesthetic in the WOSP Area, and the Design Guidelines would ensure that development under the WOSP would be compatible with the projected built form and anticipated architectural character of the WOSP Area as a whole, and compatible with the distinctive visual character of individual areas. Development in the WOSP Area will be required to comply with SCA 18 related to shielded lighting.

Shadow (Criteria 1b through 1d)

The WOSP EIR determined that development under the WOSP would result in less-than-significant impacts from shading that substantially impairs beneficial use of any public or quasi-public park, lawn, garden, or open space, or cast shadow on an historic resource such that the shadow would materially impair the resource's historic significance. In addition, the WOSP EIR concluded that development under the WOSP would not cast shadows that substantially impair the function of a building using passive solar heat collection or any other photovoltaic solar collectors.

Wind (Criterion 1e)

The WOSP Area does not lie within an area identified by the City as requiring modeling for evaluation of wind impacts. Therefore, the WOSP EIR concluded that wind impacts from development within the WOSP Area would be less than significant and determined that no mitigation measures for wind impacts were required for development within the WOSP.

Project Analysis and Conclusion

At a maximum of 130 feet in height, the Proposed Project buildings would be 30 feet lower than the maximum 160 foot height allowed under the S-15 Transit Development Zone and anticipated by the WOSP. The WOSP EIR found that 160 foot tall buildings in the 7th Street Opportunity Area would result in less than significant impacts to aesthetics, shadows and wind. As the Proposed Project includes construction of a building that is a maximum of only 130 feet in height, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR, nor would it result in new significant impacts related to aesthetics, shadow or wind that were not identified in the WOSP EIR. Furthermore, other than implementation of the SCA for lighting mitigation (see SCA 18 in **Appendix D**), there are no mitigation measures that would apply to the Project with respect to impacts on aesthetics, shadow or wind. Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not result in new significant impacts or substantially increase the severity of significant impacts identified in the WOSP EIR related to aesthetic resources.

AIR QUALITY

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
2. Air Quality • Would the project:			
a) Conflict with or obstruct implementation of the applicable air quality plan?	I	☐	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	I	☐	☐
c) During project construction result in average daily emissions of 54 pounds per day of ROG, NO_X, or $PM_{2.5}$ or 82 pounds per day of PM_{10}; during project operation result in average daily emissions of 54 pounds per day of ROG, NO_X, or $PM_{2.5}$, or 82 pounds per day of PM_{10}; result in maximum annual emissions of 10 tons per year of ROG, NO_X, or $PM_{2.5}$, or 15 tons per year of PM_{10}; or	I	☐	☐
d) For new sources of Toxic Air Contaminants (TACs), during either project construction or project operation expose sensitive receptors to substantial levels of TACs under project conditions resulting in (a) an increase in cancer risk level greater than 10 in one million, (b) a non cancer risk (chronic or acute) hazard index greater than 1.0, or (c) an increase of annual average $PM_{2.5}$ of greater than 0.3 microgram per cubic meter; or, under cumulative conditions, resulting in (a) a cancer risk level greater than 100 in a million, (b) a non cancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 microgram per cubic meter; or expose new sensitive receptors to substantial ambient levels of Toxic Air Contaminants (TACs) resulting in (a) a cancer risk level greater than 100 in a million, (b) a non cancer risk (chronic or acute 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 microgram per cubic meter.	I	☐	☐
e) Create objectionable odors affecting a substantial number of people?	I	☐	☐

Construction and Operational Emissions (Criteria 2a, 2b, 2c)

The WOSP EIR found that increased criteria pollutant and precursor emissions associated with construction and operations resulting from development under the WOSP could result in significant and unavoidable effects for individual projects, depending on their size, even with adherence to mitigation measures or SCAs. Impact Air-1 provided that development facilitated by the proposed WOSP would not fundamentally conflict with the Bay Area 2010 CAP because the projected rate of increase in vehicle miles travelled and vehicle trips would be less than the projected rate of increase in population. The WOSP EIR conservatively identified a significant and unavoidable impact with respect to construction-related emissions (Impact AIR-5) with application of current City of Oakland SCAs as "large construction projects are likely to occur pursuant to the WOSP, and implementation of SCAs may not be fully capable of reducing criteria pollutants during construction." Impact Air-8 provided that the WOSP would not expose sensitive uses and would not generate emissions leading to significant concentrations of CO that would violate any ambient air quality standard or contribute substantially to an existing or projected air quality violation. Impact Air-4 concluded that during construction, individual development projects pursuant to the WOSP will generate fugitive dust from demolition, grading, hauling and construction activities.

Since information on the above mentioned air quality issues was known, or could have been known, when the 2014 WOSP EIR was being prepared, it is not "new information" under CEQA. However, an analysis of the Proposed Project relying on the previously recommended May 2011 Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines and Thresholds, has nevertheless been conducted for the Proposed Project in order to provide more information to the public and decision-makers.

Construction Air Emissions

Assumptions for Construction Emissions

The air quality analysis used the following assumptions to calculate average daily construction emissions associated with a worst-case construction scenario for the Proposed Project:

- Geotechnical and/or environmental remedial excavation of up to 30,000 cubic yards of material that will likely be removed and replaced on site as engineered fill, with some amount of soil exported off site;
- The length of the various construction phases (e.g., demolition, grading, building, etc.) assumed CalEEMod default values based on acreage of the project site and size of project elements;
- The amount and types of construction equipment used for each phase and the number of off-road vehicle trips were based on CalEEMod defaults for a 5 acre site;
- The footprint lot size of the Proposed Project input into CalEEMod 5 acres;
- Construction of up to 426 dwelling units, 34,119 square feet of retail use and 44,918 square feet charter school / commercial space.

Analysis of Construction Emissions

The average daily construction-related emissions for the Proposed Project, based on the assumptions above, are presented in **Table AIR-1.** As shown in the table, annual average daily construction emissions for the Proposed Project would not exceed the City's thresholds for ROG NO_X, PM_{10} or $PM_{2.5}$.

TABLE AIR-1
UNMITIGATED EMISSIONS FROM CONSTRUCTION (AVERAGE LBS PER DAY)[A]

Construction Year (phase)	ROG	NO_x	PM_{10}	$PM_{2.5}$
Project				
Average Daily Construction Emissions	45.3	44.7	2.0	1.9
City of Oakland Thresholds	54	54	82	54
Significant (Yes or No)?	No	No	No	No

[A] Project construction emissions estimates were made using CalEEMod, version 2013.2.2. Emissions are average daily pounds per day during the thirteen month construction period. SOURCE: ESA, 2015.

The construction impacts associated with the Proposed Project would be less than those identified for the WOSP in the WOSP EIR. Therefore, the Proposed Project would have less severe construction-related air quality impact compared to the impacts evaluated in the WOSP EIR. Supplemental SCAs (see e.g., 19) (Construction-related Air Pollution Controls for Dust and Equipment Emissions) would apply to the Proposed Project, as identified in the WOSP EIR in order to further mitigate construction-related impacts.

Operational Air Emissions

The WOSP EIR identified a significant and unavoidable impact with respect to operational emissions (Impact AIR-7) with application of current City of Oakland SCAs as "Individual development projects as well as the aggregate of all development assumed pursuant to the Specific Plan in conservatively considered to generate criteria air pollutants and ozone precursor emissions at a level that would be considered significant and unavoidable."

Assumptions for Operational Emissions

The analysis below used the following assumptions to calculate the daily operational emissions associated with a worst-case construction scenario for the Proposed Project:

- The vehicle trip generation rates that were input into CalEEMod (Version 2013.2.2) account for the 2000 Bay Area Travel Survey (BATS) modal split adjustment factor that is required by the City of Oakland for near-transit developments;
- The operational emissions generated assumed a default number of fireplaces. All fireplaces were assumed to be gas-fired. No wood burning fireplaces or woodstoves were assumed;
- All other inputs in CalEEMod were based on model default values.
- A backup diesel generator was assumed pursuant to California Building Code Requirements for buildings of this height. The generator was assumed to have a rating of 560 kW-hr (750 hp), a Tier 3 engine and to be operated for maintenance purposes 50 hours per year or about 1 hour per test day.

Analysis of Operational Emissions

Table AIR-2 presents the daily operational emissions for the Proposed Project, based on the assumptions above. As shown in the table, annual average daily regional emissions for the Proposed Project would not exceed the City's thresholds for ROG, PM_{10} or $PM_{2.5}$, but would exceed the threshold for NOx. As with the construction thresholds, these thresholds were developed to represent a cumulatively

considerable contribution to regional air quality and as such, represent not only a project level threshold but a cumulative threshold as well.

TABLE AIR-2
UNMITIGATED EMISSIONS FROM OPERATION (LBS PER DAY)[A]

	ROG	NO_x	PM_{10}	$PM_{2.5}$
Project				
Area Source Emissions	23.37	0.55	0.88	0.87
Energy Emissions	0.14	1.21	0.10	0.10
Project Vehicle Emissions[b]	22.01	56.75	28.43	8.09
Backup Diesel Generator	0.33	4.62	0.53	0.53
Total Emissions	45.85	63.13	29.94	9.59
City of Oakland Thresholds	54	54	82	54
Significant (Yes or No)?	No	Yes	No	No

[a] Project operational emissions estimates were made using CalEEMod, version 2013.2.2.

[b] The vehicle trip rates used to calculate the emissions accounts for mode split and internal capture as recommended by the City of Oakland for projects located in dense, urban environments such as the Project site.

SOURCE: ESA, 2015.

Therefore, the Proposed Project would result in the same or less operational air quality impact compared to that previously identified in the WOSP EIR. No mitigation measures were identified in the WOSP EIR with respect to this operational criteria pollutant impact. SCA-71 (Parking and Traffic Management Plan) would apply to the Proposed Project to further reduce Project vehicle emissions presented in Table AIR-2. Vehicle trip reduction credits were applied for both proximity to BART station and the required TDM program under SCA-71 in order to further reduce WOSP emissions.

Cumulative Air Emissions

The WOSP EIR also conservatively identified a significant cumulative air quality impact for the WOSP, presuming that its significant but mitigatable project-levels of ROG and NOx (ozone precursor emissions) would be a "considerable" contribution to the region's nonattainment for ozone and state standard for PM_{10}.

As shown in Table AIR-2, the Proposed Project would result in a project-level exceedance of NOx, a precursor of ozone and a criteria pollutant. Consequently, this analysis conservatively assumes that the Proposed Project could still have a considerable contribution to regional conditions. The current SCAs regarding TDM (see e.g., SCA 71) would apply to the Proposed Project's conservatively-assessed contribution to the cumulative impact, which would remain significant and unavoidable.

Toxic Air Contaminants (Criterion 2d)

Development under the WOSP would result in increased emissions of criteria pollutants associated with construction and operations. Construction activities would result in less-than-significant effects for

construction-related toxic air contaminants (TACs) emissions due to adherence to SCAs. Impact Air-6 determined that during construction, individual development projects pursuant to the WOSP will generate construction-related toxic air contaminant (TAC) emissions from fuel combusting construction equipment and mobile sources that could exceed thresholds for cancer risk, chronic health index, acute health index or annual average PM2.5 concentration levels. Nonetheless, development of the WOSP would result in significant and unavoidable impacts with regard to operational TAC emissions.

As presented in the analysis below, the Proposed Project would not result in a new significant impact or in a substantial increase in the severity of impacts previously evaluated in the WOSP EIR with respect to cumulative TACs impacts and the WOSP operational impacts covered the impacts associated with the Proposed Project.

Assumptions and Area Sources for Health Risk

TACs are types of air pollutants that can cause health risks. TACs do not have ambient air quality standards, but are regulated using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control as well as the degree of control. The health risk assessment, presented in the analysis below, considers exposure to toxic substances and human health risks from exposure to toxic substances is estimated, based on the potency of the toxic substances. Such an assessment evaluates chronic, long-term effects, calculating the increased risk of cancer as a result of exposure to one or more TACs.

Additionally, the City's CEQA significance thresholds require that new projects containing sensitive receptors (such as residences) be evaluated to determine whether those receptors would be exposed to health risks from existing nearby sources of TACs. When siting new sensitive receptors, existing TAC sources located within 1,000 feet including, but not limited to, stationary sources, freeways, and major roadways (10,000 or greater vehicles per day) should be considered.[1] The BAAQMD provides a publicly available inventory of TAC-related health risks for permitted stationary sources throughout the San Francisco Bay Area Air Basin as well as for freeways. The inventory presents community risk and hazards from screening tools and tables that are intentionally conservative. The screening-level risk factors derived from the BAAQMD's tools are intended to indicate whether additional review related to the impact is necessary and are not intended to be used to assess actual risk for all projects.

Analysis of Health Risk

Construction Impact

Regarding construction TACs emissions, BAAQMD developed screening tables for commercial and residential development projects that estimate screening distances from sensitive receptors sufficient to avoid exposure to substantial construction-related health risks. For development sites of less than 8 acres in area, a screening distance of 125 meters (410) feet is identified as sufficient to avoid a construction-related TAC impact. The Property is approximately 3 acres in area and is located

---

[1] CEQA requires the analysis of potential adverse effects of a project on the environment. Potential effects of the environment on a project are not required to be analyzed or mitigated under CEQA. However, this analysis nevertheless assesses potential effects of "the environment on the project" in order to provide information to decisionmakers.

approximately 100 feet from the nearest sensitive receptors across 7th Street to the northwest and northeast. Therefore, the air quality analysis evaluated potential impacts of the Proposed Project regarding exposure to construction related health risks to nearby receptors.

The WOSP EIR determined that sensitive receptors in proximity to construction-related diesel particulate matter (DPM) emissions (generally within 200 meters) could be subject to increased cancer risk, chronic health problems and acute health risk. However, all future development projects under the WOSP would be subject to basic construction control measures through implementation of the City's Standard Conditions of Approval. The WOSP EIR determined that SCA ("A") (now referenced as SCA 19.j), which requires "enhanced" construction emission control measures for all residential development in excess of 240 units, would implement construction-related Best Management Practices to substantially reduce construction-related impacts to a less-than-significant level.

SCA 19, includes, but is not limited to, the following measures that would reduce DPM emissions from construction:

- Project will utilize electrically generated power generators on site having minimal environmental impacts;
- Demonstrating that the off-road equipment to be used in the construction project would achieve a project wide fleet-average 20 percent NOx reduction and 45 percent particulate matter (PM) reduction compared to the most recent California Air Resources Board (CARB) fleet average; and
- Ensuring that all construction equipment, diesel trucks, and generators are equipped with Best Available Control Technology for emission reductions of NOx and PM, and that off-road heavy diesel engines shall meet the CARB's most recent certification standard.
- Addressing best management practices for transport procedures for reuse and disposal of soil at an appropriate off-site facility.

The OSP Final EIR states that at all construction sites where access to grid power is available, grid power electricity shall be used. If grid power is not available, then propane or natural gas generators may be used, as feasible. Only if propane or natural gas generators prove infeasible shall portable diesel engines be allowed. Therefore a backup diesel generator is assumed for the Proposed Project and (given its high-rise height, as previously described under *Assumptions for Operational Emissions*), would be the only new source of TACs associated with the Proposed Project. The WOSP EIR acknowledged that stationary sources complying with applicable BAAQMD permit requirements generally would not be considered to have an individual significant air quality impact as the BAAQMD would deny an Authority to Construct or would deny a Permit to Operate any new or modified source of TACs that exceeds a cancer risk of 10 in one million or a chronic or acute hazard index of 1.0. Therefore, the health risks impact of the Proposed Project on the environment would be less than significant.

The WOSP EIR also acknowledged that such sources may result in a cumulative TAC impacts, and identified applicable SCAs that require that all potable diesel engines be prohibited at construction sites within the WOSP Area.

Project Analysis:

Construction of the Proposed Project would occur over approximately 24 months. The Proposed Project would have a total of approximately 79,037 square feet of retail and charter school/commercial uses and 426 residential units—generating approximately 385 net new vehicle trips during the weekday a.m. peak hour (172 inbound and 213 outbound), and approximately 404 vehicle trips during the

weekday p.m. peak hour (217 inbound and 187 outbound), as described in the Transportation and Circulation Appendix (see **Appendix B**). The Proposed Project would be required to comply with applicable SCAs related to parking demand, and construction and operational source emissions set forth in Recommended Measures AIR-1 and AIR-2 from the WOSP EIR.

The Proposed Project would introduce new sensitive receptors (residents) to the Property. At all construction sites where access to the grid power is available, grid power electricity shall be used. If the grid is not available, then propane or natural gas generators may be used when feasible. Only if propane or natural gas generators prove infeasible shall potable diesel be allowed thereby introducing new sources of TACs. A screening-level analysis was completed, assessing the Proposed Project's emissions of TACs on adjacent sensitive receptors, and impacts of nearby sources of TACs on the Proposed Project's new residential sensitive receptors.[2] Based on that analysis, SCAs related to construction related emissions would apply.

Project-Level Operations and Cumulative Impact

Regarding exposure of new sensitive receptors to existing and new sources of TACs, the screening health risk analysis contained herein relies on the BAAQMD's conservative screening-level tool to screen out low-emitting existing sources of TACs that pose no substantial threat to increased cancer risk exposure.

According to BAAQMD's screening-level tool for Alameda County, there are 4 stationary TAC sources within 1,000 feet of the Project site. According to the BAAQMD's intentionally conservative estimates, some of these sources have screening-level cancer risks up to 72 in one million at the property line of the source.

ESA conducted refinements to these screening values to account for distance between receptors on the project site and the stationary TAC sources within 1,000 feet of the Project site. **Table AIR-3** presents the results of this refined, project-specific, screening effort that includes the risks posed by roadway traffic on Interstate 880 and the Proposed Project's backup diesel generators. As shown, the cumulative cancer risks for new receptors (residents) of the Proposed Project would be below the significance criterion of 100 in one million. As such, a Health Risk Assessment in accordance with the California Air Resources Board and the Office of Environmental Health and Hazard Assessment requirements was not required. The cumulative impact would be less than significant.

TABLE AIR-3
CUMULATIVE HEALTH IMPACTS FOR NEW RECEPTORS

Site #	Facility Type	Address	Cancer Risk (persons per million)	Chronic Hazard Impact	PM2.5 Concentration (µg/m3)
5133	Coffee Roaster	696 3rd Street	NA[a]	NA	NA
G9838	Gas Station	1395 7th Street	0.25	<0.001	0
G6875	Gas Station	1107 5th Street	0.21	<0.001	0
16848	Generator	1075 7th Street	2.88	0.001	0.005
	Roadway Sources				
	I-880[a]		48.36	0.288	0.0
	Project Generator		10	1	
	Cumulative Impacts		51.70	0.289	0.240
City of Oakland Significance Criteria (new receptor)			100	10	0.8
Potentially Significant Impact?			No	No	No

[a] This source is mis-located on BAAQMD GoogleEarth application. 696 3rd Street is the Mr. Espresso facility at this address which is 3,000 feet from the Project Site.

[B] Risks and concentrations from roadway traffic on I-880 are for an assumed distance of 300 feet from the edge of the nearest travel lane.
Source: BAAQMD, 2014; ESA, 2015.

As shown in **Table AIR-3**, the Proposed Project would not expose residents to substantial levels of TACs that would result in a cumulative cancer risk level greater than 100 in a million, and the project is within the level of development contemplated under the WOSP. Thus, the impact is less-than-significant and would not be substantially greater than the impacts analyzed in the WOSP EIR. Including consideration of roadway traffic on I-880, the cumulative cancer risks for new receptors (residents) of the Proposed Project would be less than 100 in one million. No mitigation is required.

Conclusion

Based on the analysis, findings, and conclusions of the WOSP EIR and the new analysis presented above per current thresholds, implementation of the Proposed Project would not result in a new significant impact or in a substantial increase in the severity of operational air quality emissions or a cumulative air quality impact identified in the WOSP EIR. Also, based on the health risk analysis above, implementation of the Proposed Project would not result in a new significant impact or in a substantial increase in the severity of impacts related to construction, operational, or cumulative TAC emissions, which were addressed in the WOSP and found to be significant and unavoidable.

Mitigation measures and adopted City of Oakland SCAs identified in the WOSP EIR would ensure that impacts are either less than significant or consistent with and no greater than the significant and unavoidable air quality impacts identified in the WOSP EIR. The Proposed Project would implement Mitigation Measure AIR-9 (Risk Reduction Plan) and AIR-10 (Air Filtration), and incorporate supplemental SCA 19 (Construction-related Air Pollution Controls for Dust and Equipment Emissions), SCA 68 (Best Management Practices for Soil and Groundwater Hazards) and SCA #24 (Parking and Transportation Demand Management). Recommended Measures AIR-1 and AIR-2 from the WOSP EIR would apply to

the Proposed Project as identified in **Table 7**, at the end of the CEQA Checklist, as would SCAs related to construction-related emissions controls and development Parking and Transportation Demand Management Plans, as identified in at the end of the CEQA Checklist (for reference, these are SCA 19 and 71).

Odor Impacts (Criterion 2e)

Development under the WOSP would result in the exposure of additional residents within the WOSP to the potential for odor complaints due to the EBMUD Waste Treatment Facility and various industrial and food processing-related land uses. Development of the WOSP would result in significant and unavoidable impacts with regard to odor impacts according to WOSP EIR Impact Air-3.

The Proposed Project would involve the construction new residences within a mile or two miles of the odor generating land uses consistent with the analysis contained in the WOSP EIR. No SCAs or mitigation measures, however were previously identified that would apply to the Proposed Project and the impact would remain significant and unavoidable.

BIOLOGICAL RESOURCES

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
3. Biological Resources • 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 (CDFW) or U.S. Fish and Wildlife Service (USFWS);	I	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;	I	☐	☐
c) Have a substantial adverse effect on federally protected wetlands (per Section 404 of the Clean Water Act) or state protected wetlands, through direct removal, filling, hydrological interruption, or other means;	I	☐	☐

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
3. Biological Resources • Would the project:			
d) Substantially interfere 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;	I	☐	☐
e) Fundamentally conflict with the City of Oakland Tree Protection Ordinance (Oakland Municipal Code [OMC] Chapter 12.36) by removal of protected trees under certain circumstances; or	I	☐	☐
f) Be inconsistent with an adopted HCP, NCCP or other approved local, regional, or state habitat conservation plan.	I	☐	☐

Special-Status Species, Wildlife Corridors, Riparian and Sensitive Habitat, Wetlands, Tree and Creek Protection (Criteria 3a through 3f)

As described in the WOSP EIR, the WOSP Area is within and surrounded by a fully developed urban environment, and impacts of development on biological resources under the WOSP would be less than significant. Few special-status animals or plant species are present in the WOSP Area, and no wetlands, drainages, riparian or aquatic habitats that could support migratory fish or birds are present. In addition, very little natural vegetation exists; and because this vegetation is not connected to other nearby natural habitats, it would not constitute a wildlife corridor. There are no natural sensitive communities in the WOSP Area. The EIR identified landscape trees in the WOSP Area as potential nursery sites for nesting birds.

Impact Bio-1 concluded that future development pursuant to the WOSP would not have a substantial direct adverse effect on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS. However, tree removal, building demolition, and other construction activities can cause disturbance, noise, or loss of habitat for resident or migratory birds and mammals, including special-status species potentially occurring within the Planning Area as described in Impacts Bio-4 and -5. In addition, projects developed under the WOSP could cause harm to birds by increasing bird collisions with buildings.

Per Impact Bio-2, future development pursuant to the WOSP would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS. Impact BIO-3 states that future development pursuant to or consistent with the WOSP would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to,

marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

Project Analysis and Conclusion

The approximately 2.85-acre Property is developed with a vacant lot and staging area for Caltrans vehicles, and is completely covered with impervious surfaces. No special status species or habitats are present on the Property. No wetlands, drainages, riparian or aquatic habitats that could support migratory fish or birds are present on the Property. Landscaping and storm water treatment planters would be installed along the pedestrian mid-block corridor path and the interior courtyards.

Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR, nor would it result in new significant impacts related to biological resources that were not identified in the WOSP EIR. The WOSP EIR did not identify any mitigation measures related to biological resources, and none would be needed for the Proposed Project. SCAs related to tree removal and replacement and bird protection identified in **Appendix D** would apply to the Project. For reference, these are SCAs 25, 26, 27 and 28.

CULTURAL RESOURCES

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
4. Cultural Resources • Would the project:			
a) Cause a substantial adverse change in the significance of an historical resource as defined in CEQA Guidelines Section 15064.5. Specifically, a substantial adverse change includes physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be "materially impaired." The significance of an historical resource is "materially impaired" when a project demolishes or materially alters, in an adverse manner, those physical characteristics of the resource that convey its historical significance and that justify its inclusion on, or eligibility for inclusion on an historical resource list (including the California Register of Historical Resources, the National Register of Historic Places, Local Register, or historical resources survey form (DPR Form 523) with a rating of 1-5);	I	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5;	I	☐	☐

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
4. Cultural Resources • Would the project:			
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or	I	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries.	I	☐	☐

Historical Resources (Criterion 4a)

The WOSP EIR identified approximately one dozen local register properties within the Opportunity Areas. The WOSP does not propose demolition of any structures on these properties to allow new development and requires that any changes to these properties adhere to the Secretary of the Interior's Standards for the Treatment of Historic Properties. Impact CR-1 indicates that there are about a dozen Local Register properties within the Opportunity Areas. The WOSP does not propose demolition of any of these properties to allow for new development, and requires that any changes to these properties adhere to the Secretary of the Interior's Standards for the Treatment of Historic Properties. Implementation of the WOSP would not cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5

Archaeological and Paleontological Resources (Criteria 4b and 4c)

Development in accordance with the WOSP could cause substantial adverse change in the significance of an archaeological resource or destroy a unique paleontological resource or site or unique geologic feature per Impact CR-2. Therefore, all future development on and around the Project would be required to implement SCA 30 for archaeological resources to address potential impacts to sensitive cultural resources sites and SCA 29 for impacts to paleontological resources.

Human Remains (Criterion 4d)

Although the WOSP EIR did not identify any locations of buried human remains in the WOSP Area, the inadvertent discovery of human remains during ground-disturbing activities cannot be entirely discounted as set forth in Impact CR-3. In the event that human remains are discovered during excavation as part of Project construction, the project applicant would implement SCA-31 for Human Remains. SCA-31 would ensure that the appropriate procedures for handling and identifying the remains are followed, and thus would reduce impacts to a less-than-significant level.

Project Analysis and Conclusion

In the early 19th and 20th centuries, 7th Street was the commercial core of West Oakland. With the construction of the Cypress Freeway in the 1950's, the West Oakland neighborhood was cut in half. Later the construction of the main Post Office and the West Oakland BART station essentially destroyed the 7th Street commercial area. The WOSP EIR identified only 4 parcels within the 7th Street Opportunity Area that are of historical significance, all of which are to the west of the Property, closer to the BART station.

The Property was part of the Cypress Freeway that cut through the 7th Street neighborhood and has been largely vacant since the freeway was removed following the 1989 Loma Prieta earthquake. The WOSP EIR did not identify any historic resources related to the Property, and as a result the Proposed Project would not cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5.

Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR, nor would the Proposed Project result in new significant impacts related to cultural resources that were not previously identified in the WOSP EIR.

GEOLOGY, SOILS & GEOHAZARDS

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
5. Geology, Soils, and Geohazards • Would the project:			
a) Expose people or structures to substantial 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 or Seismic Hazards Map issued by the State Geologist for the area or based on other substantial evidence of a known fault; • Strong seismic ground shaking; • Seismic-related ground failure, including liquefaction, lateral spreading, subsidence, collapse; or • Landslides.	I	☐	☐
b) Be located on expansive soil, as defined in Section 1802.3.2 of the California Building Code (2007, as it may be revised), creating substantial risks to life or	I	☐	☐

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
property; result in substantial soil erosion or loss of topsoil, creating substantial risks to life, property, or creeks/ waterways.			

Seismic Hazards, Expansive Soils, and Soil Erosion (Criterion 5a and 5b)

This Addendum incorporates the impact analysis and mitigation measures contained in the WOSP EIR, and provides a site specific analysis of geologic, seismic and geotechnical conditions characterizing the Property based on the ENGEO Preliminary Geotechnical Report for 500 Kirkham Street dated October, 2015 attached as **Appendix A**.

According to the WOSP EIR, there are no Alquist-Priolo Earthquake Fault Zones and no known earthquake fault traces within the WOSP Area as discussed in Impact Geo-1. Future development in accordance with the WOSP would not expose people or structures to substantial adverse effects, including the risk of loss, injury or death, as a result of the surface rupture of a known earthquake fault per Impact Geo-2. Impact Geo-4 concluded that grading and excavations associated with future development pursuant to or consistent with the WOSP could result in the loss of topsoil through erosion. Portions of the Planning Area are underlain by unstable geologic conditions and soils, and potentially wells, pits, tank vaults or unmarked sewer lines, creating substantial risks to life or property. Future development under or consistent with the WOSP could expose people or structures to substantial adverse effects as set forth in Impact Geo-5. Development proposed under the WOSP would avoid and minimize potential geologic impacts through compliance with local and state regulations governing design and construction practices, such as the Seismic Hazards Mapping Act (in liquefaction hazard zones) and the California Building Code. Implementation SCA 34 that requires the preparation of soils and geotechnical reports specifying generally accepted and appropriate engineering techniques would reduce potential impacts to less-than-significant levels.

Project Analysis and Conclusion

Existing Seismic, Geology and Groundwater Conditions

As with the WOSP Planning Area, the Property is not located within a State of California Earthquake Fault Zone. Based on the 2010 USGS Quaternary Fault and mapping by Graymer (2000), the deposits underlying the subject site are comprised of Holocene and Pliestocene-aged Merritt Sand Deposits (Qms), described as very well sorted, well-drained eolian deposits. The Property is also underlain by a small portion of Artificial Fill (af) that is described as man-made deposits of various materials and ages.

Based on test pits conducted by ENGEO, the shallow subsurface conditions at the exploration locations predominantly consist of 6 to 8 inches of asphalt concrete (AC), over 1½ to 7 feet of silty sand and clayey sand fill. Below the fill, native soil encountered consists mainly of poorly graded sand, with the

exception of a layer of clayey sand encountered in one test pit located on the southern side of the site. The native soil at the site consists of Merritt Sand.

Groundwater levels range from approximately 10 to 12 feet below the existing ground surface (ENGEO, 2015). Historical high groundwater level in the area is mapped by the California Geological Survey at a depth between approximately 5 and 10 feet below the ground surface indicating that the depth to groundwater may vary across the site. Fluctuations in groundwater levels should be expected during seasonal changes or over a period of years because of precipitation changes, perched zones, changes in drainage patterns, and/or irrigation.

Fill

Fill extends between 1½ and 7 feet below existing grade. The existing pavement surfaces encountered were 6 to 8 inches of asphalt. Non-engineered fill can undergo excessive settlement, under new fill or building loads. Complete removal and recompaction of the existing fill will be conducted as part of the Project, unless, depending on total depth, fill quality and lateral extent, some fill would remain in place with deeper footings or stiffened foundations to span the areas of non-engineered fill.

Seismic Hazards

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking, liquefaction, densification, lateral spreading, and ground lurching. Based on topographic and lithologic data, the risk of regional subsidence/uplift, landslides, tsunamis, or seiches is considered low to negligible at the Property.

Since there are no known active faults crossing the Property and the site is not located within an Earthquake Fault Special Study Zone, ground rupture is unlikely at the Property.

An earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking at the site. All structures will be designed in accordance with the current California Building Code (CBC) requirements as further discussed in the ENGEO Geotechnical Report. Structures would be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse but with some structural as well as nonstructural damage.

Soil Liquefaction

Soil liquefaction results from loss of strength during cyclic loading, such as imposed by earthquakes. Soils most susceptible to liquefaction are clean, loose, saturated, uniformly graded, fine-grained sand. Empirical evidence indicates that loose to medium dense gravel, silty sand, low-plasticity silt, and some low-plasticity clay are also potentially liquefiable. In clay, liquefaction is commonly referred to as cyclic softening.

The native site soil encountered was primarily a sandy soil. ENGEO performed a detailed liquefaction potential analysis to estimate liquefaction potential. The results indicate that layers of silty sand at the Property are potentially liquefiable. The total liquefaction-induced settlement across the site is estimated at less than 2-inches. Because the Property is located in a mapped liquefaction hazard zone, a more extensive subsurface exploration program will be conducted as part of design-level studies.

Ground Lurching and Lateral Spreading

Ground lurching is a result of the rolling motion imparted to the ground surface during energy released by an earthquake. Such rolling motion can cause ground cracks to form in weaker soils. The potential for the formation of these cracks is considered greater at contacts between deep alluvium and bedrock. The ENGEO report concludes that the offset is expected to be minor at the Property.

Expansive Soil

ENGEO encountered high plasticity clay in the native soil in test pit (TP5) indicating a high expansion potential. Expansive soil shrinks and swells as a result of moisture changes and can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. The soil was moderate to highly expansive. Exposed soils will be kept moist during construction.

Groundwater

Shallow groundwater beneath the site could affect the construction phase of the proposed development by impeding grading activities, especially compacting soil below basement elevations; requiring dewatering during underground construction; and causing moisture damage to sensitive floor coverings. Additionally, shallow groundwater can cause moisture vapor through slabs causing excessive mold/mildew build-up, fogging of windows, and require permanent dewatering and waterproofing for below-grade structures.

Corrosivity

The soils are "mildly corrosive" to "corrosive", and as such, all buried iron, steel, cast iron, ductile iron, galvanized steel, and dielectric coated steel or iron would be properly protected against corrosion.

The Preliminary Geotechnical Report concludes that the proposed development is feasible on the Property from a geotechnical standpoint with incorporation of the geotechnical recommendations contained in the ENGEO Preliminary Geotechnical Report (see **Appendix A**). Future design-level geotechnical studies will be completed as part of the design level review in accordance with the SCAs are also incorporated into the Project development plans. The primary geotechnical concerns include the presence of non-engineered fill and shallow groundwater. A design-level geotechnical exploration would be conducted as part of the design process to validate the findings of the Preliminary Geotechnical Report. Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant geologic, seismic and soils impacts identified in the WOSP EIR, nor would the Proposed Project result in new significant impacts related to geologic and soils conditions that were not otherwise identified in the WOSP EIR. Applicable recommendations contained in the ENGEO Geotechnical Report have been incorporated into the Project.

GREENHOUSE GAS AND CLIMATE CHANGE

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
6. Greenhouse Gas and Climate Change • Would the project:			
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment, specifically: • For a project involving a land use development, produce total emissions of more than 1,100 metric tons of CO_2e annually AND more than 4.64 metric tons of CO_2e per service population annually. The service population includes both residents and employees of the project. The Project's impact would be considered significant if the emissions exceed BOTH the 1,100 metric tons threshold and the 4.6 metric tons threshold. Accordingly, the impact would be considered less than significant if the Project's emissions are below either of these thresholds.	I	☐	☐
b) Fundamentally conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing greenhouse gas emissions.	I	☐	☐

Greenhouse Gas Emissions (Criterion 6a)

Climate change and greenhouse gas emissions were addressed in the WOSP EIR and determined to be less than significant at both the plan level and at the project-level. However, an analysis of the Proposed Project using the previously recommended May 2011 BAAQMD CEQA Guidelines and Thresholds has been conducted to provide more information to the public and decision-makers, and in the interest of being conservative. Thus, although the analysis in this CEQA Checklist evaluates climate change and greenhouse gas emissions, there is no resulting significant CEQA impact, and the analysis is consistent with the findings of the WOSP EIR. Nevertheless, the City will impose its applicable SCAs.

Greenhouse Gas Emissions (Criterion 6a)

The WOSP EIR included GHG emissions and impacts analyses, and identified less-than-significant impacts with the incorporation of numerous applicable SCAs. Impact GHG-1 concluded that development facilitated by the WOSP would allow for the construction and operation of land uses that would produce

greenhouse gas emissions. The level of emissions is expected to exceed the project-level threshold of 1,100 annual tons of MTCO2e, but would not exceed the project-level efficiency threshold of 4.6 MTCO2e of annual emissions per service population nor would it exceed the Plan-level threshold of 6.6 MTCOC2e annually per service population. Development facilitated by the WOSP would thus not be expected to generate greenhouse gas emissions at levels that would result, in the aggregate, in significant or cumulatively considerable GHG emissions. No mitigation measures were necessary.

According to Impact GHG-2, the WOSP does not conflict with applicable plans, policies and regulations adopted for the purpose of reducing GHG emissions. Further under Impact GHG-3, new industrial and commercial growth facilitated by the WOSP could introduce new stationary sources of greenhouse gases. On an individual basis, certain development projects envisioned and enabled under the WOSP could exceed, on an individual and project-by-project basis, the project-level GHG threshold.

The Proposed Project would not result in a significant effect (cumulative) relating to GHG emissions, as analyzed below. Both BAAQMD and the California Air Pollution Control Officers Association (CAPCOA) consider GHG impacts to be exclusively cumulative impacts, in that no single project could, by itself, result in a substantial change in climate. Therefore, the evaluation of GHG emissions impacts evaluates whether the Proposed Project would make a considerable contribution to cumulative climate change effects.

Construction GHG Emissions

The CalEEMod model run for the construction emissions associated with the Proposed Project (under *2. Air Quality,* above) also calculated the GHG emissions that would be generated by construction activities of the Proposed Project. As shown in **Table GHG-1**, construction-related emissions would total 1,303 metric tons of CO_2 equivalents (CO_2e) during the entirety of the construction period. Annualized over an assumed project life of 40 years, construction-related GHG emissions would be 32.6 metric tons per year of CO_2e. These emissions are factored into the total operational GHG emissions calculation below to determine significance.

TABLE GHG-1
PROPOSED PROJECT GHG EMISSIONS (METRIC TONS PER YEAR)[A,B]

Project Component	CO_2e
Project	
Area Source Emissions	26.24
Energy Emissions	1,419.21
Mobile Emissions	3,477.06
Backup Generator[c]	19.73
Solid Waste	178.94
Water and Wastewater	145.31
Annualized Construction Emissions (Over 40 Years)	32.6
Total Increase[c]	5,279
Total Increase without Mobile Sources[c]	1,802
City of Oakland Screening Threshold	1,100
Total Emissions per Service Population (1083 residents + 133 employees)	1.50
City Emissions per Service Population Threshold	4.6
Significant?	No

[a] Project operational emissions estimates were made using CalEEMod, version 2013.2.
[b] The GHG analysis relied on inputs from the Transportation Analysis by Abrams Associates.
c Emissions from stationary sources such as backup generators are assessed under a separate 10,000 metric ton per year threshold.

Operational GHG Emissions

The Proposed Project would generate GHG emissions from many of the same sources as presented in air quality **Tables AIR-1** and **AIR-2** (under *2. Air Quality*, above). Additionally, GHGs would be generated indirectly by increased electrical demand, increased water and wastewater demand, and increased solid waste generation.

The total operational GHG emissions for the Proposed Project are presented in **Table GHG-1.** This table presents the project-related GHG emissions from all sources and assesses the impact relative to City thresholds. Emissions from stationary sources permitted by the BAAQMD are assessed separately from other emissions relative to a threshold of 10,000 metric tons per year of CO_2e. Emissions from the backup diesel generator would be below this threshold and therefore less than significant. Therefore, the Proposed Project would have an equal or less severe GHG impact compared to that previously identified in the WOSP EIR.

As discussed in the supplemental attachments to this document, the Proposed Project meets the criteria for a residential or mixed use "transit priority project," and is located within a "Regional Center" Priority Development Area (PDA) pursuant to the Plan Bay Area, which represents the Sustainable Communities Strategy (SCS) for the greater San Francisco Bay Area (MTC, 2013). Environmental documents for such projects need not analyze global warming impacts resulting from cars and light duty trucks. A lead agency should consider whether such projects may result in GHGs from other sources, however, consistent with the CEQA Guidelines. Consequently, if the project meets the requirements of a transit priority project, its mobile source need not be included in the assessment of GHG impacts. For this

reason, **Table GHG-1** presents the project-related GHG emissions without the mobile emissions, as permitted per CEQA Guidelines Section 15183.5 (c).

As shown in **Table GHG-1**, the Proposed Project would exceed the threshold of 1,100 metric tons of CO2e per year but would not exceed the City's 4.6 metric tons of CO2e per service population threshold. Therefore, the GHG emission impact would be less than significant. The City's GHG reduction plan SCA would not be triggered because the proposed residential component does not exceed 500 units, and it would be within the impacts GHG evaluated for the WOSP. Numerous other City of Oakland SCAs that would contribute to minimizing potential GHG emissions from construction and operations of development projects would apply to the Proposed Project; they pertain to alternative transportation facilities (bicycles and BART), construction equipment emissions, transportation demand management, construction waste reduction and recycling, as well as California Green Building Standards.

Consistency with GHG Emissions Plans and Policies (Criterion 6b)

The Proposed Project would comply with the Oakland Energy and Climate Action Plan, current City Sustainability Programs, and General Plan policies and regulations regarding GHG reductions and other local, regional and statewide plans, policies and regulations that are related to the reduction of GHG emissions and relevant to the Proposed Project. Specifically, the Proposed Project would also be consistent with the State's Updated Climate Change Scoping Plan and the City of Oakland's Energy and Climate Action Plan in that it will include a number of sustainability design features. The Proposed Project would comply with the Green Building ordinance and requirements. Additionally, the Proposed Project is located within a "Regional Center" Priority Development Area (PDA) pursuant to the Plan Bay Area, which represents the Sustainable Communities Strategy (SCS) for the greater San Francisco Bay Area; as discussed below and the Proposed Project meets all conditions for qualification as a transit priority project with respect to the SCS, as discussed below.

Transit Priority Project

As introduced above, per CEQA Guidelines Section 15183.5 (c), environmental documents for certain residential and mixed use projects and transit priority projects, as defined in Section 21155 of the Public Resources Code, that are consistent with the general use designation, density, building intensity and applicable policies specified for the project area in an applicable SCS or alternative planning strategy need not analyze global warming impacts resulting from cars and light duty trucks. A lead agency should consider whether such projects may result in GHGs from other sources, however, consistent with the CEQA Guidelines. Consequently, if the project meets the requirements of a transit priority project, its mobile source emissions need not be included in the assessment of GHG impacts.

Section 21155 of the *California Public Resources Code* defines transit priority projects as projects which:

- Contain at least 50 percent residential use, based on total building square footage and, if the project contains between 26 percent and 50 percent nonresidential uses, a floor area ratio of not less than 0.75;
- Provide a minimum net density of at least 20 dwelling units per acre; and
- Be located within one-half mile of a major transit stop or high-quality transit corridor included in a regional transportation plan. A major transit stop is as defined in Section 21064.3, except that, for purposes of this section, it also includes major transit stops that are included in the applicable regional transportation plan. For purposes of this section, a high quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. A project shall be considered to be within one-half mile of a major transit stop or high-quality transit

corridor if all parcels within the project have not more than 25 percent of their area farther than one-half mile from the stop or corridor and if not more than 10 percent of the residential units or 100 units, whichever is less, in the project are farther than one-half mile from the stop or corridor.

The project proposes an approximately 387,965 square feet of residential uses and approximately 79,037 square feet of non-residential (retail and school) uses. Based on that distribution of uses, 86% of the total project square footage is for residential use. The Proposed Project meets condition (1) above for qualification as a transit priority project. The Project proposes a maximum of 426 residential units on a parcel of 2.85 acre, which is equivalent to 135 dwelling units per acre. Consequently, the Proposed Project meets condition (2) above for qualification as a transit priority project.

Finally, a major transit stop is defined in Section 21064.3 of the California Public Resources Code as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute period. An entrance to the West Oakland BART station is approximately 500 feet from the western property boundary. Other transit lines and major transfer points are located along 7th Street within one to three blocks from the Property. Consequently, the Proposed Project meets all three conditions above for qualification as a transit priority project. Therefore, pursuant to Section 15183.5 (c) of the CEQA Guidelines, the mobile source emissions of the project need not be included in the assessment of GHG impacts in the environmental document.

Project Analysis and Conclusion

Project Construction GHG Emissions

The CalEEMod model run for the construction emissions associated with the proposed Alternative also calculated the GHG emissions that would be generated by construction activities of the Project as shown in **Table GHG-2**, construction-related emissions would total 1,147 metric tons of CO_2 equivalents (CO_2e) during the entirety of the construction period. Annualized over an assumed project life of 40 years, construction-related GHG emissions would be 28.7 metric tons per year of CO_2e. These emissions are factored into the total operational GHG emissions calculation below to determine significance.

TABLE GHG-2 PROJECT GHG EMISSIONS (METRIC TONS PER YEAR)[A,B]

Project Component	CO_2e
Project	
Area Source Emissions	18.82
Energy Emissions	1,186.80
Mobile Emissions	2,783.77
Backup Generator[C]	19.73
Solid Waste	145.04
Water and Wastewater	108.75
Annualized Construction Emissions (Over 40 Years)	28.7
Total Increase[C]	4,291
Total Increase without Mobile Sources[C]	1,508

City of Oakland Screening Threshold	1,100
Total Emissions per Service Population (777 residents + 133 employees)	1.66
City Emissions per Service Population Threshold	4.6
Significant?	No

[a] Project operational emissions estimates were made using CalEEMod, version 2013.2.
[b] The GHG analysis relied on inputs from the Transportation Analysis by Abrams Associates.
c Emissions from stationary sources such as backup generators are assessed under a separate 10,000 metric ton per year threshold.

Project Operational GHG Emissions

The Project would generate GHG emissions from many of the same sources as presented in air quality **Tables AIR-1** and **AIR-2** (under *2. Air Quality*, above). Additionally, GHGs would be generated indirectly by increased electrical demand, increased water and wastewater demand, and increased solid waste generation.

The total operational GHG emissions for the Project are presented in **Table GHG-2**. This table presents the project-related GHG emissions from all sources and assesses the impact relative to City thresholds. Emissions from stationary sources permitted by the BAAQMD are assessed separately from other emissions relative to a threshold of 10,000 metric tons per year of CO_2e. Emissions from the backup diesel generator would be below this threshold and therefore less than significant. Therefore, the project would have an equal or less severe GHG impact compared to that previously identified in the WOSP EIR.

The Project meets the criteria for a residential or mixed use "transit priority project," and is located within a "Regional Center" Priority Development Area (PDA) pursuant to the Plan Bay Area, which represents the Sustainable Communities Strategy (SCS) for the greater San Francisco Bay Area (MTC, 2013). Environmental documents for such projects need not analyze global warming impacts resulting from cars and light duty trucks. Consequently, if the project meets the requirements of a transit priority project, its mobile source need not be included in the assessment of GHG impacts. For this reason, Table GHG-1 presents the project-related GHG emissions without the mobile emissions, as permitted per CEQA guidelines Section 15183.5 (c).

As shown in **Table GHG-2**, the Project would exceed the threshold of 1,100 metric tons of CO2e per year but would not exceed the City's 4.6 metric tons of CO2e per service population threshold. Therefore, the GHG emission impact would be less than significant. The City's GHG reduction plan SCA would not be triggered because the residential component of the Project Alternative is less than 500 units, therefore disqualifying it as a "very large project". Numerous other City of Oakland SCAs that would contribute to minimizing potential GHG emissions from construction and operations of development projects would apply to the Project; they pertain to alternative transportation facilities (bicycles and BART), construction equipment emissions, transportation demand management, construction waste reduction and recycling, as well as California Green Building Standards. Included are SCA 71 (Parking and Transportation Demand Management), SCAs H and I (Compliance with Green Building Ordinance), SCA 36 (Waste Reduction and Recycling) SCA 75 (Construction Storm water Pollution Prevention Plan), and SCA 80 (Post-Construction Stormwater Pollution Prevention Plan).

Conclusion

Based on the analysis above, implementation of the Proposed Project would not result in a new significant impact regarding GHG emissions or compliance with applicable plans, policies, or regulations adopted for the purposes of reducing greenhouse gas emission. Additionally, because of the size of the project, City of Oakland SCAs related to GHG emissions would ensure a less-than-significant impact with the Proposed Project. Additionally, the implementation of other mitigation measures and City of Oakland SCAs that apply to the construction and operation of the Proposed Project would help minimize GHG emissions: SCA #71 (Parking and Transportation Demand Management), SCAs 77 and 78 (Compliance with Green Building Ordinance), SCA 74 (Waste Reduction and Recycling) SCA 46 (Construction Stormwater Pollution Prevention Plan), and SCA 50 (Post-Construction Stormwater Pollution Prevention Plan).

HAZARDS AND HAZARDOUS MATERIALS

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
7. Hazards and Hazardous Materials • Would the project:			
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;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; • Create a significant hazard to the public through the storage or use of acutely hazardous materials near sensitive receptors; Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (i.e., the "Cortese List") and, as a result, would create a significant hazard to the public or the environment;	I	☐	☐
b) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;	I	☐	☐
c) Result in less than two emergency access routes for streets exceeding 600 feet in length unless otherwise determined to be acceptable by the Fire Chief, or his/her designee, in specific instances due to climatic,	I	☐	☐

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
geographic, topographic, or other conditions; or			
d) Fundamentally impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.		☐	☐

Exposure to Hazards, Hazardous Materials Use, Storage and Disposal (Criterion 7a)

The WOSP EIR determined that development under the WOSP could result in construction activities that use hazardous materials, as well as ongoing commercial activities that involve the use of chemicals that are considered hazardous materials. Adoption and development under the WOSP could therefore require the transportation, use, and storage of additional quantities of hazardous materials to new businesses and entities. In addition, the EIR determined that demolition under the WOSP could result in disturbance of hazardous building materials, such as lead-based paint, asbestos, and polychlorinated biphenyls (PCBs). The transportation, use, and storage of all hazardous materials would be required to follow the applicable laws and regulations adopted to safeguard workers and the Impact Haz-5: The Planning Area is not located within an airport land use plan area or within two miles of a public airport or public use airport, or near a private airstrip. In addition, development under the WOSP would be subject to the City of Oakland's SCAs pertaining to best management practices for hazardous materials; removal of asbestos and lead-based paint; and other hazardous materials and wastes, including those found in the soil and groundwater, which would reduce impacts to less-than-significant levels.

Status of Project Site Contamination and Remediation

In 1994, Caltrans entered into a Voluntary Cleanup Agreement (VCA) with the California Department of Toxic Substances Control (DTSC) for the Cypress Freeway Relocation Project and East Bay Municipal Utility District Sewer Line Realignment in Oakland and Emeryville, California. The reconstruction project covered 34 separate properties, including the 500 Kirkham Street property (also referred to as, the "Site"). The VCA was subsequently amended twice in 1996, and once in each 1997, 1999, and 2002.

According to a site investigation report prepared by Professional Service Industries, Inc. (PSI), all on-site structures were demolished in April 1995 and one approximately 2,000-gallon underground storage tank (UST) was removed from the Site on August 30, 1995. Petroleum hydrocarbons were detected in soil and groundwater samples collected from the UST excavation pit. Heavy metals were detected in a composite sample collected from the excavated soil stockpile. In November 1995, the southwest portion of the Property was over-excavated and a total of 92 confirmation samples were collected from the excavation pit. Twenty-five chemicals were detected in the soil samples, including polychlorinated biphenyls (PCBs), which were found at concentrations exceeding the Region 9 Preliminary Remedial Goals (PRGs), established by the U.S. EPA. The EnviroStor database record for the Property maintained

by the DTSC notes the completion of soil excavation to 6 feet below the ground surface (bgs). In 2000, PSI installed four monitoring wells at the Site and collected soil samples from depths of 6.5 and 7 feet. Low levels of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and heavy metals were detected in the soil samples. Low levels of total petroleum hydrocarbons as gasoline (TPH-g) and diesel (TPH-d), VOCs, SVOCs, and heavy metals were detected in groundwater beneath the Site. The report concluded that groundwater monitoring should continue at the Property on a quarterly basis. However, groundwater monitoring data for 2001 and beyond could not be located and it is unclear whether quarterly groundwater monitoring occurred at the Property.

The Phase II Investigation performed by Northgate consisted of the collection of soil samples from 16 soil borings advanced to depths of 10 to 15 feet bgs, collecting grab groundwater samples from nine of the boring locations, and redeveloping and sampling three of four existing groundwater monitoring wells. Soil and groundwater samples were selectively analyzed for total petroleum hydrocarbons (TPH), VOCs, SVOCs, organo-chlorine pesticides, PCBs, and metals. Northgate's Phase II Investigation report concluded the following:

- Soil in the vicinity of boring B-11, located along the western property boundary, appears to be locally impacted by TPH-g. The concentration of TPH-g at 6-feet bgs exceeds both the Tier 1 (residential) and commercial/industrial land use environmental screening levels (ESLs) established by the California Regional Water Quality Control Board. Soil in this area should be excavated and removed off-site or encapsulated beneath an engineered cap or beneath proposed structures as appropriate.
- Shallow soil in several locations throughout the Site (borings B-8, B-9, and B-13) contains concentrations of total petroleum hydrocarbons as oil (TPH-o) above the Tier 1 (residential land use) ESL. Shallow soil in these areas should be excavated and removed off-Site or encapsulated beneath an engineered cap or beneath proposed structures as appropriate. Given the long industrial use of the Site, localized areas of hydrocarbon impacted soil could be encountered elsewhere. Additional evaluation should be performed for any impacted soil encountered during Site grading activities to confirm soils management measures.
- Elevated concentrations of total lead were measured in soil samples collected from the elevated roadway, located along the northern Site boundary. Total lead concentrations in individual samples exceed the California Human Health Screening Level (CHHSL) for residential land use established by the DTSC. However, when averaged, the total lead concentration in the four samples collected from the roadway only slightly exceeds the residential land use standard. The measured concentrations of lead do not exceed the CHHSL for commercial/industrial land use. Soil with lead above 80 milligrams per kilogram (mg/kg) should be excavated and removed off-Site for the residential area, or selectively relocated to commercial development areas of the Site or encapsulated beneath an engineered cap or beneath proposed structures as appropriate.
- Soluble (leachable) lead test results indicate that any soil from the main body of the Site containing total lead greater than 50 mg/kg could potentially contain soluble lead above the Soluble Threshold Limit Concentration (STLC) of 5 milligrams per liter (mg/L), which would classify the soil as a hazardous waste for off-Site landfill disposal purposes. Any soil that will be removed from the Site shall be tested for total and soluble lead prior to off-Site disposal.
- Petroleum-related VOCs are present in groundwater beneath the southwestern portion of the Site, in close proximity to the location of a former on-Site UST. However, the reported concentrations of petroleum-related VOCs do not exceed their respective ESLs for vapor intrusion or the Maximum Contaminant Levels (the State primary drinking water standards, or MCLs), where established. Northgate concluded that the petroleum-related VOCs in groundwater appear to be limited in extent and do not represent a significant concern for potential Site redevelopment.

- Chlorinated VOCs are present in groundwater beneath the southern portion of the Site, at boring B-13 and in well JA-4, located down gradient of boring B-13. PCE, TCE, and several breakdown products were reported at concentrations above their respective MCLs but did not exceed their respective ESLs for vapor intrusion. Northgate concluded that the VOCs in groundwater are unlikely to represent a significant environmental concern, as shallow groundwater in this area is not expected to be used for drinking water. However, the source area and full extent of VOCs in groundwater beneath the Site have not been fully defined, and additional investigation may be warranted. Any construction dewatering performed at the Site will account for VOCs in groundwater.

Project Analysis and Conclusion

Based on the Northgate report recommendations, the developer is implementing the following soils management program to reduce the potential for significant hazardous materials impacts.

For the ground-level commercial development scenario, the Property would be remediated to meet commercial/industrial land use standards. For the mixed use development scenario, if ground floor residential uses are proposed, the Property would be remediated to meet unrestricted residential land use standards. For each scenario, it is assumed that soils containing chemical constituents above their respective screening standards for residential or commercial land use may be excavated and removed from the Property, or alternatively, may be encapsulated as appropriate at the Property.

Petroleum Hydrocarbons

Petroleum hydrocarbons as gasoline and xylenes are present above residential and commercial land use ESLs at a depth of six feet bgs along the western edge of the Site at boring B-11. Hydrocarbons as oil are present above the residential land use ESLs at a depth of 1 foot bgs at boring B-13 and B-9, and at a depth of 5 feet bgs at boring B-8. Oil is not present above the commercial land use ESL in samples collected by Northgate. For the residential areas, the following excavation areas are proposed for Site mitigation, subject to additional characterization testing and volumetric revision:

1. Excavation of a 50 x 50 foot area to a depth of 8 feet bgs at boring B-11;
2. Excavation of 50 x 50 foot areas to a depth of 3 feet bgs at borings B-13 and B-9;
3. Excavation of a 100 x 100 foot area to a depth of 6 feet bgs at boring B-8.

Based on the overall average concentration of lead measured in soil samples from these borings (about 40 mg/kg), we have assumed that the soil will not be classified as California Hazardous Waste based on its soluble lead content.

For ground-level residential development, approximately 3,500 in-place cubic yards, or 5,600 tons, assuming a conversion factor of 1.6 tons per in-place cubic yard, would be excavated. The soil will likely be classified as non-hazardous waste and accepted for disposal at the Waste Management, Incorporated facility in Altamont, California.

For a proposed ground-level commercial land use development, only excavation No. 1 above would be performed, and in this scenario, the estimated excavated soil volume would be approximately 740 cubic yards (1,184 tons). Similarly, this soil may be encapsulated as appropriate at the Property, or, if desired, excavated soil may be removed from the Site, which would require additional laboratory analysis to classify these materials for appropriate disposal. The soil will likely be classified as non-hazardous waste and accepted for disposal at the Waste Management, Incorporated facility in Altamont, California.

Metals

Three of the four soil samples collected from the elevated roadway area on the northern portion of the Site contain lead above the residential land use CHHSL of 80 mg/kg. The average concentration of the four samples is 88 mg/kg. Under the assumptions used for this Site mitigation evaluation, this soil would be removed from the Site for an unrestricted ground-floor residential development scenario. The soil could be re-used on-Site under encapsulated beneath an engineered cap or beneath proposed structures as appropriate if additional soil is needed for Site development (or to replace soil excavated and removed during petroleum hydrocarbon mitigation). If the soil is not needed, it would be removed from the Site.

Based on the testing performed to date, if soil is to be removed from the Site, it would likely be disposed of off-site at an approved landfill as non-hazardous waste, assuming an in-place soil volume of up to approximately 4,600 cubic yards (7,360 tons). Additional laboratory analysis of these materials would be required to confirm this disposal classification.

Groundwater Mitigation

Based on the testing performed, groundwater remediation would not likely be necessary for either residential or commercial land use development. This would be confirmed with additional groundwater sampling on the Property. Additional investigation of the source and extent of VOCs in ground water measured at boring B-13 and well JA-4 would be performed prior to grading. This additional investigation to confirm the extent of contamination would include analysis of soil samples collected from four additional borings located in the area of B-13 and JA-4, sampling of the two existing groundwater monitoring wells, and installation of four additional groundwater monitoring wells (one at the former UST location, one upgradient of the former UST, and two off-site wells).

With respect to potential impacts to indoor related to groundwater, all of the detected concentrations of VOCs are well below their respective ESLs for evaluating potential vapor intrusion into buildings established by the RWQCB. A soil gas investigation may be needed in areas shown to contain elevated levels of volatile organic compounds (VOCs) in soil, such as localized areas of the southwestern portion of the Site with the exception of soil vapor testing Geocon performed in this area as described in the Geocon PSI.

The source area and full extent of VOCs in subsurface groundwater at the Site have not been fully defined, and additional investigation may be warranted. Active groundwater cleanup actions have not generally been required at sites containing the relatively modest levels of petroleum hydrocarbons and VOCs measured in groundwater at the subject Site to date. Alternative strategies for managing potential impacts related to the modest levels of VOCs in groundwater at the Site are appropriate and consistent with the WOSP EIR mitigation measures. Typical solutions could include sub-slab vapor barriers and venting systems in new buildings consistent with the WOSP.

Additional investigation will be performed to further delineate and confirm the extent of the potential impacts to soil, soil gas, and groundwater at the site. The objective of the groundwater investigation is to collect further data to validate earlier groundwater investigations that demonstrated active remedial actions are not required for the relatively modest levels of groundwater contamination at the Property. In the event that further groundwater investigations conclude contaminant levels exceed applicable standards for unrestricted use in the case of residential mixed use development, further groundwater remediation may be required in accordance with the WOSP EIR mitigation measures.

Hazardous Materials within a Quarter Mile of a "School" (Criterion 7b)

The Proposed Project anticipates a school in the WOSP Area. Impact Haz-4 concluded that all schools within the Planning Area are located within ¼ mile of an existing permitted hazardous materials use or identified contamination. The WOSP could facilitate the addition of new businesses that emit hazardous emissions or handle hazardous materials or acutely impact sensitive receptors. Development under the WOSP would be required to comply with the City of Oakland's Ordinances and General Plan Policies, which require hazardous material handlers within 1,000 feet of a school or other sensitive receptor to prepare a Hazardous Materials Assessment Report and Remediation Plan. Additionally, those handling or storing hazardous materials would be required to prepare a Hazardous Materials Management Plan and Hazardous Materials Business Plan, as required by Alameda County and a City of Oakland SCA; preparation of these plans would reduce impacts to less-than-significant levels.

Emergency Access Routes (Criteria 7c)

The WOSP EIR determined that construction under the WOSP would result in temporary road closures, which would require traffic control plans to ensure at least two emergency access routes are available for streets exceeding 600 feet in length, per City of Oakland's Ordinances and General Plan Policies. Compliance with all applicable requirements would reduce potential impacts to a less-than-significant level. Impact Haz-7 determined that the Planning Area is located in an urbanized part of Oakland, within a non Very High Fire Hazard Severity Zone as mapped by the California Department of Forestry and Fire Protection, and well outside of the City's Fire Prevention and Assessment District boundary. Per Impact Haz-6, many of the development Opportunity Sites under the proposed Specific Plan are located along these streets identified as Emergency Evacuation Routes, potentially interfering with an emergency response plan or emergency evacuation plan.

The Proposed Project would not change the surrounding streets or roadways, or limit emergency access or plans. Any temporary roadway closures required during construction of the Proposed Project would be subject to City of Oakland review and approval, to ensure consistency with City of Oakland requirements.

Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR, nor would it result in new significant impacts related to hazards and hazardous materials that were not identified in the WOSP EIR. The WOSP EIR did not identify any mitigation measures related to hazards and hazardous materials, and none would be needed for the Proposed Project. SCAs related to asbestos removal; lead-based paint / coatings; PCBs; Environmental Site Assessment reports and remediation; health and safety plans; groundwater and soil contamination; hazardous materials business plans; fire safety phasing plan and site review by the Fire Services Division, as identified in at the end of the CEQA Checklist, would apply to the Proposed Project (for reference, these are SCAs 40, 41, 42, and 43).

HYDROLOGY AND WATER QUALITY

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
8. Hydrology and Water Quality • Would the project:			
a) Violate any water quality standards or waste discharge requirements; • Result in substantial erosion or siltation on- or off-site that would affect the quality of receiving waters; • Create or contribute substantial runoff which would be an additional source of polluted runoff; • Otherwise substantially degrade water quality; • Fundamentally conflict with the City of Oakland Creek Protection Ordinance (OMC Chapter 13.16) intended to protect hydrologic resources.	I	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or proposed uses for which permits have been granted);	I	☐	☐
c) Create or contribute substantial runoff which would exceed the capacity of existing or planned stormwater drainage systems; Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course, or increasing the rate or amount of flow, of a creek, river, or stream in a manner that would result in substantial erosion, siltation, or flooding, on- or off-site	I	☐	☐
d) Result in substantial flooding on or off site. Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, that would impede or redirect flood flows; • Expose people or structures to a substantial risk of	I	☐	☐

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
8. Hydrology and Water Quality • Would the project:			
loss, injury, or death involving flooding.			

Water Quality, Stormwater, and Drainages and Drainage Patterns (Criteria 8a and 8c)

The WOSP EIR determined that development in the WOSP Area would result in construction activities that would require ground disturbance, resulting in impacts to hydrology and water quality. Grading and excavations associated with future development pursuant to or consistent with the Specific Plan could expose underlying soils to erosion or siltation, leading to downstream sedimentation in stormwater runoff. However, with required implementation of City of Oakland Standard Conditions of Approval, impacts related to siltation would be reduced to less than significant levels. Impact Hydro-1 found that future development in accordance with the WOSP would not be subject to waste discharge requirements and would not violate any water quality standards or waste discharge requirements.

The WOSP EIR determined that many of the storm drain facilities in the WOSP Area are old and are approaching the end of design life. Operational activities such as increased vehicular use, landscaping maintenance and industrial operations could potentially introduce pollutants into stormwater runoff, resulting in degradation of downstream water quality.

Per Impact Hydro-5, the WOSP does not propose any changes to the existing drainage pattern within the Planning Area. All drainage and stormwater runoff is conveyed via underground pipes and conduits to pumping plants, which discharge runoff into the Bay. There are no surface water features or open drainage systems which would be altered, or where an increase in captured runoff may adversely affect the capacity of such features

The WOSP EIR identified recommended mitigation measures and several SCAs (46, 48 59, 50, and 51) that would reduce impacts to a less-than-significant level by minimizing runoff and erosion, as well as sedimentation and contamination to stormwater and surface water during construction activities.

Project Analysis and Conclusion

Project development would involve construction activities, generate stormwater runoff, and increase sewage requiring treatment at the wastewater treatment facility within the levels evaluated for the WOSP. Future development is not expected to result in discharge of water supply water requiring compliance with the General Permit for such discharges or an individual WDR/NPDES permit.

A 48 inch storm drain main is located in Kirkham Street and flows south to a 54" storm drain main in 5th Street. A series of inlets and 12 inch pipes are located on the Property. The Property is nearly 100% paved and impervious (Wood Rogers Technical Memorandum dated November 13, 2015, Feasibility Review – 500 Kirkham Street ("Wood Rogers Memorandum"). The flat topography of the Property would limit the potential for substantial soil erosion, and there are only limited areas on the Property where native topsoil has not been covered with impermeable surfaces such as paving and buildings. Site grading and construction activity, however, may expose underlying soils. If left unprotected during construction, such exposed soils could be carried via stormwater runoff into the storm drain system and/or into adjacent surface water, resulting in increased sedimentation as evaluated in the WOSP EIR.

Future development under the WOSP could result in increased pollution associated with development project generated stormwater runoff. Potential pollutants may include motor oil and other automotive fluids from spills and leaks, metals from brake pad dust gathered in the parking lots; pesticides, fertilizers and herbicides used in on-site landscaping; air pollutants deposited on roof tops and decomposition of roofing and roof gutter materials and other building materials; trash and excess irrigation water. These pollutants could enter the storm drainage system and eventually contribute to surface water quality degradation. Nonetheless, based on the fact that the Project will not generate an increase in impervious surfaces, and no upgrades to the existing storm drain system, the Project is not expected to result in additional impacts.

The Project will be required to comply with the C.3 provisions of the National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, which requires that recharge rates at the site of major development projects shall be at least equivalent to the recharge rate at the site before redevelopment. Additionally, the Project must demonstrate compliance with City of Oakland Storm Drainage Design Guidelines. These Guidelines require a net reduction of 25 percent in the peak stormwater runoff rate from new projects, to the extent possible, in an effort to better address City-wide storm drainage capacity. The Project would qualify for a Special Project Category C and thus would be eligible for LID Treatment Reduction Credits of 75% (Wood Rogers Memo, page 6). The Project has incorporated an approach to stormwater quantity and quality control that reduces long-term runoff by minimizing impervious cover and maximizing on-site infiltration in accordance with the C.3 requirements. Moreover, the Project would conduct capacity and operational assessments during design to validate the available capacity to serve the Project. The Project impacts would be less than significant with implementation of the City of Oakland SCAs 44, 45, and 48.

Groundwater Impacts (Criteria 8b)

Potable water is supplied to the WOSP Area through imported surface water by EBMUD, and groundwater is generally not used in the WOSP Area. The WOSP Area is primarily developed and covered in impervious surfaces, and the amount of water able to infiltrate the aquifer in the East Bay Plain groundwater basin would not substantially decrease with development under the WOSP. Impact Hydro-2 concluded that future redevelopment of existing developed properties and future development of vacant properties in WOSP pursuant to or consistent with the WOSP would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells) would drop to a level which would not support existing land uses or proposed uses for which permits have been granted. Additionally, compliance with the C.3 provisions of the National Pollutant Discharge Elimination System Municipal Stormwater Permit for the Alameda

County Clean Water Program would require that recharge rates at a project site be equivalent to the recharge rate at the site prior to development.

Project Analysis and Conclusion

As with the WOSP, the amount of water able to infiltrate the aquifer through pervious areas on the Property would not substantially decrease as a result of the Project because the property is a vacant site mostly covered in impervious surface. Development of the Property with new structures and uses would not substantially change the total area of impervious surfaces and thus would not substantially change groundwater recharge or the groundwater table level, or affect groundwater supplies.

Flooding and Substantial Risks from Flooding (Criteria 8d)

The WOSP EIR concluded that the Planning Area is not located within a 100-year or a 500-year flood hazard area as depicted on the National Flood Insurance Program Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency. All of West Oakland is designated Zone X, which means that it is an area determined to be an area of minimal flood hazard, outside the 0.2 percent annual chance floodplain. Implementation of the WOSP would not result in substantial flooding on- or off-site; would not expose people or structures to a substantial risk of loss, injury, or death involving flooding; would not impede or redirect flood flows or place within a 100-year flood hazard area structures which would impede or redirect flood flows; now would it place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Map. SCAs 55, 56 and 57 require regulatory permits prior to construction and preparation of hydrological calculations and would ensure that structures will not interfere with the flow of water or increase flooding would further reduce impacts to less-than-significant levels.

Project Analysis and Conclusion

The flood designation for the Property is shown on Flood Insurance Rate Map (FIRM) Panel 06001C006G dated August 3, 2009 and indicates that the Property is located within Zone X other Areas. The Property is not located within a special flood hazard area and would not expose residents to 100-year flood events. The Project would not result in a new significant or substantially more severe impact compared to the WOSP impacts

Dam Inundation (Criteria 8e)

The WOSP EIR concluded that the Planning Area is not subject to risk from a seiche or landslides. However, the western portion of the Planning Area, generally west of Mandela Parkway, is subject to tsunami inundation. The Alaska Tsunami Warning Center, State Warning System and OES emergency alert system, including the outdoor warning sirens in West Oakland, would provide early notification of an advancing tsunami allowing evacuation of people, although there could be property damage due to inundation.

Impact Hydro-7 also indicated that the portion of the Planning Area north of I-580 is located within the Temescal Lake dam failure inundation area and could be subject to flooding in the event of a catastrophic failure of the dam. The WOSP does not propose any land use changes or improvements to the area north of I-580, and would not affect established emergency procedures for the evacuation and control of populated areas below Temescal Lake dam. Therefore, the WOSP would not expose people or structures to a substantial risk of loss, injury or death involving flooding due to dam failure inundation.

Additionally, the WOSP EIR evaluated potential impacts to mineral resources and determined that future development pursuant to or consistent with the WOSP would not 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 or 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.

Project Analysis and Conclusion

The Property is not located within an area subject to dam inundation, tsunami, and seiche, and would not expose residents to flooding. The Project would not result in a new significant or substantially more severe impact compared to the WOSP impacts.

Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR, nor would it result in new significant impacts related to hydrology and water quality that were not identified in the WOSP EIR. The WOSP EIR identified no mitigation measures related to hydrology and water quality, and none would be required for the Proposed Project. The Proposed Project would be required to implement SCAs related to stormwater, drainages and drainage patterns, and water quality, as summarized above.

LAND USE, PLANS AND POLICIES

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
9. Land Use, Plans, and Policies • Would the project:			
a) Physically divide an established community;		☐	☐
b) Result in a fundamental conflict between adjacent or nearby land uses; or		☐	☐
c) Fundamentally conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect and actually result in a physical change in the environment.		☐	☐

Division of Existing Community, Conflict with Land Uses, or Land Use Plans (Criteria 9a through 9c)

The WOSP EIR determined that adoption and implementation of the WOSP would have less-than-significant land use impacts related to the division of an established community, potential conflicts with nearby land uses, or applicable land use plans, policies, and regulations. The WOSP would not disrupt or divide the physical arrangement of the West Oakland community or any surrounding community, but rather would improve certain existing conditions that currently divide the community per Impact LU-1.

Under Impact LU-2, the WOSP would not result in a fundamental conflict between adjacent or nearby land uses, but rather would result in a gradual improvement in compatibility between residential and other types of land uses. The WOSP would not fundamentally conflict with any applicable land use plan, policy or regulation adopted for the purpose of avoiding or mitigating an environmental effect and result in a physical change in the environment. In fact, the WOSP EIR concluded that implementation of the WOSP will ultimately help counteract existing conditions that have separated West Oakland from the rest of the City for decades and also gradually reduce conflicting land uses that currently disrupt the West Oakland community. The WOSP EIR also determined that no mitigation measures were required for any of the identified land use impacts.

The WOSP designates the project site as a "large opportunity site," meaning it is an underused property with the potential to accommodate a significant development that can enhance the character of the subarea. For these types of large opportunity sites, the WOSP emphasizes development with a mix of uses including retail, commercial, and residential uses.

Project Analysis and Conclusion

The Proposed Project is located on what was formerly the site of a portion of the Cypress Freeway, which cut through the heart of the West Oakland community. With the freeway gone, the Proposed Project provides an opportunity to revitalize a large section of 7th Street and strengthen the sense of community in the area. Rather than divide the community, the Proposed Project will help reestablish connections along 7th Street and contribute to the restoration of what was once a vibrant commercial corridor.

The WOSP rezoned the properties along 7th Street on either side of the BART Station to allow for high intensity commercial and residential uses that will take advantage of the area's unique transit opportunities. As found in the WOSP EIR, the rezoning created a unified district that reduces the potential for conflicts with surrounding land uses. The Proposed Project furthers the vision of the WOSP to create a mixed use transit village around the BART Station by activating the street with ground floor retail and incorporating high density residential uses designed to take full advantage of the nearby transit opportunities.

The WOSP EIR found that the WOSP would not fundamentally conflict with any land use plan, policy or regulation adopted for the purpose of avoiding or mitigating an environmental effect and result in a physical change in the environment. The Proposed Project complies with the land use regulations and development standards established by the WOSP and, thus, will not create any conflict with such land use plans, policies or regulations.

Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR,

nor would it result in new significant impacts related to land use, plans, and policies that were not identified in the WOSP EIR. The WOSP EIR did not identify any SCAs or mitigation measures related to land use, and none are necessary for the Proposed Project because it would not result in any new significant or substantially more severe land use impacts.

NOISE

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
10. Noise • Would the project:			
a) Generate noise in violation of the City of Oakland Noise Ordinance (Oakland Planning Code Section 17.120.050) regarding construction noise, except if an acoustical analysis is performed that identifies recommend measures to reduce potential impacts. During the hours of 7 p.m. to 7 a.m. on weekdays and 8 p.m. to 9 a.m. on weekends and federal holidays, noise levels received by any land use from construction or demolition shall not exceed the applicable nighttime operational noise level standard;	I	☐	☐
b) Generate noise in violation of the City of Oakland Noise Ordinance (Oakland Planning Code Section 17.120.050) regarding operational noise;	I	☐	☐
c) Generate noise resulting in a 5 dBA permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or, if under a cumulative scenario where the cumulative increase results in a 5 dBA permanent increase in ambient noise levels in the project vicinity without the project (i.e., the cumulative condition including the project compared to the existing conditions) and a 3-dBA permanent increase is attributable to the project (i.e., the cumulative condition including the project compared to the cumulative baseline condition without the project);	I	☐	☐
d) Expose persons to interior LDN or CNEL greater than 45 dBA for multi-family dwellings, hotels, motels, dormitories and long-term care facilities (and may be extended by local legislative action to include single-family dwellings) per California Noise Insulation Standards (CCR Part 2, Title 24); • Expose the project to community noise in conflict with the land use compatibility guidelines of the Oakland General Plan after incorporation of all	I	☐	☐

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
applicable Standard Conditions of Approval (see Figure 1); • Expose persons to or generate noise levels in excess of applicable standards established by a regulatory agency (e.g., occupational noise standards of the Occupational Safety and Health Administration [OSHA]); or			

Environmental Noise

The Property is located adjacent to environmental noise sources including BART trains, vehicles on I-880, and local traffic. The WOSP identifies the Property within the CNEL 85 dB noise contour (Figure 4.7-2), and identifies noise levels that correspond with the following noise levels from these sources:

BART – CNEL 76 to 72 dB, with hourly average Leq 71 dB
I-880 – CNEL 69 to 72 dB, with hourly average Leq 68 dB
7th Street – CNEL 68 to 72 dB, with hourly average Leq 68 dB

Ground-Borne Vibration

The WOSP outlines rail vibration criteria as published by the Federal Transit Administration (FTA). In summary, the project will locate the building approximately 56 feet from active BART tracks, which is within the 150-foot screening distance identified by the FTA for rail vibration.

Project Generated Noise

Section 17.120.050 of the Oakland Planning Code limits operational noise from stationary sources. The project would include garage exhaust fans and rooftop mechanical equipment. In addition, specific commercial tenants may generate noise that extends beyond the building shell (i.e., amplified music).

Project Generated Vibration

Section 17.120.060 of the Oakland Planning Code regulates vibration as follows: "All activities, shall be so operated as not to create a vibration which is perceptible without instruments by the average person at or beyond any lot line of the lot containing such activities." The project is not expected to include significant generators of ground-borne vibration.

Construction Noise and Vibration

The WOSP addresses construction noise and vibration, and includes a series of measures to be implemented so that noise and vibration from construction of the various projects will not generate significant impacts (on adjacent land uses). Projects in the WOSP area will be required to prepare and submit site specific construction noise and vibration control plans. Construction details, including schedule and equipment/process lists are not available at this time and the report will be prepared and submitted prior to construction.

Construction, Operational Noise and Vibration, Exposure of Receptors to Noise (Criteria 12a, 12b, 10c, and 12e).

The WOSP EIR determined that impacts related to construction and operations of development under the WOSP would be less than significant. Construction-related activities associated with development under the WOSP would temporarily increase ambient noise levels and vibration as indicated in Impact Noise-1. Implementation of SCAs would minimize construction noise impacts by limiting hours of construction activities; require best available noise control technology; require vibration monitoring for activities adjacent to historic structures; and require a project applicant and/or its contractors to notify any local residents of construction activities, and to track and respond to noise complaints.

Ongoing operational noise generated by stationary sources could generate noise in violation of the City of Oakland Noise Ordinance regarding operational noise as explained in Impact Noise-2. New development pursuant to the WOSP would not generate traffic noise resulting in a 5 dBA permanent increase in ambient noise levels in the project vicinity above levels existing without the WOSP as described in Impact Noise-3. During operations, mechanical equipment used in projects developed under the WOSP would generate noise; however, equipment would be standardized and would be required to comply with the City of Oakland Noise Ordinance. Potential impacts would be reduced with implementation of SCAs that would require that project design achieve acceptable interior noise levels for buildings; limit ground borne vibration at the project site; and require mechanical equipment comply with applicable noise performance standards.

As described in the WOSP EIR, noise measurements taken at various locations in the WOSP Area indicate that the ambient noise environment in the WOSP Area would be in the conditionally acceptable category for residential uses and in the normally acceptable category for commercial uses in the WOSP Area. The WOSP EIR identified an SCA that would ensure that project components are appropriately sound-rated to meet land use compatibility requirements throughout the WOSP Area. Impact Noise-5 concluded that development in accordance with the WOSP may generate operational ground-borne vibration at levels that would be perceptible beyond the property boundary, which would violate City of Oakland standards for operational vibration. The occupants of new residential and other noise-sensitive development facilitated by the WOSP could be exposed to community noise in conflict with the Land Use Compatibility Guidelines of the Oakland General Plan, and to interior noise standards.

The WOSP Area is located more than two miles outside of the Oakland International Airport 65 dBA Ldn/CNEL noise contour, which the Federal Aviation Administration regards as a significance threshold for noise-sensitive land uses. Therefore, the impacts of the Specific Plan related to airport noise would be significant. Potential effects of the environment on a project are legally not required to be analyzed or mitigated under CEQA. However, the WOSP EIR nevertheless analyzed potential effects of the environment on the project (i.e. siting new receptors near existing noise sources) in order to provide information to the public and decision-makers.

Project Analysis and Conclusions

Construction activities for the Proposed Project are expected to occur over approximately 24 months, and would entail demolition of the existing surface parking lot and paving; hazardous material remediation; minor excavation and shoring; foundation construction; and construction of the building and finishing interiors. The construction noise impacts were previously evaluated in the WOSP EIR and would not increase as a result of the standard construction activities proposed as part of the Project.

The Proposed Project includes mechanical equipment comparable to the stationary noise sources typical of mixed use residential development projects included in the WOSP. Standard equipment would be installed in accordance with the City of Oakland Noise Ordinance and the SCAs. Potential impacts would be reduced with a project design that is designed to achieve acceptable interior noise levels for buildings as further explained in Appendix C. This is considered a less than significant increase when compared to existing conditions or the conditions with the WOSP buildout, and as a result, the Project would not result in a new significant impact or in a substantial increase in the noise impacts identified in the WOSP EIR.

Traffic Noise (Criterion 10c)

The WOSP EIR determined that development under the Specific Plan would increase noise levels adjacent to nearby roads due to additional vehicles traveling throughout the WOSP Area. The increase in traffic noise from the Existing Plus Project scenario as compared to existing conditions would increase peak hour noise levels by less than 5 A-weighted decibels (dBA) at all studied roadway segments. The cumulative increases in traffic generated noise could also combine with stationary noise sources, such as rooftop mechanical equipment and back-up generators, to result in significant cumulative impacts. The WOSP EIR determined that no feasible mitigation measures are available, and that these impacts would remain significant and unavoidable, but would not substantially increase the impact on the surrounding area.

Project Analysis and Conclusion

A traffic memorandum prepared by Abrams Associates Traffic Engineering, Inc., dated 8 July 2015 and updated in March 2016, provides existing, project generated, and cumulative traffic volumes for six intersections in the project vicinity. The memorandum indicates the project will generate approximately 386 AM peak hour trips and 404 PM peak hour trips. Based on the intersection volumes, the project will increase existing vehicle noise along the local roadways by 3 dB or less (CNEL) during the AM and PM peak hours. This is considered a less than significant increase when compared to existing conditions or the conditions with the WOSP buildout, and as a result, the Project would not result in a new significant impact or in a substantial increase in the noise impacts identified in the WOSP EIR.

Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR, nor would it result in new significant impacts related to noise that were not identified in the WOSP EIR. The WOSP EIR did not identify any mitigation measures related to noise, and none would be necessary for the Proposed Project. The Proposed Project would be required to implement SCAs to reduce construction noise and vibration, achieve interior noise standards, and require mechanical equipment to meet applicable noise performance standards.

POPULATION AND HOUSING

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
11. Population and Housing • Would the project:			
a) Induce substantial population growth in a manner not contemplated in the General Plan, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extensions of roads or other infrastructure), such that additional infrastructure is required but the impacts of such were not previously considered or analyzed;	I	☐	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere in excess of that contained in the City's Housing Element; or • Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere in excess of that contained in the City's Housing Element.	I	☐	☐

Population Growth and Displacement of Housing and People (Criteria 11a and 11b)

The WOSP EIR determined that impacts related to population growth and displacement of housing and people due to development within the WOSP would be less than significant. Development under the WOSP would add up to 7,312 housing units and 37,493 residents to the WOSP Area between 2005 and 2035. This would represent approximately 2 percent of the total population growth projected for Oakland through 2035, and is consistent with the ABAG projections for household and employment growth for that period. Although development under the WOSP could require the demolition of existing housing units, existing regulations such as Housing Element policies, the Ellis Act (Government Code Sections 7060 through 7060.7), and the City of Oakland's Ellis Act Ordinance (Oakland Municipal Code Sections 8.22.400 through 8.22.480) would prevent significant impacts.

Project Analysis and Conclusion

The Proposed Project is within the allowable threshold for residential density set forth in the WOSP and studied in the WOSP EIR. Therefore, it will not add more housing units or residents in the WOSP Area than were previously studied in the WOSP EIR. Furthermore, the Property is currently vacant land, so the Proposed Project would not demolish or displace any existing housing units.

Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR, nor would it result in new significant impacts related to population and housing that were not identified in the WOSP EIR. The WOSP EIR did not identify any mitigation measures or SCAs related to population and housing, and none would be required for the Proposed Project.

PUBLIC SERVICES, PARKS AND RECREATION FACILITIES

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
12. Public Services, Parks and Recreation Facilities • Would the project:			
a) 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 following public services: - Fire protection; - Police protection; - Schools; or - Other public facilities.	I	☐	☐
b) Increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or • Include recreational facilities or require the construction or expansion of recreational facilities which might have a substantial adverse physical effect on the environment.	I	☐	☐

Public Services and Parks and Recreation (Criteria 12a and 12b)

The WOSP EIR determined that impacts related to fire and police protection, schools, and other public facilities would be less than significant. Although development under the WOSP would increase density and population in the WOSP Area, any corresponding increase in crime and need for police protection would likely be counteracted by the revitalization of the area as envisioned by the WOSP. Development

under the Specific Plan would generate a need for additional parkland, adding to the existing deficiency of parkland acreage, and would increase the use of existing parks and recreational facilities. No new public parks or recreational facilities are proposed as part of the Specific Plan. The increased demand would occur incrementally over the 25-year timeframe of the Specific Plan. The Specific Plan would not be expected to increase the use of existing parks and recreational facilities such that substantial physical deterioration of such facilities may occur or be accelerated.

The EIR identified SCAs that would reduce the potential impacts related to the increased need for fire protection by requiring all projects to implement safety features, and to comply with all applicable codes and regulations. Adherence to the General Plan's Open Space, Conservation and Recreation Element policies 3.1, 3.3, and 3.10 would reduce potential impacts to recreational facilities. In addition, any increases in need for police protection, fire protection, schools, or other public facilities would be mitigated by adherence to General Plan policies N.12.1, N.12.2, N.12.5, FI-1, and FI-2. No additions or expansions of parks or recreational facilities are proposed under the WOSP, and no new parks or recreational facilities, or expansion of existing parks or recreational facilities, were determined to be required under the WOSP.

Project Analysis and Conclusion

The Proposed Project's increase in demand for public services has been addressed in the WOSP EIR and because the Proposed Project was within the level of development contemplated under the WOSP, the Proposed Project would not result in significant or substantially more severe impacts.

In addition, the Proposed Project would provide private open space for the residential units, as described in the Project Description, above. A landscaped pedestrian corridor on 7th Street proposed by the project at 500 Kirkham is consistent with the development plan of the WOSP. In addition, the proposed building would be set back 9' 1/2 feet from the property line along 7th Street. A proposed school for up to 200 children would occupy the 6th story building on 7th street on the 3rd and 3rd floors with commercial uses on the ground floor.

Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR, nor would it result in new significant impacts related to the provision of public services and parks and recreation facilities that were not identified in the WOSP EIR. The WOSP EIR did not identify any mitigation measures related to public services and parks and recreation, and none would be required for the Proposed Project. The Proposed Project would be required to implement SCAs related to fire safety and compliance with building, fire, and public works code requirements, as identified at the end of the CEQA Checklist.

TRANSPORTATION AND CIRCULATION

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
13. Transportation and Circulation • Would the project: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit, specifically:			
a) Traffic Load and Capacity Thresholds • At a study, signalized intersection which is located outside the Downtown area and that does not provide direct access to Downtown, the project would cause the motor vehicle level of service (LOS) to degrade to worse than LOS D (i.e., LOS E or F) and cause the total intersection average vehicle delay to increase by four (4) or more seconds;	I	☐	☐
b) At a study, signalized intersection which is located within the Downtown area or that provides direct access to Downtown, the project would cause the motor vehicle LOS to degrade to worse than LOS E (i.e., LOS F) and cause the total intersection average vehicle delay to increase by four (4) or more seconds;	I	☐	☐
c) At a study, signalized intersection for all areas where the level of service is LOS F, the project would cause (a) the overall volume-to-capacity ("V/C") ratio to increase 0.03 or more or (b) the critical movement V/C ratio to increase 0.05 or more;	I	☐	☐
d) For a roadway segment of the Congestion Management Program (CMP) Network, the project would cause (a) the LOS to degrade from LOS E or better to LOS F or (b) the V/C ratio to increase 0.03 or more for a roadway segment that would operate at LOS F without the project; or	I	☐	☐
e) Cause congestion of regional significance on a roadway segment on the Metropolitan Transportation System (MTS) evaluated per the requirements of the Land Use Analysis Program of the CMP.	I	☐	☐

Criteria 13a through 13h

This section of the CEQA Checklist summarizes the findings of the transportation analysis completed for the Proposed Project.[3] The analysis is provided in two parts below as follows: the first part describes the WOSP EIR analysis for the EIR study intersections in the vicinity of the Proposed Project, and the impacts identified at those intersections; the second part compares the Proposed Project's impacts to those analyzed in the EIR, and provides additional analysis of project study intersections to supplement the analysis in the EIR.

WOSP EIR Analysis

The WOSP EIR analyzed transportation and circulation conditions in and around the WOSP Area under existing conditions and two future scenarios (Years 2020 and 2035), with and without the WOSP Development Program and transportation improvements. For the purposes of this analysis, these scenarios are referred to as: existing conditions and existing conditions plus Development Program (full buildout of the WOSP Development Program); Year 2020 no project and Year 2020 plus Development Program (partial buildout of the Development Program); and Year 2035 no project and Year 2035 plus Development Program (full buildout of the Development Program).

This discussion focuses on level of service (LOS) impacts at key intersections in the vicinity of the Proposed Project. Because the EIR determined that no significant impacts to transit, pedestrian, bicycle, and other related topics would occur under any of the scenarios, these topics are not discussed further herein.

Project Analysis and Conclusion

The transportation analysis completed for the Proposed Project determined that the project would not result in any significant impacts to vehicle queuing at the parking garages, transit, pedestrian, bicycle, and loading, consistent with the findings of the WOSP EIR.

The WOSP EIR analyzed the impacts of the WOSP development program on the roadway network serving the plan area. As noted in the EIR, the Development Program represents the reasonably foreseeable development expected to occur in by the year 2035. The WOSP and the EIR intend to provide flexibility in the location, amount, and type of development. Thus, the traffic impact analysis in the EIR does not assign land uses to individual parcels. Therefore, as long as the trip generation in the overall plan area remains below the levels estimated in the EIR, the traffic impact analysis presented in the EIR continues to remain valid for the Proposed Project.

Trip Generation

The total automobile trips generated by the Proposed Project would represent approximately 7% of the total traffic forecast to be generated by buildout of the WOSP Area. The up to 424 proposed residential units would represent approximately 30% of the 1,900 new residential units planned under the WOSP

for the area within one half mile of the West Oakland BART Station. The WOSP and EIR state that at the envisioned 24-acre mixed use Transit-Oriented Development planned at the West Oakland BART station there would be a range of between 1,325 to 2,308 new housing units. The average is a just over 1,800 units. Thus, the Proposed Project's location, uses, and access points are consistent with the assumptions used in the traffic impact analysis for the WOSP EIR.

Comparison of Project with the Development Program Analyzed in the WOSP EIR.

All of the EIR study intersections in the vicinity of the Proposed Project would continue to operate at acceptable LOS conditions under the existing conditions plus Development Program and Year 2020 plus Development Program.

Considering the project trip generation, and that the WOSP EIR analyzed the impacts at signalized intersections along most of the roadways that provide direct access to the project site, further analysis was conducted at three nearby signalized intersections that were not analyzed in the WOSP EIR. In addition to these signalized intersections, there were also three unsignalized intersections that were identified as requiring an analysis of traffic operations. The six additional intersections include:

1. 7th Street at Kirkham Street
2. 7th Street at Union Street
3. 5th Street at Mandela Parkway
4. 5th Street at Kirkham Street
5. 5th Street at the Proposed Project Entrance
6. 5th Street at Union Street

Project-generated vehicle trip distribution and assignments were derived from similar methodologies and assumptions included in the traffic analyses for the WOSP EIR as well as application of standard transportation planning methods, which include but not limited to: existing travel patterns, roadway access, and proximity to freeways. Intersection level of service (LOS) for each intersection was analyzed for the peak commute hours when the highest traffic volumes were recorded at each intersection during the morning and evening peak periods. Traffic counts for the six study intersections to the project site were collected by Abrams Associates in June and July of 2015 and then adjusted to be consistent with the higher peak hour volumes that were used in the WOSP EIR.

Figure 4 in Appendix B presents the lane configurations and traffic controls for each of the study intersections. Existing operational conditions at the six (6) study intersections have been evaluated according to the requirements set forth by the City of Oakland and Caltrans. Analysis of traffic operations was conducted using the 2010 Highway Capacity Manual (HCM) Level of Service (LOS) methodology analyzed with Synchro software. LOS D is the minimum standard that applies to intersections in the study area. The City of Oakland's Transportation/Traffic CEQA Thresholds of Significance were used to evaluate potential impacts at intersections that were forecast to be operating at LOS E or F in the future.

Existing Plus Project Traffic Operations - Figure 5 in Appendix B presents the existing traffic volumes at the study intersections and Figure 6 presents the existing plus project volumes. The cumulative volumes were based on the WOSP EIR traffic forecasts which equated to an increase of 28% to the year 2035. As shown in Table 5, all intersections are forecast to continue operating with acceptable operations (LOS D or better) under existing plus project conditions.

The Proposed Project will also include improvements to the intersection of 7th Street and Union Street. A separate southbound left turn lane will be added on Union Street and the existing traffic signal will be modified to provide for protected left turns on the eastbound and westbound approaches along with a protected overlap phase for the northbound right turn movement. The Project also includes a Traffic Management Plan for drop-off and pick-up of students before and after school, as well as a robust Project Transportation Demand Management Plan. The project includes bicycle parking to encourage alternative transportation modes.

Cumulative Plus Project Traffic Operations - Figure 7 in Appendix B presents the cumulative traffic volumes at each of the study intersections and Figure 8 presents the cumulative plus project volumes. The cumulative volumes were based on the WOSP EIR traffic forecasts which equated to an increase of 28% to the year 2035. As shown all intersections are forecast to continue having acceptable operations (LOS D or better) under cumulative plus project conditions with the exception of the intersection of 7th Street and Union Street. The increase in traffic generated by the proposed project combined with growth associated with buildout of the City's General Plan is forecast to cause significant impacts to traffic operations at the intersection of 7th Street and Union Street (i.e. it would cause this intersection to exceed the established standard of LOS D) but the Project incorporates additional roadway improvements to avoid any impacts at this location as described in Appendix B and the project description. Therefore, the Proposed Project would not result in significant impacts to the project study intersections, either under the existing plus Proposed Project conditions or Year 2035 plus Proposed Project conditions.

Conclusion

Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR, nor would it result in new significant impacts related to transportation and circulation that were not identified in the WOSP EIR as further analyzed in Appendix B.

The Proposed Project would implement recommended improvement measures identified in the transportation analysis completed for the Proposed Project related to vehicle queuing, pedestrian circulation, and loading, as identified in Table 7, at the end of the CEQA Checklist. In addition, the Proposed Project will implement SCAs related to city review and approval of all improvements proposed in the public right-of-way, reduction of vehicle traffic and parking demand generated by development projects, and construction traffic and parking management.

UTILITIES AND SERVICE SYSTEMS

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
14. Utilities and Service Systems • Would the project:			
a) Exceed wastewater treatment requirements of the San Francisco Bay Regional Water Quality Control Board; • Require or result in construction of new storm water drainage facilities or expansion of existing facilities, construction of which could cause significant environmental effects; • Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the providers' existing commitments and require or result in construction of new wastewater treatment facilities or expansion of existing facilities, construction of which could cause significant environmental effects;	I	☐	☐
b) Exceed water supplies available to serve the project from existing entitlements and resources, and require or result in construction of water facilities or expansion of existing facilities, construction of which could cause significant environmental effects;	I	☐	☐
c) Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs and require or result in construction of landfill facilities or expansion of existing facilities, construction of which could cause significant environmental effects; a) Violate applicable federal, state, and local statutes and regulations related to solid waste;	I	☐	☐
b) Violate applicable federal, state and local statutes and regulations relating to energy standards; or c) Result in a determination by the energy provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the providers' existing commitments and require or result in construction of new energy facilities or expansion of existing facilities, construction of which could cause	I	☐	☐

CEQA ENVIRONMENTAL CHECKLIST	Equal or Less Severity of Impact Previously Identified in WOSP EIR	Substantial Increase in Severity of Previously Identified Significant Impact in EIR	New Significant Impact
14. Utilities and Service Systems • Would the project:			
significant environmental effects.			

Water, Wastewater, and Stormwater (Criteria 14a and 14b)

As described in the WOSP EIR, EBMUD has accounted for the water demand projections associated with development under the WOSP; and the WOSP EIR determined that development under the WOSP would not require new water supply entitlements, resources, facilities, or expansion of existing facilities beyond those already planned, and that impacts related to water supplies would be less than significant.

The WSA prepared by EBMUD for the Specific Plan concluded that EBMUD has sufficient water supplies to meet current water demand and future water demand through 2035, including the increased water demand associated with the Specific Plan, during normal, single dry, and multiple dry years. Construction of needed water system improvements would typically occur within existing public rights-of-way and construction period traffic, noise, air quality, water quality and other potential impacts would be mitigated through the City's standard construction mitigation practices. With the City's sub-basin allocation system, construction of needed sewer system improvements pursuant to SCA 91, Stormwater and Sewer, payment of improvement and hook-up fees, the wastewater collection and treatment system would have adequate capacity to serve future development in accordance with the Specific Plan. The WOSP EIR also determined that development under the WOSP would have less-than-significant impacts related to stormwater and wastewater facilities. Much of the WOSP Area is composed of impervious surfaces, and new development would likely decrease storm drain runoff because Proposed Projects would be required to incorporate additional pervious areas through landscaping, in compliance with City of Oakland requirements.

Solid Waste Services (Criterion 14c)

As described in the WOSP EIR, impacts associated with solid waste would be less than significant. Nonhazardous solid waste in the WOSP Area is ultimately hauled to the Altamont Landfill and Resource Facility. The Altamont Landfill would have sufficient capacity to accept waste generated by development under the WOSP. In addition, implementation of an SCA pertaining to waste reduction and recycle, would reduce waste through compliance with the City of Oakland's Recycling Space Allocation Ordinance (Oakland Municipal Code, Chapter 17.118).

Energy (Criterion 14d)

Development under the WOSP would result in less-than-significant impacts related to energy standards and use. Pacific Gas & Electric Company (PG&E) has indicated that there is ample capacity to handle

projected demand with its current system. Therefore, development under the Specific Plan would not cause a violation of regulations relating to energy standards nor result in a determination by PG&E that it does not have adequate capacity to serve the project, or result in construction or expansion of energy facilities, construction of which could cause significant environmental effects. Developments would be required to comply with the standards of Title 24 of the California Code of Regulations. SCAs pertaining to compliance with the green building ordinance would require construction projects to incorporate energy-conserving design measures.

Project Analysis and Conclusion

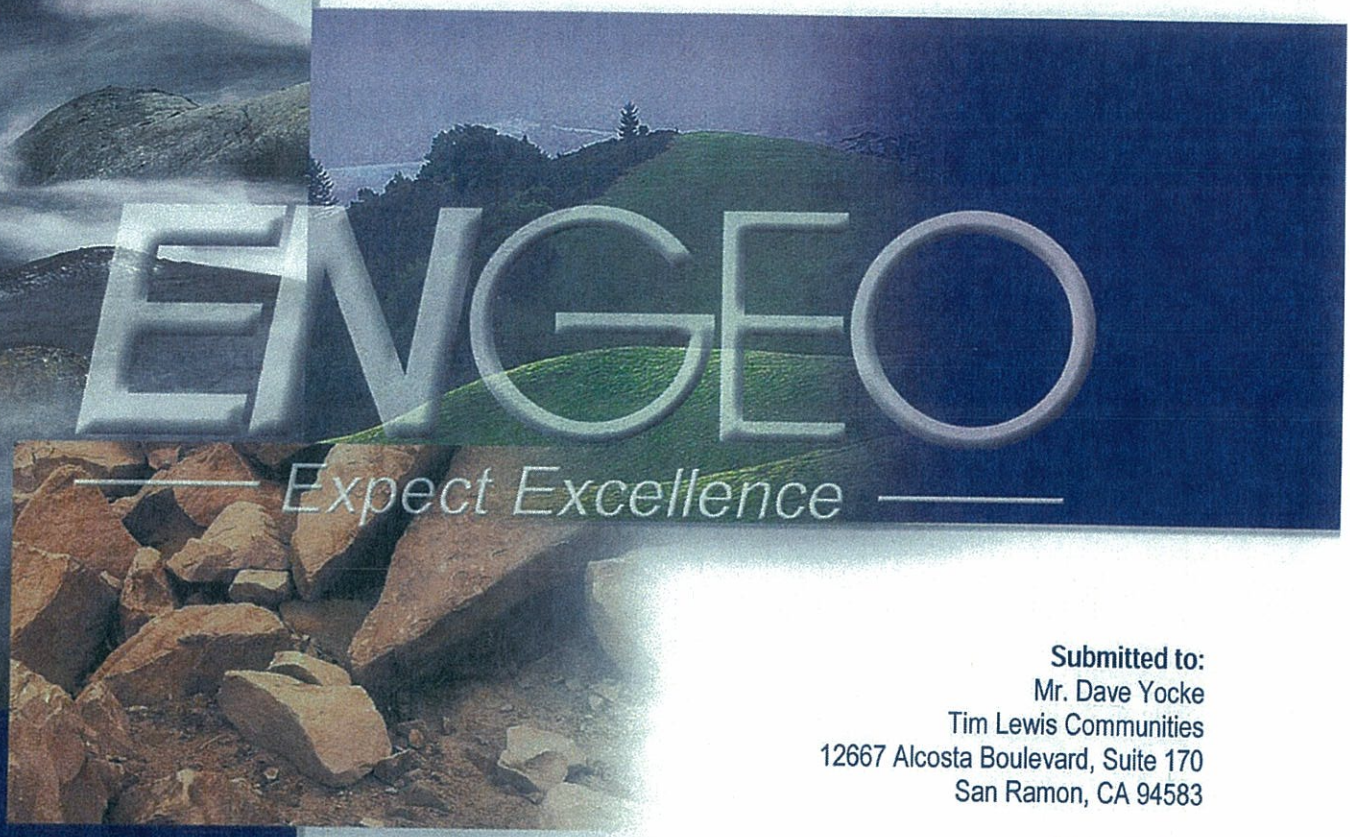
The water and sanitary sewer demand and stormwater facilities, as well as solid waste and energy associated with the Proposed Project, have been addressed in the WOSP EIR analysis.

The Project will provide sewer, water, stormwater drainage, and water quality infrastructure in accordance with the City of Oakland's Standard Conditions of Approval as further described under the utilities and services section of this Addendum. Sewer system improvements include mechanisms to control or minimize increases in infiltration/inflow to offset project-related sanitary sewer increases and implementation of best management practices. Adequate water supply would be available to serve the project though a connection to the existing 8" water main in Union Street and the on-site 4" main in Kirkham is proposed to be replaced with an approximately 8" main. Because the Project will not increase impervious area, upgrades to the existing storm drainage system are not expected, although the Project includes a connection to the existing storm drain system in Kirkham.

Based on the analysis, findings, and conclusions of the WOSP EIR, implementation of the Proposed Project would not substantially increase the severity of significant impacts identified in the WOSP EIR, nor would it result in new significant impacts related to utilities and service systems that were not identified in the WOSP EIR. The WOSP EIR did not identify any mitigation measures related to utilities and service systems, and none would be required for the Proposed Project. The Proposed Project would be required to implement SCAs related to sewer capacity, stormwater drainage facilities, solid waste services, and energy, as identified at the end of the CEQA Checklist.

APPENDIX A

PRELIMINARY GEOTECHNICAL REPORT
500 KIRKHAM STREET
OAKLAND, CALIFORNIA



Submitted to:
Mr. Dave Yocke
Tim Lewis Communities
12667 Alcosta Boulevard, Suite 170
San Ramon, CA 94583

Prepared by:
ENGEO Incorporated

October 21, 2015

Project No.
12473.000.000

ENGEO
Expect Excellence

GEOTECHNICAL
ENVIRONMENTAL
WATER RESOURCES
CONSTRUCTION SERVICES

Project No.
12473.000.000

October 21, 2015

Mr. Dave Yocke
Tim Lewis Communities
12667 Alcosta Boulevard, Suite 170
San Ramon, CA 94583

Subject: 500 Kirkham Street
Oakland, California

PRELIMINARY GEOTECHNICAL REPORT

Dear Mr. Yocke:

With your authorization, we completed a preliminary geotechnical report for the proposed mixed-use development project at 500 Kirkham Street in Oakland, California. The report presents the field exploration data with our conclusions and preliminary recommendations for development at the site.

Our findings indicate that the subject site is suitable for the proposed mixed-use development provided the preliminary recommendations and guidelines in this report are incorporated in project planning. The scope of this report was limited as an initial study and was based on limited subsurface exploration. Once the proposed site development plans are available, a more extensive design-level geotechnical exploration is necessary to refine the foundation design and grading recommendations.

We are pleased to have been of service to you on this project and are prepared to consult further with you and your design team as the project progresses.

Sincerely,

ENGEO Incorporated

Dino Bernardi

REGISTERED PROFESSIONAL ENGINEER
DANIEL JEFFREY BERNARDI
No. 82727
CIVIL
STATE OF CALIFORNIA

Dino Bernardi, PE

Jeff Fippin

REGISTERED PROFESSIONAL ENGINEER
JEFFREY A. FIPPIN
No. 2631
GEOTECHNICAL
STATE OF CALIFORNIA

Jeff Fippin, GE

db/jf/bvv

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this preliminary geotechnical study is to provide preliminary conclusions and recommendations for the planned residential development of the site. The information presented in this report may be used for general land planning purposes.

The scope of our services included:

- Performing limited field exploration
- Review of nearby information
- Evaluation of geologic and geotechnical hazards
- Preparation of this report

We prepared this report exclusively for Tim Lewis Communities and their design team consultants. We should review any changes made in the character, design or layout of the development to modify the conclusions and recommendations contained in this report, as necessary.

1.2 SITE LOCATION AND DESCRIPTION

The subject site is located at 500 Kirkham Street in Oakland, California (Figures 1 and 2). The approximately 3.13-acre site is identified as Assessor's Parcel Number (APN) 004-049-001. The site is bordered by 7th Street to the north, Union Street to the east, Kirkham Street to the west, and 5th Street to the south. The existing Bay Area Rapid Transit (BART) track crosses the site near the southern tip of the site in Oakland, California. Our site visit found that the site is currently unoccupied, and site improvements consist of a paved area with a fill stockpile on the north site of the site and several in-place street lights.

1.3 PROPOSED DEVELOPMENT

Based on our review of conceptual site plans prepared by Bendrew Jong, FAIA, Architects and Associates, dated June 8, 2015, we understand the project will include construction of an 11-story building including the following:

- Commercial units and store fronts
- Parking garage
- Live/work "flex space"
- Residential units
- Landscaped courtyards, roofs, and landscaping

- Underground utilities
- Sidewalks and hardscape

Structural loads are not available at this time; however, we anticipate heavy building loads and assume no below-grade construction.

1.4 AERIAL PHOTOGRAPH REVIEW

We reviewed aerial photographs of the site taken between 1946 and 2012 available through Google Earth and historicaerials.com. Review of the photographs indicates that warehouses and industrial buildings occupied the land. By 1958 the Cypress Freeway was constructed within the site with a warehouse occupying the southwest side of the site. By 1968 two of the structures on the southwest corner of the site were demolished, and by 1980 the Bay Area Rapid Transit (BART) rail system was constructed. Following the 1989 Loma Prieta Earthquake, the Cypress Freeway and other structures were demolished. By 2000 the site appears as it does today with the stockpile on the north side, a majority of the site being paved, and the street lights in place. Since that time the site appears to be have used for a variety of purposes, such as parking vehicles and a staging area for construction with construction trailers and equipment present.

2.0 GEOLOGY AND SEISMICITY

2.1 REGIONAL GEOLOGY AND SITE SOIL

The region is within the Coast Range Province of California, an area dominated by northwest-trending geologic features such as folds and faults. More specifically, the subject site is located on alluvial deposits near the eastern margin of the San Francisco Bay. The San Francisco Bay is located in a fault bound, elongated structural trough that has been filled with a sequence of Quaternary age sedimentary deposits derived from the surrounding Coast Ranges.

Based on mapping by Graymer (2000), the deposits underlying the subject site are comprised of Holocene and Pliestocene-aged Merrit Sand Deposits (Qms), described as very well sorted, well-drained eolian deposits. The site is also underlain by a small portion of Artificial Fill (af) that is described as man made deposits of various materials and ages (Figure 3).

2.2 SITE SEISMICITY

An active fault is defined by the California Geological Survey as one that has had surface displacement within Holocene time (about the last 11,000 years) (Hart, 1997). Because of the presence of nearby active faults, the Bay Area Region is considered seismically active. Numerous small earthquakes occur every year in the region, and large (greater than Moment Magnitude 7) earthquakes have been recorded and can be expected to occur in the future. The site is not located within a State of California Earthquake Fault Zone. Figure 5 shows the approximate location of active and potentially active faults and significant historic earthquakes mapped within the San Francisco Bay Region. Based on the 2010 USGS Quaternary Fault and

Fold Database, the following table shows the distances relative to the site and the nearest active faults.

TABLE 2.2-1
Regional Faults

Fault Name	Approximate Distance (miles)	Estimate of Maximum Moment Magnitude (Ellsworth)
Hayward-Rodgers Creek	4.5	7.3
North San Andreas	13.6	7.9
Mount Diablo Thrust	14.7	6.7
Calaveras	15.4	7.0
San Gregorio	17.6	7.5
Green Valley	17.7	6.8
West Napa	25.0	6.7

Approximate Site Location: Latitude = 37.8039; Longitude = -122.29214

The Uniform California Earthquake Rupture Forecast (UCERF, 2013) evaluated the 30-year probability of a Moment Magnitude 6.7 or greater earthquake occurring on the known active fault systems in the Bay Area, including the Hayward fault. The UCERF generated an overall probability of 72 percent for the Bay Area as a whole, a probability between 14 percent for the various subsections of the Hayward fault, 6 percent for the San Andreas, and 7 percent for the Calaveras fault.

The site is located in a mapped liquefaction hazard zone as shown on the State of California, Seismic Hazard Zone of the Oakland West Quadrangle (Figure 4).

3.0 FIELD EXPLORATION

The sections below summarize our field exploration activities as well as ground surface, subsurface, and groundwater conditions.

3.1 SURFACE CONDITIONS

The relatively flat site generally slopes from the north to the south. The site contains mainly paved areas with the exception of the unpaved sides of the small stockpile located on the northern side of the site.

3.2 CONE PENETRATION TESTS

The field exploration for this preliminary study was conducted on October 2, 2015, and included advancing five cone penetration tests (CPTs) to depths of approximately 24 feet below the existing grade. Figure 2 shows the approximate location of the CPT probes established by taping or pacing from existing features. As a result, the mapped locations should be considered only as accurate as the methods used to determine them.

The CPTs were performed in general accordance with ASTM D-5778. Measurements include the tip resistance to penetration of the cone (Qc), the resistance of the surface sleeve (Fs), and dynamic pore pressure (U). The CPT logs and supporting empirical data are located in Appendix A. The CPT holes were backfilled with cement grout upon completion in accordance with the requirements of Alameda County Public Works Department.

3.3 TEST PITS

The test pits for this study were conducted on October 2, 2015, and consisted of excavating nine test pits at the approximate locations shown on the Site Plan, Figure 2. The test pits were excavated to depths of about 4½ to 8½ feet using a rubber tire backhoe. An ENGEO geologist logged the conditions exposed on the excavations and the logs are provided in Appendix C.

After completion of logging, the excavations were backfilled using nominal compactive effort by the backhoe bucket and wheel rolling the surface. Depending on future grading activities in this area, it should be anticipated that the excavation spoils will need to be removed and replaced as engineered fill.

3.4 SUBSURFACE CONDITIONS

Based on our test pits the shallow subsurface conditions at the exploration locations predominantly consist of 6 to 8 inches of asphalt concrete (AC), over 1½ to 7 feet of silty sand and clayey sand fill. Below the fill, native soil encountered consists mainly of poorly graded sand, with the exception of a layer of clayey sand encountered in test pit 1-TP5 on the southern side of the site. Below the bottom of the test pits the descriptions of the soil encountered is based on measured soil behavior type from the CPTs.

The test pits, CPT logs, geologic mapping, and our local experience indicate that the native soil at the site consists of Merritt Sand. The Merritt Sand is a relatively homogeneous sand layer consisting of medium dense to very dense fine grained silty and clayey sand.

Consult the site plan and exploration logs for specific subsurface conditions at each location. We include the test pit logs and CPT sounding logs in Appendix A and B, respectively. The logs graphically depict the subsurface conditions encountered at the time of the exploration. We collected surficial samples from the test pits and tested them in our lab and an outside lab. Results of the lab testing are attached as Appendix D and E of this report.

3.5 GROUNDWATER

While performing the CPTs, the operator performed pore pressure dissipation tests that indicated the water level to be approximately 10 to 12 feet below the existing ground surface at the time of testing. Prior to backfilling the CPTs, we dropped a weighted line to measure the water depth. We encountered groundwater at approximately 5 to 11 feet below existing grade at the CPT locations. We noted groundwater seepage in the test pits at approximately 4 feet below the ground surface. Historical high groundwater level in the area is mapped by the California

Geological survey at a depth between approximately 5 and 10 feet below the ground surface. This groundwater data indicates that the depth to groundwater may be variable across the site. For the purposes of this preliminary report, we assumed groundwater at a depth of 5 feet below existing grade.

Fluctuations in groundwater levels should be expected during seasonal changes or over a period of years because of precipitation changes, perched zones, changes in drainage patterns, and/or irrigation.

4.0 DISCUSSION AND CONCLUSIONS

Based upon this preliminary exploration, it is our opinion that the project site is feasible for the proposed development from a geotechnical standpoint provided the preliminary recommendations contained in this report and future design-level geotechnical studies are incorporated into the development plans. A design-level geotechnical exploration should be performed as part of the design process. The exploration should include borings and laboratory soil testing to provide data for preparation of specific recommendations regarding grading, foundation design, and drainage for the proposed development. The exploration will also allow for more detailed evaluation of the geotechnical issues discussed below and afford the opportunity to provide recommendations regarding techniques and procedures to be implemented during construction to mitigate potential geotechnical and geological hazards.

Based on our field exploration and review of readily available published maps and reports for the site, the main geotechnical concerns for the proposed site development include the presence of non-engineered fill and shallow groundwater. These items and other geotechnical issues are discussed in the following sections of this report.

4.1 EXISTING FILL

As stated previously, during test pit excavations we encountered fill extending between 1½ and 7 feet below existing grade. The existing pavement surfaces encountered were 6 to 8 inches of asphalt. Non-engineered fill can undergo excessive settlement, especially under new fill or building loads. Without proper documentation of existing fill placed on the site, we recommend complete removal and recompaction of the existing fill. We present fill removal recommendations in Section 5.2. As an alternative, it may be feasible, depending on total depth, fill quality and lateral extent, to leave some fill in place and deepen footings or stiffen foundations to span the areas of non-engineered fill.

4.2 SEISMIC HAZARDS

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking, liquefaction,

densification, lateral spreading, and ground lurching. The following sections present a discussion of these hazards as they apply to the site.

Based on topographic and lithologic data, the risk of regional subsidence/uplift, landslides, tsunamis, or seiches is considered low to negligible at the site.

4.2.1 Ground Rupture

Since there are no known active faults crossing the property and the site is not located within an Earthquake Fault Special Study Zone, it is our opinion that ground rupture is unlikely at the subject property.

4.2.2 Ground Shaking

An earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking at the site, similar to that which has occurred in the past. To mitigate the shaking effects, all structures should be designed using sound engineering judgment and the current California Building Code (CBC) requirements, as a minimum.

Seismic design provisions of current building codes generally prescribe minimum lateral forces, applied statically to the structure, combined with the gravity forces of dead-and-live loads. The code-prescribed lateral forces are generally considered to be substantially smaller than the comparable forces that would be associated with a major earthquake. Therefore, structures should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse but with some structural as well as nonstructural damage. Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake; however, it is reasonable to expect that a well-designed and well-constructed structure will not collapse or cause loss of life in a major earthquake (SEAOC, 1996).

4.2.3 Liquefaction and Clay Cyclic Softening

Soil liquefaction results from loss of strength during cyclic loading, such as imposed by earthquakes. Soils most susceptible to liquefaction are clean, loose, saturated, uniformly graded, fine-grained sand. Empirical evidence indicates that loose to medium dense gravel, silty sand, low-plasticity silt, and some low-plasticity clay are also potentially liquefiable. In clay, liquefaction is commonly referred to as cyclic softening.

As described previously, the native site soil encountered in our limited explorations was primarily a sandy soil. We performed a detailed liquefaction potential analysis of the CPTs to estimate liquefaction potential using the computer software CLiq Version 1.7 developed by GeoLogismiki. We performed our analysis using the method by Robertson (2009) using a Peak Ground Acceleration (PGA) value of 0.59g as outlined in 2013 California Building Code. We

evaluated liquefaction potential to the depth explored. The results indicate that layers of silty sand at the site are potentially liquefiable.

4.2.3.1 Liquefaction Cyclic Softening Induced Settlement

We calculated potential liquefaction-induced settlement estimates using the program Cliq based on the methods published by G. Zhang, P.K. Robertson, and R. Brachman (2002).

We estimate the total liquefaction-induced settlement across the site to be less than 2-inches.

We have included our liquefaction analysis results in Appendix C. Because the site is located in a mapped liquefaction hazard zone, a more extensive subsurface exploration program will be necessary as part of design-level studies.

4.2.4 Ground Lurching and Lateral Spreading

Ground lurching is a result of the rolling motion imparted to the ground surface during energy released by an earthquake. Such rolling motion can cause ground cracks to form in weaker soils. The potential for the formation of these cracks is considered greater at contacts between deep alluvium and bedrock. Such an occurrence is possible at the site as in other locations in the Bay Area region, but based on the site location, it is our opinion that the offset is expected to be minor.

4.3 EXPANSIVE SOIL

We encountered high plasticity clay in the native soil in test pit (TP5). The results showed a Plasticity Index of 27 (Appendix D), which indicates a high expansion potential. Expansive soil shrinks and swells as a result of moisture changes. This can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations.

Successful construction on expansive soil requires special attention during grading. It is imperative to keep exposed soils moist by occasional sprinkling. If the soils dry, it is extremely difficult to remoisturize the soils (because of their clayey nature) without excavation, moisture conditioning, and recompaction.

Laboratory testing of clayey fill on nearby sites found that the soil was moderate to highly expansive. The soil expansion potential of the Property soil should be evaluated at the time of design-level study and mitigated during remedial grading activities. Based on the current observations, we opine that the effectives of expansive soil can be mitigated through blending during remedial grading to address non-engineered fill.

4.4 STATIC AND PERCHED GROUNDWATER

Based on the groundwater levels previously discussed, it appears that shallow groundwater beneath the site could affect the construction phase of the proposed development. Shallow groundwater can:

1. Impede grading activities, especially compacting soil below basement elevations.
2. Require dewatering during underground construction.
3. Cause moisture damage to sensitive floor coverings.
4. Transmit moisture vapor through slabs causing excessive mold/mildew build-up, fogging of windows, and damage to computers and other sensitive equipment.
5. Require permanent dewatering and waterproofing for below-grade structures.

4.5 CORROSIVITY CONSIDERATIONS

Two soil samples were collected during our study and transported under proper chain-of-custody to CERCO Analytical, Inc. for laboratory testing. One sample was collected from the fill material (1-TP2 at 2 feet bgs), and the other was collected from the site native soil (1-TP3 at 7½ feet bgs). The samples were tested for redox potential, pH, resistivity, soluble sulfate, and chloride ion concentrations. These tests provide an indication of the corrosion potential of the soil environment on buried concrete structures and metal pipes. The results are summarized below with a detailed description of the laboratory results contained in the report prepared by CERCO Analytical, Inc. (Appendix C).

TABLE 4.5-1

Soil Corrosivity Test Results

Sample Number and Depth	Redox Potential (mV)	pH	Resistivity* (OHM-CM)	Soluble Sulfate* (mg/kg)	Chloride Ion* (mg/kg)
1-TP2 at 2 feet bgs (Fill)	220	7.05	3,200	98	17
1-TP3 at 7 ½ feet bgs (Native)	300	7.98	2,000	150	N.D.

*Results reported on a wet weight basis

The resistivity measurements indicate the material is "mildly corrosive" to "corrosive", and as such, all buried iron, steel, cast iron, ductile iron, galvanized steel, and dielectric coated steel or iron should be properly protected against corrosion. A corrosion consultant should provide specific design recommendations on corrosion protection for important buried metallic lines.

According to the sulfate test results by CERCO, the sulfate ion concentration was reported as 98 to 150 mg/kg of water-soluble sulfate (SO_4). The CBC references the American Concrete Institute Manual, ACI 318 (Chapter 4) for concrete requirements. Based on the criteria in ACI 318, the test results are classified in the S1, moderate, sulfate exposure class. The minimum concrete strength for this exposure class is specified by the CBC. As minimum requirements, we recommend that Type II cement be used in foundation concrete for structures at the project site and concrete should incorporate a maximum water cement ratio of 0.5 and a minimum compressive strength of 3,000 psi. It should be noted, however, that the structural engineering design requirements for concrete might result in more stringent concrete specifications.

4.6 CBC SEISMIC DESIGN PARAMETERS

Based on the subsurface conditions encountered, we characterized the site as Site Class D in accordance with the 2013 CBC. We provide the 2013 CBC seismic design parameters in Table 4.6.1below, which include design spectral response acceleration parameters based on the mapped Risk-Targeted Maximum Considered Earthquake (MCE_R) spectral response acceleration parameters.

TABLE 4.6-1
2013 CBC Seismic Design Parameters
Latitude: 37.8039 Longitude: -122.29214

Parameter	Value
Site Class	D
Mapped MCE_R Spectral Response Acceleration at Short Periods, S_S (g)	1.53
Mapped MCE_R Spectral Response Acceleration at 1-second Period, S_1 (g)	0.61
Site Coefficient, F_A	1.0
Site Coefficient, F_V	1.5
MCE_R Spectral Response Acceleration at Short Periods, S_{MS} (g)	1.53
MCE_R Spectral Response Acceleration at 1-second Period, S_{M1} (g)	0.91
Design Spectral Response Acceleration at Short Periods, S_{DS} (g)	1.02
Design Spectral Response Acceleration at 1-second Period, S_{D1} (g)	0.61
MCE Geometric Mean Peak Ground Acceleration, PGA_M (g)	0.591
Long period transition-period, T_L	8 sec

4.7 DESIGN-LEVEL REPORT

A design-level geotechnical study should be performed as part of the on-going planning process, and should include a subsurface exploration and laboratory testing to provide data for the preparation of specific recommendations regarding site grading, foundations, and drainage for the proposed development. The study should include a more detailed evaluation of the above-described geotechnical issues and provide recommendations to mitigate the potential geotechnical/geological hazards, as appropriate.

5.0 PRELIMINARY RECOMMENDATIONS

The following recommendations are for initial land planning, estimating and design purposes. Final recommendations regarding site grading and foundation construction will be provided after the additional site-specific exploration has been completed.

5.1 DEMOLITION

Site development should commence with the removal of buried structures, including abandoned utilities. All debris should be removed from any location to be graded, from areas to receive fill or structures. The depth of removal of such materials should be determined by the Geotechnical Engineer in the field at the time of grading.

The existing pavement section (asphalt concrete/concrete and underlying aggregate base) should be removed from areas to receive fill, or structures, or those areas to serve for borrow. It may be suitable to recycle existing pavement and aggregate base as pavement base material. Alternatively, recycled material can be used in utility backfill and as subgrade material for roadways/

All excavations from demolition below design grades should be cleaned to a firm undisturbed soil surface determined by the Geotechnical Engineer. This surface should then be scarified, moisture conditioned, and backfilled with compacted engineered fill. The requirements for backfill materials and placement operations are the same as for engineered fill.

5.2 EXISTING NON-ENGINEERED FILL

As previously discussed, our explorations encountered existing non-engineered fill material varying from 1½ to 7 feet in thickness. In general, the fill thickness increases towards the north of the project limit. The existing fill is variable in consistency. Because of the variable nature of the fill and the lack of documentation of its placement, we recommend the fill be considered unsuitable for structural support and should be overexcavated, removed and replaced with properly compacted engineered fill.

Additional field exploration to better understand the extent and depth of the fill could be performed to reduce construction phase uncertainty. The excavated material may be reused as engineered fill if it meets environmental requirements and the requirements of Section 5.3. Material with low expansion potential, such as silty sand, should be placed within the upper 24 inches of the building pad and material with moderate to high expansion potential should be placed deeper than 24 inches. Due to existing boundary constraints, it is possible that the use of shoring will be required to stabilize the sidewalls of the excavation. Depending on shoring type, monitoring for construction vibration and ground movement are recommended.

Environmental studies of the site are currently ongoing. Based on past site history, it may be infeasible to remove and replace non-engineered fill. The environmental conditions of the site should be considered in determining approach to mitigation of non-engineered fill. If existing fill

is to remain in place, foundations should be designed for additional settlement, reduced bearing capacity, and increased embedment depth as presented in Section 6.0.

5.3 SELECTION OF MATERIAL

With the exception of construction debris (wood, brick, asphalt, concrete, metal, etc.), trees, high organic content soil (soil which contains more than 3 percent organic content by weight), and environmentally impacted soil, we anticipate the site soil is suitable for use as engineered fill. Other materials and debris, including trees with their root balls, should be removed from the project site. If reuse of select material such as asphalt and concrete onsite as engineered fill is desired, site-specific breakdown, blending and placement recommendations can be developed.

The contractor should anticipate encountering excessively over-optimum (wet) soil moisture conditions during winter or spring grading, or during or following periods of rain. Wet soil can make proper compaction difficult or impossible. Wet soil conditions can be mitigated by:

1. Frequent spreading and mixing during warm dry weather.
2. Mixing with drier materials.
3. Mixing with a lime, lime-flyash, or cement product; or
4. Stabilizing with aggregate, geotextile stabilization fabric, or both.

Options 3 and 4 should be evaluated and approved by ENGEO prior to implementation.

5.4 FILL PLACEMENT

For land planning and cost estimating purposes, the following compaction control requirements should be anticipated for general fill areas:

Test Procedures:	ASTM D-1557.
Required Moisture Content:	Not less than 2 percentage points above optimum moisture content.
Minimum Relative Compaction:	Not less than 90 percent.

Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same material.

Successful construction on expansive soils requires special attention during grading. It is imperative to keep exposed soils moist by occasional sprinkling. If the soils dry, it is extremely difficult to remoisturize the soils (because of their clayey nature) without excavation, moisture conditioning, and recompaction. Additional compaction requirements may need to be developed during our detailed exploration to address potentially expansive soil.

5.5 SITE DRAINAGE

The project civil engineer is responsible for designing surface drainage improvements. With regard to geotechnical engineering issues, we recommend that finish grades be sloped away from buildings and pavements to the maximum extent practical. The latest California Building Code Section 1804.3 specifies minimum slopes of 5 percent away from foundations. Where lot lines or surface improvements restrict meeting this slope requirement, we recommend that specific drainage requirements be developed. As a minimum, we recommend the following:

1. Discharge roof down spouts into closed conduits and direct away from foundations to appropriate drainage devices.

2. Do not allow water to pond near foundations, pavements, or exterior flatwork.

Stormwater from roof downspouts should not be allowed to discharge onto splashblocks or into landscape areas within 5 feet from the foundation; rather, they should discharge through the curb and into the street or onto an impermeable material that drains into the street. ENGEO should be consulted to develop recommendations if these criteria are not feasible.

6.0 PRELIMINARY FOUNDATION RECOMMENDATIONS

Based on the available soil data and anticipated structure type, we opine that the proposed structure can be supported on shallow spread footings if all of the non-engineered fill is removed and replaced as engineered fill, a structural mat or spread footings in conjunction with ground improvement if the non-engineered fill is to remain in place. The major considerations in foundation design at the site are the potential for high expansive soil, liquefaction settlement and large building loads. placement of relatively non-expansive soil in the upper 2 feet of the building pad will reduce heave pressure on the building slab. In order to reduce the effects of the potentially expansive soils, spread footing should extend below much of the zone of seasonal moisture variation, typically about 3 feet below finished grade in this region.

For planning purposes, the following preliminary foundation design information is provided for the above recommended foundation types.

Suitability of foundation types should be re-assessed during the design-level phase based on design structural loads and laboratory testing of site soils.

6.1 SPREAD FOOTINGS AND SLAB-ONGRADE

Based on our experience, provided the remedial earthwork described above to address potentially expansive soil and non-engineered fill, the proposed structure may be supported by a spread footing system. Footing trenches should be cleared of loose soil and rock fragments prior to steel and concrete placement. It is important that footing trenches not be allowed to desiccate prior to placing concrete. The footing system should be developed considering the potential for

liquefaction settlement. Based on our preliminary investigation, the potential total settlement from liquefaction is on the order of 2 inches with a differential settlement over 50 feet approximately half of the total. The following guidelines may be used for preliminary design:

Minimum Width.....36 inches
Minimum Depth [1].....36 inches
Allowable Bearing Capacity (dead-plus-live loads) [2].....3,500 psf

[1] Depth below lowest adjacent finish grade.
[2] May be increased by ⅓ for total loads including wind and seismic.

The bearing capacity values can be re-evaluated when the building loads are known. The footing design should consider settlement predictions stated above. Based on our experience on similar projects, the amounts of differential settlement should be tolerable for the proposed building when considering that the liquefaction is a result of the extreme loading scenario and a larger amount of architectural distress is typically allowable for seismic design cases compared to static load cases.

6.1.1 Interior Slab-on-Grade Construction

The interior slab-on-grade should be underlain by a layer of a relatively non-expansive fill at least 24 inches thick. Consideration should be given to constructing concrete slabs to a minimum thickness of 5 inches; however, the final slab thickness and reinforcing should be designed by the structural engineer based on the intended use and loading of the slab. If existing fill is to remain in-place, it should be anticipated that additional static and seismic settlement may occur.

6.1.2 Ground improvement

Rammed Aggregate Piers (RAPs) or stone columns can be used to stiffen the underlying non-engineered fill and reduce the static and seismic settlement potential without the removal of the non-engineered fill. If environmental constraints exist the make removal of existing soil undesireable, we recommend construction of RAPs or stone columns using displacement methods where soil is not excavated to construct the ground improvement columns. At a minimum, columns should extend through the non-engineered fill into the Merritt Sand below. The use of ground improvement in combination with spread footings will reduce the potential post-construction static settlement to minor amounts. Ground improvement can provide an improved allowable bearing capacity of about 6,000 psf or greater. Spread footings used with ground improvement should have an embedment depth of at least 24 inches.

6.2 MAT FOUNDATION

As an alternative to spread footings, a structural mat slab may be used to support the structure at this site. The structural mat may be implemented if the remedial earthwork is impractical or if the building loads result in footing sizes that are impractical. Final recommendations will be provided in our geotechnical report for the site, and once laboratory testing is completed. To address building loads, a structural mat on non-engineered soil can be designed using an average

allowable bearing pressure of 1,000 pounds per square foot (psf) for dead plus live loads, with maximum localized bearing pressures of 1,500 psf at column or wall loads. These allowable bearing pressures can be increased by one-third for load combinations that include wind or seismic. If remedial earthwork is performed, the allowable bearing capacity can be doubled.

Foundations should be designed to allow for a liquefaction settlement of up to 2 inches with a differential settlement of 1 inch over a lateral distance of 50 feet. If the remedial earthwork recommended above is not performed, we recommend assuming an additional 2 inches of differential settlement due to static loading. The structural engineer should design the mat thickness.

6.2.1 Subgrade Modulus for Structural Slab Design

The following modulus of subgrade reaction (k_s) can be used for conventionally reinforced structural mat:

- Existing non-engineered fill material: ks = 50 psi/in
- Engineered fill after remedial earthwork: ks = 150 psi/in

6.3 PRELIMINARY PAVEMENT DESIGN

As applicable, the following preliminary pavement section for new streets has been determined for a Traffic Index of 4 through 7, based on an assumed R-value of 5, and in accordance with the design methods contained in the Caltrans Highway Design Manual. Preliminary recommendations are presented in the table below.

TABLE 6.3-1
Preliminary Pavement Sections

Traffic Index	HMA (inches)	AB (inches)
4.0	2½	8
5.0	3	10
6.0	3½	13
7.0	4	16

Notes: HMA – Hot Mix Asphalt
AB – Caltrans Class 2 aggregate base (R-value of 78 or greater)

The above preliminary pavement sections are provided for estimating only. We recommend the actual subgrade material be tested for R-value once established and the Traffic Index and minimum pavement section(s) should be confirmed by the Project Civil Engineer and City of Hayward.

6.4 REQUIREMENTS FOR LANDSCAPING IRRIGATION

For planning purposes, vegetation should not be planted immediately adjacent to the structures. If planting adjacent to a building is desired, we recommend using plants that require very little moisture with drip irrigation systems. Similarly, sprinkler systems should not be installed where they may cause ponding or saturation of foundation soils within 5 feet of the walls or under the structures as ponding or saturation of foundation soils may cause loss of soil strength, and movements of the foundation and slabs.

Irrigation of landscaped areas should be strictly limited to that necessary to sustain vegetation. Excessive irrigation could result in saturating and weakening of foundation soils.

6.5 STORMWATER INFILTRATION OPPORTUNITIES AND POST-CONSTRUCTION BMPS

Based on the anticipated fines content and density, the near-surface site soils are expected to have low permeability values to handle stormwater infiltration. Post-construction BMPs should not rely on infiltration; rather, we recommend BMPs receive subdrains that discharge treated stormwater into the planned bioretention areas.

If possible, we recommend the bioretention areas and other BMPs be planned a minimum of 5 feet away from structural site improvements. Where this is not practical, bioretention areas located within 5 feet of structural onsite or offsite improvements can either:

1. Be constructed with structural side walls capable of withstanding the loads from the adjacent improvements, or

2. Incorporate filter material compacted to between 85 and 90 percent relative compaction (ASTM D1557, latest edition). Bioretention design should incorporate a waterproofing system lining the bioretention excavation. The waterproofing system should cover the bioretention area excavation in such a manner as to reduce the potential for moisture transmission beneath the adjacent improvements.

In addition, site improvements located adjacent to bioretention areas that are underlain by base rock, sand, or other imported granular materials, should be designed with a deepened edge that extends to the bottom of the imported material underlying the improvement. Where adjacent site improvements include streets steeper than 3 percent or design elements that will experience lateral loads (such as from impact or traffic patterns), additional design considerations may be required.

Given the nature of bioretention systems and possible proximity to improvements, we recommend we consult further with you as needed, review design plans, and provide testing and observation services during the installation of linings, compaction of the filter material, and connection of designed drains (if implemented).

It should be noted that the contractor is responsible for conducting all excavation and shoring in a manner that does not cause damage to adjacent improvements during construction and future maintenance of the bioretention areas. As with any excavation adjacent to improvements, the contractor should minimize the exposure time such that the improvements are not detrimentally impacted.

7.0 FUTURE STUDIES

As previously discussed, a site-specific design-level geotechnical exploration should be performed as part of the design process. The exploration would include borings and laboratory soil testing to provide data for preparation of specific recommendations regarding grading, foundation design, and drainage for the proposed development. The exploration will also allow for more detailed evaluations of the geotechnical issues discussed in this report and afford the opportunity to provide recommendations regarding techniques and procedures to be implemented during construction to mitigate potential geotechnical/geological hazards.

8.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report presents geotechnical recommendations for preliminary design of the improvements discussed in Section 1.3 for the 500 Kirkham Street Project. If changes occur in the nature or design of the project, we should be allowed to review this report and provide additional recommendations, if any. It is the responsibility of the owner to transmit the information and recommendations of this report to the appropriate organizations or people involved in design of the project, including but not limited to developers, owners, buyers, architects, engineers, and designers. The conclusions and recommendations contained in this report are solely professional opinions and are valid for a period of no more than 2 years from the date of report issuance.

We strived to perform our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty is expressed or implied. There are risks of earth movement and property damages inherent in building on or with earth materials. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our services.

This report is based upon field and other conditions discovered at the time of report preparation. We developed this report with limited subsurface exploration data. We assumed that our subsurface exploration data is representative of the actual subsurface conditions across the site. Considering possible underground variability of soil, rock, stockpiled material, and groundwater, additional costs may be required to complete the project. We recommend that the owner establish a contingency fund to cover such costs. If unexpected conditions are encountered, notify us immediately to review these conditions and provide additional and/or modified recommendations, as necessary.

Our services did not include excavation sloping or shoring, soil volume change factors, flood potential, or a geohazard exploration. In addition, our geotechnical exploration did not include

work to determine the existence of possible hazardous materials. If any hazardous materials are encountered during construction, then notify the proper regulatory officials immediately.

This document must not be subject to unauthorized reuse that is, reusing without our written authorization. Such authorization is essential because it requires us to evaluate the document's applicability given new circumstances, not the least of which is passage of time.

Actual field or other conditions will necessitate clarifications, adjustments, modifications or other changes to our documents. Therefore, we must be engaged to prepare the necessary clarifications, adjustments, modifications or other changes before construction activities commence or further activity proceeds. If our scope of services does not include on-site construction observation, or if other persons or entities are retained to provide such services, we cannot be held responsible for any or all claims arising from or resulting from the performance of such services by other persons or entities, and from any or all claims arising from or resulting from clarifications, adjustments, modifications, discrepancies or other changes necessary to reflect changed field or other conditions.

SELECTED REFERENCES

American Society of Civil Engineers. Minimum Design Loads for Buildings and other Structures ASCE 7-10. Reston: American Society of Civil Engineers. 2010.

American Concrete Institute, 2008, Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary (ACI 318R-08).

California Building Standards Commission, 2013 California Building Code, Volumes 1 and 2.Sacramento, California.

California Geological Survey (2003). Seismic Hazard Zone Report For the Oakland West 7.5-Minute Quadrangle, Alameda County, California.

Federal Emergency Management Agency; Federal Insurance Rate Map, Alameda County, California, Panel 59 of 725, Map Number 06001C0059G, Effective Date August 3, 2009.

Graymer, R. W. (2000). Geological Map and Map Database of the Oakland Metropolitan Area, Alameda, Contra Costa, and San Francisco Counties, California.

Historicaerials.com

Robertson, P. K. and Campenella, R. G. (1988), Guidelines for Geotechnical Design Using CPT and CPTU Data.

Robertson, P. K. (2009), Performance based earthquake design using the CPT, Gregg Drilling and Testing, Inc.

Robertson, P. K. and Lisheng, S., 2010, Estimation of Seismic Compression in dry soils using the CPT. Fifth International Conference on Recent Advances in Geotechnical Earthquake.

SEAOC, 1996, Recommended Lateral Force Requirements and Tentative Commentary.

Southern California Earthquake Center (SCEC), 2008, Recommended Procedures for Implementation of DMG Special Publication 117A, Guidelines for Evaluation and Mitigating Seismic Hazards in California, adopted September 11.

State of California, Division of Mines and Geology (CDMG), 1982, Earthquake Fault Hazard Zones Map (previously named Special Studies Zones Map).

United States Geological Survey (2008). Uniform California Earthquake Rupture Forecast.

United States Geological Survey (2010). Quaternary Fault and Fold Database of the United States.

SELECTED REFERENCES (Continued)

Youd, T. L. and I. M. Idriss, 2001, Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshop on Evaluation of Liquefaction Resistance of Soils.

Zhang, G., Robertson, P. K., and Brachman, R. W. I., 2002, Estimating Liquefaction-Induced Ground Settlements from CPT for Level Ground, Can. Geotech. J. 39, 1168-1180.

FIGURES

LIST OF FIGURES

N

0 FEET 2000

0 METERS 1000

BASE MAP SOURCE: GOOGLE EARTH PRO

ENGEO
Expect Excellence

VICINITY MAP

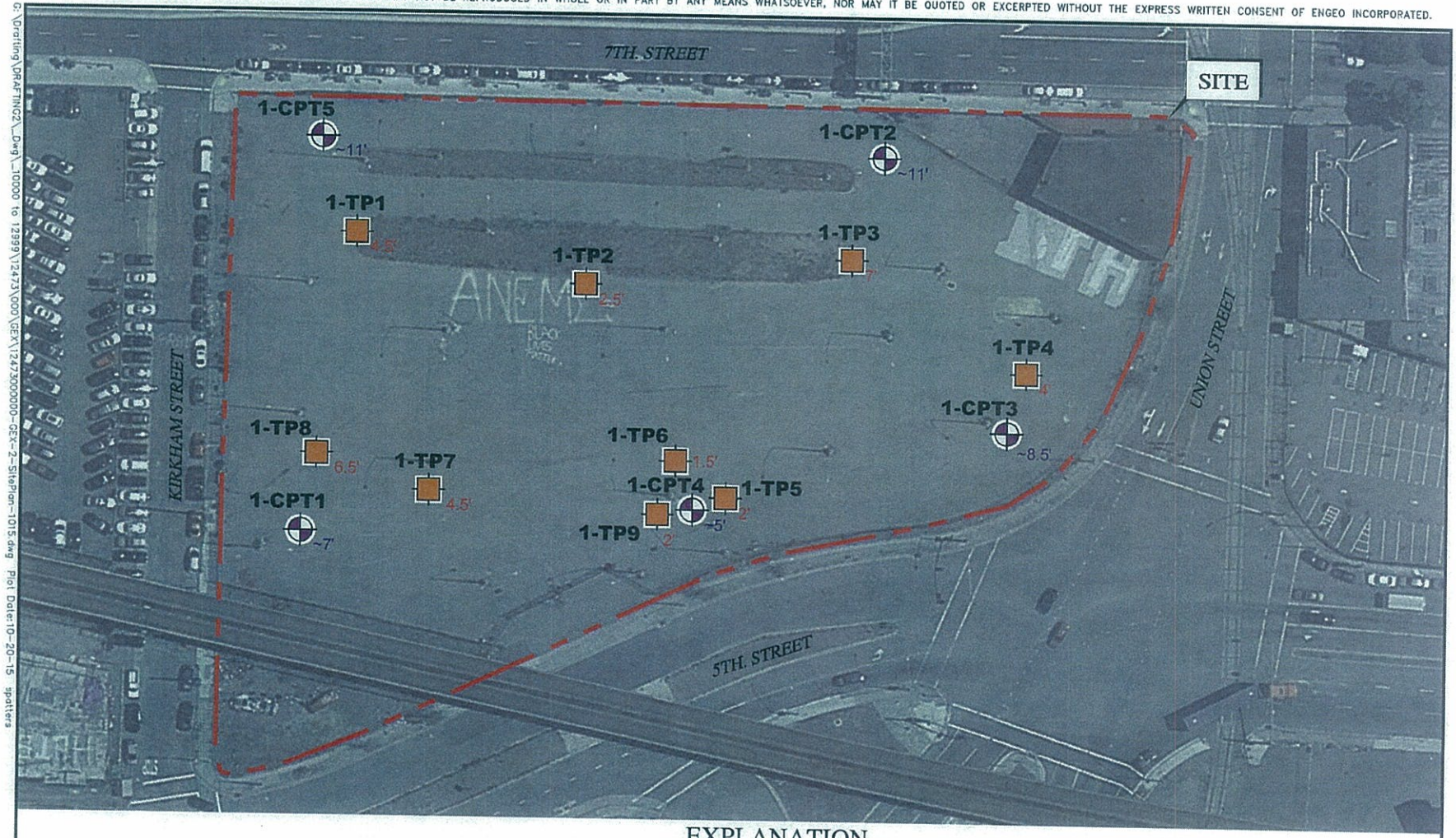
500 KIRKHAM STREET

OAKLAND, CALIFORNIA

PROJECT NO.: 12473.000.000		FIGURE NO. 1
SCALE: AS SHOWN		
DRAWN BY: SRP	CHECKED BY: JF	

G:\Drafting\DRAFTING2_Dwg_10000 to 12999\12473\000\GEX\12473000000-GEX-1-VicinityMap-1015.dwg Plot Date: 10-20-15 spatters

ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

1-CPT5 ~11' CONE PENETRATION TEST SHOWING GROUNDWATER DEPTH

1-TP9 2' TEST PIT SHOWING FILL DEPTH

N

0 FEET 80

0 METERS 40

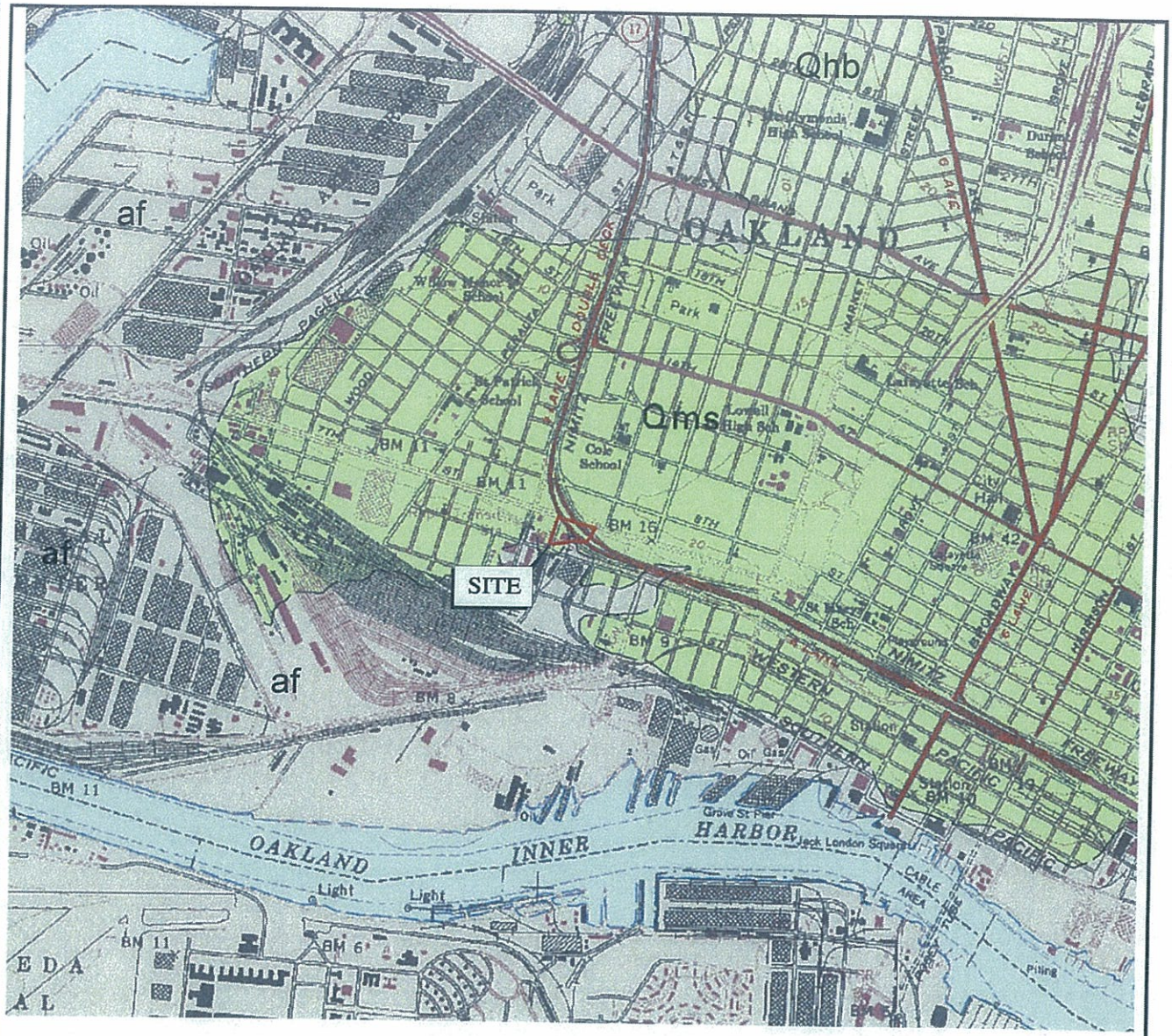
BASE MAP SOURCE: GOOGLE EARTH PRO

ENGEO Expect Excellence

SITE PLAN
500 KIRKHAM STREET
OAKLAND, CALIFORNIA

PROJECT NO.: 12473.000.000	FIGURE NO. 2
SCALE: AS SHOWN	
DRAWN BY: SRP	CHECKED BY: JF

ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

af	ARTIFICIAL FILL
Qhb	BASIN DEPOSITS (HOLOCENE)
Qms	MERRIT SAND (HOLOCENE AND PLEISTOCENE)

N

0 FEET 2000

0 METERS 1000

BASE MAP SOURCE: GRAYMER, 2000

ENGEO — Expect Excellence

REGIONAL GEOLOGIC MAP

500 KIRKHAM STREET

OAKLAND, CALIFORNIA

PROJECT NO.: 12473.000.000

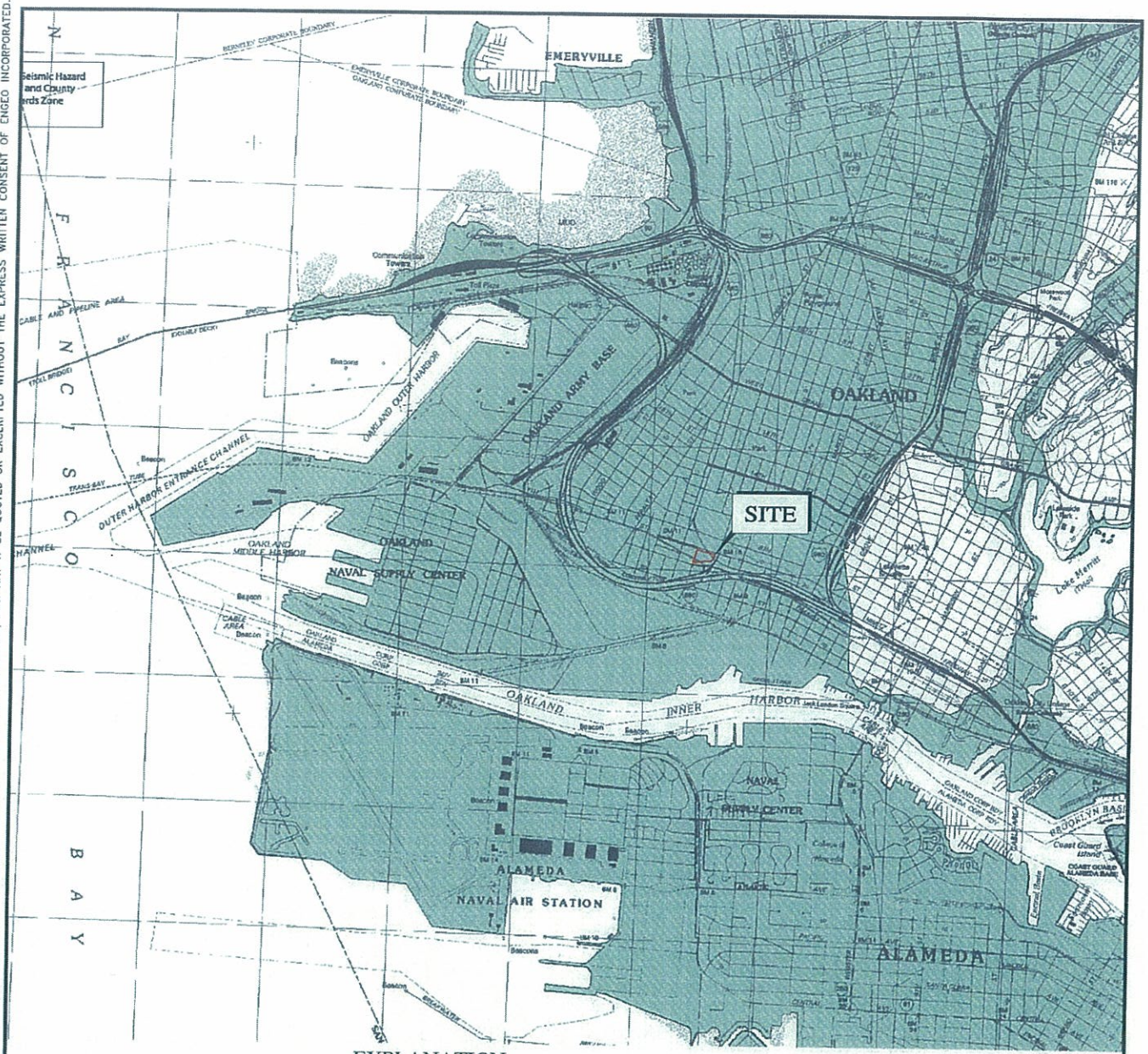
SCALE: AS SHOWN

DRAWN BY: SRP CHECKED BY: JF

FIGURE NO. 3

G:\Drafting\DRAFTING2_Dwg_10000 to 12999\12473\000\GEX\12473000D00-GEX-3-GeologicMap2-1015.dwg Plot Date: 10-20-15 spatters

ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

LIQUEFACTION

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

EARTHQUAKE-INDUCED LANDSLIDES

AREAS WHERE PREVIOUS OCCURRENCE OF LANDSLIDE MOVEMENT, OR LOCAL TOPOGRAPHIC, GEOLOGICAL, GEOTECHNICAL AND SUBSURFACE WATER CONDITIONS INDICATE A POTENTIAL FOR PERMANENT GROUND DISPLACEMENTS SUCH THAT MITIGATION AS DEFINED IN PUBLIC RESOURCES CODE SECTION 2693(c) WOULD BE REQUIRED

BASE MAP SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION, CALIFORNIA GEOLOGICAL SURVEY, 2006

ENGEO Expect Excellence

SEISMIC HAZARD ZONES MAP

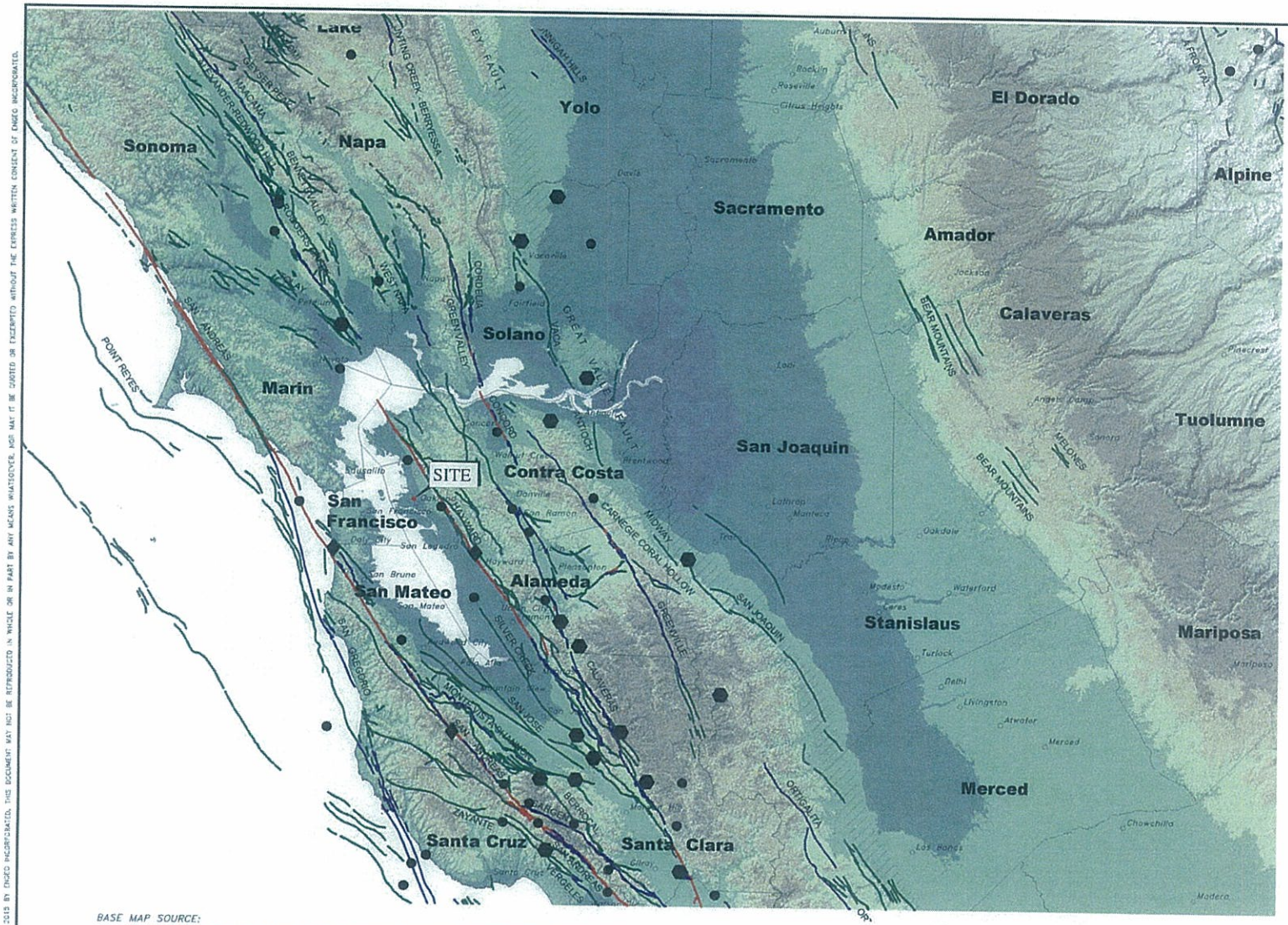
500 KIRKHAM STREET

OAKLAND, CALIFORNIA

PROJECT NO.: 12473.000.000		FIGURE N° 4
SCALE: AS SHOWN		
DRAWN BY: SRP	CHECKED BY: JF	

G:\Drafting\DRAFTING2_Dwg_10000 to 12999\12473\000\GEX\12473000000-GEX-4-HazardZonesMap-1015.dwg Plot Date: 10-20-15 spotters

ORIGINAL FIGURE PRINTED IN COLOR



BASE MAP SOURCE:
COLOR HILLSHADE IMAGE BASED ON THE NATIONAL ELEVATION DATASET (NED) AT 30 METER RESOLUTION
U.S.G.S. QUATERNARY FAULT DATABASE, NOVEMBER, 2010
U.S.G.S. HISTORIC EARTHQUAKE DATABASE (1800–2000)

ENGEO
Expect Excellence

REGIONAL FAULTING AND SEISMICITY
500 KIRKHAM STREET
OAKLAND, CALIFORNIA

PROJECT NO.: 12473.000,000		FIGURE NO
SCALE: AS SHOWN		5
DRAWN BY: SRP	CHECKED BY: JF	

ORIGINAL FIGURE PRINTED IN COLOR

APPENDIX A

Test Pit Logs

APPENDIX A

ENGEO INCORPORATED		TEST PIT LOG
500 Kirkham Street Oakland, California 12473.000.000		Logged By: G. Cubbon Logged Date: 10/2/2015
Test Pit Number	Depth (feet)	Description
1-TP1		6 inches of AC, no AB
	0.5 – 4.5	SILTY SAND (SM), brown and orange brown, slightly moist, medium dense, contains trace gravel, some charcoal and brick fragments, glass, concrete up to 7" diameter (fill)
	4.5 – 5.5	POORLY GRADED SAND (SP), orange, very moist, medium dense, moisture content increasing with depth, fine sand (native)
1-TP2		6 inches of AC, no AB
	0.5 – 2.5	SILTY SAND (SM), dark brown, slightly moist, medium dense, contains trace gravel, some brick and wood fragments, and one 4 inch thick by 2 foot wide concrete block (fill)
	2.5 – 4.5	POORLY GRADED SAND (SP), orange, moist, medium dense to dense, moisture content increasing with depth, fine sand (native)
1-TP3		8 inches of AC, no AB
	0.7 – 7	SILTY SAND (SM), dark brown, slightly moist, medium dense, contains trace gravel, brick, glass, wood, charcoal, and pottery fragments (fill)
	7 – 8.5	POORLY GRADED SAND (SP), orange, moist, medium dense to dense, moisture content increasing with depth, fine sand (native)
		NOTE: Seepage at 8.5 feet
1-TP4		8 inches of AC, no AB
	0.7 – 4	SILTY SAND (SM), dark brown, slightly moist, medium dense, contains trace gravel, brick, glass, wood, some minor concrete (fill)
	4 – 5	SILTY SAND (SM), brown, slightly moist, medium dense (native)

Test Pit Number	Depth (feet)	Description
		NOTE: Strong odor of gasoline from test pit, logged from ground surface
1-TP5		6 inches of AC, no AB. AC appears to be placed in 3 inch lifts.
	0.5 - 2	POORLY GRADED SAND (SP), orange and grey, very moist, medium dense, fine sand, contains minor trash items (fill)
	2 – 5	SILTY SAND (SM), black, very moist to wet, loose to medium dense, strong organic odor, contains some small rootlets (native)
	5 – 7.5	CLAYEY SAND (SC), orange and grey, wet, medium dense (native)
		NOTE: Seepage at 4 feet
1-TP6		6 inches of AC, no AB. AC appears to be placed in 3 inch lifts
	0.5 – 1.5	SILTY SAND (SM), reddish brown and black, slightly moist, medium dense, contains trace gravel, brick, some minor concrete (fill)
	1.5 – 3.5	SILTY SAND (SM), black, very moist, loose to medium dense, strong organic odor, contains some small rootlets (native)
	3.5 – 5.5	POORLY GRADED SAND (SP), orange and reddish brown, very moist to wet, medium dense (native)
		NOTE: Seepage at 5.5 feet
1-TP7		6 inches of AC, no AB. AC appears to be placed in 3 inch lifts
	0.5 – 2.5	SILTY SAND (SM), black and grey, slightly moist, medium dense, contains trace gravel, brick and plastic (fill)
	2.5 – 4.5	CLAYEY SAND (SC), orange and brown, slightly moist, medium dense to dense, contains some rock fragments and concrete (fill)
	4.5 – 6.5	POORLY GRADED SAND (SP), orange and reddish brown, very moist, medium dense to dense (native)

Test Pit Number	Depth (feet)	Description
1-TP8		8 inches of AC, no AB
	0.7 – 2	SILTY SAND (SM), dark brown, slightly moist, medium dense, contains trace gravel and plastic (fill)
	2 – 6.5	CLAYEY SAND (SC), orange and brown, slightly moist, medium dense to dense, contains some rock fragments and concrete (fill)
	6.5 - 8	POORLY GRADED SAND (SP), orange and reddish brown, very moist to wet, medium dense to dense (native)
		NOTE: Seepage at 8 feet
1-TP9		7 inches of AC, no AB
	0.6 - 2	SILTY SAND (SM), orange and grey, very moist, medium dense, contains trace gravel, brick and concrete. Encountered one 6 inch thick by 3.5 foot wide concrete block (fill)
	2 – 3.5	POORLY GRADED SAND (SP), black, very moist, loose, fine sand, strong organic odor (native)
	3.5 - 5	POORLY GRADED SAND (SP), orange and reddish brown, very moist to wet, loose to medium dense (native)
		NOTE: Seepage at 4.5 feet

APPENDIX A

APPENDIX B

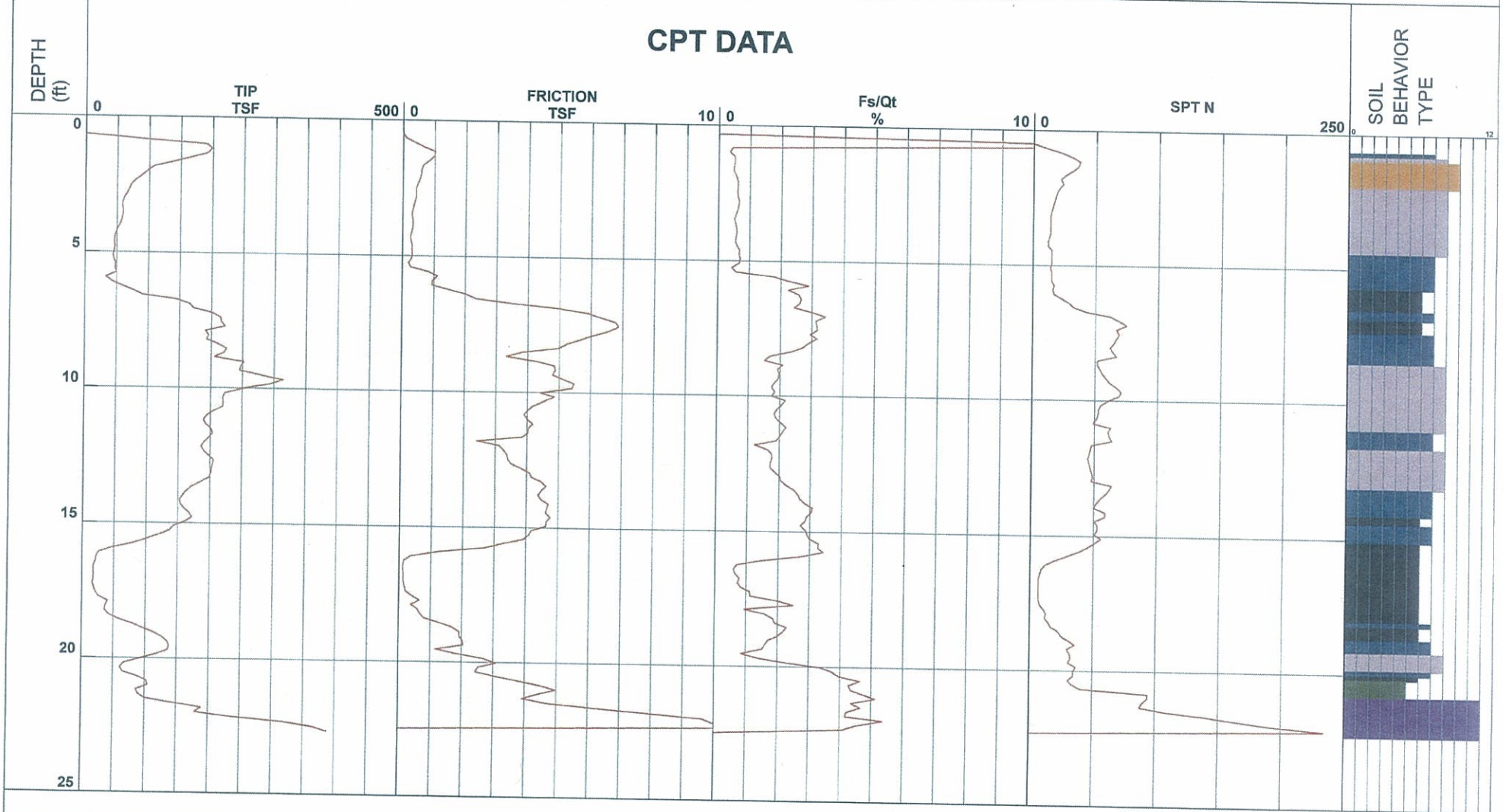
Cone Penetration Test (CPT) Logs
(Middle Earth Geo-Testing Inc.)

Engeo Inc

Project	500 Kirkham Street	Operator	CB	Filename	SDF(006).cpt
Job Number	12473.000.000	Cone Number	DDG1281	GPS	
Hole Number	CPT-01	Date and Time	10/2/2015 8:03:10 AM	Maximum Depth	22.64 ft
EST GW Depth During Test	10.00 ft				

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

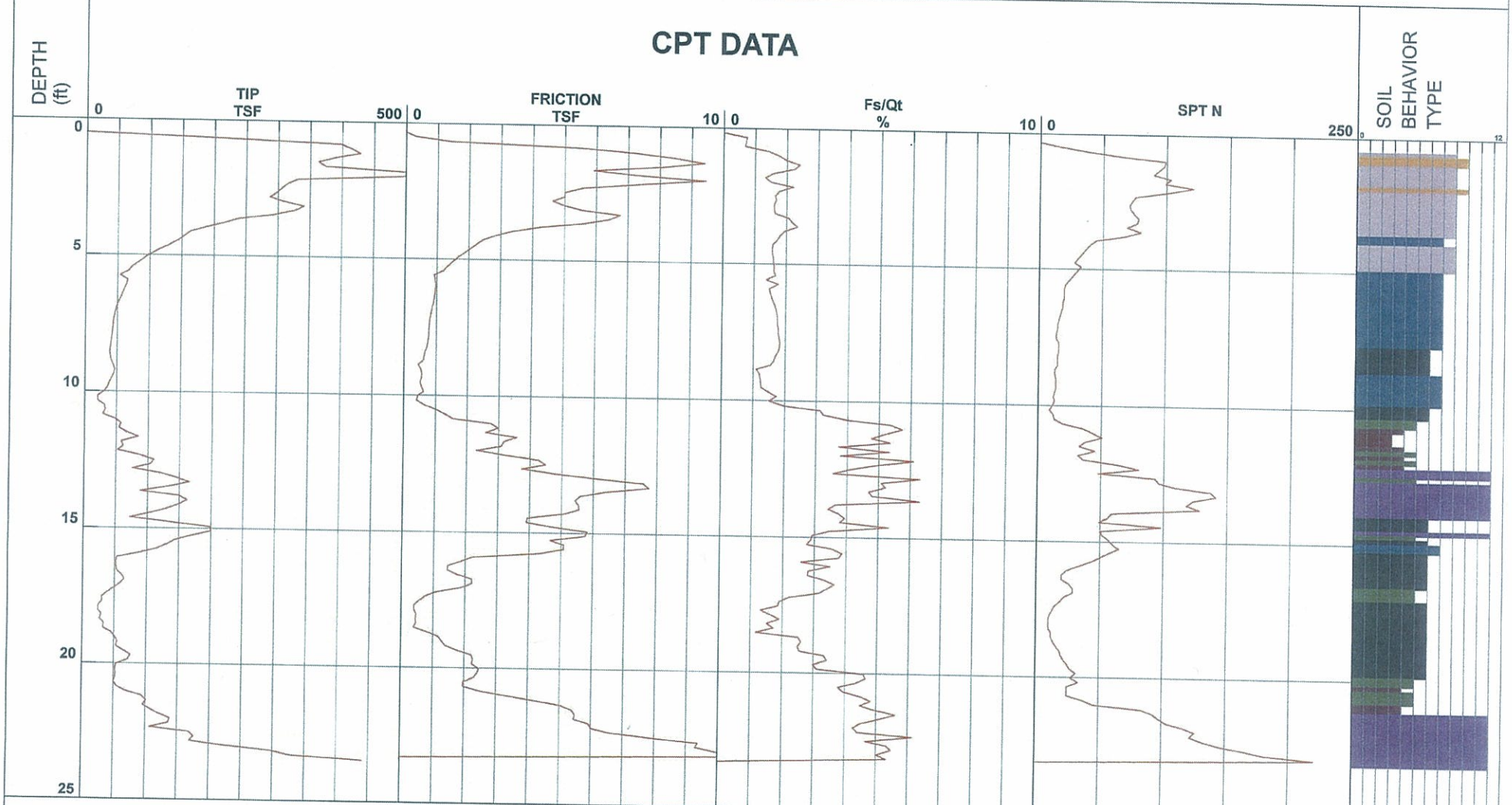
S*Soil behavior type and SPT based on data from UBC-1983

Engeo Inc

Project	500 Kirkham Street	Operator	CB	Filename	SDF(008).cpt
Job Number	12473.000.000	Cone Number	DDG1281	GPS	
Hole Number	CPT-02	Date and Time	10/2/2015 8:48:19 AM	Maximum Depth	23.46 ft
EST GW Depth During Test	10.00 ft				

Net Area Ratio .8

CPT DATA



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

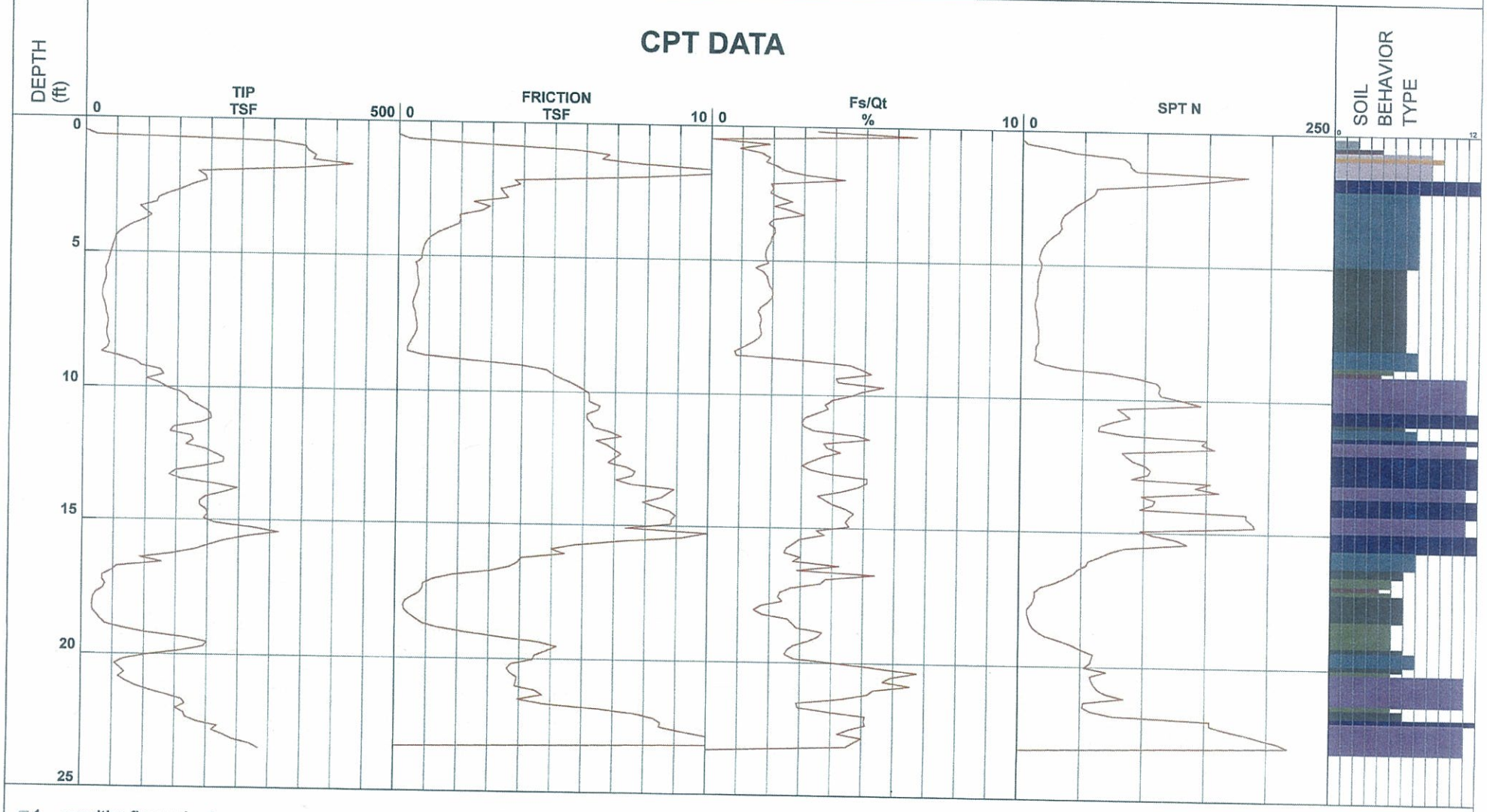
S*Soil behavior type and SPT based on data from UBC-1983

Engeo Inc

Project	500 Kirkham Street	Operator	CB	Filename	SDF(009).cpt
Job Number	12473.000.000	Cone Number	DDG1281	GPS	
Hole Number	CPT-03	Date and Time	10/2/2015 9:34:30 AM	Maximum Depth	23.46 ft
EST GW Depth During Test		12.00 ft			

Net Area Ratio .8

CPT DATA



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

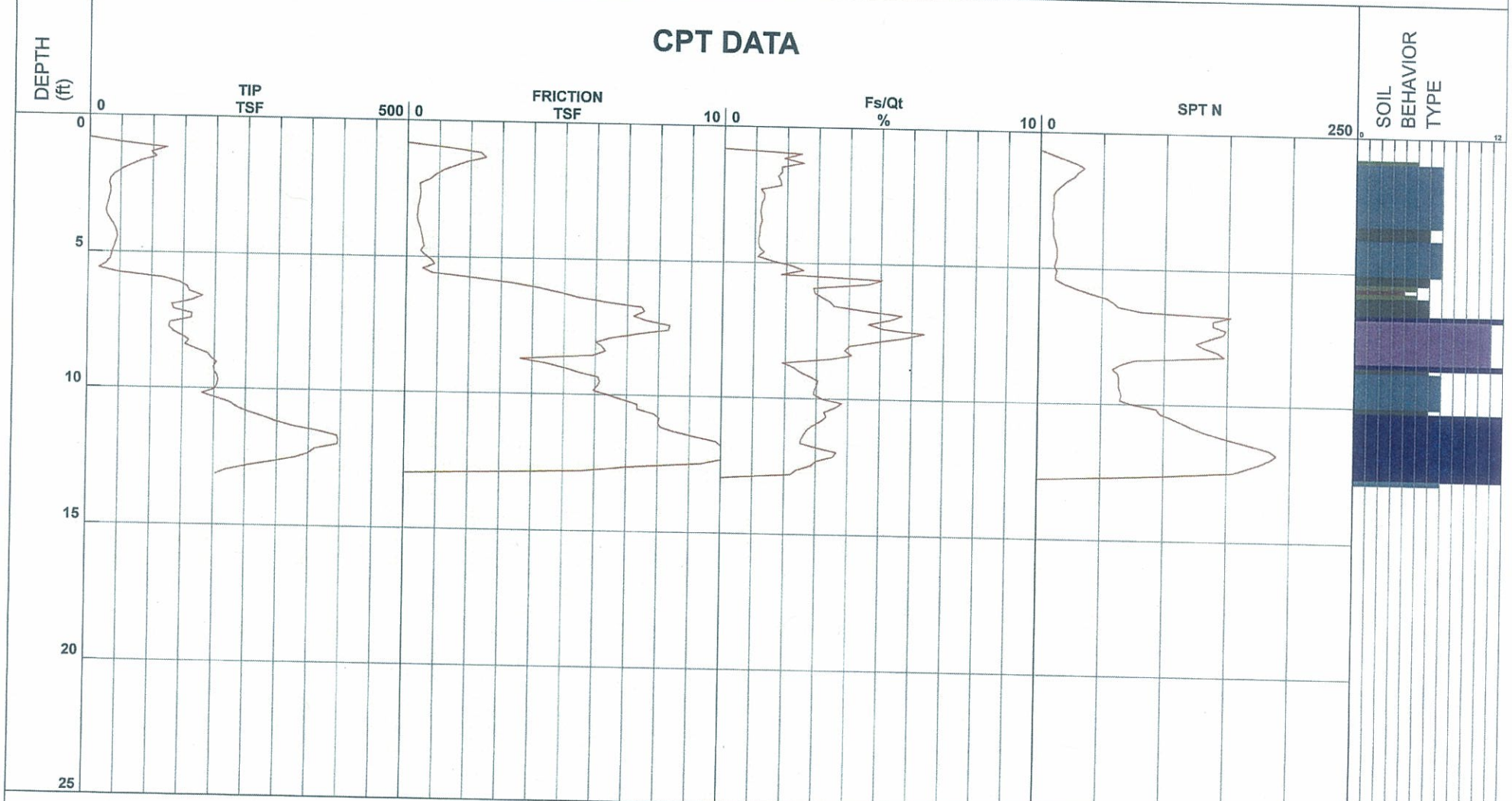
S*Soil behavior type and SPT based on data from UBC-1983

Engeo Inc

Project	500 Kirkham Street	Operator	CB	Filename	SDF(010).cpt
Job Number	12473.000.000	Cone Number	DDG1281	GPS	
Hole Number	CPT-04	Date and Time	10/2/2015 9:59:17 AM	Maximum Depth	13.12 ft
EST GW Depth During Test		12.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

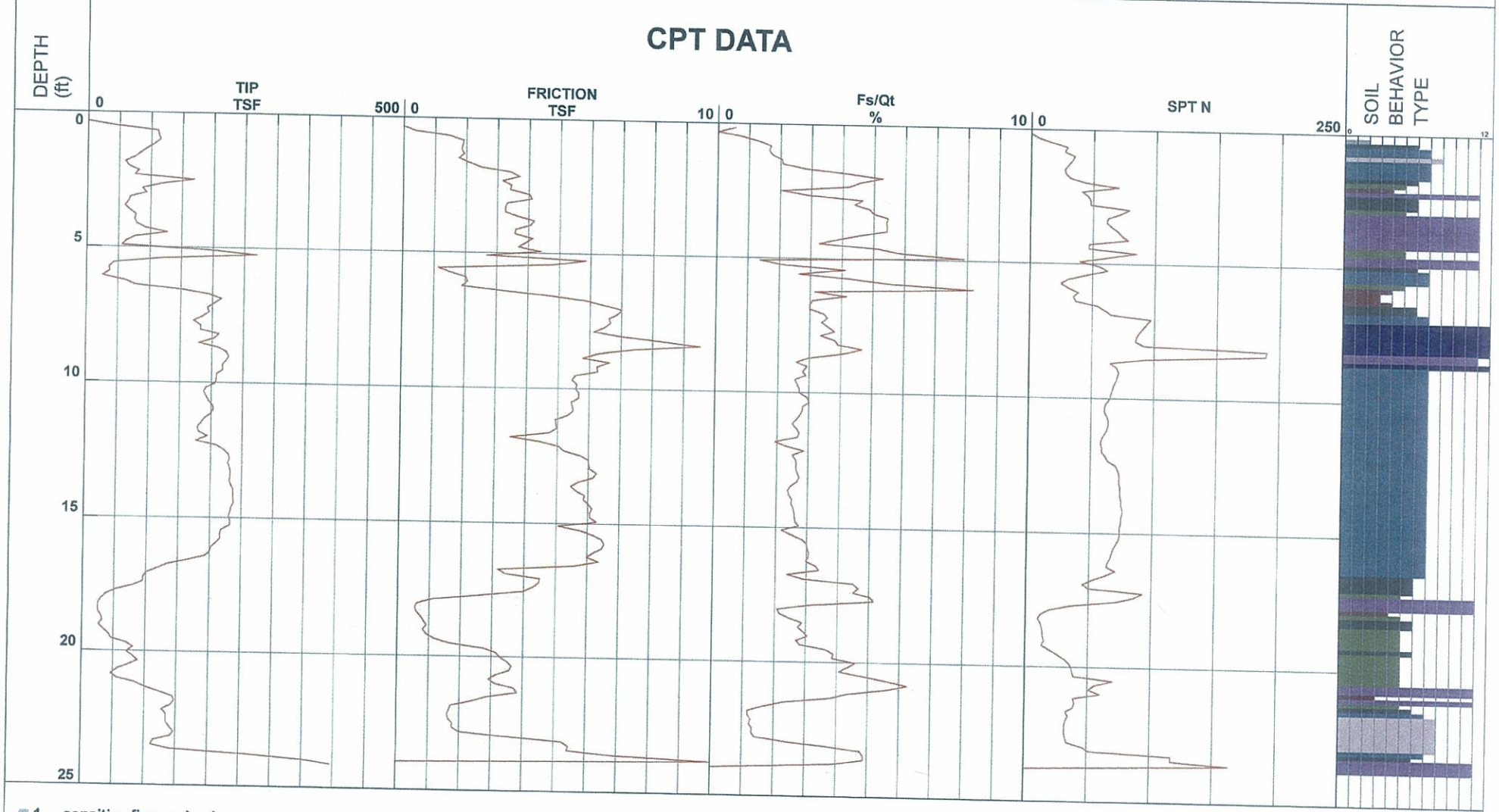
S*Soil behavior type and SPT based on data from UBC-1983

Engeo Inc

Project	500 Kirkham Street	Operator	CB	Filename	SDF(011).cpt
Job Number	12473.000.000	Cone Number	DDG1281	GPS	
Hole Number	CPT-05	Date and Time	10/2/2015 10:27:28 AM	Maximum Depth	24.11 ft
EST GW Depth During Test	12.00 ft				

Net Area Ratio .8

CPT DATA



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

APPENDIX C

CPT Liquefaction Analysis

APPENDIX C

ENGEO
Expect Excellence

LIQUEFACTION ANALYSIS REPORT

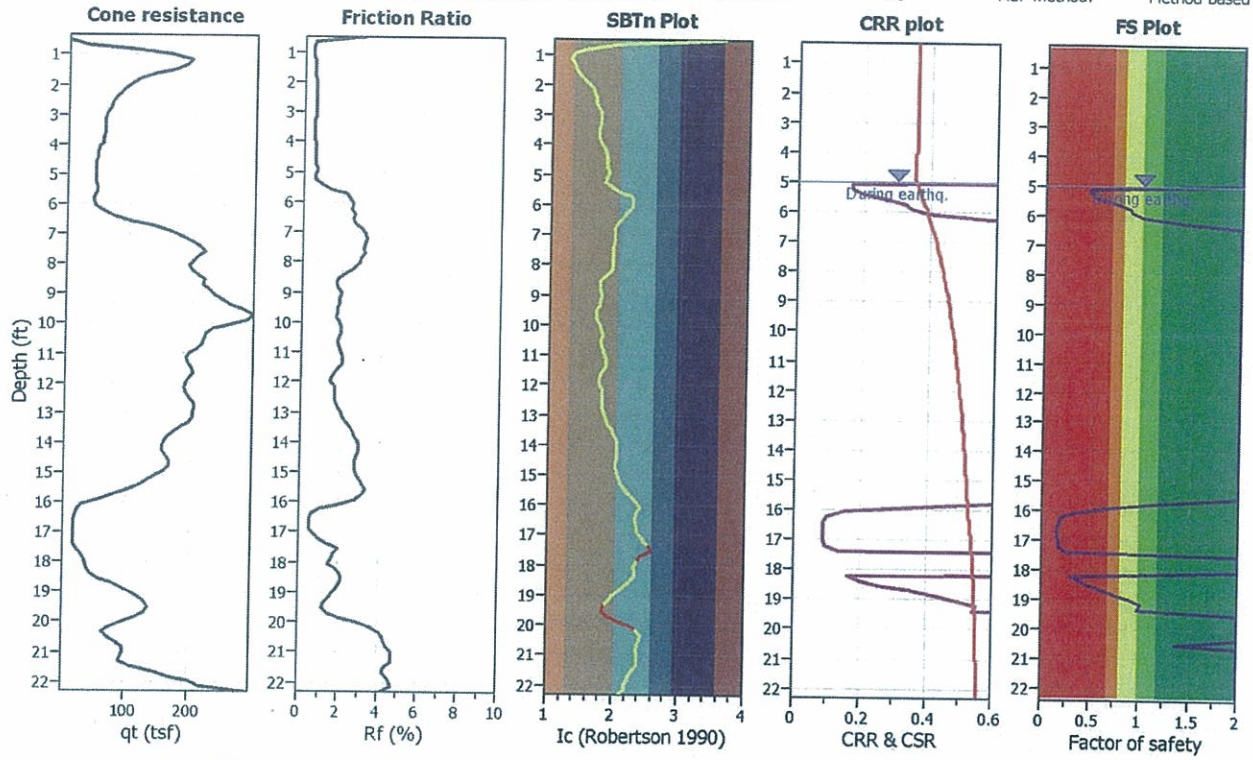
Project title : 500 Kirkham Street

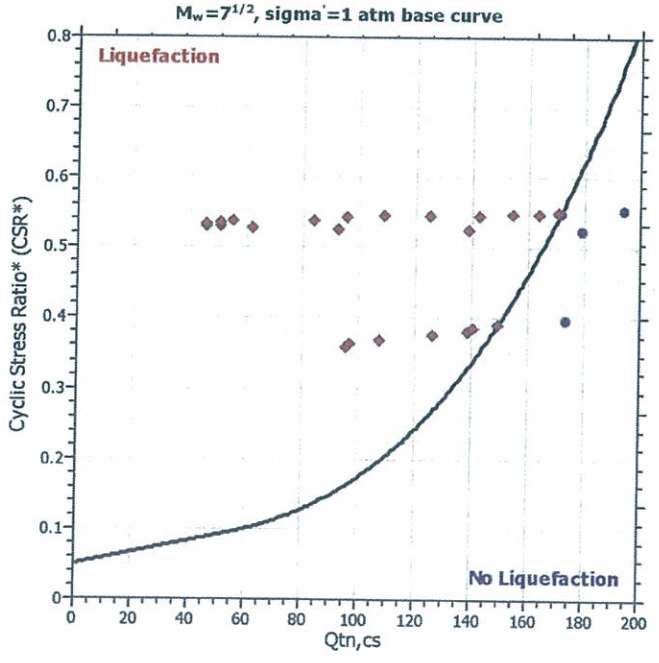
Location : Oakland, CA

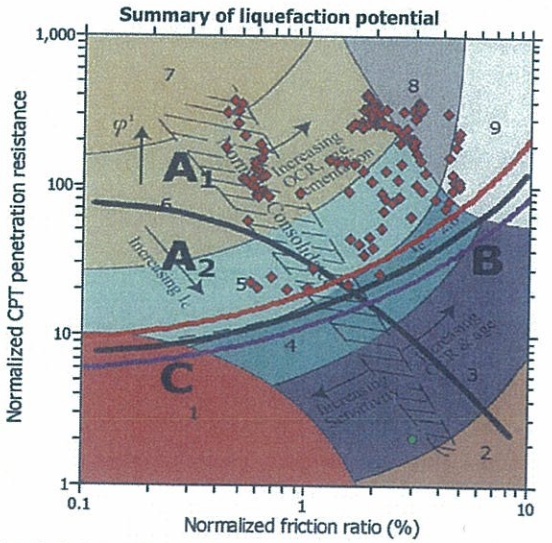
CPT file : 1-CPT1

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	7.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	5.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.30	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.59	Unit weight calculation:	Based on SBT	K_σ applied:	No		

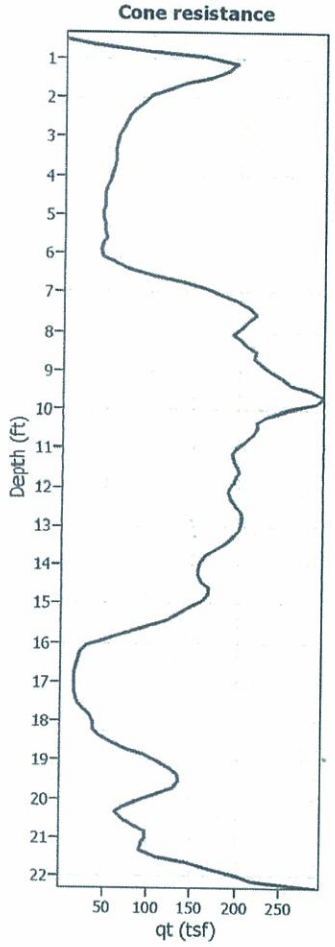


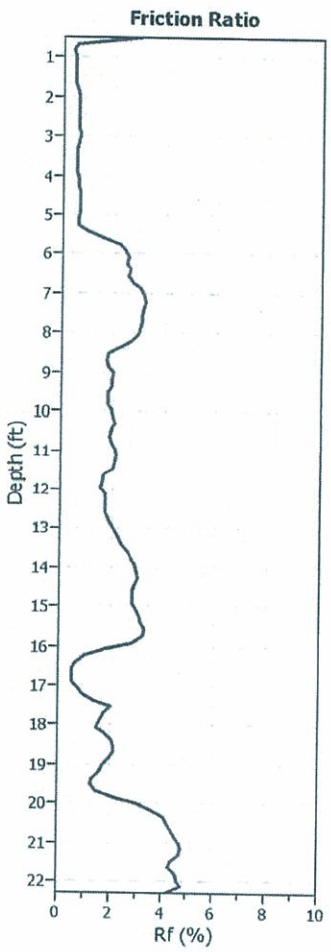


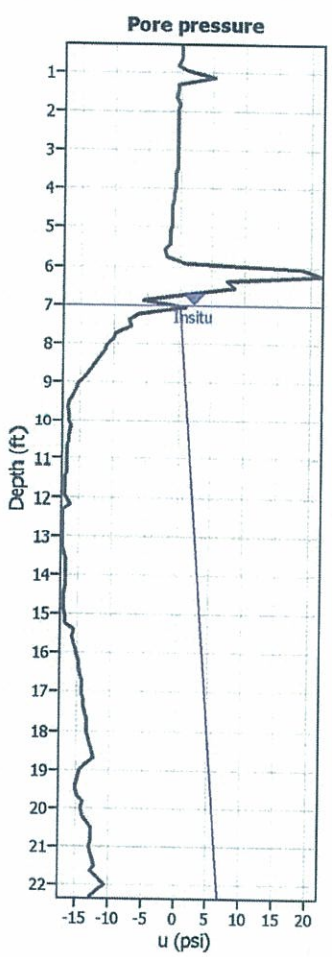


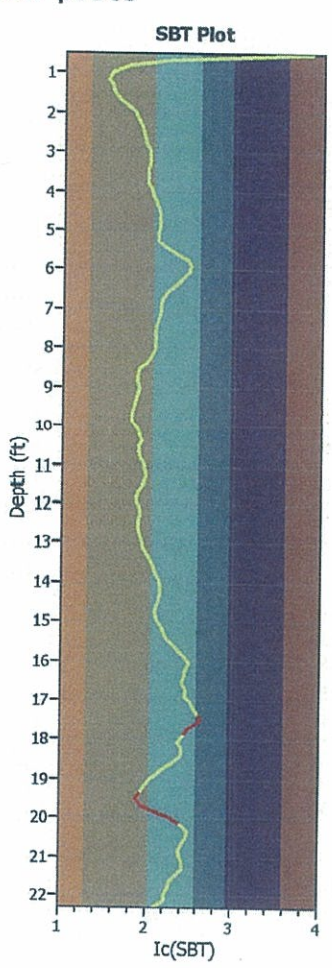
Zone A: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

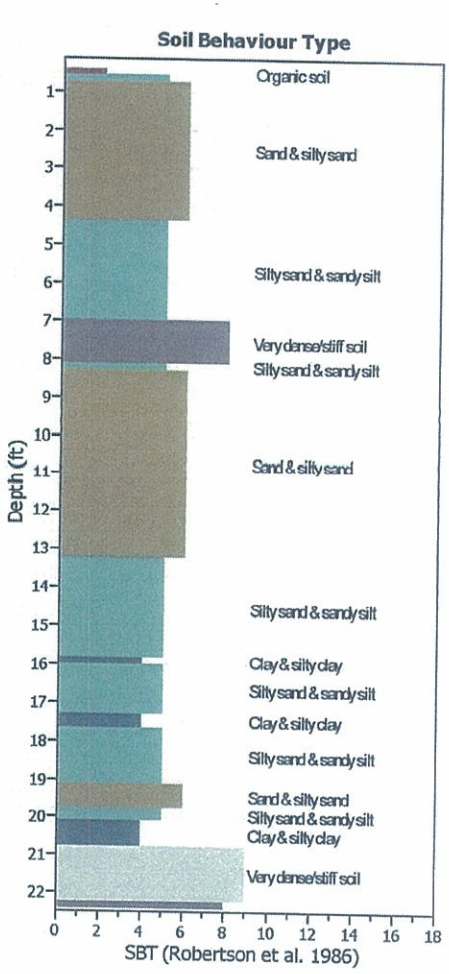
CPT basic interpretation plots











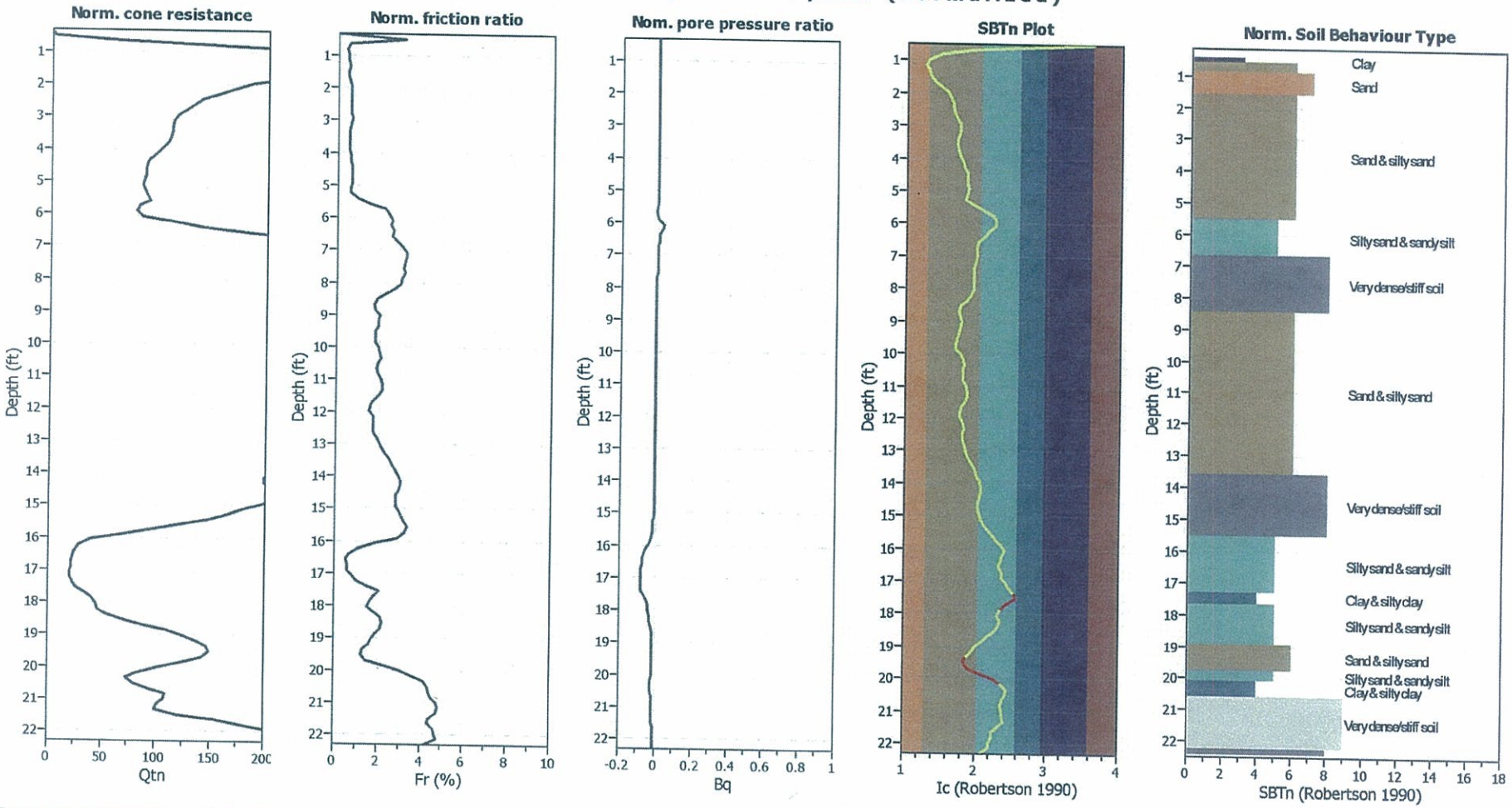
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	7.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



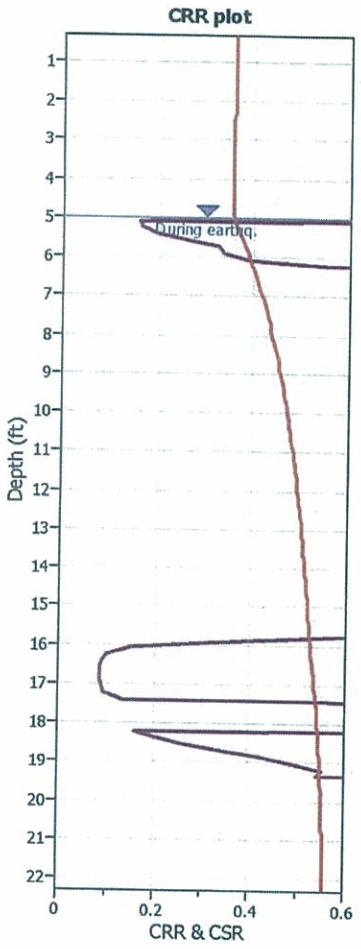
Input parameters and analysis data

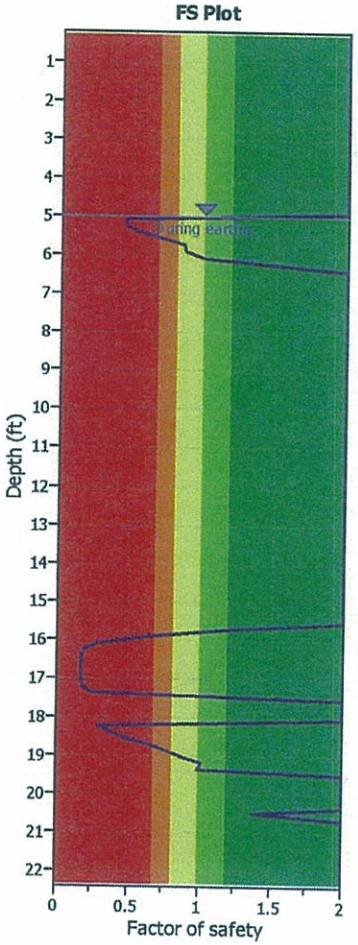
Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	7.00 ft	Fill height:	N/A	Limit depth:	N/A

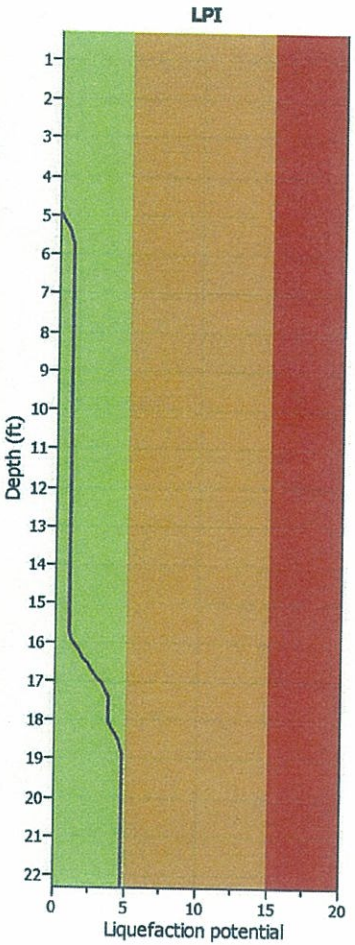
SBTn legend

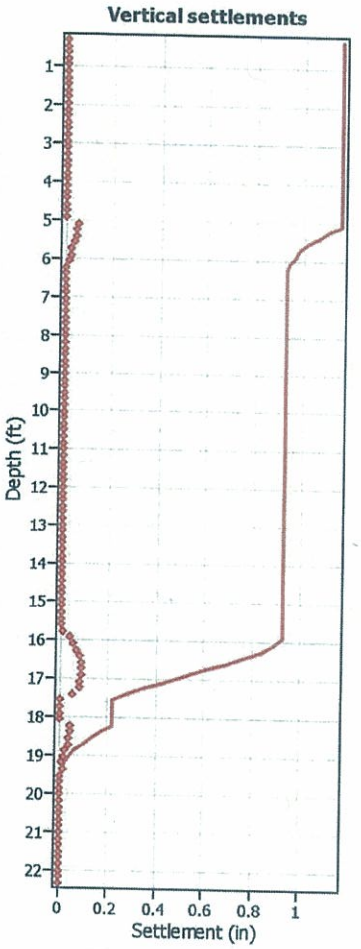
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

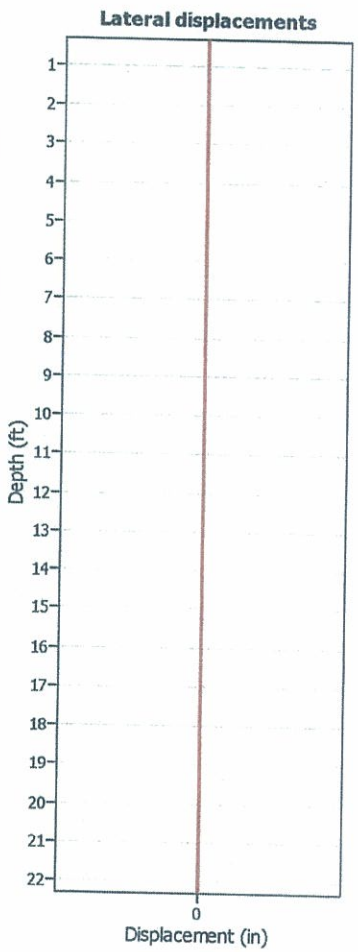
Liquefaction analysis overall plots











Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	7.00 ft	Fill height:	N/A	Limit depth:	N/A

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

ENGEO
Expect Excellence

LIQUEFACTION ANALYSIS REPORT

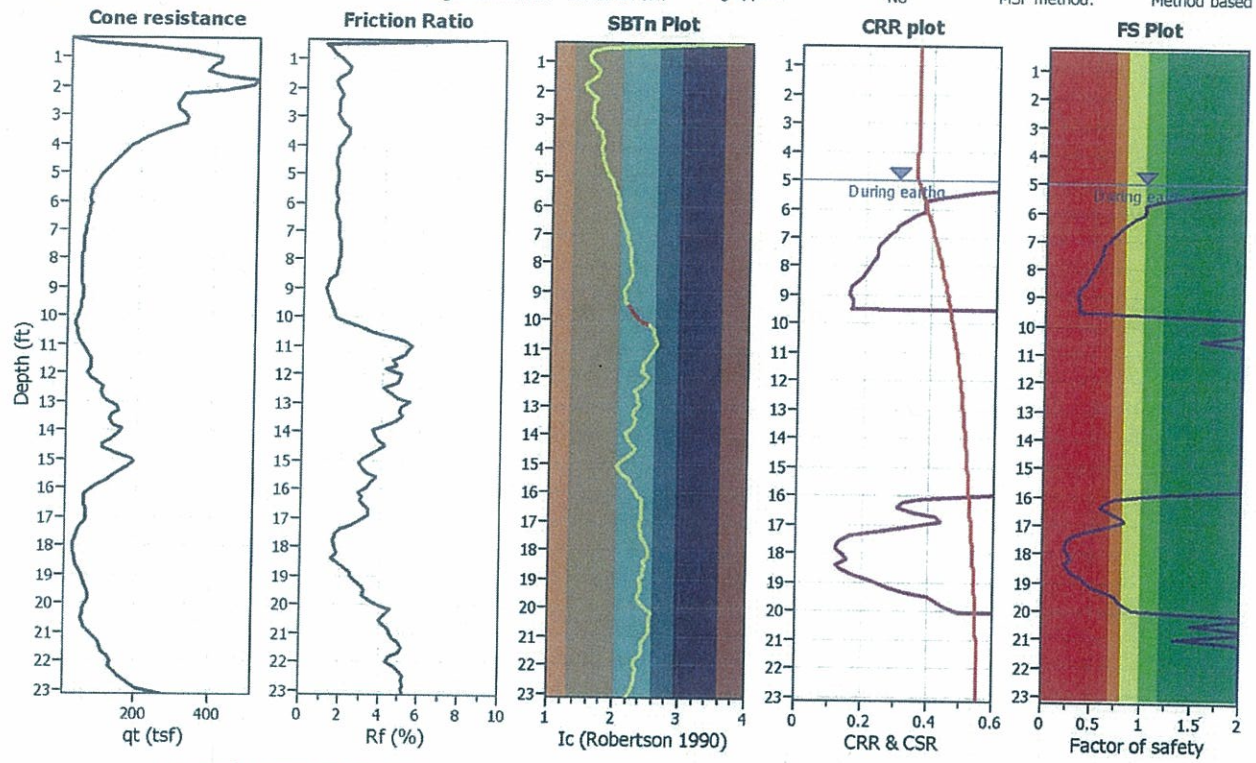
Project title : 500 Kirkham Street

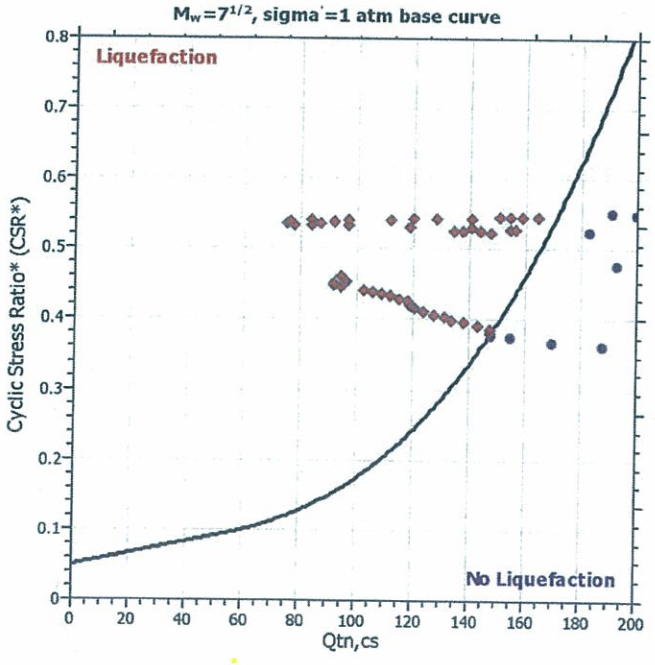
Location : Oakland, CA

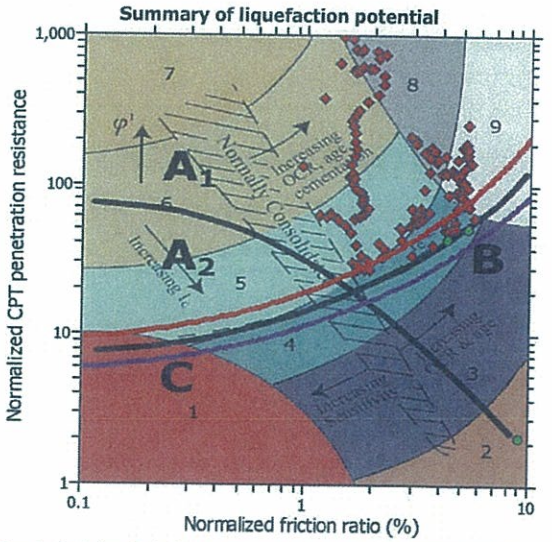
CPT file : 1-CPT2

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	11.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	5.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.30	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.59	Unit weight calculation:	Based on SBT	K_σ applied:	No		

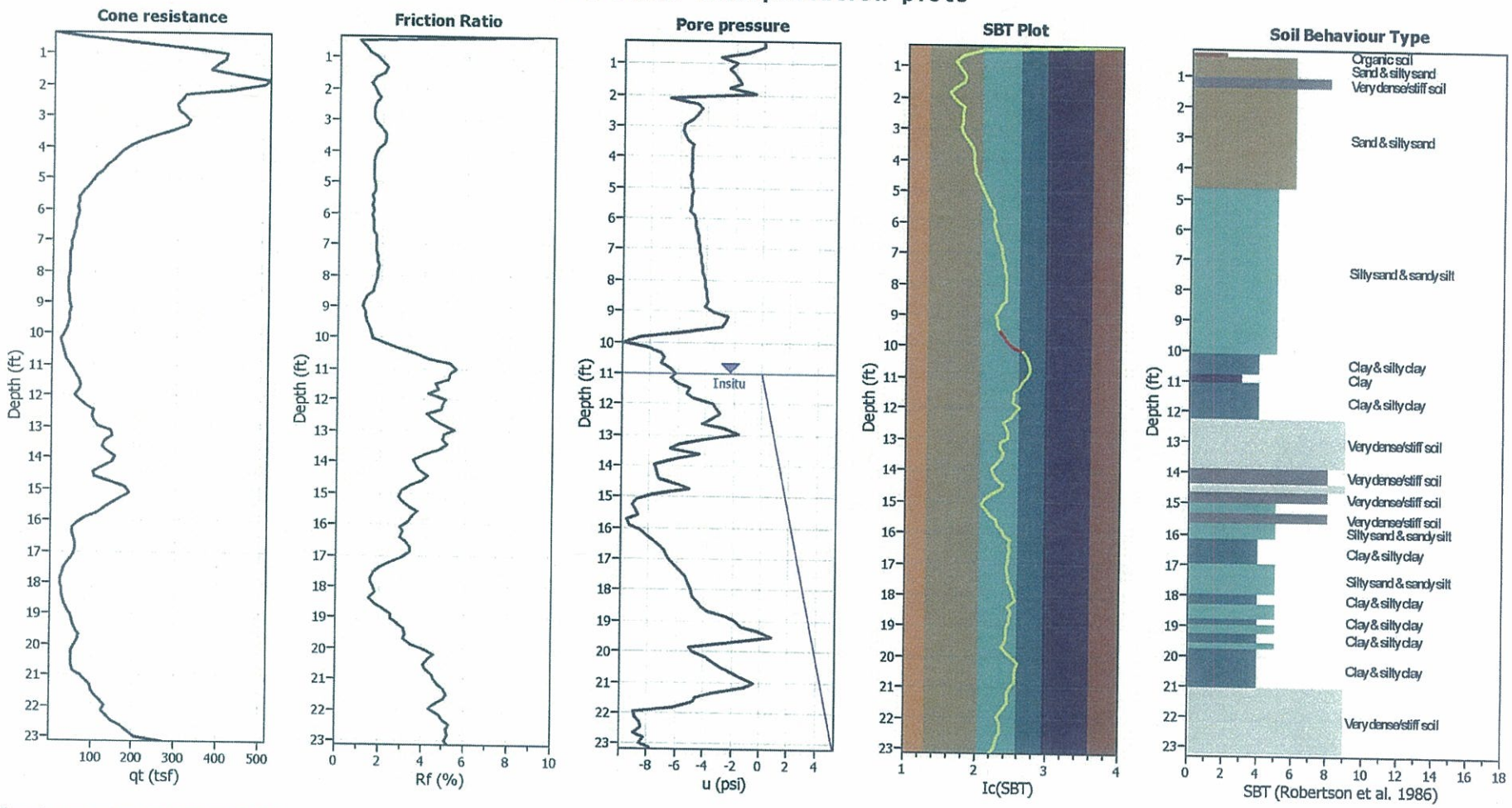






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



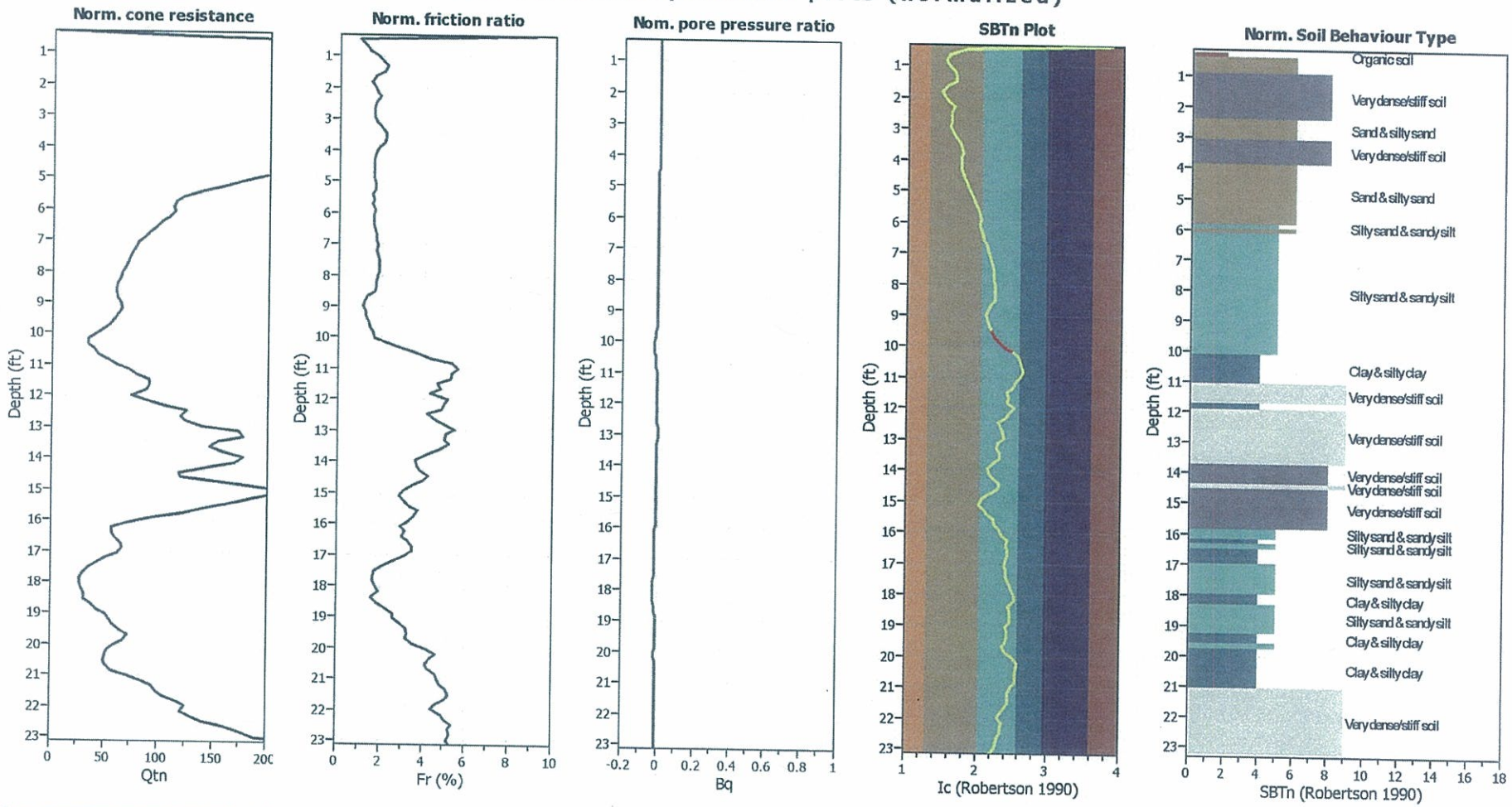
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



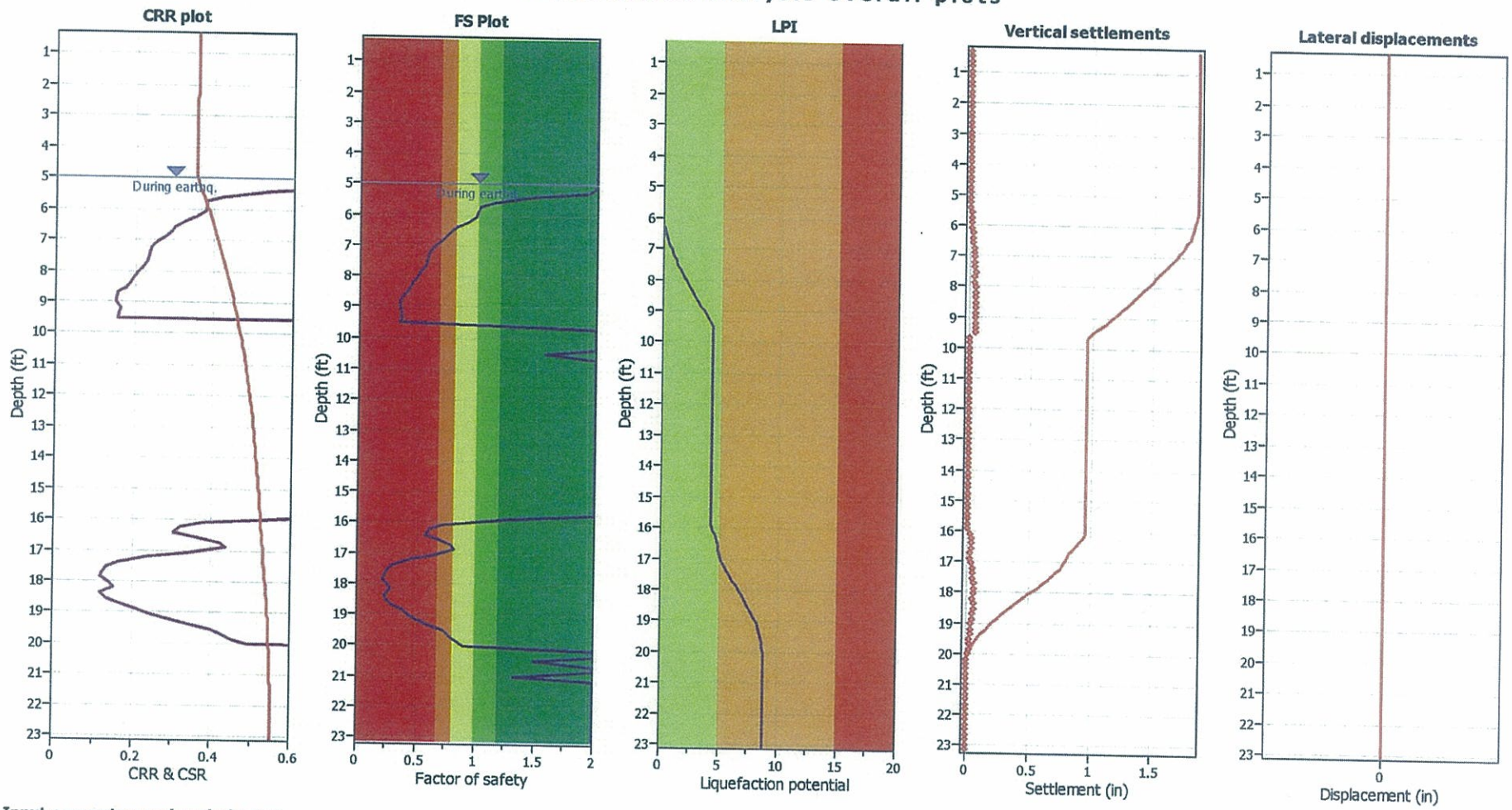
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

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

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

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

ENGEO
Expect Excellence

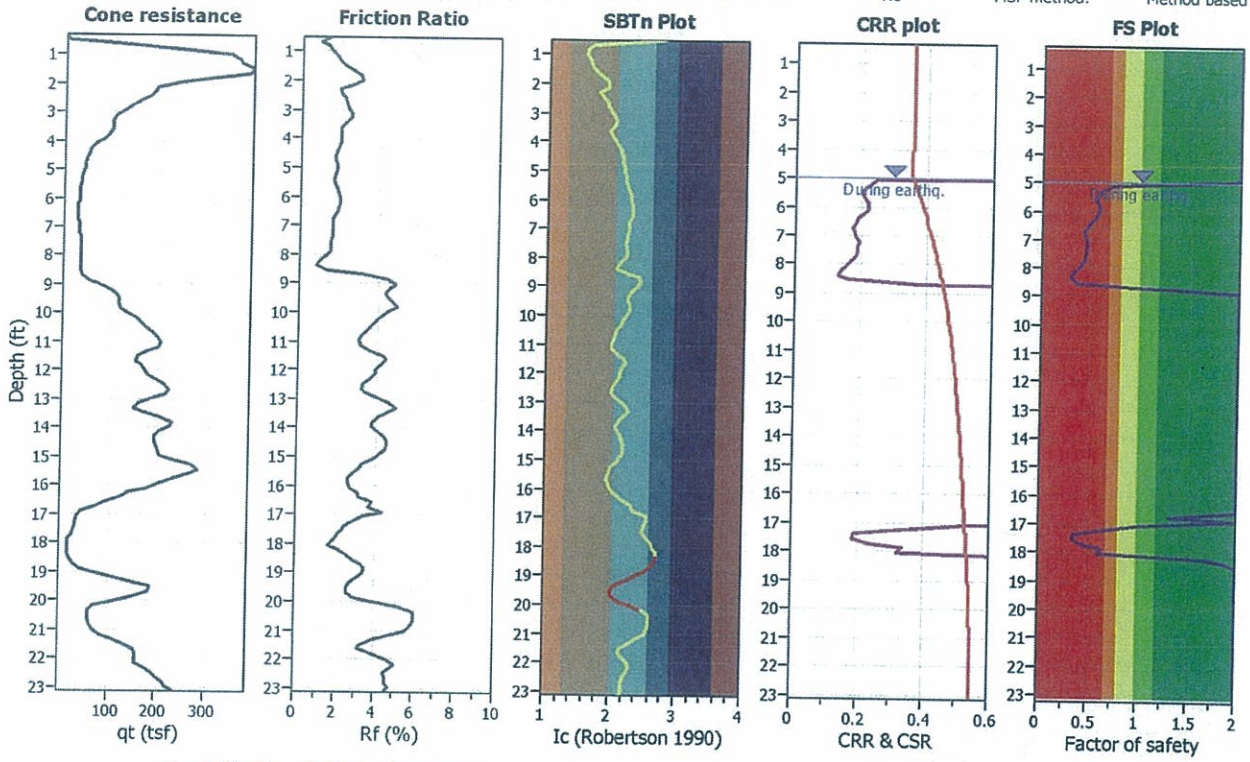
LIQUEFACTION ANALYSIS REPORT

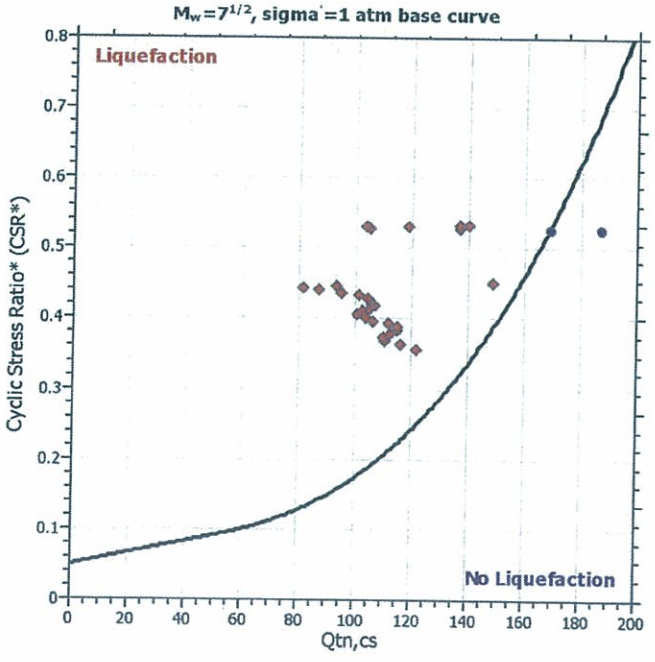
Project title : 500 Kirkham Street **Location : Oakland, CA**

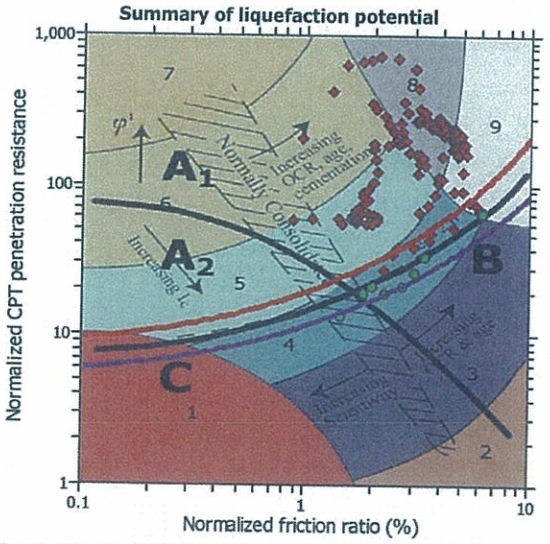
CPT file : 1-CPT3

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	8.50 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	5.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.30	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.59	Unit weight calculation:	Based on SBT	K_σ applied:	No		

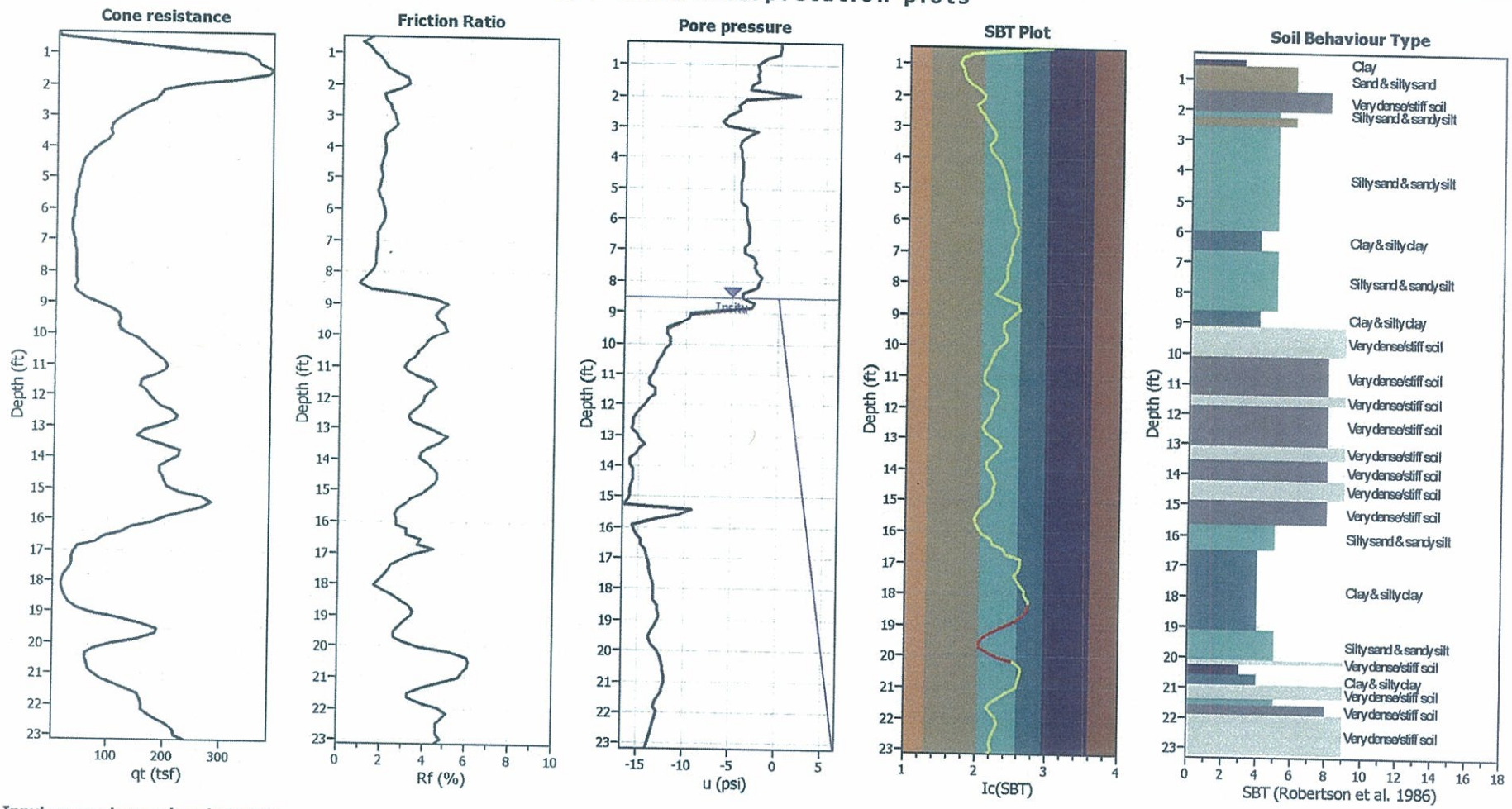






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



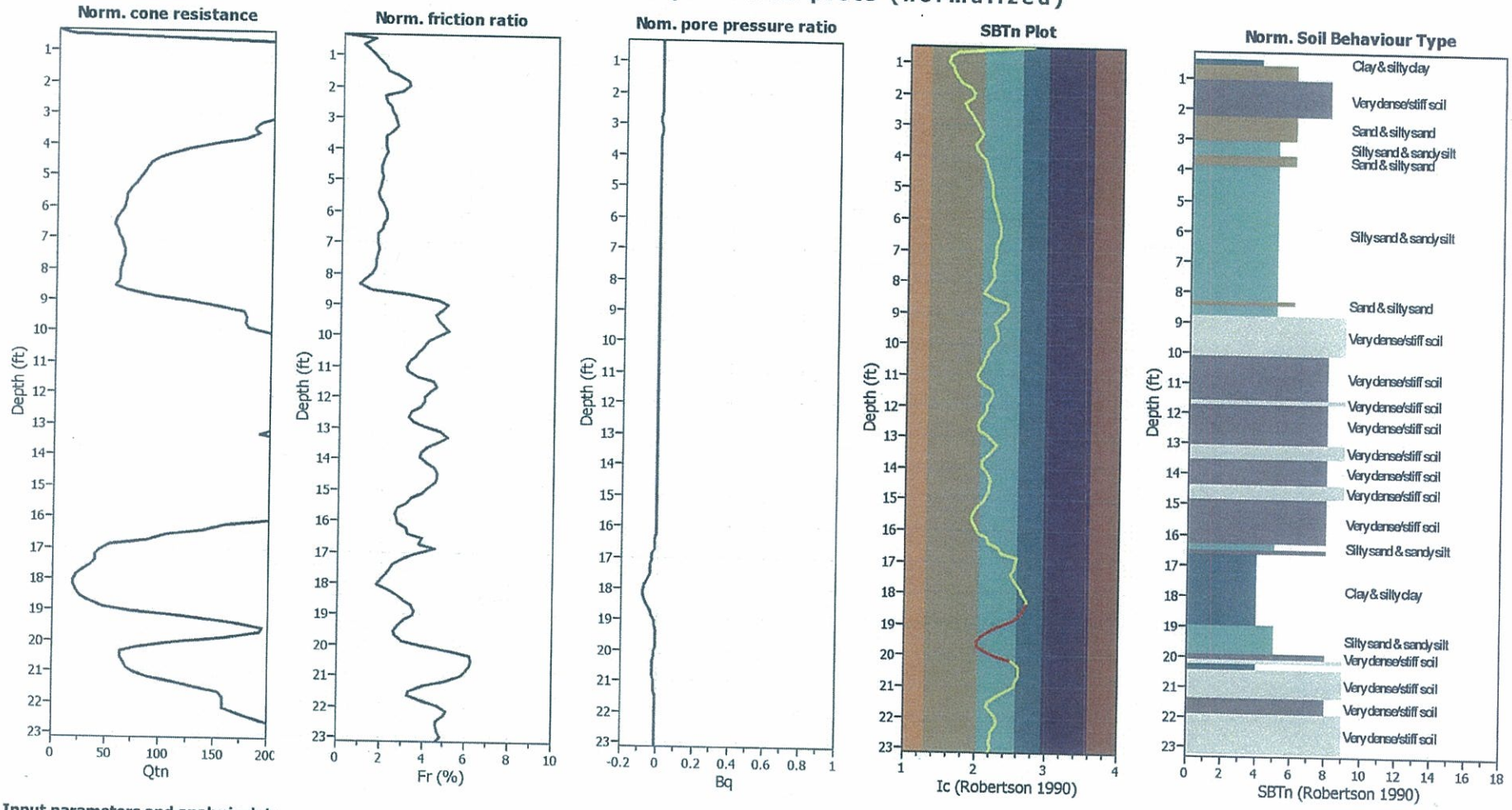
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	8.50 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



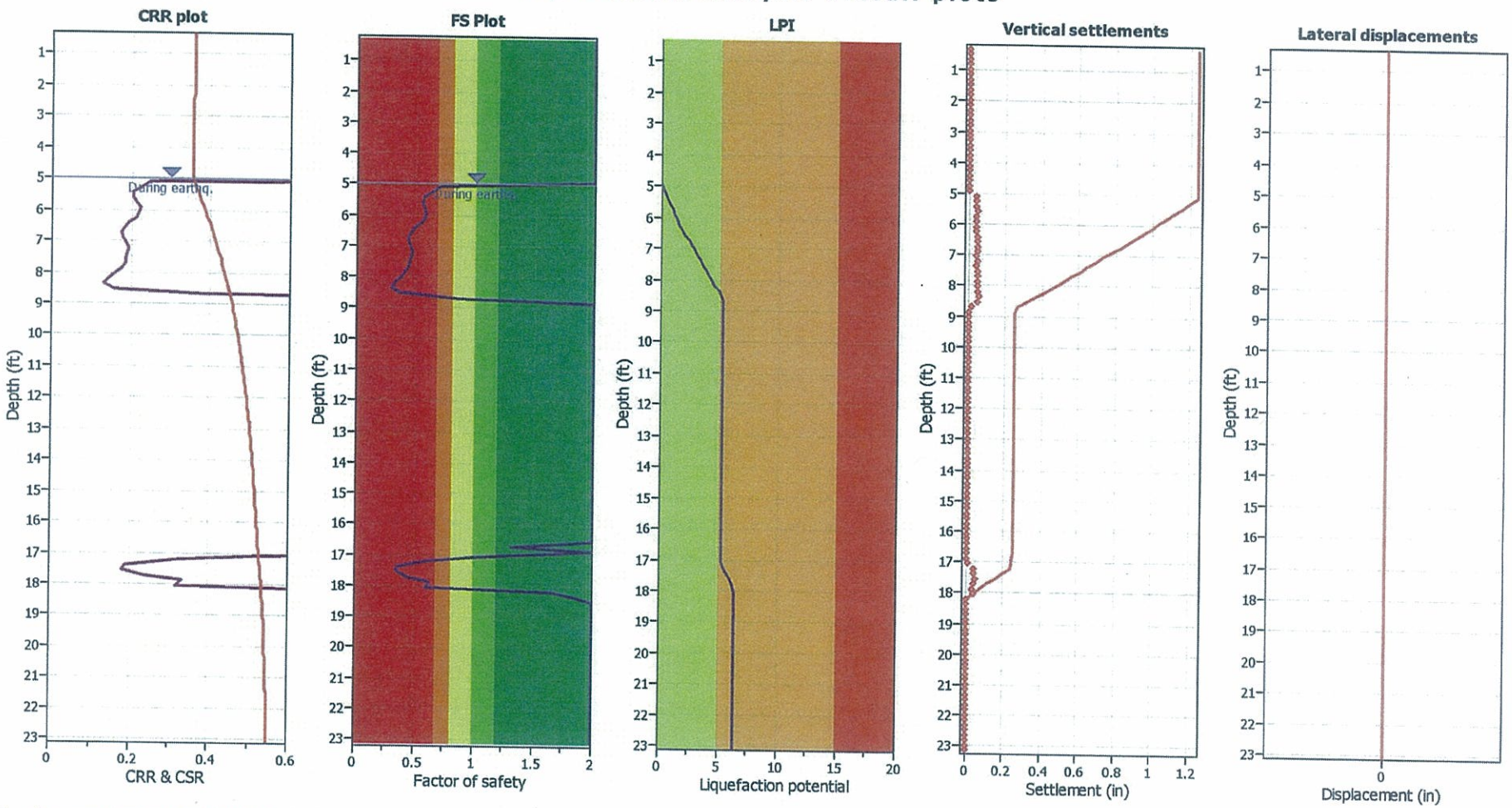
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	8.50 ft	Fill height:	N/A	Limit depth:	N/A

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

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	8.50 ft	Fill height:	N/A	Limit depth:	N/A

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

ENGEO
Expect Excellence

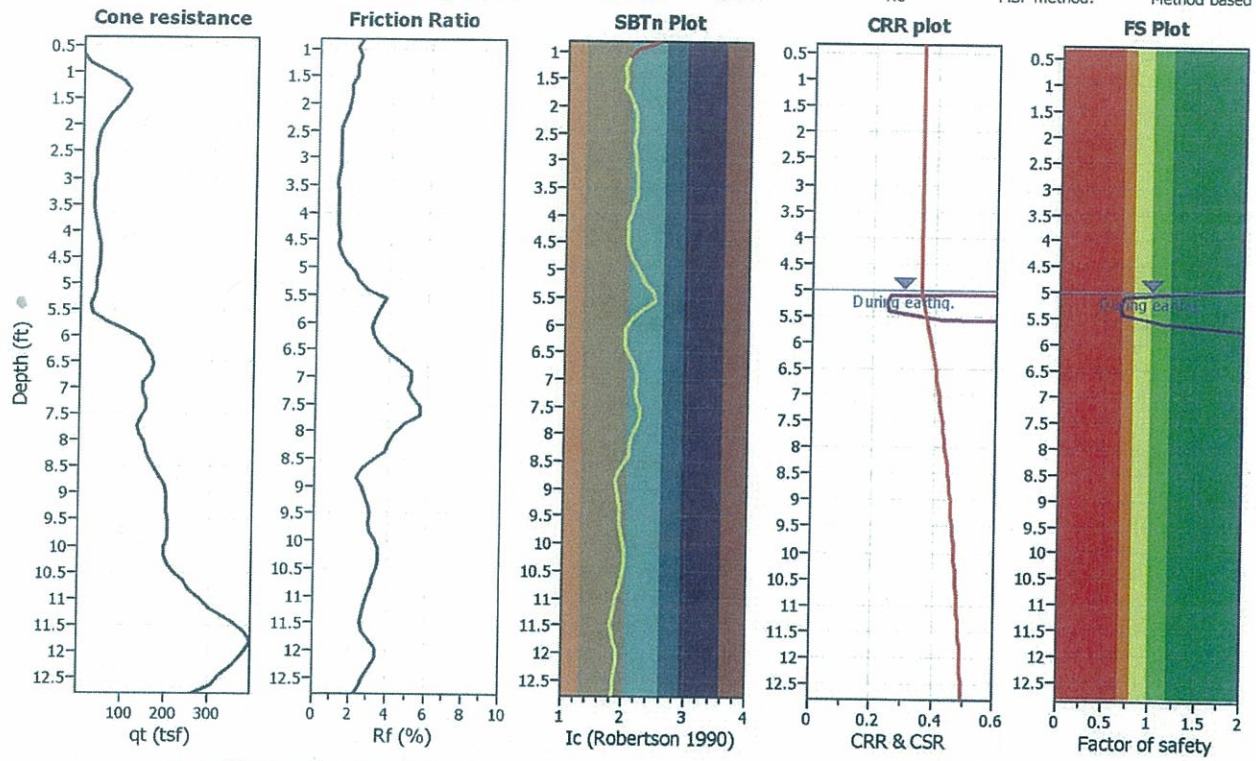
LIQUEFACTION ANALYSIS REPORT

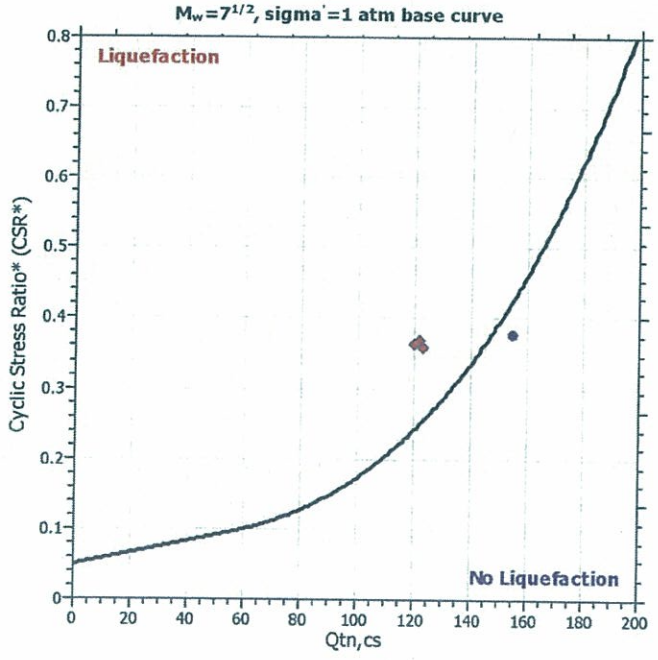
Project title : 500 Kirkham Street **Location : Oakland, CA**

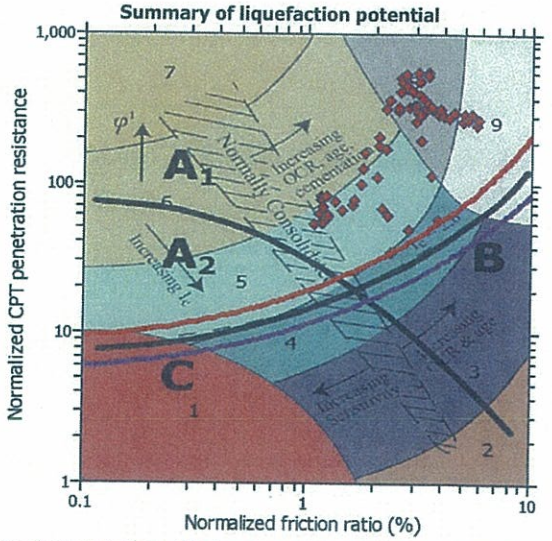
CPT file : 1-CPT4

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	5.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	5.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.30	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.59	Unit weight calculation:	Based on SBT	K_σ applied:	No		

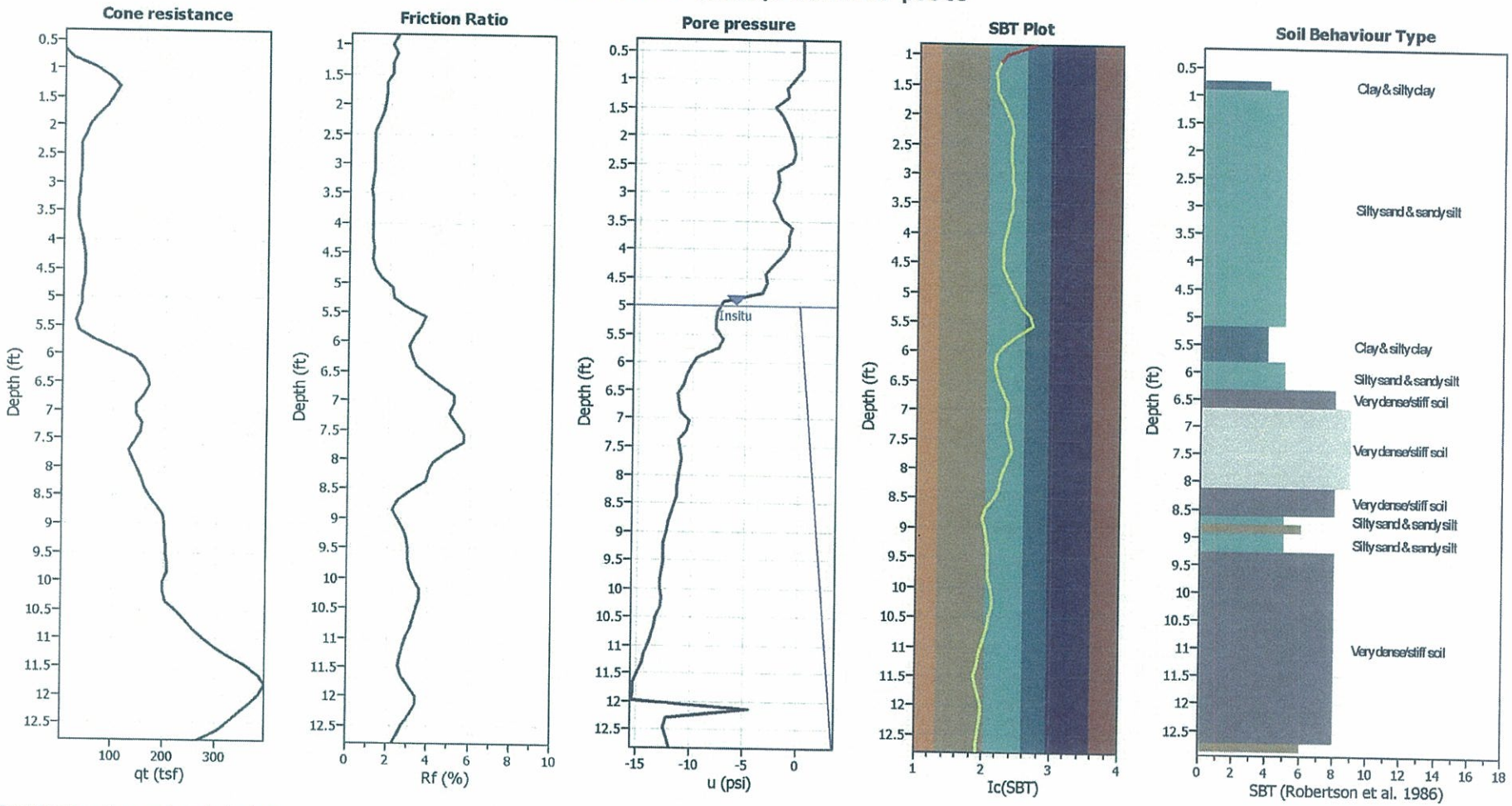






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



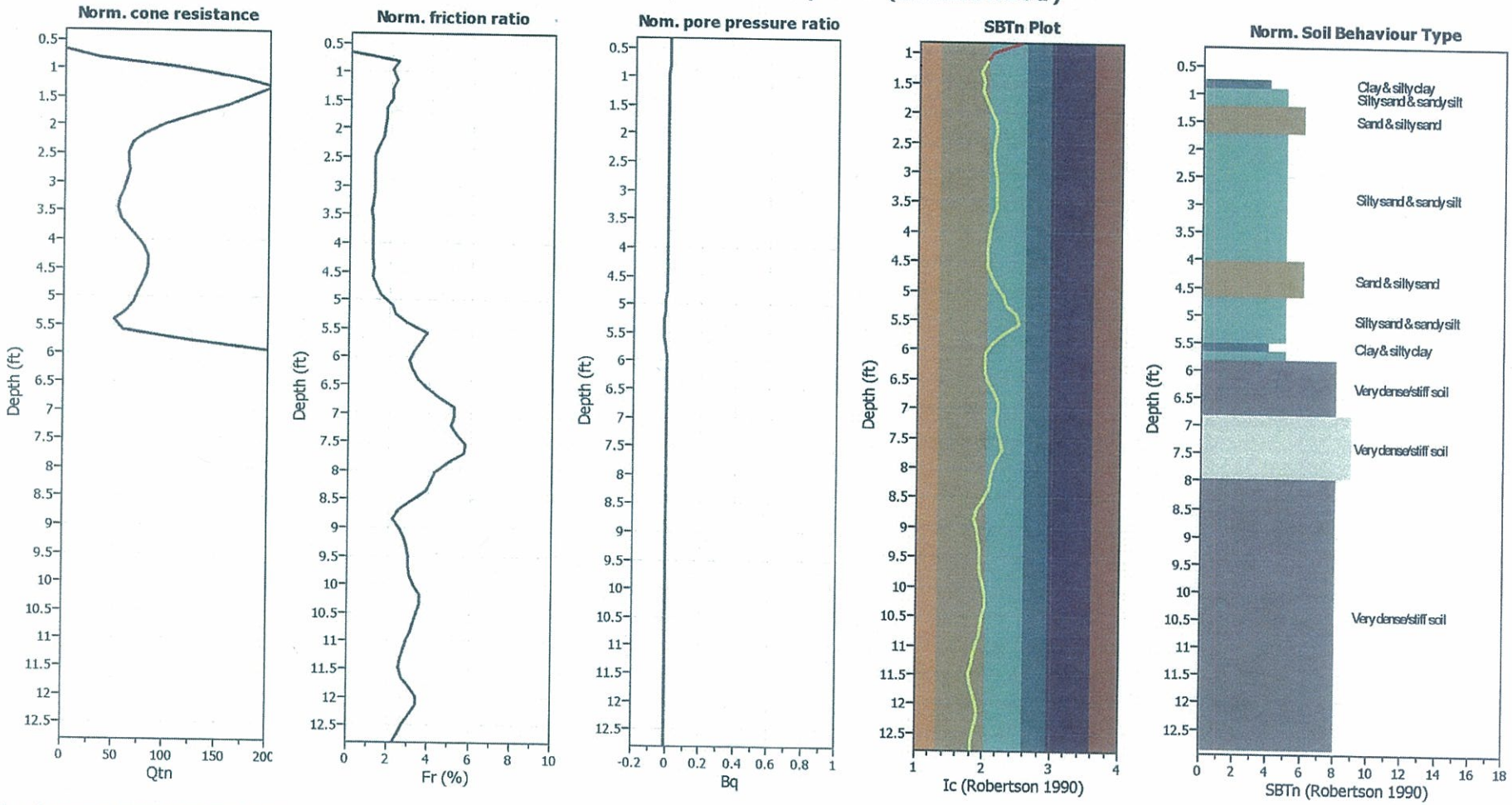
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	5.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



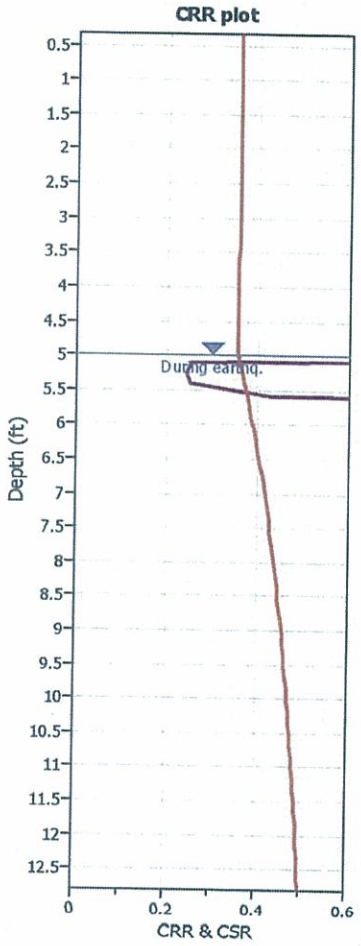
Input parameters and analysis data

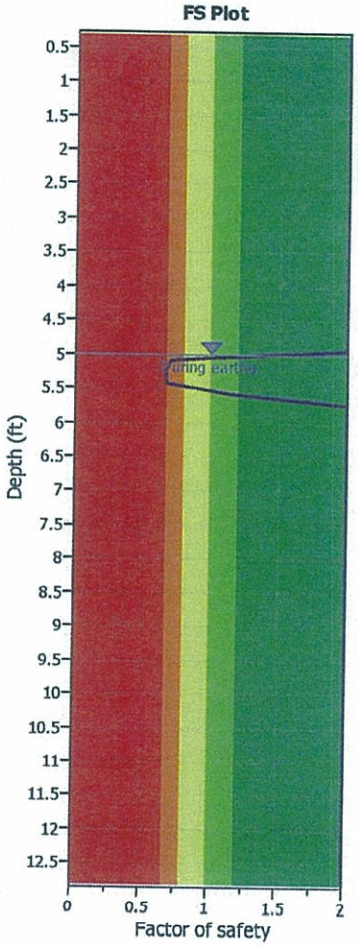
Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	5.00 ft	Fill height:	N/A	Limit depth:	N/A

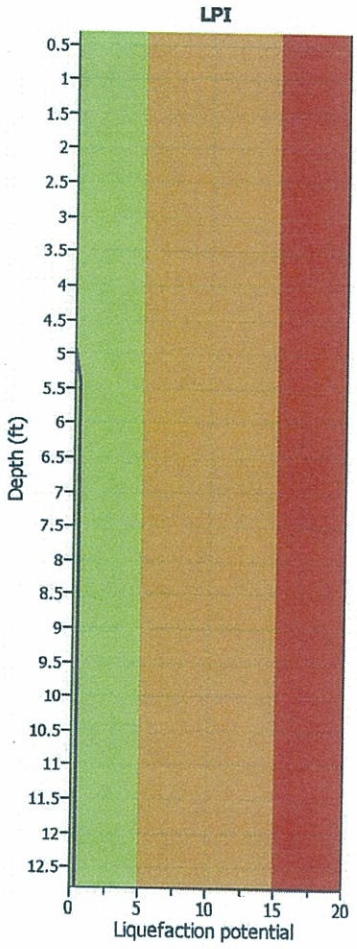
SBTn legend

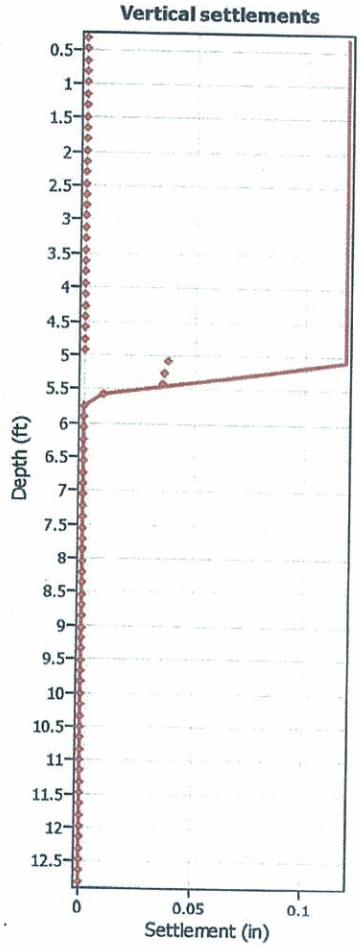
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

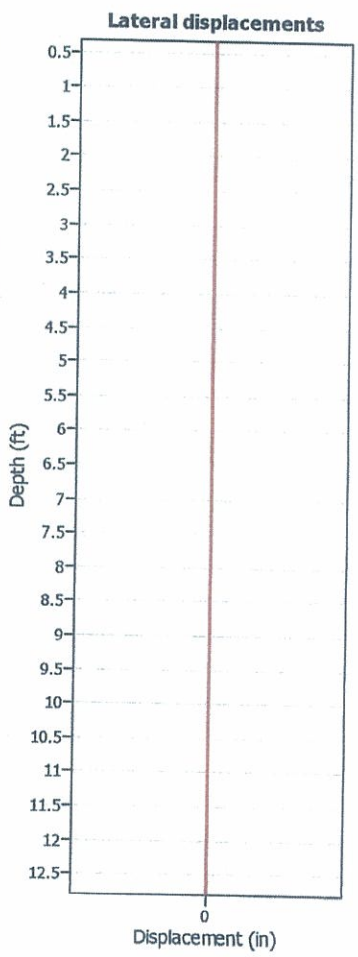
Liquefaction analysis overall plots











Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	5.00 ft	Fill height:	N/A	Limit depth:	N/A

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

ENGEO
Expect Excellence

LIQUEFACTION ANALYSIS REPORT

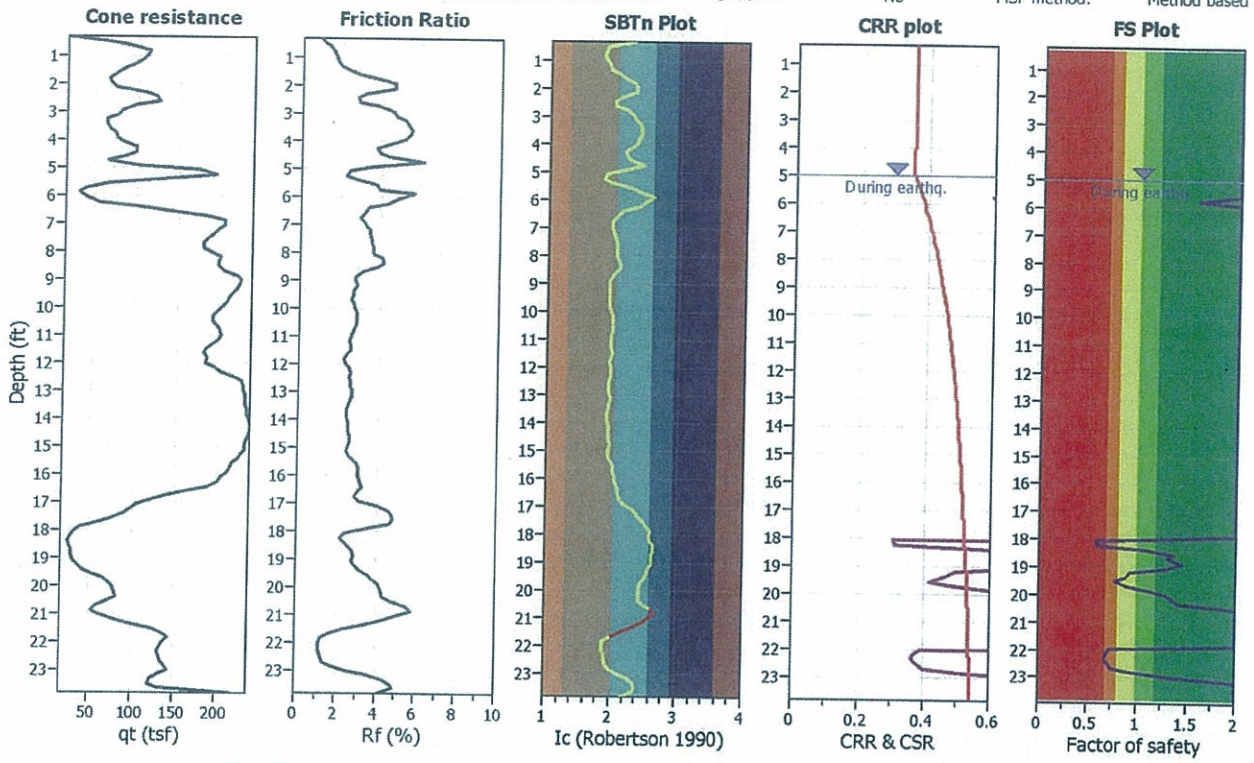
Project title : 500 Kirkham Street

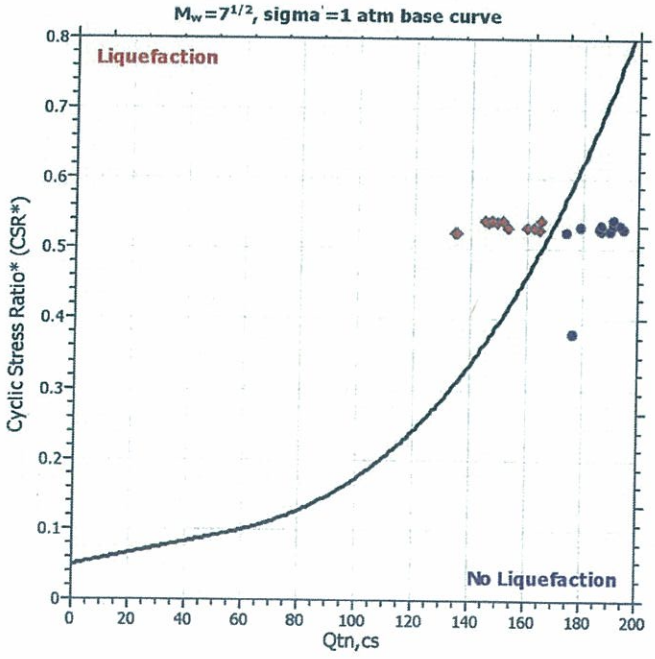
Location : Oakland, CA

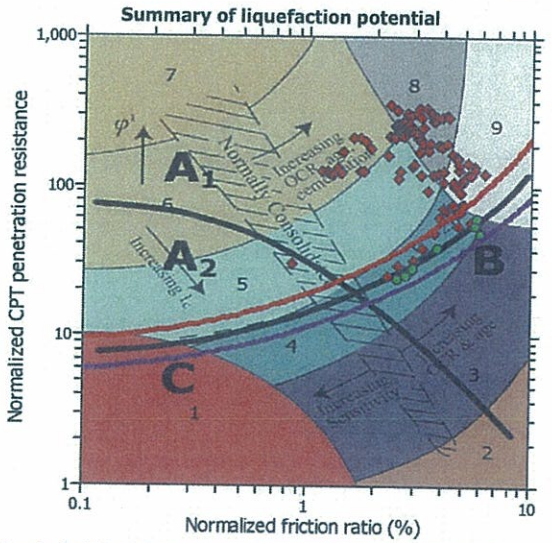
CPT file : 1-CPT5

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	11.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	5.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.30	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.59	Unit weight calculation:	Based on SBT	K_σ applied:	No		

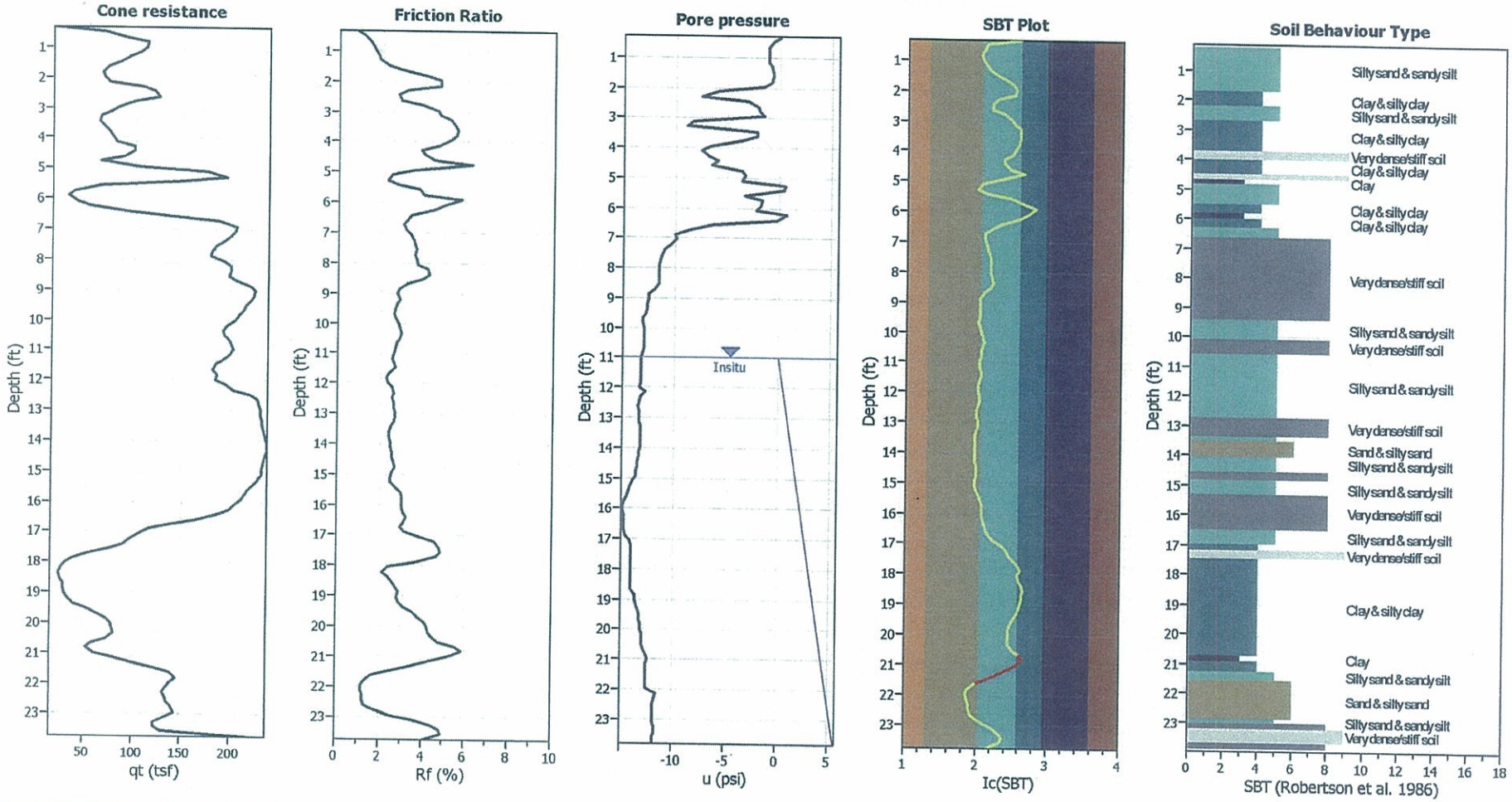






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



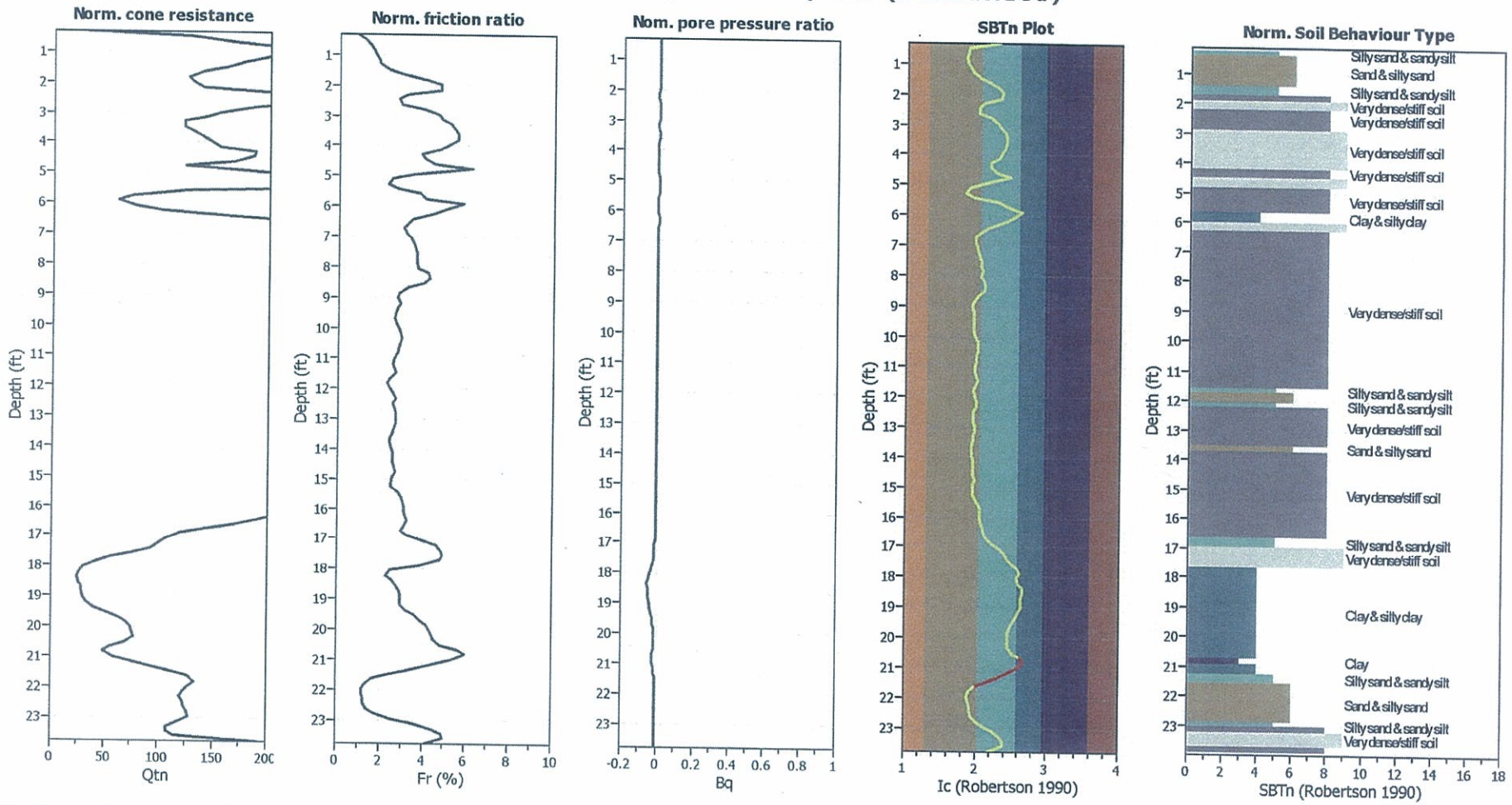
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



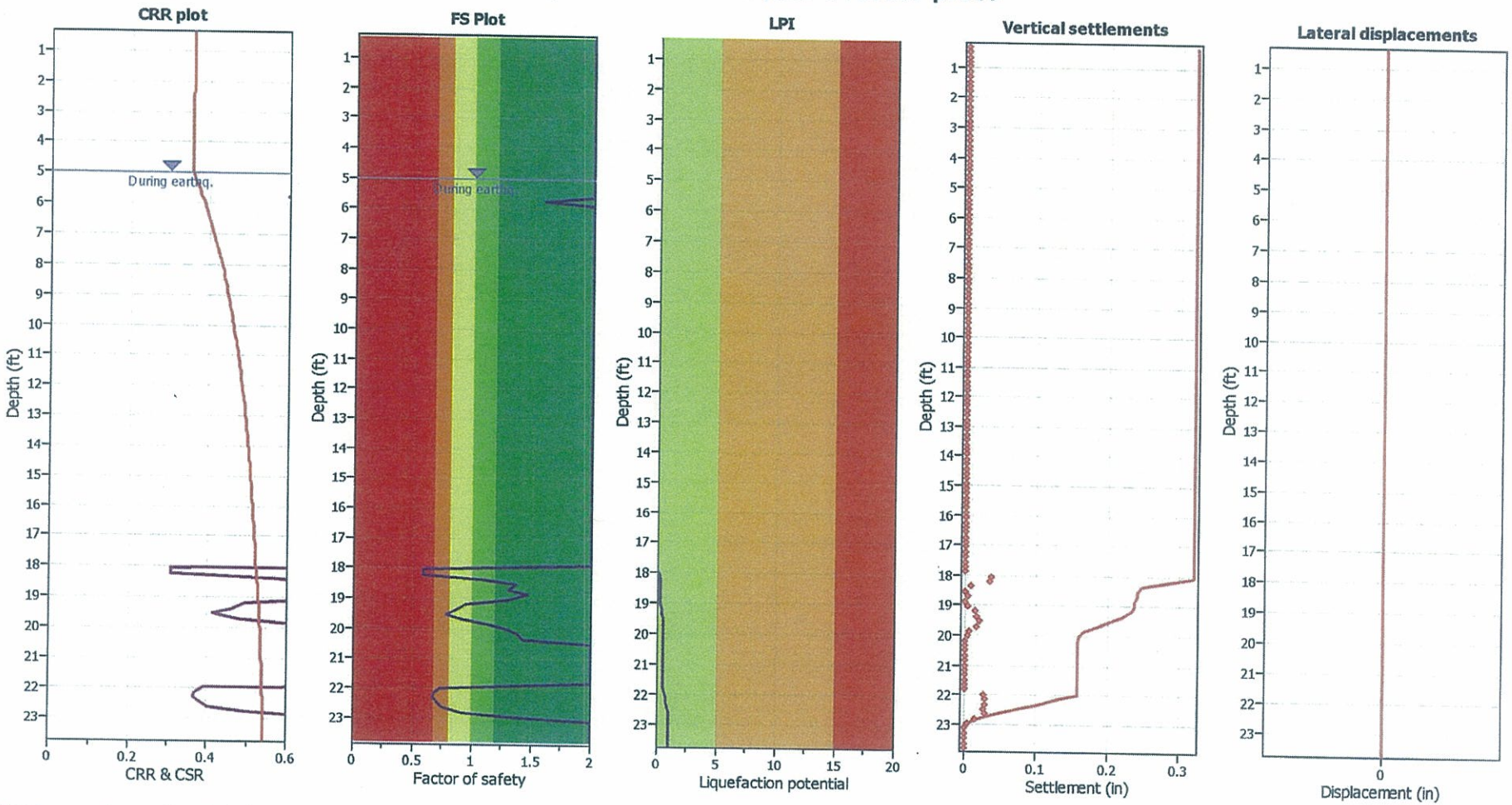
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

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

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

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

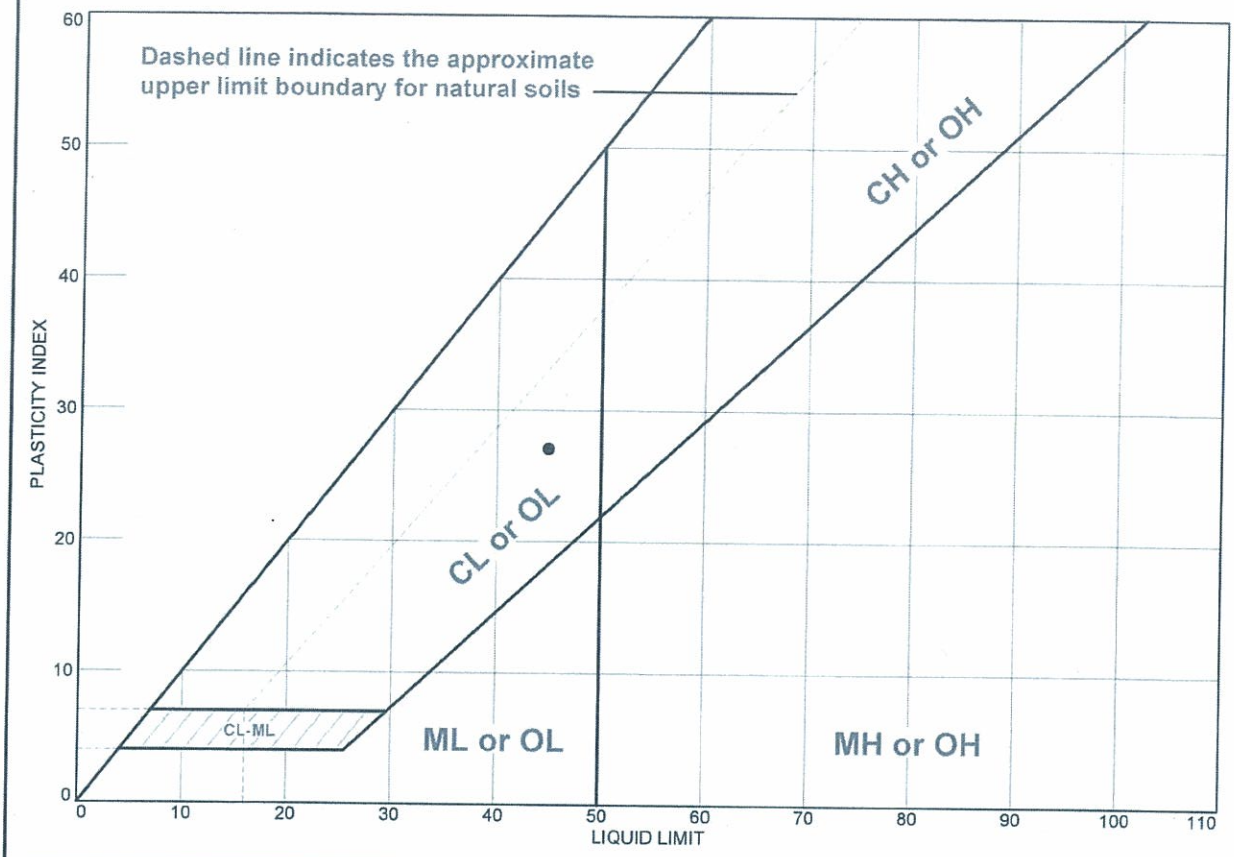
- Very high risk
- High risk
- Low risk

APPENDIX D

ENGEO Laboratory Results

APPENDIX D

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark gryish brown clayey SAND	45	18	27			

Project No. 12473.000.000 **Client:** Tim Lewis Communities

Project: 500 Kirkham Street, Oakland

●**Depth:** 5.0-7.5 feet **Sample Number:** 1-TP5 @ 5-7.5

Remarks:

●ASTM D4318, Wet method

ENGEO INCORPORATED

Tested By: W. Miller **Checked By:** G. Criste

APPENDIX E

CERCO Laboratory Results

APPENDIX E

California State Certified Laboratory No. 2153

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

13 October, 2015

Job No. 1510059
Cust. No.10169

Mr. Dino Bernardi
ENGEO Inc.
2010 Crow Canyon Place, Suite 250
San Ramon, CA 94583

Subject: Project No.: 12473.000.000
Project Name: 500 Kirkham Street
Corrosivity Analysis – ASTM Test Methods

Dear Mr. Bernardi:

Pursuant to your request, CERCO Analytical has analyzed the soil samples submitted on October 08, 2015. Based on the analytical results, this brief corrosivity evaluation is enclosed for your consideration.

Based upon the resistivity measurements, sample 001 is classified as "moderately corrosive" and sample 002 is classified as "corrosive". All buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron should be properly protected against corrosion depending upon the critical nature of the structure. All buried metallic pressure piping such as ductile iron firewater pipelines should be protected against corrosion.

The chloride ion concentrations ranged from none detected to 17 mg/kg. Because the chloride ion concentrations are less than 300 mg/kg, they are determined to be insufficient to attack steel embedded in a concrete mortar coating.

The sulfate ion concentrations range from 98 to 150 mg/kg and are determined to be insufficient to damage reinforced concrete structures and cement mortar-coated steel at these locations.

The pH of the soils range from 7.05 to 7.98, which does not present corrosion problems for buried iron, steel, mortar-coated steel and reinforced concrete structures.

The redox potentials range from 220 to 300-mV which is indicative of potentially "slightly corrosive" soils resulting from anaerobic soil conditions.

This corrosivity evaluation is based on general corrosion engineering standards and is non-specific in nature. For specific long-term corrosion control design recommendations or consultation, please call *JDH Corrosion Consultants, Inc. at (925) 927-6630.*

Very truly yours,
CERCO ANALYTICAL, INC.

J. Darby Howard, Jr., P.E.
President

JDH/jdl
Enclosure

California State Certified Laboratory No. 2153

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

Client: ENGEO Incorporated
Client's Project No.: 12473.000.000
Client's Project Name: 500 Kirkham Street
Date Sampled: 2-Oct-15
Date Received: 8-Oct-15
Matrix: Soil
Authorization: Signed Chain of Custody

Date of Report: 13-Oct-2015

Job/Sample No.	Sample I.D.	Redox (mV)	pH	Conductivity (umhos/cm)*	Resistivity (100% Saturation) (ohms-cm)	Sulfide (mg/kg)*	Chloride (mg/kg)*	Sulfate (mg/kg)*
1510059-001	1-TP2	220	7.05	-	3,200	-	17	98
1510059-002	1-TP3	300	7.98	-	2,000	-	N.D.	150

Method:	ASTM D1498	ASTM D4972	ASTM D1125M	ASTM G57	ASTM D4658M	ASTM D4327	ASTM D4327
Reporting Limit:	-	-	10	-	50	15	15
Date Analyzed:	9-Oct-2015	12-Oct-2012	-	9-Oct-2015	-	12-Oct-2015	12-Oct-2015

Cheryl McMillen
Laboratory Director

* Results Reported on "As Received" Basis
N.D. - None Detected

Quality Control Summary - All laboratory quality control parameters were found to be within established limits

1510059 10169

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 12473.000.000	PROJECT NAME: 500 Kirkham Street
SAMPLED BY: (SIGNATURE/PRINT) Dino Bernardi	Dino Bernardi
PROJECT MANAGER: Dino Bernardi	
ROUTING: E-MAIL	dbernardi@engeo.com

SAMPLE NUMBER	DATE	TIME	MATRIX	NUMBER OF CONTAINERS	CONTAINER SIZE	PRESERVATIVE	Corrosivity Analysis - ASTM Test Methods	REMARKS REQUIRED DETECTION LIMITS
001 1-TP2	10/02/15	10:00 AM	Soil	1	1 gal bag	N/A	X	With Brief Evaluation
002 1-TP3	10/02/15	11:00AM	Soil	1	1 gal bag	N/A	X	With Brief Evaluation

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Dino Bernardi	10-7-15 1400	Jackie Schuyler	Jackie Schuyler	10/8/15 11:55	Michael Stokkebye
Michael Stokkebye	10/8/15 1540	Michael Stokkebye			
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME		

REMARKS: Standard 10 day turn-around time

ENGEO INCORPORATED
2010 CROW CANYON PLACE, SUITE 250
SAN RAMON, CALIFORNIA 94583
(925) 837-2973 FAX (888) 279-2698
WWW.ENGEO.COM

DISTRIBUTION: ORIGINAL ACCOMPANIES SHIPMENT; COPY TO PROJECT FIELD FILES

APPENDIX B - TRANSPORTATION ASSESSMENT

PART I – DECEMBER 2015 ANALYSIS

MEMORANDUM

Date: December 14, 2015

To: Mike Rivera
Planning and Zoning Department
City of Oakland

From: Steve Abrams

Subject: 500 Kirkham Street Mixed Use Project – Transportation Assessment

The purpose of this memorandum is to summarize the focused transportation assessment that Abrams Associates conducted on the proposed mixed use project at 500 Kirkham Street in the City of Oakland. As part of this review Abrams Associates estimated the travel demand for the proposed project and reviewed the proposed project for consistency with the West Oakland Specific Plan (WOSP) and its EIR. An analysis traffic operations and intersection level of service was also conducted at all intersections that could potentially be affected by the project and were not studied in the WOSP EIR. In addition, the access and on-site circulation presented in the project site plan was also reviewed for potential impacts on traffic operations and safety.

Summary of Findings

The following is a summary of the analysis findings:

1. The proposed project is forecast to generate approximately 386 AM peak hour and 404 PM peak hour automobile trips.
2. The total automobile trips generated by the proposed project would represent approximately 7 percent of the total traffic forecast to be generated by buildout of the WOSP Area.
3. The 573 proposed residential units would represent approximately 30% of the 1,900 new residential units planned under the WOSP for the area within one half mile of the West Oakland BART Station.

4. Since the project location and uses are consistent with the assumptions in the WOSP EIR the proposed project would not be forecast to cause additional transportation impacts (or significantly worsen any impacts) beyond those identified in the WOSP EIR.
5. The increase in traffic generated by the proposed project combined with growth associated with buildout of the WOSP is forecast to cause impacts to traffic operations at the adjacent intersection of 7th Street and Union Street. Beyond this intersection the analysis indicated there would be no significant impacts at study intersections that were not included in the WOSP EIR.
6. The proposed mitigation for the intersection of 7th Street and Union Street would be to mark a separate southbound left turn lane and modify the existing traffic signal to provide for protected left turns on the eastbound and westbound approaches along with a protected overlap phase for the northbound right turn movement.
7. The traffic generated by the proposed project combined with background growth associated with buildout of the WOSP and the City's General Plan would trigger the following mitigation measure as identified in the WOSP EIR:
   Mitigation Measure TRANS-8 at the intersection of 7th Street and Union Street

Based on a review of the project site plan dated March 3, 2015 the proposed project would not cause any significant impacts on safety. However, this memorandum includes several recommendations to improve project access and on-site circulation. The recommended improvement measures are summarized below:

1. Provide adequate sight distance for motorists exiting the proposed garage to the satisfaction of the City of Oakland's Bureau of Engineering and Construction.
2. Provide a traffic management plan for drop-off and pick-up of students before and after school. This could require revisions to the current access plan and garage layout.
3. Consider converting the proposed service entrance on Kirkham Street to a full access driveway for project residents. The proposed entrance to the garage on Union Street should remain restricted to commercial deliveries and emergency vehicles only due to the relatively high traffic volumes on this roadway.
4. It is recommended that a separate left turn pocket be considered for westbound 5th Street at Kirkham Street to help maximize safety for motorists exiting the project, some of whom will need to make a U-turn at Kirkham Street to access the I-880 freeway ramps.
5. The project should provide sufficient long term and short term bicycle parking to exceed the City of Oakland Planning Code requirements (as per the WOSP).

6. The project would be required to implement a robust transportation demand management plan with a goal of achieving a 20% reduction in the project's automobile trips.

Project Description

The proposed project would be located on a currently vacant lot that was formerly used as a parking lot. The site is located one block to the east of the West Oakland BART Station and is bounded by 7th Street, Union Street, 5th Street, and Kirkham Street. Based on the site plan dated March 3, 2015 the proposed project would consist of a seventeen story building with 36,679 square feet of ground floor retail, a 500 student school on the second and third floors, with residential taking up the remainder of the building with a total of 424 units. The project is proposing three levels of parking in an on-site garage with a total of 476 parking spaces to be provided. The project location and study intersections are shown in **Figure 1** (attached to this memo) and the proposed ground floor site plan is shown in **Figure 2.**

Project Travel Demand and Trip Generation

"Travel demand" refers to the new vehicles, transit, pedestrian, and other traffic generated by a planned development. The project travel demand was forecast based on the methodologies set forth in the City of Oakland's Transportation Impact Study Guidelines, dated November 26, 2013.

Since the proposed project would be located in an area with excellent BART access and numerous bus connections the vehicle trip rates would be less than would be generated the average apartment project that was surveyed for the ITE trip generation rates. The ITE apartment trip generation rates are based on surveys of hundreds of apartment buildings in a wide variety of locations, including suburban apartment buildings. The proposed project would be a transit oriented development in a mixed-use urban environment where many trips are walk, bike, or transit trips The vehicle trip generation for the project is shown in **Table 1** and the forecast distribution of project trips to the surrounding area is shown in **Table 2.** The trip generation rates are based on the ITE rates for Apartments (Land Use 220), Retail (Land Use 820), and a K-12 Private School (Land Use 536) taken from the 9th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. The rates have been adjusted (as described below) to account for traffic conditions in this part of Oakland.

The proposed live/work units are intended to encourage lower trip generation by supporting telecommuting and home businesses. Other types of live/work units can

sometime have ground floor frontages and serve a wider variety of office and commercial uses. However, the proposed live work units would be no larger than the typical apartments (approximately 700 square feet) and would be accessed from internal hallways on the upper floors like the apartment units. While some units might generate additional trips from the permitted work uses other units might also reduce the overall trip generation by allowing residents to work at home and/or employing other residents within the building. To be conservative the residential trip rates were used with no additional reductions taken.

The ITE trip generation rates are based on data collected at mostly single-use suburban sites where the automobile is often the only travel mode. However, the project site is in a mixed-use urban environment with robust transit available and where many trips are walk, bike, or transit trips. Since the proposed project is less than one-half mile from the West Oakland BART Station, this analysis reduces the ITE based trip generation by 43 percent to account for the non-automobile trips. This reduction is consistent with City of Oakland's Transportation Impact Study Guidelines and is based on the Bay Area Travel Survey (BATS) 2000 which shows that the non-automobile mode share within one-half mile of a BART Station in Alameda County is about 43 percent. A 2011 research study shows reducing ITE based trip generation using BATS data results in a more accurate estimation of trip generation for mixed use developments than just using ITE based trip generation.[1]

[1] Evaluation of the Operation and Accuracy of Five Available Smart Growth Trip Generation Methodologies. Institute of Transportation Studies, UC Davis, 2011.

Table 1
Preliminary Trip Generation Calculations

Land Use	ITE Code[1]	Size	ADT	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Apartment Trip Rates	220		6.65	0.10	0.41	0.51	0.40	0.22	0.62
Residential Trip Generation		424 units	3,810	58	234	292	231	124	355
Shopping Center Trip Rates	820		42.70	0.60	0.36	0.96	1.78	1.93	3.71
Retail Trip Generation		36,679 sq. ft.	1,566	22	13	35	65	71	136
Pass-By/Diverted Linked Trip Reduction (14%)[2]			219	3	2	5	9	10	19
Subtotals – Retail Space			*1,347*	*19*	*11*	*30*	*56*	*61*	*117*
K-12 Private School Trip Rates	536		2.48	0.49	0.32	0.81	0.24	0.34	0.58
School Trip Generation		500 students	1,240	247	158	405	122	168	290
Project Subtotals			*6,397*	*324*	*403*	*727*	*409*	*353*	*762*
Non-Auto Trip Reduction (43%)[3]			2,751	139	173	313	176	152	328
Reduction for Pass-By/Non-Auto Trips (34%)[4]			256	13	16	29	16	14	30
Net New Project Trip Generation			***3,390***	***172***	***213***	***385***	***217***	***187***	***404***

Sources: 1) ITE Trip Generation, 9th Edition, 2012, 2) ITE Trip Generation Handbook, 2nd Edition, June 2004, 3) Trip reduction for projects within 0.5 miles of a BART Station - City of Oakland Transportation Impact Study Guidelines, April, 2013, and 4) TDM plan reduction to EIR trips of 4.2% - The Hive Transportation Demand Management Plan, September 26, 2014.

Table 2
Preliminary Project Trip Distribution

Origin/Destination	% of Trips	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
West on 7th Street	9%	305	15	19	35	20	17	36
North on the Mandela Parkway	8%	271	14	17	31	17	15	32
North on Union Street	4%	136	7	9	15	9	7	16
North on Adeline Street	5%	170	9	11	19	11	9	20
East on 7th Street	23%	780	40	49	89	50	43	93
East on 5th Street (I-880 SB Ramps)	19%	644	33	41	73	41	36	77
South on Adeline St./Middle Harbor Rd.	5%	170	9	11	19	11	9	20
South on Union Street (I-880 NB Ramps)	22%	746	38	47	85	48	41	89
South on Mandela Parkway/3rd Street	1%	34	2	2	4	2	2	4
West on 5th St. (West Oak. BART Station)	4%	136	7	9	15	9	7	16
TOTALS	100%	3,390	172	213	385	217	187	404

As shown in Table 1, the total trip generation for the retail space has been reduced by 14% to account for the fact that a portion of the retail trips would be forecast to be pass-by trips as determined from data contained in the standard reference for pass-by rates, the ITE Trip Generation Handbook. Pass-by trips are vehicle trips that are already in the traffic stream passing by the site and are not counted as new trips. At the proposed project site it is expected the forecast levels of pass-by traffic can be readily met due to the high volumes of traffic passing by the site. Located directly adjacent to the proposed project site are two busy four lane roadways. It should be noted that the ITE pass-by rate for shopping centers (ITE Land Use 820) is 34% but for this project only a 14% reduction was applied based on ITE data on primary trips to retail sites and also to account for the combination of the pass-by reduction with the non-auto trip reduction.

A 4% reduction to the overall trip generation was also applied to account for the effects of the required TDM program for the project. The proposed bicycle parking, provision of parking spaces for car share services, and designation of a TDM coordinator are among

some of the proposed TDM components that would ensure a minimum reduction of at least 4%. However, as described in The Hive development's TDM program, although the required goal of the TDM program would be 20%, for the purposes of a planning analysis only a 4% reduction to the ITE trip generation should be assumed.[2] The resulting project trips added at each of the study intersections are shown in Figure 3.

Trip Generation Consistency with West Oakland Specific Plan EIR

The WOSP EIR analyzed the impacts of the West Oakland Specific Plan development program on the roadway network serving the plan area. As noted in the EIR, the Development Program represents the reasonably foreseeable development expected to occur in by the year 2035. The Specific Plan and the EIR intend to provide flexibility in the location, amount, and type of development. Thus, the traffic impact analysis in the EIR does not assign land uses to individual parcels. Therefore, as long as the trip generation in the overall plan area remains below the levels estimated in the EIR, the traffic impact analysis presented in the EIR continues to remain valid.

Please note that the total automobile trips generated by the proposed project would represent approximately 7% of the total traffic forecast to be generated by buildout of the WOSP Area. In addition, the 424 proposed residential units would represent approximately 30% of the 1,900 new residential units planned under the WOSP for the area within one half mile of the West Oakland BART Station. Please note the West Oakland Specific Plan and its FEIR state that at the envisioned 24-acre mixed use Transit-Oriented Development planned at the West Oakland BART station there would be a range of between 1,325 to 2,308 new housing units. The average is a little over 1,800 units and this was rounded up to 1,900 based on the likelihood of some other smaller residential projects also being located within a half mile of the BART Station. In general, the proposed project's location, uses, and access points are consistent with the assumptions used in the traffic impact analysis for the WOSP EIR.

Traffic Impacts and Recommended Mitigation Measures

Traffic Impacts at the Additional Study Intersections - The City's TIS Guidelines state that all intersections located adjacent to the project site shall be analyzed and all unsignalized intersections (e.g., all-way stop-controlled) where 50 or more peak hour trips are added by the project shall also be analyzed to evaluate traffic-related effects with implementation of the proposed project.

---

[2] *The Hive Transportation Demand Management Plan*, Nelson/Nygaard, Oakland, CA, September 26, 2014.

Considering the project trip generation, and that the WOSP EIR analyzed the impacts at signalized intersections along most of the roadways that provide direct access to the project site, the proposed project was only found to warrant further analysis of three nearby signalized intersections that were not analyzed in the WOSP EIR. In addition to these signalized intersections, there were also three unsignalized intersections that were identified as requiring an analysis of traffic operations as part of this assessment. The six additional intersections that were analyzed as part of this assessment are as follows:

1. 7th Street at Kirkham Street
2. 7th Street at Union Street
3. 5th Street at Mandela Parkway
4. 5th Street at Kirkham Street
5. 5th Street at the Proposed Project Entrance
6. 5th Street at Union Street

In order to assess traffic conditions at these six intersections with implementation of the proposed project, project-generated vehicle trip distribution and assignments were derived from similar methodologies and assumptions included in the traffic analyses for the WOSP EIR as well as application of standard transportation planning methods, which include but not limited to: existing travel patterns, roadway access, and proximity to freeways. The following section includes a detailed evaluation of traffic conditions at the six adjacent intersections not previously analyzed in the WOSP EIR and a determination if the project would contribute to any impacts previously identified in the WOSP EIR.

Intersection level of service (LOS) for each intersection was analyzed for the peak commute hours when the highest traffic volumes were recorded at each intersection during the morning and evening peak periods. Traffic counts for the six study intersections to the project site were collected by Abrams Associates in June and July of 2015 and then adjusted to be consistent with the higher peak hour volumes that were used in the WOSP EIR.

Figure 4 presents the lane configurations and traffic controls for each of the study intersections. Existing operational conditions at the six (6) study intersections have been evaluated according to the requirements set forth by the City of Oakland and Caltrans. Analysis of traffic operations was conducted using the 2010 Highway Capacity Manual (HCM) Level of Service (LOS) methodology analyzed with Synchro software. Level of service is an expression, in the form of a scale, of the relationship between the capacity of an intersection (or roadway segment) to accommodate the volume of traffic moving through it at any given time. The level of service scale describes traffic flow with six

ratings ranging from A to F, with "A" indicating relatively free flow of traffic and "F" indicating stop-and-go traffic and traffic jams.

For signalized intersections the HCM methodology determines the capacity of each lane group approaching the intersection. The LOS is then based on average control delay (in seconds per vehicle) for the various movements within the intersection. Table 3 summarizes the relationship between LOS, average control delay, and the volume to capacity ratio at signalized intersections.

For unsignalized (all-way stop controlled and two-way stop controlled) intersections, the average control delay and LOS operating conditions are calculated by approach (e.g., northbound) and movement (e.g., northbound left-turn) for those movements that are subject to delay. In general, the operating conditions for unsignalized intersections are presented for the worst approach. Table 4 summarizes the relationship between LOS and average control delay at unsignalized intersections.

Please note LOS D is the minimum standard that applies to intersections in the study area. The City of Oakland's Transportation/Traffic CEQA Thresholds of Significance were used to evaluate potential impacts at intersections that were forecast to be operating at LOS E or F in the future.

Existing Plus Project Traffic Operations - The attached Figure 5 presents the existing traffic volumes at the study intersections and Figure 6 presents the existing plus project volumes. The cumulative volumes were based on the WOSP EIR traffic forecasts which equated to an increase of 28% to the year 2035. As shown in Table 5, all intersections are forecast to continue having acceptable operations (LOS D or better) under existing plus project conditions. Please note that a complete set of the detailed LOS calculations are available in the technical appendix to this assessment.

TABLE 3
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Delay (sec/veh)	Volume to Capacity Ratio
A	Insignificant Delays: No approach phase is fully used and no vehicle waits longer than one red indication.	≤ 10	< 0.60
B	Minimal Delays: An occasional approach phase is fully used. Drivers begin to feel restricted.	> 10 to 20	> 0.61 to 0.70
C	Acceptable Delays: Major approach phase may become fully used. Most drivers feel somewhat restricted.	> 20 to 35	> 0.71 to 0.80
D	Tolerable Delays: Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly without excessive delays.	> 35 to 55	> 0.81 to 0.90
E	Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues from upstream.	> 55 to 80	> 0.91 to 1.00
F	Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.	> 80	> 1.00

SOURCES: 2010 Highway Capacity Manual, Transportation Research Board, 2011.

TABLE 4
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Delay (seconds/vehicle)
A	No delay for stop-controlled approaches.	0 to 10
B	Operations with minor delays.	> 10 to 15
C	Operations with moderate delays.	> 15 to 25
D	Operations with some delays.	> 25 to 35
E	Operations with high delays and long queues.	> 35 to 50
F	Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50

SOURCE: 2010 Highway Capacity Manual, Transportation Research Board, 2011.

TABLE 5
EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	7TH ST & KIRKHAM ST	Two Way Stop	AM	9.4	A	10.0	B
			PM	11.3	B	12.6	B
2	7TH ST & UNION ST	Signalized	AM	5.4	A	5.9	A
			PM	13.9	B	21.0	C
3	MANDELA PKWY & 5TH ST	Signalized	AM	5.8	A	6.0	A
			PM	6.9	A	7.2	A
4	KIRKHAM ST & 5TH ST	Two Way Stop	AM	10.0	B	11.5	B
			PM	11.6	B	15.1	C
5	5TH ST & PROJECT ENTRANCE	Two Way Stop	AM	N/A	N/A	12.3	B
			PM	N/A	N/A	11.4	B
6	5TH ST & UNION ST	Signalized	AM	13.3	B	15.4	B
			PM	20.0	C	23.6	C

SOURCE: Abrams Associates, 2015
NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

Cumulative Plus Project Traffic Operations - Figure 7 presents the cumulative traffic volumes at each of the study intersections and Figure 8 presents the cumulative plus project volumes. The cumulative volumes were based on the WOSP EIR traffic forecasts which equated to an increase of 28% to the year 2035. As shown all intersections are forecast to continue having acceptable operations (LOS D or better) under cumulative plus project conditions with the exception of the intersection of 7th Street and Union Street. The increase in traffic generated by the proposed project combined with growth associated with buildout of the City's General Plan is forecast to cause significant impacts to traffic operations at the intersection of 7th Street and Union Street (i.e. it would cause this intersection to exceed the established standard of LOS D). Beyond this intersection the analysis indicated there would be no significant impacts at any other study intersections that were not included in the WOSP EIR.

The additional impact at the 7th Street and Union Street intersection is forecast to occur by the year 2035. Under cumulative conditions the addition of traffic generated by the project would degrade the intersection operations from LOS D to LOS E in the AM peak hour and LOS E to F in the PM peak hour. (LTS with MM)

TABLE 6
CUMULATIVE PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1111	7TH ST & KIRKHAM ST	Two Way Stop	AM	13.5	B	15.5	C
			PM	19.5	C	25.5	D
22	7TH ST & UNION ST	Signalized	AM	30.3	C	**60.2**	**E**
			PM	**69.7**	**E**	**103.5**	**F**
3	MANDELA PKWY & 5TH ST	Signalized	AM	7.7	A	8.3	A
			PM	8.5	A	8.8	A
4	KIRKHAM ST & 5TH ST	Two Way Stop	AM	10.8	B	12.7	B
			PM	13.1	B	17.6	C
5	5TH ST & PROJECT ENTRANCE	Two Way Stop	AM	N/A	N/A	12.8	B
			PM	N/A	N/A	11.6	B
6	5TH ST & UNION ST	Signalized	AM	21.8	C	25.8	C
			PM	47.1	D	54.4	D

SOURCE: Abrams Associates, 2015
NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

The recommended mitigation measure includes the following improvements for the intersection of 7th Street and Union Street:

Revise the pavement markings at the intersection to provide for a separate left turn lane on the southbound Union Street approach and modify the existing traffic signal to provide for protected left turns on the eastbound and westbound 7th Street approaches. This would then allow for a new protected overlap phase for the northbound right turn movement.

Please note this segment of Union Street currently has only one shared right/through/left lane on the southbound approach to 7th Street with one northbound lane leaving the intersection. Union Street is approximately 45 feet wide in this area with sufficient room for the additional turn lane that is recommended. However, it should be noted that two parking spaces on the west side of Union Street may ultimately need to be removed as part of the final design.

To implement this measure, the project applicant shall submit the following to City of Oakland for review and approval:

Plans, Specifications, and Estimates (PS&E) to will be required for modification of the intersection. All elements shall be designed to City standards in effect at the time of construction and all new or upgraded signals shall include these enhancements. All other facilities supporting vehicle travel and alternative modes through the intersection shall be brought up to both City standards and ADA standards (according to Federal and State Access Board guidelines) at the time of construction. Current City Standards call for among other items the elements listed below:

- 2070L Type Controller
- GPS communication (clock)
- Accessible pedestrian crosswalks according to Federal and State Access Board guidelines
- City Standard ADA wheelchair ramps
- Full actuation (video detection, pedestrian push buttons, bicycle detection)
- Accessible Pedestrian Signals, audible and tactile according to Federal Access Board guidelines
- Signal interconnect and communication to City Traffic Management Center for corridors identified in the City's ITS Master Plan.
- Signal timing plans for the signals in the coordination group.

The project applicant shall fund the cost of preparing and implementing the above measures. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, individual project applicants shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall mitigate this impact to less than significant.

Upon implementation of this mitigation, the intersection operations would improve to LOS D or better during both the AM and PM peak hours and the impact would thereby be reduced to a level of less than significant. No secondary significant impacts would result from implementation of this measure.

Traffic Impacts at West Oakland Specific Plan EIR Intersections - The WOSP EIR identifies significant impacts at numerous intersections serving the specific plan area. Based on the review of the WOSP EIR and the forecast trip distribution of the proposed project the following cumulative traffic operations impact and its associated mitigation measure were identified as being required by the project:

The proposed project's traffic combined with the cumulative background growth in traffic forecast to occur under the City's General Plan would trigger Impact Trans-8. This impact is forecast to occur by the year 2035 at the intersection of 5th Street and Adeline

Street. Under cumulative conditions the addition of traffic generated by the WOSP would degrade the PM peak hour operation from LOS D to LOS E at the signalized intersection of 5th Street and Adeline Street. (LTS with MM)

Mitigation Measure Trans-8 includes the following improvements for the intersection of 5th Street and Adeline Street:

Modify the traffic signal to remove split phasing and provide protected-permitted left turn phasing for the northbound and southbound left-turn movements. To implement this measure, individual project applicants shall submit the following to City of Oakland for review and approval:

Plans, Specifications, and Estimates (PS&E) to modify the intersection. All elements shall be designed to City standards in effect at the time of construction and all new or upgraded signals shall include these enhancements. All other facilities supporting vehicle travel and alternative modes through the intersection shall be brought up to both City standards and ADA standards (according to Federal and State Access Board guidelines) at the time of construction. Current City Standards call for among other items the elements listed below:

- 2070L Type Controller
- GPS communication (clock)
- Accessible pedestrian crosswalks according to Federal and State Access Board guidelines
- City Standard ADA wheelchair ramps
- Full actuation (video detection, pedestrian push buttons, bicycle detection)
- Accessible Pedestrian Signals, audible and tactile according to Federal Access Board guidelines
- Signal interconnect and communication to City Traffic Management Center for corridors identified in the City's ITS Master Plan.
- Signal timing plans for the signals in the coordination group.

Individual project applicants shall fund the cost of preparing and implementing the above measures. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, individual project applicants shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall mitigate this impact to less than significant.

Please note that based on Caltrans method for calculating equitable mitigation measures the project's proportionate share of future traffic growth was determined to be

26%, assuming the preferred alternative is approved. Upon implementation of this mitigation, the intersection operations would improve to LOS C or better during both the AM and PM peak hours and the impact would thereby be reduced to a level of less than significant. No secondary significant impacts would result from implementation of this measure.

Site Plan Review

An evaluation of access and circulation was conducted for all travel modes based on the current site plans dated March 3, 2015. The results of that evaluation are summarized below:

Vehicle Access and Circulation -The proposed project would provide parking access via a two-lane driveway (i.e. one ingress lane and one egress lane) on 5th Street between Union Street and Kirkham Street. Service entries to the garage are also proposed on Union Street and on Kirkham Street. The project is proposing three levels of parking in an on-site garage with a total of 476 parking spaces to be provided. Based this review the proposed project would not be expected to cause any significant impacts on safety. However, this memorandum includes several recommendations to improve project access and on-site circulation. The recommended improvement measures are summarized below:

1. Provide adequate sight distance for motorists exiting the proposed garage to the satisfaction of the City of Oakland's Bureau of Engineering and Construction.
2. Provide a traffic management plan for drop-off and pick-up of students before and after school. This could require revisions to the current access plan and garage layout.
3. Consider converting the proposed service entrance on Kirkham Street to a full access driveway for project residents. The proposed entrance to the garage on Union Street should remain restricted to commercial deliveries and emergency vehicles only due to the relatively high traffic volumes on this roadway.
4. It is recommended that a separate left turn pocket be considered for westbound 5th Street at Kirkham Street to help maximize safety for motorists exiting the project, some of whom will want to make a U-turn at Kirkham Street to access the I-880 freeway ramps.
5. The project should provide sufficient long term and short term bicycle parking to exceed the City of Oakland Planning Code requirements (as per the WOSP).
6. The project would be required to implement a robust transportation demand management plan with a goal of achieving a 20% reduction in the project's automobile trips.

Transit Access - Transit service providers in the project vicinity include Bay Area Rapid Transit (BART) and the Alameda-Contra Costa Transit District (AC Transit). BART provides regional rail service and the nearest BART station to the project site is the West Oakland BART Station which is located one block to the west of the project site.
The proposed project would not modify access between the project site and BART station.
800 62 and 26

AC Transit is the primary bus service provider in the City of Oakland and there are three routes that operate on 7th Street adjacent to the project. Routes 26, 62, and 800 all operate along 7th Street with bus stops at Union Street adjacent to the proposed project. It is our understanding that no changes to the bus routes operating in the vicinity of the project are currently planned. However, this would be subject to verification by AC Transit. In summary, no significant impacts to transit were identified since the proposed project would not relocate any bus stops or modify access between the project site and existing bus stops.

Bicycle Access/Bicycle Parking – There are some facilities for bicycles near the project site including existing bicycle lanes on 8th Street and on Mandela Parkway. In addition, as per the WOSP, 7th Street is proposed to ultimately have bike lanes in the vicinity of the proposed project. Field observations at the project site were conducted on Tuesday June 30, 2015 and, based on a qualitative review, there was some bicycle activity observed along adjacent streets (along 7th Street, Union Street, and the Mandela Parkway). Based on the existing bicycle network and existing activity levels within the project vicinity, it is reasonable to assume that the anticipated increase in bicycle trips associated with the proposed project (about 26 bicycle trips in the AM peak hour and 28 bicycle trips in the PM peak hour) would be accommodated by the existing and planned bicycle network facilities within the project vicinity.

Note that although the proposed project would result in an increase in the number of vehicles in the vicinity of the project site, this anticipated increase would not be substantial enough to create potentially safety hazards for bicyclists. Further, the proposed project would not otherwise substantially interfere with bicycle accessibility to the site and adjoining areas. Chapter 17.117 of the City of Oakland Planning Code requires long-term and short-term bicycle parking for new buildings. Long-term bicycle parking includes lockers or locked enclosures and short-term bicycle parking includes bicycle racks. Preliminary calculations of the City's requirements indicate the project would be required to provide a minimum of about 300 long-term bicycle parking spaces and about 90 short-term bicycle parking spaces.

Pedestrian Access & Circulation - The project site is located within a well-established pedestrian network comprised of 5- to 15-foot wide sidewalks on most streets in the vicinity of the project site along with curb ramps and striped crosswalks (standard and ladder-style at the majority of intersections. On-street parking is also provided along 5th Street and Kirkham Street adjacent to the project site, which provides a buffer between pedestrians and moving vehicles and bicyclists.

Pedestrian access to the project site would be via the main residential entrance and lobby on 7th Street and additional pedestrian egress for the project would be on Union Street and Kirkham Street. The proposed project would also include streetscape improvements along adjacent sidewalk areas. Such improvements would be consistent with the 7th Street Concept and Urban Design Plan.

During field reconnaissance at the project site conducted on Tuesday June 30th, 2015 it was noted that with implementation of the proposed project it appeared there may not be adequate sight distance at the entrance/exit to the parking garage due to the presence of on-street parking on 5th Street, which could potentially block views for outbound vehicles. Recommended improvement measures are provided to enhance sight distances between project vehicles and other users of adjacent streets (see below) and to provide traffic calming devices to outbound vehicles from the parking garage to reduce and/or eliminate any pontifical conflicts with pedestrians.

Recommended Pedestrian Improvement #1: To enhance sight distances and reduce and/or eliminate potential vehicle-pedestrian conflicts at project driveways, the final design of the project shall ensure that the project driveway on 5th Street provides adequate sight distance between motorists exiting the driveways and pedestrians on adjacent sidewalks (to the satisfaction of the City of Oakland's Bureau of Engineering and Construction. In addition the Project Sponsor shall not install street trees at or near the driveway to maintain adequate sight distance and visual clearance for pedestrians walking along the north side sidewalk of 5th Street and vehicles entering/exiting the project driveway. These measures should reduce and/or eliminate potential conflicts between vehicles and pedestrians at the driveway on 5th Street.

Recommended Pedestrian Improvement #2: To reduce and/or eliminate potential pedestrian-vehicle conflicts, it is recommended that the project install traffic calming devices along the exit lane of the garage driveway. The project shall install signage at the egress driveway to notify drivers to slow, stop, and yield to any pedestrians walking along the sidewalk on 5th Street. The Project Sponsor shall also install rumble strips or similar devices to maintain slow speeds for vehicles exiting the parking garage.

Recommended Pedestrian Improvement #3: The project shall ensure that pedestrians maintain the right of way along all sidewalks adjacent to the project site. Therefore, to maintain an even path of travel for pedestrians crossing the planned driveway curb cuts the final design of the project shall ensure that the curb cuts within the Union Street, 5th Street, and Kirkham Street sidewalks are constructed such that the sidewalks continue to be at grade and not depress across the driveway threshold. Constructing at-grade sidewalks at the driveway locations would also serve as a traffic calming measure which encourages vehicles entering or exiting the driveways to reduce their vehicle speeds and yield to any crossing pedestrians prior to entering the sidewalk space.

Transportation Demand Management

Since the proposed project would generate more than 50 net new PM peak hour trips the City's Standard Condition of Approval (SCA) requires the preparation of a Transportation Demand Management (TDM) plan as described below.

Parking and Transportation Demand Management Plan - Prior to issuance of a final inspection of the building permit. The project applicant shall submit a Transportation and Parking Demand Management (TDM) plan for review and approval by the City. The intent of the TDM plan shall be to reduce vehicle traffic and parking demand generated by the project to the maximum extent practicable consistent with the potential traffic and parking impacts of the project. Since the project would generate more than 100 peak hour trips the goal of the TDM shall be to a 20 percent reduction in vehicle trips. The TDM plan shall include strategies to increase pedestrian, bicycle, transit, and carpool use, and reduce parking demand. All four modes of travel shall be considered, as appropriate.

The project applicant will be required to implement the approved TDM Plan on an ongoing basis. Since the project would generate 100 or more net new peak hour vehicle trips the project applicant shall be required to submit an annual compliance report for the first five years following completion of the project (or completion of each phase for phased projects) for review and approval by the City. The annual report shall document the status and effectiveness of the TDM program. If deemed necessary, the City may elect to have a peer review consultant, paid for by the project applicant, review the annual report. If timely reports are not submitted and/or the annual reports indicate that the project applicant has failed to implement the TDM Plan, the project will be considered in violation of the Conditions of Approval and the City may initiate enforcement action as provided for in these Conditions of Approval. The project shall not be considered in violation of this Condition if the TDM Plan is implemented but the trip reduction goals are not achieved.

Analysis of the Reduced Intensity Alternative

A detailed analysis of the reduced intensity alternative was conducted including a review of traffic operations at each of the project study intersections. Please note that a complete set of the detailed LOS calculations for the reduced intensity alternative are available in the technical appendix to this assessment. The reduced intensity alternative would reduce the building from 17 stories to 11 stories and eliminate 147 units of residential for a new total of 426 units.

The vehicle trip generation for the reduced intensity alternative is shown in Table 7 and the forecast distribution of project trips to the surrounding area is shown in Table 8.

Table 7
Preliminary Trip Generation Calculations
Reduced Intensity Alternative

Land Use	ITE Code[1]	Size	ADT	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Apartment Trip Rates	220		6.65	0.10	0.41	0.51	0.40	0.22	0.62
Residential Trip Generation		426 units	2833	43	174	217	172	92	264
Shopping Center Trip Rates	820		42.70	0.60	0.36	0.96	1.78	1.93	3.71
Retail Trip Generation		36,679 sq. ft.	1,566	22	13	35	65	71	136
Pass-By/Diverted Linked Trip Reduction (14%)[2]			219	3	2	5	9	10	19
Subtotals – Retail Space			1,347	19	11	30	56	61	117
K-12 Private School Trip Rates	534		2.48	0.49	0.32	0.81	0.24	0.34	0.58
School Trip Generation		500 students	1,240	247	158	405	122	168	290
Project Subtotals			5,639	312	345	657	359	331	690
Non-Auto Trip Reduction (43%)[3]			2,425	134	148	283	154	143	297
Reduction for Pass-By/Non-Auto Trips (34%)[4]			226	12	14	26	14	13	28
Net New Project Trip Generation			2,989	166	183	348	191	175	366

Sources: 1) ITE Trip Generation, 9th Edition, 2012, 2) ITE Trip Generation Handbook, 2nd Edition, June 2004, 3) Trip reduction for projects within 0.5 miles of a BART Station - City of Oakland Transportation Impact Study Guidelines, April, 2013, and 4) TDM plan reduction to EIR trips of 4.2% - The Hive Transportation Demand Management Plan, September 26, 2014.

Table 8
Preliminary Project Trip Distribution
Reduced Intensity Alternative

Origin/Destination	% of Trips	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
West on 7th Street	9%	269	15	16	31	17	16	33
North on the Mandela Parkway	8%	239	13	15	28	15	14	29
North on Union Street	4%	120	7	7	14	8	7	15
North on Adeline Street	5%	149	8	9	17	9	9	18
East on 7th Street	23%	687	38	42	80	44	40	84
East on 5th Street (I-880 SB Ramps)	19%	568	31	35	66	37	33	70
South on Adeline St./Middle Harbor Rd.	5%	149	8	9	17	9	9	18
South on Union Street (I-880 NB Ramps)	22%	658	36	40	77	42	39	80
South on Mandela Parkway/3rd Street	1%	30	2	2	4	2	2	4
West on 5th St. (West Oak. BART Station)	4%	120	7	7	14	8	7	15
TOTALS	100%	2,989	166	183	348	194	175	366

generation of the proposed project. The resulting project trips added at each of the study intersections are shown in Figure 9.

Existing Plus Project Traffic Operations - As shown in Table 9, for the reduced intensity alternative all intersections are forecast to continue having acceptable operations (LOS D or better) under existing plus project conditions with no significant differences in the LOS conditions versus those identified for the proposed project.

Cumulative Plus Project Traffic Operations - As shown in Table 10, for the reduced intensity alternative all intersections are forecast to continue having acceptable operations (LOS D or better) under cumulative plus project conditions with the exception of the same intersection where a significant impact was identified for the proposed project – the intersection of 7th Street and Union Street. The increase in traffic generated by the reduced intensity alternative combined with growth associated with buildout of the City's General Plan is forecast to cause significant impacts to traffic operations at the

intersection of 7th Street and Union Street (i.e. it would cause this intersection to exceed the established standard of LOS D). Beyond this intersection the

TABLE 9
EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS FOR THE REDUCED INTENSITY ALTERNATIVE

INTERSECTION		CONTROL	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	7TH ST & KIRKHAM ST	Two Way Stop	AM	9.4	A	9.9	A
			PM	11.3	B	12.2	B
2	7TH ST & UNION ST	Signalized	AM	5.3	A	5.7	A
			PM	13.7	B	19.4	B
3	MANDELA PKWY & 5TH ST	Signalized	AM	5.8	A	6.0	A
			PM	6.8	A	7.1	A
4	KIRKHAM ST & 5TH ST	Two Way Stop	AM	10.0	B	11.1	B
			PM	11.5	B	14.1	B
5	5TH ST & PROJECT ENTRANCE	Two Way Stop	AM	N/A	N/A	11.5	B
			PM	N/A	N/A	10.8	B
6	5TH ST & UNION ST	Signalized	AM	13.4	B	15.1	B
			PM	20.1	C	23.1	C

SOURCE: Abrams Associates, 2015
NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

TABLE 10
CUMULATIVE PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS FOR THE REDUCED INTENSITY ALTERNATIVE

INTERSECTION		CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	7TH ST & KIRKHAM ST	Two Way Stop	AM	13.5	B	15.1	C
			PM	19.5	C	24.7	C
2	7TH ST & UNION ST	Signalized	AM	30.3	C	58.4	E
			PM	69.7	E	111.7	F
3	MANDELA PKWY & 5TH ST	Signalized	AM	7.7	A	8.2	A
			PM	8.5	A	8.8	A
4	KIRKHAM ST & 5TH ST	Two Way Stop	AM	10.8	B	12.3	B
			PM	13.1	B	16.9	C
5	5TH ST & PROJECT ENTRANCE	Two Way Stop	AM	N/A	N/A	12.2	B
			PM	N/A	N/A	11.2	B
6	5TH ST & UNION ST	Signalized	AM	21.8	C	25.1	C
			PM	47.1	D	53.3	D

SOURCE: Abrams Associates, 2015
NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

analysis indicated there would be no significant impacts at any other study intersections that were not included in the WOSP EIR. In summary, the resulting project transportation impacts for the reduced intensity alternative were essentially identical to those identified for the proposed project.

If there are any questions, or if additional information is needed, please don't hesitate to contact me at (925) 945-0201.

APPENDIX B - TRANSPORTATION ASSESSMENT

PART II – MARCH 2016 UPDATE

MEMORANDUM

Date: March 11, 2016

To: Elois Thornton
Planning and Zoning Department

City of Oakland

From: Steve Abrams

Subject: 500 Kirkham Street Mixed Use Project – Transportation Assessment

---

The purpose of this memorandum is to summarize the focused transportation assessment that Abrams Associates conducted on the proposed mixed use project at 500 Kirkham Street in the City of Oakland. As part of this review Abrams Associates estimated the travel demand for the proposed project and reviewed the proposed project for consistency with the West Oakland Specific Plan (WOSP) and its EIR. An analysis traffic operations and intersection level of service was also conducted at all intersections that could potentially be affected by the project and were not studied in the WOSP EIR. In addition, the access and on-site circulation presented in the project site plan was also reviewed for potential impacts on traffic operations and safety.

A. Summary of Findings

The following is a summary of the analysis findings:

1. The proposed project is forecast to generate approximately 386 AM peak hour and 404 PM peak hour automobile trips.
2. The total automobile trips generated by the proposed project would represent approximately 7 percent of the total traffic forecast to be generated by buildout of the WOSP Area.

3. The 573 proposed residential units would represent approximately 30% of the 1,900 new residential units planned under the WOSP for the area within one half mile of the West Oakland BART Station.
4. Since the project location and uses are consistent with the assumptions in the WOSP EIR the proposed project would not be forecast to cause additional transportation impacts (or significantly worsen any impacts) beyond those identified in the WOSP EIR.

Based on a review of the project site plan dated March 3, 2015 the proposed project would not cause any significant impacts on safety. However, this memorandum includes several recommendations to improve project access and on-site circulation. The recommended improvement measures are summarized below:

1. Provide adequate sight distance for motorists exiting the proposed garage to the satisfaction of the City of Oakland's Bureau of Engineering and Construction.
2. Provide a traffic management plan for drop-off and pick-up of students before and after school. This could require revisions to the current access plan and garage layout.
3. Consider converting the proposed service entrance on Kirkham Street to a full access driveway for project residents. The proposed entrance to the garage on Union Street should remain restricted to commercial deliveries and emergency vehicles only due to the relatively high traffic volumes on this roadway.
4. It is recommended that a separate left turn pocket be considered for westbound 5th Street at Kirkham Street to help maximize safety for motorists exiting the project, some of whom will need to make a U-turn at Kirkham Street to access the I-880 freeway ramps.
5. The project should provide sufficient long term and short term bicycle parking to exceed the City of Oakland Planning Code requirements (as per the WOSP).
6. The project would be required to implement a robust transportation demand management plan with a goal of achieving a 20% reduction in the project's automobile trips.

B. Project Description

The proposed project would be located on a currently vacant lot that was formerly used as a parking lot. The site is located one block to the east of the West Oakland BART

Station and is bounded by 7th Street, Union Street, 5th Street, and Kirkham Street. Based on the site plan dated March 3, 2015 the proposed project would consist of a seventeen story building with 36,679 square feet of ground floor retail, a 500 student school on the second and third floors, with residential taking up the remainder of the building with a total of 573 units. The project is proposing three levels of parking in an on-site garage with a total of 476 parking spaces to be provided. In addition to the onsite development, the project will also include improvements to the intersection of 7th Street and Union Street. A separate southbound left turn lane will be added on Union Street and the existing traffic signal will be modified to provide for protected left turns on the eastbound and westbound approaches along with a protected overlap phase for the northbound right turn movement. The project location and study intersections are shown in **Figure 1** (attached to this memo) and the proposed ground floor site plan is shown in **Figure 2**.

C. Project Travel Demand and Trip Generation

"*Travel demand*" refers to the new vehicles, transit, pedestrian, and other traffic generated by a planned development. The project travel demand was forecast based on the methodologies set forth in the City of Oakland's Transportation Impact Study Guidelines, dated November 26, 2013.

Since the proposed project would be located in an area with excellent BART access and numerous bus connections the vehicle trip rates would be less than would be generated the average apartment project that was surveyed for the ITE trip generation rates. The ITE apartment trip generation rates are based on surveys of hundreds of apartment buildings in a wide variety of locations, including suburban apartment buildings. The proposed project would be a transit oriented development in a mixed-use urban environment where many trips are walk, bike, or transit trips The vehicle trip generation for the project is shown in **Table 1** and the forecast distribution of project trips to the surrounding area is shown in **Table 2**. The trip generation rates are based on the ITE rates for Apartments (Land Use 220), Retail (Land Use 820), and a K-12 Private School (Land Use 536) taken from the 9th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. The rates have been adjusted (as described below) to account for traffic conditions in this part of Oakland.

The proposed live/work units are intended to encourage lower trip generation by supporting telecommuting and home businesses. Other types of live/work units can sometime have ground floor frontages and serve a wider variety of office and commercial uses. However, the proposed live work units would be no larger than the typical apartments (approximately 700 square feet) and would be accessed from internal

hallways on the upper floors like the apartment units. While some units might generate additional trips from the permitted work uses other units might also reduce the overall trip generation by allowing residents to work at home and/or employing other residents within the building. To be conservative the residential trip rates were used with no additional reductions taken.

The ITE trip generation rates are based on data collected at mostly single-use suburban sites where the automobile is often the only travel mode. However, the project site is in a mixed-use urban environment with robust transit available and where many trips are walk, bike, or transit trips. Since the proposed project is less than one-half mile from the West Oakland BART Station, this analysis reduces the ITE based trip generation by 43 percent to account for the non-automobile trips. This reduction is consistent with City of Oakland's Transportation Impact Study Guidelines and is based on the Bay Area Travel Survey (BATS) 2000 which shows that the non-automobile mode share within one-half mile of a BART Station in Alameda County is about 43 percent. A 2011 research study shows reducing ITE based trip generation using BATS data results in a more accurate estimation of trip generation for mixed use developments than just using ITE based trip generation.[3]

[3] Evaluation of the Operation and Accuracy of Five Available Smart Growth Trip Generation Methodologies. *Institute of Transportation Studies, UC Davis, 2011.*

Table 1
Preliminary Trip Generation Calculations

Land Use	ITE Code[1]	Size	ADT	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Apartment Trip Rates	220		6.65	0.10	0.41	0.51	0.40	0.22	0.62
Residential Trip Generation		573 units	3,810	58	234	292	231	124	355
Shopping Center Trip Rates	820		42.70	0.60	0.36	0.96	1.78	1.93	3.71
Retail Trip Generation		36,679 sq. ft.	1,566	22	13	35	65	71	136
Pass-By/Diverted Linked Trip Reduction (14%)[2]			219	3	2	5	9	10	19
Subtotals – Retail Space			*1,347*	*19*	*11*	*30*	*56*	*61*	*117*
K-12 Private School Trip Rates	536		2.48	0.49	0.32	0.81	0.24	0.34	0.58
School Trip Generation		500 students	1,240	247	158	405	122	168	290
Project Subtotals			*6,397*	*324*	*403*	*727*	*409*	*353*	*762*
Non-Auto Trip Reduction (43%)[3]			2,751	139	173	313	176	152	328
Reduction for Pass-By/Non-Auto Trips (34%)[4]			256	13	16	29	16	14	30
Net New Project Trip Generation			***3,390***	***172***	***213***	***385***	***217***	***187***	***404***

Sources: 1) ITE Trip Generation, 9th Edition, 2012, 2) ITE Trip Generation Handbook, 2nd Edition, June 2004, 3) Trip reduction for projects within 0.5 miles of a BART Station - City of Oakland Transportation Impact Study Guidelines, April, 2013, and 4) TDM plan reduction to EIR trips of 4.2% - The Hive Transportation Demand Management Plan, September 26, 2014.

Table 2
Preliminary Project Trip Distribution

Origin/Destination	% of Trips	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
West on 7th Street	9%	305	15	19	35	20	17	36
North on the Mandela Parkway	8%	271	14	17	31	17	15	32
North on Union Street	4%	136	7	9	15	9	7	16
North on Adeline Street	5%	170	9	11	19	11	9	20
East on 7th Street	23%	780	40	49	89	50	43	93
East on 5th Street (I-880 SB Ramps)	19%	644	33	41	73	41	36	77
South on Adeline St./Middle Harbor Rd.	5%	170	9	11	19	11	9	20
South on Union Street (I-880 NB Ramps)	22%	746	38	47	85	48	41	89
South on Mandela Parkway/3rd Street	1%	34	2	2	4	2	2	4
West on 5th St. (West Oak. BART Station)	4%	136	7	9	15	9	7	16
TOTALS	**100%**	**3,390**	**172**	**213**	**385**	**217**	**187**	**404**

As shown in **Table 1**, the total trip generation for the retail space has been reduced by 14% to account for the fact that a portion of the retail trips would be forecast to be passby trips as determined from data contained in the standard reference for pass-by rates, the ITE Trip Generation Handbook. Pass-by trips are vehicle trips that are already in the traffic stream passing by the site and are not counted as new trips. At the proposed project site it is expected the forecast levels of pass-by traffic can be readily met due to the high volumes of traffic passing by the site. Located directly adjacent to the proposed project site are two busy four lane roadways. It should be noted that the ITE pass-by rate for shopping centers (ITE Land Use 820) is 34% but for this project only a 14% reduction was applied based on ITE data on primary trips to retail sites and also to account for the combination of the pass-by reduction with the non-auto trip reduction.

A 4% reduction to the overall trip generation was also applied to account for the effects of the required TDM program for the project. The proposed bicycle parking, provision of parking spaces for car share services, and designation of a TDM coordinator are among some of the proposed TDM components that would ensure a minimum reduction of at least 4%. However, as described in The Hive development's TDM program, although the required goal of the TDM program would be 20%, for the purposes of a planning analysis

only a 4% reduction to the ITE trip generation should be assumed.[4] The resulting project trips added at each of the study intersections are shown in **Figure 3**.

D. Trip Generation Consistency with West Oakland Specific Plan EIR

The WOSP EIR analyzed the impacts of the West Oakland Specific Plan development program on the roadway network serving the plan area. As noted in the EIR, the Development Program represents the reasonably foreseeable development expected to occur in by the year 2035. The Specific Plan and the EIR intend to provide flexibility in the location, amount, and type of development. Thus, the traffic impact analysis in the EIR does not assign land uses to individual parcels. Therefore, as long as the trip generation in the overall plan area remains below the levels estimated in the EIR, the traffic impact analysis presented in the EIR continues to remain valid.

Please note that the total automobile trips generated by the proposed project would represent approximately 7% of the total traffic forecast to be generated by buildout of the WOSP Area. In addition, the 573 proposed residential units would represent approximately 30% of the 1,900 new residential units planned under the WOSP for the area within one half mile of the West Oakland BART Station. Please note the West Oakland Specific Plan and its FEIR statet that at the envisioned 24-acre mixed use Transit-Oriented Development planned at the West Oakland BART station there would be a range of between 1,325 to 2,308 new housing units. The average is a little over 1,800 units and this was rounded up to 1,900 based on the likelihood of some other smaller residential projects also being located within a half mile of the BART Station. In general, the proposed project's location, uses, and access points are consistent with the assumptions used in the traffic impact analysis for the WOSP EIR.

E. Traffic Impacts and Recommended Mitigation Measures

Traffic Impacts at the Additional Study Intersections - The City's TIS Guidelines state that all intersections located adjacent to the project site shall be analyzed and all unsignalized intersections (e.g., all-way stop-controlled) where 50 or more peak hour trips are added by the project shall also be analyzed to evaluate traffic-related effects with implementation of the proposed project.

---

[4] The Hive Transportation Demand Management Plan, *Nelson/Nygaard, Oakland, CA, September 26, 2014.*

Considering the project trip generation, and that the WOSP EIR analyzed the impacts at signalized intersections along most of the roadways that provide direct access to the project site, the proposed project was only found to warrant further analysis of three nearby signalized intersections that were not analyzed in the WOSP EIR. In addition to these signalized intersections, there were also three unsignalized intersections that were identified as requiring an analysis of traffic operations as part of this assessment. The six additional intersections that were analyzed as part of this assessment are as follows:

1. 7th Street at Kirkham Street
2. 7th Street at Union Street
3. 5th Street at Mandela Parkway
4. 5th Street at Kirkham Street
5. 5th Street at the Proposed Project Entrance
6. 5th Street at Union Street

In order to assess traffic conditions at these six intersections with implementation of the proposed project, project-generated vehicle trip distribution and assignments were derived from similar methodologies and assumptions included in the traffic analyses for the WOSP EIR as well as application of standard transportation planning methods, which include but not limited to: existing travel patterns, roadway access, and proximity to freeways. The following section includes a detailed evaluation of traffic conditions at the six adjacent intersections not previously analyzed in the WOSP EIR and a determination if the project would contribute to any impacts previously identified in the WOSP EIR.

Intersection level of service (LOS) for each intersection was analyzed for the peak commute hours when the highest traffic volumes were recorded at each intersection during the morning and evening peak periods. Traffic counts for the six study intersections to the project site were collected by Abrams Associates in June and July of 2015 and then adjusted to be consistent with the higher peak hour volumes that were used in the WOSP EIR.

Figure 4 presents the lane configurations and traffic controls for each of the study intersections. Existing operational conditions at the six (6) study intersections have been evaluated according to the requirements set forth by the City of Oakland and Caltrans. Analysis of traffic operations was conducted using the 2010 Highway
Capacity Manual (HCM) Level of Service (LOS) methodology analyzed with Synchro software. Level of service is an expression, in the form of a scale, of the relationship between the capacity of an intersection (or roadway segment) to accommodate the

volume of traffic moving through it at any given time. The level of service scale describes traffic flow with six ratings ranging from A to F, with "A" indicating relatively free flow of traffic and "F" indicating stop-and-go traffic and traffic jams.

For signalized intersections the HCM methodology determines the capacity of each lane group approaching the intersection. The LOS is then based on average control delay (in seconds per vehicle) for the various movements within the intersection. **Table 3** summarizes the relationship between LOS, average control delay, and the volume to capacity ratio at signalized intersections.

For unsignalized (all-way stop controlled and two-way stop controlled) intersections, the average control delay and LOS operating conditions are calculated by approach (e.g., northbound) and movement (e.g., northbound left-turn) for those movements that are subject to delay. In general, the operating conditions for unsignalized intersections are presented for the worst approach. **Table 4** summarizes the relationship between LOS and average control delay at unsignalized intersections.

Please note LOS D is the minimum standard that applies to intersections in the study area. The City of Oakland's Transportation/Traffic CEQA Thresholds of Significance were used to evaluate potential impacts at intersections that were forecast to be operating at LOS E or F in the future.

Existing Plus Project Traffic Operations - The attached **Figure 5** presents the existing traffic volumes at the study intersections and **Figure 6** presents the existing plus project volumes. The cumulative volumes were based on the WOSP EIR traffic forecasts which equated to an increase of 28% to the year 2035. As shown in **Table 5**, all intersections are forecast to continue having acceptable operations (LOS D or better) under existing plus project conditions. Please note that a complete set of the detailed LOS calculations are available in the technical appendix to this assessment.

TABLE 3
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Delay (sec/veh)	Volume to Capacity Ratio
A	Insignificant Delays: No approach phase is fully used and no vehicle waits longer than one red indication.	< 10	< 0.60
B	Minimal Delays: An occasional approach phase is fully used. Drivers begin to feel restricted.	> 10 to 20	> 0.61 to 0.70
C	Acceptable Delays: Major approach phase may become fully used. Most drivers feel somewhat restricted.	> 20 to 35	> 0.71 to 0.80
D	Tolerable Delays: Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly without excessive delays.	> 35 to 55	> 0.81 to 0.90
E	Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues from upstream.	> 55 to 80	> 0.91 to 1.00
F	Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.	> 80	> 1.00

SOURCES: 2010 *Highway Capacity Manual*, Transportation Research Board, 2011.

TABLE 4
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Delay (seconds/vehicle)
A	No delay for stop-controlled approaches.	0 to 10
B	Operations with minor delays.	> 10 to 15
C	Operations with moderate delays.	> 15 to 25
D	Operations with some delays.	> 25 to 35
E	Operations with high delays and long queues.	> 35 to 50
F	Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50

SOURCE: 2010 Highway Capacity Manual, Transportation Research Board, 2011.

TABLE 5
EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

	INTERSECTION	CONTROL	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	7TH ST & KIRKHAM ST	Two Way Stop	AM	9.4	A	10.0	B
			PM	11.3	B	12.6	B
2	7TH ST & UNION ST	Signalized	AM	5.4	A	11.1	B
			PM	13.9	B	20.7	C
3	MANDELA PKWY & 5TH ST	Signalized	AM	5.8	A	6.0	A
			PM	6.9	A	7.2	A
4	KIRKHAM ST & 5TH ST	Two Way Stop	AM	10.0	B	11.5	B
			PM	11.6	B	15.1	C
5	5TH ST & PROJECT ENTRANCE	Two Way Stop	AM	N/A	N/A	12.3	B
			PM	N/A	N/A	11.4	B
6	5TH ST & UNION ST	Signalized	AM	13.3	B	15.4	B
			PM	20.0	C	23.6	C

SOURCE: Abrams Associates, 2016

NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

Cumulative Plus Project Traffic Operations - **Figure 7** presents the cumulative traffic volumes at each of the study intersections and **Figure 8** presents the cumulative plus project volumes. The cumulative volumes were based on the WOSP EIR traffic forecasts which equated to an increase of 28% to the year 2035. As shown in **Table 6**, all intersections are forecast to continue having acceptable operations (LOS D or better) under cumulative plus project conditions.

Please note the calculations assume the project's planned improvements to the intersection of 7th Street and Union Street will be in place. As per the project description a separate southbound left turn lane will be added on Union Street and the existing traffic signal will be modified to provide for protected left turns on the eastbound and westbound approaches along with a protected overlap phase for the northbound right turn movement.

TABLE 6
CUMULATIVE PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

	INTERSECTION	CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	7TH ST & KIRKHAM ST	Two Way Stop	AM	13.5	B	15.5	C
			PM	19.5	C	25.5	D
2	7TH ST & UNION ST	Signalized	AM	30.3	C	35.3	D
			PM	**69.7**	**E**	51.6	D
3	MANDELA PKWY & 5TH ST	Signalized	AM	7.7	A	8.3	A
			PM	8.5	A	8.8	A
4	KIRKHAM ST & 5TH ST	Two Way Stop	AM	10.8	B	12.7	B
			PM	13.1	B	17.6	C
5	5TH ST & PROJECT ENTRANCE	Two Way Stop	AM	N/A	N/A	12.8	B
			PM	N/A	N/A	11.6	B
6	5TH ST & UNION ST	Signalized	AM	21.8	C	25.8	C
			PM	47.1	D	54.4	D

SOURCE: Abrams Associates, 2016

NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

Traffic Impacts at West Oakland Specific Plan EIR Intersections - The WOSP EIR identifies significant impacts at numerous intersections serving the specific plan area. Based on the review of the WOSP EIR and the forecast trip distribution of the proposed project the following cumulative traffic operations impact and its associated mitigation measure were identified as being required by the project:

The proposed project's traffic combined with the cumulative background growth in traffic forecast to occur under the City's General Plan would trigger **Impact Trans-8.** This impact is forecast to occur by the year 2035 at the intersection of 5th Street and Adeline Street. Under cumulative conditions the addition of traffic generated by the WOSP would degrade the PM peak hour operation from LOS D to LOS E at the signalized intersection of 5th Street and Adeline Street. **(LTS with MM)**

Mitigation Measure Trans-8 includes the following improvements for the intersection of 5th Street and Adeline Street:

Modify the traffic signal to remove split phasing and provide protected-permitted left turn phasing for the northbound and southbound left-turn movements. To implement this measure, individual project applicants shall submit the following to City of Oakland for review and approval:

Plans, Specifications, and Estimates (PS&E) to modify the intersection. All elements shall be designed to City standards in effect at the time of construction and all new or upgraded signals shall include these enhancements. All other facilities supporting vehicle travel and alternative modes through the intersection shall be brought up to both City standards and ADA standards (according to Federal and State Access Board guidelines) at the time of construction. Current City Standards call for among other items the elements listed below:

- *2070L Type Controller*
- *GPS communication (clock)*
- *Accessible pedestrian crosswalks according to Federal and State Access Board guidelines*
- *City Standard ADA wheelchair ramps*
- *Full actuation (video detection, pedestrian push buttons, bicycle detection)*
- *Accessible Pedestrian Signals, audible and tactile according to Federal Access Board guidelines*
- *Signal interconnect and communication to City Traffic Management Center for corridors identified in the City's ITS Master Plan.*
- *Signal timing plans for the signals in the coordination group.*

Individual project applicants shall fund the cost of preparing and implementing the above measures. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, individual project applicants shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall mitigate this impact to less than significant.

Please note that based on Caltrans method for calculating equitable mitigation measures the project's proportionate share of future traffic growth was determined to be 26%, assuming the preferred alternative is approved. Upon implementation of this mitigation, the intersection operations would improve to LOS C or better during both the AM and PM peak hours and the impact would thereby be reduced to a level of less than significant. No secondary significant impacts would result from implementation of this measure.

F. Site Plan Review

An evaluation of access and circulation was conducted for all travel modes based on the current site plans dated March 3, 2015. The results of that evaluation are summarized below:

Vehicle Access and Circulation -The proposed project would provide parking access via a two-lane driveway (i.e. one ingress lane and one egress lane) on 5th Street between Union Street and Kirkham Street. Service entries to the garage are also proposed on Union Street and on Kirkham Street. The project is proposing three levels of parking in an on-site garage with a total of 476 parking spaces to be provided. Based this review the proposed project would not be expected to cause any significant impacts on safety. However, this memorandum includes several recommendations to improve project access and on-site circulation. The recommended improvement measures are summarized below:

1. Provide adequate sight distance for motorists exiting the proposed garage to the satisfaction of the City of Oakland's Bureau of Engineering and Construction.
2. Provide a traffic management plan for drop-off and pick-up of students before and after school. This could require revisions to the current access plan and garage layout.
3. Consider converting the proposed service entrance on Kirkham Street to a full access driveway for project residents. The proposed entrance to the garage on Union Street should remain restricted to commercial deliveries and emergency vehicles only due to the relatively high traffic volumes on this roadway.
4. It is recommended that a separate left turn pocket be considered for westbound 5th Street at Kirkham Street to help maximize safety for motorists exiting the project, some of whom will want to make a U-turn at Kirkham Street to access the I-880 freeway ramps.
5. The project should provide sufficient long term and short term bicycle parking to exceed the City of Oakland Planning Code requirements (as per the WOSP).
6. The project would be required to implement a robust transportation demand management plan with a goal of achieving a 20% reduction in the project's automobile trips.

Transit Access - Transit service providers in the project vicinity include Bay Area Rapid Transit (BART) and the Alameda-Contra Costa Transit District (AC Transit). BART

provides regional rail service and the nearest BART station to the project site is the West Oakland BART Station which is located one block to the west of the project site. The proposed project would not modify access between the project site and BART station.
800 62 and 26

AC Transit is the primary bus service provider in the City of Oakland and there are three routes that operate on 7th Street adjacent to the project. Routes 26, 62, and 800 all operate along 7th Street with bus stops at Union Street adjacent to the proposed project. It is our understanding that no changes to the bus routes operating in the vicinity of the project are currently planned. However, this would be subject to verification by AC Transit. In summary, no significant impacts to transit were identified since the proposed project would not relocate any bus stops or modify access between the project site and existing bus stops.

Bicycle Access/Bicycle Parking – There are some facilities for bicycles near the project site including existing bicycle lanes on 8th Street and on Mandela Parkway. In addition, as per the WOSP, 7th Street is proposed to ultimately have bike lanes in the vicinity of the proposed project. Field observations at the project site were conducted on Tuesday June 30, 2015 and, based on a qualitative review, there was some bicycle activity observed along adjacent streets (along 7th Street, Union Street, and the Mandela Parkway). Based on the existing bicycle network and existing activity levels within the project vicinity, it is reasonable to assume that the anticipated increase in bicycle trips associated with the proposed project (about 26 bicycle trips in the AM peak hour and 28 bicycle trips in the PM peak hour) would be accommodated by the existing and planned bicycle network facilities within the project vicinity.

Note that although the proposed project would result in an increase in the number of vehicles in the vicinity of the project site, this anticipated increase would not be substantial enough to create potentially safety hazards for bicyclists. Further, the proposed project would not otherwise substantially interfere with bicycle accessibility to the site and adjoining areas. Chapter 17.117 of the City of Oakland Planning Code requires long-term and short-term bicycle parking for new buildings. Long-term bicycle parking includes lockers or locked enclosures and short-term bicycle parking includes bicycle racks. Preliminary calculations of the City's requirements indicate the project would be required to provide a minimum of about 300 long-term bicycle parking spaces and about 90 short-term bicycle parking spaces.

Pedestrian Access & Circulation - The project site is located within a well-established pedestrian network comprised of 5- to 15-foot wide sidewalks on most streets in the

vicinity of the project site along with curb ramps and striped crosswalks (standard and ladder-style at the majority of intersections. On-street parking is also provided along 5th Street and Kirkham Street adjacent to the project site, which provides a buffer between pedestrians and moving vehicles and bicyclists.

Pedestrian access to the project site would be via the main residential entrance and lobby on 7th Street and additional pedestrian egress for the project would be on Union Street and Kirkham Street. The proposed project would also include streetscape improvements along adjacent sidewalk areas. Such improvements would be consistent with the 7th Street Concept and Urban Design Plan.

During field reconnaissance at the project site conducted on Tuesday June 30th, 2015 it was noted that with implementation of the proposed project it appeared there may not be adequate sight distance at the entrance/exit to the parking garage due to the presence of on-street parking on 5th Street, which could potentially block views for outbound vehicles. Recommended improvement measures are provided to enhance sight distances between project vehicles and other users of adjacent streets (see below) and to provide traffic calming devices to outbound vehicles from the parking garage to reduce and/or eliminate any pontifical conflicts with pedestrians.

Recommended Pedestrian Improvement #1: To enhance sight distances and reduce and/or eliminate potential vehicle-pedestrian conflicts at project driveways, the final design of the project shall ensure that the project driveway on 5th Street provides adequate sight distance between motorists exiting the driveways and pedestrians on adjacent sidewalks (to the satisfaction of the City of Oakland's Bureau of Engineering and Construction. In addition the Project Sponsor shall not install street trees at or near the driveway to maintain adequate sight distance and visual clearance for pedestrians walking along the north side sidewalk of 5th Street and vehicles entering/exiting the project driveway. These measures should reduce and/or eliminate potential conflicts between vehicles and pedestrians at the driveway on 5th Street.

Recommended Pedestrian Improvement #2: To reduce and/or eliminate potential pedestrian-vehicle conflicts, it is recommended that the project install traffic calming devices along the exit lane of the garage driveway. The project shall install signage at the egress driveway to notify drivers to slow, stop, and yield to any pedestrians walking along the sidewalk on 5th Street. The Project Sponsor shall also install rumble strips or similar devices to maintain slow speeds for vehicles exiting the parking garage.

Recommended Pedestrian Improvement #3: The project shall ensure that pedestrians maintain the right of way along all sidewalks adjacent to the project site. Therefore, to maintain an even path of travel for pedestrians crossing the planned driveway curb cuts the final design of the project shall ensure that the curb cuts within the Union Street, 5th Street, and Kirkham Street sidewalks are constructed such that the sidewalks continue to be at grade and not depress across the driveway threshold. Constructing at-grade sidewalks at the driveway locations would also serve as a traffic calming measure which encourages vehicles entering or exiting the driveways to reduce their vehicle speeds and yield to any crossing pedestrians prior to entering the sidewalk space.

G. Transportation Demand Management

Since the proposed project would generate more than 50 net new PM peak hour trips the City's Standard Condition of Approval (SCA) requires the preparation of a Transportation Demand Management (TDM) plan as described below.

Parking and Transportation Demand Management Plan - Prior to issuance of a final inspection of the building permit. The project applicant shall submit a Transportation and Parking Demand Management (TDM) plan for review and approval by the City. The intent of the TDM plan shall be to reduce vehicle traffic and parking demand generated by the project to the maximum extent practicable consistent with the potential traffic and parking impacts of the project. Since the project would generate more than 100 peak hour trips the goal of the TDM shall be to a 20 percent reduction in vehicle trips. The TDM plan shall include strategies to increase pedestrian, bicycle, transit, and carpool use, and reduce parking demand. All four modes of travel shall be considered, as appropriate.

The project applicant will be required to implement the approved TDM Plan on an ongoing basis. Since the project would generate 100 or more net new peak hour vehicle trips the project applicant shall be required to submit an annual compliance report for the first five years following completion of the project (or completion of each phase for phased projects) for review and approval by the City. The annual report shall document the status and effectiveness of the TDM program. If deemed necessary, the City may elect to have a peer review consultant, paid for by the project applicant, review the annual report. If timely reports are not submitted and/or the annual reports indicate that the project applicant has failed to implement the TDM Plan, the project will be considered in violation of the Conditions of Approval and the City may initiate enforcement action as provided for in these Conditions of Approval. The project shall not be considered in violation of this Condition if the TDM Plan is implemented but the trip reduction goals are not achieved.

H. Analysis of the Reduced Intensity Alternative

A detailed analysis of the reduced intensity alternative was conducted including a review of traffic operations at each of the project study intersections. Please note that a complete set of the detailed LOS calculations for the reduced intensity alternative are available in the technical appendix to this assessment. The reduced intensity alternative would reduce the building from 17 stories to 11 stories and eliminate 147 units of residential for a new total of 426 units. The vehicle trip generation for the reduced intensity alternative is shown in **Table 7** and the forecast distribution of project trips to the surrounding area is shown in **Table 8.** The resulting project trips added at each of the study intersections are shown in **Figure 9**.

Table 7
Preliminary Trip Generation Calculations *Reduced Intensity Alternative*

Land Use	ITE Code[1]	Size	ADT	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Apartment Trip Rates	220		6.65	0.10	0.41	0.51	0.40	0.22	0.62
Residential Trip Generation		426 units	2833	43	174	217	172	92	264
Shopping Center Trip Rates	820		42.70	0.60	0.36	0.96	1.78	1.93	3.71
Retail Trip Generation		36,679 sq. ft.	1,566	22	13	35	65	71	136
Pass-By/Diverted Linked Trip Reduction (14%)[2]			219	3	2	5	9	10	19
Subtotals – Retail Space			*1,347*	*19*	*11*	*30*	*56*	*61*	*117*
K-12 Private School Trip Rates	534		2.48	0.49	0.32	0.81	0.24	0.34	0.58
School Trip Generation		500 students	1,240	247	158	405	122	168	290
Project Subtotals			*5,639*	*312*	*345*	*657*	*359*	*331*	*690*
Non-Auto Trip Reduction (43%)[3]			2,425	134	148	283	154	143	297
Reduction for Pass-By/Non-Auto Trips (34%)[4]			226	12	14	26	14	13	28
Net New Project Trip Generation			***2,989***	***166***	***183***	***348***	***191***	***175***	***366***

Sources: 1) ITE Trip Generation, 9th Edition, 2012, 2) ITE Trip Generation Handbook, 2nd Edition, June 2004, 3) Trip reduction for projects within 0.5 miles of a BART Station - City of Oakland Transportation Impact Study Guidelines, April, 2013, and 4) TDM plan reduction to EIR trips of 4.2% - The Hive Transportation Demand Management Plan, September 26, 2014.

Table 8 Preliminary Project Trip Distribution
Reduced Intensity Alternative

Origin/Destination	% of Trips	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
West on 7th Street	9%	269	15	16	31	17	16	33
North on the Mandela Parkway	8%	239	13	15	28	15	14	29
North on Union Street	4%	120	7	7	14	8	7	15
North on Adeline Street	5%	149	8	9	17	9	9	18
East on 7th Street	23%	687	38	42	80	44	40	84
East on 5th Street (I-880 SB Ramps)	19%	568	31	35	66	37	33	70
South on Adeline St./Middle Harbor Rd.	5%	149	8	9	17	9	9	18
South on Union Street (I-880 NB Ramps)	22%	658	36	40	77	42	39	80
South on Mandela Parkway/3rd Street	1%	30	2	2	4	2	2	4
West on 5th St. (West Oak. BART Station)	4%	120	7	7	14	8	7	15
TOTALS	**100%**	**2,989**	**166**	**183**	**348**	**194**	**175**	**366**

Existing Plus Project Traffic Operations - As shown in **Table 9**, for the reduced intensity alternative all intersections are forecast to continue having acceptable operations (LOS D or better) under existing plus project conditions with no significant differences in the LOS conditions versus those identified for the proposed project.

Cumulative Plus Project Traffic Operations - As shown in **Table 10**, for the reduced intensity alternative all intersections are forecast to continue having acceptable operations (LOS D or better) under cumulative plus project conditions. In general the analysis indicated there would be no significant impacts at any other study intersections that were not included in the WOSP EIR. In summary, the resulting project transportation impacts for the reduced intensity alternative were essentially identical to those identified for the proposed project.

If there are any questions, or if additional information is needed, please don't hesitate to contact me at (925) 945-0201.

TABLE 9
EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS FOR THE REDUCED INTENSITY ALTERNATIVE

	INTERSECTION	CONTROL	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	7TH ST & KIRKHAM ST	Two Way Stop	AM	9.4	A	9.9	A
			PM	11.3	B	12.2	B
2	7TH ST & UNION ST	Signalized	AM	5.3	A	11.0	B
			PM	13.7	B	20.6	C
3	MANDELA PKWY & 5TH ST	Signalized	AM	5.8	A	6.0	A
			PM	6.8	A	7.1	A
4	KIRKHAM ST & 5TH ST	Two Way Stop	AM	10.0	B	11.1	B
			PM	11.5	B	14.1	B
5	5TH ST & PROJECT ENTRANCE	Two Way Stop	AM	N/A	N/A	11.5	B
			PM	N/A	N/A	10.8	B
6	5TH ST & UNION ST	Signalized	AM	13.4	B	15.1	B
			PM	20.1	C	23.1	C

SOURCE: Abrams Associates, 2016

NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

TABLE 10
CUMULATIVE PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS FOR THE REDUCED INTENSITY ALTERNATIVE

	INTERSECTION	CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	7TH ST & KIRKHAM ST	Two Way Stop	AM	13.5	B	15.1	C
			PM	19.5	C	24.7	C
2	7TH ST & UNION ST	Signalized	AM	30.3	C	31.3	C
			PM	**69.7**	**E**	50.9	D
3	MANDELA PKWY & 5TH ST	Signalized	AM	7.7	A	8.2	A
			PM	8.5	A	8.8	A
4	KIRKHAM ST & 5TH ST	Two Way Stop	AM	10.8	B	12.3	B
			PM	13.1	B	16.9	C
5	5TH ST & PROJECT ENTRANCE	Two Way Stop	AM	N/A	N/A	12.2	B
			PM	N/A	N/A	11.2	B
6	5TH ST & UNION ST	Signalized	AM	21.8	C	25.1	C
			PM	47.1	D	53.3	D

SOURCE: Abrams Associates, 2016

NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	234	10	0	466	0	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	234	10	0	466	0	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	244	0	472	122
Stage 1	-	-	-	-	239	-
Stage 2	-	-	-	-	233	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	1256	-	499	878
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	757	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1256	-	499	878
Mov Cap-2 Maneuver	-	-	-	-	499	-
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	757	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	878	-	-	1256	-
HCM Lane V/C Ratio	0.073	-	-	-	-
HCM Control Delay (s)	9.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	265	24	326	431	35	17	35	114	21	40	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1900	1712	1900
Adj Flow Rate, veh/h	9	265	24	326	431	35	17	35	114	21	40	18
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	678	1772	159	783	1789	145	205	189	217	190	134	51
Arrive On Green	0.59	0.59	0.59	0.59	0.59	0.59	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	848	3019	271	998	3048	247	317	1270	1455	269	900	345
Grp Volume(v), veh/h	9	142	147	326	229	237	52	0	114	79	0	0
Grp Sat Flow(s),veh/h/ln	848	1626	1664	998	1626	1668	1588	0	1455	1514	0	0
Q Serve(g_s), s	0.2	1.2	1.2	6.7	2.1	2.1	0.0	0.0	2.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.2	1.2	1.2	7.9	2.1	2.1	0.8	0.0	2.2	1.3	0.0	0.0
Prop In Lane	1.00		0.16	1.00		0.15	0.33		1.00	0.27		0.23
Lane Grp Cap(c), veh/h	678	955	977	783	955	979	394	0	217	376	0	0
V/C Ratio(X)	0.01	0.15	0.15	0.42	0.24	0.24	0.13	0.00	0.53	0.21	0.00	0.00
Avail Cap(c_a), veh/h	1887	3273	3349	2206	3273	3358	1220	0	1008	1168	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.5	2.8	2.8	4.6	3.0	3.0	11.3	0.0	11.9	11.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.4	0.1	0.1	0.1	0.0	2.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.5	0.6	1.9	0.9	1.0	0.4	0.0	1.0	0.6	0.0	0.0
LnGrp Delay(d),s/veh	3.6	2.9	2.9	5.0	3.1	3.1	11.5	0.0	13.9	11.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B		B	B		
Approach Vol, veh/h		298			792			166			79	
Approach Delay, s/veh		2.9			3.9			13.1			11.8	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		8.5		21.8		8.5		21.8
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		21.0		61.0		21.0		61.0
Max Q Clear Time (g_c+I1), s		4.2		4.2		3.3		9.9
Green Ext Time (p_c), s		1.0		8.0		1.0		7.9

Intersection Summary	
HCM 2010 Ctrl Delay	5.3
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	32	82	18	27	177	77	16	34	16	98	70	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	32	82	18	27	177	77	16	34	16	98	70	16
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	282	389	72	218	367	149	270	270	103	433	198	35
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	190	1147	211	78	1083	438	192	992	379	604	728	127
Grp Volume(v), veh/h	132	0	0	281	0	0	66	0	0	184	0	0
Grp Sat Flow(s),veh/h/ln	1549	0	0	1600	0	0	1563	0	0	1459	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.0	2.8	0.0	0.0	0.6	0.0	0.0	2.0	0.0	0.0
Prop In Lane	0.24		0.14	0.10		0.27	0.24		0.24	0.53		0.09
Lane Grp Cap(c), veh/h	742	0	0	734	0	0	643	0	0	665	0	0
V/C Ratio(X)	0.18	0.00	0.00	0.38	0.00	0.00	0.10	0.00	0.00	0.28	0.00	0.00
Avail Cap(c_a), veh/h	3345	0	0	3560	0	0	2997	0	0	2880	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.9	0.0	0.0	5.4	0.0	0.0	5.7	0.0	0.0	6.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.3	0.0	0.0	0.3	0.0	0.0	0.9	0.0	0.0
LnGrp Delay(d),s/veh	5.0	0.0	0.0	5.8	0.0	0.0	5.7	0.0	0.0	6.4	0.0	0.0
LnGrp LOS	A			A			A			A		
Approach Vol, veh/h		132			281			66			184	
Approach Delay, s/veh		5.0			5.8			5.7			6.4	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		9.6		11.0		9.6		11.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		38.0		44.0		38.0		44.0
Max Q Clear Time (g_c+I1), s		2.6		3.2		4.0		4.8
Green Ext Time (p_c), s		1.6		2.9		1.6		2.9

Intersection Summary	
HCM 2010 Ctrl Delay	5.8
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	14	182	0	0	273	50	0	0	0	2	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	14	182	0	0	273	50	0	0	0	2	0	8

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	323	0	0	182	0	0	508	508	162
Stage 1	-	-	-	-	-	-	298	298	-
Stage 2	-	-	-	-	-	-	210	210	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	1171	-	-	1341	-	-	491	451	830
Stage 1	-	-	-	-	-	-	705	647	-
Stage 2	-	-	-	-	-	-	800	709	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1171	-	-	1341	-	-	485	0	830
Mov Cap-2 Maneuver	-	-	-	-	-	-	485	0	-
Stage 1	-	-	-	-	-	-	705	0	-
Stage 2	-	-	-	-	-	-	790	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1171	-	-	1341	-	-	727
HCM Lane V/C Ratio	0.012	-	-	-	-	-	0.014
HCM Control Delay (s)	8.1	0	-	0	-	-	10
HCM Lane LOS	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	0	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	105	63	128	141	26	57	124	576	0	265	125
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	16	105	0	128	141	26	57	124	576	0	265	125
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	26	221	188	225	259	48	73	881	789	0	704	598
Arrive On Green	0.02	0.13	0.00	0.07	0.18	0.18	0.04	0.54	0.54	0.00	0.41	0.41
Sat Flow, veh/h	1630	1712	1455	3163	1407	259	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	16	105	0	128	0	167	57	124	576	0	265	125
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1666	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	0.5	2.6	0.0	1.8	0.0	4.2	1.6	1.8	14.0	0.0	5.0	2.6
Cycle Q Clear(g_c), s	0.5	2.6	0.0	1.8	0.0	4.2	1.6	1.8	14.0	0.0	5.0	2.6
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	26	221	188	225	0	307	73	881	789	0	704	598
V/C Ratio(X)	0.61	0.48	0.00	0.57	0.00	0.54	0.78	0.14	0.73	0.00	0.38	0.21
Avail Cap(c_a), veh/h	315	956	813	1019	0	1145	525	2341	2095	0	1765	1501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	18.8	0.0	20.9	0.0	17.2	22.0	5.3	8.1	0.0	9.5	8.8
Incr Delay (d2), s/veh	20.9	1.6	0.0	2.3	0.0	1.5	16.2	0.1	1.3	0.0	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.4	0.0	0.9	0.0	2.1	1.0	0.8	5.7	0.0	2.4	1.0
LnGrp Delay(d),s/veh	43.6	20.4	0.0	23.2	0.0	18.7	38.2	5.4	9.4	0.0	9.9	9.0
LnGrp LOS	D	C		C		B	D	A	A		A	A
Approach Vol, veh/h		121			295			757			390	
Approach Delay, s/veh		23.5			20.7			10.9			9.6	
Approach LOS		C			C			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		29.2	7.3	10.0	6.1	23.1	4.7	12.6
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		67.0	15.0	26.0	15.0	48.0	9.0	32.0
Max Q Clear Time (g_c+I1), s		16.0	3.8	4.6	3.6	7.0	2.5	6.2
Green Ext Time (p_c), s		9.3	0.3	1.5	0.1	9.0	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	592	49	0	453	0	74
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	592	49	0	453	0	74

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	641	0	844	321
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	227	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	881	-	285	649
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	763	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	881	-	285	649
Mov Cap-2 Maneuver	-	-	-	-	285	-
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	763	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	649	-	-	881	-
HCM Lane V/C Ratio	0.114	-	-	-	-
HCM Control Delay (s)	11.3	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	609	27	80	410	27	21	67	572	15	17	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1900	1712	1900
Adj Flow Rate, veh/h	30	609	27	80	410	27	21	67	572	15	17	22
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	402	1277	57	320	1248	82	209	599	658	201	221	233
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	871	3173	141	725	3099	203	282	1326	1455	260	489	515
Grp Volume(v), veh/h	30	312	324	80	215	222	88	0	572	54	0	0
Grp Sat Flow(s),veh/h/ln	871	1626	1687	725	1626	1676	1608	0	1455	1265	0	0
Q Serve(g_s), s	1.4	7.8	7.8	5.0	5.0	5.0	0.0	0.0	19.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.4	7.8	7.8	12.9	5.0	5.0	1.6	0.0	19.5	1.1	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.12	0.24		1.00	0.28		0.41
Lane Grp Cap(c), veh/h	402	655	679	320	655	675	808	0	658	655	0	0
V/C Ratio(X)	0.07	0.48	0.48	0.25	0.33	0.33	0.11	0.00	0.87	0.08	0.00	0.00
Avail Cap(c_a), veh/h	574	976	1012	463	976	1005	1499	0	1296	1173	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.5	12.1	12.1	16.9	11.3	11.3	8.7	0.0	13.6	8.6	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.5	0.4	0.3	0.3	0.1	0.0	3.7	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.6	3.7	1.0	2.3	2.3	0.8	0.0	8.5	0.5	0.0	0.0
LnGrp Delay(d),s/veh	13.6	12.7	12.7	17.3	11.6	11.6	8.8	0.0	17.3	8.6	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	A		B	A		
Approach Vol, veh/h		666			517			660			54	
Approach Delay, s/veh		12.7			12.5			16.2			8.6	
Approach LOS		B			B			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		28.9		26.1		28.9		26.1
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		49.0		33.0		49.0		33.0
Max Q Clear Time (g_c+I1), s		21.5		9.8		3.1		14.9
Green Ext Time (p_c), s		3.3		8.1		3.5		7.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	30	186	22	24	104	64	34	142	52	82	186	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	30	186	22	24	104	64	34	142	52	82	186	80
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	188	395	43	185	273	150	204	444	144	262	381	141
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	109	1368	150	97	944	521	110	1105	359	224	948	350
Grp Volume(v), veh/h	238	0	0	192	0	0	228	0	0	348	0	0
Grp Sat Flow(s),veh/h/ln	1627	0	0	1562	0	0	1574	0	0	1522	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Cycle Q Clear(g_c), s	3.0	0.0	0.0	2.5	0.0	0.0	2.5	0.0	0.0	4.2	0.0	0.0
Prop In Lane	0.13		0.09	0.12		0.33	0.15		0.23	0.24		0.23
Lane Grp Cap(c), veh/h	626	0	0	608	0	0	793	0	0	784	0	0
V/C Ratio(X)	0.38	0.00	0.00	0.32	0.00	0.00	0.29	0.00	0.00	0.44	0.00	0.00
Avail Cap(c_a), veh/h	2124	0	0	2040	0	0	3087	0	0	3012	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.6	0.0	0.0	7.4	0.0	0.0	5.4	0.0	0.0	5.9	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.3	0.0	0.0	0.2	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	1.1	0.0	0.0	1.1	0.0	0.0	1.9	0.0	0.0
LnGrp Delay(d),s/veh	8.0	0.0	0.0	7.7	0.0	0.0	5.6	0.0	0.0	6.3	0.0	0.0
LnGrp LOS	A			A			A			A		
Approach Vol, veh/h		238			192			228			348	
Approach Delay, s/veh		8.0			7.7			5.6			6.3	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		14.4		11.5		14.4		11.5
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		50.0		32.0		50.0		32.0
Max Q Clear Time (g_c+I1), s		4.5		5.0		6.2		4.5
Green Ext Time (p_c), s		4.3		2.8		4.3		2.8

Intersection Summary	
HCM 2010 Ctrl Delay	6.8
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	44	276	0	0	167	30	0	0	0	24	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	44	276	0	0	167	30	0	0	0	24	0	25

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	197	0	0	276	0	0	546	546	99
Stage 1	-	-	-	-	-	-	182	182	-
Stage 2	-	-	-	-	-	-	364	364	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	1310	-	-	1237	-	-	465	429	912
Stage 1	-	-	-	-	-	-	808	729	-
Stage 2	-	-	-	-	-	-	679	604	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1310	-	-	1237	-	-	446	0	912
Mov Cap-2 Maneuver	-	-	-	-	-	-	446	0	-
Stage 1	-	-	-	-	-	-	808	0	-
Stage 2	-	-	-	-	-	-	652	0	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1310	-	-	1237	-	-	603
HCM Lane V/C Ratio	0.034	-	-	-	-	-	0.081
HCM Control Delay (s)	7.8	0	-	0	-	-	11.5
HCM Lane LOS	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	47	199	54	109	116	17	41	596	805	0	84	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	47	199	0	109	116	17	41	596	805	0	84	40
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	57	265	225	171	253	37	49	1054	943	0	976	829
Arrive On Green	0.04	0.15	0.00	0.05	0.17	0.17	0.03	0.65	0.65	0.00	0.57	0.57
Sat Flow, veh/h	1630	1712	1455	3163	1460	214	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	47	199	0	109	0	133	41	596	805	0	84	40
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1674	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	2.4	9.3	0.0	2.8	0.0	6.0	2.1	17.0	36.5	0.0	1.9	1.0
Cycle Q Clear(g_c), s	2.4	9.3	0.0	2.8	0.0	6.0	2.1	17.0	36.5	0.0	1.9	1.0
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	57	265	225	171	0	290	49	1054	943	0	976	829
V/C Ratio(X)	0.82	0.75	0.00	0.64	0.00	0.46	0.83	0.57	0.85	0.00	0.09	0.05
Avail Cap(c_a), veh/h	175	532	452	302	0	500	156	1439	1287	0	1269	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	33.8	0.0	38.8	0.0	31.0	40.4	8.2	11.6	0.0	8.1	8.0
Incr Delay (d2), s/veh	24.0	4.3	0.0	3.9	0.0	1.1	28.6	0.5	4.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	4.7	0.0	1.3	0.0	2.9	1.3	7.6	15.4	0.0	0.9	0.4
LnGrp Delay(d),s/veh	64.1	38.1	0.0	42.7	0.0	32.2	69.0	8.7	15.9	0.0	8.2	8.0
LnGrp LOS	E	D		D		C	E	A	B		A	A
Approach Vol, veh/h		246			242			1442			124	
Approach Delay, s/veh		43.1			36.9			14.4			8.1	
Approach LOS		D			D			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		58.2	8.5	16.9	6.5	51.7	6.9	18.5
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		74.0	8.0	26.0	8.0	62.0	9.0	25.0
Max Q Clear Time (g_c+I1), s		38.5	4.8	11.3	4.1	3.9	4.4	8.0
Green Ext Time (p_c), s		15.7	0.1	1.6	0.0	18.5	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	20.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	272	10	0	466	0	132
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	272	10	0	466	0	132

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	282	0	510	141
Stage 1	-	-	-	-	277	-
Stage 2	-	-	-	-	233	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	1215	-	471	853
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	757	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1215	-	471	853
Mov Cap-2 Maneuver	-	-	-	-	471	-
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	757	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	853	-	-	1215	-
HCM Lane V/C Ratio	0.155	-	-	-	-
HCM Control Delay (s)	10	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	325	62	374	431	35	17	35	114	21	47	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1712	1712	1900
Adj Flow Rate, veh/h	17	325	62	374	431	35	17	35	114	21	47	18
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	28	786	148	471	1705	138	160	149	593	286	140	54
Arrive On Green	0.02	0.29	0.29	0.29	0.56	0.56	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1630	2732	515	1630	3048	247	327	1254	1455	1134	1180	452
Grp Volume(v), veh/h	17	192	195	374	229	237	52	0	114	21	0	65
Grp Sat Flow(s),veh/h/ln	1630	1626	1621	1630	1626	1668	1581	0	1455	1134	0	1632
Q Serve(g_s), s	0.4	3.8	3.8	8.3	2.8	2.9	0.0	0.0	2.0	0.7	0.0	1.4
Cycle Q Clear(g_c), s	0.4	3.8	3.8	8.3	2.8	2.9	1.1	0.0	2.0	1.8	0.0	1.4
Prop In Lane	1.00		0.32	1.00		0.15	0.33		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	28	468	466	471	910	933	309	0	593	286	0	193
V/C Ratio(X)	0.60	0.41	0.42	0.79	0.25	0.25	0.17	0.00	0.19	0.07	0.00	0.34
Avail Cap(c_a), veh/h	290	1198	1195	2361	3265	3349	976	0	1234	785	0	912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.2	11.3	11.3	12.9	4.4	4.5	15.8	0.0	7.5	16.6	0.0	15.9
Incr Delay (d2), s/veh	19.1	0.6	0.6	3.1	0.1	0.1	0.3	0.0	0.2	0.1	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.7	1.8	4.1	1.3	1.4	0.5	0.0	0.8	0.2	0.0	0.7
LnGrp Delay(d),s/veh	38.3	11.9	11.9	16.0	4.6	4.6	16.0	0.0	7.7	16.7	0.0	16.9
LnGrp LOS	D	B	B	B	A	A	B		A	B		B
Approach Vol, veh/h		404			840			166			86	
Approach Delay, s/veh		13.0			9.7			10.3			16.9	
Approach LOS		B			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.7	15.4	15.3		8.7	4.7	26.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		22.0	57.0	29.0		22.0	7.0	79.0
Max Q Clear Time (g_c+I1), s		4.0	10.3	5.8		3.8	2.4	4.9
Green Ext Time (p_c), s		1.0	1.2	5.5		1.0	0.0	6.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	32	82	18	36	186	113	16	36	16	98	70	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	32	82	18	36	186	113	16	36	16	98	70	16
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	267	443	80	212	366	203	248	263	96	405	188	33
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	174	1163	211	86	960	533	186	1013	369	607	724	127
Grp Volume(v), veh/h	132	0	0	335	0	0	68	0	0	184	0	0
Grp Sat Flow(s),veh/h/ln	1548	0	0	1579	0	0	1567	0	0	1457	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.0	3.6	0.0	0.0	0.7	0.0	0.0	2.2	0.0	0.0
Prop In Lane	0.24		0.14	0.11		0.34	0.24		0.24	0.53		0.09
Lane Grp Cap(c), veh/h	790	0	0	781	0	0	607	0	0	626	0	0
V/C Ratio(X)	0.17	0.00	0.00	0.43	0.00	0.00	0.11	0.00	0.00	0.29	0.00	0.00
Avail Cap(c_a), veh/h	3316	0	0	3521	0	0	2504	0	0	2403	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.6	0.0	0.0	5.4	0.0	0.0	6.4	0.0	0.0	6.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.7	0.0	0.0	0.3	0.0	0.0	1.0	0.0	0.0
LnGrp Delay(d),s/veh	4.7	0.0	0.0	5.8	0.0	0.0	6.4	0.0	0.0	7.1	0.0	0.0
LnGrp LOS	A			A			A			A		
Approach Vol, veh/h		132			335			68			184	
Approach Delay, s/veh		4.7			5.8			6.4			7.1	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		9.8		12.5		9.8		12.5
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		34.0		48.0		34.0		48.0
Max Q Clear Time (g_c+I1), s		2.7		3.2		4.2		5.6
Green Ext Time (p_c), s		1.6		3.4		1.6		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	6.0
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	14	182	0	99	320	118	0	0	0	2	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	14	182	0	99	320	118	0	0	0	2	0	8

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	438	0	0	182	0	0	787	787	219
Stage 1	-	-	-	-	-	-	577	577	-
Stage 2	-	-	-	-	-	-	210	210	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	1057	-	-	1341	-	-	329	309	762
Stage 1	-	-	-	-	-	-	505	483	-
Stage 2	-	-	-	-	-	-	800	709	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1057	-	-	1341	-	-	292	0	762
Mov Cap-2 Maneuver	-	-	-	-	-	-	292	0	-
Stage 1	-	-	-	-	-	-	455	0	-
Stage 2	-	-	-	-	-	-	788	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	1.6	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1057	-	-	1341	-	-	576
HCM Lane V/C Ratio	0.013	-	-	0.074	-	-	0.017
HCM Control Delay (s)	8.5	0	-	7.9	0.2	-	11.4
HCM Lane LOS	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	-	-	0.2	-	-	0.1

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	283	323	173	0	214
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	0	283	323	173	0	214

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	496	0	-	0	552	248
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	142	-
Critical Hdwy	4.32	-	-	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	2.31	-	-	-	3.61	3.41
Pot Cap-1 Maneuver	1003	-	-	-	443	725
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	844	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1003	-	-	-	443	725
Mov Cap-2 Maneuver	-	-	-	-	443	-
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	844	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1003	-	-	-	725
HCM Lane V/C Ratio	-	-	-	-	0.295
HCM Control Delay (s)	0	-	-	-	12
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	157	110	128	183	26	95	124	576	0	265	218
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	16	157	0	128	183	26	95	124	576	0	265	218
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	26	279	237	219	318	45	120	869	778	0	655	557
Arrive On Green	0.02	0.16	0.00	0.07	0.22	0.22	0.07	0.53	0.53	0.00	0.38	0.38
Sat Flow, veh/h	1630	1712	1455	3163	1467	208	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	16	157	0	128	0	209	95	124	576	0	265	218
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1675	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	0.5	4.4	0.0	2.0	0.0	5.8	3.0	2.0	15.7	0.0	5.8	5.6
Cycle Q Clear(g_c), s	0.5	4.4	0.0	2.0	0.0	5.8	3.0	2.0	15.7	0.0	5.8	5.6
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	26	279	237	219	0	363	120	869	778	0	655	557
V/C Ratio(X)	0.62	0.56	0.00	0.58	0.00	0.58	0.79	0.14	0.74	0.00	0.40	0.39
Avail Cap(c_a), veh/h	222	898	763	798	0	1073	602	2147	1921	0	1496	1272
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	19.8	0.0	23.2	0.0	18.1	23.4	6.0	9.2	0.0	11.6	11.5
Incr Delay (d2), s/veh	21.6	1.8	0.0	2.5	0.0	1.4	10.8	0.1	1.4	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.2	0.0	0.9	0.0	2.8	1.7	0.9	6.5	0.0	2.8	2.3
LnGrp Delay(d),s/veh	46.7	21.6	0.0	25.7	0.0	19.5	34.2	6.1	10.7	0.0	12.0	12.0
LnGrp LOS	D	C		C		B	C	A	B		B	B
Approach Vol, veh/h		173			337			795			483	
Approach Delay, s/veh		23.9			21.9			12.8			12.0	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		31.5	7.6	12.4	7.8	23.7	4.8	15.2
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		68.0	13.0	27.0	19.0	45.0	7.0	33.0
Max Q Clear Time (g_c+I1), s		17.7	4.0	6.4	5.0	7.8	2.5	7.8
Green Ext Time (p_c), s		9.8	0.2	2.1	0.2	9.4	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	641	49	0	453	0	136
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	641	49	0	453	0	136

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	690	0	893	345
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	227	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	843	-	265	626
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	763	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	843	-	265	626
Mov Cap-2 Maneuver	-	-	-	-	265	-
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	763	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	626	-	-	843	-
HCM Lane V/C Ratio	0.217	-	-	-	-
HCM Control Delay (s)	12.3	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	38	663	76	142	410	27	21	67	572	15	26	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1712	1712	1900
Adj Flow Rate, veh/h	38	663	76	142	410	27	21	67	572	15	26	22
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	51	1053	121	184	1364	89	161	446	645	332	283	240
Arrive On Green	0.03	0.36	0.36	0.11	0.44	0.44	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1630	2942	337	1630	3099	203	263	1349	1455	723	858	726
Grp Volume(v), veh/h	38	366	373	142	215	222	88	0	572	15	0	48
Grp Sat Flow(s),veh/h/ln	1630	1626	1652	1630	1626	1676	1612	0	1455	723	0	1584
Q Serve(g_s), s	1.4	11.3	11.3	5.1	5.1	5.2	0.0	0.0	20.0	0.9	0.0	1.3
Cycle Q Clear(g_c), s	1.4	11.3	11.3	5.1	5.1	5.2	2.2	0.0	20.0	3.1	0.0	1.3
Prop In Lane	1.00		0.20	1.00		0.12	0.24		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	51	582	592	184	716	737	606	0	645	332	0	523
V/C Ratio(X)	0.75	0.63	0.63	0.77	0.30	0.30	0.15	0.00	0.89	0.05	0.00	0.09
Avail Cap(c_a), veh/h	189	1048	1065	1320	2176	2243	606	0	645	332	0	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.1	16.1	16.1	26.1	10.9	10.9	14.3	0.0	15.4	15.4	0.0	14.0
Incr Delay (d2), s/veh	19.3	1.1	1.1	6.6	0.2	0.2	0.1	0.0	14.0	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	5.2	5.3	2.6	2.3	2.4	1.0	0.0	11.2	0.2	0.0	0.6
LnGrp Delay(d),s/veh	48.4	17.2	17.2	32.7	11.2	11.2	14.4	0.0	29.5	15.5	0.0	14.1
LnGrp LOS	D	B	B	C	B	B	B		C	B		B
Approach Vol, veh/h		777			579			660			63	
Approach Delay, s/veh		18.7			16.4			27.5			14.4	
Approach LOS		B			B			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		24.0	10.8	25.7		24.0	5.9	30.6
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		20.0	49.0	39.0		20.0	7.0	81.0
Max Q Clear Time (g_c+I1), s		22.0	7.1	13.3		5.1	3.4	7.2
Green Ext Time (p_c), s		0.0	0.4	8.4		2.9	0.0	9.9

Intersection Summary	
HCM 2010 Ctrl Delay	20.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	30	186	22	35	112	96	34	144	52	82	186	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	30	186	22	35	112	96	34	144	52	82	186	80
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	182	423	46	188	250	187	196	439	141	253	374	138
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	104	1370	150	117	811	606	109	1109	356	225	946	350
Grp Volume(v), veh/h	238	0	0	243	0	0	230	0	0	348	0	0
Grp Sat Flow(s),veh/h/ln	1624	0	0	1535	0	0	1575	0	0	1520	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Cycle Q Clear(g_c), s	3.1	0.0	0.0	3.3	0.0	0.0	2.7	0.0	0.0	4.5	0.0	0.0
Prop In Lane	0.13		0.09	0.14		0.40	0.15		0.23	0.24		0.23
Lane Grp Cap(c), veh/h	651	0	0	626	0	0	776	0	0	766	0	0
V/C Ratio(X)	0.37	0.00	0.00	0.39	0.00	0.00	0.30	0.00	0.00	0.45	0.00	0.00
Avail Cap(c_a), veh/h	2080	0	0	1976	0	0	2900	0	0	2826	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.5	0.0	0.0	7.6	0.0	0.0	5.7	0.0	0.0	6.3	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	1.5	0.0	0.0	1.2	0.0	0.0	2.0	0.0	0.0
LnGrp Delay(d),s/veh	7.9	0.0	0.0	8.0	0.0	0.0	6.0	0.0	0.0	6.7	0.0	0.0
LnGrp LOS	A			A			A			A		
Approach Vol, veh/h		238			243			230			348	
Approach Delay, s/veh		7.9			8.0			6.0			6.7	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		14.7		12.4		14.7		12.4
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		49.0		33.0		49.0		33.0
Max Q Clear Time (g_c+I1), s		4.7		5.1		6.5		5.3
Green Ext Time (p_c), s		4.3		3.2		4.3		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.1
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	44	276	0	89	209	92	0	0	0	24	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	44	276	0	89	209	92	0	0	0	24	0	25

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	301	0	0	276	0	0	797	797	151
Stage 1	-	-	-	-	-	-	433	433	-
Stage 2	-	-	-	-	-	-	364	364	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	1194	-	-	1237	-	-	324	305	844
Stage 1	-	-	-	-	-	-	601	562	-
Stage 2	-	-	-	-	-	-	679	604	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1194	-	-	1237	-	-	283	0	844
Mov Cap-2 Maneuver	-	-	-	-	-	-	283	0	-
Stage 1	-	-	-	-	-	-	549	0	-
Stage 2	-	-	-	-	-	-	649	0	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	2	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1194	-	-	1237	-	-	428
HCM Lane V/C Ratio	0.037	-	-	0.072	-	-	0.114
HCM Control Delay (s)	8.1	0	-	8.1	0.2	-	14.5
HCM Lane LOS	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-	-	0.4

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	389	197	222	0	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	0	389	197	222	0	193

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	419	0	-	0	503	210
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	195	-
Critical Hdwy	4.32	-	-	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	2.31	-	-	-	3.61	3.41
Pot Cap-1 Maneuver	1075	-	-	-	476	769
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	792	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1075	-	-	-	476	769
Mov Cap-2 Maneuver	-	-	-	-	476	-
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	792	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1075	-	-	-	769
HCM Lane V/C Ratio	-	-	-	-	0.251
HCM Control Delay (s)	0	-	-	-	11.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	47	246	96	109	169	17	90	596	805	0	84	160
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	47	246	0	109	169	17	90	596	805	0	84	160
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	58	313	266	167	307	31	113	1030	922	0	891	757
Arrive On Green	0.04	0.18	0.00	0.05	0.20	0.20	0.07	0.63	0.63	0.00	0.52	0.52
Sat Flow, veh/h	1630	1712	1455	3163	1531	154	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	47	246	0	109	0	186	90	596	805	0	84	160
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1685	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	2.6	12.6	0.0	3.1	0.0	9.1	5.0	19.5	41.7	0.0	2.3	5.4
Cycle Q Clear(g_c), s	2.6	12.6	0.0	3.1	0.0	9.1	5.0	19.5	41.7	0.0	2.3	5.4
Prop In Lane	1.00		1.00	1.00		0.09	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	58	313	266	167	0	338	113	1030	922	0	891	757
V/C Ratio(X)	0.81	0.79	0.00	0.65	0.00	0.55	0.80	0.58	0.87	0.00	0.09	0.21
Avail Cap(c_a), veh/h	160	541	460	276	0	514	231	1259	1126	0	1008	856
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	35.8	0.0	42.6	0.0	33.0	42.0	9.7	13.8	0.0	11.1	11.8
Incr Delay (d2), s/veh	23.2	4.4	0.0	4.2	0.0	1.4	11.9	0.5	6.7	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	6.3	0.0	1.4	0.0	4.4	2.6	8.8	18.3	0.0	1.1	2.2
LnGrp Delay(d),s/veh	67.1	40.1	0.0	46.9	0.0	34.4	54.0	10.2	20.5	0.0	11.1	12.0
LnGrp LOS	E	D		D		C	D	B	C		B	B
Approach Vol, veh/h		293			295			1491			244	
Approach Delay, s/veh		44.5			39.0			18.4			11.7	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		62.1	8.9	20.8	10.4	51.7	7.2	22.4
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		71.0	8.0	29.0	13.0	54.0	9.0	28.0
Max Q Clear Time (g_c+I1), s		43.7	5.1	14.6	7.0	7.4	4.6	11.1
Green Ext Time (p_c), s		14.5	0.1	2.2	0.1	18.3	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	950	13	0	1098	0	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	950	13	0	1098	0	82

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	963	0	1506	482
Stage 1	-	-	-	-	957	-
Stage 2	-	-	-	-	549	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	658	-	103	507
Stage 1	-	-	-	-	313	-
Stage 2	-	-	-	-	518	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	658	-	103	507
Mov Cap-2 Maneuver	-	-	-	-	103	-
Stage 1	-	-	-	-	313	-
Stage 2	-	-	-	-	518	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	507	-	-	658	-
HCM Lane V/C Ratio	0.162	-	-	-	-
HCM Control Delay (s)	13.5	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	940	81	518	1053	45	22	45	146	27	51	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1900	1712	1900
Adj Flow Rate, veh/h	12	940	81	518	1053	45	22	45	146	27	51	23
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	398	2354	203	427	2469	105	100	162	188	86	117	44
Arrive On Green	0.78	0.78	0.78	0.78	0.78	0.78	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	470	3031	261	505	3178	136	339	1259	1455	253	911	343
Grp Volume(v), veh/h	12	504	517	518	539	559	67	0	146	101	0	0
Grp Sat Flow(s),veh/h/ln	470	1626	1666	505	1626	1688	1598	0	1455	1507	0	0
Q Serve(g_s), s	0.7	8.5	8.5	57.5	9.4	9.4	0.0	0.0	8.3	1.3	0.0	0.0
Cycle Q Clear(g_c), s	10.1	8.5	8.5	66.0	9.4	9.4	3.0	0.0	8.3	5.0	0.0	0.0
Prop In Lane	1.00		0.16	1.00		0.08	0.33		1.00	0.27		0.23
Lane Grp Cap(c), veh/h	398	1263	1294	427	1263	1311	262	0	188	248	0	0
V/C Ratio(X)	0.03	0.40	0.40	1.21	0.43	0.43	0.26	0.00	0.78	0.41	0.00	0.00
Avail Cap(c_a), veh/h	398	1263	1294	427	1263	1311	352	0	274	333	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.9	3.1	3.1	19.4	3.2	3.2	33.5	0.0	35.8	34.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.2	116.1	0.2	0.2	0.5	0.0	8.3	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.9	3.9	23.7	4.1	4.3	1.5	0.0	3.8	2.3	0.0	0.0
LnGrp Delay(d),s/veh	4.9	3.3	3.3	135.6	3.4	3.4	34.0	0.0	44.1	35.4	0.0	0.0
LnGrp LOS	A	A	A	F	A	A	C		D	D		
Approach Vol, veh/h		1033			1616			213			101	
Approach Delay, s/veh		3.3			45.8			41.0			35.4	
Approach LOS		A			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		15.0		70.0		15.0		70.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		16.0		66.0		16.0		66.0
Max Q Clear Time (g_c+I1), s		10.3		12.1		7.0		68.0
Green Ext Time (p_c), s		0.7		40.8		1.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	41	105	23	35	227	99	21	44	21	126	190	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	41	105	23	35	227	99	21	44	21	126	190	41
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	224	421	78	163	401	162	223	347	135	310	336	62
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	191	1137	209	77	1082	438	195	975	378	403	943	175
Grp Volume(v), veh/h	169	0	0	361	0	0	86	0	0	357	0	0
Grp Sat Flow(s),veh/h/ln	1538	0	0	1597	0	0	1548	0	0	1520	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0
Cycle Q Clear(g_c), s	2.1	0.0	0.0	5.2	0.0	0.0	1.0	0.0	0.0	5.6	0.0	0.0
Prop In Lane	0.24		0.14	0.10		0.27	0.24		0.24	0.35		0.11
Lane Grp Cap(c), veh/h	723	0	0	727	0	0	704	0	0	708	0	0
V/C Ratio(X)	0.23	0.00	0.00	0.50	0.00	0.00	0.12	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	2033	0	0	2177	0	0	2346	0	0	2399	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.5	0.0	0.0	7.4	0.0	0.0	6.4	0.0	0.0	7.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	2.4	0.0	0.0	0.5	0.0	0.0	2.5	0.0	0.0
LnGrp Delay(d),s/veh	6.6	0.0	0.0	8.0	0.0	0.0	6.5	0.0	0.0	8.4	0.0	0.0
LnGrp LOS	A			A			A			A		
Approach Vol, veh/h		169			361			86			357	
Approach Delay, s/veh		6.6			8.0			6.5			8.4	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		14.4		14.8		14.4		14.8
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		44.0		38.0		44.0		38.0
Max Q Clear Time (g_c+I1), s		3.0		4.1		7.6		7.2
Green Ext Time (p_c), s		3.2		3.8		3.1		3.8

Intersection Summary	
HCM 2010 Ctrl Delay	7.7
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	18	233	0	0	350	64	0	0	0	3	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	18	233	0	0	350	64	0	0	0	3	0	10

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	414	0	0	233	0	0	651	651	207
Stage 1	-	-	-	-	-	-	382	382	-
Stage 2	-	-	-	-	-	-	269	269	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	1080	-	-	1283	-	-	400	372	776
Stage 1	-	-	-	-	-	-	638	593	-
Stage 2	-	-	-	-	-	-	752	667	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1080	-	-	1283	-	-	392	0	776
Mov Cap-2 Maneuver	-	-	-	-	-	-	392	0	-
Stage 1	-	-	-	-	-	-	638	0	-
Stage 2	-	-	-	-	-	-	738	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1080	-	-	1283	-	-	633
HCM Lane V/C Ratio	0.017	-	-	-	-	-	0.021
HCM Control Delay (s)	8.4	0	-	0	-	-	10.8
HCM Lane LOS	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	160	81	164	181	33	73	159	814	0	340	160
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	21	160	0	164	181	33	73	159	814	0	340	160
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	30	235	199	243	275	50	92	1040	930	0	914	777
Arrive On Green	0.02	0.14	0.00	0.08	0.20	0.20	0.06	0.64	0.64	0.00	0.53	0.53
Sat Flow, veh/h	1630	1712	1455	3163	1409	257	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	21	160	0	164	0	214	73	159	814	0	340	160
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1666	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	1.0	7.3	0.0	4.1	0.0	9.7	3.6	3.2	37.5	0.0	9.5	4.7
Cycle Q Clear(g_c), s	1.0	7.3	0.0	4.1	0.0	9.7	3.6	3.2	37.5	0.0	9.5	4.7
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	30	235	199	243	0	326	92	1040	930	0	914	777
V/C Ratio(X)	0.69	0.68	0.00	0.67	0.00	0.66	0.79	0.15	0.87	0.00	0.37	0.21
Avail Cap(c_a), veh/h	139	523	444	579	0	671	299	1350	1208	0	1024	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	33.6	0.0	36.8	0.0	30.4	38.2	5.9	12.1	0.0	11.1	10.0
Incr Delay (d2), s/veh	24.8	3.5	0.0	3.2	0.0	2.3	14.0	0.1	6.0	0.0	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	3.6	0.0	1.9	0.0	4.7	2.0	1.4	16.2	0.0	4.5	1.9
LnGrp Delay(d),s/veh	64.7	37.1	0.0	40.0	0.0	32.7	52.2	6.0	18.1	0.0	11.3	10.1
LnGrp LOS	E	D		D		C	D	A	B		B	B
Approach Vol, veh/h		181			378			1046			500	
Approach Delay, s/veh		40.3			35.9			18.6			10.9	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		56.4	10.3	15.2	8.6	47.7	5.5	20.0
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		68.0	15.0	25.0	15.0	49.0	7.0	33.0
Max Q Clear Time (g_c+I1), s		39.5	6.1	9.3	5.6	11.5	3.0	11.7
Green Ext Time (p_c), s		12.9	0.3	1.9	0.1	14.4	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	21.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1409	63	0	1281	0	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	1409	63	0	1281	0	95

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1472	0	2082	736
Stage 1	-	-	-	-	1441	-
Stage 2	-	-	-	-	641	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	412	-	41	342
Stage 1	-	-	-	-	169	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	412	-	41	342
Mov Cap-2 Maneuver	-	-	-	-	41	-
Stage 1	-	-	-	-	169	-
Stage 2	-	-	-	-	463	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	19.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	342	-	-	412	-
HCM Lane V/C Ratio	0.278	-	-	-	-
HCM Control Delay (s)	19.5	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.1	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	38	1381	85	253	1326	185	27	86	734	69	22	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1900	1712	1900
Adj Flow Rate, veh/h	38	1381	85	253	1326	185	27	86	659	69	22	28
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	160	1868	115	172	1722	239	141	409	453	195	62	60
Arrive On Green	0.60	0.60	0.60	0.60	0.60	0.60	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	317	3113	191	331	2870	398	293	1315	1455	423	200	192
Grp Volume(v), veh/h	38	720	746	253	747	764	113	0	659	119	0	0
Grp Sat Flow(s),veh/h/ln	317	1626	1678	331	1626	1642	1608	0	1455	815	0	0
Q Serve(g_s), s	9.2	28.6	28.8	25.2	30.6	31.3	0.0	0.0	28.0	7.4	0.0	0.0
Cycle Q Clear(g_c), s	40.5	28.6	28.8	54.0	30.6	31.3	4.4	0.0	28.0	11.8	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.24	0.24		1.00	0.58		0.24
Lane Grp Cap(c), veh/h	160	976	1007	172	976	985	550	0	453	317	0	0
V/C Ratio(X)	0.24	0.74	0.74	1.47	0.77	0.78	0.21	0.00	1.46	0.38	0.00	0.00
Avail Cap(c_a), veh/h	160	976	1007	172	976	985	550	0	453	317	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	28.6	12.9	13.0	38.3	13.3	13.5	22.9	0.0	31.0	25.6	0.0	0.0
Incr Delay (d2), s/veh	0.8	3.0	3.0	238.9	3.7	3.9	0.2	0.0	217.1	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	13.4	14.1	15.7	14.5	15.1	2.1	0.0	38.5	2.5	0.0	0.0
LnGrp Delay(d),s/veh	29.4	15.9	15.9	277.1	17.0	17.4	23.0	0.0	248.1	26.3	0.0	0.0
LnGrp LOS	C	B	B	F	B	B	C		F	C		
Approach Vol, veh/h		1504			1764			772			119	
Approach Delay, s/veh		16.3			54.5			215.2			26.3	
Approach LOS		B			D			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		32.0		58.0		32.0		58.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		28.0		54.0		28.0		54.0
Max Q Clear Time (g_c+I1), s		30.0		42.5		13.8		56.0
Green Ext Time (p_c), s		0.0		11.2		4.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	69.7
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	38	239	28	31	133	82	44	182	67	105	239	103
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	38	239	28	31	133	82	44	182	67	105	239	103
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	152	432	47	148	297	164	172	490	161	236	412	155
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	107	1365	149	97	939	518	116	1086	356	238	913	345
Grp Volume(v), veh/h	305	0	0	246	0	0	293	0	0	447	0	0
Grp Sat Flow(s),veh/h/ln	1621	0	0	1554	0	0	1559	0	0	1495	0	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	0.0	4.2	0.0	0.0	4.1	0.0	0.0	7.6	0.0	0.0
Prop In Lane	0.12		0.09	0.13		0.33	0.15		0.23	0.23		0.23
Lane Grp Cap(c), veh/h	630	0	0	610	0	0	824	0	0	804	0	0
V/C Ratio(X)	0.48	0.00	0.00	0.40	0.00	0.00	0.36	0.00	0.00	0.56	0.00	0.00
Avail Cap(c_a), veh/h	1637	0	0	1569	0	0	2256	0	0	2196	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.8	0.0	0.0	9.5	0.0	0.0	6.3	0.0	0.0	7.2	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.4	0.0	0.0	0.3	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	1.9	0.0	0.0	1.9	0.0	0.0	3.4	0.0	0.0
LnGrp Delay(d),s/veh	10.4	0.0	0.0	9.9	0.0	0.0	6.6	0.0	0.0	7.8	0.0	0.0
LnGrp LOS	B			A			A			A		
Approach Vol, veh/h		305			246			293			447	
Approach Delay, s/veh		10.4			9.9			6.6			7.8	
Approach LOS		B			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		19.5		14.9		19.5		14.9
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		49.0		33.0		49.0		33.0
Max Q Clear Time (g_c+I1), s		6.1		7.2		9.6		6.2
Green Ext Time (p_c), s		6.0		3.7		6.0		3.8

Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	56	354	0	0	214	38	0	0	0	31	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	56	354	0	0	214	38	0	0	0	31	0	32

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	252	0	0	354	0	0	699	699	126
Stage 1	-	-	-	-	-	-	233	233	-
Stage 2	-	-	-	-	-	-	466	466	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	1247	-	-	1156	-	-	373	349	876
Stage 1	-	-	-	-	-	-	761	692	-
Stage 2	-	-	-	-	-	-	608	543	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1247	-	-	1156	-	-	352	0	876
Mov Cap-2 Maneuver	-	-	-	-	-	-	352	0	-
Stage 1	-	-	-	-	-	-	761	0	-
Stage 2	-	-	-	-	-	-	574	0	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1247	-	-	1156	-	-	506
HCM Lane V/C Ratio	0.045	-	-	-	-	-	0.125
HCM Control Delay (s)	8	0	-	0	-	-	13.1
HCM Lane LOS	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	255	69	140	149	22	53	764	1032	0	108	51
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	60	255	0	140	149	22	53	764	1032	0	108	51
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	75	292	248	190	269	40	66	1082	968	0	1011	859
Arrive On Green	0.05	0.17	0.00	0.06	0.18	0.18	0.04	0.67	0.67	0.00	0.59	0.59
Sat Flow, veh/h	1630	1712	1455	3163	1458	215	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	60	255	0	140	0	171	53	764	1032	0	108	51
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1674	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	4.2	16.8	0.0	5.0	0.0	10.7	3.7	34.3	77.0	0.0	3.2	1.7
Cycle Q Clear(g_c), s	4.2	16.8	0.0	5.0	0.0	10.7	3.7	34.3	77.0	0.0	3.2	1.7
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	75	292	248	190	0	309	66	1082	968	0	1011	859
V/C Ratio(X)	0.80	0.87	0.00	0.74	0.00	0.55	0.80	0.71	1.07	0.00	0.11	0.06
Avail Cap(c_a), veh/h	141	355	302	191	0	309	127	1082	968	0	1011	859
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	46.8	0.0	53.5	0.0	42.8	55.0	12.2	19.3	0.0	10.4	10.1
Incr Delay (d2), s/veh	17.1	18.1	0.0	13.7	0.0	2.2	19.3	2.1	48.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.4	0.0	2.6	0.0	5.2	2.0	15.9	43.3	0.0	1.5	0.7
LnGrp Delay(d),s/veh	71.8	64.9	0.0	67.2	0.0	45.0	74.3	14.3	67.4	0.0	10.4	10.1
LnGrp LOS	E	E		E		D	E	B	F		B	B
Approach Vol, veh/h		315			311			1849			159	
Approach Delay, s/veh		66.2			55.0			45.7			10.3	
Approach LOS		E			D			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		81.0	11.0	23.7	8.7	72.3	9.3	25.3
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		77.0	7.0	24.0	9.0	64.0	10.0	21.0
Max Q Clear Time (g_c+I1), s		79.0	7.0	18.8	5.7	5.2	6.2	12.7
Green Ext Time (p_c), s		0.0	0.0	0.9	0.0	30.7	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	47.1
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	988	13	0	1098	0	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	988	13	0	1098	0	150

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1001	0	1544	501
Stage 1	-	-	-	-	995	-
Stage 2	-	-	-	-	549	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	635	-	97	492
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	518	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	635	-	97	492
Mov Cap-2 Maneuver	-	-	-	-	97	-
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	518	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	492	-	-	635	-
HCM Lane V/C Ratio	0.305	-	-	-	-
HCM Control Delay (s)	15.5	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.3	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	1000	119	566	1053	45	22	45	146	27	58	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.94	0.92		0.87	0.93		0.87
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1712	1712	1900
Adj Flow Rate, veh/h	20	1000	119	566	1053	45	22	45	146	27	58	23
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	27	1122	133	597	2331	100	87	151	178	159	157	62
Arrive On Green	0.02	0.39	0.39	0.37	0.74	0.74	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1630	2907	346	1630	3169	135	317	1074	1267	1017	1114	442
Grp Volume(v), veh/h	20	559	560	566	540	558	67	0	146	27	0	81
Grp Sat Flow(s),veh/h/ln	1630	1626	1627	1630	1626	1678	1391	0	1267	1017	0	1556
Q Serve(g_s), s	1.4	36.1	36.1	37.8	14.7	14.8	0.1	0.0	12.5	2.8	0.0	5.3
Cycle Q Clear(g_c), s	1.4	36.1	36.1	37.8	14.7	14.8	5.4	0.0	12.5	8.1	0.0	5.3
Prop In Lane	1.00		0.21	1.00		0.08	0.33		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	27	628	628	597	1196	1234	238	0	178	159	0	219
V/C Ratio(X)	0.74	0.89	0.89	0.95	0.45	0.45	0.28	0.00	0.82	0.17	0.00	0.37
Avail Cap(c_a), veh/h	87	638	639	684	1233	1273	254	0	192	170	0	236
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.9	32.2	32.2	34.5	5.9	5.9	43.1	0.0	46.8	47.4	0.0	43.6
Incr Delay (d2), s/veh	32.4	14.5	14.7	21.1	0.3	0.3	0.6	0.0	22.3	0.5	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	18.7	18.7	20.5	6.5	6.8	1.9	0.0	5.5	0.8	0.0	2.3
LnGrp Delay(d),s/veh	87.3	46.7	46.9	55.6	6.1	6.1	43.7	0.0	69.1	47.9	0.0	44.7
LnGrp LOS	F	D	D	E	A	A	D		E	D		D
Approach Vol, veh/h		1139			1664			213			108	
Approach Delay, s/veh		47.5			23.0			61.1			45.5	
Approach LOS		D			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		19.8	45.0	47.3		19.8	5.9	86.4
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		17.0	47.0	44.0		17.0	6.0	85.0
Max Q Clear Time (g_c+I1), s		14.5	39.8	38.1		10.1	3.4	16.8
Green Ext Time (p_c), s		0.4	1.3	5.1		0.9	0.0	30.5

Intersection Summary	
HCM 2010 Ctrl Delay	35.3
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	41	105	23	44	236	135	21	46	21	126	190	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	41	105	23	44	236	135	21	46	21	126	190	41
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	224	451	84	160	394	207	208	344	129	294	325	61
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	209	1119	209	87	978	514	196	990	372	407	936	174
Grp Volume(v), veh/h	169	0	0	415	0	0	88	0	0	357	0	0
Grp Sat Flow(s),veh/h/ln	1538	0	0	1579	0	0	1558	0	0	1517	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0
Cycle Q Clear(g_c), s	2.1	0.0	0.0	6.6	0.0	0.0	1.2	0.0	0.0	6.2	0.0	0.0
Prop In Lane	0.24		0.14	0.11		0.33	0.24		0.24	0.35		0.11
Lane Grp Cap(c), veh/h	759	0	0	760	0	0	680	0	0	679	0	0
V/C Ratio(X)	0.22	0.00	0.00	0.55	0.00	0.00	0.13	0.00	0.00	0.53	0.00	0.00
Avail Cap(c_a), veh/h	1982	0	0	2118	0	0	2022	0	0	2055	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.4	0.0	0.0	7.7	0.0	0.0	7.2	0.0	0.0	8.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	3.0	0.0	0.0	0.6	0.0	0.0	2.7	0.0	0.0
LnGrp Delay(d),s/veh	6.5	0.0	0.0	8.3	0.0	0.0	7.3	0.0	0.0	9.4	0.0	0.0
LnGrp LOS	A			A			A			A		
Approach Vol, veh/h		169			415			88			357	
Approach Delay, s/veh		6.5			8.3			7.3			9.4	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		15.1		16.9		15.1		16.9
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		41.0		41.0		41.0		41.0
Max Q Clear Time (g_c+I1), s		3.2		4.1		8.2		8.6
Green Ext Time (p_c), s		3.1		4.4		3.1		4.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	18	233	0	99	397	132	0	0	0	3	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	18	233	0	99	397	132	0	0	0	3	0	10

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	529	0	0	233	0	0	930	930	265
Stage 1	-	-	-	-	-	-	661	661	-
Stage 2	-	-	-	-	-	-	269	269	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	974	-	-	1283	-	-	267	254	711
Stage 1	-	-	-	-	-	-	457	441	-
Stage 2	-	-	-	-	-	-	752	667	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	974	-	-	1283	-	-	232	0	711
Mov Cap-2 Maneuver	-	-	-	-	-	-	232	0	-
Stage 1	-	-	-	-	-	-	406	0	-
Stage 2	-	-	-	-	-	-	736	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	1.5	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	974	-	-	1283	-	-	482
HCM Lane V/C Ratio	0.018	-	-	0.077	-	-	0.027
HCM Control Delay (s)	8.8	0	-	8	0.3	-	12.7
HCM Lane LOS	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-	-	0.1

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	335	414	173	0	214
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	0	335	414	173	0	214

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	587	0	-	0	669	294
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	168	-
Critical Hdwy	4.32	-	-	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	2.31	-	-	-	3.61	3.41
Pot Cap-1 Maneuver	925	-	-	-	371	676
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	818	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	925	-	-	-	371	676
Mov Cap-2 Maneuver	-	-	-	-	371	-
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	818	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	925	-	-	-	676
HCM Lane V/C Ratio	-	-	-	-	0.317
HCM Control Delay (s)	0	-	-	-	12.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	212	128	164	223	33	111	159	814	0	340	253
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	21	212	0	164	223	33	111	159	814	0	340	253
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	30	288	245	235	327	48	139	1015	908	0	846	719
Arrive On Green	0.02	0.17	0.00	0.07	0.22	0.22	0.09	0.62	0.62	0.00	0.49	0.49
Sat Flow, veh/h	1630	1712	1455	3163	1458	216	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	21	212	0	164	0	256	111	159	814	0	340	253
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1674	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	1.2	10.6	0.0	4.6	0.0	12.6	6.0	3.7	43.0	0.0	11.3	9.6
Cycle Q Clear(g_c), s	1.2	10.6	0.0	4.6	0.0	12.6	6.0	3.7	43.0	0.0	11.3	9.6
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	30	288	245	235	0	376	139	1015	908	0	846	719
V/C Ratio(X)	0.71	0.74	0.00	0.70	0.00	0.68	0.80	0.16	0.90	0.00	0.40	0.35
Avail Cap(c_a), veh/h	109	552	469	457	0	670	326	1193	1068	0	846	719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	35.5	0.0	40.6	0.0	31.9	40.4	7.1	14.4	0.0	14.4	13.9
Incr Delay (d2), s/veh	26.7	3.7	0.0	3.7	0.0	2.2	10.0	0.1	9.0	0.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.3	0.0	2.1	0.0	6.1	3.1	1.7	19.2	0.0	5.4	3.9
LnGrp Delay(d),s/veh	70.6	39.2	0.0	44.3	0.0	34.1	50.3	7.1	23.5	0.0	14.7	14.2
LnGrp LOS	E	D		D		C	D	A	C		B	B
Approach Vol, veh/h		233			420			1084			593	
Approach Delay, s/veh		42.0			38.1			23.8			14.5	
Approach LOS		D			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		60.1	10.7	19.1	11.7	48.4	5.6	24.2
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		66.0	13.0	29.0	18.0	44.0	6.0	36.0
Max Q Clear Time (g_c+I1), s		45.0	6.6	12.6	8.0	13.3	3.2	14.6
Green Ext Time (p_c), s		11.1	0.3	2.6	0.2	13.9	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	25.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1458	63	0	1281	0	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	1458	63	0	1281	0	157

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1521	0	2131	761
Stage 1	-	-	-	-	1490	-
Stage 2	-	-	-	-	641	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	393	-	38	329
Stage 1	-	-	-	-	159	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	393	-	38	329
Mov Cap-2 Maneuver	-	-	-	-	38	-
Stage 1	-	-	-	-	159	-
Stage 2	-	-	-	-	463	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	25.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	329	-	-	393	-
HCM Lane V/C Ratio	0.477	-	-	-	-
HCM Control Delay (s)	25.5	-	-	0	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	2.5	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	46	1435	134	315	1326	185	27	86	734	69	31	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.94	0.92		0.88	0.97		0.88
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1712	1712	1900
Adj Flow Rate, veh/h	46	1435	134	315	1326	185	27	86	659	69	31	28
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	57	1539	143	352	1977	273	79	209	512	129	120	108
Arrive On Green	0.03	0.51	0.51	0.22	0.69	0.69	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1630	2996	278	1630	2846	393	236	1355	1282	637	776	701
Grp Volume(v), veh/h	46	774	795	315	752	759	113	0	659	69	0	59
Grp Sat Flow(s),veh/h/ln	1630	1626	1647	1630	1626	1613	1591	0	1282	637	0	1476
Q Serve(g_s), s	2.9	45.7	47.0	19.4	27.2	28.1	0.6	0.0	16.0	9.7	0.0	3.6
Cycle Q Clear(g_c), s	2.9	45.7	47.0	19.4	27.2	28.1	6.3	0.0	16.0	16.0	0.0	3.6
Prop In Lane	1.00		0.17	1.00		0.24	0.24		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	57	836	846	352	1130	1120	289	0	512	129	0	228
V/C Ratio(X)	0.81	0.93	0.94	0.90	0.67	0.68	0.39	0.00	1.29	0.53	0.00	0.26
Avail Cap(c_a), veh/h	142	836	846	630	1303	1292	289	0	512	129	0	228
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.6	23.4	23.7	39.5	9.0	9.1	39.6	0.0	33.2	47.6	0.0	38.6
Incr Delay (d2), s/veh	22.9	16.1	18.0	8.1	1.1	1.2	0.9	0.0	143.4	4.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	24.2	25.4	9.5	12.4	12.8	3.0	0.0	34.9	2.1	0.0	1.5
LnGrp Delay(d),s/veh	72.5	39.5	41.6	47.6	10.0	10.3	40.5	0.0	176.6	51.7	0.0	39.1
LnGrp LOS	E	D	D	D	B	B	D		F	D		D
Approach Vol, veh/h		1615			1826			772			128	
Approach Delay, s/veh		41.5			16.6			156.7			45.9	
Approach LOS		D			B			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		20.0	26.4	57.2		20.0	7.6	75.9
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	40.0	52.0		16.0	9.0	83.0
Max Q Clear Time (g_c+I1), s		18.0	21.4	49.0		18.0	4.9	30.1
Green Ext Time (p_c), s		0.0	0.9	2.9		0.0	0.0	41.8

Intersection Summary	
HCM 2010 Ctrl Delay	51.6
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	38	239	28	42	141	114	44	184	67	105	239	103
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	38	239	28	42	141	114	44	184	67	105	239	103
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	149	444	48	155	269	192	169	489	159	233	408	154
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	106	1363	149	118	827	589	116	1091	355	239	911	344
Grp Volume(v), veh/h	305	0	0	297	0	0	295	0	0	447	0	0
Grp Sat Flow(s),veh/h/ln	1618	0	0	1533	0	0	1561	0	0	1494	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	0.0	5.4	0.0	0.0	4.3	0.0	0.0	7.9	0.0	0.0
Prop In Lane	0.12		0.09	0.14		0.38	0.15		0.23	0.23		0.23
Lane Grp Cap(c), veh/h	641	0	0	615	0	0	817	0	0	795	0	0
V/C Ratio(X)	0.48	0.00	0.00	0.48	0.00	0.00	0.36	0.00	0.00	0.56	0.00	0.00
Avail Cap(c_a), veh/h	1544	0	0	1467	0	0	2242	0	0	2179	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.8	0.0	0.0	9.9	0.0	0.0	6.6	0.0	0.0	7.4	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.6	0.0	0.0	0.3	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	2.5	0.0	0.0	1.9	0.0	0.0	3.5	0.0	0.0
LnGrp Delay(d),s/veh	10.4	0.0	0.0	10.5	0.0	0.0	6.8	0.0	0.0	8.1	0.0	0.0
LnGrp LOS	B			B			A			A		
Approach Vol, veh/h		305			297			295			447	
Approach Delay, s/veh		10.4			10.5			6.8			8.1	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		19.9		15.5		19.9		15.5
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		50.0		32.0		50.0		32.0
Max Q Clear Time (g_c+I1), s		6.3		7.3		9.9		7.4
Green Ext Time (p_c), s		6.1		4.1		6.0		4.1

Intersection Summary		
HCM 2010 Ctrl Delay		8.8
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	56	354	0	89	256	100	0	0	0	31	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	56	354	0	89	256	100	0	0	0	31	0	32

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	356	0	0	354	0	0	950	950	178
Stage 1	-	-	-	-	-	-	484	484	-
Stage 2	-	-	-	-	-	-	466	466	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	1137	-	-	1156	-	-	260	247	810
Stage 1	-	-	-	-	-	-	565	533	-
Stage 2	-	-	-	-	-	-	608	543	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1137	-	-	1156	-	-	220	0	810
Mov Cap-2 Maneuver	-	-	-	-	-	-	220	0	-
Stage 1	-	-	-	-	-	-	510	0	-
Stage 2	-	-	-	-	-	-	571	0	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	1.8	17.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1137	-	-	1156	-	-	349
HCM Lane V/C Ratio	0.049	-	-	0.077	-	-	0.181
HCM Control Delay (s)	8.3	0	-	8.4	0.2	-	17.6
HCM Lane LOS	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	-	-	0.2	-	-	0.6

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	474	253	222	0	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	0	474	253	222	0	193

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	475	0	-	0	601	238
Stage 1	-	-	-	-	364	-
Stage 2	-	-	-	-	237	-
Critical Hdwy	4.32	-	-	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	2.31	-	-	-	3.61	3.41
Pot Cap-1 Maneuver	1022	-	-	-	411	736
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1022	-	-	-	411	736
Mov Cap-2 Maneuver	-	-	-	-	411	-
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	754	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1022	-	-	-	736
HCM Lane V/C Ratio	-	-	-	-	0.262
HCM Control Delay (s)	0	-	-	-	11.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	302	111	140	202	22	102	764	1032	0	108	171
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	60	302	0	140	202	22	102	764	1032	0	108	171
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	75	344	292	190	326	35	125	1034	925	0	899	764
Arrive On Green	0.05	0.20	0.00	0.06	0.21	0.21	0.08	0.64	0.64	0.00	0.52	0.52
Sat Flow, veh/h	1630	1712	1455	3163	1517	165	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	60	302	0	140	0	224	102	764	1032	0	108	171
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1683	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	4.2	19.9	0.0	5.1	0.0	14.0	7.2	37.5	74.0	0.0	3.7	7.4
Cycle Q Clear(g_c), s	4.2	19.9	0.0	5.1	0.0	14.0	7.2	37.5	74.0	0.0	3.7	7.4
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	75	344	292	190	0	361	125	1034	925	0	899	764
V/C Ratio(X)	0.80	0.88	0.00	0.74	0.00	0.62	0.82	0.74	1.12	0.00	0.12	0.22
Avail Cap(c_a), veh/h	98	397	338	190	0	390	210	1034	925	0	899	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	55.0	45.1	0.0	53.8	0.0	41.4	52.9	14.5	21.2	0.0	14.0	14.9
Incr Delay (d2), s/veh	28.6	17.9	0.0	13.9	0.0	2.6	12.0	2.8	66.5	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	11.1	0.0	2.6	0.0	6.8	3.6	17.6	46.4	0.0	1.8	3.0
LnGrp Delay(d),s/veh	83.6	63.0	0.0	67.7	0.0	44.0	64.9	17.4	87.7	0.0	14.1	15.0
LnGrp LOS	F	E		E		D	E	B	F		B	B
Approach Vol, veh/h		362			364			1898			279	
Approach Delay, s/veh		66.4			53.1			58.1			14.7	
Approach LOS		E			D			E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		78.0	11.0	27.4	12.9	65.1	9.3	29.0
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		74.0	7.0	27.0	15.0	55.0	7.0	27.0
Max Q Clear Time (g_c+I1), s		76.0	7.1	21.9	9.2	9.4	6.2	16.0
Green Ext Time (p_c), s		0.0	0.0	1.4	0.1	27.8	0.0	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	54.4
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	271	10	0	466	0	121
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	271	10	0	466	0	121

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	281	0	509	141
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	233	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	1216	-	472	853
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	757	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1216	-	472	853
Mov Cap-2 Maneuver	-	-	-	-	472	-
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	757	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	853	-	-	1216	-
HCM Lane V/C Ratio	0.142	-	-	-	-
HCM Control Delay (s)	9.9	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	315	61	372	431	35	17	35	114	21	47	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1712	1712	1900
Adj Flow Rate, veh/h	16	315	61	372	431	35	17	35	114	21	47	18
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	27	773	148	470	1693	137	162	150	593	289	141	54
Arrive On Green	0.02	0.28	0.28	0.29	0.56	0.56	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1630	2725	521	1630	3048	247	327	1254	1455	1134	1180	452
Grp Volume(v), veh/h	16	186	190	372	229	237	52	0	114	21	0	65
Grp Sat Flow(s),veh/h/ln	1630	1626	1620	1630	1626	1668	1581	0	1455	1134	0	1632
Q Serve(g_s), s	0.4	3.6	3.7	8.2	2.8	2.9	0.0	0.0	2.0	0.7	0.0	1.4
Cycle Q Clear(g_c), s	0.4	3.6	3.7	8.2	2.8	2.9	1.1	0.0	2.0	1.7	0.0	1.4
Prop In Lane	1.00		0.32	1.00		0.15	0.33		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	27	461	460	470	903	927	312	0	593	289	0	195
V/C Ratio(X)	0.60	0.40	0.41	0.79	0.25	0.26	0.17	0.00	0.19	0.07	0.00	0.33
Avail Cap(c_a), veh/h	293	1171	1166	2390	3262	3346	1026	0	1280	824	0	965
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.0	11.3	11.3	12.8	4.5	4.5	15.5	0.0	7.4	16.3	0.0	15.7
Incr Delay (d2), s/veh	19.8	0.6	0.6	3.1	0.1	0.1	0.2	0.0	0.2	0.1	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.7	1.7	4.0	1.2	1.3	0.5	0.0	0.8	0.2	0.0	0.7
LnGrp Delay(d),s/veh	38.8	11.8	11.9	15.8	4.6	4.6	15.8	0.0	7.6	16.4	0.0	16.7
LnGrp LOS	D	B	B	B	A	A	B		A	B		B
Approach Vol, veh/h		392			838			166			86	
Approach Delay, s/veh		13.0			9.6			10.1			16.6	
Approach LOS		B			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.6	15.2	15.0		8.6	4.6	25.6
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		23.0	57.0	28.0		23.0	7.0	78.0
Max Q Clear Time (g_c+I1), s		4.0	10.2	5.7		3.7	2.4	4.9
Green Ext Time (p_c), s		1.0	1.2	5.3		1.0	0.0	6.2

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	32	82	18	36	184	108	16	36	16	98	70	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	32	82	18	36	184	108	16	36	16	98	70	16
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	269	436	79	214	365	195	250	265	97	409	190	33
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	175	1161	211	89	971	520	186	1013	369	606	724	127
Grp Volume(v), veh/h	132	0	0	328	0	0	68	0	0	184	0	0
Grp Sat Flow(s),veh/h/ln	1548	0	0	1580	0	0	1567	0	0	1457	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.0	3.5	0.0	0.0	0.7	0.0	0.0	2.2	0.0	0.0
Prop In Lane	0.24		0.14	0.11		0.33	0.24		0.24	0.53		0.09
Lane Grp Cap(c), veh/h	784	0	0	775	0	0	612	0	0	632	0	0
V/C Ratio(X)	0.17	0.00	0.00	0.42	0.00	0.00	0.11	0.00	0.00	0.29	0.00	0.00
Avail Cap(c_a), veh/h	3290	0	0	3488	0	0	2598	0	0	2491	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.7	0.0	0.0	5.4	0.0	0.0	6.3	0.0	0.0	6.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.6	0.0	0.0	0.3	0.0	0.0	1.0	0.0	0.0
LnGrp Delay(d),s/veh	4.8	0.0	0.0	5.8	0.0	0.0	6.4	0.0	0.0	7.0	0.0	0.0
LnGrp LOS	A			A			A			A		
Approach Vol, veh/h		132			328			68			184	
Approach Delay, s/veh		4.8			5.8			6.4			7.0	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		9.8		12.3		9.8		12.3
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		35.0		47.0		35.0		47.0
Max Q Clear Time (g_c+I1), s		2.7		3.2		4.2		5.5
Green Ext Time (p_c), s		1.6		3.3		1.6		3.3

Intersection Summary		
HCM 2010 Ctrl Delay		6.0
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	14	182	0	83	313	107	0	0	0	2	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	14	182	0	83	313	107	0	0	0	2	0	8

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	420	0	0	182	0	0	743	743	210
Stage 1	-	-	-	-	-	-	533	533	-
Stage 2	-	-	-	-	-	-	210	210	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	1074	-	-	1341	-	-	350	329	772
Stage 1	-	-	-	-	-	-	533	506	-
Stage 2	-	-	-	-	-	-	800	709	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1074	-	-	1341	-	-	316	0	772
Mov Cap-2 Maneuver	-	-	-	-	-	-	316	0	-
Stage 1	-	-	-	-	-	-	489	0	-
Stage 2	-	-	-	-	-	-	788	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	1.4	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1074	-	-	1341	-	-	599
HCM Lane V/C Ratio	0.013	-	-	0.062	-	-	0.017
HCM Control Delay (s)	8.4	0	-	7.9	0.2	-	11.1
HCM Lane LOS	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	-	-	0.2	-	-	0.1

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	267	323	165	0	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	0	267	323	165	0	180

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	488	0	-	0	540	244
Stage 1	-	-	-	-	406	-
Stage 2	-	-	-	-	134	-
Critical Hdwy	4.32	-	-	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	2.31	-	-	-	3.61	3.41
Pot Cap-1 Maneuver	1011	-	-	-	451	730
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	852	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1011	-	-	-	451	730
Mov Cap-2 Maneuver	-	-	-	-	451	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	852	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1011	-	-	-	730
HCM Lane V/C Ratio	-	-	-	-	0.247
HCM Control Delay (s)	0	-	-	-	11.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	148	103	128	180	26	93	124	576	0	265	215
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	16	148	0	128	180	26	93	124	576	0	265	215
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	26	270	230	220	310	45	118	872	780	0	659	560
Arrive On Green	0.02	0.16	0.00	0.07	0.21	0.21	0.07	0.54	0.54	0.00	0.39	0.39
Sat Flow, veh/h	1630	1712	1455	3163	1463	211	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	16	148	0	128	0	206	93	124	576	0	265	215
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1674	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	0.5	4.0	0.0	2.0	0.0	5.6	2.9	1.9	15.4	0.0	5.7	5.4
Cycle Q Clear(g_c), s	0.5	4.0	0.0	2.0	0.0	5.6	2.9	1.9	15.4	0.0	5.7	5.4
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	26	270	230	220	0	354	118	872	780	0	659	560
V/C Ratio(X)	0.62	0.55	0.00	0.58	0.00	0.58	0.79	0.14	0.74	0.00	0.40	0.38
Avail Cap(c_a), veh/h	225	910	774	810	0	1088	610	2177	1948	0	1517	1289
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	19.7	0.0	22.9	0.0	18.0	23.2	5.9	9.0	0.0	11.4	11.3
Incr Delay (d2), s/veh	21.5	1.7	0.0	2.4	0.0	1.5	11.1	0.1	1.4	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.0	0.0	0.9	0.0	2.7	1.6	0.9	6.4	0.0	2.7	2.2
LnGrp Delay(d),s/veh	46.3	21.4	0.0	25.3	0.0	19.5	34.3	6.0	10.4	0.0	11.8	11.7
LnGrp LOS	D	C		C		B	C	A	B		B	B
Approach Vol, veh/h		164			334			793			480	
Approach Delay, s/veh		23.9			21.7			12.5			11.7	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		31.2	7.5	12.0	7.7	23.6	4.8	14.7
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		68.0	13.0	27.0	19.0	45.0	7.0	33.0
Max Q Clear Time (g_c+I1), s		17.4	4.0	6.0	4.9	7.7	2.5	7.6
Green Ext Time (p_c), s		9.8	0.2	2.0	0.2	9.4	0.0	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	15.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	633	49	0	453	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	633	49	0	453	0	130

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	682	0	885	341
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	227	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	849	-	268	629
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	763	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	849	-	268	629
Mov Cap-2 Maneuver	-	-	-	-	268	-
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	763	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	629	-	-	849	-
HCM Lane V/C Ratio	0.207	-	-	-	-
HCM Control Delay (s)	12.2	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	37	658	68	132	410	27	21	67	572	15	25	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1712	1712	1900
Adj Flow Rate, veh/h	37	658	68	132	410	27	21	67	572	15	25	22
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	50	1056	109	172	1331	87	164	455	644	339	284	250
Arrive On Green	0.03	0.35	0.35	0.11	0.43	0.43	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1630	2976	307	1630	3099	203	263	1350	1455	723	841	740
Grp Volume(v), veh/h	37	359	367	132	215	222	88	0	572	15	0	47
Grp Sat Flow(s),veh/h/ln	1630	1626	1657	1630	1626	1676	1613	0	1455	723	0	1581
Q Serve(g_s), s	1.3	10.8	10.9	4.7	5.1	5.2	0.0	0.0	20.0	0.9	0.0	1.2
Cycle Q Clear(g_c), s	1.3	10.8	10.9	4.7	5.1	5.2	2.1	0.0	20.0	3.0	0.0	1.2
Prop In Lane	1.00		0.19	1.00		0.12	0.24		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	50	577	588	172	699	720	619	0	644	339	0	533
V/C Ratio(X)	0.74	0.62	0.62	0.77	0.31	0.31	0.14	0.00	0.89	0.04	0.00	0.09
Avail Cap(c_a), veh/h	192	1042	1062	1375	2221	2289	619	0	644	339	0	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.5	15.8	15.8	25.8	11.1	11.1	13.7	0.0	15.2	14.8	0.0	13.4
Incr Delay (d2), s/veh	18.8	1.1	1.1	7.0	0.2	0.2	0.1	0.0	14.2	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	5.0	5.1	2.4	2.3	2.4	1.0	0.0	11.0	0.2	0.0	0.5
LnGrp Delay(d),s/veh	47.3	16.9	16.9	32.8	11.4	11.4	13.8	0.0	29.4	14.8	0.0	13.5
LnGrp LOS	D	B	B	C	B	B	B		C	B		B
Approach Vol, veh/h		763			569			660			62	
Approach Delay, s/veh		18.4			16.3			27.3			13.8	
Approach LOS		B			B			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		24.0	10.3	25.0		24.0	5.8	29.5
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		20.0	50.0	38.0		20.0	7.0	81.0
Max Q Clear Time (g_c+I1), s		22.0	6.7	12.9		5.0	3.3	7.2
Green Ext Time (p_c), s		0.0	0.4	8.2		2.9	0.0	9.7

Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	30	186	22	33	111	93	34	144	52	82	186	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	30	186	22	33	111	93	34	144	52	82	186	80
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	183	417	46	187	251	184	197	440	141	255	375	139
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	105	1369	150	113	822	604	109	1109	356	225	946	350
Grp Volume(v), veh/h	238	0	0	237	0	0	230	0	0	348	0	0
Grp Sat Flow(s),veh/h/ln	1624	0	0	1538	0	0	1575	0	0	1521	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Cycle Q Clear(g_c), s	3.1	0.0	0.0	3.2	0.0	0.0	2.6	0.0	0.0	4.5	0.0	0.0
Prop In Lane	0.13		0.09	0.14		0.39	0.15		0.23	0.24		0.23
Lane Grp Cap(c), veh/h	646	0	0	622	0	0	779	0	0	769	0	0
V/C Ratio(X)	0.37	0.00	0.00	0.38	0.00	0.00	0.30	0.00	0.00	0.45	0.00	0.00
Avail Cap(c_a), veh/h	2098	0	0	1997	0	0	2925	0	0	2849	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.5	0.0	0.0	7.6	0.0	0.0	5.7	0.0	0.0	6.2	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	1.4	0.0	0.0	1.2	0.0	0.0	2.0	0.0	0.0
LnGrp Delay(d),s/veh	7.9	0.0	0.0	8.0	0.0	0.0	5.9	0.0	0.0	6.6	0.0	0.0
LnGrp LOS	A			A			A			A		
Approach Vol, veh/h		238			237			230			348	
Approach Delay, s/veh		7.9			8.0			5.9			6.6	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		14.6		12.2		14.6		12.2
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		49.0		33.0		49.0		33.0
Max Q Clear Time (g_c+I1), s		4.6		5.1		6.5		5.2
Green Ext Time (p_c), s		4.3		3.2		4.3		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.1
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	44	276	0	79	205	86	0	0	0	24	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	44	276	0	79	205	86	0	0	0	24	0	25

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	291	0	0	276	0	0	770	770	146
Stage 1	-	-	-	-	-	-	406	406	-
Stage 2	-	-	-	-	-	-	364	364	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	1205	-	-	1237	-	-	337	317	850
Stage 1	-	-	-	-	-	-	620	578	-
Stage 2	-	-	-	-	-	-	679	604	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1205	-	-	1237	-	-	298	0	850
Mov Cap-2 Maneuver	-	-	-	-	-	-	298	0	-
Stage 1	-	-	-	-	-	-	572	0	-
Stage 2	-	-	-	-	-	-	650	0	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	1.8	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1205	-	-	1237	-	-	446
HCM Lane V/C Ratio	0.037	-	-	0.064	-	-	0.11
HCM Control Delay (s)	8.1	0	-	8.1	0.2	-	14.1
HCM Lane LOS	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-	-	0.4

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	379	197	187	0	173
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	0	379	197	187	0	173

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	384	0	-	0	481	192
Stage 1	-	-	-	-	291	-
Stage 2	-	-	-	-	190	-
Critical Hdwy	4.32	-	-	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	2.31	-	-	-	3.61	3.41
Pot Cap-1 Maneuver	1109	-	-	-	492	790
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	797	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1109	-	-	-	492	790
Mov Cap-2 Maneuver	-	-	-	-	492	-
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	797	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1109	-	-	-	790
HCM Lane V/C Ratio	-	-	-	-	0.219
HCM Control Delay (s)	0	-	-	-	10.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	47	240	92	109	161	17	82	596	805	0	84	141
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	47	240	0	109	161	17	82	596	805	0	84	141
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	58	307	261	168	300	32	103	1032	924	0	903	768
Arrive On Green	0.04	0.18	0.00	0.05	0.20	0.20	0.06	0.63	0.63	0.00	0.53	0.53
Sat Flow, veh/h	1630	1712	1455	3163	1523	161	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	47	240	0	109	0	178	82	596	805	0	84	141
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1683	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	2.6	12.1	0.0	3.1	0.0	8.6	4.5	19.1	41.0	0.0	2.2	4.6
Cycle Q Clear(g_c), s	2.6	12.1	0.0	3.1	0.0	8.6	4.5	19.1	41.0	0.0	2.2	4.6
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	58	307	261	168	0	332	103	1032	924	0	903	768
V/C Ratio(X)	0.82	0.78	0.00	0.65	0.00	0.54	0.80	0.58	0.87	0.00	0.09	0.18
Avail Cap(c_a), veh/h	162	548	466	279	0	520	216	1275	1140	0	1039	883
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	43.4	35.5	0.0	42.1	0.0	32.6	41.8	9.5	13.5	0.0	10.6	11.2
Incr Delay (d2), s/veh	23.3	4.3	0.0	4.2	0.0	1.3	12.9	0.5	6.4	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	6.1	0.0	1.4	0.0	4.1	2.4	8.6	17.7	0.0	1.0	1.9
LnGrp Delay(d),s/veh	66.7	39.8	0.0	46.3	0.0	34.0	54.7	10.0	19.9	0.0	10.7	11.3
LnGrp LOS	E	D		D		C	D	B	B		B	B
Approach Vol, veh/h		287			287			1483			225	
Approach Delay, s/veh		44.2			38.6			17.9			11.1	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		61.5	8.8	20.3	9.7	51.8	7.2	21.9
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		71.0	8.0	29.0	12.0	55.0	9.0	28.0
Max Q Clear Time (g_c+I1), s		43.0	5.1	14.1	6.5	6.6	4.6	10.6
Green Ext Time (p_c), s		14.6	0.1	2.1	0.1	18.4	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	23.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	987	13	0	1098	0	139
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	987	13	0	1098	0	139

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1000	0	1543	500
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	549	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	636	-	97	493
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	518	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	636	-	97	493
Mov Cap-2 Maneuver	-	-	-	-	97	-
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	518	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	493	-	-	636	-
HCM Lane V/C Ratio	0.282	-	-	-	-
HCM Control Delay (s)	15.1	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.1	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	990	118	564	1053	45	22	45	146	27	58	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.94	0.92		0.87	0.93		0.87
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1712	1712	1900
Adj Flow Rate, veh/h	19	990	118	564	1053	45	22	45	146	27	58	23
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	26	1134	135	595	2343	100	85	146	702	154	151	60
Arrive On Green	0.02	0.39	0.39	0.37	0.74	0.74	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1630	2907	346	1630	3169	135	310	1078	1261	1015	1113	441
Grp Volume(v), veh/h	19	554	554	564	540	558	67	0	146	27	0	81
Grp Sat Flow(s),veh/h/ln	1630	1626	1627	1630	1626	1678	1388	0	1261	1015	0	1554
Q Serve(g_s), s	1.3	34.7	34.7	37.0	14.3	14.3	0.1	0.0	7.2	2.7	0.0	5.2
Cycle Q Clear(g_c), s	1.3	34.7	34.7	37.0	14.3	14.3	5.3	0.0	7.2	8.0	0.0	5.2
Prop In Lane	1.00		0.21	1.00		0.08	0.33		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	26	634	635	595	1202	1240	232	0	702	154	0	211
V/C Ratio(X)	0.73	0.87	0.87	0.95	0.45	0.45	0.29	0.00	0.21	0.17	0.00	0.38
Avail Cap(c_a), veh/h	74	650	650	681	1255	1295	272	0	737	182	0	254
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.9	31.1	31.1	33.9	5.6	5.6	42.8	0.0	15.5	47.1	0.0	43.4
Incr Delay (d2), s/veh	31.7	12.3	12.4	21.0	0.3	0.3	0.7	0.0	0.1	0.5	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	17.7	17.7	20.1	6.4	6.6	1.9	0.0	2.5	0.8	0.0	2.3
LnGrp Delay(d),s/veh	85.6	43.4	43.5	55.0	5.9	5.9	43.5	0.0	15.7	47.6	0.0	44.5
LnGrp LOS	F	D	D	D	A	A	D		B	D		D
Approach Vol, veh/h		1127			1662			213			108	
Approach Delay, s/veh		44.1			22.5			24.4			45.3	
Approach LOS		D			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.9	44.2	47.0		18.9	5.8	85.4
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		18.0	46.0	44.0		18.0	5.0	85.0
Max Q Clear Time (g_c+I1), s		9.2	39.0	36.7		10.0	3.3	16.3
Green Ext Time (p_c), s		1.0	1.2	6.2		1.0	0.0	30.3

Intersection Summary	
HCM 2010 Ctrl Delay	31.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	41	105	23	44	234	130	21	46	21	126	190	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	41	105	23	44	234	130	21	46	21	126	190	41
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	224	447	83	162	394	201	209	345	129	296	326	61
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	207	1122	209	89	987	503	195	990	371	406	937	174
Grp Volume(v), veh/h	169	0	0	408	0	0	88	0	0	357	0	0
Grp Sat Flow(s),veh/h/ln	1538	0	0	1580	0	0	1557	0	0	1518	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0
Cycle Q Clear(g_c), s	2.1	0.0	0.0	6.4	0.0	0.0	1.2	0.0	0.0	6.2	0.0	0.0
Prop In Lane	0.24		0.14	0.11		0.32	0.24		0.24	0.35		0.11
Lane Grp Cap(c), veh/h	755	0	0	756	0	0	683	0	0	683	0	0
V/C Ratio(X)	0.22	0.00	0.00	0.54	0.00	0.00	0.13	0.00	0.00	0.52	0.00	0.00
Avail Cap(c_a), veh/h	2006	0	0	2142	0	0	2044	0	0	2079	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.4	0.0	0.0	7.6	0.0	0.0	7.1	0.0	0.0	8.6	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	3.0	0.0	0.0	0.5	0.0	0.0	2.7	0.0	0.0
LnGrp Delay(d),s/veh	6.5	0.0	0.0	8.2	0.0	0.0	7.2	0.0	0.0	9.3	0.0	0.0
LnGrp LOS	A			A			A			A		
Approach Vol, veh/h		169			408			88			357	
Approach Delay, s/veh		6.5			8.2			7.2			9.3	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		15.0		16.6		15.0		16.6
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		41.0		41.0		41.0		41.0
Max Q Clear Time (g_c+I1), s		3.2		4.1		8.2		8.4
Green Ext Time (p_c), s		3.1		4.3		3.1		4.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	18	233	0	83	390	121	0	0	0	3	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	18	233	0	83	390	121	0	0	0	3	0	10

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	511	0	0	233	0	0	886	886	256
Stage 1	-	-	-	-	-	-	617	617	-
Stage 2	-	-	-	-	-	-	269	269	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	990	-	-	1283	-	-	285	270	720
Stage 1	-	-	-	-	-	-	482	463	-
Stage 2	-	-	-	-	-	-	752	667	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	990	-	-	1283	-	-	253	0	720
Mov Cap-2 Maneuver	-	-	-	-	-	-	253	0	-
Stage 1	-	-	-	-	-	-	438	0	-
Stage 2	-	-	-	-	-	-	736	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	1.3	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	990	-	-	1283	-	-	505
HCM Lane V/C Ratio	0.018	-	-	0.065	-	-	0.026
HCM Control Delay (s)	8.7	0	-	8	0.3	-	12.3
HCM Lane LOS	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-	-	0.1

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	319	414	165	0	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	0	319	414	165	0	180

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	579	0	-	0	657	290
Stage 1	-	-	-	-	497	-
Stage 2	-	-	-	-	160	-
Critical Hdwy	4.32	-	-	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	2.31	-	-	-	3.61	3.41
Pot Cap-1 Maneuver	931	-	-	-	378	680
Stage 1	-	-	-	-	552	-
Stage 2	-	-	-	-	826	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	931	-	-	-	378	680
Mov Cap-2 Maneuver	-	-	-	-	378	-
Stage 1	-	-	-	-	552	-
Stage 2	-	-	-	-	826	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	931	-	-	-	680
HCM Lane V/C Ratio	-	-	-	-	0.265
HCM Control Delay (s)	0	-	-	-	12.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	203	121	164	220	33	109	159	814	0	340	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	21	203	0	164	220	33	109	159	814	0	340	250
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	30	277	235	236	317	48	137	1024	916	0	857	729
Arrive On Green	0.02	0.16	0.00	0.07	0.22	0.22	0.08	0.63	0.63	0.00	0.50	0.50
Sat Flow, veh/h	1630	1712	1455	3163	1455	218	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	21	203	0	164	0	253	109	159	814	0	340	250
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1673	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	1.1	10.1	0.0	4.5	0.0	12.5	5.9	3.6	42.1	0.0	11.1	9.3
Cycle Q Clear(g_c), s	1.1	10.1	0.0	4.5	0.0	12.5	5.9	3.6	42.1	0.0	11.1	9.3
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	30	277	235	236	0	365	137	1024	916	0	857	729
V/C Ratio(X)	0.71	0.73	0.00	0.70	0.00	0.69	0.80	0.16	0.89	0.00	0.40	0.34
Avail Cap(c_a), veh/h	109	517	439	460	0	636	328	1236	1106	0	880	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	35.7	0.0	40.4	0.0	32.2	40.2	6.8	13.9	0.0	13.9	13.5
Incr Delay (d2), s/veh	26.5	3.7	0.0	3.7	0.0	2.4	10.1	0.1	7.9	0.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.0	0.0	2.1	0.0	6.0	3.0	1.6	18.8	0.0	5.3	3.8
LnGrp Delay(d),s/veh	70.2	39.4	0.0	44.1	0.0	34.6	50.3	6.9	21.9	0.0	14.2	13.7
LnGrp LOS	E	D		D		C	D	A	C		B	B
Approach Vol, veh/h		224			417			1082			590	
Approach Delay, s/veh		42.3			38.3			22.5			14.0	
Approach LOS		D			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		60.3	10.7	18.5	11.5	48.8	5.6	23.5
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		68.0	13.0	27.0	18.0	46.0	6.0	34.0
Max Q Clear Time (g_c+I1), s		44.1	6.5	12.1	7.9	13.1	3.1	14.5
Green Ext Time (p_c), s		12.2	0.3	2.4	0.2	14.3	0.0	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	25.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1450	63	0	1281	0	151
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	1450	63	0	1281	0	151

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1513	0	2123	757
Stage 1	-	-	-	-	1482	-
Stage 2	-	-	-	-	641	-
Critical Hdwy	-	-	4.32	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	-	-	2.31	-	3.61	3.41
Pot Cap-1 Maneuver	-	-	396	-	38	331
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	396	-	38	331
Mov Cap-2 Maneuver	-	-	-	-	38	-
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	463	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	24.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	331	-	-	396	-
HCM Lane V/C Ratio	0.456	-	-	-	-
HCM Control Delay (s)	24.7	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.3	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	1430	126	305	1326	185	27	86	734	69	30	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.94	0.93		0.89	0.97		0.89
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1900	1712	1712	1900	1900	1712	1712	1712	1712	1900
Adj Flow Rate, veh/h	45	1430	126	305	1326	185	27	86	659	69	30	28
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	56	1536	134	342	1950	269	83	222	517	137	126	117
Arrive On Green	0.03	0.51	0.51	0.21	0.69	0.69	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1630	3013	264	1630	2846	393	242	1349	1291	638	765	714
Grp Volume(v), veh/h	45	767	789	305	752	759	113	0	659	69	0	58
Grp Sat Flow(s),veh/h/ln	1630	1626	1651	1630	1626	1612	1591	0	1291	638	0	1479
Q Serve(g_s), s	2.8	45.3	46.4	18.8	28.0	28.9	0.4	0.0	17.0	10.8	0.0	3.5
Cycle Q Clear(g_c), s	2.8	45.3	46.4	18.8	28.0	28.9	6.2	0.0	17.0	17.0	0.0	3.5
Prop In Lane	1.00		0.16	1.00		0.24	0.24		1.00	1.00		0.48
Lane Grp Cap(c), veh/h	56	829	841	342	1115	1105	305	0	517	137	0	243
V/C Ratio(X)	0.81	0.93	0.94	0.89	0.67	0.69	0.37	0.00	1.27	0.51	0.00	0.24
Avail Cap(c_a), veh/h	142	829	841	631	1290	1279	305	0	517	137	0	243
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.6	23.5	23.8	39.7	9.5	9.7	38.6	0.0	32.9	46.4	0.0	37.6
Incr Delay (d2), s/veh	23.5	16.1	17.7	8.1	1.2	1.3	0.8	0.0	137.7	3.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	23.9	25.2	9.2	12.7	13.0	3.0	0.0	34.6	2.1	0.0	1.5
LnGrp Delay(d),s/veh	73.1	39.6	41.5	47.8	10.7	10.9	39.4	0.0	170.6	49.4	0.0	38.1
LnGrp LOS	E	D	D	D	B	B	D		F	D		D
Approach Vol, veh/h		1601			1816			772			127	
Approach Delay, s/veh		41.5			17.0			151.4			44.2	
Approach LOS		D			B			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		21.0	25.7	56.7		21.0	7.5	74.9
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		17.0	40.0	51.0		17.0	9.0	82.0
Max Q Clear Time (g_c+I1), s		19.0	20.8	48.4		19.0	4.8	30.9
Green Ext Time (p_c), s		0.0	0.9	2.5		0.0	0.0	39.9

Intersection Summary	
HCM 2010 Ctrl Delay	50.9
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	38	239	28	40	140	111	44	184	67	105	239	103
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1712	1900	1900	1712	1900	1900	1712	1900	1900	1712	1900
Adj Flow Rate, veh/h	38	239	28	40	140	111	44	184	67	105	239	103
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	150	439	48	153	270	189	170	490	159	234	410	155
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	106	1363	148	113	837	586	116	1090	354	238	911	344
Grp Volume(v), veh/h	305	0	0	291	0	0	295	0	0	447	0	0
Grp Sat Flow(s),veh/h/ln	1617	0	0	1536	0	0	1561	0	0	1494	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	0.0	5.2	0.0	0.0	4.2	0.0	0.0	7.8	0.0	0.0
Prop In Lane	0.12		0.09	0.14		0.38	0.15		0.23	0.23		0.23
Lane Grp Cap(c), veh/h	637	0	0	612	0	0	820	0	0	799	0	0
V/C Ratio(X)	0.48	0.00	0.00	0.48	0.00	0.00	0.36	0.00	0.00	0.56	0.00	0.00
Avail Cap(c_a), veh/h	1558	0	0	1483	0	0	2262	0	0	2198	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.8	0.0	0.0	9.8	0.0	0.0	6.5	0.0	0.0	7.3	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.6	0.0	0.0	0.3	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	2.4	0.0	0.0	1.9	0.0	0.0	3.4	0.0	0.0
LnGrp Delay(d),s/veh	10.4	0.0	0.0	10.4	0.0	0.0	6.7	0.0	0.0	8.0	0.0	0.0
LnGrp LOS	B			B			A			A		
Approach Vol, veh/h		305			291			295			447	
Approach Delay, s/veh		10.4			10.4			6.7			8.0	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		19.8		15.3		19.8		15.3
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		50.0		32.0		50.0		32.0
Max Q Clear Time (g_c+I1), s		6.2		7.3		9.8		7.2
Green Ext Time (p_c), s		6.1		4.1		6.0		4.1

Intersection Summary	
HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	56	354	0	79	252	94	0	0	0	31	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	56	354	0	79	252	94	0	0	0	31	0	32

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	346	0	0	354	0	0	923	923	173
Stage 1	-	-	-	-	-	-	457	457	-
Stage 2	-	-	-	-	-	-	466	466	-
Critical Hdwy	4.32	-	-	4.21	-	-	6.765	6.665	7.065
Critical Hdwy Stg 1	-	-	-	-	-	-	5.965	5.665	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.565	5.665	-
Follow-up Hdwy	2.31	-	-	2.299	-	-	3.6045	4.1045	3.4045
Pot Cap-1 Maneuver	1147	-	-	1156	-	-	270	257	816
Stage 1	-	-	-	-	-	-	584	548	-
Stage 2	-	-	-	-	-	-	608	543	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1147	-	-	1156	-	-	232	0	816
Mov Cap-2 Maneuver	-	-	-	-	-	-	232	0	-
Stage 1	-	-	-	-	-	-	534	0	-
Stage 2	-	-	-	-	-	-	571	0	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	1.7	16.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1147	-	-	1156	-	-	365
HCM Lane V/C Ratio	0.049	-	-	0.068	-	-	0.173
HCM Control Delay (s)	8.3	0	-	8.3	0.2	-	16.9
HCM Lane LOS	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	-	-	0.2	-	-	0.6

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	464	253	187	0	173
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	11	11	11	11	11	11
Mvmt Flow	0	464	253	187	0	173

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	440	0	-	0	579	220
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	232	-
Critical Hdwy	4.32	-	-	-	7.02	7.12
Critical Hdwy Stg 1	-	-	-	-	6.02	-
Critical Hdwy Stg 2	-	-	-	-	6.02	-
Follow-up Hdwy	2.31	-	-	-	3.61	3.41
Pot Cap-1 Maneuver	1055	-	-	-	425	757
Stage 1	-	-	-	-	661	-
Stage 2	-	-	-	-	758	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1055	-	-	-	425	757
Mov Cap-2 Maneuver	-	-	-	-	425	-
Stage 1	-	-	-	-	661	-
Stage 2	-	-	-	-	758	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1055	-	-	-	757
HCM Lane V/C Ratio	-	-	-	-	0.229
HCM Control Delay (s)	0	-	-	-	11.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	296	107	140	194	22	94	764	1032	0	108	152
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1712	1712	1712	1712	1712	1900	1712	1712	1900	0	1712	1712
Adj Flow Rate, veh/h	60	296	0	140	194	22	94	764	1032	0	108	152
Adj No. of Lanes	1	1	1	2	1	0	1	2	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	0	11	11
Cap, veh/h	75	335	285	189	317	36	116	1043	934	0	918	780
Arrive On Green	0.05	0.20	0.00	0.06	0.21	0.21	0.07	0.64	0.64	0.00	0.54	0.54
Sat Flow, veh/h	1630	1712	1455	3163	1510	171	1630	1626	1455	0	1712	1455
Grp Volume(v), veh/h	60	296	0	140	0	216	94	764	1032	0	108	152
Grp Sat Flow(s),veh/h/ln	1630	1712	1455	1581	0	1681	1630	1626	1455	0	1712	1455
Q Serve(g_s), s	4.3	19.7	0.0	5.1	0.0	13.6	6.6	37.1	75.0	0.0	3.6	6.3
Cycle Q Clear(g_c), s	4.3	19.7	0.0	5.1	0.0	13.6	6.6	37.1	75.0	0.0	3.6	6.3
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	75	335	285	189	0	353	116	1043	934	0	918	780
V/C Ratio(X)	0.80	0.88	0.00	0.74	0.00	0.61	0.81	0.73	1.11	0.00	0.12	0.19
Avail Cap(c_a), veh/h	98	381	324	189	0	374	195	1043	934	0	918	780
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	55.2	45.7	0.0	54.0	0.0	41.9	53.5	14.2	20.9	0.0	13.4	14.0
Incr Delay (d2), s/veh	28.9	19.3	0.0	14.2	0.0	2.7	12.5	2.7	62.7	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	11.1	0.0	2.6	0.0	6.6	3.4	17.3	46.1	0.0	1.7	2.6
LnGrp Delay(d),s/veh	84.1	65.0	0.0	68.2	0.0	44.6	66.0	16.8	83.7	0.0	13.5	14.2
LnGrp LOS	F	E		E		D	E	B	F		B	B
Approach Vol, veh/h		356			356			1890			260	
Approach Delay, s/veh		68.3			53.9			55.8			13.9	
Approach LOS		E			D			E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		79.0	11.0	26.9	12.3	66.7	9.4	28.5
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		75.0	7.0	26.0	14.0	57.0	7.0	26.0
Max Q Clear Time (g_c+I1), s		77.0	7.1	21.7	8.6	8.3	6.3	15.6
Green Ext Time (p_c), s		0.0	0.0	1.2	0.1	28.7	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	53.3
HCM 2010 LOS	D

APPENDIX C - ACOUSTIC REVIEW

date:	14 July 2015	
name:	company:	email:
	West Oakland Development	
Jabari J. Herbert	**Group**	jabarijherbert@yahoo.com
cc: Mike O'Hara	**Tim Lewis Communities**	mohara@timlewis.com
cc: Thomas Casey		tbcasey1951@yahoo.com
cc: Philip N. Sanders	**Charles M. Salter Associates**	philip.sanders@cmsalter.com
from:	Joshua M. Roper, PE, LEED® AP	
subject:	**500 Kirkham Street Mixed Use Development – Oakland, California**	
	Acoustic Review of Planned Project	
	CSA project Number:	15-0431

This memo summarizes our acoustic review of the 11-story and 17-story development options for the 500 Kirkham Street site in Oakland, California. The site is part of a larger area included in the West Oakland Specific Plan (WOSP), effective 15 July 2014. It is located approximately 50 feet from an elevated portion of BART racks, one block east of the West Oakland BART station, and less than 1/10th mile from highway Interstate 880 (I-880). Either project will consist of a mixture of commercial space and parking on the first three floors, with residences above. The residences on floors four through six may be mixed-use. This review compares the proposed projects with the noise and ground-borne vibration environment identified in the Noise Section of the WOSP.

Environmental Noise – The site is located adjacent to environmental noise sources including BART trains, vehicles on I-880, and local traffic. The WOSP shows the site within the CNEL 85 dB noise contour (Figure 4.7-2), and identifies noise levels that correspond with the following noise levels from these sources:
BART – CNEL 76 to 72 dB, with hourly average Leq 71 dB
I-880 – CNEL 69 to 72 dB, with hourly average Leq 68 dB
7th Street – CNEL 68 to 72 dB, with hourly average Leq 68 dB

The project will need to incorporate noise reduction in the building design, expected to include sound-rated exterior windows, doors, and walls, with acoustic treatments at openings and vents, and with mechanical ventilation systems. We recommend a site specific noise study to quantify and document specific noise levels at the site, identify how noise levels vary at the various building facades, and propose specific mitigation measures. Applicable criteria include CNEL 45 dB inside residences, hourly average Leq 50 dB or less inside non-residential spaces.

Ground-Borne Vibration – The WOSP outlines rail vibration criteria as published by the Federal Transit Administration (FTA). In summary, the project will locate the building approximately 56 feet from active BART tracks, which is within the 150-foot screening distance identified by the FTA for rail vibration. Therefore, we recommend a site-specific vibration assessment for this project. The assessment should

include on-site measurements of rail vibration at-grade, from a sample of at least ten trains, and comparison of measured level with the FTA criteria.
Project Generated Noise – Section 17.120.050 of the Oakland Planning Code limits operational noise from stationary sources. The project is expected to include garage exhaust fans and rooftop mechanical equipment. In addition, specific commercial tenants may generate noise that extends beyond the building shell (i.e., amplified music). This will need to be addressed during the design phase, and may include equipment selection, location, localized noise barriers, sound absorbing materials, and/or enclosures.

Project Generated Traffic – A traffic memorandum prepared by Abrams Associates Traffic Engineering, Inc., dated 8 July 2015, provides existing, project generated, and cumulative traffic volumes for six intersections in the project vicinity. The memorandum indicates the project will generate approximately 386 AM peak hour trips and 404 PM peak hour trips. Based on the intersection volumes, the project will increase existing vehicle noise along the local roadways by 3 dB or less (CNEL) during the AM and PM peak hours. This is considered a less than significant increase.

Project Generated Vibration – Section 17.120.060 of the Oakland Planning Code regulates vibration as follows: "All activities shall be so operated as not to create a vibration which is perceptible without instruments by the average person at or beyond any lot line of the lot containing such activities." The project is not expected to include significant generators of ground-borne vibration.

Construction Noise and Vibration – The WOSP addresses construction noise and vibration, and includes a series of measures to be implemented so that noise and vibration from construction of the various projects will not generate significant impacts (on adjacent land uses). Projects in the WOSP area will be required to prepare and submit site specific construction noise and vibration control plans. Construction details, including schedule and equipment/process lists, are not available at this time. This report will need to be prepared and submitted prior to construction.
Please call with any questions.

APPENDIX D - STANDARD CONDITIONS OF APPROVAL & MITIGATION MEASURES

Environmental Protection Measures

GENERAL

Regulatory Permits and Authorizations from Other Agencies

Requirement: The project applicant shall obtain all necessary regulatory permits and authorizations from applicable resource/regulatory agencies including, but not limited to, the Regional Water Quality Control Board, Bay Area Air Quality Management District, Bay Conservation and Development Commission, California Department of Fish and Wildlife, U. S. Fish and Wildlife Service, and Army Corps of Engineers and shall comply with all requirements and conditions of the permits/authorizations. The project applicant shall submit evidence of the approved permits/authorizations to the City, along with evidence demonstrating compliance with any regulatory permit/authorization conditions of approval.
When Required: Prior to activity requiring permit/authorization from regulatory agency
Initial Approval: Approval by applicable regulatory agency with jurisdiction; evidence of approval submitted to Bureau of Planning
Monitoring/Inspection: Applicable regulatory agency with jurisdiction

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
GENERAL ADMINISTRATIVE CONDITIONS		
SCA 3-Compliance with Other Requirements The project applicant shall comply with all other applicable federal, state, regional, and local laws/codes, requirements, regulations, and guidelines, including but not limited to those imposed by the City's Bureau of Building, Fire Marshal, and Public Works Department. Compliance with other applicable requirements may require changes to the approved use and/or plans. These changes shall be processed in accordance with the procedures contained in Condition #4 (Minor and Major Changes).		

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	**Responsibility**
[The following condition applies to all major development projects, specifically those involving any of the following: **a. Construction of 50 or more residential dwelling units;** **b. Construction of 50,000 sq. ft. or more of nonresidential floor area; or** **c. CEQA review (e.g., negative declaration, mitigated negative declaration, or EIR).]** **SCA 13-Construction Management Plan** Prior to the issuance of the first construction-related permit, the project applicant and his/her general contractor shall submit a Construction Management Plan (CMP) for review and approval by the Bureau of Planning, Bureau of Building, and other relevant City departments such as the Fire Department and the Public Works Department as directed. The CMP shall contain measures to minimize potential construction impacts including measures to comply with all construction related Conditions of Approval (and mitigation measures if applicable) such as dust control, construction emissions, hazardous materials, construction days/hours, construction traffic control, waste reduction and recycling, stormwater pollution prevention, noise control, complaint management, and cultural resource management (see applicable Conditions below). The CMP shall provide project-specific information including descriptive procedures, approval documentation, and drawings (such as a site logistics plan, fire safety plan, construction phasing plan, proposed truck routes, traffic control plan, complaint management plan, construction worker parking plan, and litter/debris clean-up plan) that specify how potential construction impacts will be minimized and how each construction-related requirement will be satisfied throughout construction of the project.		
AESTHETICS, SHADOW AND WIND		
SCA 17-Landscape Plan a. ***Landscape Plan Required*** **Requirement:** The project applicant shall submit a final Landscape Plan for City review and approval that is consistent with the approved Landscape Plan. The Landscape Plan shall be included with the set of drawings submitted for the construction-related permit and shall comply with the landscape requirements of chapter 17.124 of the Planning Code.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Bureau of Planning **Monitoring/ Inspection:** N/A
b. ***Landscape Installation*** **Requirement:** The project applicant shall implement the approved Landscape Plan unless a bond, cash deposit, letter of credit, or other equivalent instrument acceptable to the Director of City Planning, is provided. The financial instrument shall equal the greater of $2,500 or the estimated cost of implementing the Landscape Plan based on a licensed contractor's bid.	**When Required:** Prior to building permit final	**Initial Approval:** Bureau of Planning **Monitoring/ Inspection:** Bureau of Building
c. ***Landscape Maintenance*** **Requirement:** All required planting shall be permanently maintained in good growing condition and, whenever necessary, replaced with new plant materials to ensure continued compliance with applicable landscaping	**When Required:** Ongoing	**Initial Approval:** N/A **Monitoring/**

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
requirements. The property owner shall be responsible for maintaining planting in adjacent public rights-of-way. All required fences, walls, and irrigation systems shall be permanently maintained in good condition and, whenever necessary, repaired or replaced.		**Inspection:** Bureau of Building
SCA 18-Lighting **Requirement:** Proposed new exterior lighting fixtures shall be adequately shielded to a point below the light bulb and reflector to prevent unnecessary glare onto adjacent properties.	**When Required:** Prior to building permit final	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building
AIR QUALITY		
Mitigation Measure AIR-9: Risk Reduction Plan. Applicants for projects that would include backup generators or other stationary sources of toxic air contaminants shall prepare and submit to the City, a Risk Reduction Plan for City review and approval. The applicant shall implement the approved plan. This Plan shall reduce cumulative localized cancer risks to the maximum feasible extent. The Risk Reduction Plan may contain, but is not limited to the following strategies: a. Demonstration using screening analysis or a health risk assessment that all project sources of toxic air contaminants, when combined with local cancer risks from cumulative sources with 1,000 feet would be less than 100 in one million. b. Installation of non-diesel fueled generators. c. Installation of diesel generators with an EPA-certified Tier 4 engine or Engines that are retrofitted with an ARB Level 3 Verified Diesel Emissions Control Strategy.	**When Required:** Prior to building permit	**Initial Approval:** Prior to building permit **Monitoring/ Inspection:** Bureau of Building
Mitigation Measure Air-9B: Place loading docks as far from residences as feasible.	**When Required:** Prior to building permit	**Initial Approval:** Prior to building permit **Monitoring/ Inspection:** Bureau of Building
Mitigation Measure Air-10: In addition to the City's Standard Conditions of Approval (Supplemental SCA B and C), require future discretionary development projects that would place new sensitive receptors in areas subject to cancer risks and exposure to diesel PM concentrations that exceed applicable thresholds to incorporate the following additional (i.e., in addition to the SCAs) best management practices (BMPs) for air quality: a. Air filtration units shall be installed to achieve BAAQMD effectiveness performance standards in removing PM2.5 from indoor air. The system effectiveness requirement shall be determined during final design when the exact level of exposure is known, based on proximity to emission sources. According to recent BAAQMD recommendations, air filtration systems rated MERV 16 or higher protect sensitive receptors from toxic air containments and PM2.5 concentrations while inside a building. This measure is effective for reducing exposure from TACs and PM2.5 emissions from diesel engines, highways and roadways.	**When Required:** Prior to building permit	**Initial Approval:** Prior to building permit **Monitoring/ Inspection:** Bureau of Building

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
b. When locating sensitive receptors near at-grade highways, to the extent feasible, encourage uses that serve sensitive receptors to locate on the upper floors of buildings. PM2.5 concentrations generally decrease with elevation. c. Where appropriate, install passive electrostatic filtering systems, especially those with low air velocities (i.e., 1 mph).		
SCA 19-Construction-Related Air Pollution Controls (Dust and Equipment Emissions) **Requirement:** The project applicant shall implement all of the following applicable air pollution control measures during construction of the project:	**When Required:** During construction	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Planning
[BASIC CONTROLS (apply to ALL construction sites)] a. Water all exposed surfaces of active construction areas at least twice daily. Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water should be used whenever feasible. b. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer). c. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. d. Pave all roadways, driveways, sidewalks, etc. within one month of site grading or as soon as feasible. In addition, building pads should be laid within one month of grading or as soon as feasible unless seeding or soil binders are used. e. Enclose, cover, water twice daily, or apply (non-toxic) soil stabilizers to exposed stockpiles (dirt, sand, etc.). f. Limit vehicle speeds on unpaved roads to 15 miles per hour. g. Idling times on all diesel-fueled commercial vehicles over 10,000 lbs. shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485, of the California Code of Regulations). Clear signage to this effect shall be provided for construction workers at all access points. h. Idling times on all diesel-fueled off-road vehicles over 25 horsepower shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes and fleet operators must develop a written policy as required by Title 23, Section 2449, of the California Code of Regulations ("California Air Resources Board Off-Road Diesel Regulations"). i. All construction equipment shall be maintained and properly tuned in accordance with the manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. j. Portable equipment shall be powered by electricity if available. If	**When Required:** Prior to building permit	**Initial Approval:** Prior to building permit **Monitoring/ Inspection:** Bureau of Building

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	**Responsibility**
electricity is not available, propane or natural gas shall be used if feasible. Diesel engines shall only be used if electricity is not available and it is not feasible to use propane or natural gas.		
[ENHANCED CONTROLS: All "Basic" controls listed above plus the following controls because the project involves 240 or more multi-family units.] k. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe. l. All excavation, grading, and demolition activities shall be suspended when average wind speeds exceed 20 mph. m. Install sandbags or other erosion control measures to prevent silt runoff to public roadways. n. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for one month or more). o. Designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holidays and weekend periods when work may not be in progress. p. Install appropriate wind breaks (e.g., trees, fences) on the windward side(s) of actively disturbed areas of the construction site to minimize wind blown dust. Wind breaks must have a maximum 50 percent air porosity. q. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. r. Activities such as excavation, grading, and other ground-disturbing construction activities shall be phased to minimize the amount of disturbed surface area at any one time. s. All trucks and equipment, including tires, shall be washed off prior to leaving the site. t. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel. u. All equipment to be used on the construction site and subject to the requirements of Title 13, Section 2449, of the California Code of Regulations ("California Air Resources Board Off Road Diesel Regulations") must meet emissions and performance requirements one year in advance of any fleet deadlines. Upon request by the City, the project applicant shall provide written documentation that fleet requirements have been met. v. Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., BAAQMD Regulation 8, Rule 3: Architectural Coatings). w. All construction equipment, diesel trucks, and generators shall be equipped with Best Available Control Technology for emission reductions of NOx and PM. x. Off-road heavy diesel engines shall meet the California Air Resources	**When Required:** Prior to building permit	**Initial Approval:** Prior to building permit **Monitoring/ Inspection:** Bureau of Building

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	**Responsibility**
Board's most recent certification standard. y. Post a publicly-visible large on-site sign that includes the contact name and phone number for the project complaint manager responsible for responding to dust complaints and the telephone numbers of the City's Code Enforcement unit and the Bay Area Air Quality Management District. When contacted, the project complaint manager shall respond and take corrective action within 48 hours.		
[The following condition applies to all projects that involves a stationary pollutant source requiring a permit from BAAQMD, including but not generators. The California Building Code requires back-up diesel generators for all buildings over 70 feet tall.] **SCA 20-Stationary Sources of Air Pollution (Toxic Air Contaminants)** **Requirement:** The project applicant shall incorporate appropriate measures into the project design in order to reduce the potential health risk due to on-site stationary sources of toxic air contaminants. The project applicant shall choose one of the following methods: a. The project applicant shall retain a qualified air quality consultant to prepare a Health Risk Assessment (HRA) in accordance with California Air Resources Board (CARB) and Office of Environmental Health and Hazard Assessment requirements to determine the health risk associated with proposed stationary sources of pollution in the project. The HRA shall be submitted to the City for review and approval. If the HRA concludes that the health risk is at or below acceptable levels, then health risk reduction measures are not required. If the HRA concludes the health risk exceeds acceptable levels, health risk reduction measures shall be identified to reduce the health risk to acceptable levels. Identified risk reduction measures shall be submitted to the City for review and approval and be included on the project drawings submitted for the construction-related permit or on other documentation submitted to the City. - or - b. The project applicant shall incorporate the following health risk reduction measures into the project. These features shall be submitted to the City for review and approval and be included on the project drawings submitted for the construction-related permit or on other documentation submitted to the City: i. Installation of non-diesel fueled generators, if feasible, or; ii. Installation of diesel generators with an EPA-certified Tier 4 engine or engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy, if feasible.	**When Required:** Prior to approval of construction-related permit	**Approval:** Bureau of Planning **Monitoring/ Inspection:** Bureau of Building
BIOLOGICAL RESOURCES		
No applicable SCAs or Mitigation Measures		
CULTURAL RESOURCES		
[The following condition applies to all projects involving construction.]		

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	**Responsibility**
SCA 29-Archaeological and Paleontological Resources – Discovery During Construction **Requirement:** Pursuant to CEQA Guidelines section 15064.5(f), in the event that any historic or prehistoric subsurface cultural resources are discovered during ground disturbing activities, all work within 50 feet of the resources shall be halted and the project applicant shall notify the City and consult with a qualified archaeologist or paleontologist, as applicable, to assess the significance of the find. In the case of discovery of paleontological resources, the assessment shall be done in accordance with the Society of Vertebrate Paleontology standards. If any find is determined to be significant, appropriate avoidance measures recommended by the consultant and approved by the City must be followed unless avoidance is determined unnecessary or infeasible by the City. Feasibility of avoidance shall be determined with consideration of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is unnecessary or infeasible, other appropriate measures (e.g., data recovery, excavation) shall be instituted. Work may proceed on other parts of the project site while measures for the cultural resources are implemented. In the event of data recovery of archaeological resources, the project applicant shall submit an Archaeological Research Design and Treatment Plan (ARDTP) prepared by a qualified archaeologist for review and approval by the City. The ARDTP is required to identify how the proposed data recovery program would preserve the significant information the archaeological resource is expected to contain. The ARDTP shall identify the scientific/historic research questions applicable to the expected resource, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. The ARDTP shall include the analysis and specify the curation and storage methods. Data recovery, in general, shall be limited to the portions of the archaeological resource that could be impacted by the proposed project. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practicable. Because the intent of the ARDTP is to save as much of the archaeological resource as possible, including moving the resource, if feasible, preparation and implementation of the ARDTP would reduce the potential adverse impact to less than significant. The project applicant shall implement the ARDTP at his/her expense. In the event of excavation of paleontological resources, the project applicant shall submit an excavation plan prepared by a qualified paleontologist to the City for review and approval. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and/or a report prepared by a qualified paleontologist, as appropriate, according to current professional standards and at the expense of the project applicant.	**When Required:** During construction	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building
[The following condition applies to all projects involving construction.]		

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	**Responsibility**
SCA 31-Human Remains – Discovery During Construction **Requirement:** Pursuant to CEQA Guidelines section 15064.5(e)(1), in the event that human skeletal remains are uncovered at the project site during construction activities, all work shall immediately halt and the project applicant shall notify the City and the Alameda County Coroner. If the County Coroner determines that an investigation of the cause of death is required or that the remains are Native American, all work shall cease within 50 feet of the remains until appropriate arrangements are made. In the event that the remains are Native American, the City shall contact the California Native American Heritage Commission (NAHC), pursuant to subdivision (c) of section 7050.5 of the California Health and Safety Code. If the agencies determine that avoidance is not feasible, then an alternative plan shall be prepared with specific steps and timeframe required to resume construction activities. Monitoring, data recovery, determination of significance, and avoidance measures (if applicable) shall be completed expeditiously and at the expense of the project applicant.	**When Required:** During construction	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building
GEOLOGY AND SOILS		
[The following condition applies to all projects involving 1) a subdivision (except condominium subdivisions and subdivisions between existing buildings with no new structures) per OMC sections 16.20.060 and 16.24.090 or 2) a grading permit per OMC section 15.04.660. The condition does not apply to projects located in an Earthquake Fault Zone or a Seismic Hazards Zone (see other conditions applicable to those projects).] **SCA34-Soils Report** **Requirement:** The project applicant shall submit a soils report prepared by a registered geotechnical engineer for City review and approval. The soils report shall contain, at a minimum, field test results and observations regarding the nature, distribution and strength of existing soils, and recommendations for appropriate grading practices and project design. The project applicant shall implement the recommendations contained in the approved report during project design and construction.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Bureau of Building **Monitoring/ Inspection:** Bureau of Building
GREENHOUSE GAS EMISSIONS / GLOBAL CLIMATE CHANGE		
No applicable SCAs or Mitigation Measures		
HAZARDS AND HAZARDOUS MATERIALS		
[The following condition applies to all projects involving (a) redevelopment or change of use of a historically industrial or commercial site; (b) a contaminated site as identified in City records; or (c) a site listed on the State Cortese List; and site remediation activities are required based on an environmental site assessment. (Note 1: Presence on the Cortese List precludes use of a Categorical Exemption under CEQA, but a Statutory Exemption {such as section 15183} may apply. In that case, staff should consult first with a supervisor and then with the City Attorney's Office. Note 2: The environmental site assessment referenced in this condition is typically required prior to project approval.)]		

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
SCA 40-Site Contamination a. ***Environmental Site Assessment Required*** **Requirement:** The project applicant shall submit a Phase I Environmental Site Assessment report, and Phase II Environmental Site Assessment report if warranted by the Phase I report, for the project site for review and approval by the City. The report(s) shall be prepared by a qualified environmental assessment professional and include recommendations for remedial action, as appropriate, for hazardous materials. The project applicant shall implement the approved recommendations and submit to the City evidence of approval for any proposed remedial action and required clearances by the applicable local, state, or federal regulatory agency.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Oakland Fire Department **Monitoring/ Inspection:** Oakland Fire Department
b. ***Health and Safety Plan Required*** **Requirement:** The project applicant shall submit a Health and Safety Plan for the review and approval by the City in order to protect project construction workers from risks associated with hazardous materials. The project applicant shall implement the approved Plan.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Bureau of Building **Monitoring/ Inspection:** Bureau of Building
c. ***Best Management Practices (BMPs) Required for Contaminated Sites*** **Requirement:** The project applicant shall ensure that Best Management Practices (BMPs) are implemented by the contractor during construction to minimize potential soil and groundwater hazards. These shall include the following: i. Soil generated by construction activities shall be stockpiled on-site in a secure and safe manner. All contaminated soils determined to be hazardous or non-hazardous waste must be adequately profiled (sampled) prior to acceptable reuse or disposal at an appropriate off-site facility. Specific sampling and handling and transport procedures for reuse or disposal shall be in accordance with applicable local, state, and federal requirements. ii. Groundwater pumped from the subsurface shall be contained on-site in a secure and safe manner, prior to treatment and disposal, to ensure environmental and health issues are resolved pursuant to applicable laws and policies. Engineering controls shall be utilized, which include impermeable barriers to prohibit groundwater and vapor intrusion into the building.	**When Required:** During construction	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building
HYDROLOGY AND WATER QUALITY		
SCA 44-Erosion and Sedimentation Control Measures for Construction **Requirement:** The project applicant shall implement Best Management Practices (BMPs) to reduce erosion, sedimentation, and water quality impacts during construction to the maximum extent practicable. At a minimum, the project applicant shall provide filter materials deemed acceptable to the City at nearby catch basins to prevent any debris and dirt from flowing into the City's storm drain system and creeks.	**When Required:** During construction	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	**Responsibility**
[The following condition applies to all projects involving construction activities that require a grading permit per OMC sec. 15.04.660 or are located on a hillside property (20% or greater slope), except projects requiring a category III or IV creek protection permit (see other conditions for creek protection permits).] **SCA 45-Erosion and Sedimentation Control Plan for Construction** a. ***Erosion and Sedimentation Control Plan Required*** **Requirement:** The project applicant shall submit an Erosion and Sedimentation Control Plan to the City for review and approval. The Erosion and Sedimentation Control Plan shall include all necessary measures to be taken to prevent excessive stormwater runoff or carrying by stormwater runoff of solid materials on to lands of adjacent property owners, public streets, or to creeks as a result of conditions created by grading and/or construction operations. The Plan shall include, but not be limited to, such measures as short-term erosion control planting, waterproof slope covering, check dams, interceptor ditches, benches, storm drains, dissipation structures, diversion dikes, retarding berms and barriers, devices to trap, store and filter out sediment, and stormwater retention basins. Off-site work by the project applicant may be necessary. The project applicant shall obtain permission or easements necessary for off-site work. There shall be a clear notation that the plan is subject to changes as changing conditions occur. Calculations of anticipated stormwater runoff and sediment volumes shall be included, if required by the City. The Plan shall specify that, after construction is complete, the project applicant shall ensure that the storm drain system shall be inspected and that the project applicant shall clear the system of any debris or sediment.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Bureau of Building **Monitoring/ Inspection:** N/A
b. ***Erosion and Sedimentation Control During Construction*** **Requirement:** The project applicant shall implement the approved Erosion and Sedimentation Control Plan. No grading shall occur during the wet weather season (October 15 through April 15) unless specifically authorized in writing by the Bureau of Building.	**When Required:** During construction	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building
[The following condition applies to all projects that disturb one acre or more of surface area.] **SCA 46-State Construction General Permit** **Requirement:** The project applicant shall comply with the requirements of the Construction General Permit issued by the State Water Resources Control Board (SWRCB). The project applicant shall submit a Notice of Intent (NOi), Stormwater Pollution Prevention Plan (SWPPP), and other required Permit Registration Documents to SWRCB. The project applicant shall submit evidence of compliance with Permit requirements to the City.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** State Water Resources Control Board; evidence of compliance submitted to Bureau of Building **Monitoring/ Inspection:** State Water Resources Control Board

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	**Responsibility**
[The following condition applies to all projects considered Regulated Projects under the NPDES C.3 requirements. Regulated Projects are:] **a. Projects that create or replace 10,000 square feet or more of new or existing impervious surface area; and** **b. The following projects that create or replace 5,000 square feet or more of new or impervious surface area:** **i. Auto servicing, auto repair, and gas stations;** **ii. Restaurants (full service, limited service, and fast-food); and** **iii. Uncovered surface parking lots (including stand-alone parking lots, parking lots serving an activity, and the uncovered portion of parking structures unless drainage from the uncovered portion of the parking structure is connected to the sanitary sewer system).** **Regulated Projects do not include individual single-family dwellings (that are not part of a larger multi-unit development) or routine maintenance activities.]**		
SCA 50-NPDES C.3 Stormwater Requirements for Regulated Projects a. ***Post-Construction Stormwater Management Plan Required*** **Requirement:** The project applicant shall comply with the requirements of Provision C.3 of the Municipal Regional Stormwater Permit issued under the National Pollutant Discharge Elimination System (NPDES). The project applicant shall submit a Post-Construction Stormwater Management Plan to the City for review and approval with the project drawings submitted for site improvements, and shall implement the approved Plan during construction. The Post-Construction Stormwater Management Plan shall include and identify the following: i. Location and size of new and replaced impervious surface; ii. Directional surface flow of stormwater runoff; iii. Location of proposed on-site storm drain lines; iv. Site design measures to reduce the amount of impervious surface area; v. Source control measures to limit stormwater pollution; vi. Stormwater treatment measures to remove pollutants from stormwater runoff, including the method used to hydraulically size the treatment measures; and vii. Hydromodification management measures, if required by Provision C.3, so that postproject stormwater runoff flow and duration match pre-project runoff.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Bureau of Planning; Bureau of Building **Monitoring/ Inspection:** Bureau of Building
b. ***Maintenance Agreement Required*** **Requirement:** The project applicant shall enter into a maintenance agreement with the City, based on the Standard City of Oakland Stormwater Treatment Measures Maintenance Agreement, in accordance with Provision C.3, which provides, in part, for the following: i. The project applicant accepting responsibility for the adequate installation/construction, operation, maintenance, inspection, and reporting of any on-site stormwater treatment measures being	**When Required:** Prior to building permit final	**Initial Approval:** Bureau of Building **Monitoring/ Inspection:** Bureau of Building

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
incorporated into the project until the responsibility is legally transferred to another entity; and ii. Legal access to the on-site stormwater treatment measures for representatives of the City, the local vector control district, and staff of the Regional Water Quality Control Board, San Francisco Region, for the purpose of verifying the implementation, operation, and maintenance of the on-site stormwater treatment measures and to take corrective action if necessary. The maintenance agreement shall be recorded at the County Recorder's Office at the applicant's expense.		
NOISE		
[The following condition applies to all projects involving construction.] **SCA 58-Construction Days/Hours** **Requirement:** The project applicant shall comply with the following restrictions concerning construction days and hours: a. Construction activities are limited to between 7:00 a.m. and 7:00 p.m. Monday through Friday, except that pier drilling and/or other extreme noise generating activities greater than 90 dBA shall be limited to between 8:00 a.m. and 4:00 p.m. b. Construction activities are limited to between 9:00 a.m. and 5:00 p.m. on Saturday. In residential zones and within 300 feet of a residential zone, construction activities are allowed from 9:00 a.m. to 5:00 p.m. only within the interior of the building with the doors and windows closed. No pier drilling or other extreme noise generating activities greater than 90 dBA are allowed on Saturday. c. No construction is allowed on Sunday or federal holidays. Construction activities include, but are not limited to, truck idling, moving equipment (including trucks, elevators, etc.) or materials, deliveries, and construction meetings held on-site in a nonenclosed area. Any construction activity proposed outside of the above days and hours for special activities (such as concrete pouring which may require more continuous amounts of time) shall be evaluated on a case-by-case basis by the City, with criteria including the urgency/emergency nature of the work, the proximity of residential or other sensitive uses, and a consideration of nearby residents'/occupants' preferences. The project applicant shall notify property owners and occupants located within 300 feet at least 14 calendar days prior to construction activity proposed outside of the above days/hours. When submitting a request to the City to allow construction activity outside of the above days/hours, the project applicant shall submit information concerning the type and duration of proposed construction activity and the draft public notice for City review and approval prior to distribution of the public notice.	**When Required:** During construction	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
[The following condition applies to all projects involving construction.] **SCA 59-Construction Noise** **Requirement:** The project applicant shall implement noise reduction measures to reduce noise impacts due to construction. Noise reduction measures include, but are not limited to, the following: a. Equipment and trucks used for project construction shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds) wherever feasible. b. Except as provided herein, impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used, if such jackets are commercially available, and this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures. c. Applicant shall use temporary power poles instead of generators where feasible. d. Stationary noise sources shall be located as far from adjacent properties as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the City to provide equivalent noise reduction. e. The noisiest phases of construction shall be limited to less than 10 days at a time. Exceptions may be allowed if the City determines an extension is necessary and all available noise reduction controls are implemented.	**When Required:** During construction	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building
[The following condition applies to all projects involving construction.] **SCA 60-Extreme Construction Noise** ***a. Construction Noise Management Plan Required*** **Requirement:** Prior to any extreme noise generating construction activities (e.g., pier drilling, pile driving and other activities generating greater than 90dBA), the project applicant shall submit a Construction Noise Management Plan prepared by a qualified acoustical consultant for City review and approval that contains a set of site-specific noise attenuation measures to further reduce construction impacts associated with extreme noise generating activities. The project applicant shall implement the approved Plan during construction. Potential attenuation measures include, but are not limited to, the following: i. Erect temporary plywood noise barriers around the construction site, particularly along on sites adjacent to residential buildings;	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
ii. Implement "quiet" pile driving technology (such as pre-drilling of piles, the use of more than one pile driver to shorten the total pile driving duration), where feasible, in consideration of geotechnical and structural requirements and conditions; iii. Utilize noise control blankets on the building structure as the building is erected to reduce noise emission from the site; iv. Evaluate the feasibility of noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings by the use of sound blankets for example and implement such measure if such measures are feasible and would noticeably reduce noise impacts; and v. Monitor the effectiveness of noise attenuation measures by taking noise measurements.		
*b. **Public Notification Required*** **Requirement:** The project applicant shall notify property owners and occupants located within 300 feet of the construction activities at least 14 calendar days prior to commencing extreme noise generating activities. Prior to providing the notice, the project applicant shall submit to the City for review and approval the proposed type and duration of extreme noise generating activities and the proposed public notice. The public notice shall provide the estimated start and end dates of the extreme noise generating activities and describe noise attenuation measures to be implemented	**When Required:** During construction	**Initial Approval:** Bureau of Building **Monitoring/ Inspection:** Bureau of Building
[The following condition applies to all major development projects, specifically those involving: a. Construction of 50 or more residential dwelling units; b. Construction of 50,000 sq. ft. or more of nonresidential floor area; or c. CEQA review (e.g., negative declaration, mitigated negative declaration, or EIR.] **SCA 62-Construction Noise Complaints** **Requirement:** The project applicant shall submit to the City for review and approval a set of procedures for responding to and tracking complaints received pertaining to construction noise, and shall implement the procedures during construction. At a minimum, the procedures shall include: a. Designation of an on-site construction complaint and enforcement manager for the project; b. A large on-site sign near the public right-of-way containing permitted construction days/hours, complaint procedures, and phone numbers for the project complaint manager and City Code Enforcement unit; c. Protocols for receiving, responding to, and tracking received complaints; and d. Maintenance of a complaint log that records received complaints and how complaints were addressed, which shall be submitted to the City for review upon the City's request.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
[The following condition applies to all projects for which a noise study was performed during the project review process and the project exposure to community noise is Conditionally Acceptable, Normally Unacceptable, or Clearly Unacceptable per the land use compatibility guidelines of the Noise Element of the Oakland General Plan.] **SCA 63-Exposure to Community Noise** **Requirement:** The project applicant shall submit a Noise Reduction Plan prepared by a qualified acoustical engineer for City review and approval that contains noise reduction measures (e.g., sound-rated window, wall, and door assemblies) to achieve an acceptable interior noise level in accordance with the land use compatibility guidelines of the Noise Element of the Oakland General Plan. The applicant shall implement the approved Plan during construction. To the maximum extent practicable, interior noise levels shall not exceed the following: a. 45 dBA: Residential activities, civic activities, hotels a. 45 dBA: Residential activities, civic activities, hotels b. 50 dBA: Administrative offices; group assembly activities c. 55 dBA: Commercial activities d. 65 dBA: Industrial activities	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Bureau of Planning **Monitoring/ Inspection:** Bureau of Building
[The following condition applies to all projects.] **SCA 64-Operational Noise** **Requirement:** Noise levels from the project site after completion of the project (i.e., during project operation) shall comply with the performance standards of chapter 17.120 of the Oakland Planning Code and chapter 8.18 of the Oakland Municipal Code. If noise levels exceed these standards, the activity causing the noise shall be abated until appropriate noise reduction measures have been installed and compliance verified by the City.	**When Required:** Ongoing	**Initial Approval:** N/A **Monitoring/ Inspection:** Bureau of Building
[The following condition applies to all projects involving new residential facilities or new dwelling units located adjacent to an active rail line.] **SCA 65-Exposure to Vibration** **Requirement:** The project applicant shall submit a Vibration Reduction Plan prepared by a qualified acoustical consultant for City review and approval that contains vibration reduction measures to reduce groundborne vibration to acceptable levels per Federal Transit Administration (FTA) standards. The applicant shall implement the approved Plan during construction. Potential vibration reduction measures include, but are not limited to, the following: a. Isolation of foundation and footings using resilient elements such as rubber bearing pads or springs, such as a "spring isolation" system that consists of resilient spring supports that can support the podium or residential foundations. The specific system shall be selected so that it can properly support the structural loads, and provide adequate filtering of groundborne vibration to the residences above. b. Trenching, which involves excavating soil between the railway and the	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Bureau of Planning **Monitoring/ Inspection:** Bureau of Building

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	**Responsibility**
project so that the vibration path is interrupted, thereby reducing the vibration levels before they enter the project's structures. Since the reduction in vibration level is based on a ratio between trench depth and vibration wavelength, additional measurements shall be conducted to determine the vibration wavelengths affecting the project. Based on the resulting measurement findings, an adequate trench depth and, if required, suitable fill shall be identified (such as foamed styrene packing pellets [i.e., Styrofoam] or low-density polyethylene).		
TRANSPORTATION/TRAFFIC		
Mitigation Measure Trans-8: Implement the following measure at Adeline Street and 5th Street (#24): a. Modify the traffic signal to remove split phasing and provide protected permitted left turn phasing for the northbound and southbound left-turn movements To implement this measure, individual project applicants shall submit Plans, Specifications, and Estimates (PS&E) to modify the intersection to the City of Oakland for review and approval. All elements shall be designed to City standards in effect at the time of construction and all new or upgraded signals shall include these enhancements. All other facilities supporting vehicle travel and alternative modes through the intersection shall be brought up to both City standards and ADA standards (according to Federal and State Access Board guidelines) at the time of construction. Individual project applicants shall fund the cost of preparing and implementing the above measures. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, individual project applicants shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall mitigate this impact to less than significant.	**When Required:** Per traffic report recommendation	**Initial Approval:** Prior to final map **Monitoring/ Inspection:** Bureau of Planning
[The following condition applies to all projects generating 50 or more net new a.m. or p.m. peak hour vehicle trips.] **SCA 71-Transportation and Parking Demand Management** a. ***Transportation and Parking Demand Management (TDM) Plan Required*** **Requirement:** The project applicant shall submit a Transportation and Parking Demand Management (TDM) Plan for review and approval by the City. i. The goals of the TDM Plan shall be the following: • Reduce vehicle traffic and parking demand generated by the project to the maximum extent practicable, consistent with the potential traffic and parking impacts of the project. • Achieve the following project vehicle trip reductions (VTR): o Projects generating 50-99 net new a.m. or p.m. peak hour vehicle trips: 10 percent VTR o Projects generating 100 or more net new a.m. or p.m. peak hour vehicle trips: 20 percent VTR	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Bureau of Planning **Monitoring/ Inspection:** N/A

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
• Increase pedestrian, bicycle, transit, and carpool/vanpool modes of travel. All four modes of travel shall be considered, as appropriate. • Enhance the City's transportation system, consistent with City policies and programs. ii. TDM strategies to consider include, but are not limited to, the following: • Inclusion of additional long-term and short-term bicycle parking that meets the design standards set forth in chapter five of the Bicycle Master Plan and the Bicycle Parking Ordinance (chapter 17.117 of the Oakland Planning Code), and shower and locker facilities in commercial developments that exceed the requirement. • Construction of and/or access to bikeways per the Bicycle Master Plan; construction of priority bikeways, on-site signage and bike lane striping. • Installation of safety elements per the Pedestrian Master Plan (such as crosswalk striping, curb ramps, count down signals, bulb outs, etc.) to encourage convenient and safe crossing at arterials, in addition to safety elements required to address safety impacts of the project. • Installation of amenities such as lighting, street trees, and trash receptacles per the Pedestrian Master Plan and any applicable streetscape plan. • Construction and development of transit stops/shelters, pedestrian access, way finding signage, and lighting around transit stops per transit agency plans or negotiated improvements. • Direct on-site sales of transit passes purchased and sold at a bulk group rate (through programs such as AC Transit Easy Pass or a similar program through another transit agency). • Provision of a transit subsidy to employees or residents, determined by the project applicant and subject to review by the City, if employees or residents use transit or commute by other alternative modes. • Provision of an ongoing contribution to transit service to the area between the project and nearest mass transit station prioritized as follows: 1) Contribution to AC Transit bus service; 2) Contribution to an existing area shuttle service; and 3) Establishment of new shuttle service. The amount of contribution (for any of the above scenarios) would be based upon the cost of establishing new shuttle service (Scenario 3). • Guaranteed ride home program for employees, either through 511.org or through separate program. • Pre-tax commuter benefits (commuter checks) for employees. • Free designated parking spaces for on-site car-sharing program (such as City Car Share, Zip Car, etc.) and/or car-		

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	**Responsibility**
share membership for employees or tenants. • On-site carpooling and/or vanpool program that includes preferential (discounted or free) parking for carpools and vanpools. • Distribution of information concerning alternative transportation options. • Parking spaces sold/leased separately for residential units. Charge employees for parking, or provide a cash incentive or transit pass alternative to a free parking space in commercial properties. • Parking management strategies including attendant/valet parking and shared parking spaces. • Requiring tenants to provide opportunities and the ability to work off-site. • Allow employees or residents to adjust their work schedule in order to complete the basic work requirement of five eight-hour workdays by adjusting their schedule to reduce vehicle trips to the worksite (e.g., working four, ten-hour days; allowing employees to work from home two days per week). • Provide or require tenants to provide employees with staggered work hours involving a shift in the set work hours of all employees at the workplace or flexible work hours involving individually determined work hours. The TDM Plan shall indicate the estimated VTR for each strategy, based on published research or guidelines where feasible. For TDM Plans containing ongoing operational VTR strategies, the Plan shall include an ongoing monitoring and enforcement program to ensure the Plan is implemented on an ongoing basis during project operation. If an annual compliance report is required, as explained below, the TDM Plan shall also specify the topics to be addressed in the annual report.		
b. ***TDM Implementation – Physical Improvements*** **Requirement:** For VTR strategies involving physical improvements, the project applicant shall obtain the necessary permits/approvals from the City and install the improvements prior to the completion of the project.	**When Required:** Prior to building permit final	**Initial Approval:** Bureau of Building **Monitoring/ Inspection:** Bureau of Building
c. ***TDM Implementation – Operational Strategies*** **Requirement:** For projects that generate 100 or more net new a.m. or p.m. peak hour vehicle trips and contain ongoing operational VTR strategies, the project applicant shall submit an annual compliance report for the first five years following completion of the project (or completion of each phase for phased projects) for review and approval by the City. The annual report shall document the status and effectiveness of the TDM program, including the actual VTR achieved by the project during operation. If deemed necessary, the City may elect to have a peer review consultant, paid for by the project applicant, review the annual report. If timely reports are not	**When Required:** Ongoing	**Initial Approval:** Bureau of Planning **Monitoring/ Inspection:** Bureau of Planning

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
submitted and/or the annual reports indicate that the project applicant has failed to implement the TDM Plan, the project will be considered in violation of the Conditions of Approval and the City may initiate enforcement action as provided for in these Conditions of Approval. The project shall not be considered in violation of this Condition if the TDM Plan is implemented but the VTR goal is not achieved.		
UTILITY AND SERVICE SYSTEMS		
Recommendation Util-1a: As the area improves, underground storm drain lines should be added to several of the Opportunity Areas' street sections where such lines do not exist. Additional storm drainage structures, including conduit, would be a way to address both ponding and adequate conveyance of storm runoff.	**When Required:** Prior to final map	**Initial Approval:** Public Works Department, Engineering **Monitoring/ Inspection:** N/A
Recommendation Util-2a: Because many of the parcels within West Oakland's industrial areas are very large, there are several streets that have no public water main. For projects that create a new parcel which fronts a street that does not have a water main, a new public water main constructed at the developer's expense will likely be required. **Recommendation Util-2b:** EBMUD block maps indicate that many of the lines in the area are cast iron and were installed in the 30's. These pipes have likely experienced significant corrosion and should be replaced. **Recommendation Util-2c:** Service to new development would likely require reassessment and upsizing of conduits, especially if the pipe length is greater than 1,000 feet to the nearest transmission line.	**When Required:** Prior to final map	**Initial Approval:** Public Works Department, Engineering **Monitoring/ Inspection:** N/A
Recommendation Util-3a: Underground utility improvements should be installed prior to final streetscape improvements to prevent damage and the need for patching such improvements during trenching operations. **Recommendation Util-3b:** Properties to be redeveloped and/or reused should abandon existing sewer laterals and install new laterals, and verify that there are no cross-connections from the downspouts to the sewer lateral. This would result in much lower I/I flow into the main sewer lines. **Recommendation Util-3c:** Prior to the installation of underground utility improvements at properties to be redeveloped, sewage flow rates and I/I rates should be monitored to determine whether there is significant potential for I/I reduction.	**When Required:** Prior to final map	**Initial Approval:** Public Works Department, Engineering **Monitoring/ Inspection:** N/A
[The following condition applies to all construction projects.] **SCA 74-Construction and Demolition Waste Reduction and Recycling Requirement:** The project applicant shall comply with the City of Oakland Construction and Demolition Waste Reduction and Recycling Ordinance (chapter 15.34 of the Oakland Municipal Code) by submitting a Construction and Demolition Waste Reduction and Recycling Plan (WRRP) for City review and approval, and shall implement the approved WRRP.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Public Works Department, Environmental Services Division

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
Projects subject to these requirements include all new construction, renovations/alterations/modifications with construction values of $50,000 or more (except R-3 type construction), and all demolition (including soft demolition) except demolition of type R-3 construction. The WRRP must specify the methods by which the project will divert construction and demolition debris waste from landfill disposal in accordance with current City requirements. The WRRP may be submitted electronically at www.greenhalosystems.com or manually at the City's Green Building Resource Center. Current standards, FAQs, and forms are available on the City's website and in the Green Building Resource Center.		**Monitoring/ Inspection:** Public Works Department, Environmental Services Division
[The following condition applies to all major development projects, specifically those involving any of the following: **a. Construction of 50 or more residential dwelling units;** **b. Construction of 50,000 sq. ft. or more of nonresidential floor area; or** **c. CEQA review (e.g., negative declaration, mitigated negative declaration or EIR).]** **SCA 79-Sanitary Sewer System** **Requirement:** The project applicant shall prepare and submit a Sanitary Sewer Impact Analysis to the City for review and approval in accordance with the City of Oakland Sanitary Sewer Design Guidelines. The Impact Analysis shall include an estimate of pre-project and post-project wastewater flow from the project site. In the event that the Impact Analysis indicates that the net increase in project wastewater flow exceeds City-projected increases in wastewater flow in the sanitary sewer system, the project applicant shall pay the Sanitary Sewer Impact Fee in accordance with the City's Master Fee Schedule for funding improvements to the sanitary sewer system.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Public Works Department, Department of Engineering and Construction **Monitoring/ Inspection:** N/A
[The following condition applies to all major development projects, specifically those involving any of the following: **a. Construction of 50 or more residential dwelling units;** **b. Construction of 50,000 sq. ft. or more of nonresidential floor area; or** **c. CEQA review (e.g., negative declaration, mitigated negative declaration or EIR).]** **SCA 80-Storm Drain System** **Requirement:** The project storm drainage system shall be designed in accordance with the City of Oakland's Storm Drainage Design Guidelines. To the maximum extent practicable, peak stormwater runoff from the project site shall be reduced by at least 25 percent compared to the pre-project condition.	**When Required:** Prior to approval of construction-related permit	**Initial Approval:** Bureau of Building **Monitoring/Inspection:** Bureau of Building
Requirement: The project applicant shall maintain, repair, and/or replace installed health risk reduction measures, including but not limited to the HVAC system (if applicable), on an ongoing and as-needed basis. Prior to occupancy, the project applicant shall prepare and then distribute to the building manager/operator an operation and maintenance manual for the HVAC system and filter including the maintenance and replacement	**When Required:** Ongoing	**Initial Approval:** N/A **Monitoring/Inspection:** Bureau of Building

Standard Conditions of Approval/Mitigation Measures	Mitigation Implementation/Monitoring	
	Schedule	Responsibility
schedule for the filter.		

SUPPLEMENTAL ATTACHMENT 1 - PROJECT CONSISTENCY WITH GENERAL PLAN

Community Plan or Zoning (Analyze as well), Per CEQA Guidelines Section 15183

Section 15183(a) of the California Environmental Quality Act (CEQA) Guidelines states that "...projects which are consistent with the development density established by the existing zoning, community plan, or general plan policies for which an Environmental Impact Report (EIR) was certified shall not require additional environmental review, except as may be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site."

Proposed Project. West Oakland Development Group (***"WODG"***) proposes the development of a residential mixed use building on the 2.85 acre property located at 500 Kirkham Street (the **"Property"**). The proposed building will include up to 426 residential units, up to 34,119 square feet of ground floor retail, the potential for up to 44,918 square feet of space for a charter school or other commercial uses on the 2nd and 3rd floors, a 2 story above ground garage and a ½ acre park.

The building will range from 7 to 12 stories, and from approximately 85 feet to 130 feet in height. The zoning on the Property allows a height of 160 feet, so the proposed building is well below the maximum height. The proposed building would step up from 7 stories along 7th Street to 12 stories along 5th Street. The lower profile facing 7th Street is intended to match up with the buildings in the surrounding area. The entire proposed development would be set back 50' from the Bay Area Rapid Transit (***"BART"***) tracks, which cut through the southern portion of the Property.

Project Consistency. The WOSP EIR was prepared for the WOSP; it was certified by the Planning Commission on June 11, 2014, and confirmed by the City Council on June 17, 2014. As determined by the City of Oakland Bureau of Planning, the proposed project is permitted in the zoning district in which it is located, and is consistent with the bulk, density, and land uses envisioned in the Plan Area, and also includes objectives and strategies that support and facilitate desired development as indicated in the General Plan as outlined below.

- Promotes high density development near the West Oakland BART station;
- Identifies a development vision for other major locations throughout the Specific Plan area;
- Encourages residential and neighborhood-serving commercial establishments on major corridors such as San Pablo Avenue.
- Redirects more intensive commercial activities to locations closer to the Port of Oakland and away from residential areas;
- Protects and enhances West Oakland's residential neighborhoods; and
- Encourages and enhanced multimodal transportation system to better link residents and businesses.
- The land use designation for the site is Community Commercial; this designation applies to areas suitable for a wide variety of commercial and institutional operations along the City of Oakland's major corridors, and in shopping districts or centers. The proposed mixed-use project would be consistent with this designation.

- The site is zoned for S-15W (Mixed-Use Transit Oriented Development Zone) and West Oakland Specific Plan overlay. The proposed project would be consistent with the purposes of these districts, which are generally intended to create a "complete" neighborhood that includes destination retail, as well as a mix of retail, entertainment, office, and residential uses to allow residents to live within a short walk or transit ride to work, shop, and play. They are intended to be pedestrian, bicycle, and transit friendly districts that can continue to accommodate automobiles in a managed way.
- The proposed project would be up to 130 feet in height, and would be in compliance with the height limits on the site, which are 160 feet along the 7th Street frontage.
- The proposed 426 dwelling units would be below the maximum residential density of 585 dwelling units allowed on the project site with a MCUP.
- The proposed 79,037 square feet of nonresidential uses is below the maximum nonresidential square footage of uses allowed on the site, conservatively estimated to be 131,606 square feet. Therefore, the proposed project would comply with the amount of nonresidential FAR allowed under the Planning Code.

Therefore, the proposed project is eligible for consideration of an exemption under California Public Resources Code Section 21083.3, and Section 15183 of the CEQA Guidelines.

EXHIBIT A

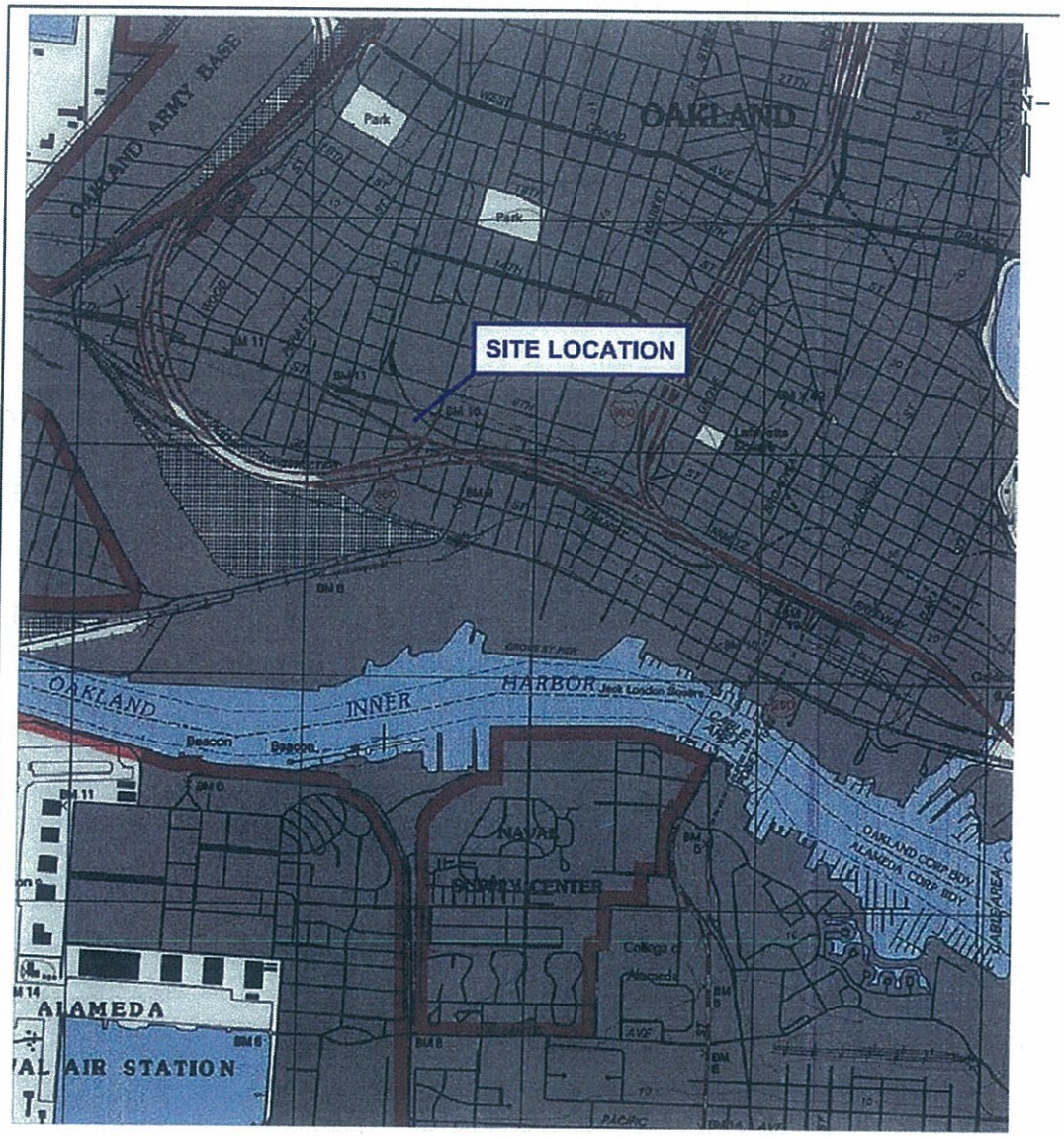


FIGURE 1
Site Location Map

Phase II Environmental Site Assessment
500 Kirkham Street
Oakland, California

Source: National Geographic USGS TOPO! 2000

northgate environmental management, inc.

Project No. 1204.22

SUPPLEMENTAL ATTACHMENT 2 - INFILL PERFORMANCE STANDARDS, PER CEQA GUIDELINES SECTION 15183.3

California Environmental Quality Act (CEQA) Guidelines Section 15183.3(b) and CEQA Guidelines Appendix M establish eligibility requirements for projects to qualify as infill projects. Table B-1, on the pages following, shows how the proposed project satisfies each of the applicable requirements.

Table B-1
Project Infill Eligibility

	CEQA Eligibility Criteria	Eligible?/Notes for Proposed Project
1.	Be located in an urban area on a site that either has been previously developed or that adjoins existing qualified urban uses on at least seventy-five percent of the site's perimeter. For the purpose of this subdivision "adjoin" means the infill project is immediately adjacent to qualified urban uses or is only separated from such uses by an improved right-of-way. (CEQA Guidelines Section 15183.3[b][1])	Yes The project site is located within the WOSP area and as such is qualified for urban uses according to said plan. .
2.	Satisfy the performance Standards provided in Appendix M (CEQA Guidelines Section 15183.3[b][2]) as presented in 2a and 2b below:	—
	2a. *Performance Standards Related to Project Design.* All projects must implement **all** of the following:	—
	Renewable Energy. *Non-Residential Projects.* All nonresidential projects shall include onsite renewable power generation, such as solar photovoltaic, solar thermal, and wind power generation, or clean back-up power supplies, where feasible. *Residential Projects.* Residential projects are also encouraged to include such on site renewable power generation.	Yes, as a residential project. According to Section IV (G) of CEQA Appendix M, for mixed-use projects "...the performance standards in this section that apply to the predominant use shall govern the entire project." Because the predominant use is residential, the proposed project is not required to include onsite renewable power generation. It is not known at this time if the proposed project will provide onsite renewable power.
	Soil and Water Remediation. If the project site is included on any list compiled pursuant to Section 65962.5 of the Government Code, the project shall document how it has remediated the site, if remediation is completed. Alternatively, the project shall implement the recommendations provided in a preliminary endangerment assessment or comparable document that identifies remediation appropriate for the site.	Yes According to the Phase 1 Environmental Site Assessment completed for the proposed project (Northgate Environmental Management), the site is listed in regulatory databases compiled pursuant to Section 65962.5 of the Government Code. Remediation and clean-up are ongoing under the Department of Toxic Substances Control..
	Residential Units Near High-Volume Roadways and Stationary Sources. If a project includes residential units located within 500 feet, or other distance determined to be appropriate by the local agency or air district based on local conditions, of a high volume roadway or other significant sources of air pollution, the project shall comply with any policies and standards identified in the local general plan, specific plan, zoning code, or community risk reduction plan for the protection of public health from such sources of air pollution. If the local government has not adopted such plans or policies, the project shall include measures, such as enhanced air filtration and project design, that the lead agency finds,	Yes

Table B-1
Project Infill Eligibility

	CEQA Eligibility Criteria	Eligible?/Notes for Proposed Project
	based on substantial evidence, will promote the protection of public health from sources of air pollution. Those measures may include, among others, the recommendations of the California Air Resources Board, air districts, and the California Air Pollution Control Officers Association.	
	2b. Additional Performance Standards by Project Type. In addition to implementing all the features described in 2a above, the project must meet eligibility requirements provided below by project type.	—
	Residential. A residential project must meet one of the following: A. Projects achieving below average regional per capita vehicle miles traveled (VMT). A residential project is eligible if it is located in a "low vehicle travel area" within the region; B. Projects located within ½ mile of an Existing Major Transit Stop or High Quality Transit Corridor. A residential project is eligible if it is located within ½ mile of an existing major transit stop or an existing stop along a high quality transit corridor; or C. Low - Income Housing. A residential or mixed-use project consisting of 300 or fewer residential units all of which are affordable to low income households is eligible if the developer of the development project provides sufficient legal commitments to the lead agency to ensure the continued availability and use of the housing units for lower income households, as defined in Section 50079.5 of the Health and Safety Code, for a period of at least 30 years, at monthly housing costs, as determined pursuant to Section 50053 of the Health and Safety Code.	Yes—The Proposed Project is located within ½ mile of the West Oakland BART station.
	Commercial/Retail. A commercial/retail project must meet one of the following: A. Regional Location. A commercial project with no single-building floor-plate greater than 50,000 square feet is eligible if it locates in a "low vehicle travel area"; or B. Proximity to Households. A project with no single-building floor-plate greater than 50,000 square feet located within ½ mile of 1,800 households is eligible.	Not Applicable According to Section IV (G) of CEQA Appendix M, for mixed-use projects "...the performance standards in this Section that apply to the predominant use shall govern the entire project." Because the predominant use is residential, the requirements for commercial/retail projects do not apply.
	Office Building. An office building project must meeting one of the following: A. Regional Location. Office buildings, both commercial and public, are eligible if they locate in a low vehicle travel area; or B. Proximity to a Major Transit Stop. Office buildings, both commercial and public, within ½ mile of an existing major transit stop, or ¼ mile of an existing stop along a high quality transit corridor, are eligible.	Not Applicable
	Schools. Elementary schools within 1 mile of 50 percent of the projected student population are eligible. Middle schools and high schools within 2 miles of 50 percent of the projected student population are eligible. Alternatively, any school within ½ mile of an existing major transit stop or an existing stop along a high quality transit corridor is eligible.	Not Applicable

SUPPLMENT ATTACHMENT 2
INFILL PERFORMANCE STANDARDS

Table B-1 Project Infill Eligibility		
	CEQA Eligibility Criteria	**Eligible?/Notes for Proposed Project**
	Additionally, to be eligible, all schools shall provide parking and storage for bicycles and scooters, and shall comply with the requirements of Sections 17213, 17213.1, and 17213.2 of the California Education Code.	
	Transit. Transit stations, as defined in Section 15183.3(e)(1), are eligible.	Not Applicable
	Small Walkable Community Projects. Small walkable community projects, as defined in Section 15183.3, subdivision (e)(6), that implement the project features in 2a above are eligible.	Not Applicable
3.	Be consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy, except as provided in CEQA Guidelines Sections 15183.3(b)(3)(A) or (b)(3)(B) below: (b)(3)(A). Only where an infill project is proposed within the boundaries of a metropolitan planning organization for which a sustainable communities strategy or an alternative planning strategy will be, but is not yet in effect, a residential infill project must have a density of at least 20 units per acre, and a retail or commercial infill project must have a floor area ratio of at least 0.75; or (b)(3)(B). Where an infill project is proposed outside of the boundaries of a metropolitan planning organization, the infill project must meet the definition of a "small walkable community project" in CEQA Guidelines §15183.3(f)(5). (CEQA Guidelines Section 15183.3[b][3])	Not Applicable

Note:
[a] Where a project includes some combination of residential, commercial and retail, office building, transit station, and/or schools, the performance standards in this section that apply to the predominant use shall govern the entire project.

SUPPLMENTAL ATTACHMENT 3 - CRITERIA FOR USE OF ADDENDUM, PER CEQA GUIDELINES SECTIONS 15164 AND 15162

Section 15164(a) of the California Environmental Quality Act (CEQA) Guidelines states that "a lead agency or responsible agency shall prepare an addendum to a previously certified EIR [Environmental Impact Report] if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred." Section 15164(e) states that "a brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR."
Project Modifications. The West Oakland Specific Plan (WOSP) EIR analyzed the West Oakland Transit Village Development Program (Development Program), which represents the maximum feasible development that the City of Oakland has projected can reasonably be expected to occur in the Plan Area over a 25-year planning period.[1] Appendix D of the WOSP identified the Development Program at the project site (designated Project Opportunity Site #2 in the WOSP), which included 2,754 residential units and 50,000 square feet of retail. The proposed project differs from the Development Program for the project site, and would construct up to 426 residential units, up to 34,000 square feet of ground floor retail space, and up to 44,000 square feet of commercial or charter school space.
The EIR indicates that the CEQA analysis was based on the development quantities set forth in the Development Program, and that the intent of the WOSP is to provide as much flexibility as is feasible in terms of precise mix of newly developed land uses and their location in the Plan Area, while conforming to the CEQA analysis and thresholds. The EIR identified traffic capacity as the key environmental factor constraining development, and stated that the City of Oakland would track and measure vehicle trip generation by projects proposed under the WOSP rather than the amount of specific land uses
Therefore, the proposed project would represent a minor change in the Development Program, and such changes are anticipated in the EIR.
Conditions for Addendum. None of the following conditions for preparation of a subsequent EIR per Section 15162(a) apply to the proposed project:
(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:
(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or Mitigation measures or alternatives which are considerably different from those analyzed in the previous WOSP EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

SUPPLMENTAL ATTACHMENT 3

CRITERIAL FOR USE OF ADDENDUM

Project Consistency with Section 15162 of the CEQA Guidelines. Since certification of the Final WOSP EIR, no changes have occurred in the circumstances under which the revised project would be implemented, that would change the severity of the proposed project's physical impacts as explained in the CEQA Checklist above, and no new information has emerged that would materially change the analyses or conclusions set forth in the Final EIR.
Furthermore, as demonstrated in the CEQA Checklist, the proposed modifications to the Development Program would not result in any new significant environmental impacts, result in any substantial increases in the significance of previously identified effects, or necessitate implementation of additional or considerably different mitigation measures than those identified in the EIR, nor render any mitigation measures or alternatives found not to be feasible, feasible. The effects of the proposed project would be substantially the same as those reported for the Development Program in the EIR.
The analysis presented in this CEQA Checklist, combined with the prior EIR analysis, demonstrates that the proposed project would not result in significant impacts that were not previously identified in the EIR. The proposed project would not result in a substantial increase in the significance of impacts, nor would the proposed project contribute considerably to cumulative effects that were not already accounted for in the certified EIR. Overall, the proposed project's impacts are similar to those identified and discussed in the EIR, as described in the CEQA Checklist, and the findings reached in the EIR are applicable.

SUPPLMENTAL ATTACHMENT 4 - TRANSIT PRIORITY PROJECT

As introduced above, per CEQA Guidelines Section 15183.5 (c), environmental documents for certain residential and mixed use projects and transit priority projects, as defined in Section 21155 of the Public Resources Code, that are consistent with the general use designation, density, building intensity and applicable policies specified for the project area in an applicable SCS or alternative planning strategy need not analyze global warming impacts resulting from cars and light duty trucks. A lead agency should consider whether such projects may result in GHGs from other sources, however, consistent with the CEQA Guidelines. Consequently, if the project meets the requirements of a transit priority project, its mobile source emissions need not be included in the assessment of GHG impacts.

Section 21155 of the California Public Resources Code defines transit priority projects as projects which:

1. Contain at least 50 percent residential use, based on total building square footage and, if the project contains between 26 percent and 50 percent nonresidential uses, a floor area ratio of not less than 0.75;
2. Provide a minimum net density of at least 20 dwelling units per acre; and
3. Be located within one-half mile of a major transit stop or high- quality transit corridor included in a regional transportation plan. A major transit stop is as defined in Section 21064.3, except that, for purposes of this section, it also includes major transit stops that are included in the applicable regional transportation plan. For purposes of this section, a high quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. A project shall be considered to be within one-half mile of a major transit stop or high-quality transit corridor if all parcels within the project have not more than 25 percent of their area farther than one-half mile from the stop or corridor and if not more than 10 percent of the residential units or 100 units, whichever is less, in the project are farther than one-half mile from the stop or corridor.

The project proposes a minimum of 387,965 square feet of residential uses and a maximum of 79,037 square feet of non-residential (commercial) uses (80 percent residential use) Therefore, the proposed project meets condition (1) above for qualification as a transit priority project. The project proposes a minimum of 426 residential units on a parcel of 3.13 acres, which is equivalent to 136 dwelling units per acre. Consequently, the proposed project meets condition (2) above for qualification as a transit priority project.

Finally, a major transit stop is defined in Section 21064.3 of the California Public Resources Code as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute period. An entrance to the 7th Street BART entrance (7^{th} and Kirkham) is approximately 50 feet from the BART right of way. In addition the project fronts on a high-quality transit corridor with fixed route bus service. Consequently, the proposed project meets all three conditions above

for qualification as a transit priority project. Therefore, pursuant to Section 15183.5 (c) of the CEQA Guidelines, the mobile source emissions of the project need not be included in the assessment of GHG impacts in the environmental document.